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## A REVISION OF RHODODENDRON

### II. Subgenus *Hymenanthes*

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**ABSTRACT.** A revision of the elepidote (non-scaly) species of *Rhododendron* subgenus *Hymenanthes* (Ericaceae) is presented. The subgenus is divided into 24 subsections with 225 species. Distribution maps are provided for most of the species, and taxonomic characters, relationships of the subsections of subgenus *Hymenanthes* and geographical distributions are all discussed separately. Latin descriptions are included for the taxa described for the first time. These are: *Rhododendron* subsection *Williamsiana* Chamberlain, *R. barkamense* Chamberlain, *R. lanatoides* Chamberlain and *R. oreodoxa* Franchet var. *shensiense* Chamberlain.

## CONTENTS

|                                                                           | <i>Page</i> |
|---------------------------------------------------------------------------|-------------|
| Introduction to subgenus <i>Hymenanthes</i> . . . . .                     | 209         |
| Presentation of the revision . . . . .                                    | 210         |
| Taxonomic characters . . . . .                                            | 213         |
| Taxonomic account . . . . .                                               | 219         |
| List of specimen identifications . . . . .                                | 433         |
| Relationships of the subsections of subgenus <i>Hymenanthes</i> . . . . . | 459         |
| Geographical distribution . . . . .                                       | 461         |
| Acknowledgements . . . . .                                                | 467         |
| Major references . . . . .                                                | 467         |
| Appendix—Latin descriptions . . . . .                                     | 478         |
| Index . . . . .                                                           | 479         |

## INTRODUCTION TO SUBGENUS HYMENANTHES

This account is part of a revision of the genus *Rhododendron* that is being co-ordinated at the Royal Botanic Garden, Edinburgh. The first part, a Revision of subgenus *Rhododendron* sections *Rhododendron* and *Pogonanthum* by Dr J. Cullen, was published in 1980 and comprises the first part of Volume 39 of the *Notes RBG Edinb.* This second part includes those species in subgenus *Hymenanthes* as defined by Sleumer (1949), i.e. the elepidote (non-scaly) species of *Rhododendron* excluding the 'Azaleas' and their immediate allies, subgenus

*Azaleastrum* (series *Ovatum* and *Stamineum*) and subgenus *Therorhodon* (*R. camschaticum* and its allies).

In this account the subgenus is split into 24 subsections within a single section, a treatment that generally agrees with that of Sleumer. Several significant changes have however been made, especially in subsections *Barbata* and *Selsensia*. It is realised that several of the subsections maintained here, notably subsections *Fortunea*, *Errorata*, *Maculifera* and *Taliensia*, could (and probably should) be subdivided. However, without further biosystematic research, the significance of the morphological differences that are used to delimit them cannot be properly assessed. Subdivision of these subsections therefore seems premature.

Since completion of the taxonomic account, a dissertation by W. Spethmann (1980) has been brought to my attention in which a radically new infrageneric classification of the genus *Rhododendron* is proposed, largely based on biochemical and anatomical evidence. The value of this classification may be reduced by the relatively small number of species sampled; further comments are however reserved for a later publication.

#### Reference

SPETHMANN, W. (1980). *Infragenerische Gliederung der Gattung Rhododendron unter Berücksichtigung der flavonoiden und carotinoiden Blüteninhaltsstoffe und der Entstehung der Blütenfarben*. Doctoral Diss., Hamburg University.

### PRESENTATION OF THE REVISION

The revision of subgenus *Hymenanthes* presented here closely follows the format adopted by Dr Cullen in his account of subgenus *Rhododendron*. There are however minor modifications in the treatment of some of the more significant, naturally occurring hybrids; such hybrids are not included in the keys and the descriptions are given in small type under one of the parents.

Over the past two years contact has been established with Chinese taxonomists working on *Rhododendron*. Consequently, several recently described species have come to my attention, some of them after the completion of this revision. These new species have been incorporated into the account though some have not been included in the keys and some are not fully described.

The following points should also be borne in mind.

(a) *Citation of illustrations*. As in the revision of subgenus *Rhododendron*, only illustrations that give a good representation of the species are cited. Preference is given to illustrations that are readily available. It is therefore possible that for some of the species for which no illustrations are cited, illustrations do in fact exist.

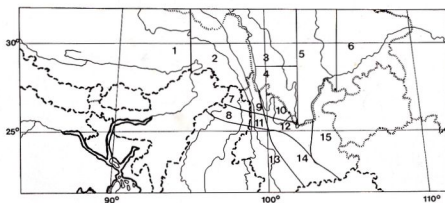
(b) *Descriptions*. Several new taxa are described for the first time in this account. Latin descriptions for these will be found in the Appendix (see p. 478).

(c) *Geographical distribution*. This is indicated by country and province only. Map 59 shows the countries most involved and the provinces of N India. Map 60 shows the provinces of western China and the divisions of them used in the descriptions of the distributions. Subgenus *Hymenanthes* is better represented in





MAP 59. Country and province names used in the description of geographical distributions.



MAP 60. Areas of Burma and China used in the description of geographical distributions. 1-2 China, Xizang: 1 S Xizang, 2 SE Xizang; 3-6 China, Sichuan: 3 NW Sichuan, 4 SW Sichuan, 5 C Sichuan, 6 E Sichuan; 7-8 Burma: 7 NE Burma, 8 E Burma; 9-15 China, Yunnan: 9 NW Yunnan, 10 N Yunnan, 11 W Yunnan, 12 C Yunnan, 13 SW Yunnan, 14 S Yunnan, 15 E Yunnan.

C and S China than is subgenus *Rhododendron*, therefore subdivisions of some of the provinces outside the western part of China are used for some of the species. The province names are transliterated in the Pinyin system even in the citation of the type specimens, though the old equivalents are also cited where confusion could arise.

(d) *Identification of specimens.* Because of the large number of herbarium specimens involved in this revision, individual specimens are not cited after the description of the species. Instead, almost every species is mapped (Maps 61-133), and a list of specimens (in alphabetical order of collectors and in numerical order under each collector) and their identifications are given on pp. 433-458. This list includes all the numbered specimens examined in detail for every species. In addition, a few of those not seen but cited by others are included (cited in *italics*) where they appear to be reliably named, but only when they add significantly to the distributions of the taxa or to the descriptions.

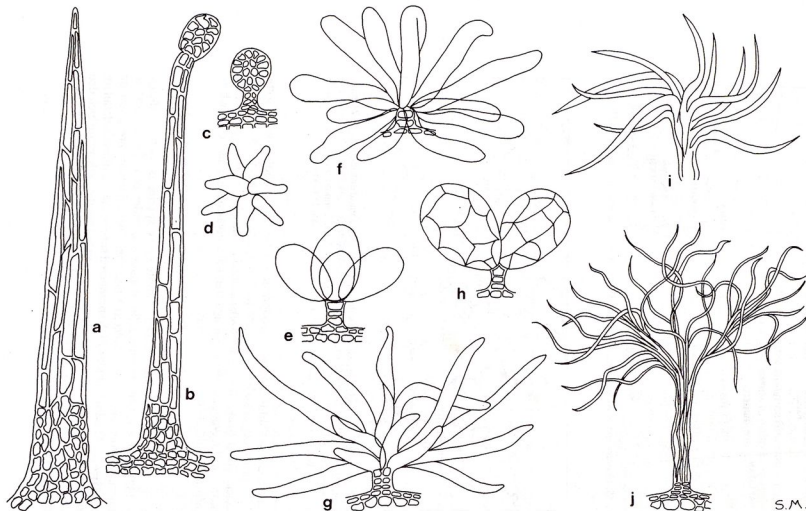


FIG. 6. *Rhododendron* hair types (diagrammatic): a, setose hair: *R. barbatum*; b, setose gland: *R. griersonianum*; c, stipitate gland: *R. fulvum*; d, e, radiate: d, *R. traillianum*, e, *R. lacteum*; f, rosulate: *R. sinogrande*; g, long-rayed: *R. alutaceum* var. *iodes*; h, vesicular: *R. vesiculiferum*; i, stellate: *R. facetum*; j, dendroid: *R. pocophorum*. (After Cowan, J. M., 1950).

S.M.

I have now seen a large amount of material collected in the last thirty years by Chinese collectors. Efforts have been made to transcribe the collectors' names into Pinyin or into some other recognisable form. However, there are problems in the transcription of some Chinese characters. It is therefore possible that some of the names are incorrectly cited or perhaps duplicated.

(e) *Maps*. The maps presented here are as accurate as possible. However, many place names found on herbarium labels are difficult to trace, and their transliteration often causes additional problems. Localities only cited in Chinese characters have proved to be particularly difficult. I am grateful to my many Chinese colleagues who have helped me to trace them. I have been fortunate to have had the opportunity to consult the specimens in several Chinese herbaria over the past 2 years. These specimens have greatly improved my knowledge of the distribution of some of the taxa mapped.

### TAXONOMIC CHARACTERS

Certain characters used in the descriptions require further discussion. This section is intended to clarify the terms used in the taxonomic account.

**GROWTH HABIT.** Most species are shrubs or trees. In general, if the plant has one or more well-defined trunks then it is considered to be a tree. If it has a number of main branches arising from near the base then it is considered to be a shrub. One or two species are dwarf shrubs growing over rocks (e.g. *R. forrestii*); for these the length of the creeping stems is given.

In contrast to subgenus *Rhododendron*, epiphytes are extremely rare and are presumed to be accidental.

**PERULAE.** The scales of the vegetative buds persist on the stems of a few of the more alpine species for several years. These scales are called perulae in the species account.

**LEAVES.** The leaves in subgenus *Hymenanthes* always persist through at least one winter. They are variable in shape and this has in the past been an important character in delimiting the subsections. However, this has led in several instances to an unnatural classification.

At maturity the leaves of members of subgenus *Hymenanthes* are glabrous, to more or less densely hairy below; more rarely they are densely hairy on both surfaces. In some species the leaves are densely hairy as they unfold but lose their indumentum as they mature. Occasionally, the lower epidermis is covered with well-developed papillae. These are covered with wax, giving a white or glaucous bloom to the epidermis. This occurs most commonly in the related subsections *Neriiflora* and *Thomsonia*.

**INDUMENTUM.** The indumentum in subgenus *Hymenanthes* provides a number of diagnostic characters for the delimitation of both species and subsections. A covering of hairs and/or glands may occur on every part of the plant. The leaf indumentum (or lack of it) is, however, the most valuable taxonomic character.

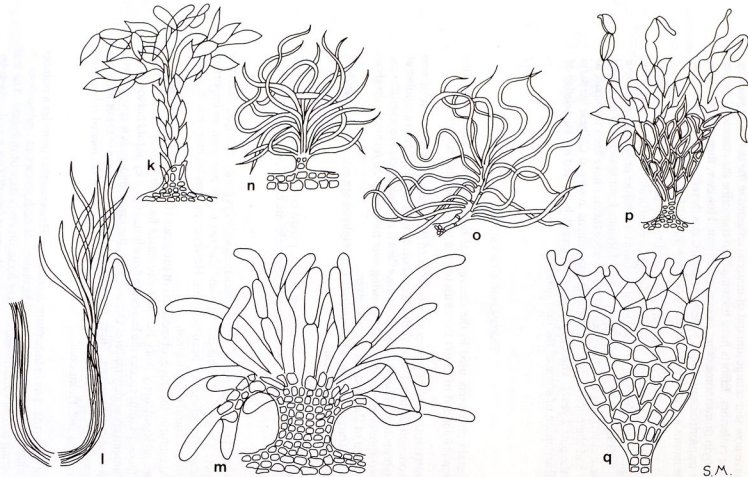


FIG. 7. *Rhododendron* hair types (diagrammatic): k, folioliferous: *R. pachytrichum*; l, flagellate: *R. longesquamatum*; m, fasciculate: *R. hookeri*; n, capitellate: *R. fulvum*; o, ramiform: *R. adenognum*; p, q, cup-shaped: p, *R. falconeri*, q, *R. basilicum*.

The leaves of a number of species are glabrous by maturity though they are sometimes densely hairy as they unfold. The loss of leaf indumentum is most probably a characteristic that has evolved several times and cannot be used as a measure of affinity. However, several subsections have leaves that are either predominantly glabrous by maturity or persistently hairy.

The hairs that comprise the indumentum of subgenus *Hymenanthes* have a wide range of relatively complex forms. It should be noted however that their structure can be obscured, especially on the leaves, by a waxy film in which the individual hairs are embedded.

In this revision the fairly conservative classification of hair types proposed by Cowan (1950) has been used. A more comprehensive classification is now available (Seithe, 1980) though the greater subdivision of hair types does not apparently help in the classification of the species within the genus. Terms used to describe the hair types in this revision are as follows:

*Setose hairs* (fig. 6). Stiff setose hairs or bristles that are sometimes gland-tipped occur particularly in subsections *Auriculata*, *Barbata*, *Glischra*, *Maculifera* and *Selensia*. These may be on the young shoots, petioles or the leaf lamina.

*Glands*. Stalked or stipitate glands (fig. 6) are widespread in the subgenus and may be found on any part of the plant (though only rarely on the corolla). Minute red sessile punctate glands occur on the undersurface of the leaves of some species, notably in subsections *Irrorata*, *Neriiflora* and *Thomsonia*. These are sometimes hair bases that remain after the rest of the hair has rubbed off.

*Radiate hairs*. These consist of sessile or shortly stalked rosettes of cells (fig. 6). The leaf indumentum may consist entirely of radiate hairs as in some species of subsection *Taliensia*. Then it generally has a powdery appearance. However, radiate hairs more usually occur as an adpressed lower layer under an upper layer composed of hairs of the dendroid or ramiform type.

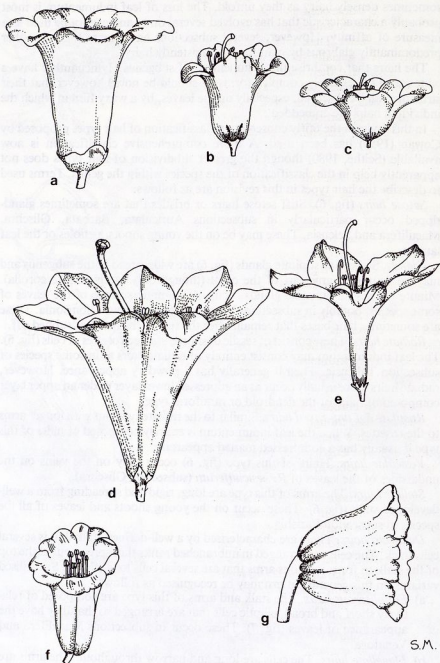
*Rosulate & Long-rayed hairs*. Similar to the radiate type but with longer arms to the rosettes. When the leaf indumentum is entirely composed of hairs of this type it usually has a compressed matted appearance.

*Vesicular hairs*. Hairs of this type (fig. 6) occur only on the veins on the undersides of the leaves of *R. vesiculiferum* (subsection *Glischra*).

*Stellate hairs*. The arms of this type are long, rigid and spreading from a well-developed stalk (fig. 6). These occur on the young shoots and leaves of all the species in subsection *Parishia*.

*Dendroid hairs*. These are characterised by a well-defined stalk that is several cells thick. The cells are arranged in unbranched ranks that spread out at the top of the stalk to form flexuous arms that are several cells long (fig. 6). Specialised variants on this general pattern may be recognised as follows:

- a) *Folioliferous hairs*. The stalk and arms of this type are composed of relatively short and broad, elliptic cells that are arranged so that they have the appearance of leaves (fig. 7). These occur in subsections *Maculifera* and *Venatora*.
- b) *Flagellate hairs*. The cells are long and narrow throughout. The arms are more or less straight and not much spreading (fig. 7).
- c) *Fasciculate hairs*. These are characterised by a broad stalk composed at the base of several tiers of short thickened cells. The arms are long and flexuous (fig. 7). The characteristic leaf indumentum of *R. fulvum* (subsection *Fulva*) is partly composed of fasciculate hairs.



S.M.

FIG. 8. *Rhododendron* corolla shapes (diagrammatic): a, b, campanulate: a, *R. thomsonii*, b, *R. campylocarpum*; c, open-campanulate: *R. souliei*; d, funnel-campanulate: *R. auriculatum*; e, f, tubular-campanulate: e, *R. griersonianum*, f, *R. irroratum*; g, oblique-campanulate: *R. falconeri*.

- d) *Capitellate hairs*. These are like fasciculate hairs but with a shorter stalk (fig. 7). These occur on the lower surface of the leaf veins of *R. hookeri* and close allies in subsection Thomsonia.

*Ramiform hairs*. These have much the same appearance as the dendroid hairs and like them, usually form a dense matted interwoven lanate indumentum. They differ in that their arms are branched (fig. 7).

*Cup-shaped hairs*. This hair type comprises a narrow base that is expanded above into a cup-shaped network of cells that may be narrow and funnel-shaped or broader and sometimes like a goblet. The rim is almost entire to deeply fimbriate (fig. 7). This hair type only occurs on the leaves of species in subsection Falconera.

**INFLORESCENCE.** The inflorescence is always a terminal raceme. It is usually few- to many-flowered, lax or dense, but in *R. forrestii* it is 1-flowered. The rhachis may be very short, when the inflorescence may be umbel-like, or it may be well-developed. In subsection Pontica the rhachis often elongates as the capsules ripen. The floral bud scales of *R. griersonianum* and *R. auriculatum* are cuspidate. In most other species they are oblong to ovate. They may be glabrous or may have a varying amount of indumentum. Bud scales are not used as taxonomic characters though they may well prove useful in defining taxa.

**CALYX.** The calyx provides several useful diagnostic characters. When well developed it may be coloured and cupular as in some species of subsections Thomsonia and Neriiflora. However, the calyx is usually green and is often reduced to a rim with minute triangular lobes. The indumentum generally is the same as that of the pedicels, though the lobes may be ciliate.

**COROLLA.** The corolla is always zygomorphic. The majority of the species have 5-lobed corollas, though those of subsections Auriculata, Falconera, Fortunea and Grandia are mostly 6–9-lobed as are those of a few species in other subsections. The length of the corolla ranges from about 2.5 to 11 cm. The tube is longer than the lobes in all but subsection Pontica in which they are more or less equal.

Corolla shape is an important character though it is difficult to categorise. The terminology used in this account follows that suggested by Cowan (*Rhododendron Yearbook* 1949: 29–58). A range of categories are illustrated in fig. 8. They are as follows:

*Campanulate*. The campanulate corolla has a broad, rounded base, a tube with more or less parallel sides and widely spreading lobes (fig. 8).

*Open-campanulate*. Similar to the preceding but with a broader, more open tube that widens slightly towards the mouth, so appearing bowl-shaped (fig. 8).

*Funnel-campanulate*. The corollas of this type have a narrow base and a tube that widens regularly towards the mouth (fig. 8).

*Tubular-campanulate*. When the tube is more clearly defined, usually by being relatively narrow, the corolla is considered to be tubular-campanulate. The tube itself may be parallel-sided or more or less tapering (fig. 8).

*Ventricose-campanulate & oblique-campanulate*. These two terms are used to describe the corollas of species in subsections Grandia and Falconera. The tube is relatively broad and the lobes are short and only slightly spreading. The tube is symmetrical in the ventricose-campanulate corolla (fig. 8) but when the corolla is



borne horizontally on the inflorescence then the tube may be obliquely asymmetrical.

Tubular-campanulate corollas often have marked depressions or nectar pouches that may be coloured differently from the rest of the corolla. The presence or absence of these nectar pouches is of some importance in the classification of the subgenus.

Those corollas with nectar pouches tend to be intensely coloured, either deep red or purple. When nectar pouches are absent the corollas tend to be paler, from white or yellow to pink. The upper petals sometimes have patches of more or less coalescing, strongly coloured spots or flecks that are usually purplish or reddish, though in subsections *Fortunea* and *Pontica* they may be yellow, brown or green. Occasionally there is also a blotch at the base of the inner surface of the corolla.

The corolla tube is occasionally pubescent on the outer surface (subsection *Fortunea* and *Griersoniana*) and also within (subsection *Irrorata* in particular).

**STAMENS.** The number of stamens is usually about twice the number of the corolla lobes and varies from 10 to 20 or more. *R. haofui* is exceptional in its 5-lobed corolla and 18–20 stamens. The stamens are usually declinate and zygomorphically arranged. The filaments are glabrous or pilose towards the base.

**OVARY.** The ovary varies from 5- to 18-locular. The number of loculi does not necessarily correlate with the number of corolla lobes. It may be glabrous, or covered with a sparse to dense indumentum that is sometimes at least partly glandular. The ovary is generally more or less abruptly contracted into style though in *R. neriiflorum* and its immediate allies it is tapering.

The style is usually glabrous though it may be glandular and/or tomentose. The stigma is usually capitate though in subsections *Falconera* and *Grandia* and in *R. calophytum* and *R. asteronchoum* (subsection *Fortunea*) it is more massive and discoid.

**CAPSULE.** The capsule is cylindrical, oblong to linear, and may be straight or curved to rarely circinnate. The ovary indumentum generally only persists for a short while and often is soon reduced to protruberant hair bases. Capsule characters have not been used in the classification of the subgenus though differences in capsule shape are sometimes diagnostic at species level.

**SEEDS.** The seeds of subgenus *Hymenanthus* are fusiform and almost always winged. There is much variation in the development of the wings which may be irregular and are sometimes broken up into finger-like projections at the ends of the seeds. This variation is not however of much taxonomic value. For a discussion on seed morphology see Hedegaard (1980).

#### Reference

- HEDGEGAARD, J. 1980. *Morphological Studies in the Genus Rhododendron*. Copenhagen.

TAXONOMIC ACCOUNT

Subgenus **Hymenanthes** (Blume) K. Koch, Dendrologie 2: 170 (1872).

Syn.: Genus *Hymenanthes* Blume, Bijdragen Fl. Nederlandsch Indie 862 (1826).

Subgenus *Eurhododendron* auct. plur, incl. Sleumer (1949)\*, non K. Koch (1872).

Description as for sect. Ponticum, the only section.

Type species: *Rhododendron japonicum* (Blume) Schneider (*Hymenanthes japonica* (Blume)).

Section **Ponticum** G. Don, Gen. Hist. 3: 843 (1834).

Syn.: Section *Leiorrhodium* Rehder, J. Arnold Arbor. 15: 269 (1934).

Dwarf shrubs to large trees. Leaves evergreen, only rarely aromatic (*R. taliense*). Scales absent. Plants glabrous or with varying types of indumentum on the young shoots, bud scales, leaves, pedicels, calyx, ovary, style and stamens. Calyx obsolete to well-developed. Corolla 5–10-lobed, open- or ventricose-campanulate to tubular-campanulate, with or without nectar pouches. Stamens 10–20, declinate. Ovary 5–20-locular. Capsule with hard woody valves. Seeds winged or unwinged. Type species: *R. ponticum* L.

A large section divided into the following 24 subsections:

1. Young shoots and usually petioles setulose to setose-glandular .....2
- + Young shoots sometimes stipitate-glandular or tomentose but never setulose .....11
2. Corolla 7-lobed; stamens c. 14.....**II. Auriculata** (p. 240)
- + Corolla 5-lobed; stamens 10 .....3
3. Outer surface of corolla tube densely hairy .....**XIX. Griersoniana** (p. 374)
- + Outer surface of corolla glabrous .....4
4. Corolla campanulate to funnel-campanulate, without nectar pouches, white or yellow to clear pink, not scarlet or carmine .....5\*
- + Corolla tubular-campanulate, with nectar pouches, often deep scarlet ....7
5. Leaf apex acute to cuspidate, lamina setose to densely lanate-tomentose below .....**IX. Glischra** (p. 283)
- + Leaf apex rounded, apiculate to shortly acuminate, lamina glabrous to tomentose below .....6
6. Corolla open-campanulate or if campanulate then style glandular to tip (C Sichuan, E Guizhou).....**V. Williamsiana** (p. 260)
- + Corolla funnel-campanulate; style glabrous (S Xizang, NE Burma, W Yunnan).....**VIII. Selensia** (p. 274)
7. Rhachis up to 40 mm; style glandular, at least in the lower half  

**XX. Parishia** (*R. kyawi*) (p. 376)
- + Rhachis 5–10 mm; style glabrous or glandular only at base .....8
8. Inflorescence 2–8(–12)-flowered; leaf apex usually rounded and apiculate .....**XXII. Neriiflora** (p. 384)
- + Inflorescence 7–20-flowered; leaf apex cuspidate to rounded .....9

\* For a discussion of the application of subgen. *Rhododendron* see *Notes RBG Edinb.* 39(1): 4.

\* But see *R. diphricalyx* (p. 287).

9. Leaf apex cuspidate; inflorescence 8–12-flowered (C & E Sichuan)  
**VII. Maculifera** (p. 267)  
 + Leaf apex acute to rounded; inflorescence 7–25-flowered (Indo-Himalayas eastwards to Yunnan) .....10
10. Leaves  $3.5-4 \times$  as long as broad, apex acute, lower lamina glabrous at maturity though with a thin white folioliferous indumentum overlying midrib.....**X. Venatora** (p. 290)  
 + Leaves up to  $3.2 \times$  as long as broad, apex acute to rounded, lower surface often with setae towards base, especially on midrib  
**XXI. Barbata** (p. 379)
11. Corolla (5–)6–10-lobed; stamens (10–)12–18 .....12  
 + Corolla 5-lobed; stamens 10(–20).....17
12. Leaves glabrous at maturity .....13  
 + Leaves with a  $\pm$  continuous indumentum at maturity.....15
13. Leaves (12–)20–37 cm long; ovary tomentose, eglandular  
**III. Grandia** (p. 241)  
 + Leaves usually less than 20 cm long, if more then ovary glabrous or stipitate-glandular .....14
14. Corolla open-campanulate, lacking nectar pouches; ovary glabrous or glandular .....**I. Fortunea** (p. 224)  
 + Corolla campanulate to tubular-campanulate, with nectar pouches; ovary glabrous or with a few rufous hairs  
**XI. Irrorata** (*R. anthosphaerum*) (p. 303)
15. Leaf indumentum at least partly composed of cup-shaped hairs  
**IV. Falconera** (p. 251)  
 + Leaf indumentum not composed of cup-shaped hairs .....16
16. Ovary tomentose to glandular, or if glabrous then leaf indumentum thin and agglutinated.....**III. Grandia** (p. 241)  
 + Ovary glabrous; leaves with a thick lanate indumentum  
**XV. Taliensia** (*R. clementinae*) (p. 358)
17. Corolla open- to funnel-campanulate, nectar pouches lacking.....18  
 + Corolla campanulate to tubular-campanulate, with nectar pouches .....43
18. Leaf lamina glabrous below at maturity or with an indumentum of scattered hairs .....19\*  
 + Leaf lamina with a discontinuous, matted or floccose indumentum or with a sparse to dense, continuous indumentum below at maturity .....28
19. Style glandular to tip.....20  
 + Style glabrous or glandular at base (rarely for up to half its length).....23
20. Lower surface of leaf midrib with a persistent indumentum; dwarf shrub, to c. 1.3 m .....**XV. Taliensia** (*R. codonanthum*) (p. 337)  
 + Lower surface of leaf midrib glabrous at maturity; shrubs or small trees, to c. 8 m .....21

\* See also *R. dignabile* in subsect. *Taliensia* (p. 365).

21. Calyx 1–3.5 mm; leaf apex acute, lower surface of leaf with numerous sessile hair-bases overlying the veins ..... **XI. Irrorata** (p. 290)  
+ Calyx 3–20 mm; leaf apex rounded or acute, red sessile hair-bases lacking .....22
22. Corolla yellow or pink to (occasionally) white; stamens 10 (China) ..... **VI. Campylocarpa** (p. 262)  
+ Corolla white; stamens 12–18 ..... **I. Fortunea** (p. 224)
23. Young shoots and petioles densely tomentose, tomentum extending along the midrib on the lower surface of the leaves ..... **VII. Maculifera\*** (p. 267)  
+ Young shoots and petioles glabrous, glandular or sometimes sparsely tomentose though tomentum not usually extending along midrib .....24
24. Corolla with lobes equalling tube, often with brownish or yellow to greenish flecks (America, Europe, Turkey, USSR, Japan, Korea, Taiwan) ..... **XII. Pontica** (p. 305)  
+ Corolla with lobes much shorter than tube, flecks, if present, red to purple (India, China, Burma) .....25
25. Ovary glabrous ..... **I. Fortunea†** (p. 224)  
+ Ovary stipitate-glandular to hairy .....26
26. Leaf with apex acute to cuspidate, red hair-bases sometimes present on the veins on the lower surface ..... **XI. Irrorata** (p. 290)  
+ Leaf with apex rounded and apiculate, red hair-bases absent .....27
27. Corolla funnel-campanulate, white, sometimes flushed pink (rarely pink) ..... **VIII. Selensia** (p. 274)  
+ Corolla open-campanulate to campanulate, clear yellow or pink (rarely white) ..... **VI. Campylocarpa\*\*** (p. 262)
28. Ovary glabrous (or occasionally with a few scattered hairs) .....29  
+ Ovary sparsely to densely tomentose and/or glandular .....35
29. Leaf indumentum brown to rufous .....30  
+ Leaf indumentum white to fawn .....33
30. Leaf indumentum two-layered; the lower layer usually compacted and whitish, ± obscured by the upper layer .....31  
+ Leaf indumentum apparently one-layered, lacking the lower whitish layer .....32
31. Upper layer of leaf indumentum lanate, composed of ramiform hairs ..... **XV. Taliensia** (p. 333)  
+ Upper layer of leaf indumentum granular, partly composed of capitate hairs ..... **XVI. Fulva** (p. 366)

\* *R. pubicostatum* (subsect. *Taliensia*) may also key out here.

† Some forms of *R. przewalskii* (subsect. *Taliensia*) will also key out here.

\*\* Some forms of *R. oreodoxa* (subsect. *Fortunea*) will key out here.



- † *R. schistocalyx* (subject, *Parishia*) will also key out here.

- |                                                         |                          |
|---------------------------------------------------------|--------------------------|
| 1. Style glandular to tip.....                          | 2                        |
| + Style glabrous or with a few glands towards base..... | 11                       |
| 2. Calyx large, (7-) 15-20 mm (Indo-Himalaya) .....     | 15. <i>griffithianum</i> |
| + Calyx 1-10 mm .....                                   | 3                        |



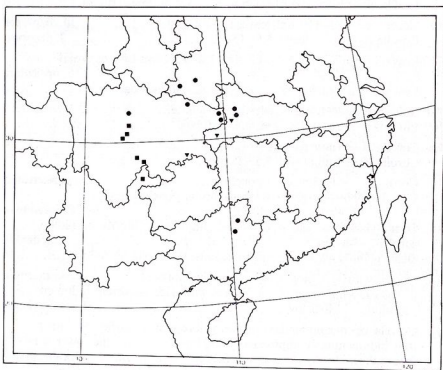
3. Rhachis 5–10 mm; stylar glands usually red; leaves  $1.5\text{--}2.2 \times$  as long as broad ..... **8. vernicosum**
- + Rhachis 15–60 mm; stylar glands white; leaves  $1.7\text{--}4 \times$  as long as broad ..... 4
4. Leaf apex long-cuspidate; corolla pale to purplish or lilac ..... **4. huianum\***
- + Leaf apex rounded to acuminate; corolla white or pink ..... 5
5. Leaf base cordate (Mt Omei) ..... **13. hemsleyanum**
- + Leaf base rounded (C & E China) ..... 6
6. Outer surface of corolla and pedicels densely covered in long-stipitate glands ..... **7. glanduliferum**
- + Outer surface of corolla and pedicels sparsely covered in short-stipitate glands or glabrous ..... 7
7. Filaments glabrous ..... 8
- + Filaments puberulent below ..... 9
8. Corolla 75–90 mm; leaves 16–22.5 cm ..... **11. faithae**
- + Corolla 55–70 mm; leaves 8–18 cm ..... **12. fortunei**
9. Leaf lamina broadly elliptic,  $1.4\text{--}1.7 \times$  as long as broad ..... **14. platypodium**
- + Leaf lamina oblanceolate to elliptic,  $1.7\text{--}3 \times$  as long as broad ..... 10
10. Corolla (65–)80–110 mm; leaves 12–19(–30) cm ..... **10. diaprepes**
- + Corolla 45–60 mm; leaves 5.5–15 cm ..... **9. decorum**
11. Leaves orbicular to ovate-orbicular,  $1.2\text{--}1.5 \times$  as long as broad ..... **16. orbiculare**
- + Leaves ovate to oblanceolate,  $1.7\text{--}6 \times$  as long as broad ..... 12
12. Inflorescence 5–12-flowered; stigma capitate ..... 13
- + Inflorescence 5–30-flowered; stigma discoid ..... 17
13. Corolla 25–40 mm; leaves 6–14 cm ..... 14
- + Corolla 40–70 mm; leaves 9.5–25 cm ..... 15
14. Corolla 5-lobed, with nectar pouches ..... **18. praeteritum**
- + Corolla 7-lobed (rarely 5–6-lobed), nectar pouches lacking ..... **17. oreodoxa**
15. Ovary glandular; leaf apex long-acuminate to shortly cuspidate; corolla 7–8-lobed ..... **3. davidii**
- + Ovary glabrous; leaf apex shortly acuminate; corolla 5(–6)-lobed ..... 16
16. Corolla with basal blotch; leaves entirely glabrous below ..... **2. praevernium**
- + Corolla lacking basal blotch; leaves with a  $\pm$  persistent indumentum along midrib below ..... **1. sutchuenense**
17. Corolla open-campanulate; leaves glabrous at maturity or with a thin indumentum composed of long-rayed hairs on the lower surface of the midrib ..... **5. calophytum**
- + Corolla funnel-campanulate; lower surface of leaves at maturity with a sparse whitish indumentum composed of scattered stellate hairs ..... **6. astrochnoum**

\* See also *R. davidii*, p. 228.

1. (163.†) *R. sutchuenense* Franchet, J. Bot. (Morot) 9:392 (1895). Type: China, E Sichuan, aux environs de Tchen-keou-tin, *Farges* (iso.E). Ic.: Millais, *Rhododendrons* ed. 1:16, t. (1917).

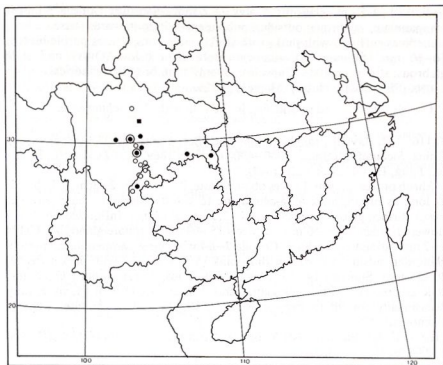
Shrub, 1–5 m. Leaves oblong-lanceolate, 11–25 × 3.5–5 cm, 3.3–4.2 × as long as broad, apex acuminate to cuspidate, base broadly cuneate, lower surface with a floccose, ± persistent indumentum along the midrib, otherwise glabrous; petioles 1.7–2.5 cm, with a floccose indumentum. Inflorescence c.10-flowered; rhachis 10–15 mm; pedicels 20–25 mm, glabrescent. Calyx 1–2 mm, glabrous. Corolla 5(–6)-lobed, widely campanulate, glabrous outside, densely puberulent within, rose-pink, with darker flecks but no basal blotch, 50–75 mm; stamens 12–15, filaments with hairs at base. Ovary and style glabrous; stigma capitate. Capsule 45–50 × c. 12 mm, slightly curved. CHINA (N Sichuan, Shaanxi, Hubei, Guizhou, Guangxi). Forests, etc. Map. 61.

A specimen, *Chu, K. N.* 2309, from Sichuan, Tien chuan, has a few-flowered inflorescence as in *R. sutchuenense* but has glabrous leaves and a large stigma as in *R. calophytum* var. *openshawianum*. The status of this plant remains in doubt.



MAP 61. ● *R. sutchuenense*; ▼ *R. praeevernum*; ■ *R. davidii*.

† The numeration of species follows on from that of Cullen (1980).



MAP 62. ● *R. calophytum* var. *calophytum*; ○ var. *openshawianum*; ■ *R. asterochnoum*.

1\*. *R. × geraldii* (Hutchinson) Ivens, Gard. Chron. ser. 3, 101: 220 (1937) — *R. sutchuenense* × *R. praevernium*.

Syn.: *R. sutchuenense* Franchet var. *geraldii* Hutchinson, Gard. Chron. ser. 3, 67:127 (1920). Type: presumed to be a plant grown by Gerald Loder and exhibited in 1920—n.v.

Intermediate between the two parents; leaves with a  $\pm$  persistent indumentum on the lower surface of the midrib; corolla with a pronounced blotch.

Wilson's field notes for plants referred to *R. sutchuenense* (*Pl. Wilsonianae* 1:544, 1913) indicate that the four plants collected under the number 509 had corollas with a blotch, suggesting that they are not referable to *R. sutchuenense* in the strict sense. Indeed, the two unlocalised herbarium specimens seen (*Wilson* 509, 509a) are almost certainly referable to *R. × geraldii* though they are apparently closer to *R. praevernium* than they are to *R. sutchuenense*. In cultivation plants raised from seed as *Wilson* 509 have proved to be very variable (see Osborn in *Gard. Chron.* ser. 3, 73:159, 1923) suggesting a hybrid origin for at least part of this batch of seed. It therefore seems probable that the hybrid occurs in the wild when the two parents meet.

2. (164.) *R. praevernium* Hutchinson, Gard. Chron. ser. 3, 67:127 (1920). Syntypes: China, W Hubei, iii & ix 1900, *Wilson* 17 (E, K); 1908, *Wilson* 507 [error for *Wilson* 509?]; S Patung, *Henry* 5285 (K).

Shrub. Leaves elliptic-oblongate, 10–18 × 2.5–6 cm, 3–4 × as long as broad, apex acuminate, base broadly cuneate, lower surface entirely glabrous; petioles 1–1.5 cm, glabrous. Inflorescence c. 10-flowered; rhachis c. 10 mm;

pedicels 1–1.5 cm, glabrous. Calyx 1–2 mm, glabrous. Corolla 5-lobed, campanulate, glabrous outside, puberulent within towards base, white, sometimes suffused with pink, with flecks and a conspicuous purple blotch, 50–60 mm. Stamens 10, filaments puberulent below. Ovary and style glabrous; stigma capitate. Capsule c.  $30 \times 12$  mm, broadly cylindrical. CHINA (SE Sichuan, Hubei). Map 61, p. 226.

Closely allied to and hybridising in the wild with *R. sutchuenense*.

3. (165.) *R. davidii* Franchet, Bull. Soc. Bot. France 33:230 (1886). Type: China, Sichuan, Moupine, 3000–4000 m, ii–iv 1869, *Père David* (iso. E, K). Ic.: Fang, Pl. Omeiens. t.28 (1942).

Shrub or tree, 3–8 m. Leaves oblanceolate,  $9.5\text{--}15.5 \times 2\text{--}3$  cm,  $3.5\text{--}5.2 \times$  as long as broad, apex long-acuminate to shortly cuspidate, base cuneate, lower surface glabrous; petioles 1.5–2.5 cm, glabrous. Inflorescence 7–12-flowered; rhachis 25–60 mm; pedicels 15–20 mm, stipitate-glandular. Calyx 1–2 mm, stipitate-glandular. Corolla 7–8-lobed, open-campanulate, sparsely glandular outside, glabrous within, pink to rose-purple, with darker flecks, 40–55 mm. Stamens 14–16, filaments glabrous. Ovary stipitate-glandular; style glabrous or with a few glands and then usually only at the base, only occasionally for up to two-thirds of its length, stigma capitate. Capsule unknown.

CHINA (C & S Sichuan, NE Yunnan). Open places, bamboo thickets, 1900–4000 m. Map 61, p. 226.

Allied to *R. huianum* but lacking the well-developed calyx of that species. The style is usually  $\pm$  glabrous though even the type has some glandular styles.

4. (166.) *R. huianum* Fang in Contr. Biol. Lab. Sci. Soc. China Bot. ser. 12: 38 (1939). Syntypes: China, Sichuan, Ma-pien hsien, Shiao Liang-shan, 2500 m, 20 vi 1930, Fang 4546 (fr. –SZ); N of Ma-pien-hsien, 2400–2700 m, 11 v 1931, Wang 22900 (fl. –A, E).

Shrub or small tree, 2–9 m. Leaves oblanceolate,  $10\text{--}12.5 \times 2\text{--}3$  cm,  $3.3\text{--}5 \times$  as long as broad, apex long-cuspidate, base cuneate, lower surface glabrous; petioles 2–2.5 cm, glabrescent. Inflorescence 6–10-flowered; rhachis (10–) 30–60 mm; pedicels 25–40 mm, glabrous. Calyx 5–10 mm, lobes rounded, glabrous or gland-fringed. Corolla 7-lobed, open-campanulate, glabrous, pale red to purplish or lilac, 35–50 mm. Stamens 12–14, filaments glabrous. Ovary glandular; style glandular to tip, stigma capitate. Mature capsule not known. CHINA (NE Yunnan, Sichuan). Forests and thickets, 1000–2700 m. Map 65, p. 235.

Allied to *R. davidii* but differing in the larger calyx. Fang (loc. cit.) remarks on the similarity in leaf shape with *R. calophytum* var. *openshawianum* but notes the obvious floral difference between the two species.

5. (167.) *R. calophytum* Franchet, Bull. Soc. Bot. France 33:230 (1886).

Tree, (2–)5–12 m. Leaves oblong-oblanceolate,  $14\text{--}30 \times 4\text{--}7.2$  cm,  $3.5\text{--}6 \times$  as long as broad, apex cuspidate to acuminate, base cuneate, lower surface glabrous when mature, or with vestiges of juvenile indumentum persisting along the midrib; petioles 1–2 cm, stout, glabrous or with a thin indumentum.

Inflorescence 5–30-flowered; rhachis 12–20 mm; pedicels 30–55 mm, glabrous. Calyx c. 1 mm, glabrous. Corolla 5–7-lobed, open-campanulate, glabrous, pinkish white with purple flecks and a basal blotch, 40–60 mm. Stamens 15–20, filaments puberulent below. Ovary and style glabrous; stigma discoid. Capsule 25–33 × 6–12 mm.

CHINA (C & E Sichuan, NE Yunnan). Forests, etc., 1800–4000 m. Map 62, p. 227.

1. Leaves 18–30 cm long, apex acuminate; inflorescence 15–30-flowered ..... **5a. var. calophytum**  
 + Leaves 14–18.5 cm long, apex cuspidate; inflorescence 5–10-flowered..... **5b. var. openshawianum**

**5a. var. calophytum.** Type: China, Sichuan, Moupine, 4000 m, 1870, *Père David* (iso. E).

Ic.: Bot. Mag. 153: t. 9173 (1929); Fang, Pl. Omeiens. t. 26 (1942).

**5b var. openshawianum** (Rehder & Wilson) Chamberlain, Notes R.B.G. Edinb. 37: 330 (1979)

Syn.: *R. openshawianum* Rehder & Wilson in Pl. Wilsonianae 1: 543 (1915).

Type: China, W Sichuan, Yung Ching hsien, Wa Wu shan, 2300–2800 m, 18 ix 1908, *Wilson* 3414 (holo. A; iso. K).

Ic.: Fang, Pl. Omeiens. t. 27 (1942).

**6. (168.) R. astrochnoum** Diels, Feddes Repert. 17: 296 (1921). Type: China, Sichuan, Wen tchuan hsien, in valle Scha pa, 3500–4000 m, 27 iv 1914, *Limpricht* (iso. K).

Small tree. Leaves oblanceolate, 18–20 × 5–6 cm, c. 3.5 × as long as broad, apex rounded, base cuneate, lower surface with a sparse discontinuous whitish stellate indumentum; petioles 1.5–2.5 cm, floccose. Inflorescence 15–20-flowered; rhachis 20–25 mm; pedicels 35–50 mm, glabrous or with a few hairs. Calyx c. 2 mm. Corolla 5-lobed, funnel-campanulate, white tinged with rose, apparently with a basal blotch, c. 45 mm. Stamens c. 20, puberulent at base. Ovary and style glabrous; stigma discoid.

CHINA (C Sichuan). Map 62, p. 227.

Most probably allied to *R. calophytum* with which it shares the discoid stigma and large number of stamens but from which it differs in its stellate leaf indumentum, a unique feature in subsection *Fortunea*.

**7. (169.) R. glanduliferum** Franchet in Bull. Soc. Bot. France 33: 231 (1886). Type: China, NE Yunnan, ad Ta'kuan, *Delavay* 295 (iso. E).

Shrub. Leaves oblong-lanceolate, ± glabrous below; petioles c. 2.5 cm, glabrous. Inflorescence 5–6-flowered; rhachis elongate; pedicels densely covered with long-stipitate glands. Calyx c. 3 mm, lobes rounded, stipitate-glandular. Corolla 7–8-lobed, funnel-campanulate, densely long-stipitate-glandular on outer surface, white, c. 50 mm. Stamens 14–16, filaments glabrous. Ovary and style stipitate-glandular.

CHINA (NE Yunnan). Map 65, p. 235.

Only known for certain from the type specimen which is very incomplete. The long-stipitate glands on the corollas are unlike those found on any of the

remaining species in the subsection. A specimen, *Feng, K. M.* 73436 from NE Yunnan, with setose-glandular capsules,  $45-50 \times c. 18$  mm, probably belongs to this species but, without flowers, a definite determination cannot be made.

8. (170.) *R. vernicosum* Franchet, J. Bot. (Morot) 12: 258 (1898). Type: China, W Sichuan, Tongolo, *Soulié* 812 (iso. E).

Syn.: *R. lucidum* Franchet, J. Bot. (Morot) 9: 390 (1895), non Nuttall (1853).

*R. sheltonii* Hemsley & Wilson, Kew Bull. 1910: 108 (1910). Type: China, Sichuan, neighbourhood of Tatsienlu, 2750–3000 m, *Wilson* (Veitch) 3977 (iso. K).

*R. euanthum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 10: 103 (1917). Type: China, NW Yunnan, western flank of the Lichiang Range, 11–12000 ft, vi 1910, *Forrest* 5880 (holo. E; iso. K).

*R. rhanthum* Balfour f. & W. W. Smith, *ibid.* 10: 145 (1917). Type: China, NW Yunnan, Lichiang Range, 10–11000 ft, vi 1913, *Forrest* 10075 (holo. E).

*R. hexamerum* Handel-Mazzetti, Akad. Wiss. Wien Math.-Naturwiss. Kl. Anz. 4–5 (1921). Type: China, Sichuan, in fruticetis jugi Schao-schan, ad merid. urbis Ningyuen, 22–2700 m, 15 iv 1914, *Handel-Mazzetti* 1343–n.v.

*R. adoxum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 28 (1922). Type: NW Yunnan, Yunling Mountains, 13000 ft, vii 1917, *Forrest* 15226 (holo. E; iso. K).

*R. araliiforme* Balfour f. & Forrest, *ibid.* 13: 232 (1922). Type: China, NW Yunnan, Mekong/Salween Divide, 10000 ft, vii 1917, *Forrest* 14151 (holo. E).

Ic.: Millais, *Rhododendrons* ed. 2: 28, t. (1924).

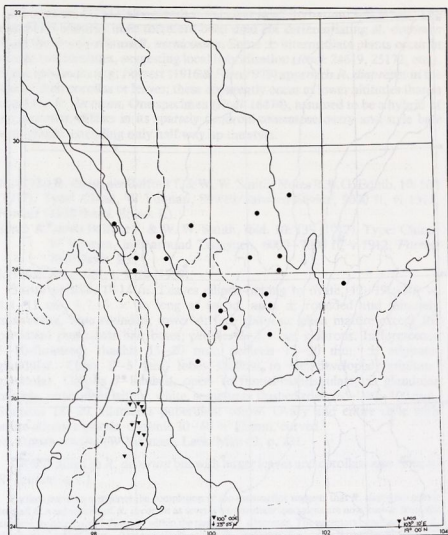
Shrub or tree, 1.3–8 m. Leaves elliptic to ovate- or obovate-elliptic,  $(4.5- ) 7-10 \times 2.7-5$  cm,  $1.5-2.2 \times$  as long as broad, apex rounded, mucronate, base rounded, lower surface with minute punctulate hairs; petioles 2–3 cm, glabrous. Inflorescence 6–10-flowered; rhachis 5–10 mm; pedicels 17–30 mm, stipitate-glandular. Calyx c. 2 mm, lobes rounded, stipitate-glandular. Corolla 6–7-lobed, broadly funnel-campanulate, glabrous, pale rose to pinkish-purple, with crimson flecks, 35–50 mm. Stamens c. 14, filaments glabrous. Ovary and style stipitate-glandular, glands red. Capsule  $17-30 \times 7-12$  mm, curved.

CHINA (N Yunnan, SW Sichuan). Thickets, mixed forest, open slopes, 2600–3650 m. Map 63.

The following specimens without flowers probably belong to this species: *Forrest* 23025; *Rock* 18139; *Yü* 13961, 14694.

Closely allied to *R. decorum* (q.v.) and to *R. fortunei* but differing in its red stylar glands. From the type description *R. hexamerum* is apparently closer to *R. vernicosum* than it is to *R. decorum* on account of its broad leaves and glabrous filaments.

9. (171.) *R. decorum* Franchet, Bull. Soc. Bot. France 33: 230 (1886). Syntypes: China, Sichuan, Moupin, 3000 m, *Père David* (n.v.); ad montem Tsong Chan, 2200 m, *Delavay* 1123 (n.v.); supra Ta-pin-tze, 22 v 1886, *Delavay*, s.n. (E,K).



MAP 63. ● *R. vernicosum*; ▼ *R. diaprepes*.

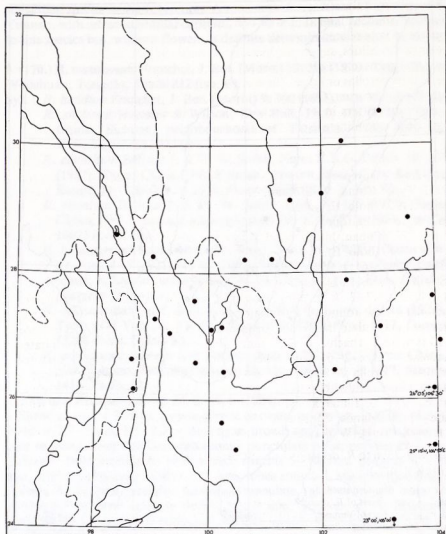
Syn.: *R. franchetianum* Léveillé, Bull. Soc. Agric. Sarthe 39: 45 (1903). Syntypes: China, Yunnan, environs de Yunnan-sen, 11 xi 1896, Bodinier (E) & 28 iii 1897, Ducloux (E).

*R. spooneri* Hemsley & Wilson, Kew Bull. 1910: 110 (1910). Syntypes: China, W Sichuan, nr Tatsien-lu, 2650–3650 m, vi 1904, Wilson 3975 (A); NW Yunnan, Tsekou, Monbeig (K).

*R. giraudissii* Léveillé, Feddes Repert. 18: 340 (1914). Type: China, E Yunnan, mont de Siao-ou-long, 2700 m, vi 1913, Maire (holo. E).

Ic.: Bot. Mag. 142: t. 8659 (1916).

Shrub or small tree, 1–6 m. Leaves oblanceolate to elliptic, (5.5–)7–15 × (2.2–)3–6.8 cm, (2–)2.3–3 × as long as broad, apex ± rounded, mucronate,



MAP 64. ● *R. decorum*.

base rounded, lower surface glabrous when mature except for punctulate hair bases; petioles 1.5–4 cm, glabrous. Inflorescence 7–10-flowered; rhachis 15–30 mm; pedicels 15–30 mm, stipitate-glandular. Calyx 1–3 mm, lobes minute, rounded, stipitate-glandular. Corolla 6–7-lobed, funnel-campanulate, usually sparsely glandular outside, often more densely so within, white to pale pink, with or without green or crimson flecks, 45–55(–62) mm. Stamens 14–16, filaments puberulent below. Ovary and style stipitate-glandular, glands whitish. Capsule 20–30 × c. 12 mm, usually slightly curved. NE BURMA, CHINA (Yunnan, Sichuan, W Guizhou). Dry situations, in open forests and amongst scrub, (1800–)2500–3600 m. Map 64.



The colour of the styler glands is not clear in all herbarium specimens. The pubescent stamens have therefore been used for differentiating *R. decorum* from the closely related *R. vernicosum*. Some  $\pm$  intermediate plants occur in one or two localities, suggesting local hybridisation (*Rock* 24619, 25172, etc.). Some specimens (e.g. *Forrest* 11916 & *Farrer* 979) approach *R. diaprepes* in the size of their corollas or leaves; these apparently occur at lower altitudes than is usual for *R. decorum*. One specimen (*Rock* 16474), assumed to be a hybrid of *R. decorum*, differs in its sparsely dendroid-tomentose ovary and style base with glands extending only half way up the style.

**10. (172.) *R. diaprepes*** Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 10: 100 (1917). Type: China, W Yunnan, Shweli/Salween Divide, 9000 ft, vi 1913, *Forrest* 11958 (holo. E; iso. K).

Syn.: *R. rarile* Balfour f. & W. W. Smith, ibid. 10: 139 (1917). Type: China, W Yunnan, hills around Tengyueh, 6000–7000 ft, v 1912, *Forrest* 7940 (holo. E).

Ic.: Bot. Mag. 161: t. 9524 (1938).

Shrub or tree, 1–14 m. Leaves elliptic-oblong to ovate, 12–19(–30)  $\times$  4.4–11 cm, 1.7–3  $\times$  as long as broad, apex  $\pm$  rounded and minutely mucronate, base rounded, lower surface glabrous when mature except for persistent punctulate hair bases; petioles 2–3.5 cm, glabrous. Inflorescence 5–10-flowered; rhachis 15–20 mm; pedicels 15–30 mm,  $\pm$  stipitate-glandular. Calyx 2–6 mm, lobes shallow to well-developed, stipitate-glandular. Corolla 7–8-lobed, open- to funnel-campanulate,  $\pm$  glandular outside, puberulent within, white, sometimes flushed rose, (65–)80–100 mm. Stamens 18–20, filaments puberulent below. Ovary and entire style with white-stipitate glands. Capsule 30–60  $\times$  12 mm, curved.

NE BURMA, CHINA (W Yunnan), Laos. Map 63, p. 231.

Closely allied to *R. decorum* but with larger leaves and corollas, also close to *R. faithae* (q.v.).

Further material seen since the completion of the manuscript suggests that *R. diaprepes* is best treated as a subspecies of *R. decorum* as several intermediate specimens are now known from the extreme western part of Yunnan, within the range of *R. diaprepes*. The necessary combination is *R. decorum* Franchet subsp. *diaprepes* (Balfour f. & W. W. Smith) T. L. Ming, based on *R. diaprepes* as cited above.

**11. (173.) *R. faithae*** Chun in Sunyatsenia 2: 78, t.19 (1934). Type: China, Guangdong, Sunji, Shektung, 21 vii 1931, *Ko, S. P.* 51693 (holo. Herb. Inst. Bot. Guangzhou; iso. E).

Shrub, c. 4 m. Leaves elliptic, 16–22.5  $\times$  6–8.5 cm, 2.5–3.2  $\times$  as long as broad, apex rounded, mucronate, base rounded, lower surface glabrous; petioles 3–4 cm, glabrous. Inflorescence c. 10-flowered; rhachis c. 50 mm; pedicels 25–35 mm, stipitate-glandular. Calyx c. 2 mm, with shallow, stipitate-glandular lobes. Corolla c. 7-lobed, open-campanulate, sparsely stipitate-glandular outside, glabrous within, probably white and lacking flecks, 75–90 mm. Stamens c. 14, filaments glabrous. Ovary and entire style glandular. Capsule not known.

CHINA (Guangdong, Guangxi). Map 65, p. 235.

Closely resembling *R. diaprepes* but differing in the glabrous filaments, etc. A large-leaved fruiting specimen from Jiangxi, *Wilson* 'A' 1686, may belong to this species.

**12. (174.) *R. fortunei* Lindley, Gard. Chron. 1859: 868 (1859).**

Shrub or tree, 3–10 m. Leaves broadly oblanceolate to obovate, 8–18 × 2.5–6 cm, 1.7–4 × as long as broad, apex ± acute to rounded and mucronate, base rounded, lower surface glabrous except for persistent punctulate hair bases; petioles 1.2–3 cm, glabrous. Inflorescence 5–12-flowered; rhachis 15–40 mm; pedicels 25–40 mm, stipitate-glandular or glabrous. Calyx 1–3 mm, lobes minute, rounded, stipitate-glandular or glabrous. Corolla 7-lobed, open-to funnel-campanulate, glandular or glabrous outside, glabrous within, pale rose, sometimes becoming almost white, 55–70 mm. Stamens 14–16, filaments glabrous. Ovary and entire style stipitate-glandular. Capsule 25–40 × c. 12 mm, straight or curved.

Open woods, etc., 600–2300 m. Map 65.

1. Leaves obovate, 1.8–2.5 × as long as broad ..... **12a. subsp. *fortunei***  
 + Leaves oblanceolate, 2.8–4 × as long as broad ..... **12b. subsp. *discolor***

**12a. subsp. *fortunei*.** Type: a cultivated specimen grown by Mr Glendinning, collected in China, Zhejiang Prov., W of Ningpo, by Mr Fortune – (n.v.).

Syn.: ?*R. albicaule* Léveillé in Feddes Repert. 18: 148 (1914). Type: China, Guizhou, montagnes de Sin Tchen, près Hin-y-Hien, vi 1912, *Cavalerie* 3923 (holo. E; iso. K).

Ic.: Bot. Mag. 92: t. 5596 (1866).

CHINA (E Sichuan, Guangxi, Hunan, Guangdong, Jiangxi, Fujian, Anhui, Zhejiang).

*Cavalerie* 4387 & 7826, from Yunnan-sen and the type of *R. albicaule* are too poor to be certain whether they belong to *R. vernicosum* or to *R. fortunei* but the locality suggests that they are probably referable to the latter species.

**12b. subsp. *discolor* (Franchet) Chamberlain, Notes R.B.G. Edinb. 37: 330 (1979).**

Syn.: *R. discolor* Franchet, J. Bot. (Morot) 9: 391 (1895). Type: China, aux environs de Tchen-keou-tin, *Farges* 705 (iso. E,K).

*R. mandarinorum* Diels, Bot. Jahrb. 29: 510 (1900). Syntypes: China, Sichuan, Nan ch'uan, *Bock von Rosthorn* 2150, 2156, 2160 (n.v.).

*R. houlstonii* Hemsley & Wilson, Kew Bull. 1910: 110 (1910). Syntypes: China, W Hubei, 1900, *Wilson* 312 (A); 2154 p.p. (K).

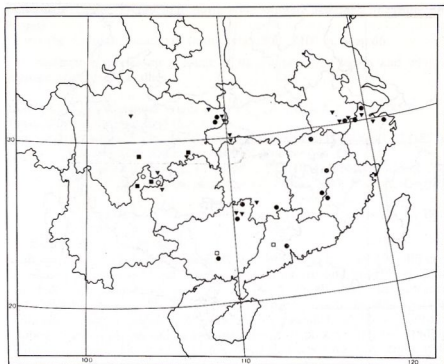
*R. kirkii* Millais, Rhododendrons, ed. 1: 169 (1917) – nom. illegit.

*R. kwangfuense* Chun & Fang, Acta Phytotax. Sin. 6: 170, t. 41 (1957). Type: China, Guangxi, Lungsheng Hsien, Tati Hsiang, Hungyai Shan, 2–8 v 1955, *Kwangfu Exped.* 146 (holo. SZ; iso. Herb. Inst. Bot. Guangzhou).

Ic.: Fang, Pl. Omeiens. t. 29 (1942).

CHINA (Sichuan, Hubei, Guizhou, Guangxi, Hunan, Anhui, Zhejiang).

*R. fortunei* in the strict sense refers to plants with broad leaves, not tapering below. The narrower-leaved forms include both *R. discolor* and *R. houlstonii*,



MAP 65. ■ *R. huianum*; ○ *R. glanduliferum*; □ *R. faithae*; ● *R. fortunei* subsp. *fortunei*; ▼ subsp. *discolor*.

the former supposedly differing from the latter in the length of its calyx, a character difference not even borne out by the type specimens. There is apparently some overlap, even in the leaf shape and, contrary to published accounts of these taxa, there is only partial geographical separation between them. For these reasons the two taxa are treated as subspecies under *R. fortunei*.

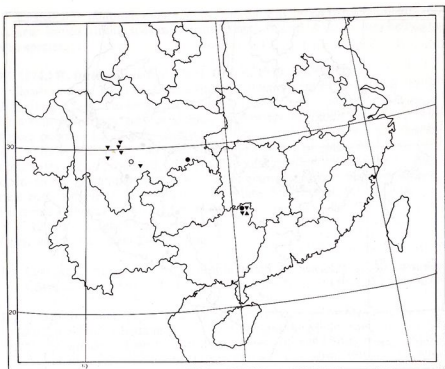
*R. kwangfuense* was originally described as having glabrous styles and was thus allied to *R. oreodoxa*; the styles of the type are however clearly glandular confirming that *R. kwangfuense* is better treated as a synonym of subsp. *discolor*.

13. (175.) *R. hemsleyanum* Wilson, Kew Bull. 1910: 109 (1910). Type: China, Sichuan, Mt Omei, vi 1904, *Wilson* 5738 (holo. A; iso. K).

Syn.: *R. chengianum* Fang, Pl. Omeiens. 1: t.31 (1942). Syntypes: China, Sichuan, Mt Omei, Hung-chun-ping, 1200 m, 1933, *Tu* 130, 950; 7 x 1940, *Lee* 3702 (n.v.).

Ic.: Fang, op. cit. t. 30 (1942).

Shrub or tree, 2–8 m. Leaves ovate to ovate-elliptic, 10–20 × 4–10 cm, 1.7–2.5 × as long as broad, apex rounded, mucronate, base cordate, margin often undulate when dry, lower surface with scattered minute punctulate hair-bases and with a few stipitate glands towards the base, otherwise glabrous; petioles 2.5–5.5 cm, glabrous. Inflorescence 5–8-flowered; rachis stout,



MAP 66. ○ *R. hemsleyanum*; ● *R. platypodum*; ▼ *R. orbiculare* subsp. *orbiculare*; ▲ subsp. *cardiobasis*.

40–50 mm; pedicels 25–30 mm, stipitate-glandular or glabrous. Calyx c. 1 mm, lobes ± stipitate-glandular or glabrous. Corolla 6–7-lobed, campanulate, glabrous or ± glandular outside, sometimes puberulent within at base, white, without flecks, 45–60 mm. Stamens c. 14, filaments glabrous. Ovary and entire style glandular. Capsule c. 30 × 12 mm.

CHINA (Sichuan—Mt. Omei). Woods, etc., 1100–2000 m. Map 66.

*R. chengianum* is supposed to differ from *R. hemsleyanum* in its glabrous pedicels. The type of *R. hemsleyanum*, however, also has glabrous pedicels. Both have a ± undulate leaf margin when dry, a feature unique in subsection *Fortunea*.

**14. (176.) *R. platypodum*** Diels, Bot. Jahrb. 29: 511 (1900). Type: China, SE Sichuan, Nan ch'uan, Ken ao p'ing, *Bock von Rosthorn* 658 (photo. E).

Shrub or tree, 2–8 m. Leaves thick, broadly elliptic, 7–11 × 5–7 cm, 1.4–1.7 × as long as broad, apex rounded, mucronate, base rounded, lower surface with minute punctulate hair-bases when mature, otherwise glabrous; petioles broad, up to 10 mm, winged, glabrous. Inflorescence c. 12-flowered; rhachis up to 45 mm; pedicels 20–25 mm, glabrous. Calyx c. 1 mm, with minute glabrous rounded lobes. Corolla 7-lobed, open-campanulate, entirely glabrous, pinkish-red, lacking markings, 35–45 mm. Stamens 14, filaments

puberulent below. Ovary and entire style stipitate-glandular. Capsule not known.

CHINA (SE Sichuan, Guangxi). In thickets, 1800–2100 m. Map 66.

A distinctive species on account of its characteristic leaves and winged petioles; without close allies.

**15. (177.) *R. griffithianum*** Wight in Ic. Pl. Ind. Or. 4: 6, t. 1203 (1850).

Type: Bhutan, *Griffith* 1045 (iso. E?).

Syn.: *R. aucklandii* Hooker f., *Rhododendrons Sikkim Himalaya* t. 11 (1851).

Type: N India, Sikkim, 7–9000 ft, *Hooker* (iso. E).

*R. oblongum* Griffith, Ic. Pl. Asiat. t. 523 (1854) & Not. Pl. Asiat. 303 (1854). Type: Bhutan, ascent to Chupcha, 8000–8500 ft, *Griffith* 1045 (n.v.).

*R. griffithianum* Wight var. *aucklandii* (Hooker f.) Hooker f., Bot. Mag. 84: t. 5055 (1858).

Ic.: Bot. Mag. 84: t. 5055 (1858).

Shrub or tree, 1.3–10 m. Leaves oblong, 10–19(–30) × 4–7.5(–10) cm, 2.6–3.8 × as long as broad, apex acute to rounded and mucronate, base rounded, lower surface glabrous; petioles 2–3.5 cm, glabrous. Inflorescence 4–5-flowered; rhachis 50–70 mm; pedicels 35–40 mm, usually sparsely glandular. Calyx cupular, 7–20 mm, lobes rounded, glabrous. Corolla 5-lobed, open-campanulate, entirely glabrous, pale pink at first, soon fading white, 55–80 mm. Stamens 12–18, filaments glabrous. Ovary and entire style glandular. Capsule 22–40 × 13–18 mm, stout.

E NEPAL, NE INDIA (Bengal, Sikkim, Arunachal Pradesh), BHUTAN. Open mixed woodland, 2100–2850 m. Map 67, p. 239.

A distinctive species on account of its well-developed calyx, etc.; without close allies.

**16. (178.) *R. orbiculare*** Decaisne, Fl. des Serres 22: 169 (1877).

Shrub or tree, 1.5–15 m. Leaves ± orbicular to ovate-orbicular, 7–12.5 × 5.6–7.7 cm, 1.2–1.5 × as long as broad, apex rounded to slightly retuse, base cordate, lower surface glabrous; petioles stout, 2.5–3.5 cm, glabrous. Inflorescence 10–17-flowered; rhachis up to 17 mm; pedicels 35–40 mm, slender, glabrous above, minutely glandular below. Calyx c. 0.5 mm, lobes rounded, glabrous. Corolla 7-lobed, campanulate, glabrous, rose-pink, without flecks, 35–40 mm. Stamens 14, filaments glabrous. Ovary stipitate-glandular; style glabrous. Capsule 15–20 × c. 5 mm, straight to circinnate. Coniferous forests, rocks, etc., 2500–4000 m. Map 66.

1. Leaves orbicular, c. 1.2 × as long as broad, 7–9.5 cm long

**16a. subsp. *orbiculare***

+ Leaves ovate-orbicular, c. 1.5 × as long as broad, 12.5 cm long

**16b. subsp. *cardiobasis***

**16a. subsp. *orbiculare*.** Type: China, W Sichuan, in monte Houang-chen-Thin, prope Moupine, 4000 m, *Père David*, (n.v.).

Syn.: *R. rotundifolium* David, J. N China Branch Asiat. Soc. 6: 216 (1873), nom. subnudum. Type assumed to be as above.

Ic.: Bot. Mag. 144: t. 8775 (1918); Stevenson (ed.), The Species of *Rhododendron* 279 (1930).

CHINA (C & S Sichuan, Guangxi).

A specimen, *Kwangfu Exped.* 636, differs from subsp. *orbiculare* in its glandular style but otherwise resembles it closely.

**16b.** subsp. *cardiobasis* (Sleumer) Chamberlain, **comb. nov.** [subsp. *cardiobasis* (Handel-Mazzetti) Chamberlain, Notes R.B.G. Edinb. 37: 331 (1979), sphalm.].

Syn.: *R. cardiobasis* Sleumer, Notizbl. Bot. Gart. Berlin-Dahlem 12: 434 (1935), basionym. Type: S China, Guangxi, Yao Shan, Kuchen, 11 v 1929, *Sin* 8979 (iso. E).

CHINA (Guangxi).

Subsp. *cardiobasis* has consistently longer leaves; the differences between the two subspecies are otherwise small.

*R. orbiculare* is a distinctive species with no close allies. The rejection of the name *R. rotundifolium* follows Rehder & Wilson (in Sargent (ed.), *Pl. Wilsonianae* 1: 540, 1913).

**17. (179.) *R. oreodoxa*** Franchet, Bull. Soc. Bot. France 33: 230 (1886).

Shrub or small tree, 1.3–5 m. Leaves obovate-elliptic to elliptic, 6–8.5 × 2.2–4 cm, 2–3.2 × as long as broad, apex rounded, mucronate, base rounded, lower surface with persistent punctulate hair-bases, otherwise glabrous; petioles 1–2.5 cm, often glandular when young, soon glabrescent. Inflorescence 6–8-flowered; rhachis 5–8 mm; pedicels 15–20 mm, glandular or sparsely rufous-tomentose. Corolla (5–) 7-lobed, campanulate, glabrous or finely pubescent within, deep pink, 35–40 mm. Stamens 10–14, filaments glabrous or puberulent. Ovary glabrous or stipitate-glandular; style glabrous. Capsule 20–25 × c. 6 mm, curved.

CHINA (NW Yunnan, Sichuan, Gansu, Shaanxi, Hubei). Forests, etc., 2650–4150 m. Map 68.

1. Ovary glabrous ..... **17a. var. *oreodoxa***  
+ Ovary stipitate-glandular ..... 2

2. Pedicels glandular; corolla usually 6–7-lobed ..... **17b. var. *fargesii***  
+ Pedicels sparsely rufous-tomentose; corolla (?always) 5-lobed

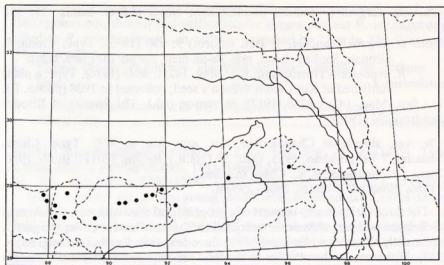
**17c. var. *shensiense***

**17a. var. *oreodoxa*.** Type: China, Sichuan, ad Moupine, *Père David* (iso. E). Syn.: *R. haematocheilum* Craib, Gard. Chron. 53: 214 (1913). Type: a cultivated specimen raised by Veitch from Wilson's seed (E).

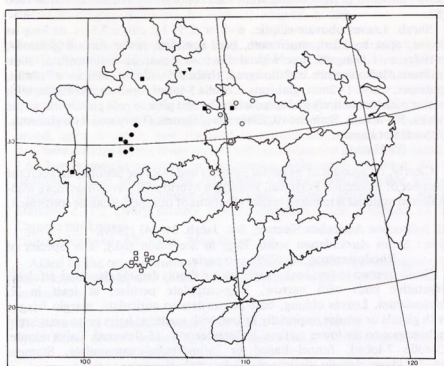
*R. reginaldii* Balfour f., Notes R.B.G. Edinb. 11: 114 (1914). Type: China, Gansu, valley between Siku and Satanee, over 9000ft, 2 v 1914, *Farrer* 63 (holo. E).

*R. limprichtii* Diels, Feddes Repert. 17: 195 (1921). Type: China, Sichuan, Wen tchuan hsien, Pe mu schan, in jugo Tien tsching, 3400 m, v 1914, *Limpricht* 1406 (iso. K).

Ic.: Gartenflora 84: 133 (1935).



MAP 67. ● *R. griffithianum*.



MAP 68. ● *R. oreodoxa* var. *oreodoxa*; ■ var. *fargesii*; ▼ var. *shensiense*; ○ *R. auriculatum*; ▽ *R. chihsinianum*; □ *R. sinofalconeri*.

**17b. var. *fargesii*** (Franchet) Chamberlain, Notes R.B.G. Edinb. 37: 331 (1979).

Syn.: *R. fargesii* Franchet, J. Bot. (Morot) 9: 390 (1895). Type: China, E Sichuan, Sanken cheou, près Ta-lin-hien, *Farges* 1317 (iso. E,K).

*R. erubescens* Hutchinson, Bot. Mag. 142: t. 8643 (1916). Type: a plant cultivated at Kew, from Wilson's seed, collected in 1908 (photo. E).

Ic.: Bot. Mag. 143: t.8736 (1917); Stevenson (ed.), The Species of Rhododendron 284 (1930).

**17c. var. *shensiense*** Chamberlain, var. nov. (see p. 478). Type: China, Shaanxi, ? Tai-pei-shan, 1955, *Gao, S. T.* (s.n.) [Beijing 370117] (holo. PE). Syn.: [*R. shensiense* R. C. Ching in sched.].

CHINA (Shaanxi). Forests, 2300–2500m.

The three varieties may be parts of a geographical cline with var. *oreodoxa* in C Sichuan and var. *shensiense* restricted to Shaanxi Province. Var. *fargesii* is apparently the most widespread of the three taxa (see distribution map 68, p. 239). However, further studies in the field are required before this variation pattern can be confirmed.

Var. *oreodoxa* can only be reliably distinguished from var. *fargesii* by the glabrous ovary; both can have either glabrous or puberulent filaments.

**18. (180.) *R. praeteritum*** Hutchinson, Gard. Chron. 71: 149 (1922). Type: a plant cultivated at Kew, raised from seed collected by Wilson as *Veitch* 1800 (E).

Shrub. Leaves obovate-elliptic, 6–8 × 2.5–3.2 cm, c.2.5 × as long as broad, apex rounded, mucronate, base rounded, lower surface glabrous; petioles c. 1.5cm, at first with a floccose dendroid indumentum, soon glabrous. Inflorescence c. 7-flowered; rhachis 5–10mm; pedicels c. 10mm, glabrous. Calyx 1–2mm, glabrous. Corolla 5-lobed, open-campanulate, with nectar pouches, entirely glabrous, white flushed pink to pale pink, with purple flecks, 30–40mm. Stamens 10, filaments glabrous. Ovary and style glabrous. Capsule not known.

CHINA (W Hubei).

Clearly, on account of its nectar pouches and floccose petioles, an aberrant member of subsection *Fortunea*. Possibly a hybrid of *R. oreodoxa*: more wild-collected material is required before the status of this species can be confirmed.

**II. Subsection *Auriculata*** Sleumer, Bot. Jahrb. 24: 543 (1949).

Syn.: Series *Auriculatum* sensu Tagg in Stevenson (ed.), The Species of Rhododendron 38 (1939), pro parte.

Small tree, up to 6m; bark rough; young shoots densely glandular-setulose; vegetative buds with narrow, long-cuspidate perulae, at least in *R. auriculatum*. Leaves oblong, base subcordate to auriculate, margin fringed with glands or setulae, especially below, with scattered hairs or an evanescent pubescence on the lower surface. Inflorescence 6–15-flowered. Calyx minute. Corolla 7-lobed, funnel-shaped or infundibular-campanulate. Stamens 14–15. Ovary densely stipitate-glandular; style glandular to tip.

Type species: *R. auriculatum* Hemsley

Closely allied to subsection *Fortunea* but distinguished by the glandular-



setulose young shoots, etc. As Davidian (in *Rhododendron Yearbook* 18: 109, 1963) points out, there is no justification for suggesting that *R. auriculatum* is allied to *R. griersonianum*, an affinity proposed by Tagg in *The Species of Rhododendron*.

1. Young shoots exclusively glandular-setulose; corolla 80–110mm long ..... **1. auriculatum**
- + Young shoots tomentose as well as glandular-setulose; corolla up to 40mm long ..... **2. chihsinianum**

**1. (181.) *R. auriculatum*** Hemsley, J. Linn. Soc. Bot. 26: 20 (1889). Type: China, Hubei, Patung district, 1885, *Henry* 513 (holo. K).

lc.: Bot. Mag. 145: t. 8786 (1919); J. Roy. Hort. Soc. Lond. 28: f. 25 (1903).

Shrub or small tree, 2–6m; young shoots setulose-glandular. Leaves oblong to oblong-ob lanceolate, 15–20(–30) × 4.5–8(–10)cm, 2.5–3(–3.5) × as long as broad, apex rounded, apiculate, base auriculate, margin fringed with small glands, lower surface with scattered villous hairs, especially on the midrib and main veins, also glandular, sometimes ± glabrous at maturity; petioles densely setulose-glandular, 1–3cm. Inflorescence 6–15-flowered; rhachis 20–40mm; pedicels 20–25mm, stout, stipitate-glandular. Calyx c. 2mm, sparsely stipitate-glandular, lobes minute. Flowers fragrant. Corolla 7-lobed, funnel-shaped, white or cream to rosy pink, with greenish colouring inside at base, 80–110mm. Stamens 14. Ovary densely stipitate-glandular; style glandular to tip. Capsule 20–35 × 8–10mm, cylindrical.

CHINA (E Sichuan, W Hubei, E Guizhou). Map 68, p. 239.

**2. (182.) *R. chihsinianum*** Chun & Fang, Acta Phytotax. Sin. 6: 168, t. 40, f. 1 (1957). Type: China, Guangxi, Lungsheng Hsien, Pingshui Hsiang, Hung Tan, Pichia Shin, 850m, 13 iv 1955, *Kwangfu Exped.* 56 (holo. Herb. Inst. Bot. Guangzhou).

Small tree, 4m; young shoots setulose-glandular, also with a loose tomentum. Leaves coriaceous, oblong, 19–23 × 5–7cm, 4–4.5 × as long as broad, apex rounded, base rounded to sub-cordate, margin with minute deciduous setulae below, lower surface with an evanescent pubescence; petioles 1.5–2cm, glandular-setulose. Inflorescence c. 8-flowered; rhachis c. 20mm; pedicels c. 10mm, brown-pilose, eglandular. Calyx c. 2mm, fimbriate. Corolla 7-lobed, broadly infundibular-campanulate, colour unknown, c. 40mm. Stamens c. 15. Ovary densely stipitate-glandular; style glandular to tip. Capsule not known.

CHINA (Guangxi). Alt. 850m. Map 68, p. 239.

Allied by the original authors to *R. strigillosum* and *R. monosematum* but the 7-lobed corolla and glandular style suggest a closer affinity with *R. auriculatum*.

### III. Subsection **Grandia** Sleumer, Bot. Jahrb. 74: 549 (1949).

Syn.: Series *Grande* sensu Tagg in Stevenson (ed.), The Species of Rhododendron 305 (1930).

Large shrubs or trees, to 30m; bark rough; young shoots glabrous to tomentose. Leaves oblanceolate to broadly elliptic, large, up to 70cm long, lower surface covered with a unistrate or bistrate, usually compacted and

agglutinated, silvery to buff indumentum, the upper layer (when present) composed of rosulate or dendroid hairs. Inflorescence dense, 12–30-flowered; rhachis 20–60mm (c. 7mm in *R. watsonii*). Calyx minute, 1–2mm. Corolla fleshy, 6–10-lobed, tubular- or funnel- to ventricose-campanulate, nectar pouches usually absent, yellow or white to rosy purple. Stamens 12–18. Ovary tomentose, glandular (*R. grande*) or glabrous (*R. watsonii*); style glabrous.

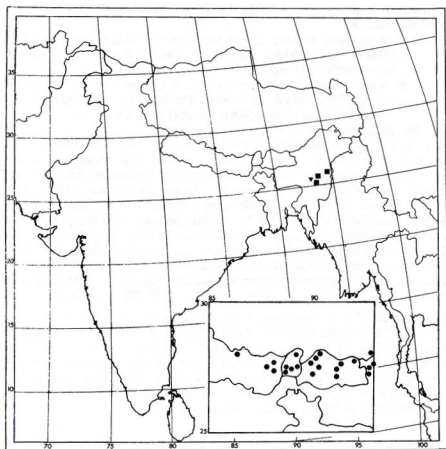
Type species: *R. grande* Wight

Closely allied to subsection Falconera, with which it shares a tendency to large size, large leaves and funnel- to ventricose-campanulate, 6–10-lobed corollas. Possibly also distantly related to subsection Fortunea.

1. Ovary glabrous; petioles up to 5mm ..... **11. watsonii**  
+ Ovary tomentose; petioles at least 10mm ..... 2
2. Petioles strongly flattened and winged ..... **7. praestans**  
+ Petioles terete, at most only slightly winged ..... 3
3. Corolla ventricose- or oblique-campanulate; leaf indumentum  
silvery, compacted and agglutinated, unistrate ..... 4  
+ Corolla tubular- to funnel-campanulate; leaf indumentum absent  
or silvery to buff-tomentose, not agglutinated, sometimes bistrate ..... 8
4. Perulae persistent on apical shoots; corolla 30–35mm, pink  
..... **6. pudorosum**  
+ Perulae deciduous; corolla 30–70mm, yellowish to pink ..... 5
5. Ovary and pedicels glandular ..... **2. grande**  
+ Ovary and pedicels eglandular ..... 6
6. Leaves 8–28cm wide, 2.2–2.8 × as long as broad ..... **3. sinogrande**  
+ Leaves 4–10(–20)cm wide, (2.5–)3–5 × as long as broad ..... 7
7. Corolla pink; petioles greyish arachnoid-tomentose ..... **5. montroseanum**  
+ Corolla yellow; petioles glabrous when mature ..... **4. sidereum**
8. Corolla lemon-yellow; leaf indumentum bistrate, with a lanate-  
tomentose upper layer ..... **10. macabeanum**  
+ Corolla pink to rosy purple; leaf indumentum unistrate or bistrate,  
not lanate-tomentose ..... 9
9. Pedicels 20–25mm; leaf indumentum a buff tomentum, sometimes  
restricted to the margins of the leaves, or ± absent ..... **8. protistum**  
+ Pedicels 8–15mm; leaves with a whitish, felted or arachnoid  
indumentum ..... 10
10. Inflorescence c. 15-flowered; leaves 11–16cm long ..... **1. wattii**  
+ Inflorescence c. 30-flowered; leaves 20–32cm long ..... **9. magnificum**

**1. (183.) *R. wattii*** Cowan, Notes R.B.G. Edinb. 19: 163, t.253 (1936). Type: NE India, Ching Sow, 9000ft, iv 1882, *Watt* 6535 (holo. E; iso. K).

Shrub or small tree, 3–7m. Leaves obovate to oblong, 11–16 × 5.5–7cm, 2–2.3 × as long as broad, apex rounded, apiculate, base rounded, glabrous above, with a sparse whitish felted indumentum beneath, with prominent lateral veins; petioles c. 2cm, terete, glabrous when mature. Inflorescence c. 15-flowered, dense; rhachis not known; pedicels c. 10mm, densely glandular.



MAP 69. ▽ *R. wattii*; □ *R. macabeaeanum*; ● *R. wightii*.

Calyx 1–2mm, glandular; lobes broadly triangular. Corolla 6-lobed, tubular-campanulate, pink with darker flecks and purplish basal patches (?nectar pouches), 35–75mm. Ovary with a densely lanate-pilose, brownish indumentum; style glabrous. Capsule not known.

NE INDIA (Manipur), only known from the type locality. Ridges, 2700m. Map 69.

Judging from a plate at Edinburgh drawn by Watt in the field, *R. wattii* is apparently better placed in subsection *Grandia* rather than in subsection *Arborea*, as suggested by Cowan. Plants raised from seed collected by Watt at the type locality and considered by him to have originated from *R. wattii*, have scarlet, 5-lobed corollas, usually a more well-developed calyx (lobes 3–4mm) and leaves ranging from 6.5–12cm long. The plants were given the name *R. arboreum* Smith var. *kingianum* Hooker (in *Bot. Mag.* 126: t. 7696, 1900) or *R. kingianum* (Hooker f.) Watson (in *Rhododendrons and Azaleas* 106, 1911). They are almost certainly hybrids of *R. arboreum* s.l. and possibly *R. wattii*. *R. wattii* itself may be a hybrid between *R. arboreum* and some other species in subsection *Grandia* but there is no real evidence to support this suggestion.

2. (184.) *R. grande* Wight, Calcutta J. Nat. Hist. 8: 176 (1847). Type: Bhutan, Griffith (holo. K).

Syn.: *R. argenteum* Hooker f., Rhododendrons Sikkim Himalaya t. 9 (1849). Type: Sikkim, summit of Sinchal, Suradah and Tonglu, 8000–10000ft, Hooker (holo. K).

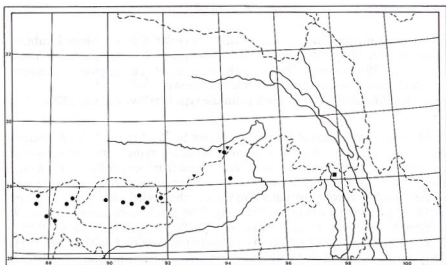
*R. longiflorum* Nuttall, Hooker's J. Bot. Kew Gard. Misc. 5: 366 (1853). Type: India, Arunachal Pradesh, on the slopes of the Oola Mountain, 6500–7500ft, Booth (?holo. K).

lc.: Bot. Mag. 84: t. 5054 (1858) – as *R. argenteum*.

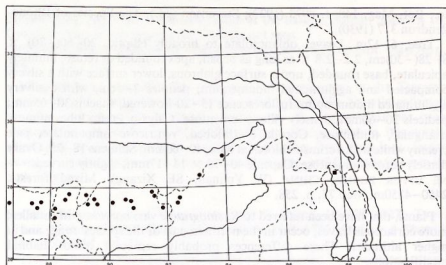
Tree, 8–12m. Leaves elliptic to oblanceolate,  $15-27 \times 5-9.5$ cm,  $2.4-3.3 \times$  as long as broad, glabrous above, with a thin compacted silvery indumentum beneath; petioles 2–3.5cm, sparsely floccose to glabrous when mature. Inflorescence 15–25-flowered; rhachis 40–50mm; pedicels 15–30mm, densely covered with sessile glands, sometimes also floccose. Calyx c.1mm, glandular. Corolla 8-lobed, ventricose-campanulate, pale yellow (rarely with a purplish tinge), with purple nectar pouches, 50–70mm. Stamens 15–16. Ovary densely stipitate-glandular, sometimes also with a dense pale brown tomentum. Capsule  $30-45 \times 8-12$ mm.

E NEPAL, NE INDIA (Bengal, Sikkim, Arunachal Pradesh), BHUTAN, CHINA (S Xizang). Open stony slopes, mixed woodland, 2500–3000m. Map 70.

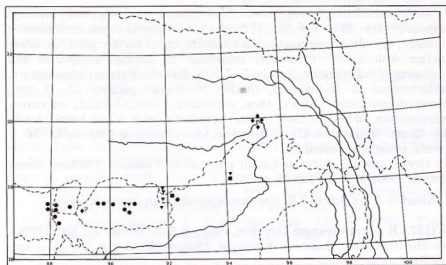
Closely allied to *R. sinogrande*. Four plants: Ludlow & Sherriff 1186, 1208, 1235 & 1258, from SE Bhutan and adjacent parts of S Xizang, differ from *R. grande* in their narrower leaves,  $3.5-3.8 \times$  as long as broad, their pink, 7-lobed corollas that are probably funnel-campanulate, and in the few (10) stamens. These may represent a new taxon allied to or within *R. grande*, or they may be hybrids. A precise indication of the corolla shape is lacking and this is essential for an assessment of the status of these plants.



MAP 70. ● *R. grande*; ■ *R. montroseanum*; ▼ *R. pudorosum*.



MAP 71. ■ *R. magnificum*; ● *R. hodgsonii*.



MAP 72. ● *R. falconeri* subsp. *falconeri*; ■ subsp. *eximium*; ▼ *R. kendrickii*; ◆ *R. ramsdenianum*.

3. (185.) *R. sinogrande* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 9: 274 (1916). Type: China, Yunnan, Western flank of the Shweli/Salween divide, 11000 ft, viii 1912, *Forrest* 9021 (holo. E).

Syn.: *R. sinogrande* Balfour f. & W. W. Smith var. *boreale* Tagg & Forrest, Notes R.B.G. Edinb. 15: 119 (1926). Type: China, SE Xizang, Tsarong, W of Chamatong, Salween/Kiu-chiang divide, 13000–14000ft, vi 1922, *Forrest* 21705 (holo. E).

Ic.: Bot. Mag. 148: t. 8973 (1922); Stevenson (ed.), The Species of Rhododendron 317 (1930).

Tree, 6–12m. Leaves oblanceolate to broadly elliptic, 20–60(–70) × 8–28(–30)cm, 2.2–2.8 × as long as broad, apex rounded or retuse, minutely apiculate, base rounded, upper surface glabrous, lower surface with a silvery compacted and agglutinated indumentum; petioles 3–5cm, with a silvery agglutinated indumentum. Inflorescence 15–20-flowered; rhachis 30–65mm; pedicels 30–60mm, densely villous-tomentose. Calyx c. 2mm, lobes minute, triangular, tomentose. Corolla 8–10-lobed, ventricose-campanulate, pale creamy white with a crimson blotch at base, 40–60mm. Stamens 18–20. Ovary densely rufous-tomentose. Capsule 40–70 × 14–17mm, slightly curved.

NE UPPER BURMA, CHINA (W Yunnan, SE Xizang). Mixed forests, 2450–4250m. Map 77, p. 258.

Plants, that have been referred to *R. sinogrande* var. *boreale*, with smaller, more coriaceous leaves, occur in the northern part of the species' range and at higher altitudes. These differences probably represent minor habitat modifications.

4. (186.) *R. sidereum* Balfour f., Notes R.B.G. Edinb. 12: 162 (1920). Type: NE Upper Burma, Tamgam, v 1912, *Abbay* 5 (holo. E).

Ic.: Bot. Mag. n.s. 179: t.638 (1973).

Shrub or small tree, 3–9m. Leaves oblanceolate to narrowly (rarely broadly) elliptic, (9–)16–23 × 4–6.3cm, (2.5–)3–5 × as long as broad, apex acute to rounded, apiculate, base rounded to attenuate, upper surface glabrous, lower surface with a buff to silvery, sometimes ± shining, compacted and agglutinated indumentum; petioles 2–2.5cm, ± terete, glabrous when mature. Inflorescence 12–20-flowered; rhachis 50–60mm; pedicels 25–35 mm, brownish-tomentose. Calyx c. 1mm, tomentose. Corolla 8-lobed, ventricose-campanulate, cream to clear yellow, sometimes with a red basal blotch, 30–40mm. Stamens 16. Ovary densely rufous-tomentose. Capsule 25–30 × 10mm, straight or curved.

NE UPPER BURMA, CHINA (adjacent parts of W Yunnan). Thickets, mixed forests, 2500–3700m. Map 73, p. 248.

Allied to *R. grande* and *R. sinogrande* though with narrower leaves.

5. (187.) *R. montroseanum* Davidian, Notes R.B.G. Edinb. 37: 338 (1979)—see also Davidian, Quart. J. American Rhododendron Soc. 21: 81 et seq. (1978).

Syn.: *R. mollyanum* Cowan & Davidian, Rhododendron Camellia Yearbook 8: 72 (1953); non *R. mollianum* Koorders (1909). Type: a specimen cultivated at Brodick; raised from seed as *Kingdon-Ward* 6261a, from Pemako, S Xizang (holo. E).

Ic.: Rhododendron & Camellia Yearbook 18: t.1,2 (1963).

Tree, 12–15m. Leaves oblanceolate, 20–30(–60) × 5.5–10(–20)cm, 3–3.5 × as long as broad, apex rounded, apiculate, base rounded, upper surface glabrous, lower surface covered with a thin silvery compacted indumentum; petioles 2–4cm, terete, greyish arachnoid-tomentose. Inflorescence c. 20-flowered; rhachis c. 45mm; pedicels 30–50 mm, greyish arachnoid-tomentose. Calyx c. 1mm, tomentose. Corolla 8-lobed, ventricose-

campanulate, pink with a crimson blotch at the base, c. 50mm. Stamens 16. Ovary densely rufous-tomentose. Capsule not seen.

CHINA(S Xizang) and probably adjacent parts of NE UPPER BURMA. Map 70, p. 244.

Kingdon-Ward describes this species as being common in the Tsangpo Gorge. Very few specimens are however available for study. No wild-collected specimen corresponding to Ward's description of number 6261 has been located; plants under this number in BM belong to *R. exasperatum*. It is closely allied to *R. pudorosum* and *R. sidereum* but differs from both in its larger leaves, from the former in its non-persistent perulae, and from the latter in its pink flowers.

6. (188.) *R. pudorosum* Cowan, Notes R.B.G. Edinb. 19: 239 (1927). Type: China, Xizang, Chayul Chu, Lung, 12500ft, 29 iv 1936, Ludlow & Sherriff 1386 (holo. BM; iso E).

Tree, 6–15m; perulae persistent on the apical shoots. Leaves oblanceolate,  $14-20 \times 5-7$ cm,  $2.8-3.2 \times$  as long as broad, apex  $\pm$  acute, apiculate, base rounded, upper surface glabrous, lower surface with a thin whitish compacted and agglutinated indumentum; petioles terete, 2–3cm, whitish-tomentose. Inflorescence 15–25-flowered; rhachis up to 25mm; pedicels 15–30mm, sparsely hairy. Calyx c. 1mm, sparsely hairy. Corolla 6–8-lobed, ventricose-campanulate, rose-pink with a dark basal blotch, 30–35mm. Stamens c. 16. Ovary whitish-tomentose. Capsule not seen.

CHINA(S Xizang). Mixed forests, 3600–3800m. Map 70, p. 244.

A distinctive species on account of its persistent perulae, a feature that is retained in cultivation.

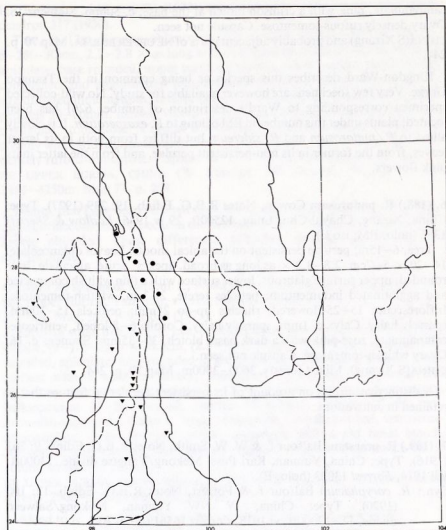
7. (189.) *R. praestans* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 9: 263 (1916). Type: China, Yunnan, Kari Pass, Mekong/Yangtse divide, 13000ft, viii 1914, Forrest 13023 (holo. E).

Syn.: *R. coryphaeum* Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 100 (1920). Type: China, W NW Yunnan, Mekong/Salween divide, 11–12000ft, vi 1918, Forrest 16561 (holo. E).

*R. semnum* Balfour f. & Forrest, ibid. 13: 59 (1920). Type: China, W NW Yunnan, Mekong/Salween divide, vi 1917, Forrest 14233 (holo. E; iso. BM).

lc.: Stevenson (ed.), The Species of Rhododendron 307, t. (1930) – as *R. coryphaeum*.

Shrub or small tree, 3–10m. Leaves oblong-obovate to oblanceolate,  $(14-20-30(-40) \times 5.2-12$ cm,  $2.2-2.8(-3.6) \times$  as long as broad, apex rounded, base cuneate, upper surface glabrous, lower surface with a silvery compacted and agglutinated indumentum; petioles 1–2cm, strongly flattened and winged, sparsely tomentose to glabrescent. Inflorescence 12–20-flowered; rhachis up to 25mm; pedicels 30–40mm, sparsely floccose-tomentose. Calyx 1–2mm, tomentose. Corolla 7–8-lobed, obliquely campanulate, pale yellow or white flushed with pink, to pink with crimson flecks and a basal blotch, 35–50mm. Stamens c. 16. Ovary covered with a dense buff tomentum. Capsule  $30-40 \times 6-10$ mm, usually curved.



MAP 73. ▼ *R. sidereum*; ● *R. praestans*.

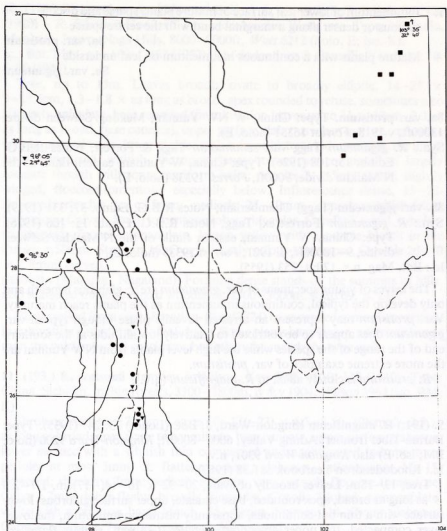
CHINA (SE Xizang, NW Yunnan). Pine and mixed forest, 3350–4250m. Map 73.

The differences in flower colour used by Tagg to separate *R. coryphaeum* from *R. praestans* are of little significance, especially since flower colours of the respective types are not known.

**8. (190.) *R. protistum*** Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 131 (1920).

Tree, 6–30m. Leaves (12–)20–37 × (4–)8.8–16cm, 2.2–3 × as long as broad, apex rounded, retuse or minutely apiculate, base ± rounded, upper





MAP 74. ● *R. protistum* var. *protistum*; ▼ var. *giganteum*; ■ *R. watsonii*.

surface glabrous, lower surface glabrous in juvenile state though sometimes developing a buff, continuous, adpressed tomentum, at least along a marginal band as the plant matures; petioles 2–3cm, terete, glabrous. Inflorescence up to c. 25-flowered; rhachis 20–30mm, stout; pedicels .20–25mm, densely reddish brown tomentose. Calyx c. 2mm, tomentose, lobes broadly triangular. Corolla 8-lobed, funnel-campanulate, rose, sometimes whitish at base, with a dark basal blotch and nectar pouches, sometimes also with a few flecks, 50–75mm. Stamens 16. Ovary densely rufous-tomentose. Capsule 40–50 × c. 15mm.

CHINA (W Yunnan), NE UPPER BURMA. Mixed woodlands, 2450–3350m. Map 74.

1. Indumentum of lower leaf surface of mature plants sparse and discontinuous or denser along a marginal band with the centre sparse  
8a. var. **protistum**
- + Mature plants with a continuous indumentum on leaf underside  
8b. var. **giganteum**

**8a. var. protistum.** Type: China, W NW Yunnan, Mekong/Salween divide, 13000ft, v 1918, *Forrest* 16351 (holo. E).

Syn.: *R. giganteum* Tagg var. *seminudum* Tagg & Forrest, Notes R.B.G. Edinb. 15: 108 (1926). Type: China, W Yunnan, eastern flank of the N'Maikha divide, 9000ft, *Forrest* 19338 (holo. E).

**8b. var. giganteum** (Tagg) Chamberlain, Notes R.B.G. Edinb. 37: 331 (1979).

Syn.: *R. giganteum* [Forrest ex] Tagg, Notes R.B.G. Edinb. 15: 106 (1926). Type: China, W Yunnan, eastern flank of the N'Maikha/Salween divide, 9–10000ft, iii 1921, *Forrest* 19335 (holo. E).

Ic.: Bot. Mag. n.s. 170: t. 253 (1955).

The leaves of young specimens of var. *giganteum* are  $\pm$  glabrous beneath and only develop the typical, continuous indumentum as the plants reach maturity. Var. *protistum* may represent an arrested juvenile phase though typical var. *giganteum* does appear to be restricted to relatively low altitudes at the southern end of the range of the species while the high level plants from NW Yunnan are the more extreme examples of var. *protistum*.

*R. protistum* is closely allied to *R. magnificum* (q.v.).

**9. (191.) R. magnificum** Kingdon-Ward, J. Bot. (Lond.) 73: 247 (1935). Type: Burma-Tibet frontier, Adung Valley, 6000–8000ft, *Kingdon-Ward* 9200 (holo. BM; iso. E) also *Kingdon-Ward* 9301, n.v.

Ic.: *Rhododendron* Yearbook 5: f.38 (1950).

Tree, 13–18m. Leaves broadly obovate,  $20-32 \times 10-14(-17)$ cm, 1.7–2.3  $\times$  as long as broad, apex rounded, base cuneate, upper surface glabrous, lower surface with a thin but continuous, apparently bistrate indumentum, the lower layer compacted, the upper arachnoid; petioles 2–3.8cm, slightly flattened, narrowly winged, glabrous when mature. Inflorescence up to c.30-flowered; rhachis c.40mm; pedicels 8–15mm, stout, rufous-tomentose. Calyx c.1mm, rufous-tomentose, lobes triangular. Corolla 8-lobed, funnel-campanulate, rosy purple with darker nectar pouches, 45–60mm. Stamens c.16. Ovary densely rufous-tomentose. Capsule not known.

NE UPPER BURMA, CHINA (adjacent parts of W Yunnan). Rain forest, 1800–2500m. Map 71, p. 245.

Only known for certain in the wild from the specimens cited above though the a specimen from Phyet in NE Burma (*Toppin* 6232) may also be this species. The origin of plants in cultivation is not certain though it is assumed that they have been raised from seed collected by Kingdon-Ward. These plants apparently have narrower leaves,  $c.3 \times$  as long as broad, but clearly have the typical funnel-campanulate corollas, a character that suggests a close affinity with *R. protistum* and *R. macabeaenum*.

**10. (192.) *R. macabeanum*** [Watt ex] Balfour f., Notes R.B.G. Edinb. 12: 128 (1920) – *R. falconeri* Hooker f. var. *macabeanum* Watt, mss. Type: NE India, Manipur, Japvo, Naga Hills, 8000–9000ft, Watt 6212 (holo. E; iso. K). Ic.: Bot. Mag. n.s. 169: t. 187 (1952); Rhododendron & Camellia Yearbook 10: f. 25 (1955).

Tree, up to 15m. Leaves broadly ovate to broadly elliptic, 14–25 × 9–18.5cm, 1.3–1.8 × as long as broad, apex rounded to retuse, sometimes also minutely apiculate, base rounded (in cultivation leaves up to 31 × 13cm, 2.3 × as long as broad, base cuneate), upper surface glabrous when mature, reticulate with impressed veins, lower surface with a dense bistrate indumentum, the lower layer compacted, whitish, the upper lanate-tomentose, composed of largely rosulate though with some ramiform hairs; petioles 2–2.5cm, terete, slightly winged, floccose-tomentose, especially below. Inflorescence dense, 15–25-flowered; rhachis to c.35mm; pedicels 25–40mm, densely whitish-felted tomentose. Calyx c.1mm, tomentose, lobes triangular. Corolla 8-lobed, tubular-to narrowly funnel-campanulate, lemon yellow with a purple blotch in the throat, c.50mm. Stamens 16. Ovary densely rufous-tomentose. Capsule 20–40 × c.8mm, curved.

NE INDIA (Manipur, Nagaland). Forming dense stands on the summits of hills, also scattered through mixed woodland, 2500–3000m. Map 69, p. 243.

Plants raised from seed (*Kingdon-Ward 7724*) have proved somewhat variable in cultivation with respect to leaf shape. Some plants have larger, narrower leaves than the wild-collected specimens but otherwise match the type well.

**11. (193.) *R. watsonii*** Hemsley & Wilson, Kew Bull. 1910: 112 (1910). Type: China, Sichuan, in thin forests, 3300–3800m, iv & v 1904, Wilson 3964 (iso. BM, K).

Shrub or small tree, 2–6m. Leaves 10–17(–23) × 4.3–8.5(–10)cm, 2–2.3 × as long as broad, apex acute to acuminate, base cuneate, upper surface glabrous, lower surface with a whitish thin compacted and agglutinated indumentum; petioles at most 5mm, ± flattened, stout, glabrous. Inflorescence 12–15-flowered; rhachis c.7mm; pedicels c.20mm, very sparsely floccose-tomentose. Calyx c.2mm, lobes fleshy, broadly triangular. Corolla 7-lobed, campanulate, white with a crimson basal blotch, 35–40mm. Stamens 14. Ovary glabrous. Capsule 30–35 × 7–8mm, usually slightly curved.

CHINA(C & N Sichuan, S Gansu). Woodland, 2600–3300m. Map 74, p. 249.

A distinctive species on account of its short, flattened petioles and glabrous ovaries. *R. watsonii* has no obvious close allies.

**IV. Subsection *Falconera*** Sleumer, Bot. Jahrb. 74: 548 (1949).

Syn.: Series *Falconeri* sensu Tagg in Stevenson (ed.), The Species of Rhododendron 235 (1930).

Large shrubs or trees, 2.5–12m; bark rough to ± smooth and peeling; young shoots ± glabrous to floccose-tomentose. Leaves oblanceolate to broadly obovate, large, up to 40cm long, lower surface with a dense whitish to rufous indumentum composed of cup-shaped hairs, sometimes also with a compacted lower layer of indumentum. Inflorescence 10–25-flowered; rhachis (5–)10–60mm. Calyx minute, 1–3mm. Corolla (5–)7–10-lobed, funnel- to oblique- or ventricose-campanulate, nectar pouches lacking, yellow or white to

rose-purple. Stamens (10-)14-18. Ovary tomentose, glandular or glabrous (*R. galactinum*); style glabrous.

Type species: *R. falconeri* Hooker f.

Closely allied to subsection *Grandia* (q.v.) but distinguished by the characteristic cup-shaped hairs.

1. Petioles flattened, winged.....2
- + Petioles terete, not winged.....4
2. Leaf indumentum agglutinated, the upper layer appearing patchy
  1. **rothschildii**
  - + Leaf indumentum not agglutinated .....3
3. Leaf indumentum composed of strongly fimbriate, narrowly cup-shaped hairs; corolla pink or white .....2. **seminoides**
- + Leaf indumentum composed of scarcely fimbriate, broadly cup-shaped hairs; corolla pale yellow .....3. **basilicum**
4. Ovary and pedicels glandular .....9. **falconeri**
- + Ovary and pedicels eglandular .....5
5. Ovary glabrous (C Sichuan) .....6. **galactinum**
- + Ovary densely tomentose .....6
6. Leaves 2.4-4 × as long as broad, upper surface ± smooth; indumentum silvery or buff to rufous; corolla white to rose-purple .....7
- + Leaves 1.5-2.5 × as long as broad, upper surface ± rugulose; corolla pale yellow .....9
7. Corolla an intense pink or rose-purple, without flecks (Indo-Himalaya) .....8. **hodgsonii**
- + Corolla white or pale pink, usually with flecks (Sino-Himalaya).....8
8. Leaves 4.8-6.2cm wide, indumentum whitish to fawn, more rarely pale cinnamon.....7. **coriaceum**
- + Leaves (3.5-)5.5-13.5cm wide, indumentum fawn to rufous .....4. **rex**
9. Leaf indumentum a rich rufous-brown.....4. **rex**
- + Leaf indumentum buff to light brown.....10
10. Leaves 1.5-1.8 × as long as broad (SE Yunnan).....10. **sino-falconeri**
- + Leaves c.2.5 × as long as broad (NE Upper Burma).....5. **preptum**

1. (194.) *R. rothschildii* Davidian, *Rhododendrons* 1972: 50 (1972). Type: China, Yunnan, 1931, *Forrest* 30528 (holo. E).

Large shrub or small tree, 5-6m. Leaves obovate-oblongate, 26.5-28(-36) × 10-14cm, 2.3-2.8 × as long as broad, apex rounded, base cuneate, upper surface glabrous when mature, lacking strongly impressed veins, lower surface with a bistrate indumentum, the lower layer white, ± compacted, the upper agglutinated, patchy, often reddish-brown, composed of strongly fimbriate cup-shaped hairs; petioles c.1.5cm, flattened and with marked wings. Inflorescence 12-17-flowered; rhachis c.20mm; pedicels c.30mm, tomentose. Calyx c.1mm, tomentose. Corolla 8-lobed, obliquely campanulate, pale yellow with a purple basal blotch, 35-45mm. Stamens 16. Ovary densely tomentose. Capsule c.25 × 10mm, curved.

CHINA (NW Yunnan, around Weixi). Mixed forests, 3700–4000m. Map 75, p. 254.

An unsatisfactory species, possibly of hybrid origin. A series of specimens (*Forrest* 29299; *Rock* 16956, 16957, 17128, 17129, 18391, 18432, 167) with a rust-red leaf indumentum that is not strongly agglutinated, but with the typical winged petioles, occurs in the field with *R. rothschildii*. While these plants are clearly closely allied, their exact status awaits proper field studies.

2. (195.) *R. semnoides* Tagg & Forrest, Notes R.B.G. Edinb. 15: 116 (1926). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, W of Chamatong, 12–13000ft, vi 1922, *Forrest* 21780 (holo. E); x 1922, *Forrest* 22788 (= 21780) (E, K).

Shrub, 4–6m. Leaves obovate-lanceolate, up to  $24 \times 11.5$  cm, c.  $2.1 \times$  as long as broad, apex rounded, minutely apiculate, base  $\pm$  cuneate, upper surface glabrous when mature,  $\pm$  smooth, lower surface with a bistrate indumentum, the lower layer compacted, the upper whitish to buff, loosely tomentose, composed of strongly fimbriate, narrowly cup-shaped hairs; petioles 1–2cm, flattened and narrowly winged (in cultivation  $\pm$  terete and scarcely winged), glabrescent. Inflorescence c. 15-flowered; rhachis c. 12mm; pedicels 30–45mm, sparsely floccose-tomentose. Calyx c. 2mm, tomentose, lobes triangular. Corolla c. 8-lobed, obliquely campanulate, white flushed rose, 40–50mm. Stamens 16. Ovary densely brownish tomentose. Capsule c.  $35 \times 8$ mm.

CHINA (SE Xizang, NW Yunnan). Rhododendron forests, 3700–4000m. Map 75.

Closely allied to *R. rothschildii* and *R. basilicum*. *R. semnoides* apparently replaces *R. basilicum* in NW Yunnan and differs in its much more strongly fimbriate cup-shaped hairs on the leaves. The occurrence of these cup-shaped hairs clearly places this species in subsection Falconera and not in subsection Grandia, its traditional position.

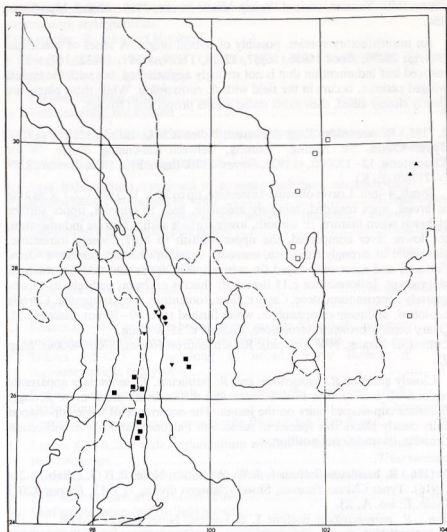
3. (196.) *R. basilicum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 9: 214 (1916). Type: China, Yunnan, Shweli/Salween divide, vi 1913, *Forrest* 12078 (holo. E; iso. A, K).

Syn.: *R. megaphyllum* Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 138 (1920). Type: China, W Yunnan, Shweli/Salween divide, 11000ft, vi 1918, *Forrest* 17650 (holo. E).

*R. regale* Balfour f. & Kingdon-Ward, Notes R.B.G. Edinb. 12: 156 (1920). Type: NE Upper Burma, Htawjaw, valley Naumchaung, 12000ft, 19 v 1914, *Kingdon-Ward* 1565 (holo. E).

*R. gratum* T. L. Ming, Acta Bot. Yunnanica 3: 118 (1981). Type: China, W Yunnan, Yunlong Xiang, Chaojian, Zibeng Shan, 3200m, 21 iv 1980, C. H. Yang 80-0008 (holo. Herb. Inst. Bot. Kunming; iso. E).

Shrub or small tree, 3–10m. Leaves obovate to oblanceolate, 17–25  $\times$  8.5–13cm, 1.8–2.4  $\times$  as long as broad, apex  $\pm$  rounded, base cuneate, upper surface glabrescent, with deeply impressed veins, lower surface with a bistrate indumentum, the lower layer compacted, the upper thick, greyish at first, usually soon becoming rufous, composed of only slightly fimbriate, broadly cup-shaped hairs; petioles 2–3cm, strongly flattened and winged, glabrescent. Inflorescence



MAP 75. ● *R. rothschildii*; ▼ *R. semnoides*; ■ *R. basilicum*; ▲ *R. williamsianum*; □ *R. souliei*.

15–25-flowered; rhachis 30–60mm; pedicels 30–40mm, sparsely grey- to rufous-tomentose, eglandular. Calyx c.2mm, tomentose, lobes rounded. Corolla fleshy, 8-lobed, obliquely campanulate, pale yellow with a crimson blotch, 35–50mm. Stamens 16. Ovary densely rufous-tomentose. Capsule 20–30 × 7–10mm, straight or curved.

NE BURMA, CHINA(W Yunnan). *Abies* forests, *Rhododendron* thickets, open slopes, 3000–3700m. Map 75.

Closely allied to *R. semnoides* (q.v.). The following specimens are intermediate between *R. basilicum* and *R. rex* subsp. *arizelum* and are probably hybrids: Forrest 8990, 17691, 18116, 18375, 18860, 23284. These may be

distinguished from *R. basilicum* by their only slightly flattened, scarcely winged petioles and by the strongly fimbriate cup-shaped hairs on the leaves.

**4. (197.) *R. rex* Léveillé, Feddes Rept. 13: 340 (1914).**

Large shrub or small tree, 2.5–12m. Leaves obovate to oblanceolate (8–)12–37 × 5.5–13.5cm, 1.5–3.8 × as long as broad, apex rounded to ± acute, base cordate to cuneate, upper surface glabrescent, ± smooth to rugulose, lower surface with a dense fawn to rufous indumentum composed of slightly to strongly fimbriate cup-shaped hairs; petioles 2–3cm, terete, with a dense pale tomentum. Inflorescence 12–20-flowered; rhachis 15–20mm; pedicels 15–30mm, sparsely brownish-tomentose. Calyx 1–2mm, ± tomentose. Corolla fleshy, 7–8-lobed, obliquely campanulate to ± regular-campanulate, white or pale yellow to pink, with a crimson basal blotch and flecks, 30–45mm. Stamens 14–16. Ovary densely brown-tomentose. Capsule 25–35 × 6–9mm, curved. Map 76, p. 256.

1. Leaves 2.4–3.1 × as long as broad, indumentum fawn, composed of only slightly fimbriate, broadly cup-shaped hairs; corolla white flushed pink ..... **4a. subsp. *rex***
- + Leaves 1.5–3.8 × as long as broad; indumentum brown to rufous, composed of narrower, moderately to strongly fimbriate cup-shaped hairs; corolla white or pink to yellow ..... **2**
2. Corolla white flushed pink; leaves (2–)2.5–3.8 × as long as broad, cup-shaped hairs moderately fimbriate ..... **4b. subsp. *fictolactum***
- + Corolla pale yellow; leaves 1.5–2.1(–2.5) × as long as broad, cup-shaped hairs narrow, strongly fimbriate ..... **4c. subsp. *arizelum***

**4a. subsp. *rex*.** Type: China, NE Yunnan, Mont Io-chan (Yao shan), 3200m, v 1911, *Maire* (holo. E).

Ic.: *Rhododendron* & *Camellia* Yearbook 10: f. 25 (1955).

CHINA (S Sichuan & adjacent NE Yunnan). Conifer forests, c. 3500m.

Subsp. *rex* apparently intergrades with subsp. *fictolactum* where the ranges of the two taxa meet. The variation pattern may be expressed as a cline, with the more extreme forms of subsp. *rex* in the east, intergrading with subsp. *fictolactum* in the west.

**4b. subsp. *fictolactum*** (Balfour f.) Chamberlain, Notes R.B.G. Edinb. 36: 330 (1979).

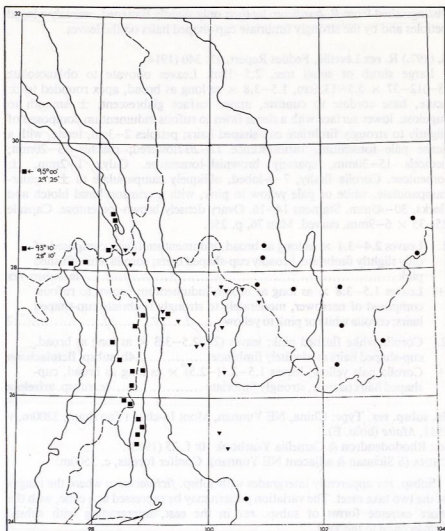
Syn.: *R. fictolactum* Balfour f., Trans. Bot. Soc. Edinb. 27: 97 (1916).

*R. lacteum* Franchet var. *macrophyllum* Franchet, Bull. Soc. Bot. France 34: 280 (1887). Type: China, Yunnan, Yen-tze-hay, 3200m, 31 v 1886, *Delavay* 2214 (iso. E,K).

Ic.: *Rhododendron* Yearbook 4: f. 36 (1948); Cox, P., The Larger Species of *Rhododendrons* t. 4 (1979).

CHINA (W Yunnan, SE Xizang), NE BURMA. Conifer forests, *Rhododendron* thickets, 3000–4000m.

A number of specimens intermediate between subsp. *fictolactum* and subsp. *arizelum* have been collected where the ranges of the two overlap. Plants with yellow flowers and narrow leaves are as follows: *Forrest* 21861, 21862, 21866,



MAP 76. ● *R. rex* subsp. *rex*; ▼ subsp. *fictolacteum*; ■ subsp. *arizelum*.

22770, 22772, 22784; *Rock* 10129, 11159, 22108, 22229, 22611. Plants with white to pink flowers and broad leaves are as follows: *Farrer* 1549; *Forrest* 21869, 22788; *Rock* 10119, 22024, 22110, 22597, 22600, 22601, 22604, 22617. The type of *R. arizelum* var. *rubicosum* Cowan & Davidian (in *Rhododendron & Camellia Yearbook* 8: 79, 1953), *Rock* 11207, also belongs to this category.

**4c. subsp. *arizelum*** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 330 (1979).

Syn.: *R. arizelum* Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 90 (1920).

Type: China, Yunnan, Shweli/Salween divide, 11°–12000ft, 1917, *Forrest* 15857 (holo. E).



CHINA (W Yunnan) & adjacent NE BURMA. Rhododendron thickets, open conifer forests, 3000–4000m.

The following specimens may belong to either subsp. *fictolactum* or to subsp. *arizelum* or may be intermediate between them: *Forrest* 20366, 20381, 20820, 20821, 21861a, 25959; *Rock* 11640, 11642, 22038, 16, 25, 51, 97, 102, 170; *Kingdon-Ward* 5877, 6818, 8163, 13146; *Yü* 20257, 20744, 20971.

A complex and variable species, with many intermediates between the subspecies that cannot be definitely placed. While the variation trends between subsp. *rex* and subsp. *fictolactum* are best expressed as a geographical cline, the intergradation between subsp. *fictolactum* and subsp. *arizelum* is more likely to be due to local hybridisation. *R. rex* is closely allied to *R. preptum* and *R. coriaceum* (q.v.).

5. (198.) *R. preptum* Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 149 (1920). Type: NE Upper Burma, N'Maikha/Salween divide, 11000ft, v 1919, *Forrest* 18034 (holo. E).

Shrub or tree, 2.5–9m. Leaves oblanceolate to elliptic, 13.5–15 × 5.5–6.2 cm, c.2.5 × as long as broad, apex ± rounded, apiculate, base rounded to tapering, upper surface glabrous, ± rugulose, lower surface with a bistrate indumentum, the lower layer adpressed, the upper buff, composed of strongly fimbriate, cup-shaped hairs; petioles 1.5–2cm, glabrous, terete. Inflorescence 10–20-flowered; rhachis c.20mm; pedicels 25–30mm, lanate-floccose. Calyx minute, densely tomentose. Corolla 6–7-lobed, obliquely ventricose-campanulate, white with a purple basal blotch, 35–45mm. Stamens (10–)12–14. Ovary densely tomentose. Capsule not known.

NE UPPER BURMA. Scrub, c.3350m. Map 77, p. 258.

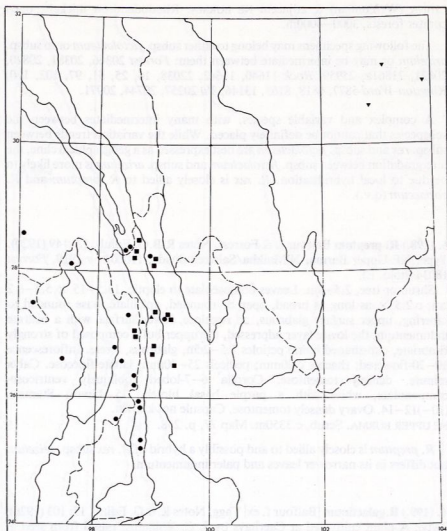
*R. preptum* is closely allied to and possibly a hybrid of *R. rex* subsp. *arizelum* but differs in its narrower leaves and paler indumentum.

6. (199.) *R. galactinum* [Balfour f. ex] Tagg, Notes R.B.G. Edinb. 15: 103 (1926). Type: A plant cultivated at Caerhays by J. C. Williams; raised from seed as *Wilson* 4254 from Pan-lan-shan, W of Kuan hsien in C Sichuan (?E).

Tree, 5–8m (in the wild). Leaves ovate-lanceolate, 14–20 × 5–6.2cm, 2.6–3.3 × as long as broad, apex ± obtuse, apiculate, base rounded, upper surface glabrous, smooth, lower surface with a bistrate indumentum, the lower layer whitish and compacted, the upper dense, cinnamon, composed of strongly fimbriate, narrowly cup-shaped hairs; petioles 2–3.5mm, terete, tomentose. Inflorescence 9–15-flowered; rhachis c.5mm; pedicels 50–55mm, sparsely tomentose. Calyx c.1mm, tomentose, teeth triangular. Corolla 7-lobed, campanulate, pale rose with a crimson basal blotch, (30–)40–50mm. Stamens 14. Ovary glabrous or with a few rufous hairs. Capsule not known.

CHINA (C Sichuan). Map 77, p. 258.

The wild-collected specimen of *Wilson* 4254 is in fruit and, although close to *R. rex* subsp. *rex*, it differs in the more strongly fimbriate hairs. The ovary is apparently consistently much less hairy than that of subsp. *rex*.



MAP 77. ● *R. sinogrande*; ▲ *R. preptum*; ▼ *R. galactinum*; ■ *R. coriaceum*.

7. (200.) *R. coriaceum* Franchet, J. Bot. (Morot) 12: 258 (1898). Syntypes: China, NW Yunnan, environs de Tsekou, *Soulié* 1021 (E, K), 1022 (E, K), 1024 (E).

Syn.: *R. foveolatum* Rehder & Wilson in Sargent (ed.), Pl. Wilsonianae 1: 537 (1913). Type: China, NW Yunnan, Tsekou, *Mombeig* 3 (E).

Ic.: Bot. Mag. n.s. 175:t.462 (1965).

Shrub or small tree, 2–7.5m. Leaves oblanceolate, (12–) 16–25 × 4.8–6.2cm, 2.5–4 × as long as broad, apex rounded, minutely apiculate, base cuneate, upper surface glabrescent, smooth, lower surface covered with a dense bistrate indumentum, the lower layer compacted, the upper whitish or fawn to pale cinnamon, composed of scarcely fimbriate, broadly cup-shaped hairs;

petioles 2–3cm, terete, sparsely whitish-tomentose. Inflorescence 15–20-flowered; rhachis 10–15(–30)mm; pedicels 20–30mm, sparsely brown-tomentose. Calyx c.1mm, lobes minute. Corolla (5–)7-lobed, funnel-campanulate, white, sometimes flushed with rose, with a crimson basal blotch, sometimes also with flecks, 35–40mm. Stamens (10–)14. Ovary densely rufous-tomentose. Capsule 18–25 × 4mm, straight or curved.

CHINA (NW Yunnan, SE Xizang). Conifer forests, Rhododendron thickets, 3000–4000m. Map 77.

*R. coriaceum* is allied to *R. rex* but may be distinguished from subsp. *rex*, which also has a pale leaf indumentum, by its more slender leaves and its more westerly distribution. Some forms of subsp. *fictolacteum* approach *R. coriaceum* in the size of their leaves but have a consistently darker indumentum.

**8. (201.) *R. hodgsonii* Hooker f.,** Rhododendrons Sikkim Himalaya 16, t.15 (1851). Type: Sikkim Himalaya, 10–12000ft, *Hooker* (holo. K).

!c.: Bot. Mag. 92: t. 5552 (1866).

Shrub or small tree, 3–11m. Leaves obovate to oblanceolate or elliptic, 17–24 × 6.4–10cm, 2.4–3.2 × as long as broad, apex rounded to retuse, base ± rounded, upper surface glabrescent, not strongly reticulated, lower surface with a dense silvery to cinnamon indumentum of two layers, the lower compacted, the upper composed of slightly fimbriate, broadly cup-shaped hairs; petioles 2.5–5cm, terete, with a thin, ± floccose greyish indumentum. Inflorescence dense, 15–25-flowered; rhachis 25–50mm; pedicels 20–40mm, with a sparse greyish floccose indumentum. Calyx 2–3mm, sparsely tomentose. Corolla fleshy, 7–8(–10)-lobed, tubular-campanulate, pink to magenta or purple, with a darker basal blotch, 30–40(–50)mm. Stamens 15–18. Ovary tomentose. Capsule 30–40 × c.6mm, curved.

E NEPAL, N INDIA (Sikkim, Bengal, Arunachal Pradesh), BHUTAN, CHINA (S Xizang). Open hillsides, Abies forests, etc., 3000–4000m. Map 71, p. 245.

*R. hodgsonii* usually occurs at higher altitudes than does *R. falconeri*, though where the two grow together hybrids occur (e.g. *Ludlow & Sherriff* 2987, 3047; *Grierson & Long*, s.n.; *Cooper* 2088). *R. decipiens* Lacaita (*J. Linn. Soc., Bot.* 43, 473, 1916), described from specimens from N Bengal & Sikkim (*Lacaita* 15375 (K); *Ribu* 18445 (K), 18446 (K)), almost certainly has the same hybrid origin.

**9. (202.) *R. falconeri* Hooker f.,** Rhododendrons Sikkim Himalaya t. 10 (1849).

Tree, 6–12m. Leaves broadly elliptic to obovate, 18–35 × 8–17cm, 1.4–2.3 × as long as broad, apex rounded, base rounded to cordate, upper surface glabrous or scurfy, rugulose, lower surface with a bistrate indumentum, the lower layer white and compacted, the upper a dense rufous tomentum composed of strongly fimbriate, narrowly cup-shaped hairs; petioles terete, 2.5–5cm, sparsely floccose and stipitate-glandular. Inflorescence 15–20-flowered; rhachis stout; 30–60mm; pedicels 40–55mm, densely stipitate-glandular, viscid. Calyx c.2mm, viscid-glandular. Corolla fleshy, 8(–10)-lobed, obliquely campanulate, whitish to cream, or pale pink with darker tips, purple basal blotch present, 40–50mm. Stamens 12–16. Ovary densely viscid-glandular. Capsule c.40 × 10mm, straight.

Deciduous and mixed forests, 2700–3750m. Map 72, p. 245.

1. Corolla white to cream; leaves glabrous above at maturity ..... **9a. subsp. falconeri**  
 + Corolla pale pink with darker tips; leaves scurfy above, even at maturity ..... **9b. subsp. eximium**

**9a. subsp. *falconeri*.** Type: N India, Bengal, Tonglu, 10000ft, *Hooker* (holo. K).  
 Ic.: Bot. Mag. 82: t. 4924 (1856).

E NEPAL, N INDIA (Bengal, Sikkim, Arunachal Pradesh), BHUTAN.

Three specimens from Duke La & Pele La in C Bhutan (Cooper 3911, 3968; Grierson & Long 1085) with pink to lilac flowers, broad, non-rugulose leaves and a fawn lanate sub-cupular indumentum have almost certainly been derived by hybridisation from *R. falconeri*. To what extent they are part of a stabilised hybrid population is not certain. Their status therefore remains doubtful. It is however noted that a plant assigned to *R. falconeri*, with yellow flowers and rugose leaves, but with the same sub-cupular indumentum (Ludlow & Sherriiff 3041) originated from Chendebe, not far from Pele La.

**9b. subsp. *eximium*** (Nuttall) Chamberlain, Notes R.B.G. Edinb. 37:330 (1979).  
Syn.: *R. eximium* Nuttall, Hooker's J. Bot. Kew Gard. Misc. 5: 364 (1853).

Type: NE India, Arunachal Pradesh, Oola Mountain, 10–11000ft, Booth (holo. K).

lc.: Bot. Mag. 119: t. 7317 (1893).

NE INDIA (Arunachal Pradesh).

Closely allied to subsp. *falconeri* and apparently replacing it in the east. A fruiting specimen (Ludlow & Sherriff 2989) from S Bhutan could belong to either subspecies. A specimen from the Subansiri district of Arunachal Pradesh, with relatively narrow leaves, c.2.5 × as long as broad, that are glabrous above and only slightly rugose, but with deep rose-pink flowers (Cox & Hutchison 427), may be a hybrid of subsp. *eximium*.

10. (203.) *R. sinofalconeri* Balfour f., Notes R.B.G. Edinb. 9: 272 (1916). Type: S Yunnan, Mangtsz, 9000ft, Henry 9449 (holo. E; iso. K).

Tree, to 7m. Leaves broadly obovate, 17–28 × 11.8–16cm, 1.5–1.8 × as long as broad, apex rounded, apiculate, base ± cuneate, upper surface glabrous, rugulose, lower surface with a unistrate or bistrate indumentum, the lower layer (when present) compacted, the upper layer dense, light brown, composed of moderately fimbriate, broadly cupular hairs; petioles terete, up to 5cm, sparsely tomentose. Inflorescence c.10-flowered; rhachis c.8mm; pedicels c.30mm, lanate-tomentose. Calyx c.3mm, lobes rounded, sparsely tomentose. Corolla 8-lobed, obliquely campanulate, pale yellow, 50–60mm. Stamens 16. Ovary densely fimbriate lanate-tomentose. Capsule not known.

CHINA (SE Yunnan) & adjacent parts of N VIETNAM. Map 68, p. 239.

Most of the material seen has a unistrate indumentum, often with narrower cupular hairs than are present on the type, which has a bistrate indumentum. Probably allied to *R. falconeri*.

V. Subsection **Williamsiana** Chamberlain, **subsect. nov.** (see p. 478).

Syn.: Series *Thomsonii* subseries *Williamsianum* Cowan & Davidian, Rhododendron Yearbook 6: 180 (1952), without a latin description.

Dwarf shrub; young shoots setose-glandular; bark smooth. Leaves ovate-orbicular to broadly oblong; lower surface with lamina glabrous at maturity though with some glands, midrib sometimes (*R. leishanicum*) setulose. Inflorescence 2–3(–5)-flowered; rhachis c.5mm. Calyx 1–3mm. Corolla 5-lobed, campanulate, lacking nectar pouches. Stamens 10, filaments glabrous or papillate below. Ovary stipitate-glandular to setulose-tomentose; style glabrous or glandular to tip.

Type species: *R. williamsianum* Rehder & Wilson

A small subsection of uncertain affinities; *R. williamsianum* is apparently allied to subsection *Campylocarpa* though *R. leishanicum* may also have some affinities with subsection *Maculifera*.

1. Leaves with midrib glabrous below; ovary and style stipitate-glandular; filaments glabrous.....1. *williamsianum*
- + Leaves with midrib setulose towards base below; ovary setulose-tomentose, eglandular; style glabrous; filaments coarsely papillate below .....2. *leishanicum*

**1. (204.) *R. williamsianum*** Rehder & Wilson in Sargent (ed.), Pl. Wilsonianae 1: 538 (1915). Type: China, W Sichuan, Wa-shan, 2800m, vi–x 1902, *Wilson* 1350 (holo. A; iso. E, K).

lc.: Gard. Chron. 93: 1 t. (1935).

Spreading dwarf shrub, 0.6–1.5m; young shoots setose-glandular. Leaves ovate-orbicular, 2–4.5 × 1.4–3.5cm, c.1.3 × as long as broad, apex rounded, minutely apiculate, base cordate, upper and lower surfaces glabrous although with red sessile glands below; petioles 0.7–1cm, glabrous to setose-glandular. Calyx c.1mm, glandular-ciliate. Corolla campanulate, lacking nectar pouches, pale rose, with darker flecks, 30–40mm. Ovary glandular; style glandular to tip. Stamens with filaments glabrous. Capsule 15–18 × c.5mm.

CHINA (C Sichuan). Alt. 2800m. Map 75, p. 254.

A distinctive species with no close allies.

**2. (205.) *R. leishanicum*** Fang & S.S. Chang, in prep.

Type: China, Guizhou, Leishan Xian, Leishan, 1850m, 29 iv 1959, *Cao, S. Y.* 909 (holo. SZ).

Shrub, c.3m; young shoots setulose. Leaves broadly oblong, 4.5–6 × 2.5–3cm, 1.8–2 × as long as broad, apex rounded, apiculate, base rounded to sub-cordate, lower surface with lamina glabrous though probably with a few scattered glands, midrib setulose, at least below; petioles 5–10mm, with a dense setulose, probably also glandular, tomentum. Inflorescence 3-flowered; rhachis minute; pedicels 12–15mm, densely setulose-tomentose. Calyx c.3mm, tomentose. Corolla open-campanulate, purple, 30–35mm. Stamens with filaments coarsely papillate below. Ovary densely setulose-tomentose; style glabrous. Capsule not known.

CHINA (E Guizhou). Only known from the type. Map 80, p. 268.

This interesting new species is probably most closely allied to *R. williamsianum*, though with a dense indumentum on the petioles and the lower surface of the leaf midribs as in subsection *Maculifera*, that is however not as dendroid and matted as is usual in that subsection.

**VI. Subsection *Campylocarpa* Sleumer, Bot. Jahrb. 74: 547 (1949).**

Syn.: Series *Thomsonii* subsection *Campylocarpum* & subseries *Souliei* sensu Tagg in Stevenson (ed.), *The Species of Rhododendron* 698 & 725 (1930).

Subsection *Souliea* Sleumer, loc. cit. (1949).

Shrubs or small trees, 0.6–6.5m; bark rough; young shoots shortly stipitate-glandular or glabrous. Leaves narrowly obovate to orbicular, glabrous on both surfaces when mature. Inflorescence 4–15-flowered, lax; rhachis c.5mm. Calyx minute to well-developed and cupular, 1–15mm. Corolla 5-lobed, campanulate to saucer-shaped, nectar pouches absent, pink, white or yellow. Stamens 10. Ovary stipitate-glandular; style glabrous or glandular to tip.

Type species: *R. campylocarpum* Hooker f.

The differences between subsections *Campylocarpa* and *Souliea* sensu Sleumer, the former with minute calyces and glabrous styles, the latter with well-developed calyces and glandular styles, do not merit the maintenance of two separate subsections.

Subsection *Campylocarpa* is probably more closely allied to subsection *Fortunea* (*R. oreodoxa* in particular) than it is to subsection *Thomsonia*, with which both Tagg and Cowan & Davidian implied an affinity.

*Reference*

COWAN, J. H. & DAVIDIAN, H. H. (1952). A review of *Rhododendrons* in their Series IV, The *Thomsonii* Series. *Rhododendron Yearbook* 6: 127–137, 155–163.

- |                                                                                |                         |
|--------------------------------------------------------------------------------|-------------------------|
| 1. Style glabrous; corolla campanulate to funnel-campanulate; calyx 1–5mm..... | 2                       |
| + Style glandular to tip; corolla saucer-shaped; calyx 3–15mm .....            | 3                       |
| 2. Corolla whitish to pink .....                                               | 1. <i>callimorphum</i>  |
| + Corolla pale to sulphur yellow .....                                         | 2. <i>campylocarpum</i> |
| 3. Corolla purplish-pink .....                                                 | 4. <i>souliei</i>       |
| + Corolla white to yellow.....                                                 | 3. <i>wardii</i>        |

**1. (206.) *R. callimorphum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 10: 89 (1919).**

Shrub, 0.6–2(–3)m; young shoots shortly stipitate-glandular. Leaves broadly ovate to orbicular, 3.5–7 × 3–5cm, 1–1.5 × as long as broad; apex rounded, acuminate, base cordate, upper surface glabrous, lower surface glaucous, with minute red punctate glands, sometimes also stipitate-glandular at base, especially on midrib; petioles 1.2–2cm, stipitate-glandular, at least when young. Inflorescence 4–8-flowered; rhachis c.3mm; pedicels c.15mm, stipitate-glandular. Calyx c.2mm, stipitate-glandular. Corolla campanulate, white to rose-pink, sometimes with purple flecks and a faint basal blotch, 30–40mm. Ovary stipitate-glandular; style glabrous or with a few glands at base. Capsule 15–20 × 3–4mm, curved.

CHINA(W Yunnan). Stony slopes, thickets, etc., 3000–4000m. Map 87, p. 289.

- |                       |                              |
|-----------------------|------------------------------|
| 1. Flowers pink ..... | 1a. var. <i>callimorphum</i> |
| + Flowers white ..... | 1b. var. <i>myiagram</i>     |

**1a. var. *callimorphum*.** Type: China, W Yunnan, Shweli/Salween divide, 25°20'N, 10000ft, *Forrest* 12019 (holo. E; iso. K).

Syn.: *R. cyclyum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 39 (1920). Type: China, W Yunnan, N'Maikha/Salween divide, vi 1919, *Forrest* 18044 (holo. E; iso. K).

*R. hedythamnium* Balfour f. & Forrest, *ibid.* 13: 261 (1922). Type: China, Mid W Yunnan, Tali Range, W flank, 11000ft, vi 1913, *Forrest* 11601 (holo. E; iso. K).

*R. hedythamnium* Balfour f. & Forrest var. *eglandulosum*. Handel-Mazzetti, Anz. Akad. Wiss. Wien 79: 3 (1923). Type: China, Yunnan, in lateris orient. montis Dzang-shan prope urbem Dali, 3900–4250m, *Handel-Mazzetti* 8712, n.v.

!c.: Bot. Mag. 145: t.8789 (1919).

**1b. var. *myiagram*** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 116 (1978).

Syn.: *R. myiagram* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 52 (1920). Type: China, W Yunnan, N'Maikha/Salween divide, 10000ft, vi 1919, *Forrest* 17793 (holo. E; iso. K).

Cowan & Davidian maintain *R. myiagram* at specific rank while admitting that the only significant difference between it and *R. callimorphum* is the flower colour, a distinction that certainly does not merit more than varietal rank.

**2. (207.) *R. campylocarpum*** Hooker f., Rhododendrons Sikkim Himalaya t. 30 (1851).

Shrub or small tree, 1–4(–6.5)m; young shoots usually with a few short stipitate glands. Leaves orbicular to elliptic, 3.2–10 × 1.5–5cm, 1.1–2.5 × as long as broad, apex rounded and apiculate, base ± cordate, upper and lower surfaces glabrous when mature, rarely with a few glands at base below; petioles 0.5–2.2cm, stipitate-glandular, at least when young. Inflorescence 3–10(–15)-flowered; rhachis 3–5mm, rarely up to 20mm; pedicels 10–35mm, stipitate-glandular. Calyx 3–5mm, stipitate-glandular, lobes rounded. Corolla campanulate, pale to sulphur yellow, sometimes tinged with red in bud, with or without a basal blotch, 25–40mm. Ovary densely stipitate-glandular; style glabrous or glandular for up to one third of its length. Capsule 13–20 × 4–7mm, curved. Map 78, p. 264.

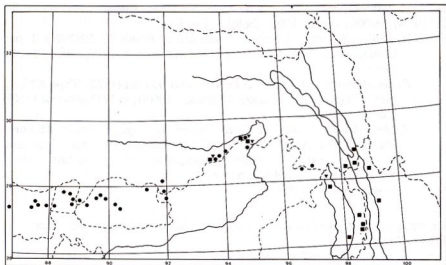
1. Leaves elliptic, 1.6–2.5 × as long as broad (Indo-Himalaya, S Xizang) ..... **2a. subsp. *campylocarpum***  
 + Leaves orbicular, 1.1–1.5(–1.7) × as long as broad (NE Burma, W Yunnan & adjacent SE Xizang)..... **2b. subsp. *caloxanthum***

**2a. subsp. *campylocarpum*.** Type: Sikkim, 11–14000ft, *Hooker* (holo. K; iso. E).

!c.: Bot. Mag. 83: t.4968 (1857); Gard. Chron. 85: 319 (1929).

NEPAL, N INDIA (Sikkim, Arunachal Pradesh), BHUTAN, CHINA (S Xizang). Open forests, stony slopes, 3000–4600m.

Several specimens from Fuchuan, SW of Weixi in NW Yunnan are technically referable to subsp. *campylocarpum* though they have leaves that are relatively



MAP 78. ● *R. campylocarpum* subsp. *campylocarpum*; ■ subsp. *caloxanthum*; ▼ *R. campylocarpum* × *R. wardii*.

small and which sometimes have rounded bases. These might be part of a stabilised hybrid population with subsp. *caloxanthum* and *R. selense* s.l. as putative parents, especially as this locality is outside the normal range of subsp. *campylocarpum*. These specimens are as follows: McLaren D 231; Rock 16980, 16996, 17011, 17012, 17019, 18353, 18373, 18393.

**2b. subsp. *caloxanthum*** (Balfour f. & Farrer) Chamberlain, Notes R.B.G. Edinb. 36: 116 (1978).

Syn.: *R. telopeum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 61 (1921).  
Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, vii 1919, Forrest 18963 (holo. E; iso. K).

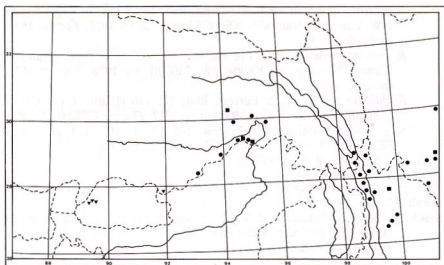
*R. caloxanthum* Balfour f. & Farrer, Notes R.B.G. Edinb. 13: 238 (1922). Type: NE Burma, Chimili, 12000ft, 18 v 1919, Farrer 837 (holo. E).

*R. campylocarpum* Hooker f. subsp. *telopeum* (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 116 (1978).

NE UPPER BURMA and adjacent provinces of CHINA (SE Xizang & W Yunnan). Forest margins, Rhododendron thickets, open places, 3000–4300m.

Apparently intergrading with subsp. *campylocarpum* though probably entirely replacing it in the eastern part of the range of the species. Some forms of subsp. *caloxanthum* have a marked glaucous bloom on the lower surface of the leaves. These have been referred to *R. telopeum*. This character is difficult to see in dried material and there are plants from the western part of the range of subsp. *campylocarpum* that also have glaucous leaves. It therefore seems likely that they are no more than local habitat forms, perhaps showing a response to more exposed conditions. A specimen from SE Xizang, Ludlow, Sherriff & Elliot 13756, is a hybrid of *R. campylocarpum*, possibly with *R. stewartianum* as the





MAP 79. ● *R. wardii* var. *wardii*; ■ var. *puralbum*; ▼ *R. papillatum*.

other parent. *R. campylocarpum* also hybridises with *R. wardii* (q.v.) where the ranges of the two species overlap.

**3. (208.) *R. wardii* W. W. Smith, Notes R.B.G. Edinb. 8: 205 (1914).**

Shrub or small tree, 0.6–8m; young shoots glandular to glabrous. Leaves narrowly obovate to broadly ovate, 6–11 × 2.3–6cm, 1.5–2.5 × as long as broad, apex rounded, acuminate, base cordate, upper and lower surfaces glabrous, glaucous or green below; petioles 1–3.5cm, glabrous or stipitate-glandular. Inflorescence 5–10(–15)-flowered; rhachis c.5mm; pedicels 1.5–5cm, glandular. Calyx 5–15mm, when well-developed ± cupular, lobes rounded, glandular-ciliate. Corolla saucer-shaped, white to sulphur yellow, with or without a purple basal blotch, 25–40mm. Ovary stipitate-glandular; style glandular to tip. Capsule 20–25 × 5–10mm, straight or curved.

CHINA (SE Xizang, NW Yunnan, SW Sichuan). Rhododendron thickets, pine forests, open places, etc., 3000–4300m. Map 79.

- |                         |                          |
|-------------------------|--------------------------|
| 1. Corolla yellow ..... | 3a. var. <i>wardii</i>   |
| + Corolla white .....   | 3b. var. <i>puralbum</i> |

**3a. var. *wardii*.** Type: China, W Yunnan, Doker La, 13–14000ft, vi 1913, *Kingdon-Ward* 529 (holo. E).

Syn.: *R. mussoii* Franchet, nom. nud.

*R. croceum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 10: 93 (1917). Type: China, NW Yunnan, mountains of the Yangtze bend, 12000ft, vii 1913, *Forrest* 10428 (holo. E; iso. A, BM, K).

*R. astrocalyx* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 30 (1920). Type: NW Yunnan, Mekong/Salween divide, 11000ft, vi 1917 *Forrest* 14128 (holo. E; iso. K).

*R. prasinocalyx* Balfour f. & Forrest, *ibid.* 13:57 (1920). Type: China, NW Yunnan, Mountains NE of Chungtien, vii 1918, *Forrest* 16511 (holo. E; iso. K).

*R. oresterum* Balfour f. & Forrest, *ibid.* 13:56 (1920). Type: China, SE Xizang, Tsarong, on Ka-gwr-pw, 13000ft, vii 1918, *Forrest* 16715 (holo. E; iso. K).

*R. litiense* Balfour f. & Forrest, *ibid.* 12: 126 (1920). Type: China, Yunnan, on the Li-ti-ping, 10000ft, vi 1917, *Forrest* 13922 (holo. E).

*R. gloeblastum* Balfour f. & Forrest, *ibid.* 13: 200 (1922). Type: China, SE Xizang, Tsargon, *Forrest* 18672 (holo. E; iso. K).

*l.c.*: Bot. Mag. n.s. 178: t. 587 (1971).

**3b. var. *puralbum*** (Balfour f. & W. W. Smith) Chamberlain, Notes R.B.G. Edinb. 36: 116 (1978).

Syn.: *R. puralbum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 9: 266 (1916). Type: China, mountains NE of the Yangtze bend, 11000ft, *Forrest* 10616 (holo. E; iso. K).

*R. litiense* was recognised as a distinct species, both by Tagg and by Cowan & Davidian, distinguished from *R. wardii* by its narrow leaves with the lower surface glaucous. However, even the type of *R. wardii* has a slight glaucous bloom and the type of *R. litiense* has at least some broad leaves that have lost their bloom, at least partially. Clearly, there is a complete range of intermediates, from forms with broad leaves that are green below (that would traditionally be placed in *R. wardii*) to those with narrow leaves that have a marked bloom below (that would be referred to *R. litiense*). Therefore *R. litiense* is not maintained, even at varietal rank.

Plants intermediate between *R. wardii* and *R. campylocarpum* occur where there distributions overlap. They are as follows: *Ludlow & Sherriff* 2085; *Ludlow, Sherriff & Elliot* 13661, 13664, 13754, 13756, 15010, 15014, 15081, 15087, 15089, 15093, 15099. The last three approach *R. campylocarpum* subsp. *caloxanthum* in their almost orbicular leaves. All are best treated as hybrids between the two species.

The hybrid between *R. wardii* and *R. selense* (*R. × erythrocalyx*) is discussed fully in the account of subsection *Selensia*.

**4. (209.) *R. souliei*** Franchet, J. Bot. (Morot) 9: 393 (1895). Syntypes: China, W Sichuan, aux environs du Tatsien-lou (Kangding), *Soulie* 793 (E, K); 52, n.v.

Syn.: *R. cordatum* Léveillé, Bull. Geog. Bot. 24: 282 (1914). Type: China, NE Yunnan, sommet de Io-chan, 3400m, vi 1913, *Maire* (holo. E).

*l.c.*: Bot. Mag. 141: t. 8622 (1915); Stevenson (ed.), The Species of *Rhododendron* 731 (1930).

Shrub, 1.2–5m; young shoots glabrous or glandular. Leaves broadly ovate, 5.5–8 × 3.5–4cm, 1.4–2 × as long as broad, apex rounded, apiculate, base rounded to cordate, upper and lower surfaces glabrous; petioles 1.5–2.3cm, glabrous or sparsely stipitate-glandular. Inflorescence lax, 3–5-flowered; rhachis c.3mm; pedicels 1.5–2.5cm, with a sparse covering of subsessile glands. Calyx 3–8mm, lobes rounded, glandular-ciliate. Corolla saucer-shaped, pale purplish-pink, 25–40mm. Ovary densely stipitate-glandular; style glandular to tip. Capsule 18–22 × c.6mm, slightly curved.

CHINA (Sichuan). Boulderly mountain summits, c.4500m. Map 75, p. 254.

Closely allied to *R. wardii* but distinguished by the more open corollas that are generally pale pink.

**VII. Subsection *Maculifera*** Sleumer, Bot. Jahrb. 74: 344 (1949).

Syn.: Series *Barbatum* subseries *Maculiferum* sensu Tagg in Stevenson (ed.), The Species of Rhododendron 144 (1930).

Large shrubs or small trees; bark rough; young shoots tomentose or glandular-setose. Leaves elliptic or oblong to obovate, apex apiculate to cuspidate, lower surface with a  $\pm$  persistent to evanescent, flagellate, folioliferous, long-rayed or stellate tomentum beneath which is often more persistent on the midrib, or with scattered hairs that are sometimes setose. Inflorescence lax or dense, 5–20-flowered; rhachis 2–20mm. Calyx usually minute and up to 2mm (6–10mm in *R. longesquamatum*). Corolla 5-lobed, narrowly to widely campanulate and lacking nectar pouches, to tubular-campanulate, with pouches, white to pink or deep red, with or without a basal blotch and flecks. Stamens 10. Ovary tomentose to stipitate-glandular, rarely glabrous.

Type species: *R. maculiferum* Franchet

Probably most closely allied to subsection *Selensia* though also showing some affinities with some members of subsection *Errorata*. A diverse group of species with considerable variation in the type of the leaf indumentum and shape of the corolla.

1. Corolla tubular-campanulate, usually with depressed nectar pouches, dark red (rarely white); young shoots stipitate-glandular or covered with glandular setae .....2
- + Corolla narrowly to widely campanulate, nectar pouches lacking, white to pink; young shoots matted-tomentose .....3
2. Lower surface of leaves with a dense matted indumentum .....2. **ochraceum**
- + Lower surface of leaves setose, setae glandular or branched at apex .....3. **strigillosum**
3. Leaf base  $\pm$  cuneate; petioles and lower surface of midrib densely rufous-tomentose; calyx 6–10mm ..... 1. **longesquamatum**
- + Leaf base rounded; petioles and lower surface of midrib with a sparse evanescent to dense and persistent, greyish or brown tomentum; calyx 1–2mm .....4
4. Leaves (7–)10–15cm long .....5
- + Leaves 3–10cm long .....7\*
5. Leaves 2–2.5  $\times$  as long as broad; young shoots and petioles stellate-tomentose and glandular .....5. **sikangense**
- + Leaves 2.7–4.5  $\times$  as long as broad; young shoots and petioles tomentose though hairs not stellate .....6
6. Pedicels, ovary and style base with at least a few glands or hairs .....7. **morii**
- + Pedicels and ovary eglandular, style base glabrous .....4. **pachytrichum**
7. Leaves with a  $\pm$  persistent tomentum at maturity; inflorescence 10–20-flowered; rhachis 10–20mm .....9. **pachysanthum**
- + Leaves glabrous beneath or with scattered hair remains at maturity; inflorescence 5–10-flowered; rhachis 2–5mm .....8

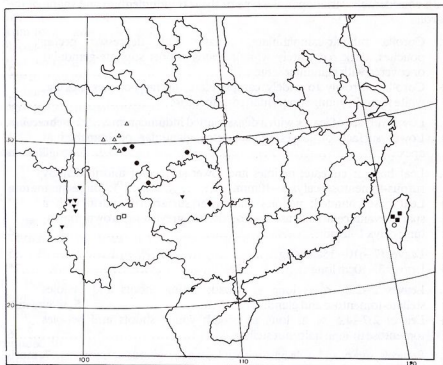
8. Ovary densely rufous-tomentose or  $\pm$  glabrous; pedicels 13–20mm .....9  
 + Ovary stipitate-glandular; pedicels 25–30mm.....8. **pseudochrysanthum**  
 9. Ovary glabrous; leaves up to  $3.5 \times$  as long as broad .....8\*. **nankotaisanense**  
 + Ovary glabrous or densely tomentose; leaves  $1.8-3 \times$  as long as broad .....6. **maculiferum**

1. (210.) *R. longesquamatum* Schneider, Ill. Handb. Laubh. 2: 483 (1909). Type: China, W Sichuan, Tatsienlu, vii 1903, Wilson 3973 (holo. HBG, n.v.; iso. A, BM, K, Herb. Inst. Bot. Guangzhou).

Syn.: *R. brettii* Hemsley & Wilson, Kew Bull. 1910: 106 (1910). Type as above.

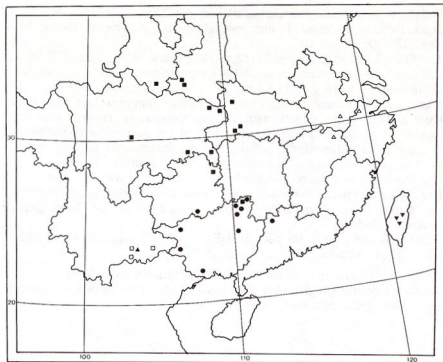
Ic.: Bot. Mag. 159: t. 9430 (1936).

Shrub, c.3m; young shoots densely rufous-tomentose. Leaves elliptic to oblanceolate,  $6-11 \times 2-3.5$ cm, c.3  $\times$  as long as broad, apex shortly cuspidate, base  $\pm$  cuneate, upper surface shortly stipitate-glandular and rufous-tomentose when young, indumentum composed of flagellate hairs and restricted to the midrib by maturity, lower surface with lamina glabrous when mature although with midrib rufous-tomentose; petioles 1–1.5cm, densely rufous-tomentose. Inflorescence dense, 4–6-flowered; rhachis minute, to 2mm; pedicels



MAP 80. ◆ *R. leishanicum*; △ *R. longesquamatum*; ● *R. ochraceum*; ■ *R. pseudochrysanthum*; ○ *R. pachysanthum*; □ *R. aberconwayi*; ▼ *R. annae*.

\* See also *R. exquisitum*, p. 272.



MAP 81. ■ *R. maculiferum* subsp. *maculiferum*; △ subsp. *anhweiense*; ▼ *R. morii*; □ *R. mengtzensense*; ● *R. brevinerve*; ▲ *R. spanotrichum*.

15–20mm, densely stipitate-glandular. Calyx 6–10mm, stipitate-glandular, lobes lingulate. Corolla open-campanulate, rose-pink, 40–45mm. Ovary and lower half of style stipitate-glandular. Capsule not known.

CHINA (Sichuan). Woodland, 2300–3350m. Map 80.

A distinctive species on account of its well-developed calyx, etc.; without close allies.

2. (211.) *R. ochraceum* Rehder & Wilson in Sargent (ed.), Pl. Wilsonianae 1: 534 (1913). Type: China, Sichuan, Wa-shan, 2400–3000m, vi 1908, *Wilson* 3425 (holo. A; iso. BM, E, K).

Small tree, c.3m; young shoots covered with glandular setae. Leaves oblanceolate, 5.5–10 × 1.3–2cm, 4–5 × as long as broad, apex cuspidate, base rounded, upper surface glabrous when mature, lower surface with a dense matted yellow-brown indumentum composed of flagellate hairs; petioles 1–1.5cm, stipitate-glandular. Inflorescence dense, 8–12-flowered; rhachis c.5mm; pedicels 5–8mm, densely stipitate-glandular. Calyx c.1mm, glandular-setulose. Corolla tubular-campanulate, apparently with depressed nectar pouches, dark red, c.35mm. Ovary densely glandular-setulose; style glabrous. Capsule not known.

CHINA (Sichuan). Thickets, 2600–3000m. Map 80.

A distinctive species on account of its persistent leaf indumentum; probably most closely allied to *R. strigillosum*.

3. (212.) *R. strigillosum* Franchet, Bull. Soc. Bot. France 33: 232 (1886). Type: China, Sichuan, Moupine, in montibus ad septentriones versus, 3000m, iv-v 1869, *Abbé David* (iso. E).

Loc.: Millais, *Rhododendrons* ed.2: 152, t. (1924); Fang, *Pl. Omeiens.* t.23 (1942).

Shrub, 1.5–2.5m; young shoots densely stipitate-glandular. Leaves elliptic to oblanceolate, 7.5–14 × 1.8–3.8cm, 2.7–3.7 × as long as broad, apex cuspidate, base ± cuneate, margins sometimes ciliate, upper surface ± glabrous when mature, lower surface with varying amounts of crisped setae with glandular or branched tips that usually persist, at least near the base, grading into stouter bristles on the midrib; petioles 1–2cm, glandular-setose. Inflorescence 8–12-flowered; rhachis less than 5mm; pedicels 10–20mm, usually covered with long weak glandular hairs. Calyx c.1mm. Corolla tubular-campanulate, with depressed nectar pouches, deep red, 40–60mm. Ovary with a dense covering of long weak glandular hairs; style glabrous. Capsule 15–20 × 4–7mm, usually narrowly cylindrical.

CHINA (Sichuan & adjacent parts of NE Yunnan). Thickets and woodlands, 2200–3350m. Map 82.

The leaf indumentum of this species is particularly variable and shows a transition from the glandular bristles typical of subsection *Barbata* to branched hairs, more typical of subsection *Maculifera*.

4. (213.) *R. pachytrichum* Franchet, Bull. Soc. Bot. France 33: 231 (1886). Type: China, Sichuan, circa Moupine, *Abbé David* (iso. E).

Syn.: *R. monosematum* Hutchinson, Bot. Mag. 142: t. 8675 (1916). Type: a plant grown at Kew from seed collected by *Wilson* in 1903 as seed no. 1521 (holo. E).

Loc.: Fang, *Pl. Omeiens.* t.22 (1942).

Shrub or small tree, 1–6m; young shoots tomentose. Leaves elliptic to obovate, 9–15 × 2–4.2cm, 2.7–4.5 × as long as broad, apex ± cuspidate, base rounded, upper surface glabrous at maturity, lower surface with short folioliferous hairs on and near the midrib, otherwise glabrous; petioles 1.4–2cm, with an evanescent tomentum and occasionally a few stipitate glands. Inflorescence lax, 7–10-flowered; rhachis less than 5mm; pedicels 10–25mm, tomentose. Calyx c.1.5mm, lobes rounded, ciliate. Corolla narrowly campanulate, with a broad base but lacking nectar pouches, white suffused with pink, with a purple basal blotch and flecks. Ovary densely tomentose, eglandular; style glabrous or glandular at base. Capsule c.20 × 4–6mm.

CHINA (Sichuan & adjacent parts of NE Yunnan). Woods, open slopes, etc., 2500–3600m. Map 83, p. 276.

*R. monosematum* is only known for certain from the type although several plants that are assumed to be hybrids between *R. strigillosum* and *R. pachytrichum* are a fair match. It differs from *R. pachytrichum* only in its glandular ovary, calyx, pedicels and petioles, trivial characters in view of the obvious transition from glandular to branched hairs in *R. strigillosum*. Furthermore, some of the plants raised from the same batch of seed (*Wilson* 1521) are typical *R. pachytrichum*.

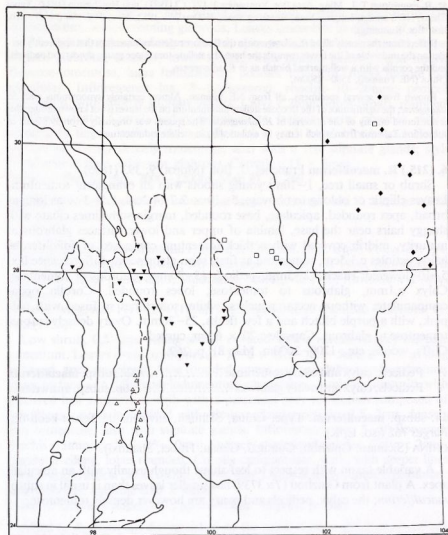
Probably most closely allied to *R. maculiferum* and *R. sikangense*.

5. (214.) *R. sikangense* Fang, Acta Phytotax. Sinica 2: 81, t. 7 (1952). Type: China, Sichuan, Erh-lang-shan, Tien-chuan hsien, 7 vii 1951, Hu, W. K. & Ho, C. 10255 (holo. SZ).

Syn.: *R. cookeanum* Davidian, Rhododendron Yearbook 16: 105 (1961). Type: China, SW Sichuan, Muli, Muti Konka, 12000ft, v-vi 1932, Rock 23698 (holo. E).

Ic.: Acta Phytotax. Sinica 2: 81, t. 7 (1952).

Shrub or tree, 1.5–8m; young shoots  $\pm$  densely rufous- to white-stellate-tomentose and glandular. Leaves elliptic to oblanceolate, (7–)10–15  $\times$  2.8–6cm, 2–2.5  $\times$  as long as broad, apex rounded, apiculate to acute, base



MAP 82.  $\blacklozenge$  *R. strigillosum*;  $\square$  *R. sikangense*;  $\triangle$  *R. araiophyllum*;  $\blacktriangledown$  *R. lukiangense*.

rounded, both surfaces  $\pm$  glabrous when mature; petioles 1–2cm, soon glabrous. Inflorescence 5–15-flowered; rhachis up to 27mm; pedicels 17–30mm, brownish stellate-tomentose. Calyx c.2mm, lobes fleshy, glabrous though with sessile glands on the margin. Corolla campanulate, nectar pouches lacking, white to pink, with or without a purplish basal blotch, 35–50mm. Ovary densely to very sparsely brownish stellate-tomentose, also sometimes with sessile glands. Capsule 20–30  $\times$  3–4mm, strongly curved.

CHINA (SW Sichuan). Forests, alpine slopes, 3700–4550m. Map 82, p. 271.

Originally assigned to subsection *Parishia* on account of its stellate indumentum but otherwise more closely resembling species in subsection *Maculifera*, especially in flower characters.

5\*. *R. exquisitum* T. L. Ming, Acta Bot. Yunnanica 3: 121, t.3 (1981), non Hutchinson (1932). Type: China, NE Yunnan, Luquan Xian, Wumeng Shan, 3500m, 24 v 1952, Mao, P. I. 994 (holo. Herb. Inst. Bot. Kunming).

Differs from the closely allied *R. sikangense* in the floccose rufous indumentum that apparently persists on the underside of the leaves towards the base, the stellate-tomentose young shoots and pedicels, and the corolla with a well-marked blotch as in *R. sikangense*.

CHINA (NE Yunnan), 3500–4500m.

Known from several specimens, all from NE Yunnan. Almost certainly synonymous with *R. sikangense*; the significance of the floccose stellate indumentum on the leaves is not known though this is not found on any of the material of *R. sikangense*. The species was originally wrongly placed in subsection *Taliensia* from which it may be excluded by its stellate indumentum.

6. (215.) *R. maculiferum* Franchet, J. Bot. (Morot) 9: 393 (1895).

Shrub or small tree, 1–10m; young shoots with an evanescent tomentum. Leaves elliptic or oblong to obovate, 5–10  $\times$  2.7–4.2cm, 1.5–3  $\times$  as long as broad, apex rounded, apiculate, base rounded, margin sometimes ciliate with shaggy hairs near the base, lamina of upper and lower surfaces glabrous at maturity, midrib covered with a thick tomentum composed of folioliferous hairs; petioles c.1.5cm, tomentose at first, soon glabrescent. Inflorescence lax, 5–10-flowered; rhachis 2–3mm; pedicels 13–20mm, glabrous or tomentose. Calyx c.1mm, glabrous to tomentose, lobes rounded. Corolla open-campanulate, without nectar pouches, white, sometimes suffused with pale pink, with a purple blotch and a few flecks, 25–30mm. Ovary densely rufous-tomentose to glabrous. Capsule c.20  $\times$  6mm, curved.

Cliffs, woods, etc., 1200–3000m. Map 81, p. 269.

1. Pedicels, calyx and ovary tomentose ..... 6a. subsp. *maculiferum*  
+ Pedicels, calyx and ovary glabrous ..... 6b. subsp. *anhweiese*

6a. subsp. *maculiferum*. Type: China, Sichuan, environs 'de Tchen-keou-tin, Farges 762 (iso. E, K).

CHINA (Sichuan, Guizhou, Guangxi, Gansu, Hubei, Shaanxi).

A variable taxon with respect to leaf shape though usually with an apiculate apex. A plant from Guizhou (*Tu* 3739) has smaller leaves than is usual in subsp. *maculiferum*; the calyx, pedicels and ovary are however densely tomentose.

6b. subsp. *anhweiese* (Wilson) Chamberlain, Notes R.B.G. Edinb. 36: 118 (1978).



Syn.: *R. anhweiense* Wilson, J. Arnold Arbor. 6: 163 (1925). Type: China, Anhui, Wang Shan, 29 viii 1923, *Ip, H. K.* 4784, n.v.  
CHINA (Jiangxi, Anhui, Zhejiang).

The tomentum on the ovaries, calyx and pedicels is apparently the only reliable character separating subsp. *maculiferum* from subsp. *anhweiense*, a difference that does not merit maintaining them as separate species. The leaves of the latter are consistently small while those of the former are usually larger, though not always so. The present species is allied to *R. pachytrichum*.

7. (216.) *R. morii* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30: 173 (1911). Syntypes: Taiwan, Randaisan, vii 1906, *Mori* 7041, n.v.; Anzan, in monte Morrison, x 1906, *Nakahara*, n.v.

Shrub or small tree, 4–8m; young shoots with a dense blackish floccose indumentum, soon becoming glabrous. Leaves lanceolate to elliptic, (7–)9–14 × 2.8–3.5cm, c.4 × as long as broad, apex acuminate, base rounded, upper surface glabrous, smooth, lower surface with lamina glabrous and midrib floccose-tomentose, hairs foliiferous; petioles 1.5–2cm, finely hirsute and glandular. Inflorescence lax, 5–12-flowered; rhachis 10–20mm; pedicels 25–40mm, with shortly stipitate glands. Calyx c.2mm, lobes broad, rounded, glandular-ciliate. Corolla widely campanulate, lacking nectar pouches, white, sometimes tinged with pink, usually with a red basal blotch and flecks, 30–50mm. Ovary densely tomentose, also with a few stipitate glands; style tomentose at base, otherwise glabrous. Capsule c.15 × 3mm.

TAIWAN. Forests, etc., 2000–2200m. Map 81, p. 269.

Allied to *R. pseudochrysanthum* but larger in stature and in the size of the leaves.

8. (217.) *R. pseudochrysanthum* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 25: 154, t.26 (1908). Syntypes: Taiwan, Mt Morrison, 13000ft, xi 1906, *Kawakami & Mori* 2144, 2240, n.v.; Nasto, Mushazan, 6000ft, viii 1906, *Kawakami & Mori* 1144, n.v.

lc.: Bot. Mag. n.s. 171: t.284 (1956); Rhododendron & Camellia Yearbook 11: f.23 (1956).

Low shrub, 0.5–3m; young shoots covered with a rufous to grey floccose tomentum. Leaves ovate to elliptic, (3–)4–8 × (1.5–)2.3–5cm, 2–3 × as long as broad, apex acuminate, base rounded, upper surface glabrous when mature, lower surface with a floccose indumentum when young, lamina at maturity with scattered hair remains, midrib with a persistent grey tomentum composed of foliiferous hairs intermixed with stipitate glands; petioles 0.5–2cm, densely grey-tomentose, also with stipitate glands. Inflorescence lax, 5–10-flowered; rhachis c.5mm; pedicels 25–30mm, sparsely stipitate-glandular. Calyx c.2mm, glandular-ciliate, lobes rounded. Corolla campanulate, pink, with deeper lines outside and crimson flecks within, 30–40mm. Ovary densely stipitate-glandular; style glabrous. Capsule c.10 × 4mm.

TAIWAN. Gravelly slopes, etc., up to 4000m. Map 80, p. 268.

Allied to *R. morii* but distinguished by the small stature, small leaves, etc. If the syntypes are properly labelled then this species has a surprisingly wide altitudinal range. Wilson describes it as being dominant on mountain tops.

8\*. *R. nankotaisanense* Hayata, Icon. Pl. Formosan. 9:66 (1920). Type: Taiwan, Nankotaisan, iv 1917, Sasaki 57 (iso. A).

Said to differ from *R. morii* in its completely glabrous ovary and shorter (c.20mm) pedicels. The very poor type specimen suggests a closer affinity with *R. pseudochrysanthum* and differs from the type description in its smaller leaves,  $6.6 \times 2.7$ cm, and larger corollas up to c.32mm. More material is required before the relationship of this taxon with *R. morii* and *R. pseudochrysanthum* can be determined.

9. (218.) *R. pachysanthum* Hayata, Icon. Pl. Formosan. 3:140 (1913). Type: Taiwan, in montibus centralibus, iv 1911, Mori, n.v.

Shrub; young shoots tomentose, later glabrescent. Leaves oblong,  $6-9 \times 2.5-3.5$ cm,  $c.2.5 \times$  as long as broad, apex acute to apiculate, base rounded, upper surface rugose to smooth, glabrous, lower surface with a whitish-brown to rufous ramiform tomentum that usually persists, occasionally only on the midrib; petioles c.1.5cm, tomentose. Inflorescence 10-20-flowered; rhachis 10-20mm; pedicels c.25mm, glandular-pubescent. Calyx c.1mm, glandular, especially on the margins of the rounded lobes. Corolla widely campanulate, white to pale pink, with or without purple flecks, c.40mm. Ovary densely stipitate-glandular; style glabrous. Capsule  $c.15 \times 5$ mm.

TAIWAN. Map 80, p. 268.

Hayata mentions the rugose leaves, densely tomentose beneath, and the glabrous style, as the chief characters separating this species from *R. morii*. Recently Patrick has introduced this species into cultivation and it is only known to me through this source. The leaves of the plants I have seen are not rugose, but have a well-developed, persistent, ramiform indumentum on the undersurface, in contrast to the folioliferous indumentum of the two preceding species, presumed to be the closest relatives of *R. pachysanthum*.

#### VIII. Subsection *Selensia* Sleumer, Bot. Jahrb. 74: 547 (1949).

Syn.: Series *Thomsonii* subseries *Selense* sensu Tagg in Stevenson (ed.), The Species of *Rhododendron* 710 (1930) & subseries *Martinianum* sensu Tagg, op. cit. 707 (1930).

Subsection *Martiniana* Sleumer, loc. cit. (1949).

Shrubs or small trees; bark rough; young shoots stipitate-glandular or setulose-glandular, sometimes also with a dendroid indumentum. Leaves obovate to elliptic, when mature entirely glabrous or with a thin dendroid indumentum below. Inflorescence (1-)3-10-flowered, lax; rhachis less than 5mm. Calyx 1-10mm, irregular, or with well-developed lobes. Corolla 5-lobed, not fleshy, funnel-campanulate to campanulate, lacking nectar pouches, white or pale yellow to pink, with or without purple flecks. Stamens 10. Ovary stipitate-glandular, sometimes also with rufous dendroid hairs; style glabrous. Type species: *R. selense* Franchet

The circumscription of this subsection has been enlarged to include *R. martinianum*, *R. hirtipes* and *R. bainbridgeanum*. (For a further discussion of this treatment see p. 459).

#### Reference

COWAN, J. H. & DAVIDIAN, H. H. (1952). A review of *Rhododendrons* in their Series IV, The *Thomsonii* Series. *Rhododendron Yearbook* 6: 140-155.

1. Young shoots and petioles dendroid-hairy as well as glandular; ovary dendroid-tomentose, with or without glands.....2
- + Young shoots and petioles lacking dendroid hairs, stipitate- to setose-glandular; ovary exclusively stipitate-glandular .....3
2. Leaf lamina glabrous below; young shoots and petioles setose-glandular .....2. *dasycladoides*
- + Leaf lamina with a thin detersile indumentum below; young shoots and petioles shortly stipitate-glandular ..... 1. *calvescens*
3. Young shoots and petioles setose-glandular .....4
- + Young shoots and petioles shortly stipitate-glandular or  $\pm$  glabrous .....6
4. Leaves with a  $\pm$  continuous indumentum beneath, 2.3–3.2  $\times$  as long as broad.....3. *bainbridgeanum*
- + Leaves glabrous or with a sparse indumentum beneath (sometimes also with glandular bristles), 1.5–2.5  $\times$  as long as broad .....5
5. Leaves broadly obovate, 3.5–6cm wide; corolla campanulate .....7. *hirtipes*
- + Leaves obovate to elliptic, 1.8–4cm wide; corolla funnel-camp-anulate .....4. *selense*
6. Leaves 4.5–5cm long; inflorescence 1–4-flowered .....5. *martinianum*
- + Leaves (3.5–)5–12cm long; inflorescence 3–10-flowered.....7
7. Leaves coriaceous; calyx (1–)4–10mm.....6. *esetulosum*
- + Leaves  $\pm$  herbaceous, thin; calyx 2–7mm .....4. *selense*

**1. (219.) *R. calvescens*** Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 29 (1919).

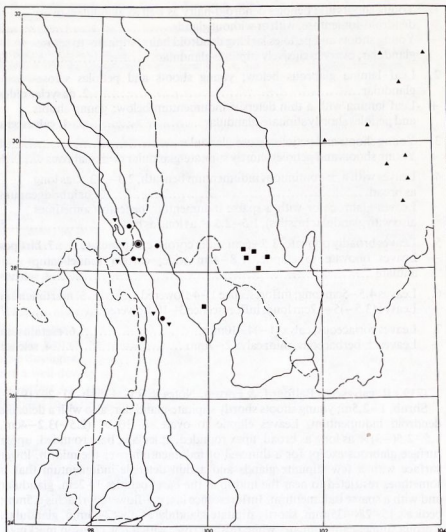
Shrub, 1–2.5m; young shoots shortly stipitate-glandular, also with a detersile dendroid indumentum. Leaves elliptic to ovate, 6–10  $\times$  (2.5–)3.2–4cm, 1.5–2.5(–3)  $\times$  as long as broad, apex rounded, apiculate, base rounded, upper surface glabrous except for a thin veil of indumentum over the midrib, lower surface with a few stipitate glands and a thin detersile indumentum that is sometimes restricted to near the midrib at the base; petioles 1–2cm, glandular and with a sparse indumentum. Inflorescence lax, c.5-flowered; rhachis c.5mm; pedicels 15–28(–35)mm, shortly stipitate-glandular. Calyx 2–3mm, glandular. Corolla funnel-campanulate, white flushed rose, with a few crimson markings, c.35mm. Ovary densely glandular, also with a varying proportion of rufous dendroid hairs; style glabrous. Capsule c.15  $\times$  4mm, curved.

CHINA (SE Xizang, NW Yunnan). Conifer forests, scrub, open rocky places, 3350–4550m. Map 83, p. 276.

1. Leaves 3.2–4cm wide, 1.5–2.5  $\times$  as long as broad; pedicels 15–20mm .....1a. var. *calvescens*
- + Leaves 2.5–3.2cm wide, c.3  $\times$  as long as broad; pedicels 20–28 (–35)mm .....1b. var. *duseimatum*

**1a. var. *calvescens*.** Type: China, SE Xizang, Tsarong, on Dokar La, 11000ft, vii vii 1917, *Forrest* 14331 (holo. E; iso. K).

**1b. var. *duseimatum*** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 119 (1978).



MAP 83. ▲ *R. pachytrichum*; ● *R. calvensens* var. *calvensens*; ○ var. *duseimatum*; ■ *R. dasycladoides*; ▼ *R. bainbridgeanum*.

Syn.: *R. duseimatum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 41 (1920).  
Type: China, SE Xizang, Dokar La, Mekong/Salween divide, 12000ft, vii 1917, *Forrest* 16464 (holo. E; iso. K).

*R. selense* Franchet subsp. *duseimatum* (Balfour f. & Forrest) Tagg in Stevenson (ed.), The Species of *Rhododendron* 722 (1930).

*R. selense* Franchet var. *duseimatum* (Balfour f. & Forrest) Cowan & Davidian, *Rhododendron Yearbook* 6: 152 (1952).

Var. *duseimatum* may be a chance hybrid between *R. selense* and var. *calvensens*, especially since it has only been collected once and then from a well-known locality. *R. calvensens* is closely allied to *R. dasycladoides*, sharing with it

the rufous dendroid-hairy ovary, but differing in the lack of bristles and in the more persistent leaf indumentum.

2. (220.) *R. dasycladoides* Handel-Mazzetti, Symb. Sin. 7: 791 (1936). Type: China, S Sichuan, in montibus supra Molien, c.4000m, 26 v 1914, *Schneider* 4083 (iso. E).

Shrub or small tree, 2–5m; young shoots densely glandular-setose. Leaves ovate to obovate, 4.5–9 × 2.9–4cm, 2–3.5 × as long as broad, apex rounded, apiculate, base rounded, margin glandular-ciliate at base, upper surface glabrous when mature or with traces of hairs at base, lower surface with lamina glabrous and midrib glandular-setose; petioles 1–1.5cm, glandular-setose and floccose-tomentose. Inflorescence 5–8-flowered; rhachis c.2mm; pedicels c.15mm, tomentose and stipitate-glandular. Calyx 2–7mm, stipitate-glandular, lobes rounded. Corolla funnel-shaped, pale to deep purplish rose, with darker flecks, 35–40mm. Ovary dendroid-tomentose; style glabrous. Capsule up to 30 × 5mm, curved.

CHINA (SW Sichuan, adjacent NW Yunnan). Forests, etc., 3000–4850m. Map 83.

Doubtfully distinct from *R. selense* subsp. *dasycladum* but apparently with no intermediates and a more easterly distribution. *Kingdon-Ward* 5201 is a mixed gathering containing both taxa.

3. (221.) *R. bainbridgeanum* Tagg & Forrest in Stevenson (ed.), The Species of Rhododendron 133 (1930). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, E of Chamatong, vi 1922, *Forrest* 21761 (holo. E).

Shrub, 0.6–2m; young shoots covered in glandular setae. Leaves obovate to elliptic, 8–12 × (2.5–)3–4cm, 2.3–3.2 × as long as broad, apex rounded, acuminate, base rounded to cordate, upper surface glabrous, lower surface with a continuous felted dark brown indumentum intermixed with glands which are prominent on midrib towards base; petioles 1–2cm, covered with stipitate glands. Inflorescence lax, 4–8-flowered; rhachis c.3mm; pedicels 20–25mm, stipitate-glandular. Calyx 3–6mm, stipitate-glandular, lobes rounded, unequal. Corolla campanulate, white to creamy yellow, usually flushed with pink, with a broad blotch and purple flecks, 30–35mm. Ovary densely stipitate-glandular; style usually glandular at base. Capsule 15–20 × 4–5mm.

CHINA (SE Xizang, NW Yunnan), NE UPPER BURMA. Scrub, conifer forests, etc., 3350–4000m. Map 83.

Closely allied to *R. selense* and probably hybridising with it.

4. (222.) *R. selense* Franchet, J. Bot. (Morot) 12: 257 (1898).

Shrub or small tree, 1–5m; young shoots stipitate- to setose-glandular. Leaves ± herbaceous, ovate or obovate to elliptic, 3.5–9 × 1.8–4cm, 1.7–2.5 × as long as broad, apex rounded, apiculate, base rounded, upper surface glabrous, lower surface occasionally with a few persistent hairs near the base when mature, otherwise glabrous, or with a sparse brownish indumentum on lamina; petioles 1–1.5(–2)cm, sparsely stipitate-glandular to densely glandular-setose, sometimes becoming glandular with age. Inflorescence lax, 3–8-flowered; rhachis 2–3mm; pedicels 15–20mm, stipitate-glandular. Calyx 1–8mm, stipitate-glandular, when well-developed with rounded ovate to lingulate lobes.

Corolla funnel-campanulate, white or pale cream to deep pink, with or without purple flecks, 25–40mm. Ovary densely stipitate-glandular; style glabrous or glandular at base, rarely glandular for half its length. Capsule 12–35 × 3.5mm, curved.

1. Young shoots with shortly stipitate glands; longest calyx lobes 2(–5)mm ..... **4a. subsp. selense**
- + Young shoots with long-stipitate to setose glands; longest calyx lobes 2–8mm ..... 2
2. Leaves with a persistent though often discontinuous indumentum beneath ..... **4c. subsp. setiferum**
- + Leaves glabrous beneath at maturity ..... 3
3. Leaves 4.5–7cm long, with a glaucous bloom beneath; longest calyx lobes (2–)4–6mm ..... **4d. subsp. jucundum**
- + Leaves 4–9cm long, usually lacking a bloom; calyx 2–3(–5)mm ..... **4b. subsp. dasycladum**

**4a. subsp. selense.** Syntypes: China, NW Yunnan, Sela (Tsekou), au sommet de la montagne entre le Mékong et la Salween, 28 vi 1895, Soulié 1001 (E), 1002 (BM, E, K).

Syn.: *R. pagophilum* Balfour f. & Kingdon-Ward, Notes R.B.G. Edinb. 9: 256 (1916). Type: China, Yunnan/Tibet frontier, Ka-gwr-pw glacier valley, 14000ft, *Kingdon-Ward* 437 (holo. E).

*R. axium* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 30 (1920). Type: China, SE Xizang, Dokar-la, 10–11000ft, vii 1918, *Forrest* 16684 (holo. E; iso. K).

*R. metrium* Balfour f. & Forrest, *ibid.* 13: 52 (1920). Type: China, SE Xizang, Tsarong, Dokar-la, 10–11000ft, vii 1918, *Forrest* 16679 (holo. E; iso. K).

*R. nanothamnum* Balfour f. & Forrest, *ibid.* 13: 53 (1920). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, vii 1919, *Forrest* 19019 (holo. E; iso. K).

*R. chalarocladum* Balfour f. & Forrest, *ibid.* 13: 240 (1922). Type: China, SE Xizang, Tsarong, 1917, *Forrest* 18646 (holo. E; iso. K).

*R. probum* Balfour f. & Forrest, *ibid.* 13: 288 (1922). Type: China, WNW Yunnan, Mekong/Salween divide, 12000ft, vii 1917, *Forrest* 14227 (holo. E; iso. K).

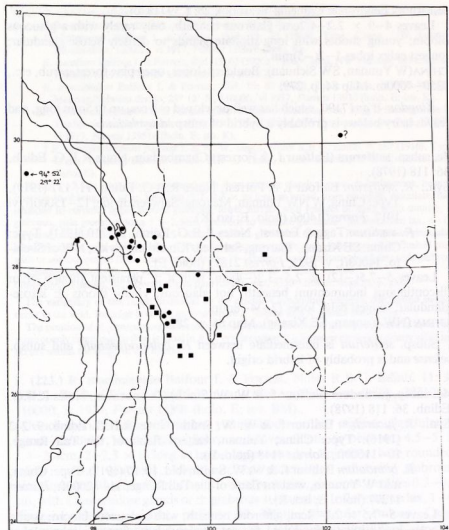
*R. selense* Franchet var. *probum* (Balfour f. & Forrest) Cowan & Davidian, *Rhododendron Yearbook* 6: 158 (1952).

*R. selense* Franchet var. *pagophilum* (Balfour f. & Kingdon-Ward) Cowan & Davidian, *ibid.* 6: 158 (1952).

Leaves 4.5–7 × 2.2–3.6cm, with or without a glaucous bloom beneath, entirely glabrous; young shoots at maturity shortly stipitate-glandular, longest calyx lobes 1–2(–5)mm.

CHINA(NW Yunnan, SE Xizang). Stony slopes, open pine forests, *Rhododendron* thickets, 3350–4550m. Map 84.

The following specimens are intermediate between subsp. *selense* and subsp. *dasycladum*: *Forrest* 15018, 20066; *Rock* 9162, 9166, 22640; *Yü* 7922, 10729.



MAP 84. ● *R. selense* subsp. *selense*; ■ subsp. *dasycladum*.

**4b. subsp. *dasycladum*** (Balfour f. & W. W. Smith) Chamberlain, Notes R.B.G. Edinb. 36: 118 (1978).

Syn.: *R. dasycladum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 10: 98 (1917). Type: China, E NW Yunnan, mountains in the NE of the Yangtze Bend, 12000ft, vii 1913, *Forrest* 10430 (holo. E; iso. BM, K).

*R. rhaibocarpum* Balfour f. & W. W. Smith, *ibid.* 10: 142 (1917). Type: China, E NW Yunnan, Mountains in the NE of the Yangtze Bend, ix 1913, *Forrest* 11312 (holo. E).

*R. dolerum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 40 (1920). Type: China, SW Sichuan, Mountains around Muli, 12000ft, vi 1918, *Forrest* 16318 (holo. E; iso. K).

Ic.: *Rhododendron* & *Camellia* Yearbook 25: f.59 (1970).

Leaves 4–9 × 2.2–4.2cm, glabrous beneath, only rarely with a glaucous bloom; young shoots with long-stipitate glands to densely setose-glandular; longest calyx lobes 1–2(–5)mm.

CHINA(W Yunnan, SW Sichuan). Bouldery slopes, open pine forest, scrub, etc., 3350–4000m. Map 84, p. 279.

*Kingdon-Ward* 7190, which has well-developed calyces, up to 5mm long, and leaves hairy below, is probably a hybrid of subsp. *dasycladum*.

**4c. subsp. setiferum** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 118 (1978).

Syn.: *R. setiferum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 137 (1919).

Type: China, WNW Yunnan, Mekong/Salween divide, 12–13000ft, vi 1917, *Forrest* 14066 (holo. E; iso. K).

*R. vestitum* Tagg & Forrest, Notes R.B.G. Edinb. 16: 210 (1931). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, NW of Si-chi-to, 14000ft, vi 1922, *Forrest* 21877 (holo. E).

Leaves 5–7.5(–12) × 2.5–3.3(–4)cm, with a ± persistent though often discontinuous indumentum beneath, not glaucous; young shoots ± setose-glandular; longest calyx lobes (2–)4–8mm.

CHINA (NW Yunnan, SE Xizang). Map 85, p. 282.

Subsp. *setiferum* is intermediate between *R. bainbridgeanum* and subsp. *selense* and is probably of hybrid origin.

**4d. subsp. jucundum** (Balfour f. & W. W. Smith) Chamberlain, Notes R.B.G. Edinb. 36: 118 (1978).

Syn.: *R. jucundum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 9: 242

(1916). Type: China, Yunnan, eastern flank of the Tali Range, 10–11000ft, *Forrest* 4148 (holo. E).

*R. blandulum* Balfour f. & W. W. Smith, *ibid.* 10: 87 (1917). Type: China, mid W Yunnan, western flank of the Tali Range, 11–12000ft, *Forrest* 11277 (holo. E; iso. K).

Leaves 5–7.5 × 2.8–4cm, glabrous beneath, with a glaucous bloom; young shoots long-stipitate-glandular to setose-glandular; longest calyx lobes (2–)4–6mm.

CHINA (mid W Yunnan). Map 85, p. 282.

A very variable species with the infraspecific taxa at least partially geographically differentiated. Subsp. *selense* approaches *R. martinianum* but has larger leaves and more flowers per inflorescence. Subsp. *dasycladum* has a more southerly distribution than does subsp. *selense* and is more extreme in its characters (with larger leaves and a denser setose indumentum on the young shoots) outside the range of subsp. *selense*. Where their ranges overlap however, the two taxa intergrade. Subsp. *setiferum* also intergrades with subsp. *selense*. Subsp. *jucundum* is apparently geographically isolated but the diagnostic differences, while constant, are small.

**4\*. *R. × orthocalyx*** Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 110 (1920) – *R. selense* × *R. wardii*, Type: China, NW Yunnan, Bei-ma-shan, 13000ft, *Forrest* 13989 (holo. E; iso. K).



- Syn.: *R. cymbomorphum* Balfour f. & Forrest, *ibid.* 12: 102 (1920). Type: China, NW Yunnan, Bei-ma-shan, 11–12000ft, vi 1917, *Forrest* 13939 (holo. E).  
*R. beimaense* Balfour f. & Forrest, *ibid.* 13: 32 (1920). Type: China, NW Yunnan, Bei-ma-shan, 12000ft, vi 1917, *Forrest* 13961b (holo. E).  
*R. eucallum* Balfour f. & Forrest, *ibid.* 13: 63 (1920). Type: China, NW Yunnan, Bei-ma-shan, 12000ft, vi 1917, *Forrest* 13938 (holo. E; iso. K).  
*R. triancatulum* Balfour f. & Forrest, *ibid.* 13: 63 (1920). Type: China, N NW Yunnan, Mekong/Salween divide, 28° 12' N, 11000ft, vi 1917, *Forrest* 13936 (holo. E; iso. K).  
*R. erythrocalyx* Balfour f. & Forrest subsp. *docimum* [Balfour f. ex] Tagg in Stevenson (ed.), *The Species of Rhododendron* 716 (1930). Type: China, NW Yunnan, Bei-ma-shan, 12000ft, vi 1917, *Forrest* 13951a (holo. E; iso. K).  
 ? *R. panteumorphum* Balfour f. & W. W. Smith, *Notes R.B.G. Edinb.* 9: 257 (1916). Type: China, Mekong/Salween divide, NW of Tseku, 11000–12000ft, ix 1904, *Forrest* 5068 (holo. E).

Shrub, 1–2.5m; young shoots covered with short stipitate glands. Leaves  $\pm$  herbaceous, broadly obovate to oblong, 6–10  $\times$  3.6–5cm, 1.7–2.3  $\times$  as long as broad, apex rounded, apiculate, base rounded to cordate, upper surface glabrous, lower surface with vestiges of hairs when mature, or glabrous, pale green; petioles 1.5–2.5cm, glabrous to stipitate-glandular. Inflorescence lax, 4–10-flowered; rhachis c.3mm; pedicels 15–30mm, stipitate-glandular. Calyx 3–7mm, stipitate-glandular, lobes triangular with rounded tips. Corolla funnel-campanulate, pale yellow or white flushed rose, with or without purple flecks and a basal blotch, 35–45mm. Ovary stipitate-glandular; style glabrous or stipitate-glandular for up to half its length. Capsule c.20  $\times$  7mm, curved.

CHINA (NW Yunnan, SE Xizang). Open pine forests, etc., 3350–3950m. Map 85, p. 282.

The variability of this taxon, indicated by the extensive synonymy, suggests that hybrid swarms occur in the wild. Its range is within an area where *R. selense* and *R. wardii* both occur.

The position of *R. panteumorphum* remains in doubt; the corolla of the type appears to have been more openly campanulate than is usual in *R. erythrocalyx*. It is however obviously closely allied and occurs within the range of the hybrid.

5. (223.) *R. martinianum* Balfour f. & Forrest, *Notes R.B.G. Edinb.* 11: 96 (1919). Type: China, W NW Yunnan, Mekong/Salween divide, 28°10' N, 11000ft, ix 1914, *Forrest* 13301 (holo. E; iso. BM).

Much-branched shrub, 0.8–2m; young shoots usually stipitate-glandular or setose-glandular, occasionally glabrous. Leaves elliptic to obovate, 4.5–5  $\times$  1.4–2.4cm, 2–2.3  $\times$  as long as broad, apex rounded, apiculate, base rounded, upper surface glabrous, lower surface punctulate, otherwise glabrous, occasionally with a few tufts of hairs even at maturity, glaucous; petioles 0.5–0.7 cm, with a few setulose glands or  $\pm$  glabrous at maturity. Inflorescence lax, 1–4-flowered; rhachis c.3mm; pedicels 20–30mm, glandular-setulose. Calyx 1–3mm, stipitate-glandular, lobes rounded. Corolla funnel-campanulate, pale yellow or white flushed rose, to pink, usually dark pink in bud, with or without purple flecks, c.30mm. Ovary and style-base densely stipitate-glandular. Capsule 20–25  $\times$  c.5mm, curved.

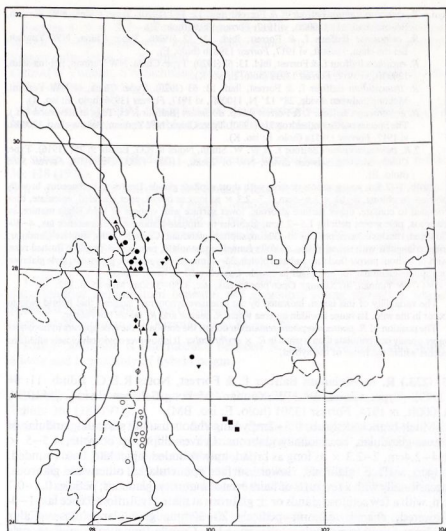
CHINA (NW Yunnan, SE Xizang), NE UPPER BURMA. Among scrub, forest margins, open pasture, 3000–4250m. Map 85, p. 282.

Closely allied to *R. selense* (q.v.).

6. (224.) *R. esetulosum* Balfour f. & Forrest, *Notes R.B.G. Edinb.* 13: 42 (1920). Type: China, E NW Yunnan, Mts NE of Chungtien, vii 1918, *Forrest* 16581 (holo. E; iso. K).

Syn.: *R. manopeplum* Balfour f. & Forrest, *Notes R.B.G. Edinb.* 13: 275 (1922). Type: China, SE Xizang, Tsarong Province, duplicate of Forrest no.?, 1919, *Forrest* 18654 (holo. E; iso. K).

Shrub, 1.5–2m; young shoots glabrous or with minute stipitate glands.



MAP 85. ● *R. selense* subsp. *setiferum*; ■ subsp. *jucundum*; ◆ *R. x erythrocalyx*; ▲ *R. martinianum*; ▼ *R. esetulosum*; □ *R. adenosum*; ○ *R. habrotrichum*; ▽ *R. diphrocalyx*.

Leaves coriaceous, ovate to elliptic, 6–12 × 3–4cm, 2(–3) × as long as broad, apex rounded, apiculate, base ± cordate, upper surface glabrous, lower surface with a thin scattered adpressed indumentum, even when mature; petioles 1–2cm, glabrous when mature. Inflorescence 8–10-flowered; rhachis less than 5mm; pedicels 15–30(–40)mm, densely stipitate-glandular. Calyx (1–) 4–10mm, lobes broadly ovate and rounded when well-developed, stipitate-glandular. Corolla funnel-campanulate, white flushed rose, with or without purple flecks, 30–35mm. Ovary densely stipitate-glandular, style glandular, at least at base. Capsule c. 20 × 10mm.

CHINA (NW Yunnan, SE Xizang). Thicket margins, bouldery slopes, 3000–4250m. Map 85.

The large coriaceous leaves distinguish this species from the remaining members of subsection *Selensia*. The length of the calyx lobes is variable, even within a single gathering (cf. *Rock* 11094).

**7. (225.) *R. hirtipes*** Tagg in Stevenson (ed.), *The Species of Rhododendron* 40 (1930) & Notes R.B.G. Edinb. 16: 97 (1931). Type: China, SE Xizang, Tsela Dzong, Tsangpo Valley, 13000ft, v 1934, *Kingdon-Ward* 5659 (holo. E; iso. BM, K).

Low shrub to tree, 0.5–8m; young shoots covered with glandular bristles. Leaves broadly obovate, 5–11 × 3.5–6cm, 1.6–2(–2.2) × as long as broad, apex rounded, blunt, base rounded, margin cartilaginous, sometimes ciliate towards the base, upper surface glabrous, lower surface with scattered stipitate glands and a sparse floccose indumentum, midrib with glandular bristles near the base; petioles 1.5–2.5cm, densely covered with persistent glandular bristles. Inflorescence lax, 3–5-flowered; rhachis less than 5mm; pedicels 15–20mm, with a dense covering of glandular bristles. Calyx 4–10mm, stipitate-glandular, lobes rounded. Corolla campanulate, white to pink, usually darker in bud, usually with a few purple flecks, c.40mm. Ovary and style base densely stipitate-glandular. Capsule c. 17 × 6mm, straight or curved.

CHINA (SE Xizang). Ravines, wet conifer forest, 3000–4000m. Map 119, p. 381.

A distinctive species, more closely allied to *R. selense* than it is to *R. glischrum*, with which it has been traditionally associated (for a further discussion of the affinities of this species see p. 459).

**IX. Subsection *Glischra*** (Tagg) Chamberlain, Notes R.B.G. Edinb. 36: 116 (1978).

Syn.: Series *Barbatum* Tagg subseries *Glischrum* Tagg in Stevenson (ed.), *The Species of Rhododendron* 137 (1930).

Subsection *Barbata* sensu Sleumer, pro parte.

Dwarf shrubs to small trees; bark rough; young shoots densely glandular-setose or long-stipitate-glandular; perulae often persistent for several years. Leaves ± herbaceous and soft to coriaceous, ovate to oblanceolate, upper surface glabrous or with persistent bristles, even when mature, lower surface with stipitate glands or bristles, especially overlying the veins, or with a dense matted indumentum of ramiform hairs. Inflorescence lax, 6–14-flowered; rhachis 5–15mm. Calyx well-developed, 5–15mm, lobes rounded, lingulate. Corolla 5-lobed, campanulate to funnel-campanulate, lacking nectar pouches, white flushed pink to pink, usually with a purple basal blotch and flecks. Stamens 10. Ovary densely stipitate-glandular to glandular-setose. Style glabrous or glandular at base.

Type species: *R. glischrum* Balfour f. & W. W. Smith

Closely allied to subsection *Taliensia*, more especially to *R. adenogynum* and its immediate allies.

1. Lower surface of leaves with a dense covering of loosely matted tomentum .....2
- + Lower surface of leaves, with or without a thin persistent tomentum, often setose .....3

2. Leaves  $7-17 \times 2.3-4.2$ cm, apex cuspidate; large shrubs up to 5m  
     5. *crinigerum*  
 + Leaves  $3-7 \times 1-2$ cm, apex blunt; dwarf shrubs, to c.1.5m.  
     6. *recurvoides*
3. Leaves  $1.8-2.4 \times$  as long as broad .....4. *habrotrichum*  
 + Leaves  $(2-2.4-4.2 \times)$  as long as broad .....4
4. Calyx fleshy, cupular, 8–20mm; corolla rose-crimson; leaf epidermis  
 glaucous-papillate below .....4\* *diphrocalyx*  
 + Calyx neither fleshy nor cupular, with lobes deeply incised, 7–  
 10mm; corolla white to pale pink (occasionally purplish); leaf  
 epidermis epapillate below .....5
5. Leaves 7–10.5cm long, margin cartilaginous, papillate .....1. *adenosum*  
 + Leaves 11.5–30cm long, margin neither cartilaginous nor papillate .....6
6. Leaves with strongly impressed veins, bullate above, vesiculate hairs  
 on the veins below .....3. *vesiculiferum*  
 + Leaves hardly to moderately bullate, vesiculate hairs absent .....2. *glischrum*

1. (226.) *R. adenosum* Davidian, Quart. Bull. Amer. Rhododendron Soc. 21: 81 (1978).

Syn.: *R. glischrum* var. *adenosum* Cowan & Davidian, Notes R.B.G. Edinb. 21: 147 (1953). Type: China, SW Sichuan, mountains of Kulu, 3540m, ix 1929, *Rock* 18228 (= *Rock* seed no. 3837, cult. E) (holo. E).

*R. kuluense* Chamberlain, Notes R.B.G. Edinb. 36: 116 (1978).

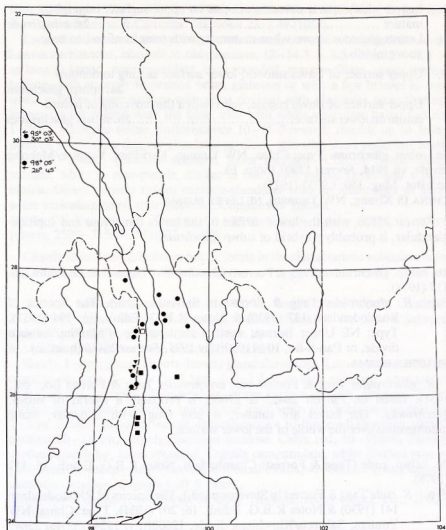
Shrub; young shoots densely setose-glandular. Leaves ovate to lanceolate or elliptic, coriaceous,  $7-10.5 \times 2.4-3.4$ cm, c.3  $\times$  as long as broad, apex acute to acuminate, base rounded, margin cartilaginous, papillate, upper surface glabrous when mature, with a few setae overlying the midrib, lower surface setose and sparsely tomentose, tomentum evanescent, at least towards apex, or  $\pm$  persistent; petioles, like midribs, densely glandular-setose. Inflorescence lax, 6–8-flowered; rhachis c.5mm; pedicels 15–25mm, densely glandular-setose. Calyx c.7mm, densely glandular-setose. Corolla (in cultivation) funnel-campanulate, pale pink with purple flecks, 35–50mm. Ovary densely glandular setose; style glabrous. Capsule c.20  $\times$  4mm, curved.

CHINA (SW Sichuan—Muli). Spruce forests, 3350–3550m. Map 85, p. 282.

Allied to *R. glischrum* and its immediate allies, but clearly differentiated by its leaf shape, texture and size. *R. adenosum* occurs in an area to the east of the range of *R. glischrum*. The wild-collected material lacks flowers; the details of the corolla have therefore been taken from cultivated specimens.

2. (227.) *R. glischrum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 9: 229 (1916).

Shrub or small tree, 2–8m; shoots densely glandular-setose. Leaves herbaceous, obovate to elliptic,  $11.5-30 \times 3.3-8$ cm,  $2-4.2 \times$  as long as broad, apex  $\pm$  cuspidate, base rounded, margin herbaceous, ciliate, upper surface smooth to moderately rugose, with glandular setae above the midrib at base, otherwise glabrous, occasionally with bristles scattered over the whole surface, lower surface with a dense covering of setae, especially overlying the veins,



MAP 86. ● *R. glischrum* subsp. *glischrum*; □ subsp. *rude*; ▼ subsp. *glischroides*; ■ *R. agastum*; ▲ *R. leptopeplum*.

sometimes also with a thin brown or whitish tomentum, especially towards the base; petioles 1–2cm, stout, covered with stout glandular setae. Inflorescence 10–14-flowered, lax; rhachis very short; pedicels (15–)25–35 (–45)mm, densely stipitate-glandular. Calyx 5–10mm, lobes lingulate, ciliate. Corolla campanulate, rose-pink to scarlet, occasionally white flushed rose, with purple flecks and usually also a basal blotch, 30–50mm. Ovary densely stipitate-glandular; style glabrous or glandular at base. Capsule 15–20 × 5–6mm.

Mixed forests, etc., 3000–4000m. Map 86.

1. Leaves with a sparse covering of setae on upper surface, even when mature ..... **2c. subsp. rude**  
 + Leaves glabrous above when mature or with setae confined to base above midrib ..... **2**
2. Upper surface of leaves smooth, lower surface lacking tomentum ..... **2a. subsp. glischrum**  
 + Upper surface of leaves rugose, veins with a thin covering of indumentum on lower surface ..... **2b. subsp. glischroides**

**2a. subsp. glischrum.** Type: China, NW Yunnan, Kari Pass, Yangtze/Mekong divide, vii 1914, *Forrest* 12901 (holo. E).

Ic.: Bot. Mag. 150: t.9035 (1925).

CHINA (S Xizang, NW Yunnan), NE UPPER BURMA.

*Forrest* 25626, with the lower surface of the leaves tomentose and stipitate-glandular, is probably a hybrid of subsp. *glischrum*.

**2b. subsp. glischroides** (Tagg & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 117 (1978).

Syn.: *R. glischroides* Tagg & Forrest in Stevenson (ed.), The Species of *Rhododendron* 137 (1930) & Notes R.B.G. Edinb. 16: 194 (1931).

Type: NE Upper Burma, western flank of the N'Maikha/Salween divide, nr Pan-ti-ho, 10–11000ft, iv 1925, *Forrest* 26426 (holo. E).

NE UPPER BURMA.

*R. glischroides* Tagg & Forrest var. *arachnoides* Tagg & Forrest (loc. cit., 1931), based on *Forrest* 26425 & 27600, is probably a hybrid of subsp. *glischroides*. The leaves are smaller, 6–8cm long, with a denser, white indumentum over the whole of the lower surface.

**2c. subsp. rude** (Tagg & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 117 (1978).

Syn.: *R. rude* Tagg & Forrest in Stevenson (ed.), The Species of *Rhododendron* 141 (1930) & Notes R.B.G. Edinb. 16: 207 (1931). Type: China, NW Yunnan, Salween/Kiu-chiang divide, 12000ft, vi 1924, *Forrest* 25645 (holo. E).

CHINA (NW Yunnan).

A specimen from the Tsangpo Gorge, *Ludlow, Sherriff & Elliot* 13606, is close to subsp. *rude* but differs in its smaller leaves, 7–10cm long, which are apparently glabrous above when mature.

*R. glischrum* is a variable species with at least partial segregation into geographically distinct taxa. Subsp. *glischroides* is apparently intermediate between *R. vesiculiferum* and subsp. *glischrum*, but lacks the characteristic vesiculate hairs of *R. vesiculiferum*. *R. glischrum* is also closely allied to *R. habrotrichum*.

**3. (228.) *R. vesiculiferum*** Tagg in Stevenson (ed.), The Species of *Rhododendron* 143 (1930) & Notes R.B.G. Edinb. 16: 208 (1931). Type: NE Upper

Burma, Seingku Wang, 9000ft, v 1926, *Kingdon-Ward* 6752 (holo. E; iso. K).  
 Ic.: *Rhododendron* & *Camellia* Yearbook 23: f.49 (1968).

Large shrub or small tree; young shoots densely covered with glandular setae. Leaves herbaceous, obovate to oblanceolate,  $12-14.5 \times 3.5-5$ cm,  $2.4-2.9 \times$  as long as broad, apex cuspidate, base rounded, margin ciliate, upper surface bullate, with strongly impressed veins, glabrous or with a few bristles at base when mature; lower surface with veins covered with glandular setae that are longer on the midrib near the base, also with white vesiculate hairs; petioles 1-2cm, glandular-setose. Inflorescence 10-15-flowered; rhachis up to 5mm; pedicels 15-20mm, densely glandular-setulose, also with short vesiculate hairs. Calyx 8-10mm, glandular-setulose, lobes lingulate. Corolla funnel-camp-anulate, white to rose-purple, darker in bud, with purple flecks and a basal blotch. Ovary densely rufous-stipitate-glandular with an understory of short white vesiculate hairs; style glabrous. Capsule not known.

CHINA (W Yunnan, SE Xizang), NE UPPER BURMA. Rocky slopes, in mixed forests, 2500-3350m. Map 87, p. 289.

Closely allied to *R. glischrum* but differing in the characteristic vesiculate hairs and in the more strongly bullate leaves.

4. (229.) *R. habrotrichum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 9: 232 (1926). Type: China, W Yunnan, western flank of the Shweli/Salween divide, vii 1912, *Forrest* 9048 (holo. E; iso. K).

Ic.: Millais, *Rhododendrons* ed.2, 152, t. (1924).

Shrub, 1-4m; young shoots densely glandular-setose. Leaves subcoriaceous, ovate to obovate,  $7-16 \times 3-7.5$ cm,  $1.8-2.4 \times$  as long as broad, apex acute, base rounded, margins ciliate-setulose, upper surface smooth, glabrous, lower surface with lamina glabrous, midrib and main veins glandular-setose; petioles 1-2cm, densely glandular-setose. Inflorescence c.10-flowered; rhachis c.10mm; pedicels 20-25mm, densely glandular-setulose. Calyx red, 10-15mm, densely stipitate-glandular, lobes rounded. Corolla campanulate, white flushed rose to pink, with or without purple flecks and a basal blotch, 40-50mm. Ovary densely glandular-setulose. Capsule c.  $20 \times 6$ mm.

CHINA (W Yunnan), NE UPPER BURMA. Thickets, rocky slopes, etc., 2700-3350m. Map 85, p. 282.

Closely allied to *R. glischrum* subsp. *glischrum* but distinguished by the broader leaves, etc.

4\*. *R. diphrocalyx* Balfour f., Notes R.B.G. Edinb. 11: 55 (1919). Type: a cultivated specimen of unknown origin, grown by Major Magor; flowered v 1919 (holo. E).

Syn.: *R. burrifolium* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 34 (1920). Type: China, W Yunnan, Shweli/Salween divide, vi 1918, *Forrest* 17598 (holo. E).

Ic.: Millais, *Rhododendrons* ed.2, 152 t. (1924).

Shrub, 1-5m; bristles present on the young shoots. Leaves elliptic to obovate,  $9-14 \times 3.5-5$ cm,  $2.4-2.8 \times$  as long as broad, apex apiculate, base cuneate, upper surface glabrous, lower surface with a few bristles at base of midrib at maturity, otherwise glabrous, cuticle glaucous-papillate; petioles 1-2cm, with scattered floccose hairs, at least when young, and a few deciduous bristles. Inflorescence c.10-flowered; rhachis c.5mm; pedicels 10-15mm, with a  $\pm$  persistent tomentum. Calyx fleshy, red, 8-20mm, lobes unequal, rounded, ciliate. Corolla funnel-camp-anulate, with poorly defined nectar pouches, light to deep crimson, without markings, 30-40mm. Ovary and style-base densely rufous-tomentose, with a few stipitate glands. Capsule c.  $25 \times 4$ mm, curved.

CHINA (W Yunnan). Open thickets, 3000-3350m. Map 85, p. 282.

The type of *R. diphrocalyx* did not originate from any of the known wild-collected specimens but matches well with several of them. *R. diphrocalyx* may be a hybrid of *R. habrotrichum*, with a member of subsection *Neriiflora*, possibly *R. neriiflorum*. The bristly indumentum suggests the former alliance and the well-developed calyx and papillate leaf epidermis the latter. Without proper field studies the status of this taxon remains in doubt.

**5. (230.) *R. crinigerum*** Franchet, J. Bot. (Morot) 12: 200 (1908).

Shrub or small tree, 1–5m; young shoots with a sparse covering of shortly stipitate glands. Leaves subcoriaceous, obovate to oblanceolate, (7–)10–17 × (2.3–)3–4.2cm, 3–4 × as long as broad, apex cuspidate, base rounded, margin not ciliate, upper surface glabrous when mature, lower surface with a dense (occasionally sparse) matted fawn to red-brown tomentum composed of ramiform hairs, intermixed with stipitate glands, especially towards the base; petioles 1–2cm, densely stipitate-glandular. Inflorescence 8–14-flowered; rhachis 10–15mm; pedicels 25–30mm, densely stipitate-glandular, also very sparsely hairy. Calyx 5–10mm, densely stipitate-glandular, lobes irregular, lingulate, rounded. Corolla campanulate, white flushed pink, with at least a few purple flecks and a basal blotch. Ovary stipitate-glandular; style glabrous or glandular at base. Capsule c. 15 × 6mm.

CHINA (NW Yunnan, SE Xizang), NE UPPER BURMA. Open pine forests, rocky slopes, 3350–4000m. Map 87, p. 289.

- 1. Leaves sparsely glandular beneath, with a dense matted indumentum ..... **5a. var. *crinigerum***
- + Leaves more densely glandular beneath, usually with a sparse indumentum ..... **5b. var. *euadenium***

**5a. var. *crinigerum***. Type: China, NW Yunnan, Tsekou, environs de Thrana, 15 v 1895, *Soulié* 1011 (holo. P, n.v.).

Syn.: *R. ixereticum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 9: 240 (1916). Type: China, NW Yunnan, Kari Pass, Mekong/Yangtze divide, 12000ft, viii 1914, *Forrest* 12944 (holo. E).

**5b. var. *euadenium*** Tagg & Forrest, Notes R.B.G. Edinb. 16: 190 (1931). Type: China, NW Yunnan, Salween/Kiu-chiang divide, vii 1924, *Forrest* 25619 (holo. E).

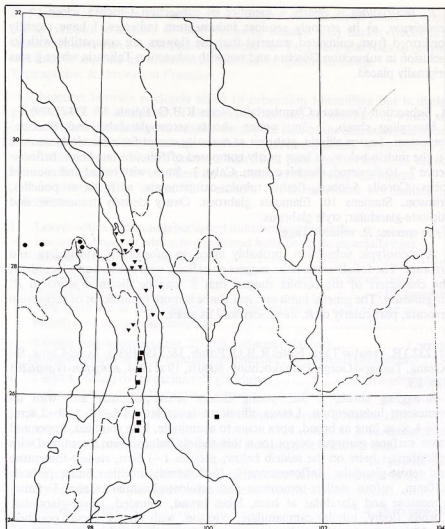
The leaves of all the specimens of var. *euadenium* are more glandular than those of var. *crinigerum* and most are less densely hairy. The type, however, is more densely tomentose. The following specimens are intermediate between the two varieties in that the lower surface of the leaves is densely tomentose but also with many stipitate glands: *Rock* 10967, 22504.

*R. crinigerum* is less setose than the remaining species of this subsection and in this respect approaches some members of subsection *Taliensia*. However, in leaf shape and in leaf characters, it is closer to the remaining members of subsection *Glischra*.

**6. (231.) *R. recurvoides*** Tagg & Kingdon-Ward, Rhododendron Society Notes 3, 5: 284 (1932). Type: NE Upper Burma, Seingku Wang, in the valley of the Di Chu, 11000ft, 25 vii 1927, *Kingdon-Ward* 7184 (holo. K; iso. E).

Ic.: Quart. Bull. Amer. Rhododendron Soc. 32: 171 (1978).





MAP 87. ■ *R. callimorphum*; ● *R. vesiculiferum*; ▼ *R. crinigerum*; △ *R. recurvoides*.

Dwarf shrub, 1–1.5m; young shoots glandular-setose. Leaves coriaceous, lanceolate to oblanceolate, 3–7 × 1–2cm, 3–3.5 × as long as broad, apex blunt, base cuneate, margins not ciliate, strongly inrolled, upper surface rough when mature from the bases of glandular setulae; lower surface with a dense cinnamon tomentum composed of ramiform hairs; petioles 1–1.5cm, setulose. Inflorescence 4–7-flowered; rhachis minute; pedicels c.15mm, glandular-setulose. Calyx 8–10mm, glandular, lobes rounded. Corolla campanulate, white flushed pink to rose, lacking a basal blotch though with crimson spots, c.30mm. Ovary densely glandular-setulose; style glabrous. Capsule not known. NE UPPER BURMA (only known from the type). Map 87.

*R. recurvoides* is clearly a member of subsection Glischra, close to *R. crinigerum*, as its strongly setulose indumentum indicates. I have recently confirmed from cultivated material that the flowers are compatible with its inclusion in subsection Glischra and not with subsection Taliensia where it was originally placed.

**X. Subsection *Venatora*** Chamberlain, Notes R.B.G. Edinb. 37: 337 (1979).

Straggling shrub, 2–3m; young shoots setose-glandular and floccose-tomentose. Leaves elliptic, glabrous at maturity except for a thin indumentum on the midrib below, at least partly composed of folioliferous hairs. Inflorescence 7–10-flowered; rhachis c.5mm. Calyx 3–5mm, with broad and rounded lobes. Corolla 5-lobed, fleshy, tubular-campanulate, with nectar pouches, crimson. Stamens 10, filaments glabrous. Ovary densely tomentose and stipitate-glandular; style glabrous.

Type species: *R. venator* Tagg

A monotypic subsection, probably allied to subsections Maculifera and Irrorata. The folioliferous hairs suggest an affinity with subsection Maculifera; the characters of the corolla suggest that it may be distantly allied to *R. strigillosum*. The general habit and leaf shape is more reminiscent of subsection Irrorata, particularly of *R. kendrickii* and its allies.

**1. (232.) *R. venator*** Tagg, Notes R.B.G. Edinb. 18: 219 (1934). Type: China, SE Xizang, Tsangpo Gorge, Pemakochung, 8000ft, 19 xi 1924, *Kingdon-Ward* 6285 (iso. E).

Straggling shrub, 2–3m; young shoots setose-glandular and with an evanescent indumentum. Leaves elliptic to lanceolate, 8.5–14 × 2–2.4cm, 3.5–4 × as long as broad, apex acute to acuminate, base rounded, upper and lower surfaces glabrous except for a thin stellate indumentum intermixed with folioliferous hairs on the midrib below; petioles 1–1.5cm, stellate-tomentose and setose-glandular. Inflorescence 7–10-flowered; rhachis c.5mm; pedicels c.10mm, rufous stellate-tomentose and setulose-glandular. Calyx 3–5mm, tomentose and glandular at base, lobes broad, rounded, ciliate-glandular. Corolla fleshy, tubular-campanulate, crimson, with darker nectar pouches, 30–35mm. Ovary with a dense tomentum intermixed with stipitate glands. Capsule c.20mm, curved.

CHINA (SE Xizang). Map 119, p. 381.

A distinctive species with no close allies.

**XI. Subsection *Irrorata*** Sleumer, Bot. Jahrb. 74: 548 (1949).

Syn.: Series *Irroratum* subseries *Irroratum* sensu Tagg in Stevenson (ed.), The Species of Rhododendron 331 (1930).

Shrubs or small trees; bark rough; young shoots stipitate-glandular, sometimes also with a floccose tomentum. Leaves ovate to oblanceolate, elliptic or oblong, lower surface usually glabrous when mature but with persistent punctate bases or (more rarely) with a thin veil of dendroid hairs embedded in a surface film. Inflorescence lax or dense, 4–20-flowered; rhachis 5–10(–35)mm. Calyx minute or cupular, then with broad lobes and up to 6mm long. Corolla

5–7-lobed, tubular to open-campanulate, with or without nectar pouches, white (rarely yellow) to mauve or deep crimson, usually with darker flecks and sometimes also with a basal blotch. Stamens 10–14. Ovary glabrous to tomentose and/or stipitate-glandular; style glabrous or glandular to tip.

Type species: *R. irroratum* Franchet

Subsection *Irrorata* is closely allied to subsection *Maculifera* but is distinguished (with the exception of *R. mengtszense* and *R. brevinerve*, which are intermediate between the two subsections) by the lack of the characteristic setose to matted-dendroid indumentum on the petioles and pedicels. Most species of subsection *Irrorata* have red punctate hair bases persisting on the veins on the lower surface of the leaves. These do not occur in subsection *Maculifera*.

It is also allied to subsection *Venatora* but indumentum not stellate or folioliferous.

1. Leaves with a continuous persistent indumentum beneath ..... 2
- + Leaves glabrous or with a few scattered hairs beneath, especially near the midrib (see also *R. papillatum*) ..... 6
2. Style glandular to tip; leaves  $2.2\text{--}2.5 \times$  as long as broad, apex rounded ..... **13. agastum**
- + Style glabrous or glandular only at base; leaves  $2.5\text{--}4 \times$  as long as broad, apex acute to acuminate ..... 3
3. Corolla open-campanulate, 25–35(–45)mm (Malaya) ..... **7. wrayi**
- + Corolla campanulate to tubular-campanulate, 40–55mm (Himalayas) ..... 4
4. Calyx 4–6mm; ovary exclusively glandular ..... **14. leptopeplum**
- + Calyx c. 2mm; ovary tomentose, sometimes also glandular ..... 5
5. Corolla tubular-campanulate with pronounced nectar pouches, crimson ..... **12. tanastylum**
- + Corolla campanulate, nectar pouches lacking, pale cream or pink ..... **18. papillatum**
6. Style glandular for at least half its length ( $\pm$  visible in mature capsules) ..... 7
- + Style glabrous or glandular only at base ..... 11
7. Leaves 3–6cm long ..... **4. aberconwayi**
- + Leaves 6.5–15cm long ..... 8
8. Corolla open-campanulate; petioles glabrous ..... **5. annae**
- + Corolla tubular- to funnel-campanulate; petioles tomentose or glandular, at least at first ..... 9
9. Pedicels, ovary and petioles stipitate-glandular; corolla yellow or white to pink or red ..... **9. irroratum**
- + Pedicels, ovary and sometimes petioles  $\pm$  setose-glandular; corolla crimson to purple ..... 10
10. Petioles with a thick, persistent indumentum that extends along midrib on upper and lower surfaces of leaves (S Yunnan) ..... **1. mengtszense**
- + Petioles with a thinner indumentum that is  $\pm$  absent by maturity (Guizhou, Guangxi, Guangdong) ..... **2. brevinerve**
11. Corolla 6–7-lobed ..... **17. anthosphaerum**
- + Corolla 5-lobed ..... 12

12. Leaf apex  $\pm$  rounded or blunt; pedicels stipitate-glandular (Vietnam, Sumatra) .....13\*  
+ Leaf apex acute to cuspidate; pedicels tomentose, usually eglandular (China, NE India, Upper Burma) .....14
13. Ovary tomentose, eglandular; corolla c.25mm .....8. *korthalsii*  
+ Ovary stipitate-glandular; corolla up to 50mm .....11. *excelsum*
14. Corolla open-campanulate; inflorescence 5–12-flowered .....15  
+ Corolla tubular- to funnel-campanulate; inflorescence 4–20-flowered .....16
15. Corolla 28–35mm, white flushed rose .....6. *araiophyllum*  
+ Corolla c.45mm, crimson .....3. *spanotrichum*
16. Corolla scarlet to crimson, 10–20 flowers per inflorescence .....17  
+ Corolla pale magenta rose or deep pink to crimson, 4–15 flowers per inflorescence .....18
17. Leaves 4–6  $\times$  as long as broad .....15. *kendrickii*  
+ Leaves 2.8–3.5  $\times$  as long as broad .....16. *ramsdanianum*
18. Inflorescence 6–15-flowered; corolla 40–45mm, rose; capsule 5–7  $\times$  as long as broad .....10. *lukiangense*  
+ Inflorescence 4–8-flowered; corolla 45–55mm, crimson (rarely deep pink); capsule 2–3.3  $\times$  as long as broad .....12. *tanastylum*

1. (233.) *R. mengtszense* Balfour f. & W. W. Smith, Trans. Bot. Soc. Edinb. 27: 206 (1917). Type: China, SE Yunnan, SE of Mengtsz, 7000ft, *Henry* 10275 (holo. E; iso. K).

Tree, c.6m. Leaves sub-coriaceous, narrowly oblanceolate, 10–14.5  $\times$  2.3–3.2cm, 4–4.5  $\times$  as long as broad, apex cuspidate, base cuneate, upper surface glabrous when mature, though sometimes midrib tomentose towards base, lower surface glabrous except for the tomentose midrib towards base, with minute red punctate hair bases persisting; petioles c.1cm, densely matted-tomentose, hairs dendroid. Inflorescence c.8-flowered; rhachis c.15mm; pedicels c.20mm, densely setose-glandular. Calyx c.1mm, setose-glandular, lobes rounded. Corolla campanulate, glabrous within, reddish-purple, apparently with darker nectar pouches, c.40mm. Ovary densely hairy, with rufous setae and setose glands; style glandular to tip. Capsule not known.

CHINA (SE Yunnan). Montane forests, c.2300m. Map 81, p. 269.

*R. mengtszense* shows some affinities with species in subsection *Maculifera* in the indumentum on the petioles and pedicels. The punctate hair-bases and glandular style do however suggest that it is correctly placed in subsection *Irrorata*.

2. (234.) *R. brevinerve* Chun & Fang, Acta Phytotax. Sinica 6: 167, t.39 (1957). Type: China, Guangxi, Lungsheng Hsien, Pingshui Hsiang, Taosan Chun, 6 ix 1955, *Kwangfu Exped.* 8, n.v.

Small tree, 4–7m; young shoots glandular-setose. Leaves elliptic, 8.5–12  $\times$  2.5–4cm, 2.4–4.3  $\times$  as long as broad, apex bluntly acuminate, base cuneate,

\*See also *R. lapidosum* from NE Yunnan, p. 298.

lower surface glabrous though with numerous red sessile punctate glands; petioles 1–3cm, glabrous at maturity. Inflorescence 2–3-flowered; rhachis c.3mm; pedicels 10–25mm, densely stipitate to setose-glandular. Calyx 2–3.5mm, lobes rounded, stipitate-glandular, especially on margins. Corolla campanulate, purple, 35–40mm. Ovary densely long-stipitate-glandular; style glandular in lower half. Capsule 12–20 × 6–8mm.

CHINA (Guizhou, Guangxi, Guangdong). Forests, 500–2000m. Map 81, p. 269.

Closely allied to *R. mengtszense*, with which it shares a setose-glandular indumentum.

3. (235.) *R. spanotrichum* Balfour f. & W. W. Smith, Trans. Bot. Soc. Edinb. 27: 214 (1917). Type: SE Yunnan, Fung chen lin Mountains (nr Mengtsz), 7500ft, *Henry* 10853 (holo. E; iso. K).

Tree, c.6m. Leaves coriaceous, oblanceolate, 9–11 × 1.3–4cm, 2.8–3.5 × as long as broad, apex acuminate, base ± cuneate, margin not undulate, upper surface glabrous, lower surface glabrous when mature though with red punctate hair bases overlying the veins; petioles 1.5–2cm, glabrous. Inflorescence 7–10-flowered; rhachis short; pedicels c.10mm, sparsely stellate-tomentose. Calyx c.1mm, glabrous. Corolla probably open-campanulate, glabrous within, crimson, c.45mm. Ovary sparsely rufous-tomentose; style glabrous. Capsule not known.

CHINA (SE Yunnan). Forests, etc., 2300m. Map 81, p. 269.

A species of doubtful affinities though there is a superficial resemblance to both *R. irroratum* and *R. mengtszense*, both of which occur near the type locality.

4. (236.) *R. aberconwayi* Cowan, Rhododendron Yearbook 3: 42, f.17 (1949). Type: China, Yunnan, Lo Shiueh Mt, vi 1937, *McLaren* 'U' 33 (holo. E; iso. BM).

Shrub, 1.5–2.5m. Leaves elliptic, thick and coriaceous, 3–6 × 1.1–2.2cm, c.3 × as long as broad, apex acute, base cuneate, margin strongly recurved, not undulate, glabrous when mature, with red punctate hair bases overlying the veins beneath; petioles 0.5–1cm, papillate. Inflorescence 6–12-flowered, dense; rhachis c.5mm; pedicels 20–30mm, sparsely hairy and stipitate-glandular. Calyx c.1mm, sparsely hairy, glandular-ciliate. Corolla open-campanulate, lacking nectar pouches, glabrous within, white to pale rose, with purple flecks, 28–35mm. Ovary and style glandular throughout. Capsule 18–20 × c.8mm.

CHINA (NE Yunnan). Mountain summits. Map 80, p. 268.

Material seen in Kunming from NE Yunnan differs from the type in having rufous-tomentose perulae but is otherwise a good match. Lo Shiueh of McLaren is assumed to be Luoxue in NE Yunnan though this is not certain.

A distinctive species, probably allied to *R. annae* and *R. araiophyllum*.

5. (237.) *R. annae* Franchet, J. Bot. (Morot) 12: 258 (1898). Type: China, ?Guizhou, Montagne de Lou Tsang Kuan, 1500m, 7 v 1897, *Bodinier* 1588 (holo. E; iso. K).

Syn.: *R. laxiflorum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 50 (1920).

Type: China, W Yunnan, Shweli/Salween divide, 8000ft, v 1919, *Forrest* 17953 (holo. E; iso. K).

*R. hardingii* Tagg, Notes R.B.G. Edinb. 16: 196 (1931). Type: China, W Yunnan, 3 days march S of Tengyueh, 24°20'N, 98°33'E, 6000ft, *Harding (Forrest)* 26313 (holo. E).

Shrub, 0.5–6m. Leaves coriaceous, elliptic to oblanceolate, 6.5–15 × 2–3.5cm, 3.5–4.5 × as long as broad, apex acuminate, base cuneate to rounded, margin usually slightly undulate, both surfaces glabrous though with red punctate hair bases overlying the veins beneath; petioles 1–3cm, glabrous. Inflorescence 7–12(–17)-flowered; rhachis 5–35mm; pedicels 15–30mm, densely stipitate-glandular. Calyx 1–2mm, lobes rounded, gland-fringed. Corolla open-campanulate, lacking nectar pouches, white with a rose flush, with or without purple flecks, 25–40mm. Ovary densely glandular; style glandular to tip. Capsule 13–25 × 6–8mm.

CHINA (W Yunnan, ?Guizhou), NE UPPER BURMA. Map 80, p. 268.

The type of *R. annae* does have smaller flowers than is usual for the species and this has been used as the main diagnostic feature to separate *R. annae* from *R. laxiflorum*. The holotype of *R. hardingii* has equally small flowers however, while the isotype material has larger flowers and matches the type of *R. laxiflorum*.

Bodinier's type of *R. annae* is supposed to have been collected in Guizhou near Guiyang. If this is confirmed, then this species has a surprisingly disjunct distribution; all the remaining material comes from Mid-West Yunnan.

**6. (238.) *R. araiophyllum*** Balfour f. & W. W. Smith, Trans. Bot. Soc. Edinb. 27: 189 (1917). Type: China, W Yunnan, Shweli/Salween divide, 9000–10000ft, vi 1913, *Forrest* 11918 (holo. E; iso. BM, K).

Shrub or small tree, 1.5–6.5m. Leaves sub-coriaceous, elliptic to oblanceolate, 5.5–13 × 1.8–3.2cm, 3–5 × as long as broad, apex acute to cuspidate, base cuneate, margin plane to slightly undulate, upper and lower surfaces glabrous when mature, punctate hair-bases apparently lacking; petioles 0.7–1.5cm, floccose-tomentose. Inflorescence lax, 5–10-flowered; rhachis c.5mm; pedicels 15–20mm, slender, smooth to minutely hairy. Calyx 1–2mm, lobes rounded, glabrous to sparsely ciliate. Corolla open-campanulate, nectar pouches lacking, glabrous within, white flushed rose, with a basal blotch, sometimes also with purple flecks, 28–35mm. Ovary with a sparse covering of short white simple hairs; style glabrous. Capsule 10–16 × 3–4mm.

CHINA (Mid W Yunnan), NE UPPER BURMA. Mixed forests, 2300–3350m. Map 82, p. 271.

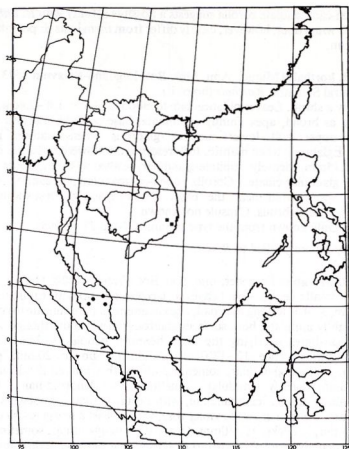
Distinguished from *R. annae* by its glabrous style and the lack of punctate hair-bases.

**7. (239.) *R. wrayi*** King & Gamble, J. Asiat. Soc. Beng. 74: 75 (1905). Syntypes: Malaya, Perak, 3500–7000ft, *Wray* 322, 886, 1569; *Scortechini*, n.v.

Syn.: *R. wrayi* King & Gamble var. *ellipticum* Ridley & var. *minor* Ridley, J. Fed. Malay States Mus. 6: 49, 157 (1915).

*R. corruscum* Ridley, J. Fed. Malay States Mus. 5: 37 (1914). Type: Malaya, Ganong Mengkuang Labah, 4800–5800ft, 1918, *Ridley et al.* (iso. BM).

*R. dubium* King & Gamble, J. Fed. Malay States Mus. 6: 78 (1915). Type: Malaya, Perak, 3400ft, *Wray* 233, 460, n.v.; *Scortechini* 367 (E).



MAP 88. ● *R. wrayi*; ▼ *R. korthalsii*; ■ *R. excelsum*.

Ic.: Sleumer in Fl. Malesiana 6,4: f.49 (1966).

Shrub or small tree, 1.5–10m. Leaves coriaceous, oblanceolate to elliptic, 6–15 × 2.5–3.5cm, 2.5–3.8 × as long as broad, apex bluntly acuminate, base cuneate, margin not or only slightly undulate, upper surface glabrous when mature, lower surface usually with conspicuous veins and a thin veil of a persistent white indumentum, punctate hair-bases conspicuous, overlying the veins and midrib; petioles 1.5–3.5cm, minutely white-tomentose or ± glabrous when mature. Inflorescence 8–12-flowered; rhachis 5–10mm; pedicels 15–20mm, rusty-floccose and shortly stipitate-glandular. Calyx c.1mm, tomentose and glandular, lobes rounded. Corolla open-campanulate, nectar pouches lacking, glabrous within, white sometimes flushed pink, with purple flecks, 25–35(–45)mm. Ovary densely rufous-tomentose, also with a few stipitate glands; style glandular at base or entirely glabrous. Capsule 10–20 × 5–8mm.

MALAY PENINSULA. Montane rain forests, occasionally epiphytic, 850–2150m. Map 88.

The open-campanulate corolla suggests a possible affinity with *R. annae* and its allies. *R. wrayi* does, however, clearly differ from them in its  $\pm$  persistent leaf indumentum.

**8. (240.) *R. korthalsii*** Miquel, Ann. Mus. Bot. Lugdano-Batavum 1: 43 (1863). Type: Central Sumatra, *Korthals* (holo. L).

Probably a shrub. Leaves oblanceolate to elliptic,  $7-8 \times 1.8-2.4$  cm,  $3.3-4 \times$  as long as broad, apex bluntly acuminate, base cuneate, margins slightly undulate, upper and lower surfaces glabrous when mature; petioles  $1-1.5$  cm,  $\pm$  glabrous when mature. Inflorescence c. 6-flowered; rhachis c. 7 mm; pedicels c. 15 mm, densely stipitate-glandular. Calyx 4-5 mm, lobes ovate, rounded, glandular-ciliate. Corolla open-campanulate, c. 25 mm, with a pubescent spot within near the base. Ovary sparsely rufous-tomentose, eglandular; style glabrous. Capsule not known.

SUMATRA. Only known from the type specimen. Map 88, p. 295.

Probably distantly allied to *R. wrayi*.

**9. (241.) *R. irroratum*** Franchet, Bull. Soc. Bot. France 34: 280 (1887).

Shrub or small tree, 1.5-9 m. Leaves coriaceous, oblanceolate to elliptic,  $7-14 \times 2-3.7$  cm,  $3-4 \times$  as long as broad, apex acuminate, base cuneate to rounded, margin slightly undulate, both surfaces glabrous when mature though with red punctate hair-bases overlying the veins beneath; petioles 1-2 cm, stipitate-glandular. Inflorescence 12-17-flowered; rhachis up to 20 mm; pedicels 10-25 mm, stipitate-glandular, sometimes also with scattered dendroid hairs. Calyx c. 2 mm, densely glandular, sometimes also dendroid-hairy. Corolla campanulate to tubular-campanulate, with nectar pouches, pubescent within near the base, white or cream to violet-rose, with at least a few greenish or more commonly purple flecks, 35-50 mm. Ovary stipitate-glandular, sometimes also sparsely to densely dendroid-tomentose, at least near the base; style glandular to tip. Capsule  $10-25 \times 6-10$  mm, curved.

1. Ovary and usually calyx stipitate-glandular, not tomentose

**9a. subsp. *irroratum***

+ Ovary and calyx tomentose and glandular ..... 2

2. Corolla white or cream to deep pink; stamens with broad papillae at base; capsule 15-25 mm long ..... **9b. subsp. *pogonostylum***

+ Corolla violet-rose, occasionally paler towards base; filaments with slender hairs at base; capsule 10-15 mm ..... **9c. subsp. *kontumense***

**9a. subsp. *irroratum***. Type: China, Yunnan, in silvis ad Pee-tsao-lo, supra Mo-so-yu, 2500 m, 9 iv 1886, *Delavay* 2952 (iso. E, K).

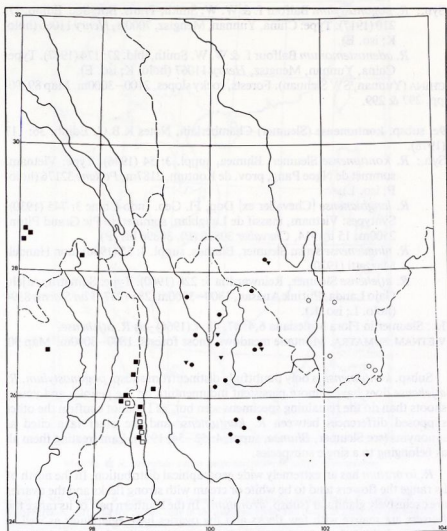
Syn.: ?*R. ninguenense* Handel-Mazzetti, Akad. Wiss. Wien Math.-Naturwiss.

Kl. Anz. 57: 288 (1920). Type: China, Sichuan, reg. temperatis montis Lose-shan, supra vicum Luschui, ad austro-or. urbis Ningyen, 2200-3200 m, 16 iv 1914, *Handel-Mazzetti* 1445 (holo. WU, iso. E).

Ic.: Bot. Mag. 120: t. 7361 (1894); Stevenson (ed.), The Species of Rhododendron 345 (1930).

CHINA (W & C Yunnan, SW Sichuan). Thickets, pine forests, 2500-3500 m. Map 89.





MAP 89. ○ *R. 'ninguenense'*; ● *R. irroratum* subsp. *irroratum*; ▼ subsp. *pogonostylum*; ■ *R. tanastylum* var. *tanastylum*; □ var. *pennivenium*.

The type of *R. ningenense* is technically referable to *R. irroratum* in that it has a glandular ovary. Material from S Sichuan and adjacent NE Yunnan does, however, appear to have a more open corolla than is usual in subsp. *irroratum* and tends to have slightly more hairy pedicels (this material includes the type of *R. ningenense*). This material may represent a minor geographical variant at the eastern end of the range of the subspecies but the differences are relatively minor.

**9b. subsp. *pogonostylum*** (Balfour f. & W. W. Smith) Chamberlain, Notes R.B.G. Edinb. 36: 117 (1978).

Syn.: *R. pogonostylum* Balfour f. & W. W. Smith, Trans. Bot. Soc. Edinb. 27: 210 (1917). Type: China, Yunnan, Mengtsz, 7000ft, *Henry* 11066 (holo. K; iso. E).

*R. adenostemonum* Balfour f. & W. W. Smith, *ibid.* 27: 174 (1917). Type: China, Yunnan, Mengtsz, *Henry* 11067 (holo. K; iso. E).

CHINA (Yunnan, SW Sichuan). Forests, rocky slopes, 2100–3000m. Map 89, 90, pp. 297 & 299.

9c. subsp. **kontumense** (Sleumer) Chamberlain, Notes R.B.G. Edinb. 36: 117 (1978).

Syn.: *R. kontumense* Sleumer, *Blumea*, suppl. 3: 54 (1946). Type: Vietnam, sommet de Ngoc Pang, prov. de Kontum, 2187m, *Poilane* 32176 (holo. P; iso. L).

*R. langbianense* [Chevalier ex] Dop, Fl. Gen. Indo-Chine 3: 745 (1930). Syntypes: Vietnam, massif de Langbian, sommet du Pic Grand Piton, 2500m, 15 ii 1914, *Chevalier* 30896 (P), 30896 bis (P).

*R. ningenense* sensu Sleumer, *Blumea*, suppl. 3: 55 (1946), non Handel-Mazzetti (1920).

*R. atjehense* Sleumer, *Reinwardtia* 5: 226 (1960). Type: Sumatra, Atjeh, Gajo Landa, Putjuk Anasan, 1800–3000m, 28 i 1937, *Van Steenis* 8394 (holo. L; iso. K).

lc.: Sleumer in *Flora Malesiana* 6, 4: 47, 48, t. (1966)—as *R. atjehense*.

VIETNAM, SUMATRA. Montane meadows, moss forests, 1800–3000m. Map 90.

Subsp. *kontumense* is only doubtfully distinct from subsp. *pogonostylum*. *R. atjehense* does have a more persistent indumentum on the petioles and young shoots than do the remaining specimens seen but, as I cannot confirm the other supposed differences between *R. kontumense* and the other taxa cited as synonyms (see Sleumer, *Blumea*, suppl. 4: 52–54, 1958), I am treating them all as belonging to a single subspecies.

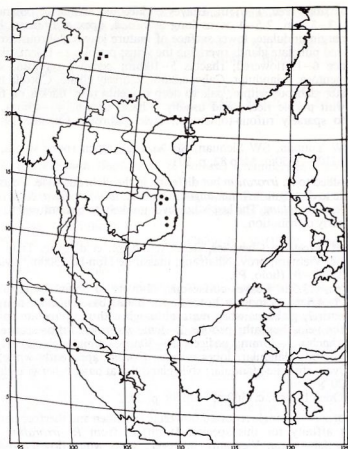
*R. irroratum* has an extremely wide geographical distribution. In the north of its range the flowers tend to be white or cream with strong flecks and the ovaries are exclusively glandular (subsp. *irroratum*). In the southern part of its range the flowers are mauve with few flecks and the ovaries have eglandular as well as glandular hairs (subsp. *kontumense*). Subsp. *pogonostylum* is morphologically intermediate and occupies an intermediate geographical range. Furthermore, there are mixed populations (as in S Yunnan) where subsp. *irroratum* and subsp. *pogonostylum* occur together along with a complete range of intermediates.

9\*. *R. lapidosum* T. L. Ming, Acta Bot. Yunnanica 3: 113, t. 1 (1981). Type: China, NE Yunnan, Zhenxiong Xian, 1900m, 26 iv 1974, *Giu, X. Z.* 74-1 (holo. Herb. Inst. Bot. Kunming).

Shrub; young shoots puberulous though soon glabrescent. Leaves lanceolate, 5.5–7.5 × 1.3–1.7cm, apex acuminate, margin slightly undulate, both surfaces glabrous, though with red sessile punctate glands below; petioles 0.8–1.3cm, glabrous. Inflorescence c. 9-flowered; rhachis c. 15mm; pedicels c. 11mm, sparsely glandular. Calyx c. 1.5mm, lobes ciliolate, otherwise glabrous. Corolla tubular-campanulate, 35–40mm, white. Ovary densely tomentose, eglandular; style glabrous. Capsule not known.

CHINA (NE Yunnan). Only known from the type.

This species was originally allied to *R. araiophyllum* on account of the glabrous style though the apparently tubular-campanulate corolla suggests a closer affinity with *R. irroratum*, a species that



MAP 90. ■ *R. irroratum* subsp. *pogonostylum*; ● subsp. *kontumense*.

occurs in NE Yunnan. *R. lapidosum* is indeed only doubtfully distinct from *R. irroratum* subsp. *pogonostylum*, differing for certain only in the glabrous style. The ovary in subsp. *pogonostylum* is usually glandular as well as tomentose though at least one specimen has a tomentose, eglandular ovary (as in *R. lapidosum*) but with a glandular style.

**10. (242.) *R. lukiangense*** Franchet, J. Bot. (Morot) 12: 257 (1898). Type: W NW Yunnan, Tseku, Loukiang Valley, 16 iii 1895, *Soulié* 1000 (iso. E, K).

Syn.: *R. gymnanthum* Diels, Notes R.B.G. Edinb. 5: 211 (1912). Type: China, W NW Yunnan, NW of Tseku, 13000ft, viii 1904, *Forrest* 5071 (holo. E).

*R. ceraceum* Balfour f. & W. W. Smith, Trans. Bot. Soc. Edinb. 27: 187 (1917). Type: W NW Yunnan, Tseku, *Mombeig* 166 (holo. E; iso. BM, K).

*R. admirabile* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 27 (1920). Type: China, SW Sichuan, 10–11000ft, vi 1918, *Forrest* 16378 (holo. E; iso. K).

*R. adroserum* Balfour f. & Forrest, *ibid.* 13: 28 (1920). Type: China, W NW Yunnan, Mekong/Salween divide, iv 1917, *Forrest* 16353 (holo. E).

Shrub or small tree, 1–7.5m. Leaves coriaceous, elliptic to oblanceolate, 8–16.5 × 3–5.2cm, 2.5–4 × as long as broad, apex acuminate, base ± cuneate, margin undulate, lower surface of mature leaves glabrous except for numerous red punctate glands overlying the veins; petioles 1–1.8cm, glabrous. Inflorescence 6–15-flowered; rhachis 5–10mm; pedicels c.10mm, sparsely stellate-tomentose, eglandular. Calyx c.2mm, sparsely ciliate. Corolla tubular-campanulate, glabrous within, pale to deep magenta rose, darker on the lobe margins, with purple flecks and usually a basal blotch, 40–45mm. Ovary glabrous to sparsely rufous-tomentose; style glabrous. Capsule 19–27 × 3–5mm.

CHINA (NW Yunnan, SW Sichuan, SE Xizang). Open rocky slopes, mixed woodland, 2100–3350m. Map 82, p. 271.

Closely allied to *R. irroratum* but differing in the glabrous style. Vegetatively there is little to distinguish *R. lukiangense* from *R. araiophyllum*, *R. irroratum*, or indeed *R. tanastylum*. The last is however unlikely to be confused as it has a more southerly distribution.

**11. (243.) *R. excelsum*** Chevalier, Rev. Act. Appl. et d'Agric. Trop. 9: 255 (1929). Type: Vietnam, prov. Nhatrang, massif de Hon-la, 1500m, 2 viii 1918, Chevalier 38707–fr. (holo. P).

Small tree, c.3.5m. Leaves coriaceous, obovate to oblanceolate, 8–14 × 3–4cm, 2.5–4.5 × as long as broad, apex blunt, base cuneate, margin not undulate, entirely glabrous when mature though with red punctate hair-bases overlying the veins beneath; petioles 2–3cm, glabrous. Inflorescence 6–12-flowered; rhachis 5–15mm; pedicels 20–30mm, stipitate-glandular. Calyx c.1.5mm, stipitate-glandular, lobes minute. Corolla apparently white, up to c.50mm. Ovary stipitate-glandular; style glandular at base, otherwise glabrous. Capsule c.20 × 8mm.

VIETNAM. Open forests, c.1500m. Map 88, p. 295.

I have not seen the single reported flowering specimen and therefore hesitate to suggest an affinity for this species. It differs from *R. irroratum* subsp. *kontumense* (also from Vietnam), however, in its white flowers and styles glandular only at base.

**12. (244.) *R. tanastylum*** Balfour f. & Kingdon-Ward, Trans. Bot. Soc. Edinb. 27: 217 (1917).

Shrub to small tree, 1–4(–10)m. Leaves coriaceous, elliptic to oblanceolate, 7.5–15 × 3–5cm, 2.5–5 × as long as broad, apex acuminate, base ± cuneate, margin not undulate, upper surface glabrous, lower surface glabrous or with a thin veil of indumentum, numerous red punctate hair-bases also present; petioles 1–2cm, glabrous. Inflorescence lax, 4–8-flowered; rhachis c.5mm; pedicels 10–15mm, sparsely to densely tomentose, with or without glands. Calyx c.2mm, glandular, sometimes also tomentose. Corolla tubular-campanulate, glabrous within, deep pink to deep crimson, with black nectar pouches and few to many flecks, 45–55mm. Ovary glabrous to rufous-tomentose and glandular; style glabrous. Capsule 11–23 × 5–8mm.

CHINA (W Yunnan), NE UPPER BURMA, NE INDIA (Arunachal Pradesh). Broad-leaved and pine forests, Rhododendron thickets, 1850–3350m. Map 89, p. 297.

1. Leaves at maturity ± glabrous beneath; pedicels eglandular

**12a. var. *tanastylum***

+ Leaves with a persistent indumentum beneath; pedicels glandular;

ovary tomentose and glandular ..... **12b. var. *penninivium***

**12a. var. *tanastylum*.** Type: E Upper Burma, Hpimaw, 9000–10000ft, 19 v 1914, *Kindon-Ward* 1566 (holo. E).

Syn.: *R. cerochitum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 36 (1920). Type: China, W Yunnan, Shweli/Salween divide; vi 1918, *Forrest* 15766 (holo. E; iso. K).

*R. ombrachares* Balfour f. & Kindon-Ward, Notes R.B.G. Edinb. 13: 280 (1922). Type: NE Upper Burma, Laktang, 8000ft, 20 x 1919, *Kindon-Ward* 3041 (holo. E).

**12b. var. *pennivenium*** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 117 (1978).

Syn.: *R. pennivenium* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 55 (1920). Type: China, W Yunnan, Shweli/Salween divide, 10000ft, v 1917, *Forrest* 15745 (holo. E).

?*R. petelotii* Dop, Fl. Gen. Indo-Chine 3: 733 (1930). Type: Vietnam, Tonkin prov. Lao Kay route de la-qui-Ho, près de Cha-pa, 1900m, *Pételot* 5135 (holo. P).

The persistence of the indumentum of var. *pennivenium* may be due to adherence caused by a secretion from the more abundant glands on the young leaves; both varieties are apparently equally tomentose when young. *R. ombrachares*, which has  $\pm$  glabrous leaves but a tomentose ovary, may be considered intermediate between the two varieties. *R. cerochitum*, with pink flowers, is apparently no more than a colour variant of var. *tanastylum*. Sleumer (*Blumea*, suppl. 3: 55, 1946) treats *R. petelotii* Dop as a synonym of *R. tanastylum*. The type is in bud and is too poor for detailed study though the leaves are narrower (c.15  $\times$  3cm) than is usual in Chinese *R. tanastylum*.

**13. (245.) *R. agastum*** Balfour f. & W. W. Smith, Trans. Bot. Soc. Edinb. 27: 178 (1917). Type: China, W Yunnan, head of the Taping-pu Valley, 7000–8000ft, v 1913, *Forrest* 9920 (holo. E).

Shrub, 1.5–3m. Leaves coriaceous, obovate to elliptic, 6–11  $\times$  2.5–5cm, 2.2–2.5  $\times$  as long as broad, apex rounded, acuminate, base rounded, margin not undulate, upper surface glabrous, lower surface with a thin veil of dendroid hairs embedded in a surface film, with numerous red punctate hair-bases overlying the veins; petioles 1.5–2cm, glabrous. Inflorescence 10–15-flowered; rhachis at most 5mm; pedicels 15–20mm, stipitate-glandular. Calyx 2–3mm, lobes rounded, glandular. Corolla campanulate to tubular-campanulate, with nectar pouches, glabrous within, rose-pink, usually with darker margins and at least a few crimson flecks, 40–50mm. Ovary stipitate-glandular, with a few rufous dendroid hairs; style glandular, usually almost to tip. Capsule up to c.30  $\times$  9mm, curved.

CHINA(W Yunnan). Rhododendron thickets, open pine forests, stony slopes, 2200–3350m. Map 86, p. 285.

Closely allied to *R. leptopeplum* and *R. tanastylum* but distinguished from both by the glandular style and the leaf shape. Two gatherings, *McLaren* L 49 & L 60, may be hybrids of this species. The leaf indumentum suggests *R. agastum* but the more acute leaves and almost glabrous styles do not.

14. (246.) *R. leptopeplum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 82 (1919). Type: China, Western NW Yunnan, Mekong/Salween divide, 13000ft, v 1918, *Forrest* 16352 (holo. E; iso. K).

Shrub or small tree, 6–9m. Leaves oblanceolate, 9–14 × 3–4cm, 3–3.7 × as long as broad, apex acuminate, base rounded, margin not undulate, upper surface glabrous when mature, lower surface with a veil of persistent dendroid hairs embedded in a surface film, with numerous red punctate hair-bases overlying the veins; petioles 1–1.5cm, glabrous. Inflorescence c.10-flowered; rhachis c.5mm; pedicels c.20mm, stipitate-glandular. Calyx 4–6mm, lobes rounded, sparsely glandular. Corolla campanulate, glabrous within, white flushed rose to rose, with crimson flecks, 40–45mm. Ovary glandular but not tomentose; style glabrous. Capsule not known.

CHINA (NW Yunnan). Rhododendron forests, c.3000m. Map 86, p. 285.

Close to *R. tanastylum* var. *pennivenium* but sufficiently distinct to be maintained as a separate species.

15. (247.) *R. kendrickii* Nuttall, J. Bot. (Lond.) 5: 358 (1853). Type: 'Mountains of Bhutan', c.7000ft, *Booth* (holo. K).

Syn.: ?*R. shepherdii* Nuttall, *ibid.* 5: 360 (1853). Type: NE India, Arunachal Pradesh, Oola Mts, *Booth*, n.v.

*R. pankimense* Cowan & Kingdon-Ward, Notes R.B.G. Edinb. 19: 180 (1936). Type: NE India, Arunachal Pradesh, Pankim La, 8000–9000ft, 3 v 1936, *Kingdon-Ward* 11378 (holo. E).

!c.: Bot. Mag. 85: t.5129 (1859).

Shrub or small tree, 3–8m. Leaves sub-coriaceous, narrowly elliptic to oblanceolate, 10–13.5 × 2–3.5cm, 4–6 × as long as broad, apex acuminate, base cuneate to rounded, margin usually strongly undulate, upper surface glabrous when mature, lower surface hairy on the midrib, otherwise glabrous, punctate hair-bases lacking; petioles 1–1.5cm, glabrescent. Inflorescence dense, 10–20-flowered; rhachis up to 15mm; pedicels c.8mm, sparsely stellate-tomentose. Calyx 2–3mm, with conspicuous rounded lobes, glabrous or sparsely glandular-ciliate. Corolla fleshy, tubular-campanulate, with nectar pouches, glabrous within, deep rose to scarlet, with darker flecks, 30–40mm. Ovary with a few rufous dendroid hairs, eglandular; style glabrous. Capsule 15–25 × c.4mm, curved.

NE INDIA (Arunachal Pradesh), BHUTAN & adjacent parts of CHINA (S Xizang). Mixed forests, 2300–2800m. Map 72, p. 245.

The status of *R. shepherdii* is problematical. The type description is inadequate in that the flowers were not known. A specimen raised from seed, supposedly from the type, flowered in cultivation and was illustrated (*Bot. Mag.* 85: t.5125, 1859). This plant differed from *R. kendrickii* in its glabrous ovary and larger calyx, but neither the cultivated nor the herbarium specimens are now extant. The available evidence suggests that *R. shepherdii* is synonymous with *R. kendrickii*.

16. (248.) *R. ramsdenianum* Cowan, Notes R.B.G. Edinb. 19: 183 (1939). Type: China, SE Xizang, Tsangpo Gorge, 7000–8000ft, 19 x 1924, *Kingdon-Ward* 6284 (K, cult. Ramsden, cult. E).

Shrub or tree, 1.5–12m. Leaves coriaceous, oblanceolate to elliptic, 8.5–14 × 3–4.5cm, 2.8–3.5 × as long as broad, apex acute to acuminate, base cuneate, margin not strongly undulate, upper surface glabrous when mature, lower surface glabrous or with vestiges of a brown indumentum, with red punctate hair-bases overlying the veins; petioles 1–1.5cm, floccose. Inflorescence dense, 15–20-flowered; rhachis c. 5mm; pedicels c. 5mm, glabrous or (rarely) stipitate-glandular. Calyx c. 2mm, glabrous, lobes broad, rounded. Corolla tubular-campanulate, scarlet to deep crimson, with prominent nectar pouches, flecks lacking, 35–40mm. Ovary glabrous or with a few rufous hairs (? rarely densely tomentose and glandular); style glabrous. Capsule not known. CHINA (SE Xizang), ?BHUTAN. Mixed forests, 2100–2700m. Map 72, p. 245.

A specimen from W Bhutan, *Ludlow, Sherriff & Hicks* 16009, closely resembles the type of *R. ramsdenianum* but differs in its densely tomentose ovary. Despite the obvious similarities, this plant may be a hybrid of *R. kendrickii*, especially as it was collected well outside the restricted area from which *R. ramsdenianum* is otherwise known.

*R. ramsdenianum* is closely allied to *R. kendrickii*, and is possibly conspecific, but may be distinguished from the latter by its broader leaves.

**17. (249.) *R. anthosphaerum*** Diels, Notes R.B.G. Edinb. 5: 215 (1912). Type: China, Yunnan, ascent to the Sungkwei Pass, 11000–12000ft, iv 1906, *Forrest* 2042 (holo. E; iso. K).

Syn.: *R. eritimum* Balfour f. & W. W. Smith, Trans. Bot. Soc. Edinb. 27: 190 (1917). Type: China, E NW Yunnan, mountains of the Chungtien Plateau, 9000ft, iii 1914, *Forrest* 12416 (holo. E; iso. BM).

*R. hylothreptum* Balfour f. & W. W. Smith, *ibid.* 27: 195 (1917). Type: China, E NW Yunnan, summit of the Sungkwei Pass, 11000–12000ft, v 1910, *Forrest* 5848 (holo. E; iso. K).

*R. gymnogynum* Balfour f. & *Forrest*, Notes R.B.G. Edinb. 13: 47 (1920). Type: China, W Yunnan, Shweli/Salween divide, 11000ft, v 1918, *Forrest* 17495 (holo. E; iso. K).

*R. heptamerum* Balfour f. in Notes R.B.G. Edinb. 13: 48 (1920). Type: NE Upper Burma, above Hpimaw, 8500–9000ft, iv 1919, *Forrest* 17827 (holo. E; iso. K).

*R. chawchiense* Balfour f. & *Farrer*, Notes R.B.G. Edinb. 13: 247 (1922). Type: NE Upper Burma, Chawchi Pass, 10500ft, 15 v 1920, *Farrer* 1552a (holo. E; iso. K).

*R. persicinum* Handel-Mazzetti, Akad. Wiss. Wien Math.-Naturwiss. Kl., Anz. 60: 97 (1924). Type: China, NW Yunnan, in montium inter Dali et Hodjing, silvis temperatis jugi Dsuningkou, 3050–3350m, 27 v 1915, *Handel-Mazzetti* 6549 (iso. A, E).

Ic.: Bot. Mag. 151: t.9083 (1926).

Shrub or small tree, 3–12m. Leaves elliptic-obovate to oblong, 6–16 × 2–4.5cm, (2.5–)3–4 × as long as broad, apex acuminate to acute, base ± cuneate, margin not undulate, upper surface glabrous when mature, lower surface ± glabrous, with a few red punctate hair-bases overlying the veins;

petioles 1–2cm, glabrescent. Inflorescence dense, 10–15-flowered; rhachis 5–10mm; pedicels 10–15mm, sparsely rufous-tomentose. Calyx 1–2mm, glabrous to stipitate-glandular. Corolla 6–7-lobed, tubular-campanulate, with nectar pouches, glabrous within, rose-magenta to crimson, occasionally magenta-blue or pale peach, with a variable amount of crimson flecks, with or without a basal blotch, 30–45mm. Ovary usually glabrous, occasionally with a few rufous hairs; style glabrous. Capsule 20–25 × c.5mm.

CHINA (Yunnan, SE Xizang), NE UPPER BURMA. Open rocky slopes, deciduous woodland, etc., 2700–4000m. Map 100, p. 339.

*R. anthosphaerum* is a variable species, both in leaf shape, and in corolla size and colour. Several entities may be recognised within the species but complete intergradation apparently occurs. The names used below are given only as a guide without implying any format taxonomic status.

1. Leaves elliptic, apex  $\pm$  acute ..... *R. anthosphaerum* sensu stricto  
+ Leaves oblong to obovate, apex rounded and apiculate ..... 2
2. Leaves up to 8cm long ..... *R. gymnogynum*  
+ Leaves 8–16cm long ..... 3
3. Corolla c.30mm, blue-magenta ..... *R. chawchiense*  
+ Corolla 35–45mm, crimson to rose-magenta ..... *R. eritimum*

I am uncertain as to how far the four entities are differentiated geographically, a problem that can only be resolved by detailed population sampling. It is clear however that plants matching the types of both *R. eritimum* and *R. anthosphaerum* occur together on the Sungkwei Pass and in the Lichiang Snow Range. However, plants matching the type of *R. eritimum* appear to be more frequent in the northern part of the species' range.

**18. (250.) *R. papillatum*** Balfour f. & Cooper, Notes R.B.G. Edinb. 13: 282 (1922). Type: Bhutan, Bela Djang Pass, 10000ft, 10 v 1915, *Cooper* 3885 (holo. E).

Syn.: *R. epapillatum* Balfour f. & Cooper, ibid. 13: 257 (1922). Type: Bhutan, Timpu, 6000ft, 24 v 1915, *Cooper* 3818 (holo. E).

Shrub or small tree, 2–5m. Leaves sub-coriaceous, oblanceolate to oblong, 9–14 × 3–5cm, c.3 × as long as broad, apex acuminate, base rounded to cuneate, margin not undulate, upper surface glabrous when mature, lower surface usually with conspicuous veins and a papillate cuticle, with a thin, persistent or detersile stellate indumentum, red punctate hair-bases lacking; petioles 1.5–2cm, glabrous. Inflorescence 5–10-flowered; rhachis c.20mm; pedicels c. 20mm, densely dendroid-tomentose. Calyx c.2mm, tomentose, lobes rounded. Corolla campanulate, glabrous within, pale cream to pink, with purple flecks and a basal blotch, 40–55mm. Ovary densely dendroid-tomentose, with stipitate glands; style glabrous. Capsule not known.

BHUTAN, NE INDIA (Arunachal Pradesh). Under *Abies*, etc., 1800–3300m. Map 79, p. 265.

The cuticle, even in *R. epapillatum*, is slightly papillate and there is no



correlation between the degree of the papillosity of the leaf cuticle and the leaf shape as has been suggested.

*R. papillatum* is accepted in preference to *R. epapillatum* since it is the more commonly used name for this species.

## XII. Subsection *Pontica* Sleumer, Bot. Jahrb. 74: 546 (1949).

Syn.: Series *Ponticum* sensu Tagg in Stevenson (ed.), The Species of Rhododendron 567 (1930).

Shrubs or small trees; bark rough; young shoots glabrous to densely tomentose, also with stipitate glands. Leaves linear to broadly elliptic or obovate, lower surface glabrous though sometimes with persistent hair-bases, or with a dendroid unistrate tomentum. Inflorescence lax or dense, 5–20-flowered; rhachis 3–60mm, pedicels in some species elongating in fruit, up to 60mm long. Calyx 1–9mm. Corolla 5(–7)-lobed for about half its length, campanulate to funnel-campanulate, nectar pouches lacking, yellow or white to pink or lilac-purple, usually with yellow or green flecks. Stamens 10. Ovary glabrous or glandular and/or tomentose; style glabrous.

Type species: *R. ponticum* L.

### Reference

DOLESHY, F. (1968). Distribution and ecology of certain Japanese Rhododendrons: a progress report. *Quart. Bull. Amer. Rhododendron Soc.* 22: 145–159.

A wide-ranging subsection, probably allied to subsection *Argyrophylla* but characterised by the deeply lobed corolla and (in most species) by the long rhachis and fruiting pedicels.

The distinction between subseries *Ponticum* and subseries *Caucasicum* is not maintained as the differences cited by Tagg are not consistent.

1. Lower surface of leaves glabrous or with scattered dendroid hairs towards the base and on the midrib, also with persistent red punctate hair-bases ..... **1. hyperythrum**
- + Leaves lacking persistent red hair-bases below, lower surface glabrous to densely lanate ..... **2**
2. Leaves glabrous or with a thin fugaceous indumentum below at maturity ..... **3**
- + Leaves with a  $\pm$  continuous adpressed to lanate indumentum at maturity ..... **8**
3. Corolla yellow; dwarf shrub, 0.2–1m ..... **8. aureum**
- + Corolla whitish to lilac-purple; usually a large shrub, 1–5(–8)m ..... **4**
4. Ovary glabrous (Europe, SW Asia) ..... **9. ponticum**
- + Ovary glandular and/or tomentose (N America, SE Asia) ..... **5**
5. Leaves 3.5–4  $\times$  as long as broad; ovary and pedicels glandular; calyx 3–5mm ..... **11. maximum**
- + Leaves 1.8–2.8(–3)  $\times$  as long as broad; ovary and pedicels eglandular; calyx 1–2mm ..... **6**

6. Corolla lilac-purple; leaves  $1.8-2.3 \times$  as long as broad (E N America) **10. catawbiense**  
 + Corolla white flushed pink, to pink; leaves  $2.3-2.8(-3) \times$  as long as broad .....7
7. Leaf apex acute, base cuneate; corolla 30-40mm (W N America) **12. macrophyllum**  
 + Leaf apex and base rounded; corolla c.25mm (Korea, Japan) **2. brachycarpum**
8. Dwarf shrub, 0.3-1m; leaves with a compacted indumentum beneath; corolla usually yellow, rarely creamy white.....7. **caucasicum**  
 + Shrub or small tree, 1-7m; leaves with a compacted to lanate indumentum beneath; corolla white to pink, rarely yellowish .....9
9. Leaves  $2.3-2.5(-3) \times$  as long as broad; corolla c.25mm; leaf indumentum compacted, thin .....2. **brachycarpum**  
 + Leaves  $2.5-10 \times$  as long as broad; leaf indumentum usually thick, compacted to lanate .....10
10. Young shoots with at least some glands; rhachis (20-)25-35 (-60)mm (Caucasia) .....11  
 + Young shoots eglandular; rhachis 2-20mm (Japan) .....12
11. Ovary and petioles stipitate-glandular; leaves 11.5-21cm long; calyx 5-9mm .....5. **ungernii**  
 + Ovary and petioles eglandular; leaves 7.5-11.5(-14)cm long; calyx 2-3mm .....6. **smirnowii**
12. Rhachis 2-5mm; leaves  $2.5-10 \times$  as long as broad; pedicels densely fulvous-tomentose .....4. **yakushmanum**  
 + Rhachis 10-20mm; leaves  $3-4 \times$  as long as broad; pedicels sparsely tomentose .....3. **japonicum**

1. (251.) *R. hyperythrum* Hayata, Icon. Pl. Formosan. 3: 133 (1913). Type: Formosa, regionibus meridionalibus, *Konishi & Vani*, n.v.

Syn.: *R. rubropunctatum* Hayata, ibid. 3: 141 (1913), non Lévillé (1911).

Type: Taiwan, Mt Shichiseitonzan, iv 1910, *Sasaki* (iso. A,E).

lc.: Bot. Mag. n.s. 167: t.109 (1950).

Shrub; young shoots glabrous. Leaves elliptic,  $8-12 \times 2.5-3.5$ cm,  $3.2-3.4 \times$  as long as broad, apex  $\pm$  cuspidate, base cuneate, upper surface glabrous when mature, lower surface with persistent punctate hair-bases, sometimes also with persistent dendroid hairs, especially towards the base and on the midrib; petioles 1.5-2cm, with a floccose indumentum at first, soon becoming  $\pm$  glabrous. Inflorescence c.10-flowered; rhachis 15-25mm; pedicels c.35mm, with a sparse dendroid indumentum. Calyx c.3mm, sparsely hairy. Corolla funnel-campanulate, white with reddish flecks, 35-45mm. Ovary densely glandular; style sparsely glandular below. Capsule not known.

TAIWAN. Map 98, p. 327.

*R. hyperythrum* is a distinctive species, only distantly allied to the remaining members of this subsection. It does, however, clearly belong to this subsection on account of the form of the inflorescence and the shape of the corolla. The punctate hair-bases are a distinctive feature in subsection Pontica.

2. (252.) *R. brachycarpum* [D. Don ex] G. Don, Gen. Syst. 3: 843 (1834).

Shrub, 2–3m; young shoots tomentose, soon glabrescent. Leaves oblong to obovate, 7–11 × 3–4.5cm, 2.3–2.5 (–3) × as long as broad, apex ± rounded, apiculate, base rounded, upper surface glabrous, lower surface glabrous or with a compacted greyish to fawn indumentum; petioles 1–2cm, glabrous, with lamina slightly decurrent. Inflorescence lax, 10–20-flowered; rhachis 20–40mm; pedicels c.30mm, sparsely tomentose. Calyx c.2mm, tomentose, lobes glabrous. Corolla broadly funnel-campanulate, white to pale rose-pink, with greenish flecks, c.25mm. Ovary densely tomentose; style c.15mm, glabrous. Capsule 20–30mm long.

Map 91, p. 308.

1. Leaves with a compacted grey to fawn indumentum beneath, even when mature ..... 2a. subsp. *brachycarpum*  
 + Leaves ± glabrous beneath when mature ..... 2b. subsp. *fauriei*

2a. subsp. *brachycarpum*. Described from Japan.

Syn.: *R. brachycarpum* G. Don var. *roseum* Koidzumi, Bot. Mag. (Tokyo) 30: 77 (1916). Type: Japan, in alpis Yeso, n.v.

*R. fauriei* Franchet var. *rufescens* Nakai, Trees Shrubs Japan, ed. 2, 1: 56 (1927). Type: uncertain.

?*R. brachycarpum* G. Don subsp. *tigerstedtii* Nitzelius, Deutsche Baum-schule no. 7: 207 (1970). Type: a specimen from a cultivated plant grown in Mustila, Finland, originating from Kongo San in E C Korea (holo. GB, n.v.).

JAPAN, E KOREA, c.2500m. See also Doleshy (1968)—ref. p. 305.

2b. subsp. *fauriei* (Franchet) Chamberlain, Notes R.B.G. Edinb. 37: 335 (1979).

Syn.: *R. fauriei* Franchet, Bull. Soc. Philom. Paris ser. 7, 10:145 (1886). Type: Nippon septentrionalis, in monte Schichinake, prope Aomori, 21 vi 1886, *Faurie* 758 (iso. E, K).

*R. brachycarpum* G. Don var. *roseiflorum* Miyoshi, J. Coll. Sci. Imp. Univ. Tokyo 27: 8 (1910), no type designated.

lc.: Nakai, Fl. Sylva Koreana 8, t. (1919) — as *R. brachycarpum*.

JAPAN, KOREA.

Ohwi (*Fl. Japan*, English Version, 698, 1965) implies that *R. brachycarpum* of G. Don has entirely glabrous leaves and that *R. fauriei* is synonymous with it. However, Don clearly states that the leaves of *R. brachycarpum* have an indumentum on the lower surface. The synonymy cited here follows from the correction of this error. Nakai (loc. cit.) implies that all the material from Korea has glabrous leaves which is not entirely true. However, most of the Korean material seen is referable to subsp. *fauriei* which does appear to have a wider range than does the type subspecies. *R. hidaense* Makino (in Hara, *Enum. Pl. Japon.* 1: 33 (1948)—Type: Japan, Prov. Hida, in silva Aoya, vii 1939, *Makino*, n.v.) is probably a hybrid between this and the next species (see Hara, loc. cit.).

Subsp. *tigerstedtii*, from mainland Korea and the offshore Dagelet Island, is described as differing from subsp. *brachycarpum* in its larger leaves, 15–25cm long, and in its large white flowers (c. 70mm in diam.), etc. I have not seen sufficient wild-collected material of subsp. *tigerstedtii* to confirm the constancy

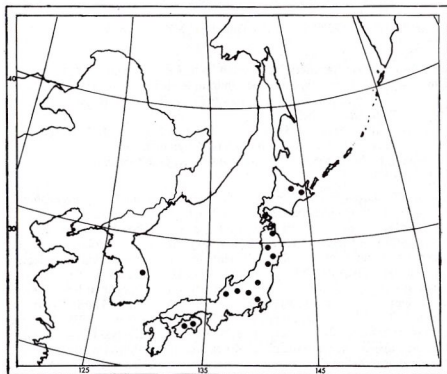
of these differences, but from the description, the distinctions made appear to be relatively trivial.

3. (253.) ***R. japonicum*** (Blume) Schneider, Ill. Handb. Laubh. 2: 490 (1909), non (A. Gray) Suringar (1908).

Shrub, 1–2.5m; young shoots sparsely tomentose, eglandular, perulae deciduous. Leaves elliptic to oblanceolate,  $8-14 \times 2.5-3.5$ cm,  $3-4 \times$  as long as broad, apex acute to  $\pm$  rounded, apiculate, base cuneate to rounded, upper surface glabrous, lower surface with a dense compacted grey to fawn tomentum or indumentum thin and agglutinated or occasionally glabrescent; petioles 2–2.5cm, usually densely floccose-tomentose. Inflorescence lax, 9–12-flowered; rachis 10–20mm; pedicels 20–30mm, with a sparse dendroid indumentum. Calyx 2–3mm, lobes rounded-triangular, glabrous. Corolla widely funnel-campanulate, pink to soft rose, with conspicuous flecks, 30–45mm. Ovary white-tomentose. Capsule to at least  $22 \times 10$ mm.

JAPAN (Honshu, Kyishu). Hill tops, mountain ridges, 200–1200m. Map 92. See also Doleshy (1968)—ref. p. 305.

1. Flowers 7-merous ..... 3a. var. ***japonicum***  
 + Flowers 5-merous ..... 3b. var. ***pentamerum***



MAP 91. ● *R. brachycarpum*.

**3a. var. japonicum.**

Syn.: *Hymenanthus japonica* Blume, Bijdr. 862 (1826). Type not designated.

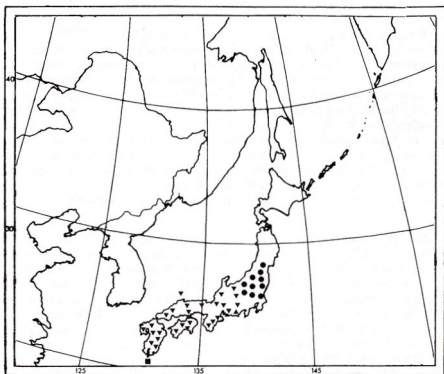
*R. metternichii* Siebold & Zuccarini, Fl. Japon. 1: 23, t.9 (1835). Type: in albus Japoniae borealis, Siebold (LE, n.v.), nomen illegit.

*R. metternichii* Siebold & Zuccarini var. *heptamerum* Maximovicz, Rhododendrons As. Or. 21 (1870)—type as above.

*R. hymenanthus* Makino, Bot. Mag. (Tokyo) 16: 33 (1902). nomen illegit.

*R. metternichii* Siebold & Zuccarini var. *hondoense* Nakai, Bot. Mag. (Tokyo) 38: 26 (1924). Described from Japan, 'the mountains of Hondo and Shikaku' & var. *micranthum* Nakai, ibid. 38: 27 (1924). Described from Japan, Prov. Yamato.

Dolshy (1968) distinguishes var. *hondoense* from the type of var. *japonicum* on account of its agglutinated rather than velutinous leaf indumentum and suggests that it replaces var. *japonicum* (var. *metternichii*) in the west of Honshu, though both occur in Kyushu. Intermediates between the two forms undoubtedly occur, though, if the geographical separation of the two forms is confirmed, then there is some justification in maintaining var. *hondoense*, perhaps as a subspecies.



MAP 92. ▼ *R. japonicum* var. *japonicum*; ● var. *pentamerum*; ■ *R. yakushimanum* subsp. *yakushimanum*; ▲ subsp. *makinoi*.

**3b. var. pentamerum** (Maximovicz) Hutchinson, Bot. Mag. 137: t. 8403 (1911). Syn.: *R. degronianum* Carrière, Rev. Hort. 40: 186, t.77 (1869). Type not designated.

*R. metternichii* Siebold & Zuccarini var. *pentamerum* Maximovicz, Rhododendrons As. Or. 22 (1870). Type: a cultivated specimen originating from Yedo in Japan.

*R. pentamerum* (Maximovicz) Matsumura, Cat. Sem. Hort. Bot. Univ. Tokyo 1916: 24 (1916).

*R. nakaii* Komatsu in Matsumura, Icon. Pl. Koisikav. 1: 145, t.73 (1913). Described from Nikko in Japan.

*R. metternichii* Siebold & Zuccarini subsp. *pentamerum* (Maximovicz) Sugimoto, New Key Jap. Trees 470 (1961).

*R. metternichii* Siebold & Zuccarini var. *kyomaruense* Yamazaki, J. Jap. Bot. 39: 17 (1964). Type: Japan, Prov. Tutomi, Iwala-yun, Jokojisan, 900m, 16 v 1961, *Yamazaki* (holo. TI, n.v.).

Ic.: Makino, Ill. Fl. Japan 925 (1924); Quart. Bull. Amer. Rhododendron Soc. 27: 35 (1973)—as *R. degronianum*.

The name *R. japonicum* (A. Gray) Suringar, the current name for *Azalea japonica* A. Gray, is rejected as the combination was only proposed provisionally to replace *R. molle* Siebold & Zuccarini, should that name prove to be nomenclaturally inapplicable for Gray's plant. By the time that it was realised that *R. molle* G. Don was an earlier homonym of *R. molle* Siebold & Zuccarini, the combination *R. japonicum* (Blume) Schneider had been effectively published, precluding the use of the name for Gray's plant.

Doleshy (op. cit., 1968) maintains var. *kyomaruense* as distinct on the basis of its agglutinated leaf indumentum (analogous to var. *hondoense*), though it is probable that it is no more than a local geographical variant of var. *pentamerum*. He proposed the combination *R. metternichii* var. *metternianum* (Wada) Doleshy for this plant, a superfluous name as var. *kyomuraense* is the first name at varietal rank for this taxon if it is retained.

In his paper he discusses in detail the distribution of the taxa and points out that var. *pentamerum* has a more northerly distribution than does var. *japonicum*. This perhaps justifies subspecific rank though the respective combinations have never been made under *R. japonicum*.

*R. japonicum* is closely allied to and possibly conspecific with *R. yakushmanum*.

**4. (254.) *R. yakushmanum*** Nakai, Bot. Mag. (Tokyo) 35: 135 (1921).

Shrub, 1–2.5m; young shoots floccose-tomentose, eglandular; perulae persistent or deciduous. Leaves narrowly to broadly elliptic or linear-lanceolate, 6–21 × 1–3cm, 2.3–10 × as long as broad, apex rounded to acute, base rounded to cuneate, upper surface glabrous or with a thin floccose indumentum towards the base, lower surface with a thick white to fulvous lanate tomentum that obscures the midrib; petioles 1–1.5cm, tomentose at first, usually soon glabrescent. Inflorescence lax, 5–10-flowered; rhachis 2–5mm; pedicels 15–25mm, densely fulvous-tomentose. Calyx 2–5(–7)mm, densely tomentose. Corolla 5-lobed, funnel-campanulate, pale rose, with or without flecks, 30–40mm. Ovary densely whitish to brown-tomentose. Capsule at least 15 × 7mm.

Mountains, 500–2000m. Map 92, p. 309. See also Doleshy (1968)—ref. p. 305.

1. Leaves  $2.3-6 \times$  as long as broad; perulae deciduous

**4a. subsp. yakushmanum**

- + Leaves  $7.5-10 \times$  as long as broad; perulae persistent .... **4b. subsp. makinoi**

**4a. subsp. yakushmanum.** Described from Yakushima, S Japan.

Syn.: *R. metternichii* Siebold & Zuccarini var. *yakushmanum* (Nakai) Ohwi, Bull. Natl. Sci. Mus. 33: 81 (1953).

*R. metternichii* Siebold & Zuccarini subsp. *yakushmanum* (Nakai) Sugimoto, New Key Jap. Trees, 470 (1961).

?*R. metternichii* Siebold & Zuccarini var. *intermedium* Sugimoto, ibid., 471 (1961).

*R. degroenianum* Carrière var. *yakushmanum* (Nakai) Kitamura, Acta Phytotax. Geobot. 25: 38 (1972).

JAPAN(Yakushima).

**4b. subsp. makinoi** (Tagg) Chamberlain, Notes R.B.G. Edinb. 37: 336 (1979).

Syn.: *R. makinoi* Tagg in Nakai & Koidzumi, Trees Shrubs Japan ed. 2, 1: 61 (1927) — basionym.

*R. stenophyllum* Makino, Bot. Mag. (Tokyo) 24: 99 (1910), non Hooker f. (1878).

*R. metternichii* Siebold & Zuccarini var. *pentamerum* Maximovicz forma *angustifolium* Makino, Bot. Mag. (Tokyo) 10: 211 (1896). Type: a specimen cultivated in Tokyo, dated 8 v 1890, n.v., also type for the above two species.

*Azalea makinoi* (Tagg) Makino in J. Jap. Bot. 6: 3 (1929), incl. var. *muranoana* Makino, J. Jap. Bot. 6: 4, t.(1929).

JAPAN (C Honshu).

Closely allied to *R. japonicum* and possibly conspecific, though consistently with a denser leaf indumentum and differently shaped leaves. *R. makinoi* is usually treated as a separate species on account of its persistent perulae and narrow leaves, while *R. yakushmanum* in the strict sense is sometimes treated as a subspecies of *R. japonicum* (see Doleshy, 1968).

Subsp. *yakushmanum* varies with respect to size and leaf length; the more dwarf and compact forms occurring in more exposed sites and the more lax forms (var. *intermedium*) in more sheltered sites. Var. *intermedium* approaches *R. japonicum* but the denser leaf indumentum will generally distinguish it. It apparently replaces *R. japonicum* on the southern island of Yakushima.

**5. (255.) *R. ungerii*** Trautvetter, Gartenflora 335 (1885). Type: NE Turkey, prope Artvin, distr. Batum, *Baron Ungern-Sternberg* (LE, n.v.).

Ic.: Bot. Mag. 136: t.8332 (1910).

Shrub or small tree, 1-7m; young shoots densely whitish lanate-tomentose, with scattered stipitate glands. Leaves oblanceolate to obovate,  $11.5-21 \times 3.5-6.2$ cm,  $2.5-3.3 \times$  as long as broad, apex usually rounded, acuminate, base cuneate to rounded, upper surface glabrous, lower surface densely whitish to fawn lanate-tomentose; petioles 1.5-2.5cm, lanate-tomentose and stipitate-glandular at first, later glabrescent. Inflorescence lax, 12-25-flowered; rhachis 25-35(-60)mm; pedicels with a persistent floccose lanate indumentum and persistent glands, 25-35mm in flower, up to 60mm in fruit. Calyx 5-9mm,

lobes lanceolate, acute, stipitate-glandular. Corolla funnel-campanulate, white, sometimes flushed pink, with greenish flecks, c.35mm. Ovary brownish stipitate-glandular, with scattered whitish non-glandular hairs. Capsule 12–15 × 4–6mm.

NE TURKEY & adjacent USSR (Georgia). Picea forests, 1200–1850m. Map: Grossgeim, Fl. Kavk. 7: Map 157 (1967).

Closely allied to *R. smirnowii* and apparently hybridising with it in the wild.

6. (256.) *R. smirnowii* Trautvetter, Gartenflora 335 (1885). Type: NE Turkey, prope Artvin, distr. Batum, *Smirnow* (LE, n.v.).  
Ic.: Rev. Hort. 500, t. (1899).

Shrub, 1–4m; young shoots whitish lanate-tomentose, with a few scattered glands. Leaves oblanceolate to elliptic, 7.5–11.5(–14) × 2.5–3.2cm, 2.8–4.5 × as long as broad, apex usually rounded or occasionally ± acute, base cuneate, upper surface glabrous when mature, lower surface with a dense white to cinnamon indumentum; petioles 1–1.5cm, densely lanate. Inflorescence 7–15-flowered; rhachis 20(–40)mm; pedicels densely stipitate-glandular, also with a sparse floccose indumentum, 30–35mm, apparently hardly elongating in fruit. Calyx 2–3mm, lobes broadly triangular, sparsely stipitate-glandular. Corolla funnel-campanulate, pink with yellowish flecks, 35–40mm. Ovary densely white-strigillose, eglandular. Capsule c.15 × 5mm.

NE TURKEY & adjacent USSR (Georgia). Under Pinus, Rhododendron scrub (500–)1500–2300m. Map: Grossgeim, Fl. Kavk. 7: Map 158 (1967).

Closely allied to *R. ungerii* and apparently hybridising with it and with *R. caucasicum*.

7. (257.) *R. caucasicum* Pallas, Fl. Rossica 1: 46, t.31 (1784). Type: USSR, altere septentrionale Caucasi, in Ossetia inter Tschin et Tschinaga meridiem versus; postea in Caucaso australiore in alpinis elatioribus (? BM).

Syn.: *R. caucasicum* Pallas var. *stramineum* W. Hooker, Bot. Mag. 62: t.3422 (1835). Type: a plant on the plate drawn from it (cited above), grown in Glasgow and flowering in iv 1835.

Ic.: Bot. Mag. 28: t.1145 (1808)– as *R. caucaseum*.

Dwarf shrub, 0.3–1m; young shoots sparsely tomentose. Leaves obovate to elliptic, 4–7.5 × 1.3–3cm, 2.2–3 × as long as broad, apex blunt to apiculate, base cuneate, upper surface glabrous, lower surface with a compacted fawn to brownish tomentum; petioles 0.5–1cm, sparsely velutinous. Inflorescence lax, 6–15-flowered; rhachis up to 35mm; pedicels pilose, 25–30mm in flower, up to 60mm in fruit; perulae usually persistent. Calyx 1–2mm, pilose. Corolla broadly campanulate, whitish to yellow, sometimes flushed with pink, with greenish flecks, 30–35mm. Ovary densely dendroid-pilose; style glabrous. Capsule 15–20 × c.8mm.

NE TURKEY & adjacent parts of USSR (Caucasia).

A distinctive species though apparently hybridising with *R. ponticum* (q.v.) and *R. smirnowii*. The plate accompanying the type description gives a false impression of the species as described here and may be disregarded as there is no direct reference to any of the type specimens cited. Plate 3422 in *Bot. Mag.* 62 (1835) is a reliable representation of the species as treated here.



**8. (258.) *R. aureum* Georgi, Reise 1: 51, 214 (1775).**

Dwarf shrub, 0.2–1m; young shoots  $\pm$  glabrous; perulae persistent for up to four years. Leaves ovate to broadly elliptic, 2.5–15.5  $\times$  1.2–7cm, 2–2.5  $\times$  as long as broad, apex rounded, base cuneate to rounded, upper and lower surfaces glabrous when mature; petioles 0.5–1cm, velutinous-tomentose. Inflorescence lax. 5–8-flowered; rachis c.10mm; pedicels 25–35mm, sparsely dendroid-pilose. Calyx 2–3mm, lobes rounded-triangular, pilose. Corolla widely campanulate, yellow, usually with at least a few flecks, 25–30mm. Ovary rufous-tomentose; style glabrous. Capsule c.10  $\times$  4mm.

USSR (C & E Siberia, Kamchatka, Sakhalin, Kuriles), KOREA, JAPAN (Hokkaido, Honshu), N CHINA (Jilin). Alpine slopes, 1500–2700m. Map 93, p. 314. See also Busch, Fl. Siber. Orient. Extremi (Ericaceae), 18 (1915).

1. Leaves 2.5–6.5(–8)cm long; perulae persistent.....**8a. var. aureum**  
 + Leaves 9–15.5cm long; perulae usually deciduous .....**8b. var. hypopitys**

**8a. var. aureum.** Type: USSR, ad Lacum Baical, *Georgi* (LE, n.v.).

Syn.: *R. chrysanthum* Pallas, Reise 3: 729 (1776). Type: USSR, Montes Sajanensium ut et Dauriae, totiusque Siberiae orientalibus.

*R. officinale* Salisb., Parad. Lond. t.80 (1807), superfluous name under *R. aureum*.

Ic.: Pallas, Fl. Rossica t.30 (1784); Busch, Fl. Siber. Orient. Extremi (Ericaceae) t.63 (1915)– both as *R. chrysanthum*.

**8b. var. hypopitys** (Pojarkova) Chamberlain, Notes R.B.G. Edinb. 37: 335 (1979).

Syn.: *R. hypopitys* Pojarkova in Fl. URSS 18: 721, t.1, f.1 (1952). Type: USSR, in parte septentrionali jugi Schote-Alinj, 1934, *Soczava* (LE, n.v.).

Var. *hypopitys* may be no more than a shade form of var. *aureum* but superficially the two taxa are sufficiently distinct to merit varietal rank.

**8\*. *R. x nikomontanum*** (Komatsu) Nakai, Bot. Mag. (Tokyo) 31: 242 (1917)– *R. aureum*  $\times$  *R. brachycarpum*.

Syn.: *R. chrysanthum* Pallas var. *nikomontanum* Komatsu in Matsumura, Ic. Fl. Koisikav. 3: t.195 (1917). Described from Nikko in Japan.

*R. brachycarpum* G. Don var. *lutescens* Koidzumi, Bot. Mag. (Tokyo) 30: 17 (1916). Type: Japan, Mt Ontakisan.

Intermediate between the two parents, with the more robust habit and leaf shape of *R. brachycarpum* and the yellowish flowers of *R. aureum*. This taxon was first recognised as a hybrid by Ohwi (Fl. Japan (English version) 698, 1965).

**9. (259.) *R. ponticum* L., Sp. Pl. ed. 2: 562 (1762). Type: a Tournefort specimen from the Orient, n.v.**

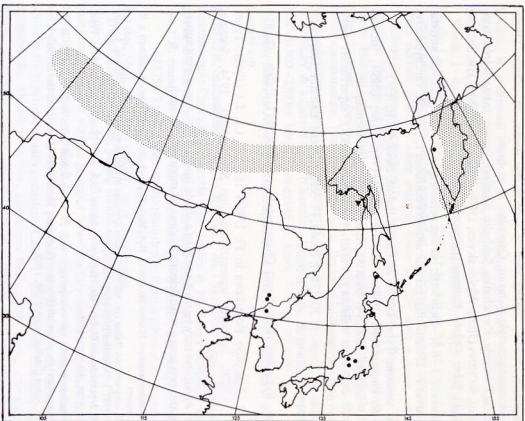
Syn.: *R. lancifolium* Moench, Meth. 45 (1794), nomen illegit.

*R. speciosum* Salisb., Prodr. 287 (1796), nomen illegit.

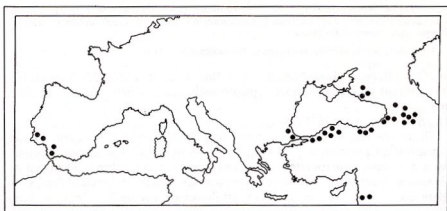
*R. parviflorum* Dumont de Courset, Bot. Cult. ed. 2,1: 253 (1811). No type designated.

*R. algarvense* Page, Prodr. Southampt. Gard. 38 (1817), nomen nudum.

*R. baeticum* Boissier & Reuter in Boissier, Diagn. Ser. 2,3: 118 (1856).



MAP 93. ● *R. aureum* var. *aureum*; ▼ var. *hypopitys*. Shaded area covers distribution of *R. aureum* in Soviet C & E Asia.

MAP 94. ● *R. ponticum*.

Type: Spain, in montibus Baeticae australibus circa Algeciras et Tarife, Boissier & Reuter, n.v.

?*R. adansonii* Pepin, Ann. Fl. Pomone 304, t. (1859).

*R. ponticum* L. var. *brachycarpum* Boissier, Fl. Or. 3: 972 (1875).

Syntypes: Lebanon, Labillardière; inter Zachle et Beckfaya, Boissier; in monte Sanin, Ehrhardt; in valle Hamama, Mart., n.v.

*R. ponticum* L. subsp. *baeticum* (Boissier & Reuter) Handel-Mazzetti, Ann. Naturhist. Mus. Wien 23: 53 (1909).

Ic.: Bot. Mag. 18: t.690 (1803).

Shrub, 2–5(–8)m; young shoots glabrous. Leaves oblanceolate to broadly elliptic, 6–18 × 2.4–5.5cm, 1.8–5 × as long as broad, apex acute to acuminate, base ± rounded to cuneate, upper and lower surfaces glabrous when mature; petioles 1–2cm, glabrous or with a few stipitate glands and a sparse floccose tomentum. Inflorescence 8–20-flowered; rhachis 10–50mm, glabrous or more rarely velutinous to ± lanate; pedicels 30–35mm, glabrous or stipitate-glandular. Calyx 1–2mm, glabrous, lobes shallowly triangular. Corolla campanulate, lilac-pink to purple, usually with greenish-yellow flecks, 35–50mm. Ovary and style glabrous. Capsule 15–25 × 3–4mm.

SPAIN, PORTUGAL, BULGARIA, N TURKEY, USSR (W Caucasia), LEBANON. Forests, Rhododendron thickets, s.l. – 1800m. Map 94.

Specimens with a velutinous rhachis, the character used to distinguish the European subsp. *baeticum* from subsp. *ponticum* (in which the rhachis is usually glabrous), occur sporadically, even in E Turkey & Caucasia. There is therefore no justification in maintaining the two taxa at any rank. Similarly, the differences used to distinguish var. *brachycarpum* from var. *ponticum* are considered to be too trivial to justify the maintenance of that taxon.

*R. adansonii* Pepin is probably synonymous with *R. ponticum* though the plate that accompanies the type description is too poor to be certain.

9\*. *R. x sochadzeae* Char & Davlianidze, Zam. Sist. Geogr. Rast. 27: 84 (1967) – *R. ponticum* × *R. caucasicum*. Type: USSR, Georgia megrelia jugi Okhaczkus in declivio orientale, locus 'Patara Djakona', 11 vii 1964, Sochadze & Davlianidze (holo. TBI, n.v.).

Intermediate between the two parents, differing from *R. ponticum* in its white to pale pink corolla and usually pubescent ovary, and from *R. caucasicum* in its longer (5–17cm), glabrous leaves. Forests, open slopes, 1700–2400m.

This hybrid occurs wherever the ranges of the two species overlap.

**10. (260.) *R. catawbiense*** Michaux in Fl. Bor. Amer. 1: 258 (1803). Type: USA, in montibus excelsis Carolinae septentrionalis, juxto origine-amnis Catawbe, n.v.

Ic.: Bot. Mag. 40: t. 1671 (1814).

Shrub, 2–3m; young shoots tomentose though soon glabrescent. Leaves broadly elliptic to obovate, 6.5–11.5 × 3.5–5cm, 1.9–2.3 × as long as broad, apex ± obtuse, base rounded, upper and lower surfaces glabrous when mature though with persistent hair bases below; petioles 2–3cm, ± lanate at first, soon glabrescent. Inflorescence dense, 15–20-flowered; rhachis 20–25mm; pedicels 30–35mm, with a sparse dendroid indumentum. Calyx c.1mm, ± glabrous. Corolla funnel-campanulate, usually lilac-purple, with faint flecks, 30–45mm. Ovary densely rufous-tomentose; style glabrous. Capsule c.20 × 4mm. Eastern USA (N Carolina & Virginia). Rocky slopes, etc., 50–1000m. Map: Little, Atlas United States Trees 4: map 118 (1977).

Closely allied to *R. ponticum* despite the surprising disjunction. Large flowered, large-leaved plants from eastern N Carolina have been referred to forma *insularis* Coker (in *J. Elisha Mitchell Sci. Soc.* 34: 76 et seq., t.19, 1919).

**11. (261.) *R. maximum*** L., Sp. Pl. 392 (1753). Type: USA, Virginia, *Collinson*, n.v.

Syn.: *R. procerum* Salisbury, Prodr. 287 (1796), superfluous name.

*R. maximum* L. var. *purpureum* Pursh & var. *album* Pursh, Fl. Amer. Sept. 1: 297 (1814).

?*R. latifolium* Hoffmannsegg, Verz. Pfl.-Kult. Nachtr. 2: 195 (1826).

*R. purpureum* (Pursh) G. Don, Gen. Syst. 3: 843 (1834).

*R. purshii* G. Don, ibid. 3: 843 (1834). Type: USA, Cedar swamps in New Jersey and Delaware, n.v.

*R. ashleyi* Coker, J. Elisha Mitchell Sci. Soc. 51: 189, t.53, 54 (1935). Type: USA, N Carolina, Ashe Co., 2 miles from Lansing, 19 vi 1935, *Ashley*, n.v.

Ic.: Bot. Mag. 24: t.931 (1806).

Shrub or small tree, 1.3–3.5m; young shoots tomentose and stipitate-glandular, soon glabrescent. Leaves oblanceolate to elliptic, 10–16 × 3–5cm, 3.3–4 × as long as broad, apex acute to shortly and bluntly cuspidate, base cuneate, upper surface glabrous when mature, lower surface with a thin fugaceous indumentum that is embedded in a thin surface film and usually persists towards the base of the leaf, especially near the midrib; petioles 2–3cm, usually sparsely tomentose, even when mature. Inflorescence 14–25-flowered; rhachis 10–30mm; pedicels sparsely stipitate-glandular, 20–30mm in flower, up to 60mm in fruit. Calyx 3–5mm, stipitate-glandular, lobes rounded. Corolla campanulate, white to rose-purple, with yellowish-green flecks, 25–30mm. Ovary stipitate-glandular and pilose; style glabrous. Capsule 17–20 × 4–6mm. Eastern USA & CANADA (from Nova Scotia to N Georgia). Upland woods, 300–1700m. Map: Little, Atlas United States Trees 4: map 119 (1977).

Allied to *R. macrophyllum*.

12. (262.) *R. macrophyllum* [D. Don ex] G. Don, Gen. Syst. 3: 843 (1834). Type: NW Coast of N America, *Menzies* (iso. BM?).

Syn.: *R. californicum* Hooker f., Bot. Mag. 81: t.4863 (1855). Type: W N America, mountains of California, *Lobb* (iso. BM, K).

Shrub, 2–4m; young shoots soon  $\pm$  glabrous. Leaves broadly elliptic, (6.5–)8.5–12(–17)  $\times$  3–5.2(–7.5)cm, 2.5–2.8  $\times$  as long as broad, apex acute to minutely apiculate, base cuneate, upper and lower surfaces glabrous when mature; petioles 1–2(–3)cm, glabrous. Inflorescence 10–20-flowered; rhachis 15–30mm; pedicels glabrous, 30–60mm in flower, hardly elongating in fruit. Calyx c.1mm, glabrous. Corolla broadly campanulate, white to pink with yellowish flecks, 30–40mm. Ovary densely rufous-pilose; style glabrous. Capsule c.25  $\times$  7mm.

Western Seaboard of USA from the Canadian border to California. Forest margins, etc., s.l.–150m. Map: Little, Atlas United States Trees 3: map 152 (1976).

Allied to *R. maximum*.

### XIII. Subsection *Argyrophylla* Sleumer, Bot. Jahrb. 74: 548 (1949).

Syn.: Series *Arboreum* subseries *Argyrophyllum* sensu Tagg in Stevenson (ed.), The Species of Rhododendron 20 (1930).

Subsection *Floribunda* Sleumer, ibid. 74: 550 (1949).

Shrubs or small trees up to 11m; bark rough; young shoots with a thin grey scurfy to stellate-tomentose indumentum. Leaves narrowly elliptic to oblanceolate, lower surface with a thin and compacted unistrate indumentum composed of rosulate hairs, or indumentum bistrate, the upper layer loosely lanate-tomentose, hairs ramiform, white to fawn or occasionally yellow. Inflorescence 4–30-flowered, lax or dense; rhachis 3–40mm. Calyx usually minute, rarely up to 6(–15)mm. Corolla 5-lobed, open- to funnel-campanulate, nectar pouches usually absent (present in *R. ririei*), white or pale pink to violet. Stamens usually 10 (18–20 in *R. haofui*). Ovary glabrous or with a thin white to dense rufous, eglandular or glandular indumentum; style glabrous or glandular to tip.

Type species: *R. argyrophyllum* Franchet

Sleumer segregated the species with a loose bistrate indumentum into subsection *Floribunda*. Since there are no other significant consistent differences, this is unwarranted. The reasons for including *R. adenopodum* here are given under the species description.

Subsection *Argyrophylla* is apparently intermediate morphologically between subsections *Pontica* and *Taliensia* and occupies an intermediate geographical range in C & S China.

1. Leaves with a bistrate indumentum; the upper layer  $\pm$  lanate and loose; inflorescence 4–12-flowered .....2
- + Leaves with a unistrate compacted indumentum that is sometimes embedded in a surface film; inflorescence 5–30-flowered .....6
2. Rhachis 10–15mm; leaves 4–4.5  $\times$  as long as broad .....8. *hunnellianum*
- + Rhachis 3–7(–10)mm; leaves 2.3–3.3  $\times$  as long as broad .....3
3. Stamens 18–20 (Guangxi, Guizhou, Hunan) .....4. *haofui*
- + Stamens 10 (Yunnan, Sichuan, Hubei, Guizhou) .....4



Syn.: *R. youngae* Fang, Contr. biol. Lab. Sci. Soc. China, Bot. ser. 12: 24 (1939). Type: China, Sichuan, Nan-Chuan-hsien, Kin shan, 2000m, 13 iv 1930, *Chang* 59 (holo. SZ; iso. E, Hb. Inst. Bot. Guangzhou).

*R. simiarum* Hance subsp. *youngae* (Fang) Chamberlain, Notes R.B.G. Edinb. 37: 329 (1979).

Ic.: Gard. Chron. 45: f. 125 (1909).

Shrub, up to 3m; young shoots densely tomentose, with a few stalked glands. Leaves coriaceous, oblanceolate, 9–16 × 2.5–4cm, 2.6–4.5 × as long as broad, apex acuminate to shortly cuspidate, glabrous above when mature, with a dense, felted, grey to fawn indumentum beneath; petioles c.3cm, tomentose. Inflorescence lax, 6–8-flowered; rhachis 10–15mm; pedicels 30–40mm, long-stipitate-glandular. Calyx 3–6(–15)mm, lobes ligulate, membranous, glandular-ciliate. Corolla funnel-campanulate, pale rose, 42–50mm. Ovary densely fulvous long-stipitate-glandular; style glabrous. Capsule c.15 × 7mm, cylindrical.

CHINA (E Sichuan, Hubei). Thin woods, 1500–2200m. Map 95, p. 322.

*R. adenopodum* has been traditionally included in subsection Pontica but differs from the remaining species in its stipitate-glandular ovaries and in its shallowly lobed corolla. Furthermore, its distribution is more in line with the other species in subsection Argyrophylla than it is with those of subsection Pontica.

**2. (264). *R. longipes* Rehder & Wilson in Sargent (ed.), Pl. Wilsonianae 1: 528 (1913).**

Shrub or small tree, 1–10m. Leaves oblanceolate, 5–11 × 1.5–3cm, c.3.3 × as long as broad, apex cuspidate, glabrous above, with a felted to compacted, fawn to brownish indumentum beneath, intermixed with a few stipitate glands; petioles c.1cm, narrowly winged, floccose to ± glabrescent. Inflorescence lax, 8–15-flowered; rhachis c.10mm; pedicels 20–30mm, floccose and sparsely stipitate-glandular. Calyx 1–2mm, floccose, lobes triangular, minute. Corolla funnel-campanulate, pinkish to pale purple, with darker flecks, 30–35mm. Ovary rufous-tomentose and glandular; style glabrous. Capsule 20–25mm, cylindrical and curved.

CHINA (W & C Sichuan, Guizhou). Thickets, 2000–2900m. Map 95, p. 322.

1. Leaves with a thin compacted indumentum.....**2a. var. *longipes***  
+ Leaves with a thicker, more spongy, felted indumentum **2b. var. *chienianum***

**2a. var. *longipes*.** Type: China, W Sichuan, Ching-chi Shien, Ta-hsiang long, 2000–2900m, 16 v 1907, *Wilson* 3424 (holo. A; iso. E, K).

A specimen from Guizhou, *Tsiang* 7459, with broader leaves than is usual in *R. longipes*, may be intermediate between this variety and *R. simiarum*.

**2b. var. *chienianum*** (Fang) Chamberlain, Notes R.B.G. Edinb. 37: 329 (1979). Syn.: *R. chienianum* Fang, Contr. biol. Lab. Sci. Soc. China, Bot. ser. 12: 28 (1939). Syntypes: China, Sichuan, Nan Chuan hsien, Kin-shan, 19 viii 1926, *Hwang* 175, fr. (SZ); Kwan-toun-shan, 2300m, 19 vi 1930, *Chang* 251, fl. (E, SZ).

The only significant difference between the two taxa is in the degree of development of the indumentum and this does not merit more than varietal rank. Closely allied to *R. simiarum*.

3. (265.) *R. simiarum* Hance, J. Bot. (Lond.) 22: 22 (1884). Type: China, Guangdong, Lofaushan, 3200ft, *Henry* (Hance 2205) (holo. BM).

Syn.: *R. fordii* Hemsley, Kew Bull. 1894: 5 (1894). Type: Hongkong, Lantau Island, *Ford* 127 (holo. K; iso. A).

*R. fokiense* Franchet, Bull. Soc. Bot. France 44: 210 (1899). Type: China, Fujian, Kuatan, 1898, *Latouche* (iso. E).

*R. versicolor* Chun & Fang, Acta Phytotax. Sin. 6: 172, t.43 (1957). Type: China, Guangxi, Hungtan, Tatan Kou, 850m, 11–13 iv 1955, *Kwangfu Exped.* 61 (holo. Hb. Inst. Bot. Guangzhou).

lc.: Bot. Mag. 132: t.8111 (1906) – as *R. fordii*.

Shrub, 2–6m. Leaves narrowly elliptic to broadly oblanceolate, 7–14.5 × 1.8–4.5cm, 2.5–4 × as long as broad, apex rounded to acuminate, upper surface glabrous, lower surface with a thin compacted whitish indumentum, lacking a surface film; petioles 1.5–2cm, floccose-tomentose at first, soon glabrescent. Inflorescence lax, 4–7-flowered; rhachis 5–15mm; pedicels 20–35mm, whitish to rusty floccose-tomentose. Calyx 1–2mm, floccose-tomentose, lobes minute. Corolla open-campanulate, pink with a few darker flecks, 25–35mm. Ovary rufous stellate-tomentose and shortly stipitate-glandular; style glabrous or with a few glands at base. Capsule 10–20 × 6mm, cylindrical, ± curved.

S & E CHINA (from Sichuan & Guangxi to Zhejiang), HONGKONG. Rocky slopes, etc., 600–1000m. Map 96, p. 323.

From the specimens seen there appears to be a complete range of variants with respect to leaf shape, from those with acute apices to those with rounded apices. The former are typical of *R. fokiense* and the latter of *R. simiarum* in the strict sense. The specimen seen from Hong Kong (*Tang* 490) is extreme in its oblong leaves and in the styles that are glandular for half their length.

4. (266.) *R. haofui* Chun & Fang, Acta Phytotax. Sin. 6: 170, t.41, f.1 (1957). Type: China, Guangxi, Lungsheng Hsien, Tati Hsiang, 1430m, 13 v 1955, *Kwangfu Exped.* 165 (holo. SZ; iso. Hb. Inst. Bot. Guangzhou, Hb. Inst. Bot. Kunming).

Shrub, 4–6m. Leaves coriaceous, lanceolate to oblanceolate, 7–10 × 3–4cm, c.2.5 × as long as broad, apex acuminate, base broadly cuneate, upper surface glabrous, lower surface with a fulvous floccose-pannose tomentum; petioles 1.5–2.2cm, glabrous. Inflorescence 5–9-flowered; rhachis small; pedicels 25–35mm. Calyx c.1mm, villous. Corolla broadly campanulate, white, sometimes flushed with rose, 40–45mm. Stamens 18–20, villous below. Ovary with a dense whitish to pale brown lanate tomentum; style glabrous. Capsule to c.20 × 10mm.

CHINA (Guizhou, Guangxi, Hunan). Alt. c.1500m. Map 95, p. 322.

A distinctive species on account of the large number of stamens and the densely lanate-tomentose ovary.

5. (267.) *R. floribundum* Franchet, Bull. Soc. Bot. France 33: 232 (1886). Type: China, Sichuan, circa Moupine, v–vi 1869, *Abbé David* (iso. E, K).



lc.: Bot. Mag. 163: t.9609 (1940).

Shrub or small tree, 2–5m. Leaves coriaceous, oblanceolate to elliptic, 10–18 × 3.2–5.5cm, 3–3.3 × as long as broad, apiculate, upper surface glabrous when mature, veins deeply impressed, lower surface with a bistrate indumentum more or less covering the veins, the lower layer adpressed and whitish, the upper loose and lanate, hairs ramiform, yellowish at first, becoming white or greyish, persistent; petioles 1–2cm, tomentose. Inflorescence 7–12-flowered; rhachis 3–5mm; pedicels c.10mm, densely tomentose. Calyx c.1mm, lobes minute. Corolla broadly campanulate, magenta-rose fading pale pink, with crimson flecks and a basal blotch, c.40mm. Ovary densely tomentose; style glabrous. Capsule 20–30 × c.10mm, cylindrical, sometimes slightly curved.

CHINA (Sichuan). Woodlands, 1300–2600m. Map 98, p. 327.

Closely allied to *R. denudatum* and *R. farinosum* (q.v.).

6. (268.) *R. aenudatum* Léveillé, Feddes Repert. 13: 339 (1914). Type: China, Yunnan, rochers de Tien Sin, iv 1911, *Maire* (holo. E; iso. K).

Syn.: *R. xanthoneuron* Léveillé, *ibid.* 13: 340 (1914). Type: China, Yunnan, Mont Ta-Pe-Lou, 3200m, v 1911, *Maire* (holo. E).

Shrub, 2–3m. Leaves sub-coriaceous, elliptic, 12.5–20 × 4–7cm, 2.5–3 × as long as broad, apex apiculate, upper surface glabrous, with impressed veins, lower surface with a bistrate indumentum, the lower layer whitish, compacted and adpressed, the upper yellow to cinnamon, even when mature, lanate, ± deterrent, hairs ramiform, sometimes lacking on the older leaves, veins prominent and ± glabrous; petioles 1–2cm, tomentose. Inflorescence 8–10-flowered; rhachis up to 7mm; pedicels 10–15mm, densely tomentose. Calyx c.1mm, tomentose, lobes minute. Corolla campanulate, rose to wine-red, probably with interior markings, c.40mm. Ovary densely whitish-tomentose; style glabrous. Capsule not known.

CHINA (C & S Sichuan, NE Yunnan, NW Guizhou). Mountains, 3100–3300m. Map 98, p. 327.

Closely allied to *R. floribundum* and doubtfully distinct. The leaves are apparently thinner and also differ in the deterrent yellowish upper layer of the indumentum.

7. (269.) *R. farinosum* Léveillé, Feddes Repert. 13: 340 (1914). Type: China, Yunnan, Flanc de lo-chan, 3200m, v 1913, *Maire* (holo. E).

Shrub, 1–5m. Leaves coriaceous, obovate-lanceolate, c.7 × 3cm, 2.3 × as long as broad, apex blunt, ± cucullate, upper surface glabrous, bullate with deeply impressed veins, lower surface with a bistrate indumentum, the lower layer white and compacted, the upper yellowish at first, becoming silvery, lanate-tomentose, hairs ramiform, persistent but with veins exposed; petioles c.1cm, densely tomentose. Inflorescence c.10-flowered; rhachis c.5mm; pedicels c.10mm, densely tomentose. Calyx c.1.5mm, tomentose, lobes minute. Corolla campanulate, white, 30–35mm. Ovary densely tomentose; style glabrous. Capsule not known.

CHINA (Yunnan), only known from the type locality. Map 98, p. 327.

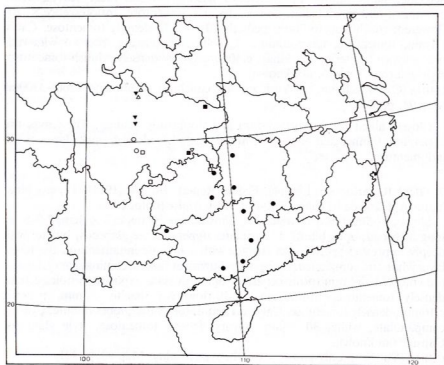
Closely allied to both *R. floribundum* and *R. denudatum* but differing from both in its smaller, cucullate-tipped leaves and white flowers, and from *R.*

*denudatum* (also recorded from lo-chan) in its dense, more persistent leaf indumentum.

8. (270.) *R. hunnewellianum* Rehder & Wilson in Sargent (ed.), Pl. Wilsonianae 1: 535 (1913).

Shrub or small tree, 2–6m. Leaves coriaceous, narrowly oblanceolate, 7–15 × 1.6–2.8cm, 4–4.5 × as long as broad, apex acuminate, upper surface glabrous, lower surface with a bistrate indumentum, the lower layer compacted, whitish, the upper loose, white to yellow, detersile or persistent, tomentose, hairs ramiform, intermixed with scattered glands that are more evident on the midrib; petioles 1–2cm, puberulous when young, later glabrescent. Inflorescence lax, 6–10-flowered; rhachis 10–15mm; pedicels c.20mm, sparsely tomentose and shortly stipitate-glandular. Calyx c.1mm, glandular-ciliate, lobes minute. Corolla widely campanulate, white to pale rose or purple, with purple flecks, 40–50mm. Ovary densely and coarsely yellowish-tomentose. Capsule 20–25 × 8–10mm, cylindrical.

1. Leaves (7–)10–15cm long, upper layer of leaf indumentum remaining whitish ..... 8a. subsp. *hunnewellianum*  
 + Leaves 7–12cm long, upper layer of leaf indumentum turning yellow ..... 8b. subsp. *rockii*



MAP 95. ■ *R. adenopodum*; □ *R. longipes* var. *longipes*; ▽ var. *chienianum*; ● *R. haofui*; ▼ *R. hunnewellianum* subsp. *hunnewellianum*; △ subsp. *rockii*; ○ *R. thayerianum*.

**8a. subsp. *hunnewellianum*.** Type: China, W Sichuan, west and nr Wen Chuan Hsien, 2000–2600m, 7 x 1908, *Wilson* 1198 (iso. E, K).

Syn.: *R. leucolasium* Diels, Feddes Repert. 17: 196 (1921). Type: China, Sichuan, Wen tschuan-hsien, Pe mu shan, supra Schu lin kou, pr. Hou schao pu, 3000m, 20 iv 1914, *Limpricht* 1462 (iso. E, fragm.).

CHINA (C Sichuan). Thickets, 2000–3000m. Map 95.

**8b. subsp. *rockii*** (Wilson) Chamberlain, Notes R.B.G. Edinb. 37: 329 (1979).

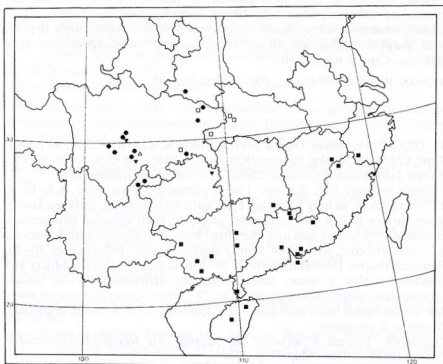
Syn.: *R. rockii* Wilson, J. Arnold Arbor. 9: 103 (1928). Type: China, S Gansu, slopes beyond Sichuan border, 2000m, iv 1925, *Rock* 12064 (iso. K).

CHINA (S Gansu & adjacent parts of Sichuan). Mountain slopes, thickets, 2000–2400m.

The only certain distinction between the two subspecies is in the leaf indumentum that turns yellow with age in subsp. *rockii* and does not do so in subsp. *hunnewellianum*. Subsp. *rockii* usually has relatively small leaves though still within the range of cultivated plants of subsp. *hunnewellianum*.

**9. (271.) *R. thayerianum*** Rehder & Wilson in Sargent (ed.), Pl Wilsonianae 1: 529 (1913). Type: China, W Sichuan, 3000m, x 1910, *Wilson* 4273 (iso. K).

Ic.: Bot. Mag. 149: t.8983 (1923).



MAP 96. ■ *R. simiarum*; ● *R. argyrophyllum* subsp. *argyrophyllum*; □ subsp. *hypoglaucom*; △ subsp. *omeiense*; ▼ subsp. *nankingense*.

Shrub, 3–4m; perulae persistent, at least on young shoots. Leaves narrowly oblanceolate, 8–13 × 1.5–3cm, 3–5 × as long as broad, apex cuspidate, glabrous above, with a dense, fawn, compacted, unistrate indumentum beneath; petioles 1–2cm, with a whitish floccose indumentum at first though soon glabrous, lower surface with a thin silvery to fawn compacted indumentum 30–50mm, sparsely glandular. Calyx 2–5mm, lobes rounded, oblong, glandular. Corolla funnel-shaped, white tinged with pink, lobes sometimes with a darker median line and purple flecks, 25–30mm. Ovary exclusively rufous-stipitate-glandular or rufous-tomentose and glandular; style glandular to tip. Capsule c.20 × 4–6mm, cylindrical.

CHINA (Sichuan). Woodland, c.2700m. Map 95, p. 322.

Remarkable for its persistent perulae and glandular style though otherwise superficially resembling *R. hunnewellianum*.

**10. (272.) *R. formosanum*** Hemsley, Kew Bull. 1895: 185 (1895). Type: Taiwan, South Cape, Henry 1976 (iso. BM, K).

lc.: Fl. Taiwan 4: t.902 (1978).

Shrub or small tree, 2–5.5m. Leaves narrowly elliptic to oblanceolate, 7–13 × 1.5–2.5cm, 4.5–5.5 × as long as broad, apex acute, glabrous above, with a compacted fawn indumentum beneath intermixed with a few glands; petioles 1–2cm, floccose at first, soon glabrescent. Inflorescence 10–20-flowered; rhachis 15–20mm; pedicels 10–30mm, densely rufous-tomentose. Calyx c.1mm, tomentose, lobes minute. Corolla widely funnel-shaped, white to pink, with purplish flecks, 30–40mm. Ovary densely rufous-tomentose; style glabrous. Capsule not known.

TAIWAN. Broad-leaved forests, 800–2000m. Map 97, p. 326.

**11. (273.) *R. coryanum*** Tagg & Forrest, Notes R.B.G. Edinb. 15: 99 (1920). Type: China, SE Xizang, Salween/Kiu-chiang divide, NW of Si-chi-to, vi 1932, Forrest 21693 (holo. E); Forrest 22889—later collection (fruiting) (E).

Shrub or small tree, 2.5–6m. Leaves elliptic to oblanceolate, 8.5–16 × 2.2–4cm, c.4 × as long as broad, apex acute to acuminate, glabrous above, lower surface with a thin compacted silvery to fawn unistrate indumentum embedded in a surface film and intermixed with a few stipitate glands; petioles 1.5–2cm, floccose, with a few shortly stipitate glands. Inflorescence 20–30-flowered; rhachis 15–30mm; pedicels 30–35mm, sparsely dendroid-hairy and glandular. Calyx 2–3mm, lobes triangular, glandular. Corolla funnel-campanulate, whitish with crimson flecks, 25–30mm. Ovary glabrous or with a few whitish simple hairs; style glabrous. Capsule 20–25 × 4–6mm, cylindrical, curved to ± circinnate.

CHINA(NW Yunnan & adjacent SE Xizang). Fir forests, Rhododendron thickets, 3650–4400m. Map 97, p. 326.

The ± glabrous ovary and many-flowered inflorescence distinguish this from the remaining species of the subsection.

**12. (274). *R. argyrophyllum* Franchet, Bull. Soc. Bot. France 33: 231 (1886).**

Shrub or small tree, 2–12m. Leaves elliptic to oblanceolate, 6–16 × 1.8–6cm, 2.7–3.6 × as long as broad, apex acute to acuminate, upper surface glabrous, lower surface with a thin silvery to fawn compacted indumentum embedded in a surface film; petioles 1–2cm, floccose at first, soon glabrescent. Inflorescence lax, 4–10-flowered; rhachis 10–15mm; pedicels 20–25mm, floccose, sometimes also glandular. Calyx c.2mm, floccose, lobes broadly triangular, sometimes glandular-ciliate. Corolla funnel-campanulate to open-campanulate, white to pale pink, with purple flecks, 30–55mm. Ovary with a thin white floccose to rufous-glandular indumentum; style glabrous. Capsule 10–25 × 3–4mm, narrowly cylindrical, curved.

Bamboo thickets, forests, open slopes, 1600–3650m. Map 96, p. 323.

1. Leaves 11–16cm; corolla 40–55mm ..... **12c. subsp. *nankingense***  
+ Leaves 6–9(–11)cm; corolla 30–35mm ..... **2**
2. Leaf indumentum fawn; ovary eglandular ..... **12d. subsp. *omeiense***  
+ Leaf indumentum white to silvery; ovary eglandular or glandular ..... **3**
3. Ovary and pedicels eglandular ..... **12a. subsp. *argyrophyllum***  
+ Ovary and pedicels glandular ..... **12b. subsp. *hypoglaucaum***

**12a. subsp. *argyrophyllum*.** Type: China, W Sichuan, circa Moupine, 3000m, *Abbé David* (iso. E).

Syn.: *R. chionophyllum* Diels, Bot. Jahrb. 29: 512 (1900). Syntypes: China, Sichuan, Nan chuan, *Bock von Rosthorn* 2157, 2161, n.v.

*R. argyrophyllum* Franchet var. *cupulare* Rehder & Wilson in Sargent, (ed.), Pl. Wilsonianae 1: 526 (1913). Type: China, W Sichuan, Mupin, 2000–3000m, vi 1905, *Wilson* 3442 (iso. E, K).

Ic.: Pl. Omeiens. t.19 (1942).

CHINA (Yunnan, Sichuan, Shaanxi).

The corolla varies from open-campanulate (var. *cupulare*) to funnel-campanulate (*R. argyrophyllum* sensu stricto). This character, however, is lost in the herbarium and there is in any case considerable overlap.

**12b. subsp. *hypoglaucaum* (Hemsley) Chamberlain, Notes R.B.G. Edinb. 37: 329 (1979).**

Syn.: *R. hypoglaucaum* Hemsley, J. Linn. Soc. Bot. 26: 25 (1889). Type: China, Hubei, Patung district, *Henry* 723 (holo. K).

*R. gracilipes* Franchet, J. Bot. (Morot) 9: 391 (1895). Type: China, E Sichuan, environs de Tchen-keou-tin, *Farges* 52 (iso. E, K).

Ic.: Stevenson (ed.), The Species of Rhododendron 30 (1930).

CHINA (E Sichuan, W Hubei).

**12c. subsp. *omeiense* (Rehder & Wilson) Chamberlain, Notes R.B.G. Edinb. 37: 329 (1979).**

Syn.: *R. argyrophyllum* Franchet var. *omeiense* Rehder & Wilson in Sargent (ed.), Pl. Wilsonianae 1: 527 (1913). Type: China, W Sichuan, v 1904, *Wilson* 3962 (holo. A; iso. K).

CHINA (W Sichuan, Mt Omei).

Close to subsp. *argyrophyllum* and possibly only a local variant.

12d. subsp. **nankingense** (Cowan) Chamberlain, Notes R.B.G. Edinb. 37: 329 (1979).

Syn.: *R. argyrophyllum* Franchet var. *nankingense* Cowan, Notes R.B.G. Edinb. 21: 148 (1953). Type: China, Guizhou, Lao Shan, 1250m, i 1931, *Steward et al.* 499 (holo. E); also in cultivation at Edinburgh as 'F 46', flowered 7 v 1946 (E).

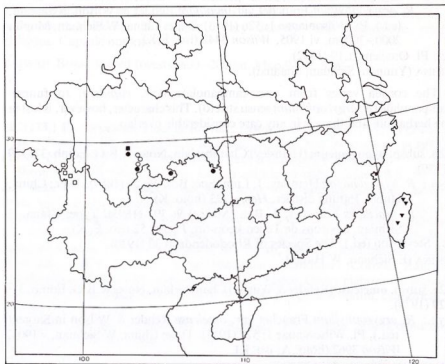
*R. argyrophyllum* Franchet var. *leiandrum* Hutchinson, Bot. Mag. 144: t.8767 (1918). Type: a plant cultivated at Kew from seed collected in 1908 in W Sichuan as *Wilson* 1353, n.v.

A very variable species with some geographical variation. Closely allied to *R. pingianum* (q.v.).

13. (275.) ***R. pingianum*** Fang, Contr. biol. Lab. Sci. Soc. China, Bot. ser. 12: 20 (1939). Type: China, Sichuan, Ma-pien-hsien, 2500m, 24–25 v 1930, *Fang* 432, fl. (holo. SZ; iso. E).

Ic.: Fang, Pl. Omeiens. t.20 (1942).

Shrub or small tree, 4–8m. Leaves coriaceous, lanceolate to oblanceolate, 8–13.5 × 3–4.2cm, (2.5–)3.2–3.5 × as long as broad, apex rounded and apiculate to acute, upper surface glabrous, lower surface with a white compacted indumentum embedded in a surface film; petioles 1.5–2cm, glabrescent when mature. Inflorescence 8–20-flowered; rhachis 10–20mm; pedicels 30–40mm, floccose. Calyx 1–2mm, floccose, lobes minute. Corolla funnel-campanulate,



MAP 97. ▼ *R. formosanum*; □ *R. coryanum*; ○ *R. pingianum*; ■ *R. insigne*; ● *R. ririei*.

pinkish to pale purple, 28–35mm. Ovary densely rufous-tomentose, eglandular; style glabrous. Capsule 15–30 × 3–4mm, curved.

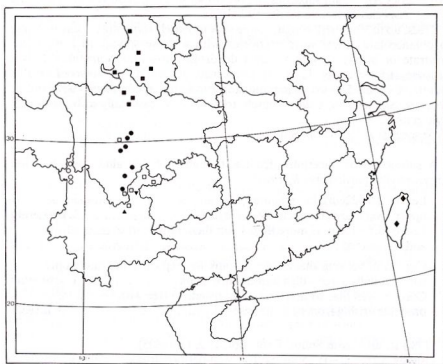
CHINA (C Sichuan). Forests, mountain slopes, 2000–2750m. Map 97.

Closely allied to *R. argyrophyllum* but distinguished by the more intensely coloured corollas and the rufous-tomentose, eglandular ovary. Apart from subsp. *nankingense*, *R. argyrophyllum* generally has smaller leaves. However, a single specimen, McLaren AH 371, is intermediate, with the rufous-tomentose ovary of *R. pingianum* but small leaves more reminiscent of *R. argyrophyllum* subsp. *argyrophyllum*.

14. (276.) *R. insigne* Hemsley & Wilson, Kew Bull. 1910: 113 (1910). Type: China, Sichuan, Mt Wa, 2300–3000m, vii 1903, Wilson 3965 (holo. A; iso. E, K).

Ic.: Millais, Rhododendrons ed. 2: 202, t. (1923); Rhododendron & Camellia Yearbook 24: t. 13 (1969).

Shrub, 1.3–3.5m. Leaves elliptic, 7–13 × 2–4.5cm, 3–3.5 × as long as broad, apex acuminate, glabrous above, lower surface with a compacted fawn indumentum embedded in a surface film, so appearing shiny; petioles 1.5–2cm, lanate at first, soon glabrescent. Inflorescence lax, c. 8-flowered; rhachis c. 5mm; pedicels 20–40mm, with a sparse white to rufous tomentum. Calyx 1–2mm, floccose, lobes minute. Corolla widely campanulate, pink with a darker median line down each lobe, c. 40mm. Ovary densely white lanate-pilose; style glabrous.



MAP 98. ◆ *R. hyperythrum*; ● *R. floribundum*; □ *R. denudatum*; ▼ *R. farinosum*; ○ *R. codonanthum*; ▽ *R. deterile*; ▲ *R. pubicostatum*; ■ *R. rufum*.

Capsule c.25 × 10mm, broadly cylindrical.

CHINA (Sichuan, Wa Shan). Woodlands, 2300–3000m. Map 97, p. 326.

The species is remarkable for the shining compacted indumentum of the lower surface of the leaves.

**15. (277.) *R. ririei*** Hemsley & Wilson, Kew Bull. 1910: 111 (1910). Type: China, Sichuan, Mt Omei, vi 1904, *Wilson* 5139 (holo. A; iso. E, K, Hb. Inst. Bot. Guangzhou).

Ic.: Fang, Pl. Omeiens. t.21 (1942).

Small tree, 3.5–16m. Leaves elliptic to oblanceolate, 9.5–17 × 3.2–5.2cm, 2.7–3.3 × as long as broad, apex acute to shortly acuminate, upper surface glabrous, lower surface with a thin compacted white indumentum embedded in a surface film; petioles 1.5–2cm, ± glabrous. Inflorescence lax, 4–10-flowered; rhachis 3–5mm; pedicels 5–10mm, with a thin white indumentum, eglandular. Calyx 1–2mm, with a thin white mealy indumentum, lobes triangular. Corolla campanulate, purplish to violet, with darker nectar pouches, 40–50mm. Ovary densely grey-felted-tomentose; style glabrous. Capsule c.25 × 10mm.

CHINA (Sichuan, ? Guizhou). Open rocky slopes, c.1850m. Map 97, p. 326.

The only species in subsection *Argyrophylla* with corollas with nectar pouches and in this respect intermediate between this subsection and subsection *Arborea*.

#### **XIV. Subsection *Arborea*** Sleumer, Bot. Jahrb. 74: 54 (1949).

Syn.: Series *Arboreum* subseries *Arboreum* sensu Tagg in Stevenson (ed.), The Species of *Rhododendron* 12 (1930).

Trees, up to 30m; bark rough; young shoots densely tomentose. Leaves elliptic to oblanceolate, lower surface covered with a dense spongy to compacted, unistrate or bistrate, white to fawn dendroid tomentum, sometimes with a floccose rufous upper layer. Inflorescence dense, 10–25-flowered. Calyx minute. Corolla 5-lobed, campanulate or tubular-campanulate, with nectar pouches. Stamens 10. Ovary densely tomentose, occasionally also glandular; style glabrous.

Type species: *R. arboreum* Smith

A subsection of uncertain affinities though probably allied to subsection *Argyrophylla* (particularly *R. ririei*).

1. Leaves 16–22cm, indumentum bistrate, with a lanate-tomentose upper layer and a compacted lower layer.....**2. lanigerum**
- + Leaves 6.5–19cm, if more than 15cm then indumentum ± unistrate and compacted .....**2**
2. Corolla of varying shades of rose-pink to deep carmine, rarely pure white; usually a tree with a well-defined trunk .....**1. arboreum**
- + Corolla deep lilac to deep magenta; usually a tree with several main branches arising from near the base.....**3. niveum**

#### **1. (278.) *R. arboreum*** Smith, Exot. Bot. 1: 9, t.6 (1805).

Usually a tree (1–)5–50m, with a well-defined trunk. Leaves narrowly to broadly elliptic or ovate, 6.5–19 × 1.8–5cm, 2.2–6.5 × as long as broad, upper surface reticulate to bullate, glabrous, lower surface with a dense compacted to



spongy, white to fawn dendroid tomentum, occasionally also with a floccose rufous upper layer; petioles 1–2cm, with a loose indumentum intermixed with glands, sometimes glabrescent at maturity. Inflorescence 10–20-flowered, dense; rhachis 15–20mm; pedicels 5–10mm, pilose and glandular. Calyx 1–2mm, lobes rounded, sparsely glandular to  $\pm$  glabrous. Corolla fleshy,  $\pm$  tubular-campanulate, pink to deep crimson, rarely pure white, with dark flecks and nectar pouches, 30–50mm. Ovary white-tomentose, sometimes also glandular. Capsule 15–30  $\times$  c.6mm. Map 99, p. 330.

1. Leaves strongly concave with bullate upper surface, lower surface with a spongy fawn indumentum (Sri Lanka) ..... **1e. subsp. zeylanicum**
- + Leaves with a  $\pm$  plane, reticulate or rugose upper surface, with a white to rufous, compacted, spongy or partially floccose indumentum beneath ..... 2
2. Lower surface with a compacted indumentum ..... 3
- + Lower surface with a spongy tomentum or a rufous floccose indumentum ..... 4
3. Leaves (8–)10–19cm long, lower surface usually with a white to silvery indumentum (W Indo-Himalaya, Kashmir to Bhutan) ..... **1a. subsp. arboreum**
- + Leaves 6.5–11cm, lower surface of leaves usually with a fawn indumentum (C Indo-Himalaya) ..... **1bii. var. roseum**
4. Lower surface of leaves with a bistrate indumentum, the upper layer floccose, rufous ..... **1bi. var. cinnamomeum**
- + Lower surface of leaves with a unistrate, white to fawn,  $\pm$  spongy tomentum ..... 5
5. Leaf apex rounded (S India) ..... **1d. subsp. nilagiricum**
- + Leaf apex acute (E Himalaya from E Bhutan & Meghalaya to W China & Thailand) ..... 6
6. Leaves 2.8–4.4  $\times$  as long as broad ..... **1ci. var. delavayi**
- + Leaves 4.5–6.5  $\times$  as long as broad ..... **1cii. var. peramoenum**

**1a. subsp. arboreum.** Type: a plate accompanying the type description, drawn from plants seen near Srinagar (Kashmir) by Capt. Hardwicke in 1796.

Syn.: *R. puniceum* Roxburgh, Fl. British India 2: 409 (1832). Type: N India, mountains N of Nohilkhund, Hardwicke, n.v.

*R. windsorii* Nuttall, Hooker's J. Bot. Kew Gard. Misc. 5: 357 (1853).

Type: Nepal, on the ridges and slopes of Ropprye, 7–9000ft, Nuttall (holo. K).

Leaves (8–)10–19  $\times$  (2.4–)3–5cm, 3–4(–5)  $\times$  as long as broad, apex acute, upper surface reticulate, lower surface with a compacted, usually white to silvery indumentum. Corolla bright red to carmine, rarely pink or white.

N INDIA (from Kashmir to Sikkim), NEPAL, BHUTAN. Usually in open or mixed forests, 1850–2550(–3200)m.

Subsp. *arboreum* apparently merges with both subsp. *cinnamomeum* var. *roseum* and subsp. *delavayi*.

**1b. subsp. cinnamomeum** (Lindley) Tagg in Stevenson (ed.), The Species of Rhododendron 17 (1930).

**1bi. var. cinnamomeum** [Wallich ex] Lindley, Edward's Bot. Reg. 23: t.1982 (1837). Type: Nepal, 1821, Wallich 760, n.v.

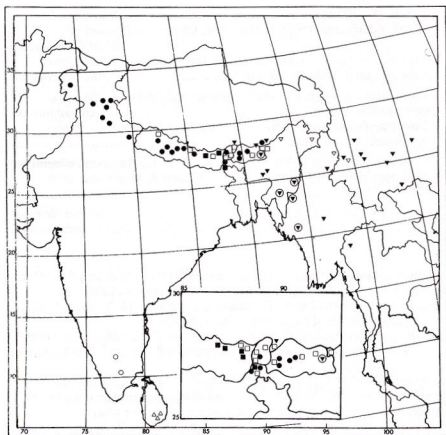
Syn.: *R. cinnamomeum* [Wallich ex] G. Don, Gen. Syst. 3: 844 (1834). Type: as above.

*R. campbelliae* Hooker f., Rhododendrons Sikkim Himalaya t.6 (1849). Type: N India, Sikkim, 9–10000ft, Hooker, n.v.

*R. arboreum* Smith subsp. *campbelliae* (Hooker f.) Tagg in Stevenson (ed.), The Species of Rhododendron 15 (1930).

Leaves 6.5–11 × 2.5–6cm, 2.5–3.7 × as long as broad, apex acute, upper surface reticulate, lower surface with a bistrate indumentum, the upper layer loose and floccose, rufous, the lower whitish to fawn and compacted. Corolla pink to carmine, occasionally white.

E NEPAL, NE INDIA (Bengal & Sikkim). Open forests and rocky slopes, 2750–3650m.



MAP 99. ● *R. arboreum* subsp. *arboreum*; ■ var. *cinnamomeum*; □ var. *roseum*; ▼ var. *delavayi*; ▽ var. *peramoenum*; ○ subsp. *nilagiricum*; △ subsp. *zeylanicum*; ⊙ subsp. *delavayi*/subsp. *arboreum*.

**1bii. var. roseum** Lindley, Bot. Reg. 15: t.1240 (1829). Type: the above plate drawn from a plant in 1828, cultivated by Mr Knight from seed sent from Nepal by Jenkinson.

Syn.: *R. arboreum* Smith var. *album* Wallich, Pl. Asiat. Rar. 2: 23, t.123 (1830). Type: Nepal, in monte Sheopore, 10000ft, Wallich, n.v.

*R. album* Buchanan-Hamilton in Sweet, British Fl. Gard. ser. 2: 2: t.148 (1832). Type: Nepal, Narainhatty, iii 1803, Buchanan-Hamilton, n.v.

Leaves 6.5–11 × 2.2–4.5cm, 2.7–3.5 × as long as broad, apex acute, upper surface reticulate, lower surface with a unistrate compacted, usually fawn or whitish indumentum. Corolla pink to carmine, rarely white.

E NEPAL, NE INDIA (Bengal, Sikkim, Arunachal Pradesh), BHUTAN, CHINA (C Xizang). Open forests, rocky slopes, 2750–3650m.

Var. *roseum* intergrades with both subsp. *arboreum* and subsp. *delavayi*.

**1c. subsp. delavayi** (Franchet) Chamberlain, Notes R.B.G. Edinb. 37: 328 (1979).

**1ci. var. delavayi.**

Syn.: *R. delavayi*, Bull. Soc. Bot. France 33: 231 (1886). Type: China, Yunnan, in monte calcareo Houangli-pin, 2500m, Delavay 242 (iso. E, K).

*R. pilovittatum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 10: 134 (1917). Type: China, W Yunnan, on the Yung-peh Mountains, 9000ft, vi 1914, Forrest 12745 (holo. E; iso. K).

Ic.: Bot. Mag. 133: t.8137 (1907).

Leaves 7–13.5(–15.5) × 2–2.4cm, 2.8–4.4 × as long as broad, apex acute, upper surface reticulate, lower surface with a unistrate spongy, whitish to fawn indumentum. Corolla usually deep crimson to carmine.

NE INDIA (Meghalaya, Manipur, Assam, Arunachal Pradesh), BURMA, THAILAND, CHINA (Yunnan, Guizhou). Open forests, etc., 1500–3000m.

**1cii. var. peramoenum** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 37: 328 (1979).

Syn.: *R. peramoenum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 56 (1920). Type: China, W Yunnan, Shweli/Salween divide, vi 1918, Forrest 17708 (holo. E; iso. K).

Leaves (7.5–)9–15(–18) × 1.8–3(–4.2)cm, 4.5–6.5 × as long as broad, apex acute to shortly cuspidate, with a loose spongy, fawn indumentum below. Corolla usually crimson to carmine.

NE INDIA (Arunachal Pradesh), CHINA (W Yunnan).

A specimen from C Xizang (*Kingdon-Ward* 19245), with narrow leaves but a compacted leaf indumentum, is probably referable to this variety.

**1d. subsp. nilagircum** (Zenker) Tagg in Stevenson (ed.), The Species of Rhododendron 15 (1930).

Syn.: *R. nilagircum* Zenker, Amer. Sci. Nat. ser. 2, 6: 150 (1836). Type: S India, Saladia, Nilgiri Hills, Utacamund, Schmidt (iso. E).

Ic.: Wight, Spicil. Neilagerr. 2: t.131 (1851).

Leaves 8.5–12 × 3.8–6cm, 1.8–2.4 × as long as broad, apex ± rounded, apiculate, upper surface rugose, lower surface with a spongy yellowish-brown indumentum. Corolla carmine.

S INDIA (Tamil Nadu). Upland forests, c.2250m.

**1e. subsp. zeylanicum** (Booth) Tagg in Stevenson (ed.), *The Species of Rhododendron* 16 (1930).

Syn.: *R. zeylanicum* Booth, *Gard. Chron.* 150 (1850). Described from a plant cultivated in Sir Charles Lemon's garden in Cornwall.

Ic.: Millais, *Rhododendrons* ed.1: 24, t. (1917).

Leaves 8–11 × 3.5–4.5cm, 2.2–2.8 × as long as broad, apex blunt to acute, upper surface with strongly impressed veins, bullate, margin strongly recurved, lower surface with a spongy brownish indumentum. Corolla carmine.

SRI LANKA. Upland regions, c.2300m.

*R. arboreum* is an extremely variable species, especially with respect to leaf shape and leaf indumentum, with a wide geographical range and clear-cut geographical differentiation. This species reaches its greatest complexity in NE India and adjacent E Nepal and Bhutan where there is intergradation between subsp. *arboreum* and subsp. *cinnamomeum*, though the former predominates below 2500m and the latter above 2900m. Subsp. *delavayi* apparently intergrades with subsp. *arboreum* in NW Burma where a range of intermediates occurs. It is also sometimes difficult to distinguish some forms of subsp. *delavayi* from subsp. *cinnamomeum*, especially where the ranges of the two approach one another, as in SE Bhutan. The two isolated subspecies, subsp. *zeylanicum* and subsp. *nilagiricum*, are closer to one another than they are to subsp. *delavayi*, from which they are clearly divided.

Natural hybrids occur between var. *roseum* and three other species: *R. barbatum*, *R. campanulatum* and *R. wallichii*.

**2. (279.) *R. lanigerum*** Tagg, *Notes R.B.G. Edinb.* 16: 199 (1931). Type: NE India, Arunachal Pradesh, Delei Valley, 10–11000ft, v 1928, *Kingdon-Ward* 8251 (iso. E).

Syn.: *R. silvaticum* Cowan, *Notes R.B.G. Edinb.* 19: 185 (1936). Type: SE Xizang, Pemako, 9–10000ft, 24 x 1924, *Kingdon-Ward* 6258 (holo. E).

Shrub or tree, 2.7–6m. Leaves elliptic to oblanceolate, 16–22 × 5–7cm, 3.3–4 × as long as broad, upper surface rugulose and ± glabrous at maturity though often with traces of indumentum along the midrib, lower surface with a dense whitish to fawn lanate-dendroid tomentum, that overlies a compacted lower layer of indumentum; petioles 1.5–2cm, velutinous. Inflorescence 20–25-flowered, dense; rhachis c.20mm; pedicels c.10mm, glabrous. Calyx fleshy, c.2mm, with minute teeth, glabrous. Corolla campanulate, deep pink to rosy purple, with darker nectar pouches, 35mm. Ovary with a dense tomentum. Capsule shortly cylindrical, c.20 × 7mm.

CHINA (S Xizang) and adjacent NE INDIA (Delei Valley). Ridges, etc., 2550–3350m. Map 110, p. 357.

**3. (280.) *R. niveum*** Hooker f. in *Rhododendrons Sikkim Himalaya* t.4 (1851). Type: Sikkim, Lachen, Lachoung and Chola, 10–12000ft, *Hooker* (iso. E).

Ic.: *Bot. Mag.* 79: t.4730 (1853).

Tree, up to 6m. Leaves oblanceolate to elliptic,  $11.5-17 \times 4-4.5$ cm,  $2.9-3.8 \times$  as long as broad, upper surface glabrous, lower surface with a dense  $\pm$  compacted fawn dendroid indumentum; petioles 1-1.5cm, floccose. Inflorescence 15-20-flowered, dense; rhachis c.20mm; pedicels c.10mm, densely white- to rufous-tomentose. Calyx 1-2mm, lobes obscure. Corolla tubular-campanulate, deep magenta to deep lilac, with darker nectar pouches, 30-35mm. Ovary densely white- to fawn-tomentose. Capsule shortly cylindrical, c.  $20 \times 8$ mm.

NE INDIA (Sikkim), BHUTAN. Rocky valleys, mixed forest, 2900-3650m. Map 110, p. 357.

A distinctive species with no close allies.

**XV. Subsection Taliensia** Sleumer, Bot. Jahrb. 74: 550 (1949).

Syn.: Series *Lacteam* Tagg in Stevenson (ed.), The Species of Rhododendron, 370 (1930) & series *Taliense* sensu Tagg, op. cit. 628.

Subsection *Lactea* Sleumer, loc. cit. (1949).

Shrubs, sometimes dwarf, to small trees; bark rough; young shoots  $\pm$  glabrous to densely tomentose, sometimes also with stipitate glands. Leaves linear to obovate or broadly elliptic, upper surface glabrous, usually smooth though occasionally bullate, lower surface at maturity with a dense unistrate or bistrate, lanate to felted or compacted indumentum composed of radiate, ramiform or fasciculate hairs or (more rarely) indumentum sparse or lacking. Inflorescence usually dense, 5-20-flowered; rhachis 3-25mm. Calyx 0.5-12mm. Corolla 5-7-lobed, campanulate to funnel-campanulate (sometimes mortar-shaped in *R. wightii*), nectar pouches lacking, white to pink or purplish or yellow, often with conspicuous flecks, occasionally also with a purple blotch. Stamens 10(-14). Ovary glabrous to densely rufous-tomentose and/or glandular; style usually glabrous, rarely glandular for most of its length. Type species: *R. taliense* Franchet

A taxonomically difficult subsection with a particularly complex group of species around *R. taliense*, *R. roxieanum*, *R. alutaceum*, *R. phaeochrysum* and *R. aganniphum*.

Subsection *Lactea* (equivalent to series *Lacteam*) has been traditionally distinguished from subsection *Taliensia* by its radiate, as opposed to ramiform, leaf indumentum; this distinction has been maintained by Cowan & Davidian (1955) in their monograph of series *Lacteam*. However, when the indumentum becomes compacted or agglutinated the hair type is difficult to ascertain. This distinction produces a totally artificial grouping of species that are not closely allied and separates species that are otherwise clearly closely related.

The present circumscription (including subsection *Lactea* within subsection *Taliensia*) creates a very diverse subsection in which some subdivision may be justified. However, I do not consider that the existing four subseries do this adequately. Those species with a well-developed calyx and stipitate-glandular ovary that are related to *R. adenogynum* do form a fairly distinct group and show some affinities with *R. crinigerum* in subsection *Glischra*. While *R. beesianum* and *R. dignabile* superficially resemble *R. uvarifolium* in subsection *Fulva*, *R. lacteam* and the allied *R. barkamense* on the one hand, and *R. wightii* on the other, do not. Therefore these species that were included in subsection *Lactea* fall into three distinct groups and have little affinity with *R. phaeochrysum* and *R.*

*traillianum* (also included within subsection *Lactea*), two species that are here considered to be more closely allied to *R. taliense*. Furthermore, *R. wasonii* and *R. wiltonii* are two distinctive species, apparently as distantly allied to *R. taliense* as are any of the species mentioned above. Biosystematic studies may provide evidence on which a sounder subdivision of this subsection can be based but on present evidence such a subdivision is not justified.

#### Reference

DAVIDIAN, H. H. & COWAN, J. H. (1955). A review of *Rhododendrons* in their Series VI, The *Lactea* Series. *Rhododendron & Camellia Yearbook* 10: 122–159.

1. Calyx 5–15mm; ovary tomentose and/or glandular (see also *R. pubicostatum*) ..... 2
- + Calyx 0.5–5(–6)mm; ovary glabrous to tomentose and/or glandular ..... 9
2. Leaf indumentum two-layered, at least when young, upper layer ramiform, sometimes  $\pm$  detersile, the lower compacted ..... 3
- + Leaf indumentum one-layered, compacted or loose, sometimes detersile ..... 4
3. Young shoots and sometimes petioles densely tomentose; upper layer of leaf indumentum at least partially detersile, rufous or deep brown ..... 26. *faberi*
- + Young shoots and petioles glabrescent; upper layer of leaf indumentum continuous, cinnamon ..... 11. *simulans*
4. Ovary tomentose, eglandular ..... 34. *pomense*
- + Ovary glandular, sometimes also tomentose ..... 5
5. Leaf indumentum whitish to pale pink ..... 9. *balfourianum*
- + Leaf indumentum olive brown to rufous ..... 6
6. Leaf indumentum  $\pm$  detersile, thin ..... 4. *dumicola*
- + Leaf indumentum continuous, thick ..... 7
7. Leaf indumentum spongy to matted, olive-brown, usually admixed with at least some glands ..... 8. *adenogynum*
- + Leaf indumentum spongy, deep salmon pink to rufous, eglandular ..... 8
8. Leaves 1.7–2.4(–2.8)  $\times$  as long as broad, base cuneate or rounded ..... 5. *bureavii*
- + Leaves c.3  $\times$  as long as broad, base rounded ..... 6. *elegantulum*
9. Mature leaf indumentum silvery, whitish or fawn, occasionally turning pale pink ..... 10
- + Mature leaf indumentum deep yellowish brown to rufous, sometimes evanescent or splitting and becoming patchy ..... 14
10. Dwarf creeping shrub, 0.15–0.6m; perulae persistent ..... 25. *prunum*
- + Upright shrub or small tree (0.3–)1–6m; perulae deciduous ..... 11
11. Corolla 40–50mm, 7-lobed ..... 24. *clementinae*
- + Corolla 25–40mm, 5-lobed ..... 12
12. Leaves (2–)2.7–3.6  $\times$  as long as broad; indumentum silvery to fawn; pedicels slender ..... 23. *principis*
- + Leaves 1.7–2.5(–2.8)  $\times$  as long as broad; indumentum whitish to pale pink; pedicels moderately thick ..... 13

13. Ovary glabrous; leaf indumentum ramiform and radiate.... **22. aganniphum**  
+ Ovary rufous-tomentose; leaf indumentum exclusively radiate ..... **35. nakotiltum**
14. Upper surface of leaves with deeply impressed veins, appearing bullate .... **15**  
+ Upper surface of leaves smooth or faintly rugulose, not bullate ..... **16**
15. Leaves 5–12cm, with a continuous persistent indumentum beneath ..... **30. wiltonii**  
+ Leaves 4–5cm, with an evanescent indumentum beneath ..... **2. detersile**
16. Mature leaves glabrous below, with a thin floccose indumentum that only persists near the midrib, or with a thin agglutinated, apparently bistrate indumentum that sometimes splits and may become patchy ..... **17**  
+ Mature leaves with a continuous unistrate or bistrate, sometimes compacted, though not agglutinated, indumentum below ..... **23**
17. Corolla deep yellow; leaves 4–6.5 × 1–1.8cm ..... **1. codonanthum**  
+ Corolla cream or white to pink; leaves 6–15 × 2–6.5cm ..... **18**
18. Calyx 3–5(–6)mm; style glandular almost to tip or ± glabrous ..... **19**  
+ Calyx 0.5–3mm; style glabrous or glandular only at base ..... **20**
19. Ovary mainly glandular; style usually glandular, at least below ..... **8\*. x detonsum**  
+ Ovary tomentose, eglandular; style glabrous ..... **3. pubicostatum**
20. Leaves 4–6.5cm wide, with only a few scattered hairs below at maturity ..... **36. dignabile**  
+ Leaves 2–4(–5)cm wide, if more than 4cm then leaf indumentum agglutinated and patchy ..... **21**
21. Young leaves with a whitish to yellowish ramiform indumentum, becoming deep brown at maturity and splitting ..... **22. aganniphum**  
+ Young leaves with a brown radiate or sub-ramiform indumentum, sometimes becoming glabrous at maturity ..... **22**
22. Leaves glabrous at maturity or with a discontinuous (rarely continuous) radiate indumentum ..... **27. przewalskii**  
+ Leaves with a ± continuous though sometimes split indumentum at maturity that is composed of radiate to sub-ramiform hairs and is felted or agglutinated ..... **41**
23. Leaf indumentum densely to sparsely lanate-tomentose, composed of ramiform hairs ..... **24**  
+ Leaf indumentum ± compacted or felted, hairs radiate or sub-ramiform ..... **36**
24. Ovary entirely glabrous ..... **25**  
+ Ovary tomentose and/or glandular to minutely papillate, at least at apex ..... **26**
25. Leaves 2.2–3(–3.5) × as long as broad ..... **13. taliense**  
+ Leaves 1.7–2.3 × as long as broad ..... **12. sphaeroblastum**
26. Leaf indumentum unistrate, sparse or dense; corolla clear yellow, or whitish to pink ..... **27**  
+ Leaf indumentum bistrate, usually dense; corolla white or pale yellow, or pale pink to purplish ..... **28**

27. Ovary densely tomentose, eglandular; sprawling shrub to c.1.3m  
     31. *wasonii*  
 + Ovary stipitate-glandular and tomentose; upright shrub, 3–5m  
     7. *nigroglandulosum*
28. Tree, 4–8m; leaves acuminate; corolla 40–50mm (E Sichuan)  
     29. *coeloneuron*  
 + Shrub, 0.6–4(–4.5)m; leaves apiculate to acuminate; corolla 20–50mm.....29
29. Ovary densely tomentose, sometimes also glandular; leaf indumentum with upper layer rufous to deep red-brown, persistent (mid-brown in *R. roxieoides*).....30  
 + Ovary sparsely tomentose, with a few scattered hairs or minute papillae; leaf indumentum with upper layer mid-brown or if rufous then partially evanescent.....36
30. Upper layer of leaf indumentum sparse or dense, sometimes detesile, if dense then lower layer embedded in a surface film; perulae deciduous.....31  
 + Upper layer of leaf indumentum dense, lower layer compacted though usually not embedded in a surface film; perulae often persistent.....32
31. Calyx c.0.5mm (N Sichuan, Gansu).....28. *rufum*  
 + Calyx 3–6mm (SW Sichuan).....10. *mimetes*
32. Ovary and petioles tomentose, eglandular; style  $\pm$  glabrous.....33  
 + Ovary and petioles  $\pm$  glandular and tomentose; style  $\pm$  glabrous or glandular for half its length.....35
33. Leaves 4–7cm, indumentum not bleaching at maturity; corolla white flushed rose.....18. *bathyphyllum*  
 + Leaves 2–5cm, indumentum sometimes bleaching at maturity; corolla white to dull pink.....34
34. Corolla dull pink, only faintly marked.....16. *comisteum*  
 + Corolla white or (occasionally) yellow, sometimes flushed pink, with conspicuous purple flecks.....15. *proteoides*
35. Corolla white or pale yellow, sometimes flushed with pink; style glabrous.....14. *roxieanum*  
 + Corolla deep pink; style glandular for half its length.....17. *roxieoides*
36. Corolla yellow.....37  
 + Corolla white, sometimes flushed pink.....39
37. Leaves 1.4–1.9  $\times$  as long as broad, cordate at base; ovary glabrous (N Sichuan).....33. *barkamense*  
 + Leaves 2–2.5  $\times$  as long as broad, cuneate to rounded at base; ovary tomentose (Indo-Himalaya, W Yunnan).....38
38. Corolla pure yellow, usually without flecks; leaf indumentum radiate (W Yunnan).....32. *lacteum*  
 + Corolla pale yellow, with flecks; leaf indumentum ramiform (Indo-Himalaya).....38. *wightii*



39. Rhachis at least 20mm; ovary densely tomentose; leaves 9–19cm long,  $3-5.3 \times$  as long as broad ..... **37. beesianum**  
 + Rhachis 10–15(–18)mm; ovary glabrous to sparsely (rarely densely) tomentose; leaves 4–17cm, if exceeding 9cm then less than  $3 \times$  as long as broad ..... 40
40. Leaf indumentum powdery, hairs radiate, with arms short and pyriform, or long and ribbon-like ..... **21. traillianum**  
 + Leaf indumentum compacted or felted, hairs radiate to sub-ramiform, arms long but not ribbon-like ..... 41
41. Ovary glabrous or with a few scattered hairs or papillae, leaves  $1.7-3(-4) \times$  as long as broad ..... **20. phaeochrysum**  
 + Ovary sparsely glandular and/or tomentose; leaves  $(2-3)-4.5 \times$  as long as broad ..... **19. alutaceum**

**1. (281.) *R. codonanthum*** Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 243 (1922). Type: China, NW Yunnan, Mekong/Salween divide, E of Yeh-chih, 8 viii 1921, *Forrest* 19810 (holo. E).

Dwarf shrub, 0.3–1.3m. Leaves oblanceolate to elliptic,  $4-6.5 \times 1-1.8$ cm,  $3.5-4.5 \times$  as long as broad, apex acute, base cuneate, lower surface with a sparse reddish sub-ramiform indumentum intermixed with stipitate glands, persistent on the midrib, detersile on the lamina; petioles c.0.5cm, tomentose. Inflorescence c.6-flowered; rhachis minute; pedicels 25–30mm, sparsely stipitate-glandular. Calyx 2–4mm, glandular-ciliate, lobes rounded. Corolla campanulate, bright yellow with crimson spots, c.30mm. Ovary stipitate-glandular; style glandular to tip. Capsule not known.

CHINA (NW Yunnan). Stony slopes, 3650–4250m. Map 98, p. 327.

A poorly known species, apparently without close allies.

**2. (282.) *R. detersile*** Franchet, J. Bot. (Morot) 12: 260 (1898). Type: China, E Sichuan, rochers de Touan tchen, s.p. de Ta-lin-hien, 2500m, *Farges* 1382 (iso. E,K).

Dwarf shrub, 0.3–1m; perulae persistent. Leaves oblanceolate to elliptic,  $4-5 \times 1.5-1.8$ cm,  $c.2.7 \times$  as long as broad, apex acute, base cuneate, upper surface with impressed veins so appearing bullate, lower surface with a unistrate red-brown detersile lanate ramiform indumentum; petioles c.0.5cm, densely tomentose. Inflorescence c.10-flowered; pedicels c.10mm, densely glandular-hirsute. Calyx c.3mm, densely hairy and stipitate-glandular, lobes ligulate, rounded. Corolla campanulate, pinkish, 25–30mm. Ovary glandular-pilose; style glandular in the lower half. Capsule not known.

CHINA (E Sichuan). Rocky slopes, c.2500m. Map 98, p. 327.

Only known from material collected by Farges near the type locality. The bullate leaves and leaf indumentum suggest a distant affinity with *R. wiltonii* but the glandular ovary and well-developed calyx suggest that it is closer to *R. adenogynum* and its immediate allies.

**3. (283.) *R. pubicostatum*** T. L. Ming, Acta Bot. Yunnanica 3: 119 (1981). Type: China, NE Yunnan, Lu-quan Xian, Wumeng Shan, 26 v 1952, *Mao*, P. I. 1014 (holo. Hb. Inst. Bot. Kunming).

Shrub, c.3m; young shoots densely rufous-tomentose. Leaves elliptic to lanceolate,  $9.5-12 \times 3.3-4$ cm,  $c.3 \times$  as long as broad, apex acuminate, base  $\pm$  rounded, lower surface with a floccose brown to rufous ramiform indumentum persisting only near the midrib by maturity; petioles c.2cm, pubescent. Inflorescence c.5-flowered; rhachis c.5mm; pedicels c.20mm, densely and minutely rufous-glandular. Calyx 5-6mm, glandular and tomentose, with broad rounded lobes. Corolla campanulate, white flushed pink, 30-35mm. Ovary densely brown-tomentose; style glabrous. Capsule not known.

CHINA (NE Yunnan). Map 98, p. 327.

The distinctive leaf indumentum suggests that this species may be allied to *R. detersile*.

4. (284.) *R. dumicola* Tagg & Forrest in Stevenson (ed.), The Species of Rhododendron 643 (1930). Type: China, NW Yunnan, Mekong/Salween divide, 14000ft,  $27^{\circ}\text{N}$ ,  $99^{\circ}2'\text{E}$ , vii 1924, *Forrest* 25580 (holo. E).

Shrub, 1-2.5m. Leaves obovate to broadly elliptic,  $6.5-7.5 \times 3-4$ cm,  $1.8-2.2 \times$  as long as broad, apex apiculate to acuminate, base rounded, lower surface with a thin unistrate lanate brown evanescent indumentum; petioles 0.5-1.5cm, glabrescent. Inflorescence 5-10-flowered; rhachis c.5mm; pedicels c.20mm, glandular-tomentose. Calyx 7-10mm, with broad chartaceous, glabrous or glandular-ciliate lobes. Corolla white flushed rose, with purple flecks, c.40mm. Ovary stipitate-glandular; style glabrous. Capsule c.  $12 \times 6$ mm, curved.

CHINA (NW Yunnan). Map 100.

A distinctive species on account of its often acuminate leaves and well-developed calyces. The calyx is reminiscent of that found in subsection Thomsonia and it is possible that this taxon is a hybrid.

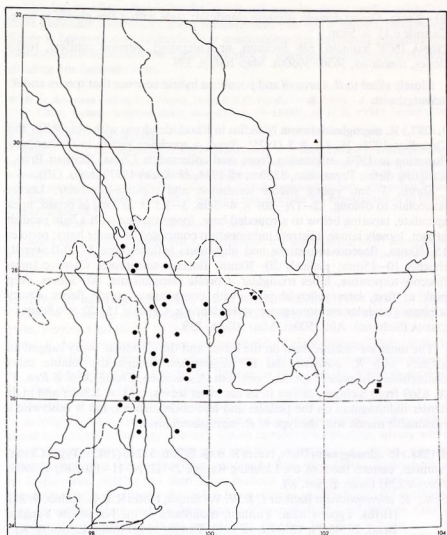
5. (285.) *R. bureavii* Franchet, Bull. Soc. Bot. France 34: 281 (1887). Type: China, Yunnan, ad collum Yen-tze-hay, prope Lankong, 3200m, 1 v 1886, *Delavay* 2213 (iso. E, K).

Syn.: *R. cruentum* L  veill  , Feddes Repert. 12: 284 (1913). Type: China, Yunnan, brousse du plateau de Ta-Hai-Tse, 3200m, v 1912, *Maire* (holo. E).

Shrub, 1-3(-6)m. Leaves elliptic,  $4.5-12 \times 2-7$ cm,  $1.7-3 \times$  as long as broad, apex acuminate, base rounded or cuneate, lower surface with a dense unistrate lanate ramiform tomentum, salmon-pink when young, becoming rich rusty red; petioles 1-2cm, densely tomentose. Inflorescence 10-20-flowered; rhachis 2-3mm; pedicels 10-20mm, densely pilose and glandular. Calyx 5-10mm, lobes fleshy or membranous, densely pilose and glandular. Corolla white flushed pink to pink, sometimes with purple flecks, 25-40mm. Ovary densely stipitate-glandular, sometimes also tomentose; style usually glandular, at least near the base. Capsule c.  $15 \times 9$ mm.

CHINA (N Yunnan). Open pine forests, Rhododendron thickets, 3350-4250m. Map 100.

*R. cruentum* is described as differing from *R. bureavii* in its smaller flowers and fleshy calyx. There is, however, a complete intergradation in these characters.



MAP 100. ● *R. anthosphaerum*; ◆ *R. dumicola*; ■ *R. bureavii*; ▼ *R. elegantulum*; ▲ *R. nigroglandulosum*.

6. (286.) *R. elegantulum* Tagg & Forrest, Notes R.B.G. Edinb. 15: 311 (1927). Type: China, SW Sichuan, Yung-ning, 13000ft, 7 v 1922, *Kingdon-Ward* 5111 (holo. E).

Shrub, 1–1.6m. Leaves elliptic-oblong,  $7-13 \times 2.4-3.5$ cm,  $3-3.7 \times$  as long as broad, apex acute, base rounded, lower surface covered with a dense unistrate ramiform lanate indumentum, deep pink when young, maturing to a rich rufous brown; petioles 1–1.5cm, tomentose at first, later glabrescent. Inflorescence 10–20-flowered; rhachis 2–3mm; pedicels c.20mm, rufous-tomentose, at least at first. Calyx c.12mm, stipitate-glandular, lobes oblong, rounded, glandular-ciliate. Corolla campanulate, pale purplish pink, with crimson flecks,

30–40mm. Ovary densely stipitate-glandular; style with a few glands at base. Capsule c.  $15 \times 5$ mm.

CHINA (NW Yunnan, SW Sichuan, nr Yungning). Among conifers, rocky slopes, meadows, 3650–3950m. Map 100, p. 339.

Closely allied to *R. bureavii* and possibly a hybrid between that species and *R. adenogynum*.

**7. (287.) *R. nigroglandulosum*** Nitzelius in *Rhododendrons* with *Magnolias* and *Camellias* 1975: 26, f.2 & 3 (1975). Type: a specimen grown in Gothenburg flowering in 1970, originating from seed collected in China, Sichuan Prov., Kangting distr., Tapanshan, 3500m, xii 1934, *H. Smith* 13979 (holo. GB).

Shrub, 3–5m; young shoots tomentose and stipitate-glandular. Leaves lanceolate to oblong,  $12-17(-20) \times 4-5$ cm,  $3-3.5 \times$  as long as broad, apex apiculate, tapering below to a rounded base, lower surface with a light reddish brown, loosely lanate unistrate indumentum composed of lanate hairs; petioles 15–30mm, floccose-tomentose and glandular. Inflorescence 8–10-flowered; rhachis 10–15mm; pedicels 20–30mm, floccose-tomentose. Calyx c. 1mm, floccose-tomentose, lobes triangular. Corolla campanulate, 40–50mm, deep pink at first, later yellowish-pink, with conspicuous purple flecks. Ovary stipitate-glandular and tomentose; style glabrous. Capsule  $15-20 \times 8$ mm.

CHINA (Sichuan). Alt. 3500m. Map 100, p. 339.

The unistrate indumentum on the leaves and the glandular ovary suggest an affinity with *R. bureavii* and *R. elegantulum* though the minute calyx distinguishes the present species from both. A specimen, *Chang, X. S. & Ren, Y. X.* 6509 from Sichuan, differs in its narrower leaves,  $c. 13 \times 2.8$ cm, and in its denser indumentum on the petioles and leaf undersurfaces, but is otherwise a reasonable match with the type of *R. nigroglandulosum*.

**8. (288.) *R. adenogynum*** Diels, *Notes R.B.G. Edinb.* 5: 216 (1912). Type: China, Yunnan, eastern flank of the Lichiang Range,  $27^{\circ}12'N$ , 11–12000ft, vi 1906, *Forrest* 2395 (holo. E; iso. K).

Syn.: *R. adenophorum* Balfour f. & W. W. Smith, *Notes R.B.G. Edinb.* 9: 211 (1916). Type: China, Yunnan, mountains in the NE of the Yangtze Bend,  $27^{\circ}45'N$ , 12000ft, vii 1913, *Forrest* 10429 (holo. E; iso. A, K).

Ic.: *Bot. Mag.* 155: t.9253 (1931); *Stevenson* (ed.), *The Species of Rhododendron* 632, t. (1930).

Shrub or small tree,  $(0.5-1.3-4)$ m. Leaves narrowly elliptic to elliptic,  $6-11 \times 2-4$ cm,  $2-2.5 \times$  as long as broad, apex acute, base usually rounded, lower surface usually with a dense (rarely sparse) unistrate finely ramiform, spongy to matted tomentum, yellowish at first, maturing to a rich olive-brown, intermixed with at least some glands; petioles 1–2cm, glabrescent or with a persistent tomentum and some stipitate glands. Inflorescence 4–12-flowered; rhachis up to 10mm; pedicels 20–30mm, densely tomentose and glandular. Calyx  $(4-8-15)$ mm, glandular, lobes oblong, unequal. Corolla campanulate, white flushed pink or pale pink, sometimes with purple flecks, 30–45mm. Ovary densely stipitate-glandular; style usually glandular in the lower third. Capsule  $10-18 \times 6-8$ mm.

CHINA (SE Xizang, W Yunnan, SW Sichuan). Thickets, open pastures, cliffs, 3000–4250m. Map 101, p. 342.

The density of the glands on the leaves and petioles varies considerably; the most glandular forms have a leaf indumentum that has a matted appearance. There is however no justification for maintaining the essentially glandular *R. adenophorum* as distinct from the eglandular *R. adenogynum* as there is no clear dividing line between them.

8\*. *R. × detonsum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 48 (1919).—*R. adenogynum* × ? Type: China, Yunnan, Sungkwei divide, eastern flank, 10–11000ft, 26°12'N, v 1917, *Forrest* 13789 (holo. E; iso. K).

Ic.: Bot. Mag. 157: t. 9359 (1934).

Shrub, 1–3.5m. Leaves obovate to broadly elliptic, 6–10 × 3–4cm, 2.3–2.8 × as long as broad, apex acuminate, base rounded, lower surface with a sparse unistrate brown evanescent ramiform tomentum; petioles 1.5–2cm, glabrescent. Inflorescence 6–10-flowered; pedicels 20–25mm, sparsely glandular. Calyx 3–5(–6)mm, glandular. Corolla campanulate, pink, with purple flecks, 40–50mm. Ovary glandular, also with a few hairs; style glandular for three-quarters of its length. Capsule unknown.

CHINA (W Yunnan). Rocky slopes, thickets, etc., 3050–3950m.

There is every reason to believe that *R. × detonsum* is a natural hybrid of *R. adenogynum*, especially since a plant raised from seed of typical *R. adenogynum* (as *Forrest* 5868) is a good match with the type of *R. × detonsum*.

9. (289.) *R. balfourianum* Diels, Notes R.B.G. Edinb. 3: 214 (1912). Type: China, W Yunnan, eastern flank of the Tali Range, 25°40'N, 11–12000ft, vii 1906, *Forrest* 4166 (holo. E; iso. A, K).

Syn.: *R. balfourianum* Diels var. *aganniphoides* Tagg & Forrest, Notes R.B.G.

Edinb. 15: 306 (1927). Type: China, SW Sichuan, mountains around

Muli, 28°12'N, 100°50'E, 12000ft, vi 1921, *Forrest* 20456 (holo. E).

Ic.: Bot. Mag. n.s. 177: t. 531 (1969).

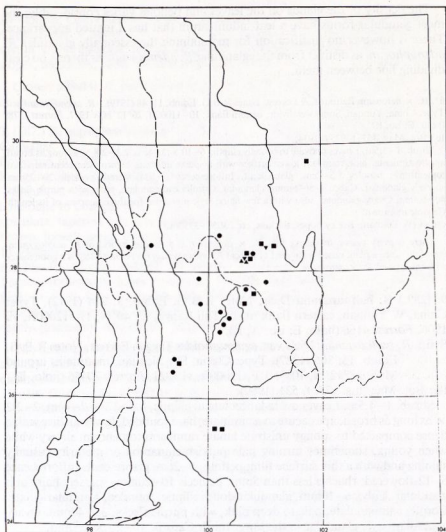
Shrub, 1–4.5m. Leaves ovate-lanceolate to elliptic, 4.5–12 × 2–4cm, 2–2.3 × as long as broad, apex acute to acuminate, base rounded, lower surface with a dense compacted to spongy unistrate lanate ramiform tomentum, silvery white when young, sometimes turning pale pinkish-cinnamon at maturity, usually shining and with a thin surface film; petioles 1–2cm, glabrescent. Inflorescence 6–12-flowered; rhachis less than 5mm; pedicels 10–20mm, sparsely hairy and glandular. Calyx 6–10mm, glandular, lobes elliptic, rounded, glandular-ciliate. Corolla campanulate, pale to deep pink, with purple flecks, 35–40mm. Ovary glandular; style glandular in the lower third. Capsule 10–20 × c.7mm.

CHINA (W Yunnan, SW Sichuan). Rocky slopes, Rhododendron thickets, 3350–4550m. Map 101, p. 342.

There is no clear dividing line between var. *balfourianum*, with a compacted leaf indumentum, and var. *aganniphoides*, with a thick spongy indumentum; the two taxa are therefore not maintained as distinct. *R. balfourianum* resembles *R. aganniphum* in its foliage but the latter may be distinguished by its short calyx and glabrous ovary. The silvery leaf indumentum, sometimes turning pinkish, distinguishes the present species from the allied *R. adenogynum*.

10. (290.) *R. mimetes* Tagg & Forrest, Notes R.B.G. Edinb. 15: 315 (1927). Type: China, SW Sichuan, mountains NE of Muli, 28°24'N, 101°6'E, 12000ft, 1922, *Forrest* 21417 (holo. E).

Shrub, 1–2.2m. Leaves lanceolate to oblanceolate, 8.5–11 × 3–4.5cm, 2.2–2.8 × as long as broad, apex acute to apiculate, base rounded, lower surface



MAP 101. ● *R. adenogynum*; ■ *R. balfourianum*; ▼ *R. mimetes*; ▲ *R. simulans*.

with a bistrate indumentum, the upper layer fulvous, lanate-tomentose and often detersile by maturity, composed of ramiform hairs, the lower whitish, compacted and persistent; petioles 1.5–2.5cm, glabrescent by maturity. Inflorescence 6–10-flowered; rhachis up to 10mm; pedicels 20–25mm, tomentose with an admixture of stipitate glands. Calyx 3–6mm, sparsely tomentose and stipitate-glandular, lobes broad, rounded. Corolla funnel-campanulate, white to rose, with crimson flecks, 35–45mm. Ovary densely rufous-tomentose and stipitate-glandular; style glabrous. Capsule 18–20 × c.5mm.

CHINA (SW Sichuan). Forest margins, among scrub, on rocky slopes, 3350–3650m. Map 101.

Probably allied to *R. adenogynum*.

**11. (291.) *R. simulans* (Tagg & Forrest) Chamberlain, stat. nov.**

Syn.: *R. mimites* Tagg & Forrest var. *simulans* Tagg & Forrest, Notes R.B.G. Edinb. 15: 316 (1927). Type: China, SW Sichuan, mountains around Muli, 28°12' N, 12000ft, vi 1921, *Forrest* 20428 (holo. E).

Shrub, c.2m. Leaves lanceolate to ovate-lanceolate, c.10 × 4–5cm, 2–2.5 × as long as broad, apex apiculate, base rounded to sub-cordate, lower surface with a dense bistrate cinnamon indumentum, the upper layer ramiform, lanate-tomentose, the lower compacted; petioles c.2cm, glabrescent. Inflorescence c.7-flowered; rhachis up to 12mm; pedicels 20–30mm, with a few glands and hairs at maturity. Calyx 3–10mm, sparsely glandular or ciliate, longer lobes narrow and reflexed. Corolla funnel-campanulate, white flushed rose, with crimson flecks, 40–50mm. Ovary densely rufous-tomentose, sometimes also stipitate-glandular. Capsule c.15 × 6–9mm.

CHINA (SW Sichuan). Fir forests, Rhododendron thickets, 3650–4450m. Map 101.

A specimen, *Rock* 16089, with small leaves (up to 8cm long) and a deep red-brown indumentum, is probably referable to *R. simulans*. This species is apparently intermediate between *R. sphaeroblastum* and *R. adenogynum* and may be of hybrid origin.

**12. (292.) *R. sphaeroblastum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 60 (1920). Type: China, SW Sichuan, mountains around Muli, *Forrest* 17360 (holo. E; iso. K).**

Shrub, 1–3(–7)m. Leaves broadly ovate-lanceolate, (6–)9–12 × 3.6–6.2cm, 1.7–2.3 × as long as broad, apex acute to apiculate, base rounded to ± cordate, lower surface with a dense bistrate indumentum that is usually rust-red, the upper layer lanate-tomentose, ramiform, felted, the lower compacted; petioles 1–1.5cm, glabrescent. Inflorescence 10–20-flowered; rhachis 10–15mm; pedicels 10–15mm, glabrous when mature. Calyx 1.5–2mm, glabrous, lobes acute. Corolla white to pink, with purple flecks, 35–40mm. Ovary and style glabrous. Capsule 20–22 × 6–8mm.

CHINA (N Yunnan, SW Sichuan). Thickets, open forests, etc., 3350–4550m. Map 102, p. 345.

Closely allied to *R. simulans* (q.v.) and to *R. taliense*.

**13. (293.) *R. taliense* Franchet, Bull. Soc. Bot. France 33: 232 (1886). Type: China, Yunnan, in monte Tsang-chan, supra Tali, 4000m, *Delavay* 160 (iso. E, K).**

Shrub, 0.8–4m. Leaves 5–11 × 2–4cm, 2.2–3(–3.5) × as long as broad, apex acute, base rounded to ± cuneate, lower surface with a dense fulvous bistrate indumentum, the upper layer ramiform, tomentose, loose to ± felted, the lower layer compacted; petioles 0.5–1cm, tomentose. Inflorescence 10–20-flowered; rhachis 5–15mm; pedicels 10–20mm, tomentose and glandular. Calyx 0.5–2mm, glabrous. Corolla white to (rarely) yellow, sometimes flushed with pink, with crimson flecks, 30–35mm. Ovary and style glabrous. Capsule 15–20 × c. 7mm.

CHINA (W Yunnan). Meadows, rocky slopes, Rhododendron thickets, 3050–3650m. Map 102, p. 345.

The following fruiting material, from W Yunnan though without precise localities, differs in its rufous leaf indumentum but otherwise resembles *R. taliense* closely: *Forrest* 29130, 29132, 29252, 29258, 29326, 29328, 29329. The status of these plants is in some doubt, particularly since flowering material is not available.

*R. taliense* is closely allied to *R. sphaeroblastum*, from which it differs in its narrower leaves, and to *R. alutaceum* (q.v.). Plants apparently intermediate between *R. taliense* and *R. roxieanum* var. *cucullatum* are as follows: *McLaren* C 21; *Rock* 6253, 6264, 6365.

**14. (294.) *R. roxieanum* Forrest, Notes R.B.G. Edinb. 8: 344 (1915).**

Shrub, sometimes dwarf, 0.15–2.5(–4)m. Leaves linear to elliptic, 5–12 × 0.6–4cm, 2.2–15 × as long as broad, apex acute to cucullate, base cuneate to ± rounded, lower surface with a thick bistrate indumentum, the upper layer rufous, ramiform, lanate-tomentose, loose, the lower radiate, compacted; petioles 0.4–1(–1.5)cm, rufous-tomentose to glabrescent. Inflorescence 6–15-flowered; rhachis c.10mm; pedicels 8–15(–20)mm, tomentose and glandular. Calyx 0.5–2mm, tomentose and glandular. Corolla funnel-campanulate, white or (rarely) pale yellow, sometimes flushed with pink, with purple flecks, 20–40mm. Ovary densely rufous-tomentose and glandular. Capsule 10–15 × 3–5mm.

Map 102.

1. Leaves more than 4 × as long as broad, apex acute ..... **14a. var. *roxieanum***

+ Leaves 2.2–4 × as long as broad, apex acute to cucullate

**14b. var. *cucullatum***

**14a. var. *roxieanum*.** Type: China, NE of the Yangtze Bend, 27°45'N, 11–12000ft, vii 1913, *Forrest* 10540 (holo. E; iso. K).

Syn.: *R. recurvum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 113 (1919).

Type as above.

*R. recurvum* Balfour f. & Forrest var. *oreonastes* Balfour f. & Forrest, ibid. 11: 113 (1915). Type: China, NW Yunnan, Kari Pass, Mekong/Yangtze divide, 27°40'N, 14000ft, viii 1914, *Forrest* 13005 (holo. E; iso. BM).

*R. aishropeplum* Balfour f. & Forrest, ibid. 13: 229 (1922). Type: China, W NW Yunnan, Mekong/Salween divide, 28°22'N, 12–13000ft, vi 1917, *Forrest* 14061 (holo. E; iso. K).

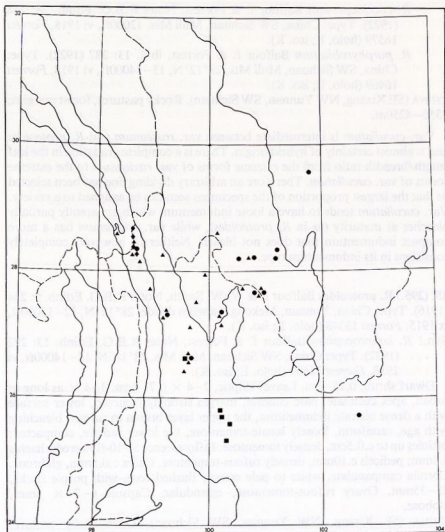
*R. poecilodermum* Balfour f. & Forrest, ibid. 13: 285 (1922). Type: China, SE Xizang, Tsarong, Mekong/Salween divide, on Ka-gwr-pw, 28°25'N, 12000ft, vii 1917, *Forrest* 14452 (holo. E; iso. K).

Ic.: Rhododendron & Camellia Yearbook 19: f. 34 (1964); Cox, Dwarf Rhododendrons t.5 (1973).

CHINA (SE Xizang, NW Yunnan, SW Sichuan). Pine forests, alpine meadows, stony slopes, 3050–4250m.

A specimen with almost glabrous leaves, *Forrest* 25539, is almost certainly referable to var. *roxieanum*. This feature is sometimes seen in cultivated plants that maintain the ability to revert to the usual dense leaf indumentum, probably depending on weather conditions.





MAP 102. ● *R. sphaeroblastum*; ■ *R. taliense*; ▲ *R. roxieanum*; ◆ *R. bathyphyllum*.

Intermediates between var. *roxieanum* and var. *cucullatum* occur frequently in the wild. The distinction in the more extreme forms with short, extremely narrow leaves (var. *oreonastes*) is not maintained here as at least part of the type collection of var. *roxieanum* matches the type of var. *oreonastes*.

**14b. var. *cucullatum*** (Handel-Mazzetti) Chamberlain, Notes R.B.G. Edinb. 36: 119 (1978).

Syn.: *R. cucullatum* Handel-Mazzetti, Akad. Wiss. Wien Math.-Naturwiss. Kl., Anz. no. 4-5 (1921). Type: China, Sichuan, in monte Lose-schan, regione frigidi, 3900-4520m, 16 iv 1914, *Handel-Mazzetti* 1416, n.v.

*R. coccinocephalum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 248 (1922). Type: China, SW Sichuan, Muli Mts, 12000ft, vi 1918, *Forrest* 16379 (holo. E; iso. K).

*R. porphyroblastum* Balfour f. & Forrest, *ibid.* 13: 287 (1922). Type: China, SW Sichuan, Muli Mts, 28°12'N, 13–14000ft, vi 1918, *Forrest* 16469 (holo. E; iso. K).

CHINA (SE Xizang, NW Yunnan, SW Sichuan). Rocky pastures, forest margins, 3350–4250m.

Var. *cucullatum* is intermediate between var. *roxieanum* and *R. proteoides* and is almost certainly of hybrid origin. There is a complete gradation in the leaf length/breadth ratio from the extreme forms of var. *roxieanum* to the extreme forms of var. *cucullatum*. Therefore an arbitrary dividing line has been selected so that the largest proportion of the specimens seen can be assigned to a variety. Var. *cucullatum* tends to have a loose indumentum which apparently partially bleaches at maturity (as in *R. proteoides*), while var. *roxieanum* has a more compact indumentum that does not bleach. Neither is, however, completely consistent in its indumentum type.

15. (295.) *R. proteoides* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 9: 264 (1916). Type: China, Yunnan, Mekong/Salween divide, 28°12'N, 12–13000ft, ix 1915, *Forrest* 13348 (holo. E; iso. K).

Syn.: *R. lamprocephalum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 272 (1922). Type: China, SW Sichuan, Muli Mts, 28°18'N, 12–14000ft, vi 1918, *Forrest* 16509 (holo. E; iso. K).

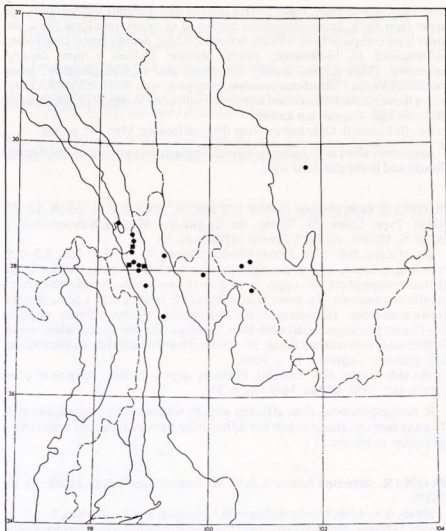
Dwarf shrub, 0.15–1m. Leaves elliptic, 2–4 × 0.7–1cm, 3–4 × as long as broad, apex cucullate, base cuneate, margin strongly recurved, lower surface with a dense bistrate indumentum, the upper layer brown to rufous, bleaching with age, ramiform, loosely lanate-tomentose, the lower radiate, compacted; petioles up to c.0.5cm, densely tomentose. Inflorescence 5–10-flowered; rhachis c.5mm; pedicels c.10mm, densely rufous-tomentose. Calyx c.0.5mm, glabrous. Corolla campanulate, white to pale cream, flushed rose, with purple flecks, 25–35mm. Ovary rufous-tomentose, eglandular. Capsule 6–7 × 6mm, globose.

CHINA (SE Xizang, NW Yunnan, SW Sichuan). Open rocky pasture, 3650–4550m. Map 103.

Closely allied to *R. roxieanum*, especially var. *cucullatum*, but there is seldom any confusion as there is almost no overlap. Also closely allied to *R. comisteum*.

16. (296.) *R. comisteum* Balfour f. & Forrest in Notes R.B.G. Edinb. 11: 42 (1919). Type: China, SE Xizang, Tsarong, on Ka-gwr-pw, Mekong/Salween divide, 28°25'N, 14000ft, vi 1917, *Forrest* 14501 (holo. E; iso. K).

Dwarf shrub, 0.6–1m. Leaves elliptic to obovate, 3–5 × 1.2–1.5cm, 2.5–3.5 × as long as broad, apex apiculate, base cuneate, lower surface with a dense bistrate indumentum, the upper layer red-brown, loosely lanate-tomentose, the lower compacted; petioles c.0.5cm, brown-tomentose. Inflorescence 6–10-flowered; rhachis c.5mm; pedicels c.10mm, brown-tomentose. Calyx c.0.5mm, brown-tomentose. Corolla deep rose, with a few flecks, c.35mm. Ovary rufous-tomentose. Capsule not known.



MAP 103. ● *R. proteoides*; ■ *R. comisteum*.

CHINA (SE Xizang, NW Yunnan). Open pasture, stony slopes, 3950–4250m. Map 103.

The shape of the corolla is not clear in the herbarium specimens available so the affinities of this species are not certain. It does, however, resemble *R. proteoides* in its vegetative characters.

**17. (297.) *R. roxieoides* Chamberlain, sp. nov.** (see p. 478.). Type: China, E Sichuan, Wu Shan, Chao Yang Ping, Liang Feng village, 2150m, 3 v 1958, Yang, K. H. 57932 (holo. PE).

Shrub, c. 2.5m; young shoots with a dense lanate tomentum; perulae persistent. Leaves linear,  $6.5\text{--}7.5 \times 1.3\text{--}1.8\text{cm}$ ,  $4\text{--}5 \times$  as long as broad, apex

acuminate, base cuneate, lower surface covered with a bistrate indumentum, the upper layer thick, lanate-tomentose, composed of brown ramiform hairs, the lower layer compacted and whitish; petioles c.0.5cm, densely lanate-tomentose. Inflorescence 12–16-flowered; rhachis minute; pedicels c.7mm, densely tomentose. Calyx c.1mm, densely tomentose, also stipitate-glandular, lobes rounded. Corolla ? funnel-campanulate, deep pink, with flecks, c.30mm. Ovary with a dense rufous indumentum intermixed with a few glands; style glandular in the lower half. Capsule not known.

CHINA (E Sichuan). Only known from the type locality. Map 107, p. 353.

Apparently allied to *R. roxieanum* but differing in the more intensely coloured flowers and in the glandular style.

**18. (289.) *R. bathyphyllum*** Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 27 (1919). Type: China, SE Xizang, on Ka-gwr-pw, Mekong/Salween divide, 28°30'N, 13000ft, viii 1917, *Forrest* 14718 (holo. E).

Dwarf shrub, 0.6–1.5m. Leaves elliptic to oblong, 4–7 × 1.5–2cm, 2.7–3.5 × as long as broad, apex ± cucullate, base rounded, lower surface with a dense bistrate indumentum, the upper layer dark rufous-brown, loosely and finely ramiform-tomentose, the lower layer compacted; petioles 0.5–1.5cm, densely brown-tomentose. Inflorescence 10–15-flowered; rhachis c.5mm; pedicels 10–15mm, glabrescent. Calyx c.0.5mm, glabrous. Corolla campanulate, white flushed rose, with crimson flecks, 30–35mm. Ovary densely rufous-tomentose; style glabrous. Capsule c. 10 × 5mm.

CHINA (SE Xizang, NW Yunnan). Bouldery slopes, thickets, margins of pine forests, etc., 3350–4250m. Map 102, p. 345.

*R. bathyphyllum* has close affinities with *R. roxieanum* var. *cucullatum* and *R. alutaceum* var. *russotinctum* but differs from both in its densely tomentose, eglandular ovary, etc.

**19. (299.) *R. alutaceum*** Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 10: 18 (1917).

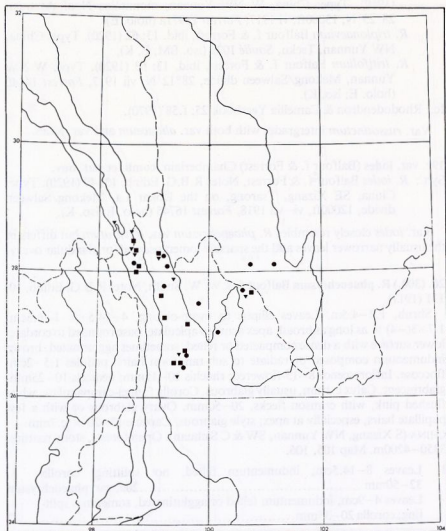
Shrub, 0.6–4.5m. Leaves oblong to oblanceolate, 5–17 × 2–4cm, 2–6.2 × as long as broad, apex apiculate, base rounded to cuneate, lower surface with a bistrate indumentum, the upper layer ramiform-tomentose, ± continuous, pale brown and lanate or more felted and mid- to reddish-brown, or partially detersile and usually rufous, lower layer whitish and compacted; petioles 0.8–2cm, usually persistently brown-tomentose. Inflorescence 10–20-flowered; rhachis 10–18mm; pedicels 10–20mm, tomentose. Calyx 0.5–1mm, tomentose, lobes rounded. Corolla campanulate to funnel-campanulate, white to pink, with crimson flecks, sometimes with a purple basal blotch, 30–40mm. Ovary sparsely glandular and tomentose to almost glabrous, though with a few simple papillate hairs; style glabrous. Capsule 12–20 × c.5mm.

CHINA (SE Xizang, NW Yunnan, SW & C Sichuan). Pine forests, cane brakes, open stony places, 3050–4250m. Map 104.

1. Leaf indumentum usually pale ochraceous brown, lanate with long fine ramiform hairs, continuous; ovary with a few papillae, otherwise ± glabrous ..... **19a. var. *alutaceum***

- + Leaf indumentum mid- to rufous-brown, not lanate, sometimes with upper layer discontinuous; ovary with a sparse indumentum of rufous ramiform hairs and glands .....2
- 2. Leaf indumentum with upper layer discontinuous, composed of ramiform rufous hairs.....19b. var. **russotinctum**
- + Leaf indumentum with a continuous felted upper layer composed of short fine usually mid-brown ramiform hairs ..... 19c. var. **iodes**

**19a. var. *alutaceum*.** Type: China, NW Yunnan, Kari Pass, Yangtze/Mekong divide, 27°40'N, viii 1917, *Forrest* 13098 (holo. E; iso. K).



MAP 104. ● *R. alutaceum* var. *alutaceum*; ■ var. *russotinctum*; ▼ var. *iodes*.

Syn.: *R. globigerum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 259 (1922). Type: China, SW Sichuan, Muli Mts, 28°12'N, 11–12000ft, vi 1918, *Forrest* 16376 (holo. E; iso. K).

*R. roxieanum* Forrest var. *globigerum* (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 119 (1978).

Closely resembling *R. taliense* but with at least a few papillae or ramiform hairs on the ovary. The type specimen is apparently a mixed gathering; part is referable to var. *alutaceum* and part to var. *russoinctum*.

**19b. var. russoinctum** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 119 (1978).

Syn.: *R. russoinctum* Balfour f. & Forrest in Notes R.B.G. Edinb. 11: 129 (1919). Type: China, W NW Yunnan, mountains N of Atuntzu, 28°25'N, 13000ft, vi 1917, *Forrest* 13971a (holo. E).

*R. triplonaevium* Balfour f. & Forrest, *ibid.* 13: 62 (1920). Type: China, NW Yunnan, Tseku, *Soulié* 1029 (iso. BM, E, K).

*R. tritifolium* Balfour f. & Forrest, *ibid.* 13: 63 (1920). Type: W NW Yunnan, Mekong/Salween divide, 28°12'N, vii 1917, *Forrest* 14140 (holo. E; iso. K).

lc.: *Rhododendron* & *Camellia* Yearbook 25: f.58 (1970).

Var. *russoinctum* intergrades with both var. *alutaceum* and var. *iodes*.

**19c. var. iodes** (Balfour f. & Forrest) Chamberlain, **comb. et stat. nov.**

Syn.: *R. iodes* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 49 (1920). Type: China, SE Xizang, Tsarong, on the Dokar La, Mekong/Salween divide, 12000ft, vi–vii 1918, *Forrest* 16745 (holo. E; iso. K).

Var. *iodes* closely resembles *R. phaeochrysum* var. *levistratum* but differs in the usually narrower leaves and the sparsely tomentose and/or glandular ovary.

**20. (300.) R. phaeochrysum** Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 10: 131 (1917).

Shrub, 1.2–4.5m. Leaves elliptic to ovate-oblong, 4–14.5 × 1–6.5cm, 1.7–3(–4) × as long as broad, apex acute to apiculate, base rounded to cordate, lower surface with a dense compacted or felted, sometimes agglutinated, brown indumentum composed of radiate to sub-ramiform hairs; petioles 1.5–2cm, floccose. Inflorescence 8–15-flowered; rhachis 10–15mm; pedicels 10–25mm, glabrescent. Calyx c.1mm, usually glabrous. Corolla funnel-campanulate, white flushed pink, with crimson flecks, 20–50mm. Ovary glabrous or with a few papillate hairs, especially at apex; style glabrous. Capsule 13–20 × c.7mm. CHINA (S Xizang, NW Yunnan, SW & C Sichuan). Open forests, stony pasture, 3350–4200m. Map 105, 106.

1. Leaves 8–14.5cm, indumentum felted, not splitting; corolla 32–50mm ..... **20a. var. phaeochrysum**
- + Leaves 4–9cm, indumentum felted or agglutinated, sometimes splitting; corolla 20–35mm ..... **2**
2. Indumentum felted, not agglutinated, continuous ..... **20c. var. levistratum**
- + Indumentum agglutinated, sometimes splitting ..... **20b. var. agglutinatum**

**20a. var. *phaeochrysum*.** Type: China, E NW Yunnan, mountains in the NW of the Yangtze Bend, 11–12000ft, vii 1913, *Forrest* 10547 (holo. E; iso. K).

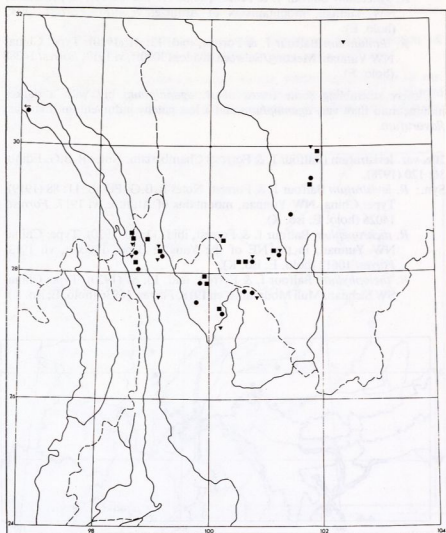
Syn.: *R. dryophyllum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 38 (1919).

Type: China, NW Yunnan, Mekong/Salween divide, 11000ft, vii 1917, *Forrest* 14107 (holo. E; iso. K).

*R. cupressens* Nitzelius, Acta Horti Gothob. 26: 117 (1963). Type: a plant cultivated in Gothenburg, from Tapanshan, Kangting distr. in Sichuan, 3 x 1934, *H. Smith* 13977 (holo. GB).

Ic.: *Rhododendron* & *Camellia* Yearbook 10: f.45 (1955).

Var. *phaeochrysum* intergrades with both vars. *agglutinatum* and *levistratum*. *R. cupressens* was differentiated on account of its pale leaf indumentum. It



MAP 105. ● *R. phaeochrysum* var. *phaeochrysum*; ■ var. *agglutinatum*; ▼ var. *levistratum*.

seems likely that introgressive hybridisation is taking place between *R. phaeochrysum* and *R. aganniphum* which may account for this pale indumentum.

**20b. var. *agglutinatum*** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 120 (1978).

Syn.: *R. agglutinatum* Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 88 (1920).

Type: China, SW Sichuan, mountains around Muli, 12–13000ft, vi 1918, *Forrest* 16319 (holo. E).

*R. lophophorum* Balfour f. & Forrest, *ibid.* 11: 95 (1919). Type: China, NW Yunnan, mountains around Atuntze, vi 1917, *Forrest* 13971 (holo. E; iso. K).

*R. syncollum* Balfour f. & Forrest, *ibid.* 11: 142 (1919). Type: China, NW Yunnan, mountains N of Atuntze, vi 1917, *Forrest* 14035 (holo. E).

*R. dumulosum* Balfour f. & Forrest, *ibid.* 13: 41 (1920). Type: China, NW Yunnan, Mekong/Salween divide, 13000ft, vi 1917, *Forrest* 14088 (holo. E).

Closely resembling some forms of *R. aganniphum* but with a darker indumentum than var. *aganniphum* and a less patchy indumentum than var. *flavorufum*.

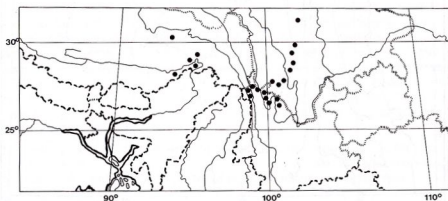
**20c. var. *levistratum*** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 120 (1978).

Syn.: *R. levistratum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 88 (1919).

Type: China, NW Yunnan, mountains of Atuntze, vi 1917, *Forrest* 14026 (holo. E; iso. K).

*R. dichropeplum* Balfour f. & Forrest, *ibid.* 13: 40 (1920). Type: China, NW Yunnan, in the NE of the Yangtze Bend, 12000ft, vii 1913, *Forrest* 10612 (holo. E; iso. K).

*R. theiophyllum* Balfour f. & Forrest, *ibid.* 13: 61 (1920). Type: China, SW Sichuan, Muli Mountains, vii 1918, *Forrest* 16836 (holo. E; iso. K).

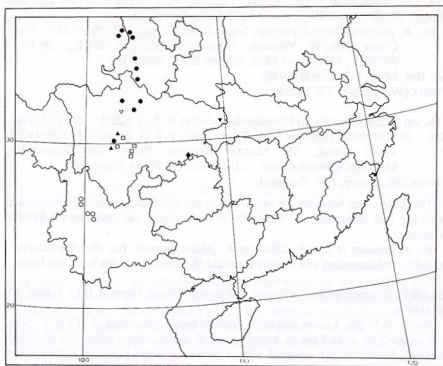


MAP 106. ● *R. phaeochrysum*.



- R. aiolopeplum* Balfour f. & Forrest, *ibid.* 13: 262 (1922). Type: China, W NW Yunnan, E of Chungtien, 12000ft, vii 1918, *Forrest* 16467 (holo. E; iso. K).
- R. helvolum* Balfour f. & Forrest, *ibid.* 13: 262 (1922). Type: China, W Yunnan, Mountains of Chungtien, 12–13000ft, vii 1918, *Forrest* 17784 (holo. E; iso. K).
- R. intortum* Balfour f. & Forrest, *ibid.* 13: 269 (1922). Type: China, NW Yunnan, Mekong/Salween divide, v 1918, *Forrest* 16303 (holo. E; iso. K).
- R. sigillatum* Balfour f. & Forrest, *ibid.* 13: 294 (1922). Type: China, NW Yunnan, Mekong/Salween divide, 12000ft, vii 1917, *Forrest* 14145 (holo. E; iso. K).
- R. vicinum* Balfour f. & Forrest, *ibid.* 13: 305 (1922). Type: China, NW Yunnan, Bei-ma-shan, 12–13000ft, vi 1917, *Forrest* 14024, (holo. E; iso. K).
- R. dryophyllum* sensu Cowan & Davidian, *Rhododendron & Camellia Yearbook* 10: 136 (1955) pro max. parte, excl. typ.

The type of *R. dryophyllum* is closer to var. *phaeochrysum* than to var. *levistratum*. However, most of the remaining material, including most cultivated specimens, that have been assigned to *R. dryophyllum*, should be referred to var. *levistratum*.



MAP 107. ▼ *R. roxieoides*; ● *R. przewalskii*; ◆ *R. coeloneuron*; □ *R. wiltonii*; ▲ *R. wasonii*; ○ *R. lacteum*; ▽ *R. barkamense*.

Intermediates between *R. phaeochrysum* and both *R. agganiphum* and *R. przewlaskii* occur in N & C Sichuan; these probably come from introgressed populations.

Var. *levistratum* in particular is also closely allied to both *R. alutaceum* (q.v.) and *R. traillianum*.

**21. (301.) *R. traillianum*** Forrest & W. W. Smith, Notes R.B.G. Edinb. 8: 204 (1914).

Shrub or small tree, 0.6–8m. Leaves obovate to elliptic,  $7-13 \times 3-6.5$ cm,  $2-3 \times$  as long as broad, apex apiculate to acuminate, base rounded, lower surface with a dense powdery compacted unistrate indumentum composed of rust-red, short- or long-rayed radiate hairs; petioles 1–2.5cm, floccose. Inflorescence 6–15-flowered; rhachis c.10mm; pedicels 10–15mm, tomentose. Calyx c.1mm, glabrous. Corolla funnel-campanulate, white, sometimes flushed with rose, with crimson flecks, 25–45mm. Ovary glabrous or sparsely red-brown tomentose; style glabrous. Capsule  $15-25 \times 8$ mm, straight or curved. Open slopes, pine forest margins, 3350–4550m. Map 108.

- 1. Hair arms of leaf indumentum short and pyriform; leaf apex apiculate; corolla 25–35mm.....**21a. var. *traillianum***
- + Hair arms of leaf indumentum long, ribbon-like; leaf apex apiculate to acuminate; corolla (35–)45mm .....**21b. var. *dictyotum***

**21a. var. *traillianum*.** Type: China, Yunnan, western Flank of the Lichiang Range,  $27^{\circ}30'N$ , vi 1918, *Forrest* 5870 (holo. E; iso. K).

Syn.: *R. aberrans* Tagg & Forrest, Notes R.B.G. Edinb. 13: 305 (1927). Type: China, Mid-W Yunnan, Chienchuan/Mekong divide,  $26^{\circ}30'N$   $99^{\circ}30'E$ , 11000ft, vi 1923, *Forrest* 23395 (holo. E).

lc.: Bot. Mag. 147: t.8900 (1938).

CHINA (W Yunnan, SW Sichuan).

**21b. var. *dictyotum*** (Tagg) Chamberlain, Notes R.B.G. Edinb. 36: 120 (1978).

Syn.: *R. dictyotum* [Balfour f. ex] Tagg, Notes R.B.G. Edinb. 15: 309 (1927).

Type: China, SE Xizang, Tsarong Prov., on Dokar La, Mekong/Salween divide, vi 1918, *Forrest* 16734 (holo. E).

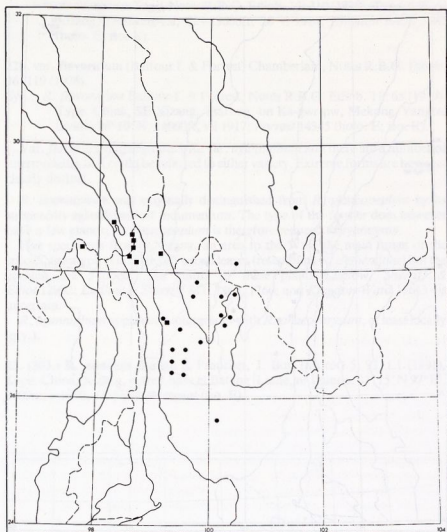
CHINA (SE Xizang, NW Yunnan).

The differences between the two varieties are small and are chiefly concerned with the leaf indumentum. Var. *dictyotum* replaces var. *traillianum* in NW Yunnan.

*R. traillianum* is closely allied to *R. phaeochrysum* but the characteristic powdery indumentum will usually separate the present species from the latter.

**22. (302.) *R. aganniphum*** Balfour f. & Kingdon-Ward, Notes R.B.G. Edinb. 10: 80 (1917).

Shrub, 0.3–3m. Leaves elliptic to broadly ovate-lanceolate,  $4-12 \times 2-5$ cm,  $1.7-2.5(-2.8) \times$  as long as broad, apex  $\pm$  acute, base cuneate to rounded-cordate, lower surface covered with a dense unistrate compacted to spongy ramiform tomentum, whitish or yellowish at first, sometimes turning deep reddish-brown, continuous, or splitting and becoming patchy; petioles 1–2cm, tomentose at first, later glabrescent. Inflorescence 10–20-flowered; rhachis less



MAP 108. ● *R. traillianum* var. *traillianum*; ■ var. *dictyotum*.

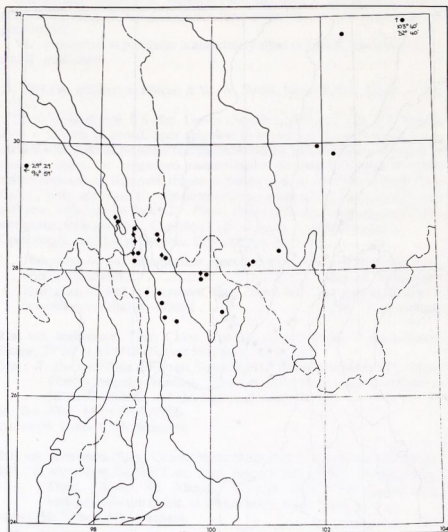
than 5mm; pedicels 10–30mm, sparsely tomentose to glabrescent. Calyx 0.5–1mm, glabrous or with a few scattered glands, lobes rounded. Corolla campanulate, white, often flushed with pink, with purple flecks, 30–35mm. Ovary and style glabrous. Capsule 10–20 × 4–6mm.

CHINA (SE Xizang, NW Yunnan, SW Sichuan). Open forests, among rocks, 3350–4550m. Map 109, p. 356.

1. Indumentum remaining pale and intact at maturity ... **22a. var. *aganniphum***

+ Indumentum turning deep red-brown and becoming patchy

**22b. var. *flavorufum***



MAP 109. ● *R. aganniphum* var. *aganniphum*; ◆ var. *flavorufum*.

**22a. var. *aganniphum*.** Type: China, Yunnan/Xizang Border, Dokar La, 14–15000ft, *Kingdon-Ward* 768 (iso. E).

Syn.: *R. schizopeplum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 13 (1919).

Type: China, NE Yunnan, mountains NW of Atuntze, 28°35'N, 14000ft, vi 1917, *Forrest* 14094 (holo. E).

*R. fissotectum* Balfour f. & Forrest, *ibid.* 13: 44 (1920). Type: China, NW Yunnan, W of Atuntzi, vi 1917, *Forrest* 14049 (holo. E; iso. K).

*R. glaucopeplum* Balfour f. & Forrest, *ibid.* 13: 46 (1920). Type: China, NW Yunnan, Mekong/Yangtze divide, vii 1917, *Forrest* 14133 (holo. E; iso. K).

*R. doshongense* Tagg, Notes R.B.G. Edinb. 15: 310 (1928). Type: China, Xizang, Doshong-La, 12–13000ft, 26 vi 1924, *Kingdon-Ward* 5863 (holo. E; iso. K).

**22b. var. *flavorufum*** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 36: 119 (1978).

Syn.: *R. flavorufum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 65 (1919). Type: China, SE Xizang, Tsarong, on Ka-gwr-pw, Mekong/Yangtze divide, 28°10' N, 14000ft, vii 1917, *Forrest* 14345 (holo. E; iso. K).

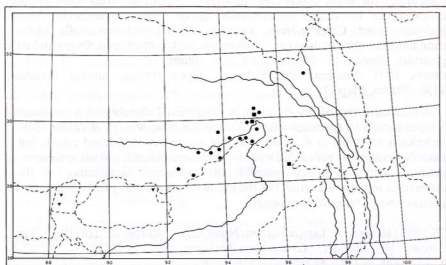
Var. *flavorufum* intergrades with var. *aganniphum* and there are a number of intermediates that could be referred to either variety. Extreme forms are however clearly distinct.

*R. aganniphum* was originally distinguished from *R. glaucopeplum* by its supposedly eglandular leaf indumentum. The type of the former does however have a few glands; *R. glaucopeplum* is therefore reduced to synonymy.

Five specimens from S Xizang, an area to the W of the main range of the species, are atypical in their stiff broad leaves (resembling *R. clementinae*) but the corollas are 5-lobed. The status of these plants—*Ludlow, Sherriff & Elliot* 12002; *Ludlow & Sherriff* 811, 1568, 1760; and *Kingdon-Ward* 11613—is uncertain.

*R. aganniphum* apparently intergrades with *R. phaeochrysum*, at least locally (q.v.).

**23. (303.) *R. principis*** Bureau & Franchet, J. Bot. (Morot) 5: 93, t.1 (1891). Type: China, Xizang, entre Lhasa et Batang [Lamé, nr Lamda, 31°15' N 97°E], 3000m, v 1890, *Henry & Bonvalot* (iso. E).



MAP 110. ■ *R. lanigerum*; ▼ *R. niveum*; ● *R. principis*.

Syn.: *R. vellereum* Hutchinson in Stevenson (ed.), *The Species of Rhododendron* 688 (1930). Described from the Tsangpo Valley in SE Xizang—based on a specimen from Lang Dzong, *Kingdon-Ward* 5640 (holo. K).

Ic.: Bot. Mag., n.s. 168: t.147 (1951).

Shrub, 2–6m. Leaves oblong to ovate-lanceolate, 6–12 × 1.8–5cm, (2–) 2.7–3.6 × as long as broad, apex ± acute, base rounded to cordate, lower surface with a white to fawn bistrate indumentum, the upper layer ramiform, spongy, lanate-tomentose, the lower ± compacted; petioles 1–2cm, tomentose at first, usually soon glabrescent. Inflorescence 10–20-flowered; rhachis 5–10mm; pedicels 15–20mm, glabrous, slender. Calyx c.1mm, lobes rounded, glandular-ciliate. Corolla campanulate, white to pink, with purple flecks, 25–37mm. Ovary and style glabrous. Capsule narrowly cylindrical.

CHINA (E Xizang). Open forests, among deciduous shrubs, etc., 2900–3950m. Map 110, p. 357.

Some of the ovaries of the type of *R. principis* have a few scattered hairs, whereas they are totally glabrous in the remaining material, including the type of *R. vellereum*. This is the only difference between the two taxa; the latter is therefore not maintained here. The following specimens are intermediate between *R. aganniphum* and *R. principis*: *Ludlow, Sherriff & Elliot* 15002, 15016.

**24. (304.) *R. clementinae*** Forrest, *Notes R.B.G. Edinb.* 8: 343 (1915). Type: China, Yunnan, on the mountains of the Chungtien Plateau, 11000ft, vii 1915, *Forrest* 10857 (holo. E; iso. K).

Ic.: Bot. Mag. 158: t.9392 (1935).

Shrub, 1–3m. Leaves ovate-lanceolate, (6.5–)9–14 × (3–)4.5–8cm, 1.5–2 × as long as broad, apex rounded, obtuse, base ± cordate, lower surface with a thick whitish to buff bistrate indumentum, the upper layer ramiform, lanate-tomentose, the lower compacted; petioles 1.5–2cm, glabrous when mature. Inflorescence 10–15-flowered; rhachis up to 12mm; pedicels 15–30mm, glabrous, stout. Calyx c.1mm, glabrous, lobes rounded. Corolla 7-lobed, campanulate, white to deep rose, with purple flecks, 40–50mm. Ovary and style glabrous. Stamens 12–14. Capsule c.20 × 10mm.

CHINA (NW Yunnan, SW Sichuan). Open forests, among boulders, 3350–3950m. Map 111, p. 360.

A distinctive species, the only one in subsection Taliensia with a consistently 7-lobed corolla. A specimen from S Xizang, *Ludlow, Sherriff & Taylor* 3868, is technically referable to *R. clementinae* on account of its 7-lobed corolla but it has an apiculate leaf with a thin white indumentum beneath and white-tomentose petioles. Without further material, the taxonomic significance of these differences remains uncertain but the locality is considerably further west of the present known range of the species.

**25. (305.) *R. prunum*** Tagg & Forrest, *Notes R.B.G. Edinb.* 13: 318 (1927). Type: China, W Yunnan, Chienchuan/Mekong divide, 26°30'N, 99°40'E, 13–14000ft, vi 1923, *Forrest* 23375 (holo. E).

Creeping shrub, 0.15–0.6m; perulae persistent. Leaves elliptic, (4–)6–7.5 × 1.8–2.8cm, 2.7–3.5 × as long as broad, apex acuminate, base cuneate, lower

surface with a dense greyish to fawn bistrate indumentum, the upper layer loosely ramiform, lanate-tomentose, the lower compacted; petioles c.1cm, glabrescent. Inflorescence 6–10-flowered; rhachis less than 5mm; pedicels 10–15mm, glabrous. Calyx 1–2mm, glabrous or occasionally sparsely floccose. Corolla funnel-campanulate, white or pale yellow to pink, with purple flecks, 35–45mm. Ovary and style glabrous. Capsule c.10 × 4mm.

CHINA (W Yunnan). Rocky pastures, 3650–4400m. Map 111, p. 360.

A distinctive species with no close allies.

**26. (306.) *R. faberi*** Hemsley, J. Linn. Soc., Bot. 26: 22 (1889).

Shrub, c.2m. Leaves elliptic to ovate-lanceolate, 6–17 × 2.8–8cm, 2–2.5 × as long as broad, apex acuminate to apiculate, base rounded, lower surface with a bistrate indumentum, the upper layer loose, composed of rust-red detersile ramiform hairs that usually do not persist, the lower compacted, whitish, persistent; petioles 0.5–2cm, densely tomentose. Inflorescence 7–20-flowered; rhachis up to 10mm; pedicels (15–)25–30mm, densely glandular. Calyx 7–10mm, sparsely glandular, lobes broad, divided almost to base. Corolla campanulate to funnel-campanulate, white or cream to pink, sometimes with crimson flecks and/or a basal blotch, 30–40mm. Ovary densely stipitate-glandular, sometimes also hairy; style glabrous or glandular at base. Capsule 15–20 × c.5mm.

CHINA (C Sichuan). Alt. 3050–4400m. Map 111, p. 360.

1. Leaves 6–11 × 2.8–4.5cm, when juvenile with upper layer of indumentum dense ..... **26a. subsp. *faberi***
- + Leaves 10–17 × 5–8cm, when juvenile with upper layer of indumentum sparse ..... **26b. subsp. *prattii***

**26a. subsp. *faberi*.** Type: China, Sichuan, summit of Mt Omei, *Faber* (holo. K).

Syn.: *R. faberioides* Balfour f., Notes R.B.G. Edinb. 13: 44 (1920). Type: China, W Sichuan, vi 1908, *Wilson* 3436 (holo. K).

*R. wuense* Balfour f., ibid. 13: 64 (1920). Type: China, SW Sichuan, Mt Wu, *Wilson* 3960 (A,K).

!c.: Fang, Pl. Omeiens. t.24 (1942).

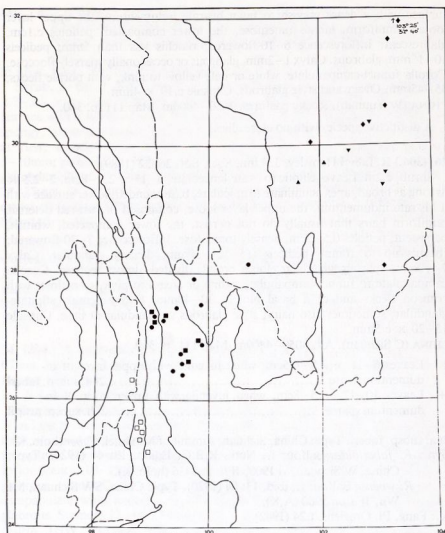
**26b. subsp. *prattii*** (Franchet) Chamberlain, Notes R.B.G. Edinb. 36: 120 (1978).

Syn.: *R. prattii* Franchet, J. Bot. (Morot) 9: 389 (1895). Syntypes: China, Sichuan, aux environs de Ta-tzien-lou, *Pratt* 58 (A, E, K); *Soulié* 8 bis, n.v.

*R. leeii* Fang, Acta Phytotax. Sin. 2: 82 (1952). Type: China, Sichuan, Hsi-shui-lo, Mow Hsien, 2850–3000m, 21 vi 1951, *Lee*, T. C. 2210 (holo. SZ).

!c.: Bot. Mag. 158: t.9414 (1935).

At their extremes the two subspecies are very distinct. However there are intermediates, especially from around Tatsien-lu (Kang-ting Xian). These intermediates include the type of *R. bureavioides* Balfour f. (Notes R.B.G. Edinb. 13: 35, 1920) from W China, 1904, *Wilson* 3954 (holo. K; iso. A), with the large leaves of subsp. *prattii* but a thicker, more persistent upper layer of leaf indumentum than is usual in subsp. *prattii*.



MAP 111. ● *R. clementinae*; ■ *R. prunum*; ▼ *R. faberi* subsp. *faberi*; ▲ subsp. *faberi*/subsp. *prattii*; ◆ subsp. *prattii*; □ *R. griersonianum*.

*R. faberi* resembles *R. bureavii* and *R. nigroglandulosum* in its well-developed calyx and glandular ovary but differs from both in its clearly bistrate leaf indumentum which suggests an affinity with *R. rufum*.

27. (307.) *R. przewalskii* Maximovicz, Bull. Acad. Sci. Saint-Petersbourg 23: 350 (1877). Type: China, Prov. Kansu, *Przewalsky* (iso. E, K).

Syn.: *R. kialense* Franchet, J. Bot. (Morot) 9: 392 (1895). Type: China, Sichuan, aux environs de Ta-tzien-lou, *Soulié* 763 (iso. E).

*R. dabanshanense* Fang & Wang, Acta Bot. Sin. 20: 358 (1978). Type: China, Qinghai, Lo Tu (Daban Shan), 2600–3200m, *Chao* 7212 (holo. Qinghai Biological Research Inst., n.v.).



Shrub, 1–2.7m. Leaves broadly elliptic, (4.5–)6–10 × 2–4.5cm, 1.8–3 × as long as broad, apex apiculate, base rounded, lower surface with a compacted, ± agglutinated, unistrate, whitish to pale brown indumentum of long-rayed hairs, or sometimes glabrescent; petioles c.1cm, glabrous, usually yellowish in herbarium specimens. Inflorescence 10–15-flowered; rhachis 10–15mm; pedicels 15–20mm, glabrous. Calyx c.0.5mm, glabrous. Corolla campanulate, white to pale pink, with purple flecks, 25–35mm. Ovary and style glabrous. Capsule c.20 × 5mm.

CHINA (Qinghai, Gansu, N & C Sichuan). Mountain ridges, spruce forest, 3050–4250m. Map 107, p. 353.

*R. przewalskii* shares a compacted, often agglutinated leaf indumentum with *R. phaeochyrsum* and apparently intergrades with that species in Sichuan.

The leaves of *R. dabanshanense* are described as being entirely glabrous which is uncommon in *R. przewalskii*, though, when they are glabrous the leaf undersurface and the petioles tend to be yellowish-green, a feature that is particularly mentioned in the type description of *R. dabanshanense*. In that species the corollas are described, possibly erroneously, as being 12mm long, about half the size of those of *R. przewalskii*.

28. (308.) *R. rufum* Batalin, Acta Horti Petrop. 11: 490 (1891). Type: China, W Sichuan, in valle fluv. Kaernzo, 6 vii 1895, *Potanin*, n.v.

Syn.: *R. weldianum* Rehder & Wilson in Sargent (ed.), Pl. Wilsonianae 1: 532 (1913). Type: China, E Sichuan, W of and near Wen-chuan Hsien, 3300m, x 1910, *Wilson* 4235, n.v.

Shrub, 1.3–4.5m. Leaves narrowly obovate to elliptic, 6.5–11 × 2.5–5cm, 2.2–3 × as long as broad, apex apiculate, base rounded to cuneate, lower surface covered with a bistrate indumentum, the upper layer a thin to dense reddish-brown ramiform tomentum, the lower compacted, whitish, embedded in a surface film; petioles c.1cm, tomentose. Inflorescence 6–11-flowered; rhachis c.5mm; pedicels 7–15mm, densely tomentose. Calyx c.0.5mm, tomentose. Corolla campanulate, white to pale pink, with crimson flecks, 20–32mm. Ovary densely reddish-tomentose, with a few stipitate glands below the style; style glabrous or with a few hairs at base. Capsule 15–25 × 5–7mm, falcate.

CHINA (N Sichuan, Gansu). Alt. 3050–3650. Map 98, p. 327.

The differences between the cuneate leaf-bases of *R. weldianum* and the rounded leaf bases of *R. rufum* do not merit the maintenance of the former at any rank. *R. rufum* is a distinctive species, probably distantly allied to *R. przewalskii*.

29. (309.) *R. coeloneuron* Diels, Bot. Jahrb. 29: 513 (1900); Fang, Contr. biol. Lab. Sci. Soc. China, Bot. ser. 12: 57 (1939), descr. ampl. Type: China, E Sichuan, Nan Chuan, Met'u-Wan, 1891, *Bock von Rothorn* 929 (photo. E).

Tree, 4–8m. Leaves oblanceolate, 7.5–12 × 2.5–4cm, 3–3.5 × as long as broad, apex acuminate, sometimes with extreme tip blunt, base cuneate, lower surface with a dense bistrate indumentum, the upper layer rufous, ramiform-tomentose, persistent or evanescent, the lower whitish, adpressed, scurfy; petioles 1–2cm, densely rufous-tomentose. Inflorescence 6–9-flowered; rhachis c.3mm; pedicels 7–15mm, densely rufous-tomentose. Calyx c.2mm, tomentose.

Corolla funnel-campanulate, pink or purplish, 40–45mm. Ovary densely rufous-tomentose; style glabrous. Capsule not known.  
CHINA (SE Sichuan). Map 107, p. 353.

Distantly allied to *R. rufum* and *R. wiltonii*.

**30. (310.) *R. wiltonii*** Hemsley & Wilson, Kew Bull. 1910: 107 (1910). Type: China, Sichuan, in thin woods, 3300m, v 1904, *Wilson* 3952 (holo. A; iso. BM, K, SYS).

Ic.: Bot. Mag. 158: t.9388 (1935); Fang, Pl. Omeiens. t.25 (1942).

Shrub, 1–4.5m. Leaves oblanceolate to broadly elliptic, 5–12 × 1.5–4cm, 2.5–6 × as long as broad, apex apiculate, base cuneate, upper surface with deeply impressed veins so appearing bullate, lower surface with a dense unistrate cinnamon to rust-red fasciculate to ramiform tomentum; petioles 1.5–3cm, tomentose at first, soon glabrescent. Inflorescence c.10-flowered; rhachis 5–7mm; pedicels 15–25mm, usually lanate-pubescent. Calyx c.1mm, tomentose. Corolla campanulate, white to pink, with red flecks, 30–40mm. Ovary densely rust-red lanate-tomentose, eglandular; style glabrous or hairy at base. Capsule 22–25 × 4–5mm, falcate.

CHINA (C Sichuan). Rocky pastures and slopes, 2450–3350m. Map 107, p. 353.

A distinctive species on account of its bullate leaves, apparently without close allies.

**31. (311.) *R. wasonii*** Hemsley & Wilson, Kew Bull. 1910: 105 (1910). Syntypes: China, W Sichuan, nr Tatsienlu, 2800–3000m, *Wilson* 3955 (BM, E), 3956 (BM, K), 3965a (A).

Sprawling shrub, 0.6–1.5m. Leaves ovate-lanceolate, 7–8 × 2.5–4cm, 1.6–3 × as long as broad, apex apiculate to shortly acuminate, base cuneate, lower surface with a sparse to dense unistrate reddish-brown indumentum of long-rayed hairs intermixed with a few glands, rarely glabrescent; petioles 1–1.5cm, tomentose and sparsely glandular. Inflorescence 8–15-flowered; rhachis c.10mm; pedicels 20–30mm, tomentose. Calyx c.0.5mm, tomentose. Corolla open-campanulate, yellow or white to pink, with purple flecks, 35–40mm. Ovary densely reddish-hairy, eglandular; style glabrous. Capsule cylindrical.

CHINA (C Sichuan). Alt. 2300–3000m. Map 107, p. 353.

A variable species. In cultivation two forms are known, one with creamy yellow corollas and the other with whitish to pink corollas (forma *rhododactylum*). The latter matches the syntype *Wilson* 3956. The status of this form will remain uncertain until further field-work is carried out.

**32. (312.) *R. lacteum*** Franchet, Bull. Soc. Bot. France 33: 231 (1890). Type: China, Yunnan, ad collem Yen-tze-hay, 3200m, 31 v 1887, *Delavay* 164 (iso. E). Syn.: *R. mairei* Léveillé, Feddes Repert. 12: 285 (1913). Type: China, Yunnan, Lei Tsou mountains, 3000m, v 1912, *Maire* (holo. E).

Ic.: Bot. Mag. 149: t.8988 (1923); Stevenson (ed.), The Species of Rhododendron 380, t. (1930).

Shrub or small tree, 2–7.5m. Leaves elliptic to obovate, 8–17 × 4.5–7cm, 2–2.5 × as long as broad, apex rounded, apiculate, base rounded, lower surface

covered with a thin unistrate compacted indumentum composed of grey-brown radiate hairs; petioles 2–2.5cm, glabrescent. Inflorescence 15–30-flowered; rhachis 25–30mm; pedicels 25–30mm, floccose at first, soon glabrescent. Calyx c.1mm, glabrescent. Calyx c.1mm, glabrous, lobes rounded. Corolla widely campanulate, pure yellow, without flecks, sometimes with a purple basal blotch, 40–50mm. Ovary densely tomentose; style glabrous. Capsule c.20 × 5mm, curved.

CHINA (W Yunnan). Rocky slopes, forest margins, 3700–4000m. Map 107, p. 353.

Two plants, *Forrest* 25583 & 25776, with pink flowers but otherwise resembling *R. lacteum*, may be hybrids.

**33. (313.) *R. barkamense* Chamberlain, sp. nov.** (see p. 478). Type: China, N Sichuan, Barkam Xian (Ma-erh-Kang), Gong Zhang Mts, 3800m, 20 vi 1957, *Li, X.* 71626 (holo. PE).

Shrub, 4.5m. Leaves ovate, 5.5–7 × 4–4.7 cm, 1.4–1.9 × as long as broad, apex apiculate, base cordate, lower surface covered with a thin brown velutinous tomentum composed of radiate hairs; petioles c.1cm, finely tomentose. Inflorescence c.7-flowered; rhachis c.12mm; pedicels 7–10mm, with a thin discontinuous tomentum. Calyx c. 1mm, ± glabrous, lobes rounded. Corolla open-campanulate?, c.35mm, pale yellow with purple flecks. Ovary and style glabrous. Capsule not known.

CHINA (N Sichuan). Alt. 3800m. Map 107, p. 353.

Allied to *R. lacteum* with which it shares yellow flowers and a radiate leaf indumentum, but with smaller leaves with cordate bases and smaller flowers with glabrous ovaries.

**34. (314.) *R. pomense* Cowan & Davidian, Notes R.B.G. Edinb. 21: 146 (1953).** Type: China, SE Xizang, Pome Prov., above Showa Dzong, 11000ft, 18 vi 1947, *Ludlow, Sherriff & Elliot* 13177 (holo. BM).

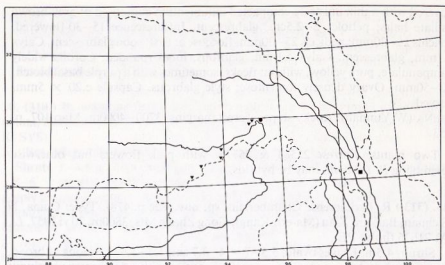
Shrub, 0.6–1.2m. Leaves oblong-oval, 8.5–10 × 3.5–4.7cm, 2–2.5 × as long as broad, apex apiculate, base rounded, lower surface with a thin unistrate compacted brown indumentum; petioles 1.5–2cm, floccose. Inflorescence c.5-flowered; rhachis short; pedicels 13–25mm, densely tomentose. Calyx c.12mm, glabrous, lobes unequal, with ciliate margins. Corolla pink, c.38mm. Ovary densely tomentose. Capsule not known.

CHINA (SE Xizang). Only known from the type. Map 112, p. 364.

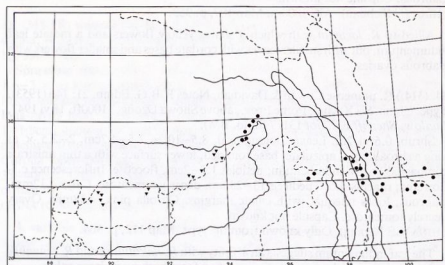
The leaf indumentum suggests an affinity with *R. nakotiltum* and *R. dignabile* but the present species may be distinguished from both by its large calyx.

**35. (315.) *R. nakotiltum* Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 143 (1920).** Type: China, W NW Yunnan, Mekong/Salween divide, 11–12000ft, vi 1917, *Forrest* 14060 (holo. E; iso. K).

Shrub, 1–3.5m. Leaves elliptic, 8–11 × 3–4.3cm, c.2.5 × as long as broad, apex acute to apiculate, base rounded, lower surface with a bistrate indumentum, the upper layer loose and fawn, with long-rayed floccose hairs, the lower compacted; petioles c.1.5cm, glabrescent. Inflorescence 12–15-flowered; rhachis 5–10mm; pedicels c.15mm, sparsely pubescent. Calyx c.1mm, glabrous,



MAP 112. ● *R. pomense*; ■ *R. nakotitum*; ▼ *R. dignabile*.



MAP 113. ● *R. uvarifolium*; ▼ *R. lanatum*.

lobes rounded. Corolla funnel-campanulate, white flushed rose to pale pink, with purple flecks and sometimes also a basal blotch, 30–35mm. Ovary densely rufous-tomentose; style glabrous. Capsule not known.

CHINA (NW Yunnan). Open scrub and pine forests, 3350–4000m. Map 112.

Allied to *R. pomense* and *R. dignabile*.

36. (316.) *R. dignabile* Cowan, Notes R.B.G. Edinb. 19: 241 (1938). Type: China, SE Xizang, Le La (Kyimpu), Chayul Charme, 13000ft, 9 v 1936, Ludlow & Sherriff 1564 (holo. BM; iso. E).

Shrub or small tree, 0.6–6m. Leaves elliptic to obovate-lanceolate, 7.5–18 × 4–6.5cm, 1.8–2.7 × as long as broad, apex acute to apiculate, base cordate to ± rounded, lower surface with a thin discontinuous unistrate brown indumentum composed of the scattered remains of hairs and glands; petioles 0.5–2cm, sparsely floccose or glabrescent. Inflorescence 5–15-flowered; rhachis c.10mm; pedicels 5–20mm, glabrescent or sparsely floccose. Calyx 0.5–3mm, lobes rounded, usually glandular-ciliate. Corolla campanulate to funnel-campanulate, white to yellow, sometimes flushed pink, with or without purple flecks and basal blotch, 25–45mm. Ovary glabrous or with a brownish-red floccose indumentum, sometimes interspersed with glands; style usually glabrous, occasionally glandular below. Capsule not known.

CHINA (E Xizang). Forests, open stony slopes, 3350–4550m. Map 112.

A variable species. Specimens from open habitats are significantly smaller, with shorter corollas and leaves. There also appears to be considerable variation in the amount of indumentum on the ovaries.

37. (317.) *R. beesianum* Diels, Notes R.B.G. Edinb. 5: 214 (1912). Type: China, Yunnan, E Flank of the Lichiang Range, 11–12000ft, v 1906, Forrest 2323 (holo. E; iso. K).

Syn.: *R. colletum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 39 (1919).

Type: China, W NW Yunnan, Mekong/Salween divide, 11000ft, vii 1917, Forrest 14450 (holo. E; iso. K).

*R. emaculatum* Balfour f. & Forrest, ibid. 13: 42 (1920). Type: China, SE Xizang, Tsarong, Dokar-la, Mekong/Salween divide, vii 1917, Forrest 14352 (holo. E; iso. K).

Ic.: Rhododendron & Camellia Yearbook 10: f.47 (1955).

Shrub or tree, 1.8–9m. Leaves oblanceolate to elliptic, 9–19 × 2.6–8.2cm, 3–5.3 × as long as broad, apex apiculate, base attenuate to rounded, lower surface with a thin unistrate compacted fawn to brown indumentum composed of radiate hairs; petioles 1.5–2cm, sometimes winged, glabrous or floccose. Inflorescence 10–25-flowered; rhachis c.25mm; pedicels 15–25mm, sparsely hairy. Calyx 0.5–1mm, glabrous, lobes rounded. Corolla broadly campanulate, white flushed rose to pink, with or without purple flecks and a basal blotch, 35–45(–55)mm. Ovary densely white- to brown-tomentose; style glabrous. Capsule 20–45 × 6–9mm, curved.

CHINA (SE Xizang, NW Yunnan, SW Sichuan), NE UPPER BURMA. Map 114, p. 367.

In general form *R. beesianum* resembles *R. uvarifolium* (subsection Fulva) but its leaf indumentum suggests a closer affinity with *R. nakotiltum* and *R. dignabile*.

38. (318.) *R. wightii* Hooker f., Rhododendrons Sikkim Himalaya t.27 (1851). Type: N India, Sikkim, wooded valleys and on spurs of all the mountains, 12–14000ft, abundant (holo. K).

Ic.: Bot. Mag. 139: t.8492 (1913).

Shrub, 2–4.5m. Leaves broadly elliptic to obovate, 5–14 × 3.5–6.5cm,

2–2.5 × as long as broad, apex apiculate, base ± cuneate to rounded, lower surface with a dense unistrate rust-brown indumentum composed of ramiform hairs; petioles 1–2.5cm, sparsely tomentose to glabrescent. Inflorescence 10–20-flowered; rhachis 15–20mm; pedicels 15–30mm, tomentose. Calyx c.0.5mm, glabrous. Corolla 5(–7)-lobed, campanulate to mortar-shaped, pale to lemon-yellow, with brown or purple flecks, 35–45mm. Ovary densely red-brown tomentose; style glabrous. Capsule 20–30 × c.5mm, straight or curved. NEPAL, NE INDIA (Sikkim, Arunachal Pradesh), BHUTAN, CHINA (S Xizang). Among scrub, stony ground, on ridges, 3350–4550m. Map 69, p. 243.

Cultivated material seen has a lobed corolla resembling species of subsection *Grandia* and an inflorescence reminiscent of that subsection. However, it is not known how typical these plants are of the species in the wild, especially as most of the herbarium material seen has 5-lobed corollas. *R. wightii* clearly has aberrant features in subsection *Taliensia* and further field studies may result in its transfer to subsection *Grandia*.

**XVI. Subsection *Fulva*** Sleumer, Bot. Jahrb. 74: 549 (1949).

Syn.: Series *Fulvum* sensu Tagg in Stevenson (ed.), The Species of *Rhododendron* 287 (1930).

Large shrubs or small trees, 2–10m; bark rough; young shoots fulvous- or greyish-tomentose. Leaves coriaceous, elliptic to oblong, lower surface covered with a dense unistrate or bistrate indumentum, the upper, when present, fulvous, composed of capitellate hairs, or greyish and floccose, the lower composed of dendroid hairs. Inflorescence dense, 6–30-flowered; rhachis 5–15mm. Calyx minute. Corolla 5-lobed, campanulate, lacking nectar pouches, white to pale pink, usually with a basal blotch, often also with crimson flecks. Stamens 10. Ovary glabrous.

Type species: *R. fulvum* Balfour f. & W. W. Smith

A subsection of uncertain affinity; possibly allied to either subsections *Taliensia* or *Argyrophylla*.

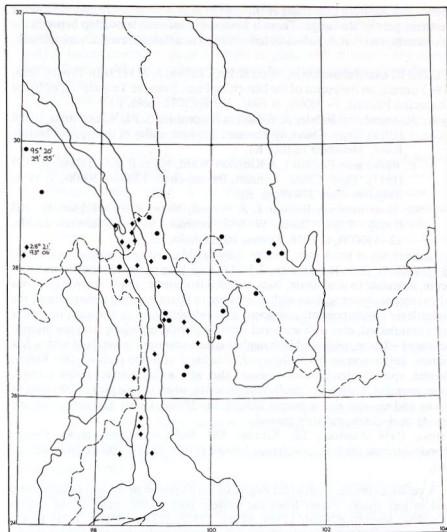
1. Leaf indumentum bistrate, the upper layer fulvous, composed of capitellate hairs..... **1. *fulvum***
- + Leaf indumentum unistrate or bistrate, white or silvery, composed of dendroid hairs, giving a more continuous, matted appearance **2. *uvarifolium***

**1. (319.) *R. fulvum*** Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 10: 110 (1917). Type: China, W Yunnan, western flank of the Shweli/Salween divide, 10–11000ft, viii 1912, *Forrest* 8929 (holo. E).

Syn.: *R. fulvoides* Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 112 (1920).

Type: China, NW Yunnan, Mekong/Salween divide, 11000ft, x 1914 *Forrest* 13400 (holo. E).

Shrub or small tree, 2–8m; young shoots rufous-tomentose. Leaves oblanceolate to elliptic, 8–22 × 3.6–8cm, 2.2–3.5 × as long as broad, apex ± rounded, apiculate, base cuneate, upper surface glabrous when mature, lower surface with a dense bistrate indumentum, the upper layer fulvous, largely composed of capitellate hairs, giving the surface a granular appearance, the lower stellate-velutinous, whitish; petioles 1–2cm, with a compacted tomentum intermixed with some stipitate glands. Inflorescence 10–20-flowered; rhachis



MAP 114. ● *R. beesianum*; ◆ *R. fulvum*.

10–15mm; pedicels 20–30mm, slender, glabrous. Calyx c.0.5mm, glabrous. Corolla campanulate, white to pink, usually with a basal blotch, with or without purple or crimson flecks, 25–45mm. Ovary glabrous. Capsule 25–40 × 4–5mm, strongly curved.

CHINA (W Yunnan, SE Xizang), and adjacent NE UPPER BURMA. Rhododendron thickets, etc., 3000–4700m. Map 114.

There is variation in leaf shape and in the colour of the indumentum which is only partly correlated with geographical distribution. Plants with relatively broad leaves on which the indumentum is pinkish-brown to rust-coloured (matching the type) occur in the southern part of the species range, though apparently alongside narrower-leaved forms, with a darker, often yellowish-

brown indumentum (matching *R. fulvoides*) that become more common in the northern part of the range. There is however considerable overlap between the two extremes so that *R. fulvoides* has not been maintained, even at varietal rank.

2. (320.) *R. uvarifolium* Diels, Notes R.B.G. Edinb. 5: 213 (1912). Type: China, NW Yunnan, on the ascent of the Nin-ching Pass, from the Yangtze Valley to the Chungtien Plateau, 7–8000ft, ix 1904, *Forrest* 5072 (holo. E).

Syn.: *R. mombeigii* Rehder & Wilson in Sargent (ed.), Pl. Wilsonianae 1: 536 (1913). Type: China, W Yunnan, Tse-kou, valley of the Upper Mekong River, *Mombeig* 16 (iso. K).

*R. niphargum* Balfour f. & Kingdon-Ward, Notes R.B.G. Edinb. 10: 125 (1917). Type: China, Yunnan, Bei-ma-chan, 12000–13000ft, vi 1913, *Kingdon-Ward* 324 (holo. E).

*R. dendritrichum* Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 103 (1920). Type: China, W NW Yunnan, Mekong/Salween divide, 12–13000ft, iii 1918, *Forrest* 16366 (holo. E).

Large shrub or small tree, 2–10m. Leaves oblanceolate to elliptic or oblong, (8–)14–22 × (3.3–)4.5–6.5cm, 2.3–4.6 × as long as broad, apex rounded to acute, apiculate to acuminate, base rounded to cuneate, upper surface glabrous when mature, lower surface with a unistrate to bistrate silvery indumentum, the upper layer (when present) composed of dendroid hairs, ± floccose, the lower layer compacted, also with scattered stipitate glands, especially near the midrib; petioles 1–2.5cm, with a whitish agglutinated tomentum intermixed with a few glands. Inflorescence 6–30-flowered; rhachis 5–10mm; pedicels 20–30mm, slender, sparsely dendroid-tomentose, also with a few glands. Calyx c.1mm, lobes rounded, glabrous. Corolla campanulate, white to pale pink, with crimson flecks and usually also a purple blotch, 30–35mm. Ovary glabrous. Capsule 25–45 × 4–5mm, strongly curved.

CHINA (NW Yunnan, SE Xizang, SW Sichuan). Open rocky slopes, Rhododendron thickets, coniferous forests, (2100–)3000–4000m. Map 113, p. 364.

A variable species, both in the degree of development of the leaf indumentum and in leaf shape. Plants from the western part of the range of the species (*Ludlow*, *Sherriff* & *Elliot* 12329, 12342, 12372, 12375, 12388, 12521, 13544, 13567, 15034, 15054, 15080) have been referred to var. *griseum* Cowan (Notes R.B.G. Edinb. 21: 147, 1953); type: *L.*, *S.* & *E.* 13521. These have leaves with rounded bases and consistently compacted indumentum but there is considerable variation in the relative width of the leaves and in the number of flowers per inflorescence. Over most of its range, however, the species is more uniform and almost always has oblanceolate leaves with cuneate bases. The leaf indumentum ranges from bistrate with a persistent dendroid tomentum characteristic of plants referred to *R. dendritrichum* to unistrate and compacted (as in var. *griseum*). Without extensive field studies the status of var. *griseum* remains uncertain.

**XVII. Subsection *Lanata*** Chamberlain, Notes R.B.G. Edinb. 37: 337 (1979).

Syn.: Series *Campanulatum* sensu Tagg, pro parte.

Subsection *Campanulata* Sleumer, pro parte.

Shrubs, 0.3–4m, or small trees, up to 7.5m; young shoots densely lanate-tomentose. Leaves obovate to elliptic, lower surface covered with a dense



unistrate light brown to rufous (rarely whitish) lanate or crisped tomentum composed of dendroid hairs. Inflorescence lax or dense, 3–15-flowered; rhachis 3–10 mm. Calyx minute. Corolla 5-lobed, campanulate or open-campanulate, lacking nectar pouches, yellow or white to pink, with at least a few crimson flecks. Stamens 10. Ovary densely tomentose (predominantly glandular in *R. circinnatum*).

Type species: *R. lanatum* Hooker f.

Probably only distantly related to subsection Campanulata in the strict sense; possibly closer to *R. wasonii* and its immediate relatives in subsection Taliensia.

1. Leaves 3.5–5.5 cm long .....4. *tsariense*
- + Leaves 6.5–11 cm long .....2
2. Leaves usually 4–4.5 × as long as broad; leaf indumentum lanate-tomentose.....3. *lanatoides*
- + Leaves usually 2–3 × as long as broad; leaf indumentum ± crisped-tomentose .....3
3. Ovary rufous-tomentose, eglandular .....1. *lanatum*
- + Ovary densely stipitate-glandular.....2. *circinnatum*

1. (321.) *R. lanatum* Hooker f., *Rhododendrons Sikkim Himalaya* 17, t.16 (1849). Type: N India, Sikkim, common at Jongri and Chola, 10–12000ft, *Hooker* (holo. K; iso. A, E).

Syn.: *R. lanatum* Hooker f. var. *luciferum* Cowan in *Notes R.B.G. Edinb.* 19: 228 (1937). Type: China, S Xizang, Tsari, Bimbi La, 3 vi 1936, *Ludlow & Sherriff* 1762 (holo. BM).

*R. luciferum* (Cowan) Cowan, *Notes R.B.G. Edinb.* 21: 145 (1953).

*R. flinckii* Davidian, *Quart. Bull. Amer. Rhododendron Soc.* 25: 143 (1975). Type: Bhutan, Kopub, Pumthang, 10000ft, 18 vi 1915, *Cooper* 3990 (holo. E).

Ic.: *Rev. Hort. ser.* 4,4: 161, t. (1855); *Rhododendron & Camellia Yearbook* 21: frontispiece (1966).

Shrub, 0.3–4(–7.5)m; shoots densely rufous- or white-tomentose. Leaves usually coriaceous, elliptic to obovate, 6.5–11 × 2.5–4.2cm, 2–3(–3.5) × as long as broad, apex rounded, apiculate, base rounded, upper surface with lamina glabrous or with a floccose indumentum that in most specimens persists over the midrib, lower surface with a dense, usually thick ± crisped tomentum composed of dendroid hairs, whitish when young, maturing to a deep rufous-brown or mid coffee-brown; petioles c.1cm, densely tomentose. Inflorescence 5–10-flowered; rhachis 3–10mm; pedicels 10–20mm, densely white- to brown-tomentose. Calyx c.1mm, tomentose. Corolla campanulate, creamy yellow, with crimson flecks, 32–50mm. Ovary densely rufous-tomentose. Capsule 15–25 × 4–8mm, curved.

NE INDIA (Sikkim, Arunachal Pradesh), BHUTAN, CHINA (S Xizang). Abies forests, scrub, cliffs, etc., 3000–4500m. Map 113, p. 364.

A species with considerable local geographical variation. Material from Sikkim in general matches the type in having a thick, coffee-coloured leaf indumentum. However, specimens from around Bumthang in C Bhutan have a thinner, more crisped rufous leaf indumentum and sometimes have pinkish flowers. These include the type of *R. flinckii* (see above), also *Cooper* 2148, 3987

& Ludlow, Sherriff & Elliot 18890, 18998. Plants from W Bhutan are intermediate in these characters. Specimens from S Xizang (*R. luciferum*) often have relatively narrow leaves (c.3 × as long as broad) with a thick, mid-brown indumentum, although one plant Ludlow & Sherriff 1608, from Yarap, approaches *R. circinnatum* in its more crisped, thinner leaf indumentum. Field studies are required before this species is further subdivided.

*R. lanatum* apparently hybridises with *R. tsariense* where the ranges of the two species overlap.

2. (322.) *R. circinnatum* Cowan & Kingdon-Ward, Notes R.B.G. Edinb. 19: 179 (1936). Type: China, S Xizang, Bimbi La, 13–14000ft, 12 vii 1935, *Kingdon-Ward* 11964 (iso. E).

Differs from *R. lanatum* in its predominantly glandular ovary that only has a few lanate hairs.

Leaves elliptic to oblong, up to 11 × 3.5cm, lower surface with a thin mid-brown crisped indumentum.

Map 115.

The only specimen seen is very poor and only has old corollas; the flower colour is therefore not known. In the absence of adequate material, the status of this taxon is unclear.

3. (323.) *R. lanatoides* Chamberlain, *sp. nov.* (see p. 478). Type: China, SE Xizang, Pomé, Tongyuk Dzong, 12000ft, 21 v 1947, *Ludlow, Sherriff & Elliot* 13746 (holo. E; iso. BM).

Shrub, 2–4m. Leaves lanceolate, 9–11 × 2.1–2.7(–3.2)cm, (3–)4–4.7 × as long as broad, apex acuminate, upper surface glabrous except for a persistent tomentum overlying the midrib towards the base, lower surface covered with a dense lanate, dark fawn to light brown indumentum composed of dendroid hairs with long ± straight (not crisped) branches; petioles 1–1.5cm, densely light brown to whitish tomentose. Inflorescence dense, 10–15-flowered; rhachis 7–10mm; pedicels 7–15mm, densely brownish lanate-tomentose. Calyx c.1mm, lobes triangular, sparsely tomentose. Corolla campanulate, white flushed pink, with a few faint flecks, 35–40mm. Ovary densely brown-tomentose; style glabrous. Capsule not known.

CHINA (SE Xizang). Among rocks, 3200–3650m. Map 115.

Allied to *R. lanatum* but leaves narrow and acuminate, with a non-crisped lanate indumentum and flowers white flushed pink.

4. (324.) *R. tsariense* Cowan, Notes R.B.G. Edinb. 19: 232 (1937). Type: China, S Xizang, Tsari Chu, Podzo Samdo, 11000ft, 22 v 1936, *Ludlow & Sherriff* 1636 (holo. BM; iso. E).

Ic.: *Rhododendron* & *Camellia* Yearbook 19: t.1 (1964).

Shrub, 1–3m; young shoots densely tomentose. Leaves coriaceous, obovate to oblong, 3.5–5.5 × 1.5–3cm, 1.6–2.2 × as long as broad, apex rounded and bluntly apiculate to acute, base rounded, upper surface with lamina glabrous though with a persistent indumentum overlying the midrib, lower surface with a dense rufous-tomentose indumentum composed of ramiform hairs; petioles c.1cm, densely tomentose. Inflorescence 3–5-flowered; rhachis 3–5mm; pedicels c.8mm, densely tomentose. Calyx c.2mm, densely tomentose. Corolla

open-campanulate, white or pale cream, with a pink flush, or pale pink with crimson flecks, 25–35mm. Ovary densely tomentose. Capsule c.  $12 \times 4$ mm. CHINA (S Xizang), NE INDIA (Arunachal Pradesh), ? E BHUTAN. Mixed forests, rock ledges, 3500–4500m. Map 115.

Closely allied to *R. lanatum* and apparently hybridising with it, especially in E Bhutan.

**XVIII. Subsection *Campanulata* Sleumer, Bot. Jahrb. 74: 550 (1949).**

Syn.: Series *Campanulatum* sensu Tagg in Stevenson (ed.), The Species of *Rhododendron* 175 (1930), pro parte.

Shrubs or small trees, 1–4.5m; bark rough; young shoots with a whitish floccose tomentum or glabrous. Leaves ovate to broadly elliptic, glabrous above when mature, the lower surface with a dense fulvous lanate or sparse dark brown tomentum. Inflorescence 5–15-flowered; rhachis 10–25mm. Corolla 5-lobed, open- to funnel-campanulate, nectar pouches absent, whitish or pale mauve to pink. Stamens 10. Ovary and style glabrous.

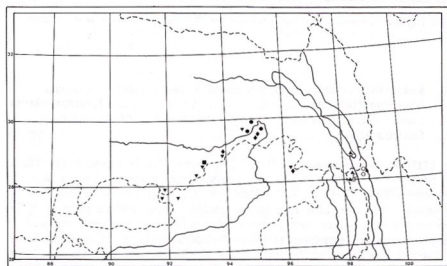
Type species: *R. campanulatum* D. Don

Both Tagg and Sleumer take a broad view in their treatments of subsection *Campanulata*, including species transferred in this account to subsections *Fulgensia* and *Lanata*.

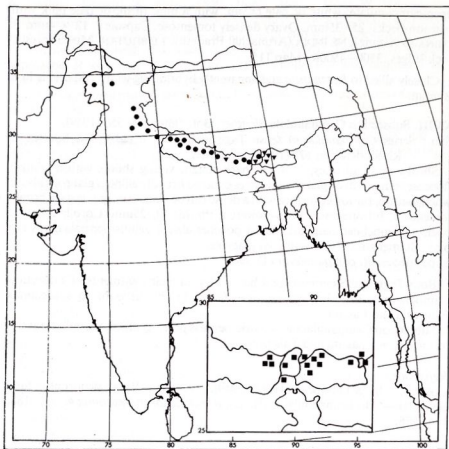
Subsection *Campanulata* in the strict sense is possibly allied, though distantly, to subsections *Lanata* and *Taliensia*.

*Reference*

COWAN, J. M. & DAVIDIAN, H. H. (1949). A review of *Rhododendrons* in their Series III — The *Campanulatum* Series. *Rhododendron Yearbook* 4: 164–168, 174–176.



MAP 115. ■ *R. circinnatum*; ● *R. lanatoides*; ▼ *R. tsariense*; ▲ *R. chamaethomsonii* var. *chamaethomsonii*; ○ var. *chamaedoron*; ◆ var. *chamaethauma*.



MAP 116. ● *R. campanulatum* subsp. *campanulatum*; ▼ subsp. *aeruginosum*; ■ *R. wallichii*.

1. Leaves with a dense fulvous tomentum beneath composed of capitate to ramiform hairs ..... **1. *campanulatum***
- + Leaves with a sparse dark brown indumentum beneath composed of fasciculate hairs ..... **2. *wallichii***

**1. (325.) *R. campanulatum* D. Don, Mem. Wern. Nat. Hist. Soc. 3: 410 (1821).**

Shrub or small tree, 1.3–4.5m; young shoots glabrous. Leaves ovate to broadly elliptic, 7–14 × 3.8–7.5cm, 1.9–2.5 × as long as broad, apex ± rounded, apiculate, base rounded to cordate, upper surface glabrous when mature, lower surface with a dense fulvous lanate tomentum composed of capitate to ramiform hairs; petioles 1.5–2.5cm, glabrous. Inflorescence 8–15-flowered; rhachis up to 25mm; pedicels 15–25mm, glabrous. Calyx c.1mm, glabrous. Corolla open-campanulate, white to pale mauve or pink, with ± pronounced purple flecks, 30–50mm. Ovary glabrous. Capsule 20–30 × c.5mm, usually curved. Map 116.

1. Leaves 9.5–14cm long, subcoriaceous, without a metallic bloom; corolla whitish to pale rose or lilac ..... **1a. subsp. campanulatum**  
 + Leaves 7–9.5cm long (wild specimens), coriaceous, opening with a bluish metallic bloom on the upper surface; corolla lilac or purple  
**1b. subsp. aeruginosum**

**1a. subsp. campanulatum.** Type: C Nepal, Gossaingthan, *Wallich* 756a (iso. E). Syn.: *R. nobile* Wallich, pro parte, nomen nudum.

Ic.: Bot. Mag. 66: t.3759 (1840).

N INDIA (Kashmir to W Sikkim), NEPAL, BHUTAN. Mixed forest, scrub, etc., 2700–3500m.

**1b. subsp. aeruginosum** (Hooker f.) Chamberlain, Notes R.B.G. Edinb. 37: 329 (1979).

Syn.: *R. aeruginosum* Hooker f., Rhododendrons Sikkim Himalaya 23, t.22 (1849). Type: Sikkim Himalaya, Laochun, Lachung, *Hooker* (E).

*R. campanulatum* D. Don var. *aeruginosum* [Hooker f. ex] Cowan & Davidian, Rhododendron Yearbook 4: 168 (1949).

N INDIA (Sikkim), BHUTAN, ? E NEPAL. Alpine slopes, 3800–4500m.

All specimens seen of subsp. *aeruginosum* have small coriaceous leaves and in this respect agree well with the type specimen. However, the characteristic bloom on the upper surfaces of the leaves is usually lost on drying so it cannot be observed on most herbarium material. I have not seen any specimens from C and E Sikkim or from Bhutan that match W Himalayan specimens in the size of their leaves but there is a series of fruiting specimens, presumed to have been collected in Sikkim (*Cave* 6719, 6726, 6983; *Watt* 5245, 5295, 5296), with leaves 7.5–9cm long, but subcoriaceous and with a less thick indumentum than is usual in subsp. *aeruginosum*. These may be considered as being intermediate between the two subspecies. There is also a series of intermediate plants in cultivation from E Nepal (*Spring-Smythe* 7, 8, 9, 11, 17, 41, 44). On present evidence therefore, subsp. *aeruginosum* apparently replaces subsp. *campanulatum* in the east but there is a zone of overlap.

The following natural hybrids occur in the wild:

i. *R. campanulatum* × *R. arboreum*—a specimen from Chankali Lagma, Nepal (*Polunin, Sykes & Williams* 4113) is presumed to be a hybrid of this parentage.

ii. *R. campanulatum* subsp. *aeruginosum* × *R. wightii*.

Shrub, 0.6–2m. Leaves coriaceous, 7–10 × 3.2–5cm, c.2 × as long as broad, apex rounded, base rounded to sub-cordate, upper surface glabrous, lower surface with a compacted reddish-brown indumentum composed of radiate hairs; petioles 0.8–1cm, densely tomentose. Inflorescence 10–12-flowered; rhachis up to 12mm; pedicels 10–15mm, very sparsely tomentose to glabrescent. Calyx c.1mm, glabrous. Corolla campanulate, white to purplish-pink, 30–35mm. Ovary glabrous. Fruit not known.

Occurs where the ranges of the two parents overlap, especially in C Bhutan.

iii. *R. campanulatum* subsp. *campanulatum* × *R. wightii*—a single specimen with leaves 11 × 6.2cm but otherwise as in 'ii.' is presumed to be a hybrid with this parentage (*Sharma* E 219, from Nepal).

2. (326.) *R. wallichii* Hooker f., Rhododendrons Sikkim Himalaya t.5 (1849). Type: 'the interior of Sikkim Himalaya' (10–11000ft, v 1848), *Hooker* (holo. E).

Shrub, 1–4.5m; young shoots with a whitish floccose tomentum. Leaves coriaceous, elliptic to ovate, 7–11(–14) × 3.5–5.5(–6.5)cm, 2–2.5 × as long as broad, apex rounded, apiculate, base rounded to ± cordate, glabrous above, with a sparse dark brown indumentum beneath composed of fasciculate hairs; petioles 1–2cm, with a floccose tomentum. Inflorescence lax, 5–8-flowered; rhachis c.10mm; pedicels 10–15mm, ± glabrous or with a sparse covering of fasciculate hairs. Calyx irregular, sparsely tomentose to glabrous, lobes 1–3mm. Corolla funnel-campanulate, whitish to pale mauve or lilac, with or without flecks, 25–40(–50)mm. Ovary ± glabrous. Capsule 15–30 × 5–7mm.

E NEPAL, BHUTAN, N INDIA (Sikkim, Bengal), CHINA (S Xizang). Mixed forests, Rhododendron scrub, etc., 3000–4000m. Map. 116, p. 372.

Closely allied to *R. campanulatum* but differing in the type of hairs that make up the leaf indumentum. *R. wallichii* apparently replaces *R. campanulatum* in the more humid areas at slightly lower altitudes on the outer slopes of the C Himalayas.

2\*. *R. wallichii* Hooker f. × *R. arboreum* Smith, s.l.

Syn.: ? *R. batemanni* Hooker f., Bot. Mag. 89: t. 5387 (1863). Type: a plant raised by Mr J. Bateman from seed supposedly collected by Booth in Bhutan (iso. E).

? *R. campanulatum* D. Don var. *campbellii* Millais, Rhododendrons ed. 1: 134 (1917). Described from plants in cultivation, thought to have been raised from seed supplied by Col. Sykes in 1840.

Differs from *R. wallichii* in its acute leaves with prominent lateral veins beneath and in its more intensely coloured flowers. It occurs where the ranges of the parents overlap.

The origin of *R. batemanni* is uncertain though the type specimen could have arisen as a chance hybrid of *R. arboreum* and *R. wallichii* or (less likely) *R. campanulatum*. The type, however, has surprisingly large leaves (up to 20cm long) for such an origin.

**XIX. Subsection *Griersoniana*** [Davidian ex] Chamberlain, Notes R.B.G. Edinb. 37: 337 (1979).

Syn.: Series *Griersonianum* Davidian, Rhododendron & Camellia Yearbook 18: 109 (1963), sine descr. lat.

Subsection *Auriculata* Sleumer, pro parte.

Shrub, 1.5–3m; bark rough; young shoots densely setulose-glandular and lanate-tomentose; bud scales long, linear-cuspidate. Leaves herbaceous, elliptic, lower surface covered with a dense whitish to pale brown dendroid tomentum. Inflorescence lax, 5–12-flowered. Calyx minute, c.1mm. Corolla 5-lobed, tubular- to funnel-campanulate, nectar pouches absent, outer surface of tube densely hairy, deep rose to scarlet. Stamens 10. Ovary with a dense dendroid indumentum intermixed with a few glands; styles glabrous.

Type species: *R. griersonianum* Balfour f. & Forrest

A monotypic subsection with no obvious close affinities. *R. griersonianum* has been traditionally included in subsection *Auriculata* on account of its setose-glandular shoots and long-cuspidate bud scales, but otherwise it differs in several important characters.

1. (327.) *R. griersonianum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 69 (1924). Type: China, W Yunnan, Shweli/Salween divide, Shweli valley, 9000ft, vi 1917, *Forrest* 15815 (holo. E; iso. K).

Ic.: Stevenson (ed.), The Species of Rhododendron 41, t. (1930); Bot. Mag. 153: t.9195 (1930).

Shrub, 1.5–3m; young shoots densely setulose-glandular and lanate-tomentose. Leaves elliptic, 10–20 × (2–)3–5cm, 3–4(–7) × as long as broad, apex acute to ± acuminate, base broadly cuneate to rounded, upper surface glabrous at maturity, lower surface densely whitish to pale brown lanate-tomentose; petioles 1–2.5cm, densely setulose-glandular and floccose, at least when young. Inflorescence 5–12-flowered; rhachis 12–20mm; pedicels 20–30mm, densely long-stipitate-glandular. Corolla tubular- to funnel-campanulate, densely hairy on outer surface of tube, deep rose to crimson or scarlet, 55–80mm. Ovary densely dendroid-hairy, with scattered stipitate glands. Capsule c.20 × 8mm.

CHINA (W Yunnan), NE UPPER BURMA. Mixed forests, 2150–2700m. Map 111, p. 360.

A distinctive species with no close allies.

**XX. Subsection *Parishia*** Sleumer, Bot. Jahrb. 74: 548 (1949).

Syn.: Series *Irroratum* subseries *Parishii* sensu Tagg in Stevenson (ed.), The Species of Rhododendron 331, 361 (1930).

Shrubs or small trees, 2–10m; bark rough; young shoots rufous stellate-tomentose, sometimes also with setose glands. Leaves elliptic to broadly obovate, usually with a rounded apex, lower surface glabrescent or with a thin stellate tomentum sometimes intermixed with glands, especially on the midrib. Inflorescence 5–15-flowered, lax; rhachis 5–40mm. Calyx usually small, 1–5mm (up to 17mm, cupular and coloured in *R. schistocalyx*). Corolla fleshy, 5-lobed, tubular- to funnel-campanulate, with pronounced nectar pouches, red to deep scarlet. Stamens 10. Ovary densely tomentose, usually also with stipitate glands; style glabrous to glandular to tip.

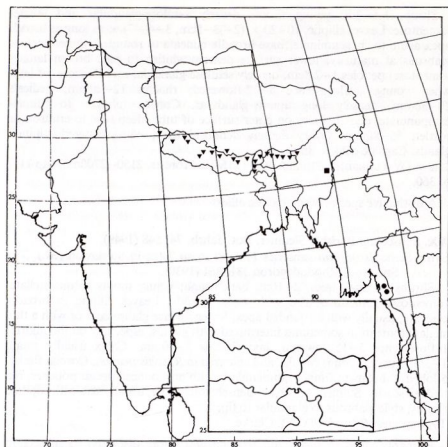
Type species: *R. parishii* C. B. Clarke

Probably allied to subsection *Irrorata* and (more distantly) to subsection *Neriiflora* but distinguished from both by the stellate indumentum.

1. Calyx large and cupular, 10–17mm long ..... **6. schistocalyx**
- + Calyx not exceeding 5mm, not cupular ..... **2**
2. Petioles and shoots setose-glandular, at least when young ..... **2. kyawi**
- + Petioles and shoots lacking setose glands ..... **3**
3. Leaves c.2 × as long as broad; corolla red with darker lines; pedicels 20–25mm ..... **1. parishii**
- + Leaves 2.2–3.2 × as long as broad; corolla uniformly deep rose to scarlet; pedicels 10–15mm ..... **4**
4. Leaves c.5.5cm long; calyx c.1.5mm (S Sichuan) ..... **3. huidongense**
- + Leaves 8.5–18.5cm long; calyx 3–5mm ..... **5**
5. Leaves 8.5–10cm; corolla funnel-campanulate (NE India) ..... **5. elliptii**
- + Leaves 10–18.5cm; corolla tubular-campanulate (NE Burma, W Yunnan) ..... **4. facetum**

**1. (328.) *R. parishii*** C. B. Clarke in Hooker f., Fl. Brit. India 3: 475 (1885). Type: Burma, Moulmein, Moollee, 6000ft, *Parish* 1021 (holo. K).

Ic.: Notes R.B.G. Edinb. 8: t.139 (1914).



MAP 117. ● *R. parishii*; ■ *R. elliottii*; ▼ *R. barbatum*.

Small tree, 5–8m; young shoots densely rufous stellate-tomentose. Leaves broadly obovate, 9–12 × 4.5–6.5cm, c.2 × as long as broad, apex acuminate, base rounded, both surfaces glabrous when mature though often with persistent stellate tomentum on midrib; petioles 1.5–2cm, densely stellate-tomentose when young, becoming less so at maturity. Inflorescence 6–12-flowered; rhachis c.20mm; pedicels 20–25mm, stipitate-glandular and with a floccose stellate tomentum. Calyx 2–5mm, lobes rounded, tomentose, glandular, especially on the margins. Corolla fleshy tubular-campanulate, red with darker lines, 30–50mm. Ovary densely tomentose, with some stipitate glands; style stipitate-glandular and floccose-tomentose. Capsule 25–30 × 6mm.

LOWER BURMA. Alt. 1900m. Map 117.

A distinctive species with an isolated distribution.

2. (329.) *R. kyawi* Lace & W. W. Smith, Notes R.B.G. Edinb. 8: 216, t.141 (1914). Type: Burma, Kachin Hills, 1 mile beyond Paypat Bungalow, 6000ft, Kyaw 36 (holo. K; iso. E).



Syn.: *R. agapetum* Balfour f. & Kingdon-Ward, Notes R.B.G. Edinb. 13: 58 (1920). Type: E Upper Burma, Hpimaw, 6000–7000ft, 31 vii 1914, *Kingdon-Ward* 1851 (holo. E).

*R. prophantum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 58 (1920). Type: NE Upper Burma, N'Maikha/Salween divide, v 1918 *Forrest* 17928 (holo. E).

lc.: Stevenson (ed.), The Species of Rhododendron 367, t. (1930); Bot. Mag. 155: t.9271 (1932).

Shrub, 3–9m; young shoots densely stellate-tomentose and glandular-setose. Leaves elliptic to oblong, 9–22(–30) × 4–9(–10)cm, 2.2–2.5(–3) × as long as broad, apex rounded, sometimes ± acuminate, base rounded, upper surface glabrous above, lower surface with a cinnamon stellate tomentum intermixed with a few glands, to ± glabrescent; petioles (1–)2.5–4cm, stellate-tomentose and glandular-setose, at least at first. Inflorescence 10–15-flowered; rhachis up to 40mm; pedicels 20–30mm, predominantly glandular-setose, usually also sparsely floccose. Calyx 1–2mm, glandular-setose, lobes broad and rounded. Corolla tubular-campanulate, bright crimson to scarlet, without flecks, 45–60mm. Ovary densely stellate-tomentose with an admixture of setose glands; style stipitate-glandular and floccose, at least in the lower half. Capsule 25–40 × 5–8mm, slightly curved.

NE UPPER BURMA, CHINA (W Yunnan). Thickets, 1800–3650m. Map 118, p. 378.

At one extreme there are forms with short petioles and styles glandular only below. These have been referred to *R. agapetum*. However, these forms completely intergrade with *R. kyawi* so that there is no justification for maintaining the former as distinct at any rank.

3. (330.) *R. huidongense* T. L. Ming, Acta Bot. Yunnanica 3: 115, t.1 (1981). Type: China, S Sichuan, Huidong Xian, 3200m, 25 iv 1959, *Wu*, S. K. 1558 (holo. Herb. Inst. Bot Kunming).

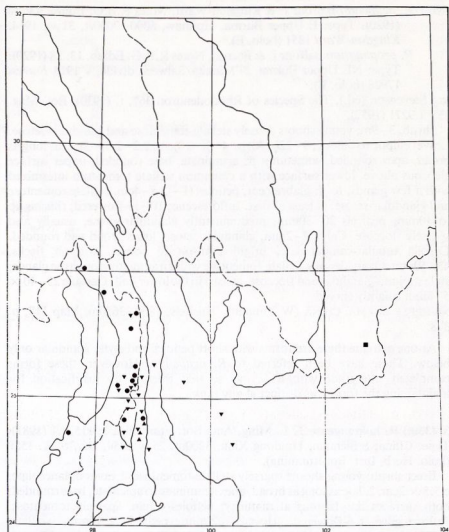
Erect shrub; young shoots sparsely stellate-tomentose. Leaves oblanceolate, c.5.5 × 2cm, 2.7 × as long as broad, apex acuminate to apiculate, base rounded; both surfaces ± glabrous at maturity; petioles c.1cm, sparsely tomentose. Inflorescence c.6-flowered; rhachis c.5mm; pedicels c.10mm, stellate-tomentose. Calyx c.1.5mm, lobes rounded, glandular-ciliate. Corolla campanulate with a broad base and ? nectar pouches, red, 40–45mm. Ovary densely light brown-tomentose; style stellate-tomentose almost to tip. Capsule not known.

CHINA (S Sichuan). Slopes in forest, c.3200m. Map 118, p. 378.

Probably most closely allied to *R. facetum* though differing in the smaller leaves and calyces, and in the tomentose styles.

4. (331.) *R. facetum* Balfour f. & Kingdon-Ward, Notes R.B.G. Edinb. 10: 104 (1917). Type: E Burma, Fengshui-ling camp, 8–9000ft, 9 vi 1914, *Kingdon-Ward* 1659 (holo. E).

Syn.: *R. eriogynum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 10: 101 (1917). Type: China, Mid W Yunnan, Ghi-shan, E of Tali Lake, 9000ft, viii 1914, *Forrest* 13508 (holo. E).



MAP 118. ● *R. kyawii*; ■ *R. huidongense*; ▼ *R. facetum*; ▲ *R. schistocalyx*.

Ic.: Cox, E., Plant introductions of Reginald Farrer 92 (1930); Cox, P., The larger species of *Rhododendron* f. 36 (1979).

Shrub or tree, 2–10m; young shoots rufous stellate-tomentose. Leaves oblanceolate to elliptic,  $10-18.5 \times 3-7.2$ cm,  $2.3-3.2 \times$  as long as broad, apex rounded, apiculate, base cuneate, both surfaces glabrous when mature or with vestiges of indumentum, especially on the midrib towards the base; petioles slender to stout, 2–3cm, stellate-tomentose at first, soon glabrescent. Inflorescence c.10-flowered; rhachis 10–15mm; pedicels 10–15mm, stellate-tomentose, sometimes also stipitate-glandular. Calyx 3–5mm, stellate-tomentose, lobes broad, rounded. Corolla tubular-campanulate, sparingly floccose-tomentose or glabrous on outer surface, deep rose to scarlet,

40–50mm. Ovary densely rufous stellate-tomentose; style with floccose stellate hairs and glands. Capsule  $15-20 \times 8$  mm, slightly curved.

NE UPPER BURMA, CHINA (W Yunnan). Forests, 2700–3350m. Map 118.

Allied to *R. kyawi* but lacking the setose glands on the young shoots, also closely allied to *R. huidongense* (q.v.).

The correlation between stout petioles and glandular pedicels, proposed by Tagg to distinguish between *R. eriogynum* and *R. facetum* does not hold for specimens now available. The latter name was chosen rather than the former as it already had a wider acceptance.

**5. (332.) *R. elliptii*** Watt in Brandis, Indian Trees 410 (1906). Type: NE India, Manipur, Japoo, 9000ft, v 1882, *Watt* 6893 (holo. K; iso. E).

lc.: Notes R.B.G. Edinb. 8: t.140 (1914); Bot. Mag. 161: t.9546 (1939).

Small straggling shrub; young shoots stellate-tomentose and stipitate-glandular. Leaves lanceolate to elliptic,  $8.5-10 \times 3.5-4.2$ cm, c.  $2.5 \times$  as long as broad, apex rounded, apiculate, base rounded, glabrous when mature on both surfaces; petioles 1.5–2.5cm, glabrous. Inflorescence 6–10-flowered; rhachis c. 20mm; pedicels c. 10mm, shortly stipitate-glandular. Calyx 3–4mm, glandular, lobes rounded, glandular-ciliate. Corolla funnel-campanulate, rose-purple, with darker flecks, 40–50mm. Ovary densely rufous stellate-tomentose, intermixed with stipitate glands; style tomentose and glandular to tip. Capsule c.  $15 \times 5-6$ mm.

NE INDIA (Nagaland). Alt. 2700–3000m. Map 117, p. 376.

Allied to *R. kyawi* and *R. facetum* but differing from both in its generally smaller leaves and apparently in the shape of the corolla.

**6. (333.) *R. schistocalyx*** Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 58 (1920). Type: China, W Yunnan, Shweli/Salween divide, vii 1918, *Forrest* 17637 (holo. E; iso. BM, K).

Shrub, 2–2.5m; young shoots rufous stellate-tomentose, eglandular. Leaves oblanceolate to elliptic,  $7-15 \times 2.5-5.1$ cm,  $2.8-3.2 \times$  as long as broad, apex rounded, apiculate, base rounded, both surfaces glabrous when mature except for a few stellate hairs on the midrib below; petioles 0.5–1.5cm, stellate-tomentose when young, later glabrescent. Inflorescence 5–10-flowered; rhachis c. 5mm; pedicels 10–15mm, stellate-tomentose. Calyx large, reddish, cupular, 10–17mm, lobes rounded, irregular, ciliate, otherwise glabrous. Corolla tubular-campanulate, crimson, 45–50mm. Ovary densely brown stellate-tomentose, eglandular; style tomentose below. Capsule c. 15mm long, curved. CHINA (W Yunnan). Pine forests, Rhododendron thickets, 2700–3350m. Map 118.

Superficially resembling *R. diphrocalyx* (subsection Maculifera) but differing in its apiculate (not acuminate) leaves and eglandular shoots. The well-developed calyx suggests that *R. schistocalyx* may have arisen as a hybrid between *R. facetum* and a species in subsection Neriiflora, perhaps *R. neriiflorum*.

**XXI. Subsection *Barbata*** Sleumer, Bot. Jahrb. 74: 544 (1949), pro parte.

Syn.: Series *Barbatum* subseries *Barbatum* sensu Tagg in Stevenson (ed.), The Species of Rhododendron 126 (1930), pro parte.

Shrubs or small trees; young shoots usually with setae or bristles (glabrous in *R. succothii* and sometimes also in *R. barbatum*); bark smooth, peeling. Leaves usually strongly concave, elliptic to broadly obovate, glabrous or with coarse bristles or stipitate glands at maturity, sometimes also with a thin continuous indumentum of lanate dendroid hairs on the lower surface. Inflorescence 10–20-flowered, dense and congested; rhachis 5–7(–10)mm. Calyx minute to large and cupular, up to c.15mm long, often coloured, lobes rounded. Corolla 5-lobed, fleshy, tubular-campanulate, with nectar pouches, crimson to deep red, rarely rose-pink. Stamens 10, filaments glabrous. Ovary glabrous to densely stipitate-glandular, with or without a rufous indumentum of dendroid hairs; style glabrous.

Type species: *R. barbatum* Wallich

For a discussion of the circumscription of this subsection see p. 459. The position of the anomalous *R. succothii* remains somewhat uncertain, though, on balance it seems to be more closely allied to the other species in subsection Barbata than it is to any other species in the genus.

1. Petioles 0–5mm; leaves and petioles glabrous.....5. *succothii*  
+ Petioles 5–20mm; leaves and/or petioles usually with setae or bristles .....2
2. Leaves  $2.3-3.2 \times$  as long as broad, apex acute to acuminate .....3  
+ Leaves  $1.5-2.2 \times$  as long as broad, apex rounded .....4
3. Lower surface of leaves with scattered dendroid hairs and stipitate glands .....1. *barbatum*  
+ Lower surface of leaves with a continuous layer of pale brown hairs that become whitish with age .....2. *smithii*
4. Lower surface of leaves with stout gland-tipped setae and a floccose lanate indumentum; corolla rose-pink to crimson .....4. *erosum*  
+ Lower surface of leaves with stout gland-tipped setae that intergrade with bristles on the midrib, lanate indumentum lacking; corolla brick-red.....3. *exasperatum*

1. (334.) *R. barbatum* [Wallich ex] G. Don, Gen. Hist. 3: 844 (1834). Type: Nepal, Gopain Than, *Wallich* 757 (holo. K).

Syn.: *R. nobile* Wallich, pro parte, nomen nudum.

*R. lancifolium* Hooker f., Rhododendrons Sikkim Himalaya t.4 (1849).

Type: Sikkim, *Hooker* (holo. K).

Ic.: Hooker f., op. cit. t.3 (1849); Tagg in Stevenson (ed.), The Species of Rhododendron 129, t. (1930).

Large shrub or small tree, 1.5–6m; young shoots with long stiff bristles (rarely glabrous). Leaves elliptic to obovate, (9–)11–19  $\times$  3.5–6.5cm, c.3  $\times$  as long as broad, apex acute to acuminate, base rounded to cuneate, upper surface  $\pm$  glabrous, lower surface with scattered dendroid hairs and stipitate glands, with or without bristles on the midrib; petioles 1–2cm, glabrous or with a dense covering of glandular bristles. Inflorescence dense, 10–20-flowered; rhachis c.5mm; pedicels 5–10mm, glabrous. Calyx cupular, 10–15mm, often with reddish tints, glabrous or with a few hairs at base, lobes well-developed, rounded, erose. Corolla fleshy, tubular-campanulate, crimson to blood-red, with darker nectar pouches, rarely pure white, 30–35mm. Ovary densely

stipitate-glandular, also with some dendroid hairs; style glabrous. Capsule  $15-20 \times 0.5$  mm, curved.

N INDIA (Uttar Pradesh, Sikkim, Bengal, W Arunachal Pradesh), CHINA (S Xizang), NEPAL, BHUTAN. Open slopes, amongst scrub, Abies forest, etc., 2700–3700m. Map 117, p. 376.

Closely allied to *R. smithii*. Natural hybrids between *R. barbatum* and *R. arboreum* are recorded.

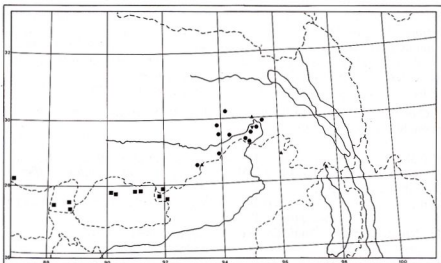
2. (335.) *R. smithii* [Nuttall ex] Hooker f., Bot. Mag. 85: t. 5120 (1859). Type: NE India, Arunachal Pradesh, 'Bhutan', Lablung Pass, Booth, n.v.

Syn.: *R. argipeplum* Balfour f. & Cooper, Notes R.B.G. Edinb. 9: 213 (1916). Type: Bhutan, Pumthang, 11000ft, 5 vii 1915, Cooper 4115 (holo. E).

Shrub or small tree, 2–7.5m; young shoots clothed with long stiff setae. Leaves elliptic to obovate-lanceolate,  $8-13 \times 2.7-4$  cm,  $2-3.2 \times$  as long as broad, apex acute to rounded, base rounded, upper surface glabrous, lower surface with a thin continuous layer of pale brown dendroid hairs, often becoming whitish with age, usually also with a few setae on the midrib towards the base; petioles 1–2 cm, densely covered with long gland-tipped bristles. Inflorescence dense, 15–20-flowered; rhachis short, 0.5 mm; pedicels 10–15 mm, glandular-setose. Calyx fleshy, reddish, 5–10 mm, lobes rounded, glandular-ciliate. Corolla fleshy, tubular-campanulate, scarlet to crimson, with darker nectar pouches, 30–45 mm. Ovary with a dense rufous tomentum intermixed with long glandular hairs; style glabrous. Capsule  $c. 15 \times 4$  mm, straight.

NE INDIA (Sikkim, Arunachal Pradesh), BHUTAN, CHINA (S Xizang). Mixed forests, etc., 2700–3600m. Map 119.

A variable species allied to *R. exasperatum* and *R. barbatum*. Some forms approach the former species in their broad  $\pm$  bullate leaves with cordate bases.



MAP 119. ● *R. hirtipes*; ▼ *R. venator*; ■ *R. smithii*; ▲ *R. exasperatum*.

These have been referred to *R. argipeplum*. I have not seen the type of *R. smithii*, though, from the plate cited above, *R. argipeplum* is apparently synonymous with that species.

The narrower-leaved forms of *R. smithii* tend to be less markedly bullate and are more common in the west, especially in Sikkim. These are apparently closer to *R. barbatum* and are possibly of hybrid origin.

3. (336.) *R. exasperatum* Tagg, Notes R.B.G. Edinb. 16: 192 (1931). Type: NE India, Arunachal Pradesh, Delei Valley, 11–12000ft, v 1928, *Kingdon-Ward* 8250 (holo. E; iso. K).

Shrub or small tree, 2–5m; young shoots with a dense covering of stout gland-tipped bristles. Leaves broadly obovate to elliptic, 11–13.5 × 6–7.5cm, 1.6–2.2 × as long as broad, apex and base rounded, upper surface glabrous, lower surface of lamina with stout gland-tipped setae that intergrade with longer gland-tipped bristles on the midrib; petioles 5–10mm, with long bristles. Inflorescence dense, 10–15-flowered; rhachis c.5mm; pedicels c.15mm, sparsely stipitate-glandular. Calyx 4–6mm, reddish, glabrous, lobes broad and rounded. Corolla tubular-campanulate, brick-red, with depressed nectar pouches, 35–45mm. Ovary densely stipitate-glandular; style glabrous.

NE INDIA (Arunachal Pradesh), NE UPPER BURMA, CHINA (SE Xizang). *Abies* forest, etc., 3000–3700m. Map 119, p. 381.

A distinctive species on account of its large leaves and characteristic indumentum; allied to *R. erosum*.

4. (337.) *R. erosum* Cowan, Notes R.B.G. Edinb. 19: 225 (1937). Type: China, S Xizang, Chayul Chu, Natrampa, Kashong La, 12500ft, 2 v 1936, *Ludlow & Sherriff* 1541 (holo. BM; iso. E).

Tree, 3.5–6.5m; young shoots with numerous gland-tipped setae. Leaves broadly obovate, 8–10 × 3.7–7cm, 1.5–2.1 × as long as broad, apex and base rounded, upper surface glabrous, lower surface with sparse stout gland-tipped setae and a floccose lanate indumentum, dense at first, becoming thinner with age, midrib with a few bristles; petioles c.1cm, sparsely glandular-bristly. Inflorescence dense, 12–15-flowered; rhachis c.10mm; pedicels c.10mm, stipitate-glandular. Calyx reddish, 3–4mm, glabrous, lobes rounded. Corolla tubular-campanulate, rose-pink to crimson, 30–35mm. Ovary densely stipitate-glandular; style glabrous. Capsule c.20 × 6mm, curved.

CHINA (SE Xizang). Under *Abies*, etc., 3000–3800m. Map 120.

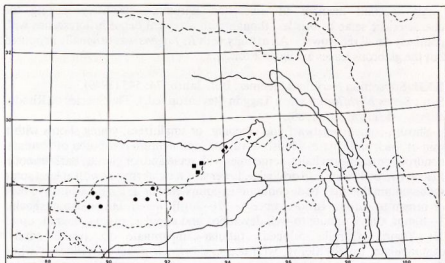
Closely allied to *R. exasperatum* but differing in several minor characters; possibly of hybrid origin.

5. (338.) *R. succothii* Davidian, *Rhododendron Yearbook* 20: 103, t.8 (1965). Type: Bhutan, Byasu La, Phobshikha, 13500ft, 18 v 1937, *Ludlow & Sherriff* 3075 (holo. E; iso. BM).

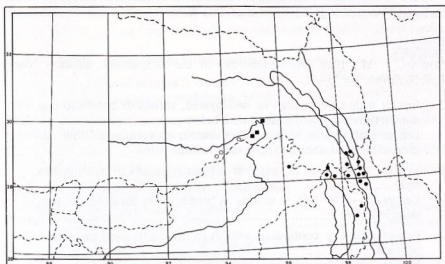
Syn.: *R. nishiokae* Hara, *J. Jap. Bot.* 45: 94 (1970). Type: Bhutan, nr Puwa La, 2 v 1966, *Nishioka* (holo. TI, n.v.).

Loc.: *Rhododendron & Camellia Yearbook* 20: t.8 (1969).

Shrub or small tree, 1–6m; young shoots glabrous. Leaves oblong to elliptic, 5–13.5 × 2.5–5.5cm, 2–2.5 × as long as broad, apex rounded, minutely apiculate, base cordate, upper and lower surfaces glabrous; petioles absent or up



MAP 120. ■ *R. erosum*; ● *R. succothii*; ▼ *R. parvulatum*; ◆ *R. trilactorum*.



MAP 121. ● *R. forrestii* subsp. *forrestii*; ■ subsp. *papillatum*; ○ aff. subsp. *forrestii*.

to 5mm, winged, glabrous. Inflorescence dense, 10–15-flowered; rhachis up to 7mm; pedicels 5–15mm, glabrous. Calyx c.1mm, lobes minute, rounded. Corolla fleshy, tubular-campanulate, crimson, with conspicuous nectar pouches, 28–35mm. Ovary and style glabrous. Capsule at least 20 × 5mm, strongly curved.

BHUTAN, NE INDIA (Arunachal Pradesh). Mixed forests, etc., 3400–4200m. Map 120.

An aberrant member of subsection *Barbata*, completely lacking the characteristic setae or bristles, though with a typical dense inflorescence with relatively small red flowers. An affinity with *R. fulgens* was originally proposed but the glabrous leaves are against this.

**XXII. Subsection *Neriiflora*** Sleumer, Bot. Jahrb. 74: 545 (1949).

Syn.: Series *Neriiflorum* sensu Tagg in Stevenson (ed.), The Species of *Rhododendron* 507 (1930).

Shrubs, sometimes dwarf and creeping, or small trees; young shoots with a thin or thick and lanate, whitish to rufous indumentum composed of rosulate, dendroid or ramiform hairs, sometimes with setae and/or glands; bark smooth. Leaves narrowly elliptic to orbicular, lower surface glabrous or with at least some indumentum that may be discontinuous, compacted or  $\pm$  lanate, whitish to buff or brown to rufous. Inflorescence 1–12(–20)-flowered, lax or dense; rachis 3–10mm. Calyx minute to well-developed and cupular, often coloured, up to 15(–20)mm. Corolla 5-lobed, tubular-campanulate to (more rarely) campanulate, usually fleshy, with depressed nectar pouches, yellow or white through various shades of pink to deep carmine. Stamens 10. Ovary tomentose, with or without stipitate glands, or glabrous; style glabrous.

Type species: *R. neriiflorum* Franchet

Allied to subsection *Thomsonia*. A taxonomically difficult subsection with a particularly complex group of taxa around *R. sanguineum* and its immediate allies.

*Reference*

COWAN, J. M., 1940. Rhododendrons of the Sanguineum alliance. *Notes R.B.G. Edinb.* 20: 55–91.

1. Leaves with a thick, one- or two-layered, rufous or brown to cinnamon (rarely whitish) indumentum below .....2  
+ Leaves glabrous or with a discontinuous to continuous thin adpressed or felted whitish to fawn indumentum below .....3
2. Leaves 2.5–4(–8)  $\times$  as long as broad; ovary usually  $\pm$  tapering into style .....5  
+ Leaves 1.6–2.7(–3.5)  $\times$  as long as broad; ovary truncate, not tapering into style .....10
3. Leaves with a  $\pm$  continuous whitish to fawn adpressed tomentum beneath .....26  
+ Leaves glabrous or with a sparse discontinuous indumentum beneath .....4
4. Shrub, sometimes dwarf, 1–6m; ovary  $\pm$  tapering into the style .....7  
+ Dwarf shrub, 0.1–1.5m; ovary truncate, not tapering above .....19
5. Leaf indumentum bistratate, the upper layer loose, the lower compacted .....6  
+ Leaves glabrous or with a unistrate indumentum, lacking a lower compacted layer .....7
6. Young shoots, petioles and ovaries eglandular .....25. *albertsenianum*  
+ Young shoots, petioles and ovaries stipitate-glandular .....26. *euchroum*
7. Mature leaves glabrous .....21. *neriiflorum*  
+ Mature leaves with a discontinuous or continuous indumentum beneath .....8



8. Ovary and usually young shoots stipitate-glandular; leaves with a dense continuous indumentum beneath.....**23. sperabile**
- + Ovary and young shoots eglandular; leaves with a sparse discontinuous indumentum beneath .....9
9. Leaves 3.3–4.5(–6) × as long as broad, lower epidermis glaucous-papillate.....**22. floccigerum**
- + Leaves 1.6–3 × as long as broad, lower epidermis ± epapillate  
**24. sperabiloides**
10. Leaves ± strongly rugulose above .....11
- + Leaves not or only slightly rugulose above .....13
11. Young shoots and petioles densely tomentose, eglandular; usually a large shrub or small tree, with a well-developed trunk .....**1. mallothemum**
- + Young shoots and petioles setulose-glandular and tomentose; usually a sprawling shrub without a well-developed trunk .....12
12. Leaves with a dense bistrate indumentum below, the upper layer rufous, tomentose, the lower whitish and adpressed .....**3. piercei**
- + Leaves with a unistrate indumentum below, lacking the lower adpressed layer .....**2. beanianum**
13. Young shoots sparsely to densely glandular; ovary glandular .....14
- + Young shoots eglandular; ovary tomentose, usually without glands .....15
14. Leaves 2–3 × as long as broad; petioles tomentose and glandular  
**4. pocophorum**
- + Leaves 1.6–2 × as long as broad; petioles ± glabrous .....**5. coelicum**
15. Young shoots and petioles ± densely setulose.....16
- + Young shoots tomentose or glabrous, setulae absent or very few .....17
16. Corolla white; leaf indumentum discontinuous .....**7. chionanthum**
- + Corolla yellow to scarlet; leaf indumentum usually ± continuous  
**8. haematodes**
17. Corolla yellow to red; pedicels with at least a few glands .....**9. citriniflorum**
- + Corolla scarlet to crimson; pedicels eglandular .....18
18. Pedicels 25–35mm; calyx 15–20mm .....**6. catacosmum**
- + Pedicels 10–25mm; calyx 5–15mm .....**8. haematodes**
19. Corolla solitary; dwarf creeping shrub usually not more than 10cm high.....**20. forrestii**
- + Inflorescence (1–)2–6-flowered; upright shrub (10–)30–150cm.....20
20. Leaves 1.5–2.6 × as long as broad .....21
- + Leaves at least 2.5 × as long as broad.....22
21. Pedicels tomentose, eglandular; petioles broad, eglandular ...**13. aperanthum**
- + Pedicels sparsely stipitate-glandular; petioles narrow, sometimes glandular .....**19. chamaethomsonii**
22. Corolla yellow; ovaries glabrous or with a few scattered hairs .....23
- + Corolla pink to carmine or yellow; ovary tomentose, sometimes sparsely so .....24

23. Leaves 4.5–8cm long; pedicels 10–20mm; corolla with conspicuous flecks.....**14. parmulum**  
 + Leaves 1–3.2cm long; pedicels 20–30mm; corolla lacking conspicuous flecks.....**15. trilectorum**
24. Leaves with lower epidermis  $\pm$  glaucous-papillate .....**17. temenium**  
 + Leaves with lower epidermis epapillate, greenish .....**25**
25. Calyx c.1.5mm; leaves  $\pm$  glabrous or with a patchy tomentum; plants 5–50cm.....**18. erastum**  
 + Calyx 2–7mm; leaves with an even though discontinuous indumentum; plants 30–120cm .....**16. eudoxum**
26. Ovary glandular; leaves  $2.5-4 \times$  as long as broad.....**27**  
 + Ovary eglandular or glandular; leaves  $1.9-3(-3.2) \times$  as long as broad .....**28**
27. Leaf indumentum spongy and felted, buff to cinnamon.....**11. microgynum**  
 + Leaf indumentum compacted, whitish to fawn .....**28**
28. Corolla 35–50mm, usually orange-red (rarely carmine); calyx to 15mm.....**10. dichroanthum**  
 + Corolla 25–35mm, yellow, pink to blackish crimson, occasionally orange or white .....**12. sanguineum**

**1. (339.) *R. mallotum*** Balfour f. & Kingdon-Ward, Notes R.B.G. Edinb. 10: 118 (1917). Type: E Upper Burma, Hpimaw, 11–12000ft, 19 v 1914, *Kingdon-Ward* 1567 (holo. E).

Syn.: *R. aemulorum* Balfour f., Notes R.B.G. Edinb. 12: 86 (1920). Type: China, W Yunnan, eastern flank of the N'Maikha/Salween divide, 26°N, 11000ft, iv 1919, *Forrest* 17853 (holo. E).

Ic.: Bot. Mag. 158: t.9419 (1935).

Shrub or small tree, 1.5–6.5m, usually with a well-defined trunk; young shoots densely rufous-tomentose. Leaves broadly oblanceolate to obovate, 10–13  $\times$  4.5–6.3cm, 1.8–2.3  $\times$  as long as broad, apex rounded, apiculate, base  $\pm$  rounded, upper surface glabrous when mature except for the tomentose midrib, rugulose; lower surface covered with a dense rufous dendroid lanate tomentum; petioles 2–2.5cm, densely tomentose. Inflorescence 7–14-flowered; rhachis c.10mm; pedicels 10–15mm, densely tomentose. Calyx 2–3mm, tomentose. Corolla fleshy, tubular-campanulate, crimson, 40–45mm. Ovary densely rufous-tomentose. Capsule c.12  $\times$  8mm, persistently tomentose.

NE UPPER BURMA, CHINA (W Yunnan). Cliffs, rocky slopes, thickets, 3350–3650m. Map 122, p. 388.

**2. (340.) *R. beanianum*** Cowan, New Flora & Silva 10: 245, f. 80 (1938). Type: China, Xizang, Seingku Wang, 10000ft, 1 vi 1926, *Kingdon-Ward* 6805 (holo. BM; iso. K).

Ic.: Bot. Mag., n.s. 169: t.219 (1953).

Straggling shrub, up to 3m; young shoots stellate-setose and stipitate-glandular. Leaves obovate to elliptic, 6–9  $\times$  3.2–4.4cm, 2–2.4  $\times$  as long as broad, apex rounded, apiculate, base  $\pm$  rounded, upper surface rugulose, glabrous, lower surface with a dense unistrate fulvous dendroid-tomentose indumentum; petioles 1.5–2cm, setulose to tomentose. Inflorescence 6–10-flowered; rhachis c.5mm; pedicels 10–15mm, setulose-tomentose. Calyx

c.5mm, cupular, sparsely tomentose. Corolla fleshy, tubular-campanulate, carmine to blood-red, c.35mm. Ovary stellate-tomentose. Capsule at least 12 × 6mm, persistently tomentose.

NE UPPER BURMA, NE INDIA (Arunachal Pradesh). Bamboo forests, rocky gullies, 3000–3350m. Map 122.

Closely allied to *R. piercei* (q.v.).

**3. (341.) *R. piercei*** Davidian, Quart. Bull. Amer. Rhododendron Soc. 30: 211 (1976). Type: China, Xizang, Dri La, Zayul, 1933, *Kingdon-Ward* 11040 (holo. BM).

Syn.: *R. beanianum* Cowan var. *compactum* Cowan, Notes R.B.G. Edinb. 21: 148 (1953), type as above.

Straggling shrub, 1.5–2.5m; young shoots tomentose. Leaves ovate to elliptic, 6–11 × 2.7–5.2cm, c.2.2 × as long as broad, apex rounded, apiculate, base rounded, upper surface glabrous when mature, rugulose, lower surface with a bistrate indumentum, the upper layer thick, fulvous and dendroid-tomentose, the lower white and adpressed; petioles 1–2cm, tomentose. Inflorescence 6–8-flowered; rhachis c.5mm; pedicels 12–15mm, tomentose. Calyx 3–6mm, irregular, glabrous. Corolla fleshy, tubular-campanulate, crimson, with darker nectar pouches, 28–36mm. Ovary densely tomentose. Capsule 14–18 × c.4.5mm.

CHINA (S Xizang). Map. 122.

Only known from the type. Closely allied to *R. beanianum* but with a very different leaf indumentum.

**4. (342.) *R. pocophorum*** [Balfour f. ex] Tagg, Notes R.B.G. Edinb. 15: 316 (1927).

Shrub, 0.6–3m; young shoots densely stipitate-glandular. Leaves oblong to obovate, 8–15 × 3.2–5.2cm, 2–3 × as long as broad, apex rounded, apiculate, base cuneate, glabrous above, with a thick continuous or patchy rufous dendroid tomentum beneath; petioles 1–2cm, stout, stipitate-glandular and tomentose when young. Inflorescence dense, 10(–20)-flowered; rhachis c.5mm; pedicels 7–18mm, stipitate-glandular. Calyx 5–10mm, lobes irregular, glandular-ciliate, otherwise glabrous. Corolla fleshy, tubular-campanulate, light to deep crimson, 40–50mm. Ovary densely stipitate-glandular. Capsule 20–25 × 7–9mm.

NE INDIA (Arunachal Pradesh), CHINA (S Xizang, NW Yunnan). Thickets, open rocky slopes, 3650–4600m. Map 122.

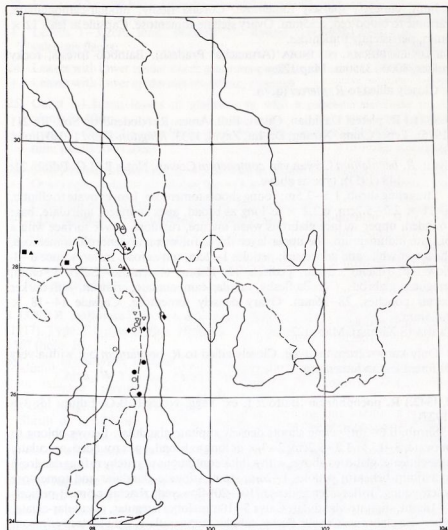
1. Leaves with a continuous indumentum beneath.....**4a. var. *pocophorum***  
+ Leaves with a patchy discontinuous indumentum beneath

**4b. var. *hemidartum***

**4a. var. *pocophorum***. Type: China, E Xizang, Tsarong, Salween/Kiu-chiang divide, NW of Si-chi-to, 12000ft, vi 1922, *Forrest* 21713 (holo. E).

**4b. var. *hemidartum*** (Tagg) Chamberlain, Notes R.B.G. Edinb. 37: 334 (1978). Syn.: *R. hemidartum* [Balfour f. ex] Tagg, Notes R.B.G. Edinb. 15: 314 (1927).

Type: China, E Xizang, Tsarong, Salween/Kiu-chiang divide, 28°24'N, 98°24'E, 13–14000ft, viii 1921, *Forrest* 20028 (holo. E).



MAP 122. ● *R. mallotum*; ■ *R. beanianum*; ▼ *R. piercei*; ▲ *R. pocophorum*; ◆ *R. aff. pocophorum*; ○ *R. coelicum*; △ *R. catacosmum*; ▽ *R. chionanthum*.

Closely allied to *R. coelicum* (q.v.). Two plants, *Rock* 10199 & *Forrest* 21721, are intermediate between *R. pocophorum* and *R. catacosmum* and may be hybrids. Three plants, *Forrest* 25590 & 25786 and *Rock* 17014, occurring in an area to the south of the range of *R. pocophorum* (see map 122), apparently differ in their loose, 4–6-flowered inflorescence, but are otherwise closer to *R. pocophorum* than they are to *R. coelicum*, with which they are sympatric. The status of these three plants remains uncertain.

4\*. *R. × hemigynum* (Tagg & Forrest) Chamberlain, Notes R.B.G. Edinb. 37: 333 (1979)–*R. pocophorum* × *R. eclectum*.

Syn.: *R. chaetomallum* Balfour f. & Forrest var. *hemigynum* Tagg & Forrest, Notes R.B.G. Edinb. 16: 189 (1931). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, NW of Si-chi-to, 12000ft, vi 1922, *Forrest* 21728 (holo. E).

Shrub, 1–2m; young shoots sparsely stipitate- to setose-glandular. Leaves obovate ('jargonelle-shaped') to elliptic, 8.5–12 × 3–5cm, 2–2.8 × as long as broad, apex rounded, apiculate, base broadly cuneate, upper surface glabrous when mature, lower surface with a thin discontinuous floccose-tomentose indumentum; petioles 0.7–1.5cm, broad, sparsely setose. Inflorescence c.6-flowered; rhachis less than 5mm; pedicels 10–15mm, setose-glandular. Calyx (5–)15mm, irregular to cupular, lobes ciliate, otherwise glabrous. Corolla fleshy, tubular-campanulate, crimson to magenta-rose, 45–52mm. Ovary rufous-tomentose to stipitate-glandular. Capsule not known.

CHINA (SE Xizang), NE UPPER BURMA. Open rocky slopes, mixed scrub, 3350–4400m.

Intermediate between *R. ecleptum* and *R. pocophorum*, with the leaf shape and broad petioles of the former species and the setose- to stipitate-glandular young shoots and petioles and a leaf indumentum more typical of the latter. Both species occur at the localities from which the hybrid has been collected.

5. (343.) *R. coelicum* Balfour f. & Farrer, Notes R.B.G. Edinb. 13: 250 (1922). Type: NE Upper Burma, Chawchi Pass, 11000ft, 15 x 1920, *Farrer* 1548 (holo. E; iso. K).

Ic.: *Rhododendron* & *Camellia* Yearbook 10: f.19 (1958).

Small shrub; young shoots sparsely stipitate-glandular. Leaves obovate, 6–8.5 × 3.1–4.4cm, 1.6–2 × as long as broad, apex rounded, apiculate, base rounded, upper surface glabrous, lower surface with a thick fulvous dendroid tomentum; petioles 1–1.5cm, sparsely short stipitate-glandular. Inflorescence c. 10-flowered; rhachis c.5mm; pedicels 7–10mm, shortly stipitate-glandular, often also with remnants of the juvenile tomentum. Calyx 5–7mm, lobes rounded, glandular-ciliate, otherwise glabrous. Corolla fleshy, tubular-campanulate, crimson, 38–45mm. Ovary shortly stipitate-glandular and tomentose. Capsule 15–18 × c.5mm, curved.

NE UPPER BURMA and adjacent parts of CHINA (W Yunnan). Shaded screes, cliffs, 2750–4400m. Map 122.

Closely allied to *R. pocophorum* but differing in its broader leaves and non-tomentose petioles. One plant, *Kingdon-Ward* 13150, is intermediate between and may be a hybrid of *R. coelicum* and *R. haematodes* subsp. *chaetomallum*. It not only has the stipitate glands of the former but also the setae on the young shoots and petioles of the latter.

6. (344.) *R. catacosmum* [Balfour f. ex] Tagg, Notes R.B.G. Edinb. 15: 307 (1927). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, NW of Si-chi-to, 13000ft, vi 1922, *Forrest* 21727 (holo. E).

Shrub, 1.3–3m; young shoots fulvous-tomentose, setae very few or entirely lacking. Leaves obovate, 8–10 × 4.2–5.5 cm, 1.6–2 × as long as broad, apex rounded, apiculate, base broadly cuneate, upper surface glabrous, lower surface densely fulvous-tomentose, indumentum bistrate, the upper layer loose, dendroid, the lower whitish and compacted; petioles 1–1.5cm, tomentose. Inflorescence 6–9-flowered; rhachis 5–10mm; pedicels 25–35mm, floccose-tomentose. Calyx 15–20mm, cupular, glabrous except for the ciliate margin, lobes shallow. Corolla fleshy, tubular-campanulate, crimson, c.45mm. Ovary densely tomentose. Capsule 20–25 × c.12mm.

CHINA (SE Xizang, NW Yunnan). Forest margins, rocky slopes, 3650–4400m. Map 122.

Closely allied to *R. haematodes* but generally with larger leaves and calyces. One specimen, *Forrest* 20908, has the leaf shape and indumentum of *R. catacosmum* but the setulose young shoots and petioles of *R. haematodes* subsp. *chaetomallum*. This may be a hybrid. A specimen, *Rock* 17016, is intermediate between *R. catacosmum* and *R. coelicum*, with the sparsely stipitate-glandular petioles of the latter and the tomentose ovaries and the large calyx of the former. *R. catacosmum* apparently hybridises with *R. citriniflorum* (q.v.) and *R. temenium*.

**7. (345.) *R. chionanthum*** Tagg & Forrest, Notes R.B.G. Edinb. 15: 309 (1927). Type: NE Upper Burma, western flank of the Salween/Kiu-chiang divide, 27°18'N, 98°40'E, 14000ft, vii 1924, *Forrest* 25592 (holo. E).

Shrub, 0.6–1m; young shoots  $\pm$  densely setose, eglandular. Leaves obovate, 6–7.5  $\times$  2.2–2.8cm, c.2.5  $\times$  as long as broad, apex rounded, acuminate, base broadly cuneate, glabrous above when mature, with a discontinuous floccose tomentum beneath; petioles 0.5–1cm, setose. Inflorescence 4–6-flowered; rhachis c.5mm; pedicels 15–20mm, sparsely setulose-glandular. Calyx 2–3mm, lobes ciliate. Corolla tubular-campanulate, white, c.35mm. Ovary densely rufous-tomentose. Capsule not known.

NE UPPER BURMA, CHINA (W Yunnan). Rocky slopes, 4400m. Map 122, p. 388.

Allied to, or a hybrid of, *R. haematodes* subsp. *chaetomallum* but differing in the white flowers and discontinuous indumentum.

**8. (346.) *R. haematodes*** Franchet, Bull. Soc. Bot. France 33: 232 (1886).

Small shrub, 0.6–1.8m; young shoots densely tomentose to setose. Leaves obovate to oblong, 4.5–8.5(–10)  $\times$  1.8–4.5(–5.5)cm, (1.5–)1.8–2.6  $\times$  as long as broad, apex rounded, apiculate, base rounded to  $\pm$  cuneate, upper surface glabrous when mature or with a few scattered hairs, lower surface with a  $\pm$  densely matted bistrate tomentum, the upper layer fawn to red-brown, dendroid, the lower whitish, compacted; petioles 0.5–1cm, densely tomentose or setose and tomentose. Inflorescence 4–6(–8)-flowered; rhachis c.5mm; pedicels 10–23mm, tomentose to setose. Calyx minute to  $\pm$  cupular, if well developed then usually irregular, lobes 3–15mm, rounded,  $\pm$  glabrous. Corolla fleshy, tubular-campanulate, scarlet to deep crimson, 35–45(–50)mm. Ovary densely rufous-tomentose. Capsule 10–15  $\times$  5–7mm.

Alpine thickets, open rocky slopes (3350–)3650–4450m. Map 123.

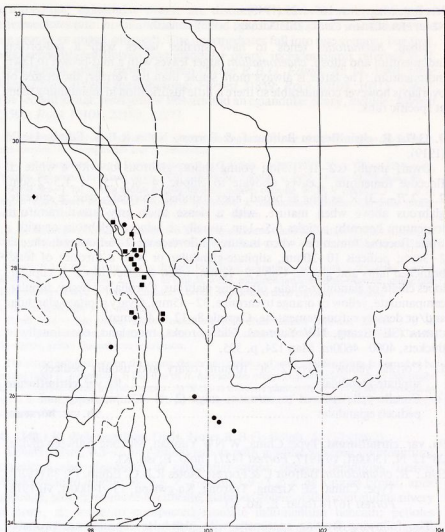
1. Petioles and young shoots predominantly tomentose, setae few and slender or lacking..... **8a. subsp. *haematodes***
- + Petioles and young shoots predominantly setose, setae  $\pm$  stout  
**8b. subsp. *chaetomallum***

**8a. subsp. *haematodes***. Type: China, Yunnan, ad montem Tsang-chan, *Delavay* 298 (iso. E).

Syn.: *R. haematodes* Forrest var. *calycinum* Franchet, Bull. Soc. Bot. France 33: 232 (1886). Type: China, Yunnan, in monte Tsang-chan, 4000m, *Delavay* (iso. K).

*R. haematodes* Franchet var. *hypoleucum* Franchet, ibid. 33: 232 (1886).

Type: China, Yunnan, in silvis ad montem Tsang-chan, 3500m, 26 vii 1886, *Delavay* 2425, n.v.



MAP 123. ● *R. haematodes* subsp. *haematodes*; ◆ aff. subsp. *haematodes*; ■ subsp. *chaetomallum*.

Ic.: Bot. Mag. 153: t.9165 (1929).

CHINA (W Yunnan).

**8b. subsp. *chaetomallum*** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 37: 333 (1979).

Syn.: *R. chaetomallum* Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 95 (1920). Type: China, Yunnan, Dokar La, Mekong/Salween divide, 12–13000ft, vi 1918, *Forrest* 16691 (holo. E).

*R. chaetomallum* Balfour f. & Forrest var. *glaucescens* Tagg & Forrest, Notes R.B.G. Edinb. 16: 189 (1931). Type: NE Upper Burma, western flank of the Salween/Kiu-chiang divide, 27°28'N, 98°40'E, 13000ft, vii 1924, *Forrest* 25607 (holo. E).

Ic.: Bot. Mag., n.s. 165: t.25 (1948).

NE UPPER BURMA, CHINA (SE Xizang, NW Yunnan).

Subsp. *haematodes* tends to have smaller leaves with a red-brown indumentum and subsp. *chaetomallum* larger leaves with a mid-brown to fawn indumentum. The latter is always more setose than the former; the degree of overlap is however considerable so there is little justification in maintaining them at specific rank.

**9. (347.) *R. citriniflorum*** Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 35 (1919).

Dwarf shrub, 0.2–1(–1.5)m; young shoots glabrous or with a white  $\pm$  floccose tomentum. Leaves obovate to elliptic, 4–6(–7.5)  $\times$  1.5–2.3cm, 2.2–2.7(–3.3)  $\times$  as long as broad, apex rounded, apiculate, base  $\pm$  cuneate, glabrous above when mature, with a dense thick grey-brown ramiform tomentum beneath; petioles 0.5–1cm, usually  $\pm$  winged, glabrous or with a white floccose tomentum when mature. Inflorescence 2–6-flowered; rhachis 2–3mm; pedicels 10–20mm, stipitate-glandular or with a mixture of long-branched hairs and glands. Calyx 2–12mm, when well-developed  $\pm$  cupular, lobes ciliate or glandular-ciliate, otherwise glabrous. Corolla not fleshy, tubular-campanulate, yellow or orange to carmine, 32–45mm. Ovary stipitate-glandular and/or densely rufous-tomentose. Capsule 8–12  $\times$  4–6mm.

CHINA (SE Xizang, NW Yunnan). Cliffs, rocks, moorland, occasionally in thickets, 4000–4600m. Map 124, p. 395.

1. Corolla yellow; calyx 2–5(–10)mm; ovary and usually pedicels stipitate-glandular ..... **9a. var. *citriniflorum***  
 + Corolla yellowish-red to carmine; calyx (2–)7–12mm; ovary and pedicels eglandular ..... **9b. var. *horeaeum***

**9a. var. *citriniflorum*.** Type: China, W NW Yunnan, Mekong/Salween divide, 28°12'N, 13000ft, vii 1917, *Forrest* 14271 (holo. E; iso. K).

Syn.: *R. chlanidotum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 38 (1920).

Type: China, SE Xizang, Tsarong, Ka-gwr-pu, 13–14000ft, vii 1918, *Forrest* 16714 (holo. E; iso. K).

The following fruiting specimens with glandular capsules are probably referable to var. *citriniflorum*: *Forrest* 15294, 22680; *Rock* 10905, 119, 124.

**9b. var. *horeaeum*** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 37: 332 (1979).

Syn.: *R. horeaeum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 264 (1922).

Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, ix 1921, *Forrest* 20287 (holo. E).

*R. citriniflorum* Balfour f. & Forrest subsp. *aureolum* Cowan in Notes R.B.G. Edinb. 20: 75 (1940). Type: China, SE Xizang, Tsarong, on Ka-gwr-pu, 14000ft, vii 1917, *Forrest* 14503 (holo. E).

The following fruiting specimens are probably referable to var. *horeaeum*: *Forrest* 14752, 22862, 25901, 25913; *Rock* 9099, 11203, 11206.

The two extremes, var. *citriniflorum* with yellow flowers, a short calyx and glandular ovary, and var. *horeaeum* with red flowers, a well-developed calyx and



a tomentose, eglandular ovary, are distinct. There is however a range of intermediates (var. *horeaum* as recognized here includes plants with flowers that are orange or tinged with red). The intermediates fall into two groups. The first, with yellowish-red flowers and glandular ovary, includes plants referred to *R. citriniflorum* subsp. *rubens* Cowan (*Notes R.B.G. Edinb.* 20: 14, 1940, type: *Rock* 23245, E) and the following: *Forrest* 21859; *Rock* 10109, 10111, 23669. The second group, with yellow flowers and an eglandular ovary, include: *Forrest* 25595; *Rock* 10106, 22189, 22277.

A number of plants are intermediate between, and apparently part of hybrid swarms involving *R. catacosmum*, *R. citriniflorum* and *R. temenium*:

i. *R. × xanthanthum* Tagg & Forrest in *Notes R.B.G. Edinb.* 15: 308 (1927). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, NW of Si-chi-to, 14000ft, vi 1922, *Forrest* 21275 (holo. E).

Shrub, 0.5–1.5m; young shoots densely setulose. Leaves obovate, 9–10 × c.4cm, 2.3–2.5 × as long as broad, lower surface with a loose, brown lanate, ± continuous tomentum. Calyx 10–15mm, cupular. Corolla creamy yellow flushed crimson, 47–60mm.

ii. *R. × hillieri* Davidian, *Rhododendrons with Magnolias and Camellias* 47 (1974). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, NW of Si-chi-to, 13–14000ft, vi 1922, *Forrest* 21736 (holo. E).

Shrub, 0.3–1.8m; young shoots densely tomentose, sometimes also with a few setae. Leaves obovate, 4.5–7 × 2–3cm, 2–2.5 × as long as broad, indumentum arachnoid-floccose, sparse and discontinuous. Calyx 7–10mm, cupular. Corolla rose-pink to deep crimson, 30–50mm.

iii. ?*R. citriniflorum × R. temenium*.

Shrub, 0.6–1.3m; young shoots tomentose and often densely setulose. Leaves 5–8 × 2.3–3(–4)cm, indumentum greyish to fawn, tomentose, dense to continuous. Calyx c.7mm. Corolla 35–40mm, yellow flushed rose to crimson.

The setose indumentum on the young shoots and petioles of some of these plants (assumed to be derived from *R. temenium*), is like that of *R. haematodes* subsp. *chaetomallum*, a taxon that might also be involved in this hybrid complex. At Si-chi-to there are plants referable to all three hybrids as well as to the three putative parents. It is perhaps significant however that subsp. *chaetomallum* does not occur there.

#### 10. (348.) *R. dichroanthum* Diels, *Notes R.B.G. Edinb.* 5: 212 (1912).

Dwarf shrub, 0.3–2.3m; young shoots with a white floccose indumentum, sometimes also glandular- or eglandular-setose; perulae deciduous. Leaves oblanceolate to elliptic, 4–9.5 × 2–4cm, 1.9–3.2 × as long as broad, apex apiculate, base ± rounded to cuneate, glabrous above, with a continuous silvery to fawn, ± loose to compacted rosulate indumentum beneath; petioles 0.5–1cm, indumentum white, floccose. Inflorescence 3–6-flowered; rhachis 5(–8)mm; pedicels 15–25mm, rufous-tomentose or stipitate-glandular. Calyx 3–15mm, coloured, cupular when well-developed, though usually irregular, glabrous except for the rounded, glandular-ciliate lobes. Corolla fleshy, tubular-campanulate, orange-red, occasionally yellow flushed red or even carmine, 35–50mm. Ovary rufous-tomentose, with or without stipitate glands. Capsule 10–15 × 4–6mm.

Open rocky slopes, cliff ledges, cane brakes, etc., 2750–4550m. Map 124, p. 395.

1. Ovary with a number of stipitate glands; young shoots often glandular-setose ..... 2
- + Ovary lacking stipitate glands, rarely with one or two towards the base; young shoots with eglandular setae or setae absent ..... 3
2. Leaves 3–3.3 × as long as broad ..... 10d. subsp. *septentrionale*
- + Leaves 1.9–2.5(–2.7) × as long as broad ..... 10c. subsp. *scyphocalyx*

3. Leaves (2.5–)2.7–3.5 × as long as broad; indumentum silvery or whitish .....4  
 + Leaves 1.9–2.4(–2.5) × as long as broad; silvery to fawn

**10b. subsp. apodectum**

4. Indumentum silvery, compacted; leaves 2.5–3 × as long as broad

**10a. subsp. dichroanthum**

- + Indumentum whitish to fawn, leaves 3–3.3 × as long as broad

**10d. subsp. septentrionale**

**10a. subsp. dichroanthum.** Type: China, Yunnan, E flank of the Tali Range, 9–10000ft, vii 1916, *Forrest* 4138 (holo. E; iso. K).

Ic.: Bot. Mag. 145: t.8815 (1919); Gard. Chron. 79: 383 (1926).

CHINA (W Yunnan, around Dali).

**10b. subsp. apodectum** (Balfour f. & W. W. Smith) Cowan, Notes R.B.G. Edinb. 20: 86 (1940).

Syn.: *R. apodectum* Balfour f. & W. W. Smith, Notes R.B.G. Edinb. 10: 83 (1917). Type: China, Yunnan, western flank of the Tali Range, 25°20'N, 10–11000ft, viii 1912, *Forrest* 8987 (holo. E; iso. K).

*R. jangtzwense* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 271 (1922). Type: China, W Yunnan, Shweli/Salween divide, Jangtzw Shan, 11000ft, vi 1919, *Forrest* 18167 (holo. E; iso. K).

*R. liratatum* Balfour f. & Forrest, *ibid.* 13: 274 (1922). Type: China, W Yunnan, Shweli/Salween divide, Jangtzw Shan, 11000ft, vi 1919, *Forrest* 18153 (holo. E; iso. K).

Ic.: Bot. Mag. 149: t.9014 (1924).

CHINA (W Yunnan), NE UPPER BURMA.

**10c. subsp. scyphocalyx** (Balfour f. & Forrest) Cowan, Notes R.B.G. Edinb. 20: 88 (1940).

Syn.: *R. scyphocalyx* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 291 (1922). Type: NE Upper Burma, western flank of the N'Maikha/Salween divide, 26°25'N, v 1919, *Forrest* 18050 (holo. E).

*R. herpesticum* Balfour f. & Kingdon-Ward, Notes R.B.G. Edinb. 10: 114 (1917). Type: E Upper Burma, Mwai divide, Ridge of Naung Chanung, 12–13000ft, 16 vii 1914, *Kingdon-Ward* 1793 (holo. E; iso. K).

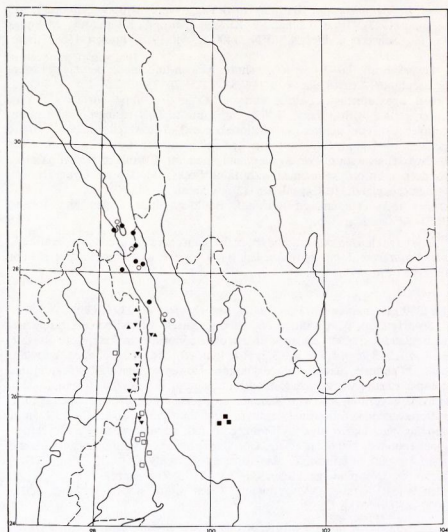
*R. torquatum* Balfour f. & Farrer, Notes R.B.G. Edinb. 13: 303 (1922). Type: NE Upper Burma, Maguchi Pass, 11–12000ft, 31 vii 1920, *Farrer* 1775 (holo. E).

*R. dichroanthum* Diels subsp. *herpesticum* (Balfour f. & Kingdon-Ward) Cowan, Notes R.B.G. Edinb. 20: 87 (1940).

NE UPPER BURMA, CHINA (W Yunnan).

**10d. subsp. septentrionale** Cowan, Notes R.B.G. Edinb. 20: 87 (1940). Type: NE Upper Burma, western flank of the Salween/Kiu-chiang divide, 27°18'N, 98°40'E, 13–14000ft, vii 1924, *Forrest* 25750 (holo. E).

CHINA (NW Yunnan) & adjacent NE UPPER BURMA.



MAP 124. ● *R. citriniflorum* var. *citriniflorum*; ○ var. *horeum*; ■ *R. dichroanthum* subsp. *dichroanthum*; □ subsp. *apodectum*; ▼ subsp. *scyphocalyx*; ▲ subsp. *septentrionale*.

A variable species showing some geographical variation; closely allied to *R. sanguineum*. A specimen, *Forrest* 27071, with yellow flowers flushed rose, sparsely hairy leaves and persistent perulae, is almost certainly a hybrid between *R. dichroanthum* and *R. aperantum*.

11. (349.) *R. microgynum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 99 (1919). Type: China, SE Xizang, Ka-gwr-pw, Mekong/Salween divide, 28°25'N, 12000ft, vii 1917, *Forrest* 14242 (holo. E).

Syn.: *R. perulatum* Balfour f. & Forrest, *ibid.* 11: 106 (1919). Type: SE Xizang, Tsarong, Dokar-la, Mekong/Salween divide, 11000ft, vii 1917, *Forrest* 14421 (holo. E; iso. K).

*R. gymnocarpum* [Balfour f. ex] Tagg, Notes R.B.G. Edinb. 15: 315 (1927). Type: China, SE Xizang, Tsarong, Ka-gwr-pw, Mekong/Salween divide, 28°40'N, 14000ft, vii 1918, *Forrest* 16687 (holo. E).

Dwarf shrub, 0.6–1.6m; young shoots whitish-tomentose; perulae persistent or deciduous. Leaves elliptic, 5.5–7.5 × 1.5–2(–3)cm, 2.5–4 × as long as broad, apex apiculate, base ± cuneate to rounded, upper surface glabrous, lower surface with a dense, felted, cinnamon to buff rosulate indumentum; petioles c.0.7cm, glabrescent. Inflorescence 3–7-flowered; rhachis c.5mm; pedicels 10–20mm, floccose-tomentose and glandular. Calyx 2–10mm, lobes fleshy to chartaceous, sparsely hairy and glandular. Corolla ± fleshy, pale rose to deep crimson, sometimes with faint flecks, 30–35mm. Ovary brown-tomentose, glandular. Capsule 10–12 × c.5mm.

CHINA (NW Yunnan, SE Xizang). Boulderly slopes, open pine forests, 3650–4250m. Map 125.

The large chartaceous calyx has been the main character used for separating *R. perulatum* from *R. microgynum*. This is not however a constant feature, even on the type of *R. perulatum*.

**12. (350.) *R. sanguineum* Franchet, J. Bot. (Morot) 12: 259 (1898).**

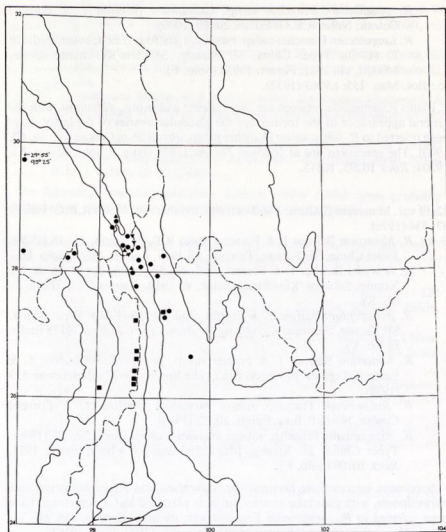
Dwarf shrub, 0.3–1.5m; young shoots sparsely white-floccose, rarely also with eglandular setae; perulae persistent or deciduous. Leaves elliptic to obovate, 3–8 × 1.5–3.2cm, 1.9–2.4(–3.2) × as long as broad, apex rounded, apiculate, base ± cuneate, upper surface glabrous, lower surface with a continuous compacted silvery to greyish rosulate indumentum; petioles 0.5–0.8cm, floccose when young, rarely also with glandular setae, usually ± glabrous when mature. Inflorescence 3–6-flowered; rhachis less than 5mm; pedicels 10–25mm, stipitate-glandular. Calyx 3–10mm, coloured, cupular when well-developed, lobes rounded, glandular-ciliate. Corolla fleshy, shortly tubular-campanulate, yellow to pink or crimson to blackish crimson, rarely white, 25–35mm. Ovary tomentose to stipitate-glandular. Capsule 10–15 × 4–6mm.

CHINA (SE Xizang, NW Yunnan). Open stony slopes, amongst scrub, 3000–4500m. Map 125.

- |                                                                     |                                |
|---------------------------------------------------------------------|--------------------------------|
| 1. Ovary eglandular-tomentose; perulae usually deciduous .....      | 2                              |
| + Ovary at least partly glandular; perulae usually persistent ..... | 5                              |
| 2. Corolla crimson .....                                            | 3                              |
| + Corolla yellow to pink, rarely white .....                        | 4                              |
| 3. Corolla bright crimson .....                                     | 12ai. var. <i>sanguineum</i>   |
| + Corolla deep blackish crimson .....                               | 12aii. var. <i>haemaleum</i>   |
| 4. Corolla yellow .....                                             | 12aiii. var. <i>himertum</i>   |
| + Corolla white, or yellow flushed pink, to pink .....              | 12aiv. var. <i>cloiophorum</i> |
| 5. Corolla yellow flushed pink to pink .....                        | 12av. var. <i>didymoides</i>   |
| + Corolla deep blackish crimson .....                               | 12b. subsp. <i>didymum</i>     |

**12a. subsp. *sanguineum*.**

Leaves 3–8cm long; corolla colour as for species; ovary eglandular-tomentose or if glandular then corolla pinkish.



MAP 125. ▼ *R. microgynum*; ● *R. sanguineum* subsp. *sanguineum*; ▲ subsp. *didymum*; ■ *R. aperantum*.

**12ai. var. *sanguineum*.** Type: China, NW Yunnan, Sela, vi 1895, Soulié 1015 (iso. E, K).

Syn.: *R. sanguineum* Franchet subsp. *sanguinioides* Cowan, Notes R.B.G. Edinb. 20: 69 (1940). Type: China, SE Xizang, N slopes of Mt Kenyichumpo, N of Sikitung, v–vi 1932, Rock 22203 (holo. E).

**12aii. var. *haemaleum*** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 37: 334 (1979).

Syn.: *R. haemaleum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 71 (1917). Type: China, NW Yunnan, Mekong/Salween divide, NW from Tseku, 11000ft, viii 1904, Forrest 5074 (holo. E).

*R. sanguineum* Franchet subsp. *haemaleum* (Balfour f. & Forrest) Cowan, Notes R.B.G. Edinb. 20: 69 (1940).

*R. sanguineum* Franchet subsp. *mesaeum* [Balfour f. ex] Cowan, *ibid.* 20: 70 (1940). Type: China, SE Xizang, Salween/Kiu-chiang divide, 14000ft, viii 1921, *Forrest* 19958 (holo. E).

*l.c.*: Bot. Mag. 155: t.9263 (1932).

Plants intermediate between var. *haemaleum* and subsp. *didymum*, with the general appearance of the former but the glandular ovaries of the latter, have been referred to *R. sanguineum* Franchet subsp. *atrorubrum* Cowan (op. cit. 69, 1940). The specimens are as follows: *Forrest* 18675 (type – holo. E; iso. K), 19204; *Rock* 10293, 10315.

**12aiii** var. *himertum* (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 37: 334 (1979).

Syn.: *R. himertum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 48 (1920). Type: China, SE Xizang, Tsarong, vii 1918, *Forrest* 16725 (holo. E).

*R. nebrities* Balfour f. & Forrest, *ibid.* 13: 53 (1920). Type: China, SE Xizang, Salween/Kiu-chiang divide, vii 1919, *Forrest* 19153 (holo. E; iso. K).

*R. poliopeplum* Balfour f. & Forrest, *ibid.* 13: 56 (1920). Type: China, SE Xizang, Salween/Kiu-chiang divide, vii 1919, *Forrest* 19175 (holo. E; iso. K).

*R. himertum* Balfour f. & Forrest subsp. *poliopeplum* (Balfour f. & Forrest) Tagg in Stevenson (ed.), The Species of *Rhododendron* 553 (1930).

*R. sanguineum* Franchet subsp. *himertum* (Balfour f. & Forrest) Cowan, Notes R.B.G. Edinb. 20: 72 (1940).

*R. sanguineum* Franchet subsp. *aisoides* Cowan, *ibid.* 20: 72 (1940). Type: China, SE Xizang, Mt. Kenyichumpo, Champutong, 1923, *Rock* 10108 (holo. E).

Specimens intermediate between var. *himertum* and *R. citriniflorum* var. *citriniflorum*, with glandular ovaries but a  $\pm$  plastered leaf indumentum have been referred to *R. sanguineum* Franchet var. *melleum* Cowan, (op. cit. 73, 1940). They are as follows: *Forrest* 16727 (holo. E), 22689; *Rock* 10282.

*Rock* 22584 has a relatively thick leaf indumentum but a tomentose ovary and is also considered to be intermediate between these two taxa. Plants intermediate between var. *himertum* and *R. temenium* var. *gilvum*, with  $\pm$  setose shoots, a thin discontinuous leaf indumentum and an epillate lower epidermis on the leaves, have been referred to *R. fulvastrum* Balfour f. & Forrest (Notes R.B.G. Edinb. 13: 45, 1920). Specimens seen are: *Forrest* 19023 (holo. E), 21782; *Rock* 10304, 10951, 22215.

**12aiv** var. *cloiophorum* (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 37: 334 (1979).

Syn.: *R. cloiophorum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 37 (1919). Type: China, W NW Yunnan, Mekong/Salween divide, 28°12'N, vii 1917, *Forrest* 14269 (holo. E; iso. K).

- R. leucopetalum* Balfour f. & Forrest, *ibid.* 11: 86 (1919). Type: China, W NW Yunnan, Mekong/Salween divide, 28°12'N, 12–13000ft, vii 1917, *Forrest* 14270 (holo. E; iso. K).
- R. asmenistum* Balfour f. & Forrest, *ibid.* 13: 29 (1920). Type: China, SE Xizang, Salween/Kiu-chiang divide, vii 1919, *Forrest* 19169 (holo. E; iso. K).
- R. cloiophorum* Balfour f. & Forrest subsp. *asmenistum* (Balfour f. & Forrest) Tagg in Stevenson (ed.), *The Species of Rhododendron* 545 (1930).
- R. sanguineum* Franchet subsp. *cloiophorum* (Balfour f. & Forrest) Cowan and subsp. *leucopetalum* (Balfour f. & Forrest) Cowan, *Notes R.B.G. Edinb.* 20: 73 (1940).

The following flowering specimens without flower colour notes probably belong to var. *cloiophorum*: *Forrest* 18642, 18644, 18662, 18686.

**12av.** var. *didymoides* Tagg & Forrest, *Notes R.B.G. Edinb.* 16: 208 (1931). Type: China, SE Xizang, Salween/Kiu-chiang divide, 28°14'N, 98°24'E, 14000ft, vii 1921, *Forrest* 19982 (holo. E).

Syn.: *R. roseotinctum* Balfour f. & Forrest, *Notes R.B.G. Edinb.* 11: 124 (1919). Type: China, W NW Yunnan, Mekong/Salween divide, 28°12'N, 12000ft, vii 1917, *Forrest* 14211 (holo. E).

*R. mannophorum* Balfour f. & Forrest, *ibid.* 13: 51 (1920). Type: China, SE Xizang, Salween/Kiu-chiang divide, vii 1919, *Forrest* 19163 (holo. E; iso. K).

*R. sanguineum* Franchet subsp. *didymoides* (Tagg & Forrest) Cowan and subsp. *roseotinctum* (Balfour f. & Forrest) Cowan, *Notes R.B.G. Edinb.* 20: 71 & 72 (1940).

*R. sanguineum* Franchet subsp. *consanguineum* Cowan, *ibid.* 20: 68 (1940). Type: China, NW Yunnan, Mekong/Yangtze divide, E of A-Wa, 14000ft, vi 1924, *Forrest* 25307 (holo. E).

**12b.** subsp. *didymum* (Balfour f. & Forrest) Cowan, *Notes R.B.G. Edinb.* 20: 70 (1940).

Syn.: *R. didymum* Balfour f. & Forrest, *Notes R.B.G. Edinb.* 13: 256 (1922). Type: China, SE Xizang, Salween/Kiu-chiang divide, 14–15000ft, 28°24'N, 98°24'E, ix 1921, *Forrest* 20220 (holo. E).

A number of specimens lacking flowers clearly belong to *R. sanguineum* in the broad sense but cannot be assigned to the infraspecific taxa recognized here.

*R. sanguineum* is an extremely variable species with a relatively narrow geographical range. The dividing lines between the infraspecific taxa are difficult to define as a result of the number of intermediates that occur, probably because of widespread hybridisation involving several related species as well as the occurrence of infraspecific taxa in *R. sanguineum* itself.

The most distinct infraspecific taxon is subsp. *didymum*, which is at one extreme of a more or less continuously varying complex of taxa, and may be one of the original parental stocks involved in the hybridisation. I have therefore treated this as a subspecies even though its distribution is within the range of subsp. *sanguineum*.

Flower colour separates most of the varieties included here under subsp. *sanguineum*. Without extensive field studies and a breeding programme, the possibility remains that they are no more than minor colour variants, not even worthy of varietal status. Cowan's treatment of the 'Sanguineum Alliance' (op. cit.) recognised many more, narrowly circumscribed, taxa than are maintained here. I have not followed this treatment as I consider that it only confuses an already complicated variation pattern unnecessarily.

**13. (351.) *R. aperantum*** Balfour f. & Kingdon-Ward, Notes R.B.G. Edinb. 13: 231 (1922). Type: NE Upper Burma, Chawchi Pass, 12000ft, vii 1921, *Farrer* 1671 (holo. E; iso. K).

Dwarf matted shrub, 0.3–0.6(–1.5)m; young shoots with a floccose tomentum; perulae persistent. Leaves obovate to oblanceolate, 3–6.5 × 1.4–2.4cm, 1.7–2.6 × as long as broad, apex rounded, apiculate, base ± cuneate, upper surface glabrous, lower surface papillate, glaucous, usually glabrous at maturity though sometimes with vestiges of reddish-brown or whitish indumentum persisting on the main veins and midrib; petioles broad, 0.3–0.6cm, usually with a floccose indumentum when young. Inflorescence 4–6-flowered; rhachis c.2mm; pedicels 15–30mm, floccose-tomentose, also with long dendroid hairs. Calyx 3–6mm, cupular, lobes glandular-ciliate, otherwise glabrous. Corolla thin, tubular-campanulate, white or yellow flushed pink to orange or rose, (30–)35–45mm. Ovary coarsely rufous-tomentose with a few glandular setae. Capsule 8–15 × c.6mm.

NE UPPER BURMA & adjacent CHINA (NW Yunnan). Cliffs, meadows, 3600–4500m. Map 125, p. 397.

Plants with a more persistent though patchy indumentum, probably hybrids of *R. aperantum*, have been referred to *R. aperantum* var. *subpilosum* Cowan (Notes R.B.G. Edinb. 20: 84, 1940). They are as follows: *Forrest* 25596 (type–holo. E), 25563, 25757, 25878.

**14. (352.) *R. parmulatum*** Cowan, Notes R.B.G. Edinb. 19: 182 (1936). Type: China, E Xizang, Doshong La, 11–12000ft, *Kingdon-Ward* 5875 (holo. E; iso. K).

Dwarf shrub, 0.6–1.3m; young shoots soon glabrescent; perulae deciduous. Leaves obovate to elliptic, 4.5–8 × 2–3.5cm, c.3 × as long as broad, apex rounded, apiculate, base rounded to ± cuneate, upper surface glabrous, lower surface finely papillate, glabrous except for a few white hairs on the midrib and main veins; petioles broad, up to 0.5cm, glabrescent. Inflorescence 4–6-flowered; rhachis c.3mm; pedicels 10–20mm, glabrous. Calyx c.5mm, glabrous, lobes broad and rounded. Corolla tubular-campanulate, white or pale yellow flushed pink, with red flecks, 40–50mm. Ovary with a few scattered hairs. Capsule not known.

CHINA (S Xizang). Cliffs, 3000–3700m. Map 120, p. 383.

An aberrant member of subsection *Neriiflora* on account of the pronounced reddish flecks on the posterior corolla lobes. There are apparently several plants referred to *R. faucium* (subsection *Thomsonia*) that approach *R. parmulatum* but differ in their more open, less obviously tubular-campanulate corollas and in the greater number of flowers per inflorescence. These intermediates may well be of hybrid origin.



15. (353.) *R. trilectorum* Cowan, Notes R.B.G. Edinb. 21: 144 (1953). Type: China, SE Xizang, Kongbo Prov., Tsari Sama, Langong, 4100–4250m, 16 vi 1938, Ludlow, Sherriff & Taylor 5582 (holo. BM).

Dwarf shrub, to c.0.3m; perulae persistent. Leaves obovate to obovate-spathulate, 1–3.2 × 0.6–1.8cm, c.2.5 × as long as broad, apex rounded, mucronate, base attenuate, decurrent, upper and lower surfaces glabrous; petioles short and winged. Inflorescence 2–3(–5)-flowered; rhachis minute; pedicels 20–30mm, glabrous. Calyx 1–3mm, glabrous, lobes fleshy. Corolla infundibular-campanulate, pale yellow, 30–40mm. Ovary glabrous. Capsule not known.

CHINA (SE Xizang). Rocky hillsides, 3600–4300m. Map 120, p. 402.

A species of uncertain affinities though in some respects resembling both *R. parvulatum* and *R. forrestii*.

16. (354.) *R. eudoxum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 62 (1919).

Dwarf shrub, 0.3–1.2m; young shoots tomentose, usually also with a few weak setae, rarely ± densely and strongly setose. Leaves elliptic, 3.5–9 × 1–3cm, 2.8–3.5 × as long as broad, apex rounded, apiculate, base rounded, upper surface glabrous, lower surfaces with a thin discontinuous, whitish to brown indumentum and a greenish epapillate epidermis; petioles 0.5–1(–1.5)cm, usually tomentose, sometimes also weakly setose. Inflorescence 2–6-flowered; rhachis c.5mm; pedicels 10–20mm, tomentose, sometimes also glandular. Calyx 2–7mm, cupular when well-developed, lobes rounded, very sparsely tomentose or glandular. Corolla not fleshy (perhaps so in var. *mesopolium*), tubular-campanulate to campanulate, pink to rose-carmine, 25–40mm. Ovary predominantly glandular to predominantly tomentose. Capsule 15–20 × c.5mm.

CHINA (border of SE Xizang & NW Yunnan). Cliffs, rocky slopes, thickets, etc., 3350–4250m. Map 126, p. 402.

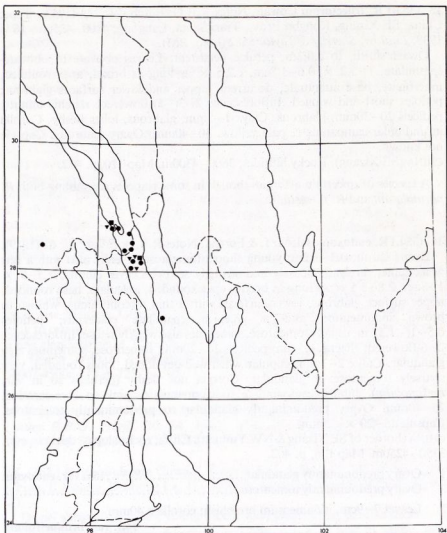
1. Ovary predominantly glandular ..... 16a. var. *eudoxum*  
+ Ovary predominantly tomentose ..... 2
2. Leaves 7–9cm, indumentum brownish; corolla c.40mm  
16b. var. *brunneifolium*  
+ Leaves 3.5–7cm, indumentum whitish; corolla 30–35mm  
16c. var. *mesopolium*

16a. var. *eudoxum*. Type: China, NW Yunnan, Mekong/Salween divide, 28°12'N, 11000ft, vii 1917, *Forrest* 14245 (holo. E; iso. K).

Syn.: *R. trichomiscum* Balfour f. Forrest, *ibid.* 12: 169 (1920). Type: China, SE Xizang, Tsarong, Ka-gwr-pw, 14000ft, 28°24'N, vii 1918, *Forrest* 16826 (holo. E; iso. K).

*R. trichophlebium* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 62 (1920). Type: China, SE Xizang, Tsarong, (1917), *Forrest* 18632 (holo. E).

*R. eudoxum* Balfour f. & Forrest subsp. *trichomiscum* (Balfour f. & Forrest) Tagg in Stevenson (ed.), *The Species of Rhododendron* 549 (1930).



MAP 126. ● *R. eudoxum* var. *eudoxum*; ■ var. *brunneifolium*; ▽ var. *mesopolium*.

*R. fulvastrum* Balfour f. & Forrest subsp. *trichomiscum* (Balfour f. & Forrest) Cowan and subsp. *trichophlebium* (Balfour f. & Forrest) Cowan, Notes R.B.G. Edinb. 20: 79 (1940).

*R. temenium* Balfour f. & Forrest subsp. *albipetalum* Cowan, ibid. 20: 83 (1940). Type: China, SE Xizang, Tsarong, Solo-la, 13000ft, v-vi 1932, *Rock* 22295 (holo. E).

*R. temenium* Balfour f. & Forrest subsp. *rhodanthum* Cowan, ibid. 20: 83 (1940). Type: China, NW Yunnan, Mts of Londre, Mekong/Salween divide, 1923, *Rock* 10285 (holo. E).

Young shoots and pedicels tomentose, usually also with a few weak glandular setae. Leaves 3.5–7(–8.5)cm, with a thin brownish discontinuous indumentum

beneath. Inflorescence lax. Corolla 30(–37)mm, rose-pink to magenta, rarely white. Ovary predominantly stipitate-glandular.

*R. fulvastrum* var. *albipetalum* is apparently no more than an albino form of var. *eudoxum*. The young shoots of the types of both *R. trichomiscum* and *R. trichophlebium* are  $\pm$  densely covered with stout setae as in *R. temenium* but otherwise are closer to *R. eudoxum*.

**16b. var. *brunneifolium*** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 37: 333 (1979).

Syn.: *R. brunneifolium* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 33 (1920). Type: China, SE Xizang, Tsarong, Kiu-chiang divide, vii 1919, *Forrest* 19025 (holo. E; iso. K).

*R. eudoxum* Balfour f. & Forrest subsp. *brunneifolium* (Balfour f. & Forrest) Tagg in Stevenson (ed.), The Species of Rhododendron 549 (1930).

Young shoots and pedicels tomentose, with a few weak glandular setae; leaves 7–9cm, with a thin floccose brownish indumentum beneath, not papillate. Inflorescence lax, corolla c.40mm, rose-carmine. Ovary tomentose, eglandular.

**16c. var. *mesopolium*** (Balfour f. & Forrest) Chamberlain, Notes R.B.G. Edinb. 37: 333 (1979).

Syn.: *R. mesopolium* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 57 (1920). Type: China, SE Xizang, Tsarong, Dokar La, 13–14000ft, vii–viii 1918, *Forrest* 16751 (holo. E; iso. K).

*R. asteium* Balfour f. & Forrest, *ibid.* 13: 235 (1922). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, 28°40'N, 98°15'E, vii 1919, *Forrest* 18937 (holo. E; iso. K).

*R. epipastum* Balfour f. & Forrest, *ibid.* 13: 258 (1922). Type: China, SE Xizang, Tsarong, 1919, *Forrest* 18645 (holo. E; iso. K).

*R. eudoxum* Balfour f. & Forrest subsp. *asteium* (Balfour f. & Forrest) Tagg, subsp. *epipastum* (Balfour f. & Forrest) Tagg and subsp. *mesopolium* (Balfour f. & Forrest) Tagg in Stevenson (ed.), The Species of Rhododendron 549 (1930).

*R. fulvastrum* Balfour f. & Forrest subsp. *mesopolium* (Balfour f. & Forrest) Cowan & subsp. *epipastum* (Balfour f. & Forrest) Cowan, Notes R.B.G. Edinb. 20: 79–80 (1940).

Young shoots and pedicels usually floccose-tomentose, eglandular, not strongly setose; leaves 3.5–7cm, with  $\pm$  prominent veins and a thin whitish discontinuous indumentum beneath; corolla 30–35mm, rose-pink; ovary predominantly tomentose though sometimes also with a few glands.

The distinction between var. *brunneifolium* and var. *mesopolium*, as implied by the key, is of a fairly trivial nature but, despite this, var. *mesopolium* may be more distantly allied to var. *brunneifolium* and var. *eudoxum* than these two are to one another. Although it cannot be confirmed for certain from herbarium material, the corollas of var. *mesopolium* do appear to have been more fleshy and more obviously tubular-campanulate than those of the other two varieties. In these respects var. *mesopolium* is apparently closer to *R. sanguineum* and its allies.

The following sterile specimens are referable to *R. eudoxum* s.l.: *Forrest* 14762, 17334, 17336, 20052, 22700.

**17. (355.) *R. temenium*** Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 146 (1919).

Dwarf shrub, 0.3–1.5m; young shoots tomentose, sometimes very sparsely so, esetose to strongly setose. Leaves elliptic, 3.5–5(–8) × 1.2(–3)cm, 2.8–3.5 × as long as broad, apex rounded, apiculate, base ± rounded, upper surface glabrous, lower surface glabrous or with the remains of a whitish floccose indumentum, especially on the midrib and main veins, lower epidermis ± glaucous-papillate; petioles 0.5–1(–1.5)cm, tomentose, usually also setose. Inflorescence 2–6-flowered, lax or dense; rhachis c.5mm; pedicels 10–20mm, tomentose. Calyx 2–5mm, lobes rounded, ciliate, otherwise glabrous. Corolla fleshy, tubular-campanulate (sometimes ? campanulate), white to pink, yellow or carmine to deep crimson, 35–45mm. Ovary tomentose, sometimes with a few glands. Capsule up to 15 × 7mm.

CHINA (borders of SE Xizang & NW Yunnan). Moorland, cliff ledges, amongst scrub, (3650–)4250–4550m. Map 129, p. 414.

1. Corolla white to deep rose-pink; inflorescence lax; young shoots and pedicels weakly setose or occasionally esetose ..... **17c. var. dealbatum**
- + Corolla yellow or crimson to carmine; inflorescence dense; young shoots and pedicels always setose, usually strongly so ..... **2**
2. Corolla carmine to crimson ..... **17a. var. temenium**
- + Corolla yellow ..... **17b. var. gilvum**

**17a. var. temenium.** Type: China, SE Xizang, Tsarong, on Ka-gwr-pw, Mekong/Salween divide, 28°25'N, 14000ft, vii 1917, *Forrest* 14364 (holo. E; iso. K).

Syn.: *R. pothinum* Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 147 (1920).

Type: China, SE Xizang, Dokar-La, Mekong/Salween divide, 13–14000ft, vi 1918, *Forrest* 16702 (holo. E; iso. K).

*R. eudoxum* Balfour f. & Forrest subsp. *temenium* (Balfour f. & Forrest) Tagg and subsp. *pothinum* (Balfour f. & Forrest) Tagg in Stevenson (ed.), *The Species of Rhododendron* 549 (1930).

*R. temenium* Balfour f. & Forrest subsp. *pothinum* (Balfour f. & Forrest) Cowan, Notes R.B.G. Edinb. 20: 81 (1940).

Young shoots and pedicels strongly glandular to eglandular-setose; leaves glabrous beneath; inflorescence dense; corolla c.40mm, carmine to crimson; ovary tomentose with at most only a few glands.

**17b. var. gilvum** (Cowan) Chamberlain, Notes R.B.G. Edinb. 37: 334 (1979).

Syn.: *R. temenium* Balfour f. & Forrest subsp. *gilvum* Cowan, Notes R.B.G. Edinb. 20: 82 (1940). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, NW of Si-chi-to, 13000ft, vi 1922, *Forrest* 21914 (holo. E).

*R. temenium* Balfour f. & Forrest subsp. *chrysanthum* Cowan, ibid. 20: 81 (1940). Type: China, SE Xizang, Tsarong, Solo La, 13000ft, *Rock* 22272 (holo. E).

Young shoots and pedicels strongly setose; leaves glabrous or with the remains of a whitish indumentum beneath, particularly on the midrib and main veins; inflorescence dense; corolla 30–35(–40)mm, yellow, sometimes faintly flushed red; ovary tomentose.

Two specimens, *Forrest* 21784 & 22709, with slightly papillate leaves up to 8cm long, and a lax inflorescence, are probably hybrids of var. *gilvum*. *Rock* 22292 is typical of var. *gilvum* except for the setose young shoots.

**17c. var. dealbatum** (Cowan) Chamberlain, Notes R.B.G. Edinb. 37: 334 (1979). Syn.: *R. temenium* Balfour f. & Forrest subsp. *dealbatum* Cowan, Notes R.B.G. Edinb. 20: 83 (1940). Type: China, SE Xizang, Tsarong Salween/Kiu-chiang divide, 28°20' N, 98°27' E, 13–14000ft, vii 1922, *Forrest* 19900 (holo. E).

*R. glaphyrum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 45 (1920). Type: China, SE Xizang, Salween/Kiu-chiang divide, vii 1919, *Forrest* 18936 (holo. E; iso. K).

*R. eudoxum* Balfour f. & Forrest subsp. *glaphyrum* (Balfour f. & Forrest) Tagg in Stevenson (ed.), The Species of Rhododendron 549 (1930).

*R. temenium* Balfour f. & Forrest subsp. *glaphyrum* (Balfour f. & Forrest) Cowan, Notes R.B.G. Edinb. 20: 82 (1940).

Young shoots and pedicels tomentose, usually also weakly setose and stipitate-glandular; leaves glabrous beneath at maturity; inflorescence 2–4-flowered, lax; corolla 25–45mm, white to deep rose-pink; ovary tomentose.

The following fruiting specimens probably belong to var. *dealbatum*: *Rock* 6, *Kingdon-Ward* 3363.

The type of *R. glaphyrum* is generally larger than is usual for var. *dealbatum*, with corollas up to 45 mm (as compared with 25–35mm). There are apparently no other significant differences, suggesting that *R. glaphyrum* is no more than a luxuriant form of var. *dealbatum*.

*R. temenium* is closely allied to both *R. sanguineum* and *R. eudoxum* but may be distinguished by its  $\pm$  glabrous leaf under-surface with a glaucous epidermis. Three specimens: *Rock* 22235, 22270, 22645, with reddish orange flowers and leaves with the lower epidermis papillate though with a sparse indumentum, are almost certainly hybrids of *R. temenium*. This species apparently hybridises with *R. citriniflorum* (q.v.) and *R. catacosmum*.

**18. (356.) R. erastum** Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 60 (1918). Type: China, W NW Yunnan, Mekong/Salween divide, 28°12' N, 14000ft, vii 1917, *Forrest* 14373 (holo. E; iso. K).

Syn.: *R. porphyrophyllum* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 108 (1919). Type: China, SE Xizang, Tsarong, on Ka-gwr-pw, 13000ft, vi 1918, *Forrest* 16695 (holo. E).

*R. serpens* Balfour f. & Forrest, *ibid.* 11: 135 (1919). Type: China, SE Xizang, Tsarong, on the northern slopes of Ka-gwr-pw, 14000ft, vii 1918, *Forrest* 16698 (holo. E).

Dwarf shrub, 0.05–0.5m; young shoots  $\pm$  densely rufous floccose-tomentose; perulae apparently  $\pm$  persistent. Leaves elliptic to narrowly elliptic, 2.5–4.7  $\times$  0.7–1.7cm, 2.6–5  $\times$  as long as broad, apex rounded, apiculate, base

± rounded, upper surface ± glabrous when mature, lower surface purple or green, with the remnants of a floccose ramiform tomentum and often a few stipitate glands, especially on the midrib; petioles c.0.5cm, floccose-tomentose. Inflorescence 1–3-flowered; rhachis minute; pedicels c.10mm, sparsely tomentose. Calyx c.1.5mm, fleshy, ± floccose. Corolla tubular-campanulate, rose-pink, 25–30mm. Ovary with a whitish to rufous tomentum intermixed with stipitate glands. Capsule not known.

CHINA (SE Xizang, NW Yunnan). Rocky meadows, 3950–4250m. Map 129, p. 414.

Allied to *R. chamaethomsonii* and *R. forrestii* and possibly of hybrid origin. Intermediates between *R. chamaethomsonii* and *R. erastum* are as follows: *Forrest* 16700, 17444, 19491, 20032.

**19. (357.) *R. chamaethomsonii*** (Tagg & Forrest) Cowan & Davidian, *Rhododendron Yearbook* 6: 70 (1951).

Dwarf shrub, 0.1–1m; young shoots stipitate-glandular or sparsely tomentose, perulae ± deciduous or persistent. Leaves broadly obovate to elliptic, (2–)4–6 × (1.3–)1.8–3.2cm, 1.5–2.1 × as long as broad, apex rounded or retuse, base rounded to broadly cuneate, shortly decurrent, upper surface glabrous, lower surface glabrous or with a sparse whitish adpressed indumentum, epapillate; petioles 0.5–1cm, tomentose and/or stipitate-glandular. Inflorescence (1–)2–5-flowered; rhachis c.5mm; pedicels 10–20mm, sparsely stipitate-glandular, sometimes also villous-tomentose. Calyx 1–7(–15)mm, minute or with well-developed, sometimes coloured, glandular-ciliate lobes. Corolla fleshy, campanulate, pink to deep crimson, usually unmarked, 25–45mm. Ovary densely to very sparsely rufous-tomentose with varying proportions of stipitate glands. Capsule c.15 × 4mm.

Amongst boulders, damp rocky slopes, 4000–4600m. Map 115, p. 371.

1. Corolla carmine to crimson; calyx lobes to 7(–15)mm; ovary sparsely hairy, sometimes glandular .....2  
+ Corolla pale to deep pink; calyx minute, 1mm or less; ovary densely hairy .....19c. var. **chamaethauma**
2. Leaves glabrous; petioles and young shoots glandular .....19a. var. **chamaethomsonii**  
+ Leaves with a thin discontinuous indumentum when mature; petioles and young shoots eglandular .....19b. var. **chamaedoron**

**19a. var. *chamaethomsonii*.**

Syn.: *R. repens* Balfour f. & Forrest var. *chamaethomsonii* Tagg & Forrest, Notes R.B.G. Edinb. 16: 206 (1931). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, NW of Si-chi-to, 14–15000ft, vi 1922, *Forrest* 21723 (holo. E).

CHINA (SE Xizang & adjacent NW Yunnan).

**19b. var. *chamaedoron*** (Tagg & Forrest) Chamberlain, Notes R.B.G. Edinb. 37: 332 (1979).

Syn.: *R. repens* Balfour f. & Forrest var. *chamaedoron* Tagg & Forrest, Notes R.B.G. Edinb. 16: 206 (1931). Type: China, SE Xizang,

Tsarong, Salween/Kiu-chiang divide, W of Chamtong, 14500ft, vi 1922, *Forrest* 21768 (holo. E).

CHINA (SE Xizang & adjacent NW Yunnan).

**19c. var. chamaethauma** (Tagg) Cowan & Davidian, *Rhododendron Yearbook* 6: 71 (1951).

Syn.: *R. repens* Balfour f. & Forrest var. *chamaethauma* Tagg, Notes R.B.G. Edinb. 16: 206 (1931). Type: China, SE Xizang, Doshong La, 12–13000ft, vi 1924, *Kingdon-Ward* 5847 (E, K).

CHINA (S Xizang, Doshong La & Deyang La).

Closely allied to and apparently hybridising with *R. forrestii* (q.v.).

**20. (358.) R. forrestii** [Balfour f. ex] Diels, Notes R.B.G. Edinb. 5: 211 (1912).

Dwarf creeping shrub; stems up to 0.6m long though rarely more than 0.1m high; perulae persistent. Leaves obovate to orbicular, 1–2.8 × 0.9–1.8cm, 1.1–2.5(–3.2) × as long as broad, apex rounded to retuse, sometimes mucronate, base broadly cuneate, often narrowly decurrent, upper surface glabrous, lower surface glabrous or with a few stipitate glands and branched hairs towards the base, green to purple or glaucous-papillate below when mature; petioles 0.5–0.8cm, stipitate-glandular and sparsely floccose-tomentose. Flowers solitary; pedicels 10–20mm, stipitate-glandular. Calyx c.1mm, lobes fleshy. Corolla fleshy, tubular-campanulate, crimson, 30–35mm. Ovary densely stipitate-glandular and rufous-tomentose. Capsule 15–20 × 6–7mm.

Moist stony pasture, on boulders, 3050–4500m. Map 121, p. 383.

1. Lower epidermis of leaf purple or green, not papillate, stipitate glands few or absent; leaves 1.1–1.5(–2.2) × as long as broad

**20a. subsp. forrestii**

- + Lower epidermis of leaf glaucous-papillate, stipitate glands conspicuous; leaves 2.2–2.6(–3.2) × as long as broad ..... **20b. subsp. papillatum**

**20a. subsp. forrestii.** Type: China, NW Yunnan, ascent of the Tsdjiong Pass, Mekong/Salween divide, 10–11000ft, vii 1905, *Forrest* 699 (holo. E).

Syn.: *R. repens* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 115 (1919). Type: China, W NW Yunnan, Mekong/Salween divide, 28°20'N, 12–14000ft, vi 1917, *Forrest* 14011 (holo. E).

*R. forrestii* Diels var. *repens* (Balfour f. & Forrest) Cowan & Davidian, *Rhododendron Yearbook* 6: 69 (1951).

!c.: Bot. Mag. 153: t.9186 (1929).

CHINA (NW Yunnan, SE Xizang) & adjacent NE UPPER BURMA.

Plants in which the juvenile state, with leaves purple below, persists to maturity, have been referred to *R. forrestii* sensu stricto. These may be no more than local ecotypes and are not worthy of formal taxonomic recognition. The more usual form with leaves green below at maturity has been referred to *R. forrestii* var. *repens*.

*Kingdon-Ward* 9816, from the Adung Valley in NE Burma, has sulphur-yellow flowers but otherwise matches subsp. *forrestii*.

Three plants from S Xizang, *Ludlow & Sherriff* 1883, 3942, 4751, have the

growth form, small leaves, scarlet to crimson flowers and densely tomentose ovaries of subsp. *forrestii* but differ in their 3–4-flowered inflorescence. The status of these plants is uncertain, particularly as they come from an area outside the range of the species (see Map 121).

**20b. subsp. *papillatum*** Chamberlain, Notes R.B.G. Edinb. 37: 338 (1979). Type: China, S Xizang, Doshong La, 11–13000ft, 24 vi 1924, *Kingdon-Ward* 5845 (holo. E; iso. K). CHINA (S Xizang).

Subsp. *papillatum* apparently intergrades with *R. chamaethomsonii*, especially on Doshong La and Deyang La. Intermediates include: *Ludlow*, *Sherriff & Elliot* 13278, 13783, 15070, 15098, 15170, 15285, 15292, 15400 and *Kingdon-Ward* 5846 (E), the type of *R. forrestii* Diels var. *tumescens* Cowan & Davidian (Notes R.B.G. Edinb. 26: 69, 1951). One specimen, *L.*, *S.* & *E.* 15013, is apparently a hybrid between subsp. *papillatum* and *R. campylocarpum*.

**20\*. ? *R. forrestii* × *haematodes*.**

Syn.: *R. chaetomallum* Balfour f. & Forrest var. *chamaephytum* Cowan, Notes R.B.G. Edinb. 21: 146 (1936). Type: China, Xizang, Singo Samba, Lo La Chu, 16 v 1936, *Ludlow*, *Sherriff & Taylor* 3786 (holo. BM; iso. E, fragm.).

Prostrate shrub, 0.3–0.6m. Leaves obovate, c.4.5 × 2.2cm, apex rounded, base cuneate, lower surface with traces of a red-brown floccose indumentum; petioles very short. Inflorescence few-flowered. Calyx c.7mm, cupular, irregular, red, glabrous. Corolla tubular-campanulate, fleshy, deep crimson, c.35mm. Ovary densely rufous-tomentose.

CHINA (S Xizang). Scrambling over rocks in *Abies*/*Rhododendron* forest, 3950m.

Apparently a hybrid between *R. forrestii* (or possibly *R. chamaethomsonii*) and *R. haematodes*. Field studies are however required to confirm the status of this plant.

**21. (359.) *R. neriiflorum*** Franchet, Bull. Soc. Bot. France 33: 230 (1886).

Shrub or small tree, 1–6m; young shoots sparsely floccose-tomentose, eglandular or (rarely) setose-glandular. Leaves elliptic to oblong or oblanceolate, 4–11 × 1.9–3.2cm, 1.7–5(–7) × as long as broad, apex rounded and apiculate to acuminate, base ± rounded, upper surface glabrous, lower surface usually ± glabrous, with a glaucous, strongly papillate epidermis; petioles 1–1.5cm, sparsely floccose-tomentose or glabrescent, rarely setose-glandular. Inflorescence 5–8(–12)-flowered; rhachis c.5mm; pedicels 10–15mm, sparsely stellate-tomentose, sometimes with a few stipitate glands. Calyx 2–15mm, cupular when well-developed, often ± deciduous, lobes tomentose, sometimes also glandular, with ciliate margins. Corolla fleshy, tubular-campanulate, crimson or bright red, occasionally straw yellow, 35–45mm. Ovary densely tomentose, sometimes with a varying proportion of stipitate glands (rarely glabrous), tapering into the ± glabrous style. Capsule 20–25 × c.4mm, usually strongly curved.

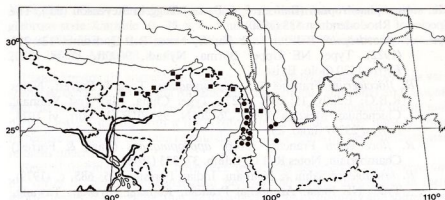
Amongst rocks and scrub, pine forests, 2750–3350m. Map 127.

1. Pedicels, calyx and/or ovary with at least some glands; leaves 8–11cm long, 3–5(–7) × as long as broad; petioles sometimes glandular

**21c. subsp. *phaedropum***

- + Pedicels, calyx and ovary eglandular; leaves 4–9cm long, 1.7–3 × as long as broad; petioles eglandular .....2





MAP 127. ● *R. neriiflorum* subsp. *neriiflorum*; ○ subsp. *agetum*; ■ subsp. *phaetropum*.

2. Leaves  $\pm$  plane below, without marked reticulations

**21a. subsp. *neriiflorum***

- + Leaves with marked reticulations below forming alveoli with some papillae horizontal ..... **21b. subsp. *agetum***

**21a. subsp. *neriiflorum*.** Type: China, Yunnan, in monte Tsangchan, *Delavay* 294 (?iso. E, K).

Syn.: *R. euchaetes* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 43 (1920).  
Type: China, W Yunnan, Shweli/Salween divide, vi 1913, *Forrest* 12125 (holo. E; iso. K).

*R. phoenicodum* Balfour f. & Farrer, Notes R.B.G. Edinb. 13: 285 (1922). Type: NE Upper Burma, Hpimaw Pass, 10000ft, 6 v 1919, *Farrer* 877 (holo. E; iso. K).

*R. neriiflorum* Franchet subsp. *euchaetes* (Balfour f. & Forrest) Tagg and subsp. *phoenicodum* (Balfour f. & Farrer) Tagg in Stevenson (ed.), The Species of *Rhododendron* 533 (1930).

Ic.: Bot. Mag. 143: t.8727 (1917).

CHINA (W Yunnan, SE Xizang), NE UPPER BURMA.

**21b. subsp. *agetum*** (Balfour f. & Forrest) Tagg in Stevenson (ed.), The Species of *Rhododendron* 533 (1930).

Syn.: *R. agetum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 29 (1920).

Type: China, W Yunnan, eastern flank of the N'Maikha/Salween divide, v 1919, *Forrest* 17851 (holo. E; iso. K).

CHINA (W Yunnan).

The status of this subspecies is uncertain as the taxonomic significance of the characteristic alveoli on the lower surfaces of the leaves (caused by more prominent veins) is not known.

**21c.** subsp. *phaedropum* (Balfour f. & Farrer) Tagg in Stevenson (ed.), The Species of *Rhododendron* 533 (1930).

Syn.: *R. phaedropum* Balfour f. & Farrer, Notes R.B.G. Edinb. 13: 283 (1922). Type: NE Upper Burma, Nyitadi, 9000ft, 17 ix 1920, Farrer 1530 (holo. E; iso. K).

*R. floccigerum* Franchet var. *appropinquans* Tagg & Forrest, Notes R.B.G. Edinb. 15: 312 (1927). Type: China, Mid-West Yunnan, Chienchuan/Mekong divide, 26°20'N, 99°40'E, 10000ft, vi 1923, Forrest 23297 (holo. E).

*R. floccigerum* Franchet subsp. *appropinquans* (Tagg & Forrest) Chamberlain, Notes R.B.G. Edinb. 37: 333 (1979).

*R. tawangense* Sahni & Naithani, Indian Forester 105: 685, t. (1979). Type: NE India, Arunachal Pradesh, Kameng Division, Tawang, Sahni & Naithani ser. 2: 751 (holo. DD, n.v.).

Ic.: *Rhododendron* & *Camellia* Yearbook 12: f. 33 (1957) — as *R. floccigerum* var. *appropinquans*.

CHINA (S Xizang, Mid W Yunnan), UPPER BURMA, NE INDIA (Arunachal Pradesh), BHUTAN.

A variable species with at least some geographical variation; allied to *R. floccigerum* (q.v.) and to *R. sperabile*.

*Kingdon-Ward* 9321, with sparsely hairy leaves, may be a hybrid of subsp. *phaedropum*.

**21\*** *R. bijiangense* T. L. Ming, Acta Bot. Yunnanica 3: 116, t.2 (1981), see p. 000. Type: China, W Yunnan, Bijiang Xian, 2900m, 23 v 1980, Yang, C. H. 80-0083 (holo. Herb. Inst. Bot. Kunming).

Shrub, c.1m; young shoots densely setose-glandular. Leaves narrowly lanceolate, 7–10 × 2–2.5cm, 3.5–4 × as long as broad, apex apiculate, lower surface green and epapillate, glabrous except for the glandular midrib and main lateral veins; petioles c.1cm, densely setulose-glandular. Inflorescence c.10-flowered; rhachis c.10mm; pedicels 15–20mm, densely setulose-glandular. Calyx 7–8mm, glandular, lobes ± fleshy, reddish, 5–6mm, with glandular-ciliate margins. Corolla fleshy, campanulate, c.30mm, reddish-purple. Ovary densely setose-glandular, ± abruptly contracted into the glabrous style. Capsule not known.

CHINA (W Yunnan).

Only known from the type. Probably allied to *R. neriiflorum* but differing in the setose indumentum, in the papillate, green leaf epidermis and in the ovary ± abruptly contracted into the style.

**22. (360.)** *R. floccigerum* Franchet, J. Bot. (Morot) 12: 259 (1898). Type: China, NW Yunnan, Tsekou, dans la Vallée du Mekong, a Thra nu, Soulié 1014 (iso. E, K).

Ic.: Bot. Mag. 155: t.9290 (1932).

Shrub, 0.6–3m; young shoots densely floccose-tomentose, setulose-glandular or eglandular. Leaves narrowly elliptic to oblong or elliptic, (3.5–)6–11 × (1–)1.5–2.7cm, 3.3–4.5(–6) × as long as broad, apex ± acute, apiculate, base cuneate to ± rounded, upper surface glabrous, lower surface with a floccose, rufous, usually patchy (rarely ± continuous) ramiform tomentum, lower epidermis glaucous-papillate; petioles 0.7–1.5cm, floccose-tomentose, usually eglandular (rarely setulose-glandular). Inflorescence 4–7-flowered; rhachis 2–3mm; pedicels c.10mm, tomentose, eglandular. Calyx 1–4mm, lobes rounded, sparsely tomentose to glabrous, margins ciliate. Corolla tubular-campanulate, usually crimson to scarlet, occasionally yellowish to pink,

30–40mm. Ovary densely stellate-tomentose, eglandular, tapering into the glabrous style. Capsule  $10-25 \times 4-5$ mm, straight to curved.

CHINA (SE Xizang & adjacent NW Yunnan). Cliffs, *Rhododendron* scrub, 2750–3950m. Map 128, p. 412.

Plants apparently intermediate between *R. floccigerum* and *R. sperabile* var. *sperabile* occur in SE Xizang (outside the range of var. *sperabile*) and around Wei-hsi in NW Yunnan. These are characterised by their glandular shoots and narrow leaves, usually with a thick rufous indumentum. Over most of their respective ranges the two taxa remain distinct so the status of these intermediates remains uncertain.

Several fruiting specimens have been tentatively assigned to *R. floccigerum* but differ in their setulose-glandular petioles and young shoots and in their shorter leaves, 4–6cm long, that are usually glabrous by maturity and sometimes epappilate. In the absence of flowering material their status remains doubtful though they may have affinities with *R. neriiflorum* rather than with *R. floccigerum*. They are as follows: *Forrest* 20305, 20321, 20877, 20855, 22808, 25640, 25800, 25831.

*R. floccigerum* is closely allied to *R. neriiflorum* and *R. sperabile* but may be recognized from both by its discontinuous floccose leaf indumentum.

**23. (361.) *R. sperabile*** Balfour f. & Farrer, Notes R.B.G. Edinb. 13: 297 (1922).

Shrub, 1–2m; indumentum of young shoots densely whitish stellate-tomentose intermixed with long stipitate glands (rarely eglandular). Leaves elliptic,  $5-9.5 \times 1-2.6$ cm,  $2.5-4(-8) \times$  as long as broad, apex acute to rounded, base rounded, upper surface glabrous, lower surface with a dense but loose continuous whitish to cinnamon ramiform indumentum with glandular setae on the midrib, lower epidermis glaucous-papillate; petioles 1–1.5cm, densely tomentose, with some setulose glands. Inflorescence 4–5-flowered; rhachis 2–3mm; pedicels 15–20mm, setulose-glandular, also with a few stellate hairs. Calyx 2–3mm, with broad, coloured, rounded, glandular-ciliate lobes. Corolla fleshy, tubular-campanulate, crimson, 35–40mm. Ovary densely rufous-tomentose and stipitate-glandular, tapering into the glabrous style. Capsule c.  $15 \times 6$ mm, curved.

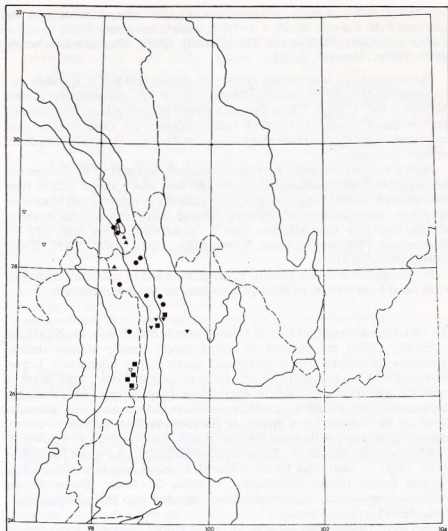
CHINA (NW Yunnan) and adjacent NE UPPER BURMA. Amongst scrub and on cliffs, 3000–3650m. Map 128, p. 412.

1. Leaf indumentum cinnamon when mature; leaves  $2.5-3.5 \times$  as long as broad ..... **23a. var. *sperabile***
- + Leaf indumentum whitish when mature; leaves  $3-4(-8) \times$  as long as broad ..... **23b. var. *weihsiense***

**23a. var. *sperabile*.** Type: NE Upper Burma, Hpimaw Pass, 10000ft, 7 v 1919, *Farrer* 888 (holo. E; iso. K).

!c.: Bot. Mag. 156: t.9301 (1933).

Three plants, *Forrest* 14195b, 15022 & 17222, all probably from NW Yunnan, lack the setulose glands and have an indumentum that is redder than is usual in *R. sperabile*. In these characters they show some affinity with *R. floccigerum* but the leaf shape and persistent indumentum are more typical of *R. sperabile*.



MAP 128. ● *R. floccigerum*; ■ *R. sperabile* var. *sperabile*; ▼ var. *weihsiense*; ▽ aff. var. *weihsiense*; ▲ *R. sperabiloides*.

**23b. var. *weihsiense*** Tagg & Forrest, Notes R.B.G. Edinb. 15: 219 (1927). Type: China, NW Yunnan, Mekong/Salween divide, 27° 12' N, 99° 2' E, *Forrest* 25447 (holo. E).

There is apparently some geographical separation between the two varieties, var. *weihsiense* generally having a more northerly distribution than var. *sperabile*.

**24. (362.) *R. sperabiloides*** Tagg & Forrest, Notes R.B.G. Edinb. 15: 319 (1927). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, W of Chamatong, 12–13000ft, vi 1922, *Forrest* 21824 (holo. E).

Dwarf shrub, 1–1.5m; young shoots stellate-tomentose, eglandular. Leaves elliptic,  $5.5\text{--}6.5 \times 1.8\text{--}2.5\text{cm}$ ,  $1.6\text{--}3 \times$  as long as broad, apex blunt, apiculate, base rounded, upper surface glabrous, lower surface with a floccose  $\pm$  unistrate, rufous, discontinuous ramiform to sub-rosulate tomentum, lower epidermis epapillate, green; petioles  $0.5\text{--}1\text{cm}$ , slightly winged, floccose-tomentose, eglandular. Inflorescence 4–5-flowered; rhachis minute; pedicels  $c.10\text{mm}$ , sparsely stellate-tomentose. Calyx 4–7mm, cupular, lobes rounded,  $\pm$  ciliate. Corolla fleshy, tubular-campanulate, crimson to deep red, 25–35mm. Ovary densely fulvous-tomentose,  $\pm$  truncate to tapering into the glabrous style. Capsule  $c.13 \times 3\text{mm}$ .

CHINA (SE Xizang). Alpine scrub, rocky slopes, 3650–3950m. Map 128.

The ovary is apparently variable in the degree to which it tapers into the style, suggesting a transitional state between that found in *R. neriiflorum* and its immediate allies and that typical of the remaining species of the subsection.

**25. (363.) *R. albertsenianum*** Forrest, Notes R.B.G. Edinb. 11: 21 (1919). Type: China, W NW Yunnan, Mekong/Salween divide,  $27^{\circ}40'N$ , 10000ft, vii 1917, Forrest 14195 (holo. E).

Shrub, 1–2m; young shoots floccose-tomentose, eglandular. Leaves elliptic,  $8.5\text{--}9.5 \times c.2.2\text{cm}$ ,  $c.4 \times$  as long as broad, apex rounded, apiculate, base rounded, upper surface glabrous, lower surface with a continuous bistrate indumentum, the upper layer light brown and ramiform-tomentose, the lower layer felted and  $\pm$  compacted; petioles  $0.5\text{--}1\text{cm}$ , sparsely floccose-tomentose. Inflorescence 5–6-flowered; rhachis 2–3mm; pedicels  $c.10\text{mm}$ , sparsely tomentose. Calyx cupular, 3–4mm, lobes fleshy, sparsely tomentose, rounded. Corolla tubular-campanulate, bright crimson-rose,  $c.30\text{mm}$ . Ovary densely tomentose, tapering into the style. Capsule not known.

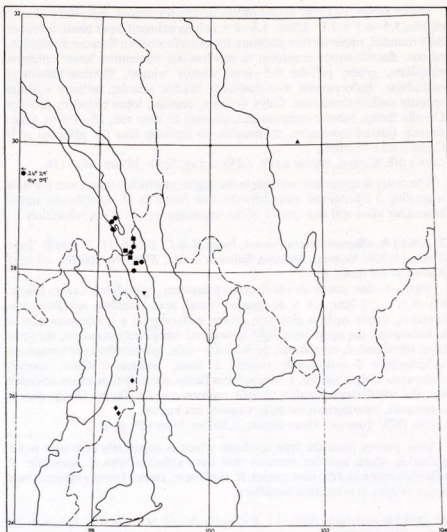
CHINA (NW Yunnan). Open forests,  $c.3000\text{m}$ . Map 129, p. 414.

Only known from the type specimen which is apparently part of a mixed gathering which includes elements that have affinities with *R. sperabile*. *R. albertsenianum* and the next species, *R. euchroum*, share a bistrate indumentum, a rare feature in subsection Neriiflora.

**26. (364.) *R. euchroum*** Balfour f. & Kingdon-Ward, Notes R.B.G. Edinb. 9: 228 (1916). Type: E Upper Burma, Mwai divide, ridge of Naung-Chaung, 10000ft, 14 vii 1914, Kingdon-Ward 1778 (holo. E; iso. K).

Dwarf shrub, up to 0.7m; young shoots floccose-tomentose and stipitate-glandular. Leaves oblanceolate to elliptic,  $4.5\text{--}7.5 \times 1.7\text{--}2.3\text{cm}$ ,  $2.7\text{--}3.3 \times$  as long as broad, apex rounded, minutely apiculate, base  $\pm$  rounded to cuneate, upper surface glabrous, lower surface with a bistrate indumentum, the upper layer fulvous, ramiform-tomentose, the lower adpressed, whitish, epidermis epapillate; petioles  $0.5\text{--}1\text{cm}$ , narrowly winged, setulose-glandular, also sparsely floccose-tomentose. Inflorescence 4–5-flowered; rhachis minute; pedicels 7–10mm, densely stipitate-glandular and floccose-tomentose. Calyx 1–2mm, lobes rounded, glandular and tomentose. Corolla fleshy, tubular-campanulate, bright brick-red to scarlet, 25–30mm. Ovary densely stipitate-glandular and stellate-tomentose, tapering into the style which is sparsely tomentose below. Capsule not known.

NE UPPER BURMA. Undershrub in thickets, 3000–3400m. Map 129, p. 414.



MAP 129. ● *R. temenium*; ■ *R. erastum*; ▼ *R. albertsenianum*; ▲ *R. bonvalotii*; ◆ *R. euchroum*.

Apparently allied to *R. albertsenianum* on account of its bistrate indumentum but differing in its glandular indumentum and smaller leaves.

**XXIII. Subsection *Fulgensia*** Chamberlain, Notes R.B.G. Edinb. 37: 336 (1979).

Shrubs or small trees, 1.5–6m; bark smooth, peeling; young shoots glandular and tomentose to glabrous. Leaves coriaceous, elliptic to broadly obovate, lower surface covered with a dense, fulvous, lanate-tomentose indumentum composed of fasciculate hairs. Inflorescence lax or dense, 4–14-flowered; rhachis 2–25mm. Calyx minute to well-developed and cupular, 1–15mm. Corolla 5-lobed, fleshy, funnel- to tubular-campanulate, with nectar pouches, crimson to deep carmine. Stamens 10. Ovary and style glabrous.

Type species: *R. fulgens* Hooker f.

Subsection *Fulgensia* is intermediate between subsection *Neriiflora* and subsections *Thomsonia* and *Barbata*; all four subsections share the red, tubular-campanulate corollas with nectar pouches. The three species comprising the subsection have only distant affinities with subsection *Campanulata* in which they have been included in the past. For a discussion of the individual species see Cowan, J. M. & Davidian, H. H. (1949). A review of *Rhododendrons* in their Series, III – The *Campanulatum* Series. *Rhododendron Yearbook* 4: 169, 170, 172–174.

1. Leaves 4–5cm long; calyx well-developed, 8–15mm .....2. *miniaturum*  
 + Leaves 7–11cm long; calyx up to 5mm .....2  
 2. Inflorescence dense, 8–14-flowered; corolla 20–35mm .....1. *fulgens*  
 + Inflorescence lax, 4–5-flowered; corolla 35–40mm .....3. *sherriffii*

1. (365.) *R. fulgens* Hooker f., *Rhododendrons Sikkim Himalaya* 27, t. 25 (1849). Type: Sikkim, 12–14000ft, *Hooker* (holo. K; iso. E).

Ic.: Bot. Mag. 88: t.5317 (1862).

Shrub, 1.5–4.5m; young shoots glabrous. Leaves broadly ovate to obovate, (7–)9–11 × (4–)5–7cm, 1.5–1.8 × as long as broad, apex rounded, apiculate, base cordate to rounded, upper surface glabrous, lower surface covered with a dense fulvous lanate tomentum composed of fasciculate hairs; petioles 1–2cm, glabrous when mature. Inflorescence dense, 8–14-flowered; rhachis 10–25mm, pedicels 7–10mm, glabrous. Calyx 1–2mm, glabrous. Corolla tubular-campanulate, scarlet to blood-red, with darker nectar pouches, 20–35mm. Ovary glabrous. Capsule 13–30 × c.5mm, curved.

E NEPAL, BHUTAN, NE INDIA (Sikkim, Bengal, Arunachal Pradesh) CHINA (S Xizang). Mixed forests, 3200–4300m. Map 130, p. 416.

*R. fulgens* superficially resembles *R. succothii* (subsection *Barbata*) but clearly differs in its lanate leaf indumentum.

2. (366.) *R. miniaturum* Cowan, Notes R.B.G. Edinb. 19: 229 (1937). Type: China, S Xizang, Tsari Chu, Migyitun, 12000ft, 26 v 1936, *Ludlow & Sherriff* 1710 (holo. BM; iso. E).

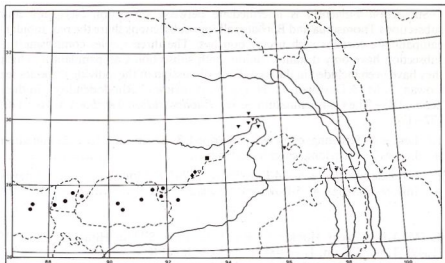
Shrub, 1.5–2m; young shoots with a thin evanescent tomentum, eglandular. Leaves elliptic, 4–5 × 2–2.6cm, c.2 × as long as broad, apex rounded, base rounded, upper surface glabrous, lower surface covered with a dense fulvous lanate tomentum composed of fasciculate hairs; petioles 0.5–0.8cm, tomentose. Inflorescence c.5-flowered; rhachis 2–3mm; pedicels c.6mm, glabrescent. Calyx 8–15mm, fleshy, cupular, glabrous, lobes crimson, rounded. Corolla funnel-campanulate, crimson, with darker nectar pouches, 30–35mm. Ovary glabrous. Capsule not known.

CHINA (S Xizang). Cliffs, etc., c.3700m. Map 130, p. 416.

Only known for certain from the type. A specimen also from the Tsari Chu (*Ludlow & Sherriff* 1627) differs in its narrower, tubular-campanulate corolla, its minute, 1–2mm calyx and in its greater stature (2.5–4.5m). From the material available, it is not possible to assess the significance of these differences.

*R. miniaturum* is closely allied to *R. sherriffii*.





MAP 130. ● *R. fulgens*; ■ *R. miniatum*; ▽ *R. sheriffii*; ▲ *R. cerasinum*; ◆ *R. populare*.

3. (367). *R. sheriffii* Cowan, Notes R.B.G. Edinb. 19: 231 (1937). Type: China, S Xizang, Chayul Chu, Lung, 12500ft, 29 iv 1936, Ludlow & Sherriff 1390 (holo. BM; iso. A, E).

Ic.: Bot. Mag., n.s. 172: 337 (1959).

Large shrub or small tree, 4.5–6m; young shoots stipitate-glandular, also with a mealy tomentum. Leaves obovate, c.  $7.5 \times 4$ cm,  $1.9 \times$  as long as broad, apex rounded, minutely apiculate, base rounded, upper surface glabrous, lower surface densely fulvous-tomentose; petioles c. 1.5cm, glabrous when mature. Inflorescence 4–5-flowered; rhachis c. 3mm; pedicels c. 10mm, glabrous. Calyx 3–5mm, glabrous, lobes broad and rounded. Corolla funnel-campanulate, deep carmine, with darker nectar pouches, 35–40mm. Ovary glabrous. Capsule c.  $13 \times 7$ mm.

CHINA (S Xizang). Alt. 4000m. Map 130.

*R. sheriffii* closely resembles *R. thomsonii* subsp. *lopsangianum* (subsection Thomsonia), particularly in the lax inflorescence and in the deep red flowers. The latter does however differ in its glabrous, strongly papillate lower leaf surface.

The fulvous lanate leaf indumentum of *R. sheriffii* effectively excludes it from subsection Thomsonia and suggests an affinity with *R. fulgens*.

#### XXIV. Subsection *Thomsonia* Sleumer, Bot. Jahrb. 74: 545 (1949).

Syn.: Series *Thomsonii* subseries *Thomsonii* sensu Tagg in Stevenson (ed.), The Species of *Rhododendron* 735 (1930).

Series *Thomsonii* subseries *Cerasinum* Cowan & Davidian, *Rhododendron* Yearbook 6: 181 (1952).

Shrubs or small trees; young shoots glabrous or sparsely stipitate-glandular; bark smooth and peeling, to rough. Leaves orbicular to elliptic, glabrous at maturity, sometimes with a strongly papillate epidermis beneath, or with a thin dendroid indumentum, sometimes with punctate-based fasciculate hairs overlying the lateral veins. Inflorescence 1–15-flowered; rhachis 1–20



(-40)mm. Calyx 2-15mm, usually well-developed and cupular, often coloured, lobes usually conspicuous. Corolla 5-lobed, often fleshy, funnel- to tubular-campanulate, with nectar pouches, white or cream to deep blackish crimson, with or without flecks. Stamens 10. Ovary glabrous, rufous-tomentose and/or stipitate-glandular (rarely exclusively tomentose); style glandular to tip, or glabrous.

Type species: *R. thomsonii* Hooker f.

Probably most closely allied to subsection Neriiflora. Subsection Thomsonia may be divided into four informal groups. The first, containing *R. cerasinum* and *R. bonvalottii*, is the most distinct and differs from the remainder in its glandular styles and relatively small obovate to elliptic leaves. The second, *R. thomsonii* and *R. viscidifolium*, is characterised by the relatively broad leaves with the lower epidermis strongly papillate. The 'hookeri' group has characteristic fasciculate hairs overlying the lower surface of the leaf midrib; these are well-developed in *R. hookeri* but may be reduced to punctate hair bases in the allied species, *R. subansiriense*, *R. hylaeum* and *R. faucium*, by the time the leaves are mature. The remaining species are a heterogeneous assemblage excluded from the previous three groups. The position of *R. populare* remains uncertain; the leaves suggest an affinity with *R. cerasinum* but the flowers are much closer to those of *R. thomsonii*.

# Reference

COWAN, J. M. & DAVIDIAN, H. H. (1952). A Review of Rhododendrons in their Series IV, the Thomsonii Series, *Rhododendron Yearbook* 6: 163-180.

1. Style glandular to tip .....2  
+ Style glabrous or glandular only at base.....4
2. Leaves 2.6-3.5 × as long as broad; corolla 22-25mm (C Sichuan)  
1. bonvalotti  
+ Leaves 1.7-2.5 × as long as broad; corolla 35-45mm (SE Xizang,  
NE Burma).....3
3. Inflorescence 4-7-flowered; corolla crimson to scarlet or white with a  
deep pink border .....2. cerasinum  
+ Inflorescence 1-3-flowered; corolla creamy white flushed pale rose  
14. euryiphon
4. Leaf lamina with a thin discontinuous indumentum below  
13. stewartianum  
+ Leaf lamina glabrous below .....5
5. Leaves glaucous below, 1-1.6 (-2) × as long as broad .....6  
+ Leaves usually greenish below, 1.8-3.5 × as long as broad .....9
6. Corolla deep coppery red or purplish crimson; leaf cuticle papillate  
below .....7  
+ Corolla white or yellow to clear pink; leaf cuticle mamillate below .....8
7. Corolla coppery red; ovary tomentose.....5. viscidifolium  
+ Corolla crimson; ovary glabrous or glandular .....4. thomsonii
8. Ovary glandular (Indo-Himalaya, S Xizang).....4.\* × candelabrum  
+ Ovary glabrous (Yunnan) .....11. cyanocarpum



least on the lobe margins. Corolla campanulate, crimson to scarlet or white with a deep pink border, nectar pouches darker, 35–45mm. Ovary shortly stipitate-glandular; style glandular to tip. Capsule c.20mm.

NE UPPER BURMA, CHINA (SE Xizang). Coniferous forests, 3200–3800m. Map 130, p. 416.

**3. (370.) *R. populare*** Cowan, Notes R.B.G. Edinb. 19: 251 (1937). Type: China, S Xizang, Chayul Chu, Lung, 12000ft, 29 iv 1936, *Ludlow & Sherriff* 1391 (holo. BM; iso. A, E).

Shrub or small tree, 1–4.5m; young shoots glandular at first, soon glabrescent. Leaves obovate to elliptic, 3.7–5.5 × 1.6–2.2cm, c.2.5 × as long as broad, apex rounded, apiculate, base rounded, upper and lower surfaces glabrous, lower epidermis epapillate though with minute mammillae, usually with a few glands; petioles 0.5–0.8cm, glabrous. Inflorescence c.6-flowered; rhachis 2–5mm; pedicels 5–10mm, glabrous. Calyx 5–10mm, irregular, reddish, glabrous. Corolla campanulate, probably with nectar pouches, deep crimson, sometimes with darker flecks and/or basal blotches, 30–35mm. Ovary and style glabrous. Capsule not known.

CHINA (S Xizang). Rhododendron and bamboo thickets, c.3700m. Map 130, p. 416.

This species has some affinities with *R. cerasinum*, especially in the leaf shape and texture, but in its corolla it appears to be closer to *R. thomsonii*.

**4. (371.) *R. thomsonii*** Hooker f., Rhododendrons Sikkim Himalaya t.12 (1851).

Shrub or small tree, 0.6–3.5(–6)m; young shoots glabrous or sparsely glandular. Leaves orbicular to obovate or elliptic, 3–7.5(–11) × 2–5.5(–7.5)cm, 1.1–2 × as long as broad, apex rounded, minutely apiculate, base rounded to cordate, upper and lower surfaces glabrous, lower epidermis strongly glaucous-papillate, with some red stipitate glands; petioles 0.5–2.5(–3)cm, glabrous or sparsely glandular. Inflorescence 3–10-flowered, dense; rhachis 5(–18)mm; pedicels 10–25mm, usually glabrous, occasionally glandular. Calyx 2–20mm, irregular to cupular, often coloured, usually glabrous. Corolla campanulate, fleshy, deep crimson, dark flecks usually absent, 35–50mm. Ovary glabrous or glandular; style glabrous. Capsule 1.5–2.5 × 0.5–1.2cm.

Map. 131, p. 421.

1. Leaves 5–7.5(–11)cm long; calyx (6–)10–18mm; shrubs,  
1.3–3.5(–6)m ..... **4a. subsp. thomsonii**
- + Leaves 3–4.5cm long; calyx 2–4mm; shrubs, 0.6–1.8m  
..... **4b. subsp. lopsangianum**

**4a. subsp. thomsonii.** Type: India, Sikkim, inner and outer ranges, 11–13000ft, *Hooker* (holo. K; iso. E).

lc.: Bot. Mag. 82: t.4997 (1857).

ENEPAL, N INDIA (Sikkim, Arunachal Pradesh), BHUTAN. Rhododendron scrub, Abies forest, 3000–4000m.

*R. thomsonii* var. *grandiflorum* Millais and var. *album* Millais (*Rhododendrons* 153, 1917) are horticultural variants not known in the wild; the status of var. *flocculosum* C.B. Clarke (in *Fl. British India* 3: 468, 1882) is uncertain (see Cowan & Davidian, *Rhododendron Yearbook* 6: 179, 1952).

4a. subsp. *lopsangianum* (Cowan) Chamberlain, **comb. et stat. nov.**

Syn.: *R. lopsangianum* Cowan, Notes R.B.G. Edinb. 19: 250 (1937). Type: China, S Xizang, Tsari Chu, Migyitun, 8500ft, 28 v 1937, *Ludlow & Sherriff* 1718 (holo. BM; iso. E).

CHINA (S Xizang). Rocky slopes, open hillsides, 2500–4300m.

A variable species; the smaller, subsp. *lopsangianum*, replaces subsp. *thomsonii* almost completely in S Xizang.

One specimen, *Ludlow, Sherriff & Taylor* 3655 (= 6561, cult. E), differs in the leaves being sparsely hairy below but is otherwise typical. Two plants from the Tsangpo Gorge, *Ludlow, Sherriff & Elliot* 13589 & 13598, have densely glandular ovaries and are relatively large shrubs, 1.5–3m tall, with leaves up to 7.5cm long. Both clearly have affinities with subsp. *lopsangianum*.

Both subspecies apparently hybridise in the wild with *R. campylocarpum*.

4\*. *R. × candelabrum* Hooker f., *Rhododendrons Sikkim Himalaya* t.29 (1851)–*R. thomsonii* × *R. campylocarpum*. Type: N India, Sikkim, 10–11000ft, *Hooker*, n.v.

Syn.: *R. thomsonii* Hooker f. var. *candelabrum* (Hooker f.) C.B. Clarke in Hooker f., *Fl. British India* 3: 468 (1882).

*R. thomsonii* Hooker f. var. *pallidum* Cowan, Notes R.B.G. Edinb. 19: 253 (1937). Type: China, S Xizang, Tsari Chu, Migyitun, 11000ft, 29 v 1939, *Ludlow & Sherriff* 1730 (holo. BM).

*R. thomsonii* Hooker f. subsp. *candelabrum* (Hooker f.) Chamberlain, Notes R.B.G. Edinb. 36: 121 (1978).

Differs from *R. thomsonii* in its pink flowers, glandular ovaries and relatively small calyces, 2–8(–15)mm long.

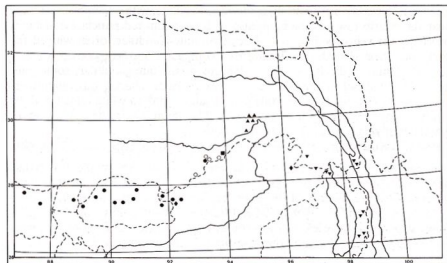
This hybrid occurs where the ranges of the two parents overlap. Subsp. *lopsangianum* is assumed to be the parent of *R. thomsonii* var. *pallidum*, and subsp. *thomsonii* the parent of *R. × candelabrum* sensu stricto.

5. (372.) *R. viscidifolium* Davidian, *Rhododendron Yearbook* 21: 104 (1966). Type: China, S Xizang, Lo La, Pachakshiri, 9–10000ft, 13 v 1938, *Ludlow, Sherriff & Taylor* 3750 (holo. BM).

Shrub, 0.6–2.4m; bark smooth; young shoots glabrous or glandular. Leaves oval to sub-orbicular, 4–9.7 × 2.8–6.6cm, c.1.5 × as long as broad, apex rounded, mucronate, base rounded to sub-cordate, upper and lower surfaces glabrous; lower epidermis strongly glaucous-papillate, with scattered viscid glands; petioles 1–2.5cm, glabrous. Inflorescence 1–2-flowered; rhachis 1–3mm; pedicels c.10mm, stipitate-glandular. Calyx cupular, 4–9mm, green, lobes rounded. Corolla tubular-campanulate, fleshy, coppery red, with dark nectar pouches and flecks, 35–45mm. Ovary densely tomentose and stipitate-glandular; style glabrous. Capsule c.20 × 9mm.

CHINA (SE Xizang). Cliff faces near waterfalls, 2700–3350m. Map 131.

The labels suggest that this species is common at the type locality though the only two specimens known may originate from a single plant. Closely allied to *R. thomsonii*.



MAP 131. ● *R. thomsonii* subsp. *thomsonii*; ○ subsp. *lopsangianum*; ■ *R. viscidifolium*; ▼ *R. hylaeum*; ▲ *R. faucium*; ▽ *R. subsansiriense*; ◆ *R. hookeri*.

6. (373.) *R. hylaeum* Balfour f. & Farrer, Notes R.B.G. Edinb. 13: 265 (1922). Type: NE Upper Burma, Chawchi Pass, 10500ft, 15 v 1920, Farrer 1551 (holo. E; iso. K).

Shrub or small tree, 2.5–12m; bark smooth, peeling; young shoots ± glabrous. Leaves oblong to oblanceolate, 8.5–14.5 × 3.4–5.7cm, 2.5–3.2 × as long as broad, apex rounded, minutely apiculate, base rounded, upper surface glabrous, lower surface greenish with an epipillate epidermis, with scattered fasciculate hairs arising from red persistent bases on the veins, otherwise glabrous; petioles 1.5–2cm, usually narrowly winged, stipitate-glandular when young, soon glabrescent. Inflorescence 10–12-flowered; rhachis 13–40mm; pedicels 8–12mm, glabrous or glandular. Calyx 2–8mm, cupular when well-developed, lobes broad and rounded, remotely glandular-ciliate, otherwise glabrous. Corolla tubular-campanulate, fleshy, rose-pink, with dark flecks, 35–50mm. Ovary and style glabrous. Capsule 15–22 × 6–10mm.

NE UPPER BURMA & adjacent parts of CHINA (SE Xizang). Open mixed forests, 2700–3700m. Map 131.

As Cowan & Davidian, *Rhododendron Yearbook* 6: 179 (1952) point out, *R. hylaeum* has affinities with subsection *Errorata*, particularly *R. anthosphaerum*. The fasciculate hairs on the leaves do, however, link this species with *R. subsansiriense* and *R. faucium* and suggest a closer affinity with *R. hookeri*.

7. (374.) *R. faucium* Chamberlain, Notes R.B.G. Edinb. 36: 124 (1978). Type: China, SE Xizang, Pome Province, Layoting, Tongyuk Chu, 9000ft, 12 iii 1947, Ludlow, Sherriff & Elliot 12289 (holo. E; iso. BM).

Shrub or small tree, 1.5–5(–6.5)m; bark smooth; young shoots ± glabrous. Leaves oblanceolate, 7–12 × 2.5–3.5cm, usually widest in the upper third, 2.8–3.5 × as long as broad, apex rounded, base cuneate, upper surface

glabrous, lower surface greenish, epidermis epapillate, with a few scattered hairs near the midrib towards the base, also with persistent red punctate hair-bases overlying the veins; petioles 0.7–1.5cm, stipitate-glandular, often winged for part of their length. Inflorescence compact, 5–10-flowered; rhachis (8–)10–20mm; pedicels 5–10mm, glabrous or stipitate-glandular, sometimes also with dendroid or crisped hairs. Calyx 3–5mm, chartaceous, glandular-ciliate, otherwise glabrous. Corolla campanulate, pink to white tinged pink or rarely sulphur yellow, with purple flecks, 37–40mm. Ovary densely stipitate-glandular, style glabrous. Capsule not known.

CHINA (SE Xizang). Forest margins, rock faces, 2600–3350m. Map 131, p. 421.

*R. faucium* is closely allied to *R. hylaeum* but differs in the smaller leaves that taper below, the shorter petioles, and the glandular ovary. The punctate hair-bases on the lower surface of the leaves confirm the affinity with *R. hylaeum*.

Ludlow, Sherriff & Elliot 13594 & 13620, which differ in their darker pink flowers and more acute leaves, show some of the characters of *R. ramsdenianum* (subsection *Irrorata*) but are otherwise closer to the present species.

**8. (375.) *R. subansiriense*** Chamberlain, Notes R.B.G. Edinb. 36: 124 (1978). Type: NE India, Arunachal Pradesh, Subansiri division, ridge of Ziro, Api Tani Valley, 8400–9200ft, Cox & Hutchison 418 (holo. E; iso. K).

Shrub or tree, up to 14m; bark smooth, peeling; young shoots apparently tomentose. Leaves oblong, 7–10.5 × 2–3.5cm, 3–3.5 × as long as broad, apex rounded and apiculate, base ± rounded, upper surface glabrous, lower surface epapillate, with numerous red punctate hair-bases on the veins, each with the vestige of a branched hair; otherwise glabrous; petioles 1–1.5cm, glabrous. Inflorescence dense, up to 15-flowered; rhachis c.5mm; pedicels 7–10mm, glabrous. Calyx 4–5mm, cupular, lobes rounded, ciliate. Corolla tubular-campanulate, fleshy, scarlet, with a few purple flecks, up to 40mm. Ovary densely tomentose, eglandular, style glabrous. Capsule not known.

NE INDIA (Arunachal Pradesh). Mossy rain forest, 2600–2800m. Map 131, p. 421.

Only known from the type specimen though apparently common in the type locality. Allied to *R. faucium* and *R. hookeri* but distinguished from both by its tomentose, eglandular ovary, etc.

**9. (376.) *R. hookeri*** Nuttall in Hooker's J. Bot. Kew Gard. Misc. 5: 359 (1853). Type: NE India, Arunachal Pradesh, 'Bootan', Oola Mountains, on the southern slopes of the Lablung Pass, 8–9000ft, Booth (holo. K). Ic.: Bot. Mag. 82: t. 4926 (1856).

Shrub or small tree, c.4m; bark smooth; young shoots glabrous. Leaves broadly oblanceolate, c.12.5 × 5cm, 2.5 × as long as broad, apex rounded, apiculate, base rounded, upper surface glabrous, lower surface glabrous except for large well-developed fasciculate hairs overlying the veins, epidermis epapillate; petioles 1.5–3cm, slightly winged, glabrous. Inflorescence 8–15-flowered, dense; rhachis c.2mm; pedicels 8–15mm, glabrous. Calyx (5–)10–20mm, cupular, greenish to yellowish, glabrous, lobes rounded, erose. Corolla tubular-campanulate, deep rose to crimson, with darker nectar pouches and a few flecks, 35–45mm. Ovary and style glabrous. Capsule 20–25mm.

NE INDIA (Arunachal Pradesh). Mixed forests, 2500–3700m. Map 131, p. 421.

Allied to *R. hylaeum* and its immediate relatives but with distinctive and well-developed fasciculate hairs on the lower surface of the leaves.

**10. (377.) *R. meddianum*** Forrest, Notes R.B.G. Edinb. 12: 136 (1920).

Shrub, 1–2.3m; bark slightly rough; young shoots glabrous. Leaves obovate to broadly elliptic, 8–11(–15) × 4.5–5.2(–8.2)cm, 1.8–2.4 × as long as broad, apex retuse to apiculate, base rounded to ± cuneate, entirely glabrous, lower epidermis epapillate, green; petioles 1–1.5cm, glabrous. Inflorescence 6–10-flowered; rhachis c.5mm; pedicels 10–20mm, glabrous. Calyx 3–12(–18)mm, fleshy, cupular, reddish, glabrous, lobes rounded, broad. Corolla fleshy, tubular-campanulate, deep rose to deep blackish crimson, 40–65mm. Ovary glabrous to densely glandular and viscid. Capsule 15–20 × 6–7mm.

Open rocky slopes, Rhododendron thickets, 2700–3600m. Map 132, p. 424.

1. Ovary ± glabrous ..... **10a. var. *meddianum***  
+ Ovary densely glandular and viscid ..... **10b. var. *atrokermesinum***

**10a. var. *meddianum*.** Type: China, W Yunnan, Shweli/Salween divide, 10–11000ft, vi 1917, *Forrest* 15767 (holo. E; iso. K).

lc.: Bot. Mag. 163: t.9636 (1942).

CHINA (W Yunnan) & NE UPPER BURMA.

**10b. var. *atrokermesinum*** Tagg in Stevenson (ed.), The Species of Rhododendron 742 (1930). Type: NE Upper Burma, western flank of the N'Maikha/Salween divide, 10000ft, iv 1925, *Forrest* 26499 (holo. E).

NE UPPER BURMA.

One specimen, *Forrest* 18073, is intermediate between the two varieties. Var. *atrokermesinum* has a more northerly distribution than does var. *meddianum* though there is some overlap.

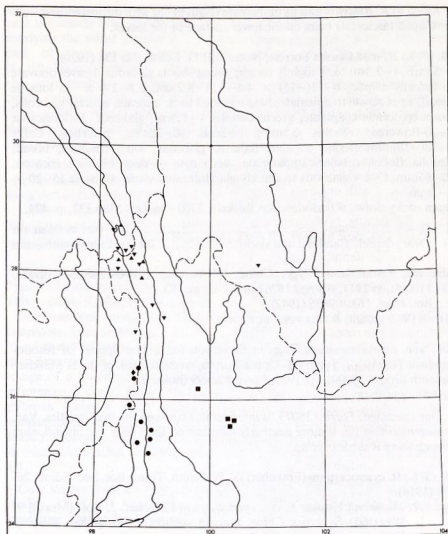
**11. (378.) *R. cyanocarpum*** (Franchet) W. W. Smith, Trans. Bot. Soc. Edinb. 26: 274 (1914).

Syn.: *R. thomsonii* Hooker f. var. *cyanocarpum* Franchet, J. Bot. (Morot) 9: 389 (1895). Syntypes: China, Yunnan, rochers de Tsang-chan, *Delavay* 3947, 4166 (K).

*R. hedythamnum* Balfour f. & Forrest var. *eglandulosum* Handel-Mazzetti, Akad. Wiss. Wien Math.-Naturwiss. Kl., Anz. 19: 3 (1923). Type: China, Yunnan, orient. montis Dsang-schan, prope Dali, 3900–4050m, 13 v 1910, *Handel-Mazzetti* 8712, n.v.

*R. cyanocarpum* (Franchet) W. W. Smith var. *eriphyllum* [Balfour f. & W. W. Smith ex] Tagg in Stevenson (ed.), The Species of Rhododendron 738 (1930). Type: China, Yunnan, western flank of the Tali Range, 11000ft, vii 1913, *Forrest* 11593 (holo. E; iso K).

Shrub or small tree, 1–3.8m; bark rough; young shoots glabrous. Leaves broadly elliptic to orbicular, 6.5–12.5 × 4.2–9cm, 1.2–1.6 × as long as broad, apex and base rounded, upper surface glabrous, lower surface ± glaucous with epidermis mammillate, glabrous or with a few scattered hairs on the midrib towards the base; petioles 1–3cm, often slightly winged, glabrous. Inflorescence 6–11-flowered; rhachis 5–10mm; pedicels 10–20mm, glabrous. Calyx



MAP 132. ● *R. meddianum* var. *meddianum*; ◆ var. *atrokermesinum*; ■ *R. cyanocarpum*; ▼ *R. ecleptum* var. *ecleptum*; ▲ var. *bellatulum*.

(2-)7-15mm, cupular, greenish, glabrous, lobes truncate. Corolla ± campanulate to funnel-campanulate, white or cream to clear pink, with dark nectar pouches, flecks lacking, (40-)50-60mm. Ovary glabrous or rarely with a few glands, style glabrous. Capsule 15-20 × 8-10mm, usually with a glaucous bloom.

CHINA (W Yunnan). Open pasture, forest margins, 3000-4000m. Map 132.

Superficially close to *R. thomsonii* but differing in the paler flowers and the mammillate leaf epidermis. Var. *eriphyllum*, which is only known from the type and differs only in its sparsely glandular ovary, is not worthy of formal recognition.



**12. (379.) *R. eclectum*** Balfour f. & Forrest, Notes R.B.G. Edinb. 12: 205 (1920).

Shrub, 1–3(–4.5)m; bark smooth and peeling; young shoots usually sparsely glandular. Leaves obovate-lanceolate (jargonelle-shaped) to elliptic, (4–)6–14.5 × (3–)3.5–5.6cm, 1.9–2.3 × as long as broad, apex rounded, apiculate to retuse, base ± cuneate to rounded, upper surface glabrous, lower surface with epidermis epappillate, glabrous though often with at least some simple straight hairs on either side of the midrib, veins conspicuous; petioles 0.4–3cm, narrowly winged, glabrous or with a few stipitate glands. Inflorescence dense, 6–11-flowered; rhachis 5–15mm; pedicels 10–25mm, glabrous or sparsely glandular. Calyx 2–15mm, usually cupular, ± glabrous, lobes rounded. Corolla campanulate or widely funnel-campanulate, white or cream to (more usually) deep crimson, with or without purple flecks, (30–)40–50mm. Ovary densely stipitate-glandular; style glabrous. Capsule 15–25 × 6–10mm, often glaucous. CHINA (SE Xizang, NW Yunnan, SW Sichuan), NE UPPER BURMA. Boulderly slopes, thickets, cane brakes, 3000–4000m. Map 132.

1. Petioles 4–10mm; leaf lamina 11–18 × as long as petioles, at least some simple straight hairs usually present near the midrib; corolla usually deep magenta-rose to crimson.....**12a. var. *eclectum***
- + Petioles 8–30mm; leaf lamina 6–12.5 × as long as petioles, usually lacking simple hairs; corolla usually white to yellow, sometimes flushed with rose .....**12b. var. *bellatulum***

**12a. var. *eclectum*.** Type: China, Yunnan, ix 1917, *Forrest* 14804 (holo. E).

Syn.: *R. brachyandrum* Balfour f. & Forrest, Notes R.B.G. Edinb. 13: 32 (1920). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, vii 1919, *Forrest* 18943 (holo. E).

*R. eclectum* Balfour f. & Forrest var. *brachyandrum* (Balfour f. & Forrest) Cowan & Davidian, *Rhododendron Yearbook* 6: 169 (1951).

Cowan & Davidian (loc. cit.) state that var. *brachyandrum* differs from var. *eclectum* in its darker flowers. However, there is no indication of the flower colour of the type of var. *eclectum*, or indeed of the majority of the herbarium specimens seen. The type of var. *brachyandrum* has small flowers, the diagnostic character used by the original authors, although, like Cowan & Davidian, I consider that to be of little taxonomic significance. If var. *eclectum* is restricted to plants with relatively short petioles and deeply coloured flowers then the following specimens are intermediate between vars. *eclectum* and *bellatulum*: *Forrest* 18023, 25603; *Rock* 8748, 8750, 9205, 22222, 22224, 22230, 22661, 22664, 22665.

**12b. var. *bellatulum*** [Balfour f. ex] Tagg in Stevenson (ed.), *The Species of Rhododendron* 739 (1930). Type: China, Yunnan, Londre Pass, Mekong/Salween divide, 12000ft, vi 1921, *Forrest* 19535 (holo. E).

Flowering specimens with relatively long petioles and elliptic leaves almost always have pale flowers but well over half the specimens seen lack flowers or flower colour notes. Therefore, the status of var. *bellatulum*, which apparently intergrades with var. *eclectum*, will remain uncertain until field studies are carried out.

*R. eclectum* hybridises with *R. pocophorum* (see under *R. × hemigynum*). *Kingdon-Ward* 6900, with leaves typical of *R. eclectum* except that they have a floccose but persistent indumentum, may also be of hybrid origin.

**13. (380.) *R. stewartianum*** Diels, Notes R.B.G. Edinb. 5: 211 (1912). Type: China, Yunnan, Tsedjiong Pass, Mekong/Salween divide, 10–11000ft, vi 1904, *Forrest* 5069 (holo. E).

Syn.: *R. niphobolobum* Balfour f. & Farrer, Notes R.B.G. Edinb. 13: 277 (1922). Type: NE Upper Burma, Chawchi Pass, etc., 10500ft, 15 v 1920, *Farrer* 1552b (holo. E; iso. K).

*R. aiolosalpinx* Balfour f. & Farrer, *ibid.* 13: 227 (1922). Type: NE Upper Burma, Chimili Pass, 11–12000ft, 16 v 1919, *Farrer* 926 (holo. E; iso. BM).

*R. stewartianum* Diels var. *aiolosalpinx* (Balfour f. & Farrer) Cowan & Davidian, *Rhododendron Yearbook* 6: 177 (1951).

*R. stewartianum* Diels var. *tantulum* Cowan & Davidian, *ibid.* 6: 177 (1951). Type: China, SE Xizang, Salween/Kiu-chiang divide, W of Si K'ai, vi 1922, *Forrest* 21918 (holo. E).

Shrub, 0.5–2.5m; bark smooth or rough, peeling on smaller branches; young shoots often glandular. Leaves obovate to elliptic, 4–12 × 2–6.5cm, 1.8–2.5 × as long as broad, apex rounded, apiculate, base rounded, upper surface glabrous, lower surface with mammillate epidermis and a thin ± persistent to evanescent fawn indumentum interspersed with sessile glands, especially towards the base; petioles 0.5–2cm, usually glabrous, occasionally with a few glands, with or without wings. Inflorescence 3–7-flowered; rachis usually less than 5mm; pedicels c.20mm, glabrous to sparsely stipitate-glandular. Calyx (2–)5–15mm, cupular, lobes broadly ovate, glandular-ciliate or glabrous. Corolla campanulate to tubular-campanulate, white or cream to pale (rarely deep) rose, with or without purple flecks, 35–55mm. Ovary usually densely glandular; style glabrous. Capsule 15–30 × c.6mm.

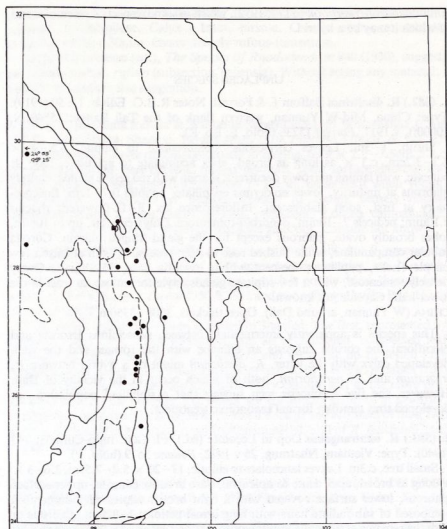
CHINA (SE Xizang, NW Yunnan), NE UPPER BURMA. Cane brakes, stony slopes, 3000–4250m. Map 133.

Cowan & Davidian, *Rhododendron Yearbook* 6: 177 (1952), refer forms with small leaves and calyces to var. *tantulum* and those with large leaves and calyces to var. *aiolosalpinx*. There is, however, apparently no correlation between these two characters and the forms do not come true from seed. *R. stewartianum* is closely allied to *R. euryisiphon* (q.v.) and to *R. cyanocarpum*.

The following specimens are minor variants or hybrids of *R. stewartianum*: *Forrest* 20302, 21687, 22702; *Rock* 8744; *Kingdon-Ward* 3880. All lack the scurfy leaf indumentum typical of *R. stewartianum*. The following are presumed to be hybrids of *R. stewartianum* and species of subsection *Neriiflora*: *Forrest* 20886, 21846, 21910, 22672.

**14. (381.) *R. euryisiphon*** Tagg & Forrest, Notes R.B.G. Edinb. 16: 191 (1931). Type: China, SE Xizang, Tsarong, Salween/Kiu-chiang divide, NW of Si-chi-to, 13000ft, vi 1922, *Forrest* 21694 (holo. E).

Shrub, 1–1.8m; young shoots minutely stipitate-glandular. Leaves 3.5–5.5 × 1.8–2.1cm, 2–2.5 × as long as broad, apex rounded, apiculate, base rounded, upper and lower surfaces glabrous, epidermis epapillate, glaucous



MAP 133. ● *R. stewartianum*; ■ *R. eurysiphon*.

beneath; petioles 0.5–0.7cm, glabrous to stipitate-glandular at maturity. Inflorescence 1–3-flowered, lax; rhachis c.3mm; pedicels 12–20mm, sparsely stipitate-glandular. Calyx c.3mm, sparsely stipitate-glandular. Corolla campanulate, creamy white flushed pale rose, with conspicuous flecks, 30–40mm. Ovary and most of style densely stipitate-glandular. Capsule 13–18 × c.6mm, curved.

CHINA (SE Xizang). Thickets, etc., 4000m. Map 133.

This species has been traditionally allied to *R. martinianum* (subsection *Selensia*) but it differs in its campanulate corolla with nectar pouches, a character that excludes it from subsection *Selensia*. Several sheets cited in the type description are said to be referable to *R. stewartianum* (Cowan & Davidian,

*Rhododendron* Yearbook 6: 177, 1952), which in some respects it resembles and of which it may be a hybrid.

#### UNPLACED SPECIES

1. (382.) *R. dimitrium* Balfour f. & Forrest, Notes R.B.G. Edinb. 11: 50 (1919). Type: China, Mid-W Yunnan, western flank of the Tali Range, 25°40'N, 10000ft, v 1917, *Forrest* 13736 (holo. E; iso. K).

Shrub, 1–3m. Leaves coriaceous, oblanceolate to elliptic, 6.5–9 × 2.2–3.2cm, c.3 × as long as broad, apex acuminate to apiculate, base ± cuneate, with lamina narrowly decurrent, margin with red sessile glands, entirely glabrous at maturity, lower epidermis epapillate; petioles 0.7–1cm, floccose-hairy at first, soon glabrescent. Inflorescence lax, 8–12-flowered; rhachis c.10mm; pedicels 7–10mm, dendroid-tomentose. Calyx cupular, up to 10mm, lobes broadly ovate, glabrous except for the gland-fringed margin. Corolla tubular-campanulate, white flushed rose to deep rose-pink, with at least a few purple flecks, papillate-pubescent within towards base, 35–40mm. Ovary densely tomentose, with a few stipitate glands; style tomentose, at least in the lower half. Capsule not known.

CHINA (W Yunnan, around Dali). Open thickets, 3000–3350m.

This species is apparently intermediate between subsections *Irrorata* and *Neriiflora*; the corolla suggests an alliance with the former and the well-developed calyx with the latter. *R. dimitrium* might be a hybrid between *R. irroratum* and *R. neriiflorum*, both of which occur in the vicinity of Dali. However, the five specimens seen suggest that a stabilised population has developed thus meriting formal taxonomic treatment.

2. (383.) *R. nhatrangense* Dop in Lecomte (ed.), Fl. Gén. Indo-Chine 3: 743 (1940). Type: Vietnam, Nhatrang, 26 v 1922, *Poilane* 3679 (holo. P).

Small tree, c.3m. Leaves lanceolate to elliptic, 17–20 × 5.2–7.5cm, 2.6–3 × as long as broad, apex acute to apiculate, base broadly cuneate, upper surface glabrous, lower surface covered with a light brown adpressed indumentum composed of sub-radiate hairs with long arms; petioles 3–3.5cm, glabrous or with the remains of a radiate indumentum. Inflorescence c.15-flowered; rhachis c.10mm; pedicels c.25mm, densely tomentose. Calyx c.5mm, densely tomentose. Capsule c.15 × 4mm, densely lanate-tomentose; style glandular, at least below.

Only known from two fruiting specimens from the same locality. Without flowers, this distinctive species cannot be referred with certainty to any subsection, though Sleumer (1958) has noted the similarity in leaf indumentum to *R. traillianum* var. *dictyotum* (subsection *Taliensia*).

3. (384.) *R. potaninii* Batalin, Acta Horti Petrop. 11: 489 (1891). Type: N China, in Prov. Kansu orientali, in valle ubi pagus Tschagon, 10 vii 1895, *Potanin*, n.v.

Tree, c.5m. Leaves oblong to obovate, 7–9 × 3.5–4cm, c.2 × as long as broad, apex obtuse, mucronate, base rounded, upper surface glabrous, lower surface presumed to be pubescent below at first though soon glabrescent, with a dense spongy indumentum of branched hairs overlying the midrib below;

petioles 2–2.5cm, densely tomentose. Inflorescence 7–8-flowered; pedicels c.18mm, rufous-pilose. Calyx c.1mm, hirsute. Corolla open-campanulate, probably white, c.30mm. Ovary densely rufous-tomentose.

Tagg, in Stevenson (ed.), *The Species of Rhododendron* 840 (1930), suggests an affinity with *R. rufum* (subsection Taliensia). Without seeing any material, I hesitate to confirm this suggestion.

4. (385.) *R. purdomii* Rehder & Wilson in Sargent (ed.), *Pl Wilsonianae* 1: 538 (1913). Type: China, Shaanxi, Tai-pei-shan, 1910, *Purdorm* 4 (holo. A; iso. K).

Robust shrub. Leaves oblong-lanceolate to oblong, 6–9 × 2.5–3.5cm, c.2.5 × as long as broad, base cuneate, margin revolute, upper surface glabrous and shining, lower surface glabrous; petioles 1–1.2cm, puberulent when young. Inflorescence 10–12-flowered; pedicels slender, 10–16mm, densely villous-tomentose. Calyx c.1mm, lobes sparsely pubescent. Corolla campanulate, 25–30mm. Ovary sparsely white-villous; style glabrous. Capsule not known.

As Rehder & Wilson suggest, *R. purdomii* is probably allied to *R. przewalskii* (subsection Taliensia) but it differs in its sparsely hairy ovaries, etc. It is only known for certain from the type collection, which is poorly dried, though four specimens from Shaanxi, *Licent* 2750 & 2845 and two collected by the Rev. Hugh are a fair match.

Two further entities have been collected in Shaanxi. The first, represented by *Purdorm* 3 and three Hugh specimens, has an agglutinated, compacted leaf indumentum (as is usual in *R. przewalskii*) and a capsule up to 30mm long (longer than in that species). The second, represented by a Hugh specimen from Ha Hsien, differs in its persistently stiffly hairy capsule and in the more pronounced hairs on the pedicels. The leaves are apparently glabrous at maturity. Further flowering material is required before the status and affinities of these two entities, at present only known from fruiting material, and of *R. purdomii* itself can be confirmed.

5. (386.) *R. spilotum* Balfour f. & Farrer, *Notes R.B.G. Edinb.* 13: 298 (1922). Type: NE Upper Burma, Nyitadi, 9 v 1920, *Farrer* 1539 (holo. E; iso. K).

Small tree; young shoots glandular-setose. Leaves elliptic, 7–11 × 3–4.2cm, c.2.5 × as long as broad, apex acuminate, base rounded, upper surface glabrous at maturity, lower surface with punctate hair bases persistent over the main lateral veins, with scattered setose glands towards the base and a thin indumentum, especially near the midrib; petioles 1–1.5cm, glandular-setose. Inflorescence c. 8-flowered; rhachis 2–3mm; pedicels 25–30mm, glandular-setose. Calyx c. 10mm, lobes narrowly triangular, glandular-ciliate. Corolla funnel-campanulate, pink with a basal blotch, c.30mm. Ovary densely stipitate-glandular; style glabrous. Capsule ? unknown.

Alpine woodlands.

Only known for certain from the type, though two fruiting specimens, *Kingdon-Ward* 10959 and 13327, from SE Xizang and N Burma respectively, are a close match. Possibly a hybrid of a species in subsection *Glischra*. Further material is required before the status of *R. spilotum* is confirmed, especially as the origin of plants under that name in cultivation is not known; they almost certainly have no connection with the type.

6. (387.) **R. sp. nov** Type: China, Jiangsu, Yue Xi, Bao Jia Ho, Mei Li Village, 1750m, ix 1953, *E China Field Station* 6911 (Herb. Inst. Bot. Guangzhou; PE).

Shrub; branches stout; perulae persistent. Leaves coriaceous, obovate, 5–7 × 3–4cm, 1.7–2 × as long as broad, apex rounded, blunt, base rounded, lower surface with a dense bistrate indumentum, the upper layer a reddish-brown tomentum composed of ramiform hairs, the lower compacted, with radiate hairs; petioles 1–1.5cm, tomentose. Inflorescence c.6-flowered; rhachis c.18mm; pedicels 25–35mm, with a thin indumentum. Calyx c.1mm, lobes rounded. Flowers unknown. Capsule 15–18 × 6–8mm.

Only known from a single gathering; clearly a distinct undescribed species, though without flowers; its affinities, therefore, remain uncertain and a formal description is not justified.

#### EXCLUDED AND POORLY DESCRIBED SPECIES

**R. blumei** Nuttall, J. Bot. (Hooker) 5: 366 (1853). Type: NE India, Arunachal Pradesh, on mountains beyond the Bhorelli River, *Booth*, n.v.

The type and only known specimen is sterile. The leaves are described as being oblong-elliptic, 12.5–15 × c.5cm, with acute apices, and a dense white tomentum beneath.

Nuttall suggests that it may be close to *R. longiflorum* (= *R. grande*) or to *R. hodgsonii*, though in the absence of the type I hesitate to confirm these proposed affinities.

**R. chlorops** Cowan, Notes R.B.G. Edinb. 21: 99 (1952). Type: plants raised from seed as *Forrest* 16463 at Edinburgh (holo. E). and at Lochinch (E).

Only known from cultivated specimens. The type sheet is annotated with the remark that *R. chlorops* may be a chance hybrid between *R. wardii* and *R. vernicosum*. The herbarium specimen of *Forrest* 16463 is however an *Acer* sp. Although *R. chlorops* is almost certainly a chance hybrid, its parentage remains uncertain.

**R. dimidiatum** Balfour f., Notes R.B.G. Edinb. 11: 53 (1919). Type: a rogue in a batch of seedlings of *R. callimorphum* raised at Caerhays by J.C. Williams; first flowered in the spring of 1918 (holo. E).

This plant is almost certainly a chance hybrid of *R. callimorphum* and *R. neriiflorum* and is only known in cultivation.

**R. imberbe** Hutchinson, Gard. Chron. 83: 214, f. 106 (1928). Type: a specimen of unknown origin cultivated at Kew by A.D. Cotton; first flowered in March 1928 (holo. K; iso. E).

Hutchinson considered that the type matched an incomplete specimen collected in the wild in N India (Kumaon, Jhuni, c.9000ft, *Strachey & Winterbottom* 5, K). Cotton himself suggested that the type plant might have been a hybrid between *R. barbatum* and *R. arboreum* and from the specimens seen I agree with this suggestion.

**R. inopinum** Balfour f., Notes R.B.G. Edinb. 15: 109 (1926). Type: a cultivated specimen raised from seed as *Wilson* 1866 at Edinburgh; first flowered in 1922 (holo. E).

Almost certainly a chance hybrid of *R. wasonii*, typical specimens of which were raised from the same batch of seed. The collector's number should probably be *Wilson* 1876 as the herbarium specimen under that number is *R. wasonii* while *Wilson* 1866 is not.

**R. kansuense** Millais, *Rhododendrons* ser. 2: 167 (1924). Type: a plant raised from seed by J. Nix, collected by Wallace in October 1910 at 9–11000ft in W Gansu, near the Xizang border.

This plant is probably referable to subsection *Taliensia* but there are no extant specimens and the type description is inadequate.

**R. magorianum** Balfour f., Notes R.B.G. Edinb. 15: 111 (1926). Type: a specimen from a plant cultivated by Mr Magor at Lamellan, raised from seed as *Wilson* 1539; first flowered in 1919 (the type description is based on a specimen collected in 1922).

The type specimen is presumed to be chance hybrid of a species in subsection *Fortunea* and is not known in the wild.

**R. maximowiczianum** Léveillé, Bull. Soc. Agric. Sarthe 39: 47 (1903). Type: China, environs de Yunnan-sen, acheté au marché de la ville, apporté des montagnes voisines, 20 iii 1897, *Bodinier* (holo. E).

The type description states that the under-surfaces of the leaves are 'subtomentoso-flavis', while the type specimen seen has completely glabrous leaves. Léveillé suggested that this species was allied to *R. siderophyllum*, a lepidote species, though this could have been a simple error. However, some doubt remains as to whether the type description refers to the supposed type specimen now at Edinburgh which is almost certainly referable to *R. irroratum* subsp. *pogonostylum*.

**R. morseadianum** Millais, *Rhododendrons* ser. 2: 189 (1924). Type: China, S Xizang, upper Nyanjang Valley, Brahapotra Bend, 28°N, 92°E, 10–14000ft, xi 1913, *Bailey* 324, n.v.

This species was described without flowers and may belong to subsection *Arborea*, but the leaves are described as being glabrous. The type description is inadequate and in the absence of herbarium material the identity of the type specimen remains doubtful.

**R. paradoxum** Balfour f., Notes R.B.G. Edinb. 15: 114 (1926). Type: a specimen from a plant raised from seed of *R. wiltonii* as *Wilson* 1353 at Edinburgh (holo. E).

Probably a chance hybrid of *R. wiltonii*.

**R. peregrinum** Tagg, Notes R.B.G. Edinb. 16: 202 (1931). Type: a plant raised from seed as *Wilson* 4254, (from Pan Lin Hsien in W Sichuan) by Mr Magor, flowered late April or early May 1923 (holo. E).

Only known in cultivation; apparently arising as a rogue in a batch of *R. galactinum* seed though clearly different from that species in its indumentum which lacks the typical cup-shaped hairs of subsection Falconera. *R. peregrinum* is almost certainly a hybrid of *R. galactinum*.

**R. planetum** Balfour f., Notes R.B.G. Edinb. 12: 145 (1920). Type: a specimen from a plant raised from seed by J.C. Williams at Caerhays as *Wilson* 1882; first flowered in February 1920 (holo. E).

The cultivated plant has no known provenance as the type number is not a *Rhododendron*. *R. planetum* is probably a chance hybrid of a species in subsection Fortunea.

**R. pyrrhoanthum** Balfour f., Notes R.B.G. Edinb. 12: 154 (1920). Type: a specimen from a plant raised from Forrest seed; found in a bed of *R. forrestii* seedlings at Werrington (holo. E).

Almost certainly a rogue hybrid of *R. forrestii*.

**R. serotinum** Hutchinson, Bot. Mag. 146: t.8841 (1920). Type: a specimen from a plant cultivated at Kew, originally received as a seedling from Paris, raised from Delavay seed supposed to have been collected S of Mengtsh in S Yunnan (holo. E).

Hutchinson remarks on the straggling habit, late flowering time (August to October) and blotched corolla as distinguished characters separating *R. serotinum* from *R. decorum*, its probable ally. No Delavay herbarium material seen matches the description of *R. serotinum*. Its provenance and even its existence in the wild remain uncertain.

**R. venosum** Nuttall, J. Bot. (Hooker) 5: 365 (1853). Type: NE India (Arunachal Pradesh), beyond the valley of the Bhorelli River, *Booth*, n.v.

The leaves of the sterile type specimen are described as being elliptic-ovate with a rounded base and as having a white adpressed pubescence below. As I have not located the type, the identity of this plant remains uncertain.

**R. wallaceanum** Millais, Rhododendrons ser. 2: 259 (1924). Described from a cultivated plant raised from seed collected by Wallace in W Gansu 'close to the Tibetan Border' at 9–11000ft in 1911.

Inadequately described from a sterile plant; presumed to belong to subsection Taliensia and possibly synonymous with *R. przewalskii*. The plant is no longer in cultivation and no herbarium specimens are known.



## IDENTIFICATION OF SPECIMENS

This list includes the identifications of all numbered herbarium specimens studied during the preparation of this revision. In addition, a few numbered specimens (generally types) that have not been seen are included: the numbers that refer to these specimens are italicised. As far as is possible, the names of Chinese collectors are cited with Pin Yin spellings. However, many of these were recorded verbatim so the spellings may not always be correct. Material grown under these numbers in gardens will not necessarily belong to the same taxa as the herbarium specimens.

- Abbey 5 *siderum*  
 Adbe et al. 9769 *weiyi*  
 Afles 47322, 78991 *maximum*  
 Aitchison 63 *campanulatum* subsp. *campanulatum*  
 Apold, Cox & Hutchison 102, 103 x *sochadzeae*; 114 *caucasicum*; 118 *smirnowii*; 119 *ungernii*; 120, 121 *ungernii* x *smirnowii*; 129 *smirnowii*; 130, 131 x *sochadzeae*; 147 *caucasicum*  
 Arnott 239 *aureum* var. *aureum*  
 Bailey 5 *arborescens* subsp. *arborescens*; 17 *campanulatum* subsp. *campanulatum*; 25 *arborescens* var. *roseum*; 26 *campanulatum*; 31 *arborescens* var. *roseum*; 32 *campanulatum* subsp. *campanulatum*; 33 *campanulatum*; 35 *barbatum*; 39 *arborescens*; 40 *campanulatum* subsp. *campanulatum*; 62, 63 *arborescens* subsp. *arborescens*; 75 *campanulatum* subsp. *campanulatum*  
 Balakrishnan D601 *arborescens* subsp. *zeylanicum*  
 Balansa 1437 *ponicum*  
 Balf 5004 *arborescens* subsp. *arborescens*  
 Bailey 1810 *caucasicum*; 8795, 9644 *macrophyllum*  
 Barclay 940 *caucasicum*  
 Barclay & Syng 2442 *arborescens* subsp. *arborescens*  
 Bartholomew 47, 150 *barbatum*; 151 *arborescens* var. *roseum*; 169 *arborescens* subsp. *arborescens*; 181 *wallichii*; 185a *succothii*; 185b *lanatum*; 207 *hodgsonii*; 238 *falconeri* subsp. *falconeri*; 259 *barbatum*; 260 *grande*; 261 *arborescens* var. *roseum*  
 Baytop 11857 *ponicum*  
 Beer et al. 8239 *wightii*; 8240 *campanulatum*; 8287 *wightii*; 10094 *thomsonii* subsp. *thomsonii*; 10181 *wightii*; 10625 *grande*; 10674 *arborescens* var. *cinnamomeum*; 10766 *campanulatum*; 10767 *camphylacarpum* subsp. *camphylacarpum*; 10770 *wightii*; 12226 *thomsonii* subsp. *thomsonii*; 25355 *hodgsonii*; 25672 *thomsonii* subsp. *thomsonii*; 25677 *hodgsonii*; 25693 *grande*; 25734 *arborescens* var. *cinnamomeum*  
 van Beneskom & Phengkilai 2395 *arborescens* var. *delavayi*  
 Billmore 6566 *causabense*  
 Biskam 2263 *arborescens* subsp. *arborescens*; 2270 *barbatum*; 2278 *campanulatum* subsp. *campanulatum*  
 Bisser 1123 *japonicum* var. *japonicum*; 2735 *brachycarpum* subsp. *brachycarpum*; 2744 *japonicum* var. *japonicum*; 3776, 3999 *brachycarpum* subsp. *brachycarpum*; 4592 *japonicum* var. *japonicum*  
 Biswas 9171 *hodgsonii*  
 Bodinier 172 *fortunei*; 1588 *annae*  
 Bor 2919 *macbatum*; 12124, 14147 *campanulatum* subsp. *campanulatum*  
 Bor & Kirat Ram 18601 *campanulatum* subsp. *campanulatum*; 18603 *thomsonii* subsp. *thomsonii*; 18625, 18630 *campanulatum* subsp. *campanulatum*; 18648 *arborescens* var. *roseum*; 18666 *wightii*; 19203 *camphylacarpum* subsp. *camphylacarpum*; 19208 *wallichii*; 19244 *arborescens* var. *roseum*; 19260 *camphylacarpum* subsp. *camphylacarpum*; 19667 *fulgens*; 19844 *camphylacarpum* subsp. *camphylacarpum*  
 Bournville 1106 *ponicum*  
 Bourne 325, 1945 *ponicum*  
 Bowyer-Lyon 48 *arborescens* var. *cinnamomeum*; 84 *campanulatum* subsp. *campanulatum*; 88, 3012, 3013 *barbatum*; 3071 *wallichii*; 3152 *lanatum*; 3155 *campanulatum* subsp. *aeruginosum*; 3197 *griffithianum*; 3225 *campanulatum*; 3226 *wallichii*; 3232 *lanatum*; 3241 *wightii*; 3255 *thomsonii* subsp. *thomsonii*; 3286 x *candelabrum*; 5089a *campanulatum* subsp. *aeruginosum*; 5289 *wightii*; 5795 *grande*; 6004 x *candelabrum*; 6008 *niveum*; 6016 *smithii*; 6035 *succothii*; 6074, 6075 *smithii*; 6078 *succothii*; 6086 *kendrickii*; 15027, 15040 *campanulatum*; 15040a *lanatum*; 15041 *wightii*; 15042 *succothii*; 15073 *smithii*  
 Bozman et al. 45204 *catawbiense*  
 Brough 28 *arborescens* var. *cinnamomeum*; 60 *camphylacarpum* subsp. *camphylacarpum*; 61 *campanulatum* subsp. *campanulatum*; 62 *hodgsonii*; 63 *campanulatum* subsp. *campanulatum*; 304 *barbatum*  
 Brown 377, 774 *macrophyllum*  
 Brummitt 12801 *ponicum*  
 Bryant 2 *arborescens* subsp. *arborescens*  
 Bullock 193 *fortunei* subsp. *fortunei*  
 Caffee 813 *arborescens*  
 Canadian Boundary Commission 72383, 72385 *macrophyllum*  
 Canton Christian College 9378, 12420 *similarum*; 12667 *fortunei* subsp. *fortunei*  
 Cavalerie 3090 *arborescens* var. *peramoenum*; 3885 *arborescens* var. *delavayi*; 3923 *aff. fortunei*; 4387 *decorum*; 4402 *arborescens* var. *delavayi*; 4627 *irroratum* subsp. *irroratum*; 7826 *decorum*; 7833 *arborescens* var. *delavayi*; 8073 *decorum*  
 Cave 746 *lanatum*; 748 *wallichii*; 751 *lanatum*; 753 *hodgsonii*; 754 *smithii*; 755 *thomsonii* subsp. *thomsonii*; 756 *hodgsonii*; 1735 *camphylacarpum* subsp. *camphylacarpum*; 2033 *wallichii*; 2343 *griffithianum*; 2365 *camphylacarpum* subsp. *camphylacarpum*; 2369 x *candelabrum*; 4793 *hodgsonii*; 6712 *falconeri* subsp. *falconeri*; 6713 *camphylacarpum* subsp. *camphylacarpum*; 6714 *smithii*; 6715 *arborescens* var. *roseum*; 6716 *hodgsonii*; 6717 *thomsonii* subsp. *thomsonii*; 6718 *hodgsonii*; 6719 *campanulatum*; 6723 *lanatum*; 6727 *campanulatum* subsp. *aeruginosum*; 6730 *niveum*; 6731 *arborescens* var. *roseum*; 6732 *grande*; 6736 *arborescens* subsp. *arborescens*; 6789 *barbatum*; 6918 *campanulatum*; 6919 *campanulatum* subsp. *aeruginosum*; 6920 *fulgens*; 6921 *hodgsonii*; 6922 *arborescens* subsp. *arborescens*; 6923 *falconeri* subsp. *falconeri*; 6924 *hodgsonii*; 6925 *thomsonii* subsp. *thomsonii*; 6926 *campanulatum*; 6927 *camphylacarpum* subsp. *camphylacarpum*; 6929 *lanatum*; 6931 *smithii*; 6935 *thomsonii* subsp. *thomsonii*  
 Chamberlain 14 *arborescens* subsp. *arborescens*; 50 *arborescens* var. *cinnamomeum*; 101 *arborescens* var. *delavayi*; 137 *wallichii* x *arborescens*; 139 *arborescens* var. *roseum*; 140 *arborescens* var. *cinnamomeum*  
 Chang, C. C. 534, 754 *brevinerve*; 5329 *longesquamatum*; 5553 *faberii* subsp. *pratensis*; 6511 *phaeochrysum*; 7152 *faberii* subsp. *pratensis*; 11173 *brevinerve*  
 Chang, H. F. 59 *adenopodum*; 78 *ochraceum*; 153 *coeloneuron*; 174 *platypodium*; 189 *calophyllum* var. *calophyllum*; 251 *longipes* var. *chianianum*  
 Chang, H. T. 5176 *fortunei* subsp. *fortunei*; 5231, 5241, 5254 *maculiferum* subsp. *anhuense*  
 Chang, S. S. 4853 *argyrophyllosum* subsp. *argyrophyllosum*; 4866 *floribundum*; 6127 *phaeochrysum* var. *levisstratum*; 6509 *nigrolaudulosum* *aff. aff.*; 6511 *phaeochrysum*; 6538 *agnaniphum* var. *agnaniphum*  
 Chang, S. Y. 4757, 5671, 6636 *fortunei* subsp. *discolor*  
 Chang, T. Y. (? = Chang, C. Y.) 2050 *agnaniphum* var. *agnaniphum*; 22070 *vernicosum*; 22116 *phaeochrysum* var. *levisstratum*; 22111 *agnaniphum* var. *agnaniphum*; 22113, 22117, 22122, 22197 *phaeochrysum* var. *levisstratum*; 22178 *vernicosum*; 23819 *phaeochrysum* var. *levisstratum*; 25085, 25163 *fortunei* subsp. *discolor*  
 Chang, Y. B. 266 *arborescens* var. *delavayi*; 566 *sphaeroblastum*; 590, 594 *rex* subsp. *rex*; 679 *sphaeroblastum*  
 Chang, Y. L. 211 *beesianum*; 486 *aureum*  
 Chang, Y. T. 3032, 3035, 3131 *arborescens* subsp. *arborescens*; 3169 *barbatum*; 3232 *arborescens* subsp. *arborescens*; 3537 *campanulatum* subsp. *campanulatum*; 3552 *barbatum*  
 Chao, C. K. (? = Zhao, Q. G.) 30088 *beesianum*; 30187 *decorum*  
 Chapman 106 *campanulatum* subsp. *aeruginosum*  
 Chatterjee 58 *griffithianum* subsp. 68 *wallichii*



































- tolactum; A226, AA5, AA38, AA48, AA99 arboreum var. delavayi; AA120, AA170 decurum; AD72 phaeochrysum var. agglutinatum; AD75 fabrii subsp. prattii; AD77 bureavii; AD92 oreodoxa var. fargesii; AD98 neriflorum subsp. neriflorum; AD101 decurum; AD106 bureavii; AD109 oreodoxa var. oreodoxa; AD111 fabrii subsp. prattii; AD170 pachytrichum; AD174 decurum; AF331 orbiculare subsp. orbiculare; AF335 longesquamatum; AF454 floribundum; AF455 pachytrichum; AG390 watsonii; AG399 floribundum; AG443 decurum; AG451 watsonii; AH277 pachytrichum; AH280 watsonii; AH284, AH293 pachytrichum; AH295, AH297 watsonii; AH298 decurum; AH307 oreodoxa var. oreodoxa; AH315 floribundum; AH371 argyrophylum x pingianum; AH418 longesquamatum; AH431 pachytrichum C1 haematodes subsp. haematodes; C5 neriflorum subsp. neriflorum; C21 decurum; C29 dimittitum; C43 fulvum; C44 neriflorum subsp. neriflorum; C54 cyanocarpum; C56 dimittitum; C106 irroratum subsp. irroratum; C186 rex subsp. ficiolactum; C206 dichroanthum subsp. dichroanthum; C209 lactum; C210 neriflorum subsp. neriflorum; C211 selense subsp. jucundum; C212 talense/roxiense subsp. cucullatum; C226 arboreum var. delavayi; D1 sperabile subsp. wuianum; D18 uvarifolium; D19 lukiangense; D28, D29 sperabile var. sperabile; D42 uvarifolium; D60 glischrum subsp. glischrum; D62 trailianum var. trailianum; D64 rex subsp. ficiolactum; D65 trailianum var. trailianum; D66 alutaceum var. russocinctum; D67, D69 roxiense var. roxiense; D103 glischrum subsp. glischrum; D105 beesianum; D106 aff. rothschildii; D107 beesianum; D201 clementinae; D204 haematodes subsp. chaetomallum; D206 clementinae; D217 forestii subsp. forestii; D218 aperantum; D231 cyanocarpum; D248 clementinae; D249 alutaceum var. russocinctum; D251 aganniphum var. aganniphum; D252 haematodes subsp. chaetomallum; D253 trailianum var. trailianum; D268 sinogrande; D271 fulvum; D272 beesianum; D273 lukiangense; D274 coriaceum; D286 selense subsp. dasycladum; D294 sperabile var. sperabile; D302 coriaceum; D306 lukiangense; D332 wardii var. wardii; L49 aff. agastum; L51 irroratum subsp. irroratum; L52 agastum; L60, L61, L67 arboreum var. delavayi; L69 irroratum subsp. pogonostylum; L72 irroratum subsp. irroratum; L73 anthospherum; L74, L93 irroratum subsp. irroratum; L107 haematodes subsp. haematodes; L108 lactum; L109 talense; L111 rex subsp. ficiolactum; L114 selense subsp. jucundum; L120 balfourianum; L121 cyanocarpum; L123 neriflorum subsp. neriflorum; L124 talense; L125 cyanocarpum; L126 lactum; L127 selense subsp. jucundum; L127a cyanocarpum; L128 talense; L131 selense subsp. jucundum; L137 haematodes subsp. haematodes; L139, L140 talense; L146, L148 lactum; P7 trailianum var. trailianum; P21 anthospherum; P29 irroratum subsp. irroratum; P32 rex subsp. ficiolactum; P40 vernicosum; P49 beesianum; P50 vernicosum; P52, P53 trailianum var. trailianum; P64 beesianum; P65 trailianum var. trailianum; P66 adenogynum; P67 trailianum var. trailianum; P71 vernicosum; P84 adenogynum; P103 phaeochrysum var. phaeochrysum; P170 decurum; U17 irroratum subsp. irroratum; U33, U35, U38, U41 aberconwayi; U49 arboreum var. delavayi; U51 aberconwayi; U53 decurum; U54 aberconwayi; U57 irroratum subsp. pogonostylum; U60 arboreum var. delavayi; U64 irroratum subsp. irroratum; U66 aberconwayi; U67 decurum; U70, U71, U73, U76 irroratum subsp. pogonostylum; U83 decurum; U101 irroratum subsp. pogonostylum; U109 irroratum subsp. irroratum; U163, U172, U187 decurum; Z6 denudatum; Z8 fabrii subsp. prattii; Z16 argyrophylum subsp. argyrophylum; Z20 bureavii; Z21 fabrii subsp. prattii; Z23 bureavii; Z25, Z27 orbiculare subsp. orbiculare; Z30 oreodoxa var. fargesii; Z31 selense subsp. selense; Z32 souliei; Z33 pachytrichum; Z70 decurum; 180 uvarifolium
- McMurphy** 87 macrophyllum  
**Macoun** 93 arboreum var. aureum  
**Maire** 12 decurum; 185 arboreum var. delavayi; 494 denudatum; 860, 1103 arboreum var. delavayi; 1104 decurum  
**Makino** 101776, 101779 japonicum var. japonicum; 101781, 133020 japonicum var. pentamerum  
**Mao, P. I.** 1007 sphaeroblastum; 1014 pubicostatum; 1018, 1020 sphaeroblastum; 3489, 3491 sinofalconeri  
**Marjoribanks** 7473 arboreum subsp. nilagiricum  
**Mason** 4896 macrophyllum  
**Matthew** 10244 arboreum subsp. nilagiricum  
**Maximova** 5080 arboreum var. aureum  
**Mizushima** 254 japonicum; 268 brachycarpum subsp. fauriei; 347 arboreum var. aureum; 1235 japonicum var. japonicum; 1990 brachycarpum subsp. brachycarpum; 2227, 2228 arboreum var. aureum; 2285 brachycarpum subsp. fauriei; 11104 japonicum var. pentamerum; 11137 brachycarpum subsp. brachycarpum; 11669 arboreum var. aureum
- Mombeig** 7 uvarifolium; 13, 14 sanguineum var. sanguineum; 165 floccigerum; 166 lukiangense; 168 sanguineum var. sanguineum; 169 roxiense var. roxiense; 170 decurum; 171 uvarifolium
- Mori** 7047 mori  
**Morris** 1010 maximum  
**Mukerji** 37 campanulatum subsp. campanulatum  
**Muroi** 366 japonicum var. japonicum; 399 arboreum var. aureum; 407 brachycarpum subsp. fauriei; 531 japonicum var. japonicum; 605 brachycarpum subsp. fauriei; 957, 1982 arboreum var. aureum; 3233 yakushimanum subsp. makinoi; 3388, 3543 brachycarpum subsp. brachycarpum; 3711 brachycarpum subsp. fauriei; 3772, 3850 brachycarpum subsp. brachycarpum; 3857, 3858 arboreum var. aureum; 3859 brachycarpum subsp. fauriei; 3862 arboreum var. aureum; 4035 brachycarpum subsp. brachycarpum; 4427, 5768 brachycarpum subsp. fauriei; 6967 yakushimanum subsp. makinoi
- Murota & Schimizu** 913 japonicum var. pentamerum  
**Murray** 894, 995 ponticum  
**Nakai** 1531 arboreum var. aureum  
**Nand** 172 arboreum subsp. arboreum  
**Ng** 1122, 5960 wrayi  
**Nicholson** 2646 campanulatum subsp. aeruginosum; 2919 arboreum; 3033 barbatum; 3176 arboreum var. roseum; 3186 aff. grande; 3188 grande; 3297 arboreum var. roseum; 3304 campanulatum subsp. aeruginosum  
**Nilsen** 1272 ponticum  
**North East Yunnan Expedition** 64 denudatum; 457 calophyllum var. openshawianum; 564, 576, 1410 denudatum  
**North West College of Agriculture Expedition** 38 przewalskii  
**North West Yunnan Expedition** 820, 832 phaeochrysum var. levistricum; 10498 roxiense var. cucullatum  
**Ohwi** 235 japonicum var. japonicum  
**Pal** 17426 facetum  
**Pan** Y. Y. 1111 oreodoxa subsp. shensiense  
**Paluchius** 5561 ponticum  
**Pammel** 24254 catawbiense  
**Parish** 1021 parishii  
**Parker** 2059 barbatum; 3105 parishii  
**Parkinson** 3975, 7461 campanulatum subsp. campanulatum  
**Parry** 11 arboreum var. delavayi; 12 arboreum  
**Pei, C.** 3889 fortunei subsp. discolor; 3988 maculiferum subsp. anhweiense; 7172, 7252, 7282 longipes var. chianianum  
**Pem, X. P.** 6129 hemslayanum  
**Permanand** 1037 campanulatum subsp. campanulatum  
**Petefor** 5135 aff. anastylum  
**Poillane** 3556, 3679 nhairangense; 6535, 29109 excelsum; 30655, 30767, 32179, 32547, 32549, 32560, 32568, 32579, 32824 irroratum subsp. kontumense  
**Polunin** 49/176, 49/1202, 56/757 campanulatum subsp. campanulatum; 427, 1009 barbatum; 1352 arboreum var. cinnamomeum; 5236 ponticum; 9546 barbatum; 9547 arboreum var. roseum  
**Polunin, Sykes & Williams** 959 campanulatum subsp. campanulatum; 1872 arboreum var. roseum; 2047 campanulatum subsp. campanulatum; 3670, 3853, 3854 arboreum subsp. arboreum; 3875 barbatum; 4071 arboreum hybrid; 4113 arboreum x campanulatum; 4141 barbatum; 4142, 5943, 5944, 5945, 5947 campanulatum subsp. campanulatum  
**Post** 674 ponticum  
**Pradhan** 4276 arboreum subsp. arboreum  
**Pratt** 58 fabrii subsp. prattii; 311 strigillosum; 325 orbiculare subsp. orbiculare; 349 igneum  
**Price** 333 arboreum var. aureum; 1000 pseudochrysanthum  
**Proud** 235 arboreum var. roseum  
**Purdum** 1077, 1078 rufum  
**Purseglove** 4221 wrayi  
**Qinghai & Xizang Complex Expedition** 7026 arboreum var. delavayi; 11601 principis  
**Raizide** 1517 campanulatum subsp. campanulatum  
**Ramseur** 3490 catawbiense; 3685 maximum  
**Reverchon** 118 ponticum  
**Ribu & Rhomoe** 1116 wightii; 6172 hodgsonii; 6176 campylocarpum subsp. campylocarpum; 6178 thomsonii subsp. thomsonii; 6180 arboreum var. roseum; 6515 wallichii  
**Rick** 60, 117 arboreum subsp. arboreum; 1398 campanulatum subsp. campanulatum  
**Robyrs** 6953, 7126 arboreum subsp. zeylanicum  
**Rock** 3012a, 3017 arboreum var. delavayi; 3043, 3050 vernicosum; 3061, 3062 decurum; 3081a arboreum var. delavayi; 3081b, 3118 decurum; 3129, 3141, 3145 cyanocarpum; 3146 neriflorum subsp. neriflorum; 3241 arboreum var. delavayi; 3257 decurum; 3365 vernicosum;



3371, 3375 trillium var. trillium; 3377 venticosum; 3389, 3408 adnigrum; 3442, 3488 venticosum; 3489 trillium var. trillium; 3499 rex subsp. ficolactum; 3500 adnigrum; 3504 besaniam; 3506 trillium var. trillium; 3509 rex subsp. ficolactum; 3567 venticosum; 3568 adnigrum; 3643 varifolium; 3669, 3739 adnigrum; 3873 trillium subsp. besaniam; 3914 adnigrum; 3929 rex subsp. ficolactum; 3981 phacelium var. phacelium; 3982 selense subsp. dasydium; 3983 var. di var. wardii; 3984 selense subsp. dasydium; 4042 arboreum var. delavayi; 4096, 4214 decurium; 4234 rex subsp. ficolactum; 4235 trillium var. roseanum; 4253 adnigrum; 4259 trillium var. trillium; 4276 rex subsp. ficolactum; 4347 adnigrum; 4349 rex subsp. adnigrum; 4399 arboreum var. delavayi; 5191 decurium; 5393 adnigrum; 5394 trillium var. trillium; 5487 rex subsp. rex; 5535 besaniam; 5537 phacelium; 5538, 5539 roseanum var. cucullatum; 5542 wardii var. wardii; 5543 baillouianum; 5546 phacelium; 5590 rex subsp. rex; 5681 decurium; 6249 sinogradae; 6251, 6254 alense; roseanum; 6260 trillium subsp. besaniam; 6271 sinogradae; 6284 irroratum subsp. irroratum; 6295 rex subsp. ficolactum; 6296 bureavi; 6308 irroratum subsp. irroratum; 6309 rex subsp. ficolactum; 6346 besaniam; 6357 selense subsp. pseudum; 6364 haenulodes subsp. haenulodes; 6365 selense; roseanum var. cucullatum; 6355 neritium subsp. neritium; 6636 arboreum; 6641 adnigrum; 6642 rex subsp. ficolactum; 6634 delavayi; 6724 neritium subsp. neritium; 6831 rex subsp. ficolactum; 6832 trillium var. trillium; 7650 trillium; 7381 sinogradae; 7648 facium; 7650 neritium subsp. neritium; 7658 habrotrichum; 7662 fulvum; 7664 anthophlerum; 7665 fulvum; 7666 neritium subsp. neritium; 7794 adnigrum; 7805 adnigrum; 7806 sinogradae; 7807 sinogradae; 7808 arboreum var. artemesium; 7911, 7915 arboreum var. delavayi; 7997 anthophlerum; 7998 fulvum; 8019 anthophlerum; 8072, 8073 irroratum subsp. irroratum; 8076 anthophlerum; 8077, 8078 irroratum subsp. pogoniolum; 8079, 8080 anthophlerum; 8081 irroratum subsp. pogoniolum; 8082, 8083, 8084 irroratum subsp. artemesium; 8085 anthophlerum; 8088 arboreum var. delavayi; 8090 decurium; 8095 arboreum var. delavayi; 8109 decurium; 8130 arboreum var. delavayi; 8131 irroratum subsp. irroratum; 8132 agatum; 8133 irroratum subsp. irroratum; 8134 agatum; 8135 arboreum var. delavayi; 8136 irroratum subsp. irroratum; 8137 arboreum var. delavayi; 8138, 8140 agatum; 8146 irroratum subsp. irroratum; 8147 arboreum var. delavayi; 8148 irroratum subsp. irroratum; 8164 lukangense; 8165, 8167, 8168, 8174 rex subsp. ficolactum; 8169, 8170, 8171, 8172, 8173, 8174 adnigrum; 8202 trillium var. trillium; 8203 venticosum; 8204 trillium var. trillium; 8205 venticosum; 8211, 8212, 8214 adnigrum; 8215 irroratum subsp. pogoniolum; 8216 varifolium; 8217 anthophlerum; 8218 varifolium; 8219 varifolium; 8240 irroratum subsp. irroratum; 8241 arboreum var. delavayi; 8250 besaniam; 8251 venticosum; 8258 rex subsp. ficolactum; 8259 besaniam; 8260 aif. besaniam; 8282 anthophlerum; 8283 bureavi; 8284 aif. besaniam; 8271, 8272, 8273, 8282, 8283 rex subsp. ficolactum; 8283 irroratum subsp. irroratum; 8284 adnigrum; 8286 irroratum subsp. irroratum; 8287 irroratum subsp. irroratum; 8288, 8308, 8310 rex subsp. ficolactum; 8309 varifolium; 8355 venticosum; 8360 varifolium; 8379 besaniam var. aganiphum; 8382, 8383, 8384 trillium var. trillium; 8385 albaicum var. albaicum; 8386 albaicum var. odor; 8388, 8389 roseanum var. cucullatum; 8390 rex subsp. ficolactum; 8391 selense subsp. dasydium; 8394 rex subsp. ficolactum; 8395 selense subsp. dasydium; 8396 rex subsp. ficolactum; 8397 selense subsp. dasydium; 8398 rex subsp. ficolactum; 8399 trillium var. trillium; 8400 roseanum var. cucullatum; 8401 trillium var. trillium; 8402, 8403 anthophlerum; 8417 selense subsp. dasydium; 8420 rex subsp. ficolactum; 8421 cucullatum; 8423 albaicum var. roseanum; 8424 varifolium; 8430 irroratum subsp. irroratum; 8431 lukangense; 8439 rex subsp. ficolactum; 8444 irroratum subsp. irroratum; 8446 roseanum var. roseanum; 8448 selense subsp. dasydium; 8449 rex subsp. ficolactum; 8450 varifolium; 8451 rex subsp. ficolactum; 8452 rex subsp. ficolactum; 8453 rex subsp. ficolactum; 8454, 8455 irroratum subsp. irroratum; 8458, 8460 besaniam; 8461 roseanum var. roseanum; 8462 trillium

var. trillium; 8463 roseanum var. roseanum; 8464 trillium var. trillium; 8465 roseanum var. roseanum; 8466, 8467 besaniam; 8496, 8498, 8499, 8500 trillium var. trillium; 8502, 8503, 8506 anthophlerum; 8508 venticosum; 8510 adnigrum; 8530, 8531 decurium; 8580 rex subsp. ficolactum; 8601, 8604 albaicum; 8605 albaicum; 8606 albaicum; 8607 adnigrum; 8700 selense subsp. dasydium; 8701 anthophlerum; 8703 lukangense; 8713 chamaehomium var. chamaehomium; 8714 varifolium; 8715 eudorum var. eudorum; 8717 forestii subsp. forestii; 8718, 8719, 8724 selense subsp. selense; 8725 sanguinum var. sanguinum; 8730 eudorum var. eudorum; 8738 fulvum; 8739 adnigrum; 8741 adnigrum; 8742, 8743 eudorum var. bellidum; 8744 aif. scuratum; 8745 chamaehomium var. chamaehomium; 8746 varifolium; 8747 concolorum; 8748, 8749, 8750 eudorum; 8751 eudorum var. bellidum; 8752 besaniam; 8753 eudorum var. bellidum; 8760 fulvum; 8761, 8762 besaniam; 8763 rex subsp. ficolactum; 8764 adnigrum; 8765 adnigrum; 8766 adnigrum; 8767 adnigrum; 8768 adnigrum; 8769 adnigrum; 8770 crinigerum var. crinigerum; 8771 x erythroxylum; 8772 crinigerum var. crinigerum; 8773 phacelium; 8777 lukangense; 8778 selense subsp. selense; 8779, 8780, 8781 crinigerum var. crinigerum; 8782 neritium; 8783, 8784 crinigerum var. crinigerum; 8785 besaniam; 8786 neritium; 8788 forestii; 8789 adnigrum; 8790 sinogradae; 8791 sanguinum var. sanguinum; 8792 delavayi; 8911 sanguinum var. sanguinum; 8912 delavayi; 8913 sanguinum var. sanguinum; 8914 sanguinum var. sanguinum; 8915 sanguinum var. sanguinum; 8916 sanguinum var. sanguinum; 8917 sanguinum var. sanguinum; 8918 sanguinum var. sanguinum; 8919 sanguinum var. sanguinum; 8920 sanguinum var. sanguinum; 8921 albaicum var. odor; 8922 roseanum var. roseanum; 8923 haenulodes subsp. haenulodes; 8924 sanguinum var. sanguinum; 8925, 8926, 8927, 8928 albaicum var. roseanum; 8929 roseanum; 8930 wardii var. wardii; 8931 albaicum var. roseanum; 8938 rex subsp. ficolactum; 8939 albaicum var. roseanum; 8941 albaicum var. roseanum; 8942 aganiphum var. aganiphum; 8943 roseanum var. cucullatum; 8947 wardii var. wardii; 8948 x erythroxylum; 8957 albaicum var. roseanum; 8958 roseanum var. cucullatum; 8959 aganiphum var. aganiphum; 8960 proteoides; 8963 rex subsp. ficolactum; 8965 wardii var. wardii; 9019 adnigrum; 9020 adnigrum; 9021 adnigrum; 9022 adnigrum; 9023 adnigrum; 9024 adnigrum; 9025 adnigrum; 9026 adnigrum; 9027 adnigrum; 9028 adnigrum; 9029 adnigrum; 9030 adnigrum; 9031 adnigrum; 9032 adnigrum; 9033 adnigrum; 9034 adnigrum; 9035 adnigrum; 9036 adnigrum; 9037 adnigrum; 9038 adnigrum; 9039 adnigrum; 9040 adnigrum; 9041 adnigrum; 9042 adnigrum; 9043 adnigrum; 9044 adnigrum; 9045 adnigrum; 9046 adnigrum; 9047 adnigrum; 9048 adnigrum; 9049 adnigrum; 9050 adnigrum; 9051 adnigrum; 9052 adnigrum; 9053 adnigrum; 9054 adnigrum; 9055 adnigrum; 9056 adnigrum; 9057 adnigrum; 9058 adnigrum; 9059 adnigrum; 9060 adnigrum; 9061 adnigrum; 9062 adnigrum; 9063 adnigrum; 9064 adnigrum; 9065 adnigrum; 9066 adnigrum; 9067 adnigrum; 9068 adnigrum; 9069 adnigrum; 9070 adnigrum; 9071 adnigrum; 9072 adnigrum; 9073 adnigrum; 9074 adnigrum; 9075 adnigrum; 9076 adnigrum; 9077 adnigrum; 9078 adnigrum; 9079 adnigrum; 9080 adnigrum; 9081 adnigrum; 9082 adnigrum; 9083 adnigrum; 9084 adnigrum; 9085 adnigrum; 9086 adnigrum; 9087 adnigrum; 9088 adnigrum; 9089 adnigrum; 9090 adnigrum; 9091 adnigrum; 9092 adnigrum; 9093 adnigrum; 9094 adnigrum; 9095 adnigrum; 9096 adnigrum; 9097 adnigrum; 9098 adnigrum; 9099 adnigrum; 9100 adnigrum; 9101 albaicum var. roseanum; 9102 besaniam; 9103 albaicum var. roseanum; 9104 besaniam; 9105 albaicum var. roseanum; 9106 crinigerum var. eudorum; 9107 rex subsp. ficolactum; 9108, 9109 besaniam; 9110 sanguinum; 9111, 9112, 9113, 9115, 9117 crinigerum var. crinigerum; 9118 sanguinum var. sanguinum; 9119 fulvum; 9120, 9122 haenulodes subsp. chamaehomium; 9123, 9125 albaicum var. roseanum; 9126 roseanum var. roseanum; 9127 albaicum var. roseanum; 9128 albaicum var. roseanum; 9129 albaicum var. roseanum; 9130 albaicum var. roseanum; 9131 forestii subsp. forestii; 9134 proteoides; 9135, 9136 crinigerum var. crinigerum; 9138 forestii; 9139 phacelium; 9140 haenulodes subsp. chamaehomium; 9144 trillium var. roseanum; 9143 selense subsp. selense; 9144 crinigerum var. crinigerum; 9152 selense subsp. selense; 9153 adnigrum; 9154 adnigrum; 9155 adnigrum; 9156 adnigrum; 9157 adnigrum; 9158 adnigrum; 9159 adnigrum; 9160 adnigrum; 9161 adnigrum; 9162 adnigrum; 9163 adnigrum; 9164 adnigrum; 9165 adnigrum; 9166 adnigrum; 9167 adnigrum; 9168 adnigrum; 9169 adnigrum; 9170 adnigrum; 9171 adnigrum; 9172 adnigrum; 9173 adnigrum; 9174 adnigrum; 9175 adnigrum; 9176 adnigrum; 9177 adnigrum; 9178 adnigrum; 9179 adnigrum; 9180 adnigrum; 9181 adnigrum; 9182 adnigrum; 9183 adnigrum; 9184 adnigrum; 9185 adnigrum; 9186 adnigrum; 9187 adnigrum; 9188 adnigrum; 9189 adnigrum; 9190 adnigrum; 9191 adnigrum; 9192 adnigrum; 9193 adnigrum; 9194 adnigrum; 9195 adnigrum; 9196 adnigrum; 9197 adnigrum; 9198 adnigrum; 9199 adnigrum; 9200 adnigrum; 9201 adnigrum; 9202 adnigrum; 9203 adnigrum; 9204 adnigrum; 9205 adnigrum; 9206 adnigrum; 9207 adnigrum; 9208 adnigrum; 9209 adnigrum; 9210 adnigrum; 9211 adnigrum; 9212 sanguinum var. sanguinum; 9210, 9211, 9212 sanguinum var.



10944 *electeum* var. *bellatulum*; 10945 *sanguineum*; 10946 *citriniflorum* var. *citriniflorum*; 10947 *sanguineum* var. *haemaleum*; 10948 *haematodes* subsp. *haematodes*; 10951 *sanguineum* var. *himertum*/temenium var. *gylvum*; 10952 *temenium* var. *temenium*; 10953 *sanguineum* var. *didymoides*; 10955 *coriaceum*; 10956 *roxieanum* var. *roxieanum*; 10957 *praestans*; 10958 *martianum*; 10959 *floccigerum*; 10960 *crinigerum* var. *crinigerum*; 10961, 10963 *selese* subsp. *selese*; 10964 *forrestii* subsp. *forrestii*; 10965 *martianum*; 10966 *praestans*; 10967 *crinigerum*; 10968, 10970, 10971, 10972, 10973, 10974, 10975, 10976, 10977, 10978 *crinigerum* var. *crinigerum*; 10979 *roxieanum* var. *roxieanum*; 10980, 10981, 10982, 10983 *crinigerum* var. *crinigerum*; 10984, 10985 *haematodes* subsp. *chaetomallum*; 10987, 10988 *besianum*; 10989 *haematodes* subsp. *chaetomallum*; 10990 *besianum*; 10992 *crinigerum* var. *crinigerum*; 10993, 10994 *forrestii* subsp. *forrestii*; 10995 *praestans*, 10996 *floccigerum*; 10997 *forrestii* subsp. *forrestii*; 10998 *proteoides*; 10999 *floccigerum*/sperabile; 11002 *sanguineum* var. *sanguineum*; 11003 *chamaethomsonii* var. *chamaedoron*; 11004 *besianum*; 11007 *praestans*; 11011 *sanguineum*; 11013 *praestans*; 11015 *lukiangense*; 11016 *fulvum*; 11017 *besianum*; 11018 *sanguineum* var. *sanguineum*; 11020 *roxieanum* var. *roxieanum*; 11021 *besianum*; 11022 *sanguineum* var. *haemaleum*; 11023 *fulvum*; 11024 *sanguineum* var. *sanguineum*; 11025 *electeum* var. *bellatulum*; 11026 *selese* subsp. *selese*; 11027 *electeum* var. *bellatulum*; 11028 *selese* subsp. *selese*; 11029 *sanguineum* var. *sanguineum*; 11030, 11031 *forrestii* subsp. *forrestii*; 11032 *electeum* var. *electeum*; 11033 *forrestii* subsp. *forrestii*; 11034 *fulvum*; 11035 *electeum* var. *electeum*; 11036 *chamaethomsonii* var. *chamaethomsonii*; 11037 *electeum* var. *bellatulum*; 11038 *electeum* var. *electeum*; 11039 *sanguineum*; 11040, 11041 *electeum* var. *bellatulum*; 11042 *chamaethomsonii* var. *chamaedoron*; 11043 *rex* subsp. *fiotolactum*; 11044 *fulvum*; 11045 *uvarifolium*; 11046, 11047 *sanguineum* var. *haemaleum*; 11048 *fulvum*; 11049 *sanguineum* var. *haemaleum*; 11050 *electeum* var. *bellatulum*; 11051 *electeum* var. *electeum*; 11052 *sanguineum*; 11053, 11054, 11055 *electeum* var. *bellatulum*; 11056 *electeum* var. *electeum*; 11057 *electeum* var. *bellatulum*; 11058 *selese* subsp. *selese*; 11059 *electeum* var. *electeum*; 11060 *electeum* var. *bellatulum*; 11061 *selese* subsp. *selese*; 11062, 11063, 11064, 11065, 11066 *selese* subsp. *selese*; 11067 *x erythrocalyx*; 11068 *besianum*; 11069 *coriaceum*; 11073 *floccigerum*; 11074 *forrestii* subsp. *forrestii*; 11075 *uvarifolium*; 11076 *proteoides*; 11077 *selese* subsp. *selese*; 11080 *electeum* var. *electeum*; 11081 *haematodes* subsp. *chaetomallum*; 11082 *sanguineum* var. *haemaleum*; 11083 *crinigerum*; 11084 *selese* subsp. *selese*; 11085 *roxieanum*; 11086 *phaeochrysum* var. *agglutinatum*; 11087, 11090 *phaeochrysum* var. *levistratum*; 11094 *estulosum*; 11095 *selese* subsp. *selese*; 11096 *phaeochrysum* var. *levistratum*; 11097 *agnaniphum* var. *agnaniphum*; 11099 *besianum*; 11100 *alutaceum* var. *alutaceum*; 11101 *alutaceum* var. *russetinum*; 11103, 11104, 11105, 11106, 11107 *phaeochrysum* var. *levistratum*; 11108 *phaeochrysum* var. *agglutinatum*; 11110 *besianum*; 11111 *selese* subsp. *selese*; 11112 *besianum*; 11114 *wardii* var. *wardii*; 11115 *roxieanum* var. *roxieanum*; 11116 *alutaceum* var. *iodes*; 11117 *alutaceum* var. *russetinum*; 11118 *agnaniphum* var. *agnaniphum*; 11119 *phaeochrysum* var. *levistratum*; 11120, 11121 *phaeochrysum* var. *levistratum*; 11122 *alutaceum* var. *russetinum*; 11123 *roxieanum* var. *roxieanum*; 11125 *agnaniphum* var. *agnaniphum*; 11127 *selese* subsp. *selese*; 11133 *agnaniphum* var. *agnaniphum*; 11134 *adenogynum*; 11135 *agnaniphum* var. *agnaniphum*; 11137 *wardii* var. *wardii*; 11138, 11139, 11140 *lukiangense*; 11142 *crinigerum* var. *crinigerum*; 11143 *agnaniphum* var. *agnaniphum*; 11145 *wardii* var. *wardii*; 11146 *alutaceum* var. *russetinum*; 11147 *wardii* var. *wardii*; 11148 *phaeochrysum* var. *levistratum*; 11149 *phaeochrysum* var. *agglutinatum*; 11150, 11151 *agnaniphum* var. *agnaniphum*; 11152 *wardii* var. *wardii*; 11153 *agnaniphum* var. *agnaniphum*; 11154 *citriniflorum*; 11155 *pocophorum* var. *pocophorum*; 11156 *haematodes* subsp. *chaetomallum*; 11157 *citriniflorum* var. *horeum*; 11158 *sanguineum*; 11159 *rex*; 11161 *sanguineum* var. *cloiochorum*; 11162 *pocophorum* var. *hemidartum*; 11163 *pocophorum* var. *pocophorum*; 11164 *haematodes* subsp. *chaetomallum* hybrid; 11165 *rex* subsp. *arizelum*; 11168 *fulvum*; 11169 *chamaethomsonii* var. *chamaethomsonii*; 11170 *haematodes* subsp. *chaetomallum* hybrid; 11173 *sinogrande*; 11174 *coryanum*; 11175 *haematodes* subsp. *chaetomallum*; 11176 *sanguineum* var. *sanguineum*; 11177 *sanguineum* var. *haemaleum*; 11178 *sanguineum*; 11179 *pocophorum* var. *hemidartum*; 11181 *sanguineum*; 11182 *pocophorum* var. *hemidartum*; 11183 *sanguineum*; 11184

*haematodes* subsp. *chaetomallum*; 11185 *catacosmum*; 11187 *rex* subsp. *fiotolactum*; 11189 *crinigerum* var. *crinigerum*; 11190 *bainbridgeanum*; 11191 *haematodes* subsp. *chaetomallum*; 11192, 11193 *crinigerum* var. *crinigerum*; 11194 *selese* subsp. *selefum*; 11195 *bainbridgeanum*; 11196 *crinigerum* var. *crinigerum*; 11199 *aff. sanguineum* var. *cloiochorum*; 11201 *pocophorum* var. *pocophorum*; 11203 *aff. citriniflorum* var. *horeum*; 11204 *haematodes* subsp. *chaetomallum*; 11205 *martianum*; 11206 *aff. citriniflorum* var. *horeum*; 11207 *rex*; 11208 *sanguineum* var. *haemaleum*; 11209 *selese* subsp. *selese*; 11210 *haematodes* subsp. *haematodes*; 11211 *coriaceum*; 11213 *selese* subsp. *selefum*; 11214 *temenium* var. *temenium*; 11216 *sanguineum* subsp. *didymum*; 11217 *anthosphaerum*; 11223 *rex* subsp. *fiotolactum*; 11225 *fulvum*; 11227 *haematodes* subsp. *chaetomallum*; 11239 *sinogrande*; 11240 *besianum*; 11241 *selese* subsp. *selese*; 11242, 11244 *rex* subsp. *fiotolactum*; 11246 *traiilianum* var. *traiilianum*; 11247 *wardii* var. *wardii*; 11250, 11252, 11253 *roxieanum* var. *ucullatum*; 11254, 11255 *clementinae*; 11256, 11257 *anthosphaerum*; 11259 *selese* subsp. *dasycladum*; 11261 *roxieanum* var. *roxieanum*; 11266 *irroratum* subsp. *irroratum*; 11269 *selese* subsp. *dasycladum*; 11272 *lukiangense*; 11273, 11274 *irroratum* subsp. *irroratum*; 11275 *lukiangense*; 11279, 11282 *arborescens* var. *delauii*; 11285 *roxieanum* var. *roxieanum*; 11286 *rex* subsp. *fiotolactum*; 11289 *selese* subsp. *dasycladum*; 11290 *rex* subsp. *fiotolactum*; 11291, 11292, 11293 *roxieanum* var. *roxieanum*; 11297 *irroratum* subsp. *irroratum*; 11301, 11302 *roxieanum* var. *dasycladum*; 11303 *pronum*; 11307, 11309 *roxieanum* var. *ucullatum*; 11310 *irroratum* subsp. *irroratum*; 11311, 11312 *roxieanum* var. *roxieanum*; 11313, 11314 *traiilianum* var. *traiilianum*; 11321 *wardii* var. *wardii*; 11322, 11324 *phaeochrysum* var. *levistratum*; 11325 *phaeochrysum* var. *phaeochrysum*; 11326, 11328 *verrucosum*; 11329 *phaeochrysum* var. *levistratum*; 11331 *verrucosum*; 11332 *phaeochrysum* var. *levistratum*; 11334 *besianum*; 11335 *phaeochrysum* var. *agglutinatum*; 11336 *agnaniphum* var. *agnaniphum*; 11337 *besianum*; 11338 *phaeochrysum* var. *levistratum*; 11339 *agnaniphum* var. *agnaniphum* 11340, 11341 *phaeochrysum* var. *agglutinatum*; 11342 *phaeochrysum* var. *levistratum*; 11343 *phaeochrysum* var. *agglutinatum*; 11344 *phaeochrysum* var. *levistratum*; 11345 *phaeochrysum* var. *agglutinatum*; 11346 *anthosphaerum*; 11348 *sinogrande*; 11349 *besianum*; 11351 *fulvum*; 11354 *wardii* var. *wardii*; 11355 *wardii* var. *wardii*; 11357 *lukiangense*; 11358 *anthosphaerum*; 11367 *adenogynum*; 11371, 11372, 11373 *traiilianum* var. *traiilianum*; 11378 *rex* subsp. *fiotolactum*; 11379 *aff. besianum*; 11380, 11381 *irroratum* subsp. *irroratum*; 11382 *bureavii*; 11383 *aff. besianum*; 11385 *selese* subsp. *dasycladum*; 11386 *uvarifolium*; 11388 *glichrum* subsp. *glichrum*; 11389 *wardii* var. *wardii*; 11390 *anthosphaerum*; 11391 *uvarifolium*; 11396 *traiilianum* var. *traiilianum*; 11397 *rex* subsp. *fiotolactum*; 11404 *decorum*; 11408 *verrucosum*; 11421 *traiilianum* var. *traiilianum*; 11452 *rex* subsp. *fiotolactum*; 11454, 11459, 11460, 11461, 11470 *traiilianum* var. *traiilianum*; 11471 *adenogynum*; 11500 *phaeochrysum* var. *levistratum*; 11501 *besianum*; 11503 *praestans*; 11504 *uvarifolium*; 11505 *lukiangense*; 11507 *selese* subsp. *selese*; 11567 *wardii* var. *wardii*; 11597 *chamaethomsonii* var. *chamaethomsonii*; 11634 *praestans*; 11635 *selese* subsp. *selese*; 11636 *besianum*; 11640, 11642 *rex*; 11644 *coriaceum*; 11702 *phaeochrysum* var. *levistratum*; 11715 *irroratum* subsp. *irroratum*; 11717 *irroratum* subsp. *irroratum*; 11720, 11723 *irroratum* subsp. *irroratum*; 12064, 12081, 12083 *hunnewellianum* subsp. *rockii*; 12189 *przewalskii*; 12230, 12232, 12233, 12234, 12238, 12331 *fulvum*; 12364, 12365 *przewalskii*; 12367 *fulvum*; 12373 *przewalskii*; 12395 *fulvum*; 12397 *przewalskii*; 12398 *fulvum*; 12399, 12415, 12417 *przewalskii*; 12418 *fulvum*; 12419, 12514, 12652, 12672 *przewalskii*; 12728 *fulvum*; 13047, 13052, 13276, 13278, 13302 *przewalskii*; 13599, 13601 *fulvum*; 13612 *przewalskii*; 13628 *fulvum*; 13629 *przewalskii*; 13640, 13675 *fulvum*; 13676, 13677, 13679 *przewalskii*; 13680 *fulvum*; 13681 *przewalskii*; 13682, 13684 *fulvum*; 13685, 13686, 13694, 13695 *przewalskii*; 13696, 13697 *fulvum*; 13906 *przewalskii*; 14955 *adenogynum*; 16007 *decorum*; 16013 *besianum*; 16014 *balfourianum*; 16015 *phaeochrysum* var. *levistratum*; 16018 *besianum*; 16019 *balfourianum*; 16024 *besianum*; 16029 *balfourianum*; 16031 *adenogynum*; 16039 *verrucosum*; 16045 *dasycladoides*; 16060 *balfourianum*; 16061 *roxieanum* var. *ucullatum*; 16078 *phaeochrysum* var. *agglutinatum*; 16080 *balfourianum*; 16082 *phaeochrysum*; 16085 *roxieanum* var. *ucullatum*; 16088 *balfourianum*; 16089 *simulans*; 16097 *phaeochrysum*; 16099 *balfourianum*; 16099 *phaeochrysum* var. *agglutinatum*; 16111 *wardii* var. *wardii*; 16112 *dasycladoides*; 16132, 16164 *rex* subsp. *rex*;

16168 wardii var. wardii; 16169, 16172 balfourianum; 16192, 16282 wardii var. wardii; 1631 adenosum; 16334 phaeochrysum; 16361 rosetum; 16366 phaeochrysum var. agglutinatum; 16367 rosetum var. rosetum; 16368 balfourianum; 16386 adenosum; 16434 phaeochrysum; 16447 wardii var. wardii; 16450 balfourianum; 16478 rosetum; 16485 dwarfoides; 16494 var. nicosum; 16499 wardii var. wardii; 16931 glischrum subsp. glischrum; 16952 eclecium var. eclecium; 16953 glischrum subsp. glischrum; 16954 crinigerum var. eudeniun; 16955 rex subsp. arzelum; 16956, 16957 aff. rotschidlii; 16974 eudeniun var. eudeniun; 16977 crinigerum var. crinigerum; 16983 rex subsp. arzelum; 16984 rosetum; 16985 dwarfoides; 16988 glischrum subsp. glischrum; 16991 coelium; 16992 haematodes subsp. chaetomallum; 16993 aperatum; 16995 calvescens var. calvescens; 16996 campylocarpum; 16997 crinigerum var. crinigerum; 16998, 16999 haematodes subsp. chaetomallum; 17000 rex subsp. arzelum; 17002, 17003 stewartianum; 17011, 17012 campylocarpum; 17014 aff. pocoborum; 17015 haematodes subsp. chaetomallum; 17016 calvescens var. calvescens; 17017 eudeniun; 17019 campylocarpum; 17021 aperatum; 17022 coriacum; 17023, 17024 stewartianum; 17037 sinogrande; 17040 pronum; 17051 rosetum; 17052 eudeniun; 17053 sinogrande; 17068 maritimum; 17073 campylocarpum subsp. calvianum; 17081 senonodes; 17082 crinigerum var. crinigerum; 17084 glischrum subsp. glischrum; 17085, 17095 eclecium; 17102 eclecium; 17103 sinogrande; 17104 rex subsp. arzelum; 17105 rosetum; 17106 sinogrande; 17107 eudeniun; 17108 rosetum var. eudeniun; 17109 sinogrande; 17110, 17116, 17117 traillianum var. traillianum; 17118, 17119 rex subsp. ficolactum; 17120, 17121, 17122 traillianum var. traillianum; 17123 clementiae; 17124 fulvum; 17125 besanum; 17126 rex subsp. ficolactum; 17127 glischrum subsp. glischrum; 17128, 17129 aff. 17146 perillae var. perillae; 17136 rex subsp. arzelum; 17146 perillae var. perillae; 17147 ficolactum; 17148 sperabile var. wehniense; 17151 ficolactum; 17159 criniferum; 17169 criniferum var. horeum; 17176 sphaerobolus; 17177, 17178 sanguineum var. didymoides; 17199 adenosum; 17201 vernicosum; 17212 phaeochrysum var. levisatum; 17213 adenosum; 17235 decorum; 17280 adenosum; 17281 agnatum var. agglutinatum; 17285 rex subsp. ficolactum; 17307 rosetum var. rosetum; 17308, 17311 agnatum var. agnatum; 17312 clementiae; 17356 phaeochrysum var. levisatum; 17366 vernicosum; 17394 uvarifolium; 17430 traillianum var. traillianum; 17443 skangense; 17473, 17511, 17513, 17558, 17556 phaeochrysum var. levisatum; 17561, 17563 adenosum; 17564 phaeochrysum var. agglutinatum; 17567 oreodoxa var. fargesii; 17568, 17569, 17576 phaeochrysum var. levisatum; 17578 phaeochrysum var. fargesii; 17629, 17630 souliei; 17655, 17656, 17691, 17718 vernicosum; 17719 decorum; 17720 vernicosum; 17723, 17732 faberi; 17733, 17734 balfourianum; 17735 rex subsp. arzelum; 17736 phaeochrysum var. phaeochrysum; 17764 souliei; 17770, 17926, 17933 balfourianum; 17904 phaeochrysum var. levisatum; 17905 rosetum var. eudeniun; 17906 rosetum var. eudeniun; 17909 besanum; 17911 rosetum var. eudeniun; 17909, 17910, 17911 phaeochrysum var. levisatum; 17912 phaeochrysum var. levisatum; 17913 rex subsp. arzelum; 17914, 17915, 17916, 17917, 17918, 17919, 17920, 17921, 17922, 17923, 17924, 17925, 17926, 17927, 17928, 17929, 17930, 17931, 17932, 17933, 17934, 17935, 17936, 17937, 17938, 17939, 17940, 17941, 17942, 17943, 17944, 17945, 17946, 17947, 17948, 17949, 17950, 17951, 17952, 17953, 17954, 17955, 17956, 17957, 17958, 17959, 17960, 17961, 17962, 17963, 17964, 17965, 17966, 17967, 17968, 17969, 17970, 17971, 17972, 17973, 17974, 17975, 17976, 17977, 17978, 17979, 17980, 17981, 17982, 17983, 17984, 17985, 17986, 17987, 17988, 17989, 17990, 17991, 17992, 17993, 17994, 17995, 17996, 17997, 17998, 17999, 18000, 18001, 18002, 18003, 18004, 18005, 18006, 18007, 18008, 18009, 18010, 18011, 18012, 18013, 18014, 18015, 18016, 18017, 18018, 18019, 18020, 18021, 18022, 18023, 18024, 18025, 18026, 18027, 18028, 18029, 18030, 18031, 18032, 18033, 18034, 18035, 18036, 18037, 18038, 18039, 18040, 18041, 18042, 18043, 18044, 18045, 18046, 18047, 18048, 18049, 18050, 18051, 18052, 18053, 18054, 18055, 18056, 18057, 18058, 18059, 18060, 18061, 18062, 18063, 18064, 18065, 18066, 18067, 18068, 18069, 18070, 18071, 18072, 18073, 18074, 18075, 18076, 18077, 18078, 18079, 18080, 18081, 18082, 18083, 18084, 18085, 18086, 18087, 18088, 18089, 18090, 18091, 18092, 18093, 18094, 18095, 18096, 18097, 18098, 18099, 18100, 18101, 18102, 18103, 18104, 18105, 18106, 18107, 18108, 18109, 18110, 18111, 18112, 18113, 18114, 18115, 18116, 18117, 18118, 18119, 18120, 18121, 18122, 18123, 18124, 18125, 18126, 18127, 18128, 18129, 18130, 18131, 18132, 18133, 18134, 18135, 18136, 18137, 18138, 18139, 18140, 18141, 18142, 18143, 18144, 18145, 18146, 18147, 18148, 18149, 18150, 18151, 18152, 18153, 18154, 18155, 18156, 18157, 18158, 18159, 18160, 18161, 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decorum; 10729 selense; 10755 phaeochrysum var. agglutinatum; 10795 phaeochrysum var. phaeochrysum; 10857 phaeochrysum var. levistratum; 10884 decorum; 10937 anthosphaerum; 10952 phaeochrysum var. levistratum; 10953 traillianum var. traillianum; 10958 decorum; 10979, 10983 phaeochrysum var. agglutinatum; 11029 balfourianum; 11158 decorum; 11176 beesianum; 11390 decorum; 11484, 11515, 11584 adenogynum; 11588 aganniphum var. aganniphum; 11663 sphaeroblastum; 11675, 11680, 11691 decorum; 11715 phaeochrysum var. levistratum; 11717, 11742 phaeochrysum var. phaeochrysum; 11750, 11863 phaeochrysum var. levistratum; 11890 aganniphum var. aganniphum; 11891 adenogynum; 11894 aganniphum; 12145, 12153, 12208, 12253, 12298 aganniphum var. aganniphum; 13723 esetulosum; 13729 aganniphum var. aganniphum; 13730 beesianum; 13731, 13732 aganniphum var. aganniphum; 13760 roxianum var. roxianum; 13762, 13763 aganniphum var. aganniphum; 13765 beesianum; 13806 phaeochrysum var. agglutinatum; 13851 esetulosum; 13881, 13894, 13895, 13897 decorum; 13909 fulvum; 13911 uvarifolium; 13920 beesianum; 13924, 13925 aganniphum var. aganniphum; 13926 beesianum; 13927, 13928 adenogynum; 13931, 13965, 13989 beesianum; 13995 traillianum var. traillianum; 14311 phaeochrysum var. levistratum; 14431 decorum; 14636 phaeochrysum var. agglutinatum; 14662 balfourianum; 14663 beesianum; 14752, 14753, 14754 wardii var. wardii; 14901 decorum; 14904 phaeochrysum var. levistratum; 14935 decorum; 14945 roxianum var. roxianum; 14947 beesianum; 14950 clementinae; 14952 uvarifolium; 14953 rex subsp. ficolacteam; 14987, 15009 anthosphaerum; 15085 beesianum; 15089 traillianum var. dictyotum; 15104 vernicosum; 15157 traillianum var. traillianum; 15300 adenogynum; 15654 uvarifolium; 15656 decorum; 15837 aboreum var. delavayi; 16663, 17839 diaprepes; 18063 irroratum subsp. irroratum; 18065 diaprepes; 18288, 19005 decorum; 19034 forrestii subsp. forrestii; 19037

sanguineum var. sanguineum; 19040 praestans; 19042 selense subsp. selense; 19045 eclectum var. eclectum; 19047 fulvum; 19048 eudoxum var. eudoxum; 19049 sanguineum var. sanguineum; 19074 beesianum; 19306 sanguineum var. haemaleum; 19310 sanguineum var. sanguineum; 19339 citriniflorum var. horaeum; 19341 forrestii subsp. forrestii; 19351 citriniflorum; 19373 temenium var. dealbatum; 19510 anthosphaerum; 19642 lukiangense; 19650 vesiculiferum; 19677 fulvum; 19740 eclectum var. eclectum; 19958 facetum; 20011 sinogrande; 20054 citriniflorum; 20205 arboreum var. delavayi; 20209 neriflorum subsp. phaedropum; 20237 rex; 20241 sanguineum var. sanguineum; 20248 stewartianum; 20309 anthosphaerum; 20372 forrestii subsp. forrestii; 20388 sanguineum; 20585 lukiangense; 20609 haematodes subsp. chaetomallum; 20611 temenium var. dealbatum; 20623 sanguineum; 20665 fulvum; 20666 eclectum var. eclectum; 20700 crinigerum var. crinigerum; 20701 fulvum; 20702 eclectum var. eclectum; 20703 anthosphaerum; 20736 decorum; 20738 haematodes subsp. chaetomallum; 20744 rex; 20745 anthosphaerum; 20834 floccigerum; 20840 decorum; 20844 anthosphaerum; 20897, 20919 floccigerum; 20931 temenium var. dealbatum; 20936, 20961 decorum; 20971 rex; 20981 sinogrande; 20997 lukiangense; 21000 facetum; 21043 decorum; 21068 anthosphaerum; 22191, 22228 sanguineum var. sanguineum; 22289 proteoides; 22891, 22910 decorum; 22935 stewartianum; 22946 forrestii subsp. forrestii; 22954 rex subsp. arizelum; 22957 anthosphaerum; 22958, 22971 floccigerum; 23161 sinogrande; 23231 temenium var. temenium; 23275 forrestii subsp. forrestii; 23277 temenium var. temenium  
Yuan, S. F. 5022, 5023 breviterve; 5521 haofui  
Yunnan Economic Biology Expedition 59-3501 rex  
Yunnan Forestry Institute 63-407 sinofalconeri  
Zhong, J. X. (See Chung, Z. S.)  
Zollinger 380 japonicum var. pentamerum

## RELATIONSHIPS OF THE SUBSECTIONS OF SUBGENUS HYMENANTHES

The 24 subsections recognised in this account are related to one another in a complex manner. The distinctions between them may well be obscured by hybridisation. In cultivation species from different subsections will cross freely and hybrids clearly also occur in the wild. Furthermore, the taxonomic significance of the morphological differences on which the classification is based is not always obvious.

Subsections *Fortunea*, *Auriculata*, *Grandia* and *Falconera* are characterised by having at least the majority of species with 6- to 9-merous flowers. In the rest of subgenus *Hymenanthès* 5-merous flowers are the rule. While there are links between these four subsections, there is no reason to believe that there are any affinities between them and *R. anthosphaerum* (subsection *Irrorata*), *R. clementinae* (subsection *Taliensia*) and *R. japonicum* (subsection *Pontica*), species which also have flowers that are more than 5-merous.

Almost all the species of subsections *Parishia*, *Barbata*, *Neriiflora*, *Fulgensia* and *Thomsonia* have campanulate to tubular-campanulate, dark-coloured (usually red or purple) corollas with depressed nectar pouches. These features also occur in apparently unrelated subsections (*Maculifera*, *Venatora*, *Irrorata*, *Argyrophylla* and *Arborea*) – all of these, with the exception of subsection *Venatora*, have a majority of species that lack nectar pouches.

The interpretation of the complex differences in indumentum (or lack of it) is a particularly difficult problem. Several subsections have a setose indumentum on the young shoots and petioles, a character that has been given undue weight in the past. It will be seen from the taxonomic account that those species that were included in series *Barbatum* in *The Species of Rhododendron* (Stevenson, 1930) have been redistributed in four subsections. The most clear-cut is subsection *Maculifera*, the species of which are characterised by a matted, dendroid indumentum that is not setose. Indeed, it is difficult to imagine why this group was originally placed in series *Barbatum*. The species of subsection *Barbata* are now restricted to those with deep red corollas and nectar pouches. This group of species apparently has closer affinities with subsections *Parishia* and *Thomsonia* than it does with the remaining species of series *Barbatum*. Of the remaining species, *R. bainbridgeanum* and *R. hirtipes* may be distinguished by their obovate leaves with rounded, apiculate apices. These two species fit better in subsection *Selensia* than they do with *R. glischrum* and its immediate allies. In contrast, subsection *Glischra* is characterised by coriaceous to herbaceous leaves with acuminate to cuspidate apices. The setose indumentum has probably therefore evolved more than once in the subgenus and cannot be taken as indicating taxonomic affinity.

Compound hairs of varying types occur in subgenus *Hymenanthès*. These are more fully discussed on p. 215. The various hair types may be arranged in order of increasing complexity. If this complexity can be taken as an index of relative advancement then the more simple stellate indumentum of subsection *Parishia* and the folioliferous indumentum of some members of subsections *Maculifera* and *Venatora* suggest that these three subsections are primitive. Following from this it is possible to suggest that subsections *Barbata*, *Neriiflora*, *Fulgensia* and *Thomsonia* are basically derived from a common stock similar to the present day members of subsection *Parishia*. Likewise, subsections *Selensia*, *Glischra*,

Venatora and Irrorata, and part of Taliensia, may be derived from subsection Maculifera or a stock closely resembling it.

Several subsections have species that are more or less glabrous by the time the leaves mature. If lack of hairs has evolved by loss of a more persistent indumentum and this has occurred more than once, as seems likely, then absence of an indumentum will not necessarily indicate affinity. For instance, the leaf lamina in subsections Fortunea, Williamsiana and Campylocarpa is almost always glabrous by maturity, and from the form of the corolla and the leaf shape, it seems likely that the last two subsections are derived from the first. However, subsection Irrorata is apparently not allied, even though many of the species also have more or less glabrous leaves.

Some of the subsections maintained in this revision are very variable and could be further subdivided, though, without clear-cut biosystematic evidence, this seems unjustified. Subsection Fortunea is one such subsection. There is a central group of species around *R. fortunei* that have in common 6–7-lobed corollas and glandular styles. This group has affinities with subsection Auriculata. *R. calophyllum* and *R. asterocnium* on the other hand have 5–7-lobed corollas that are more or less mortar-shaped, glabrous styles, and large, capitate stigmas — characters that show a closer affinity with subsections Grandia and Falconera. Furthermore, the campanulate to open-campanulate corollas of *R. orbiculare*, *R. oreodoxa* and *R. griffithianum* suggest a closer affinity with subsections Campylocarpa and Williamsiana. In addition, there are four species, *R. davidii*, *R. huianum*, *R. praevernium* and *R. sutchuenense*, that cannot be accommodated in any of these groups.

The species of subsection Maculifera can be divided into two groups. *R. strigillosum* and *R. ochraceum*, the corollas of which are deep red and have pronounced nectar pouches, have affinities with subsection Venatora and some of the species of subsection Irrorata. The remainder of the species have paler corollas that lack nectar pouches. These have closer affinities with subsections Glischra and Selensia (*R. maculiferum* in particular).

Subsection Taliensia has been subdivided in the past into four groups. In addition, subsection Lactea is now included within subsection Taliensia. While subsection Taliensia is clearly not a natural assemblage of allied species, the subdivisions at present proposed do not improve the classification. The most distinctive group of species are those allied to *R. adenogynum* (roughly equivalent to the old subseries Adenogynum) in which the ovaries are glandular and there are generally well-developed calyces. If this group is segregated out then there is a case for including *R. crinigerum* and *R. recurvoides* (both at present in subsection Glischra) in it as well. Subsection Lactea as recognised by Sleumer contains an assortment of species that have in common an exclusively radiate leaf indumentum. At one extreme it contains species (such as *R. phaeochrysum*) that are otherwise closely allied to *R. taliense*. At the other extreme, however, there are species such as *R. lacteum*, *R. beesianum* and *R. wightii* that are not closely allied to any of the remaining members of subsection Taliensia, or even to each other. In addition, *R. wasonii* and *R. wilsonii*, two species generally included in subsection Taliensia, are probably as far removed from *R. taliense* as are the previous three species. It is therefore possible to subdivide subsection Taliensia using morphological differences, but it is far from certain that this would produce a more natural classification. I therefore prefer to await further biosystematic evidence before attempting such a subdivision,

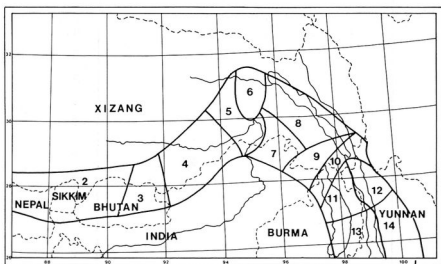
which would also have to take into account the related subsections Lanata, Campanulata and Fulva.

It will be noted that *R. griersonianum* has been assigned to a monotypic subsection which does not apparently have any close affinities with any of the other subsections.

Figure 9 illustrates possible relationships between the subsections of subgenus Hymenanthes. It is realised that the proposed affinities are speculative but it is hoped that the outlined scheme may stimulate further research.

#### GEOGRAPHICAL DISTRIBUTION

The distribution of subgenus Hymenanthes follows the general pattern for sections Rhododendron and Pogonanthum discussed in Part I of the Revision (p. 187) in that the greatest concentration of species occurs in a belt across the Himalayas, extending to Sichuan in western China. Only one subsection, Pontica, occurs exclusively outside this area, with *R. hyperythrum* in Taiwan, three species in North America, four species in the Caucasus and N Turkey, of which *R. ponticum* extends westwards to S Portugal and southwards to the Lebanon, *R. aureum* occurring over a wide area centred in NE Asia and three species centred in Japan. Subsection Irrorata has five tropical outlying taxa that occur in an area extending from central Vietnam to Sumatra and *R. arboreum* in subsection Arborea has two isolated subspecies in S India and Sri Lanka. There are other extensions outside this main belt, notably in subsections Maculifera and Fortunea. These will be discussed later.



MAP 134. Areas (indicated by 2-14) of *Rhododendron* distribution. For further explanation see pp. 463-464.

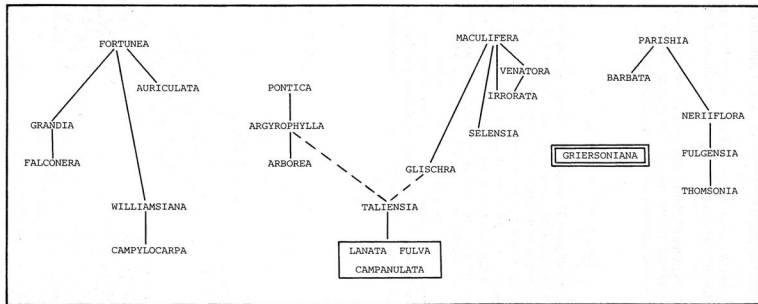
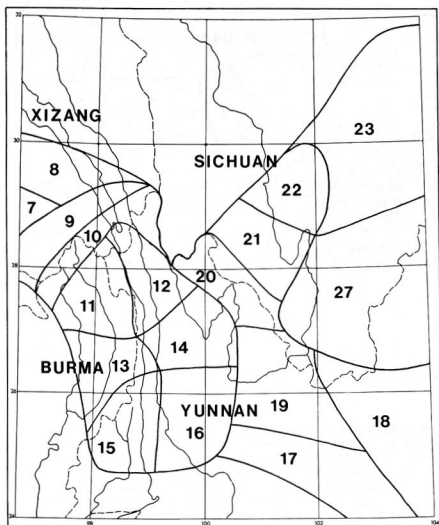


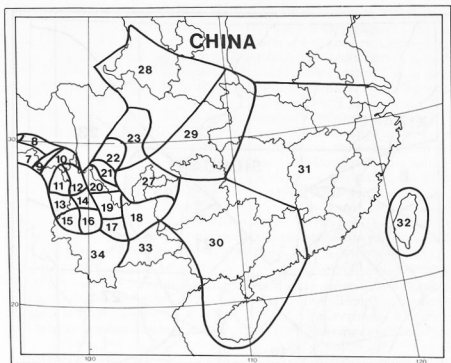
FIG. 9. Grouping of the subsections of subgenus *Hymenanthus* with an indication of their affinities. - - - indicates a distant affinity. For further information see p. 459.



MAP 135. Areas (indicated by 7-23) of *Rhododendron* distribution. For further explanation see pp. 463-464.

#### COMPARISON OF SPECIFIC DISTRIBUTION AREAS

The same areas as defined for sections *Rhododendron* and *Pogonanthum* (see map, p. 191) have been used to facilitate comparison. The outlines have been transferred as accurately as possible to the different base maps used in the present account — for details see maps 134-136. The following changes are however noted. Area 24 was intended to encompass the range of *R. augustinii* subsp. *augustinii* which is endemic to E Sichuan. However, with a greater concentration of species in subgenus *Hymenanthes* in this region, a more precise delimitation of two separate areas (Areas 28 & 29) is made in place of Area 24 which is deleted to



MAP 136. Areas (indicated by 7-34) of *Rhododendron* distribution. For further explanation see pp. 463-464.

avoid confusion. Area 27 accommodates NE Yunnan and adjacent parts of Sichuan and Guizhou. The species occurring in this area are generally also in Area 23 though there are four endemic species. For this reason Area 27 is included in Zone E. Area 28 includes the northern parts of Sichuan and the southern parts of Gansu & Shaanxi and Area 29 eastern Sichuan with W Hubei and adjacent parts of Guizhou. These two areas constitute Zone F. Areas 30-33 cover S and E China, including Taiwan, and are included in Zone G.

In the account that follows, the taxa, whether species, subspecies or varieties, whose distributions are mapped separately, are used as the basic units. The number of such taxa occurring in a particular area are as cited. The term 'species' is used where subspecies or varieties are not mapped separately.

Thirteen taxa are restricted to Zone A and may be considered as a western Himalayan element. The majority of these occur in E Nepal, Sikkim, Bhutan and adjacent parts of S Xizang though some, however, just reach Area 4 in the western part of Arunachal Pradesh in NE India. The eight taxa linking Zones A and B extend eastwards into S Xizang or to the Subansiri District of Arunachal Pradesh. The 25 taxa endemic to Zone B have two sub-centres of distribution, the first around the Tsangpo Gorges in Area 5, extending westward into Area 4 and the second in Manipur and Nagaland in Area 26 where three endemic species occur. Ten taxa extend from Zone B into Zone C, the ranges of which represent minor extensions from centres of distribution that are primarily in either zone. Three taxa, however, that fall into this category also occur in Zone A.



By far the greatest concentration of taxa occurs in Zone C with 80 endemic to this zone. Of these, no less than 29 are almost exclusively restricted to Area 12. Sixteen taxa are more or less restricted to the western Areas 11, 13 & 15 and a further 10 extend into, or are endemic to, Area 16, particularly the region around Dali in W Yunnan. Twelve taxa extend eastwards from Zone C into Zone E, especially to the region around Muli in SW Sichuan. Five further taxa also occur either in Zones D, F or G.

Zone D has relatively few species though two are endemic to it. Zone E has a relatively large number of endemic taxa (32) of which 22 are restricted to Areas 23 & 27. Extensions eastwards and northwards into Zone F account for 10 further taxa. Three taxa also reach Zone G.

Of the 13 taxa endemic to Zone F five are confined to Area 28 and eight to Area 29. A single species, *R. fortunei*, is common to Zones F & G. Seventeen taxa are endemic to Zone G and of these, five are restricted to Taiwan, two to eastern China (Area 31) and three to S Yunnan (Area 33) and adjacent parts of Vietnam. The remainder are largely confined to S China (Area 30).

The distribution of the subsections of subgenus *Hymenanthus* may be summarised as follows:

**I. Subsection *Fortunea*.** Largely an eastern and southern subsection with 16 taxa restricted to Zones E, F and G, but with three taxa extending to Zone C, and one species, *R. diaprepes*, restricted to the western and southern parts of Zone C.

**II. Subsection *Auriculata*.** Two species: *R. auriculatum* is endemic to Area 27 in Zone F and *R. chihsinianum* to Area 30 in Zone G.

**III. Subsection *Grandia*.** Largely restricted to Zone B and the western part of Zone C although with *R. grande* linking Zones A and B, and the atypical *R. watsonii* restricted to Zone E.

**IV. Subsection *Falconera*.** A widespread subsection with three taxa restricted to Zones A and B, four taxa endemic to Zone C, two taxa confined to Zone E and one species, *R. sinofalconeri*, restricted to Area 33 (Zone G) and adjacent parts of Vietnam. The three subspecies of *R. rex* form an east-west cline: subsp. *rex* links Zones C and E, subsp. *fictolactum* is restricted to Zone C and subsp. *arizelum* links Zones B and C.

**V. Subsection *Williamsiana*.** Two local species: *R. williamsianum* is endemic to Area 23 (Zone E) and *R. leishanicum* to Area 30 (Zone G).

**VI. Subsection *Campylocarpa*.** Four species: *R. souliei* is endemic to Zone E, *R. wardii* is centred in Zone C but extends into Zones B and E, *R. callimorphum* is restricted to Zone C and *R. campylocarpum* has two vicariant subspecies — subsp. *campylocarpum* extends across Zones A, B and C while subsp. *caloxanthum* is restricted to Zone C and adjacent parts of Zone B.

**VII. Subsection *Maculifera*.** This subsection has a marked eastern distribution, with four species endemic to Zone E, three species restricted to Taiwan and one species linking Zones E and F. *R. maculiferum* has two isolated subspecies: subsp. *anhweiense* is endemic to the eastern parts of Area 31 (Zone G) while the more widespread subsp. *maculiferum* links Zones E, F and G.

**VIII. Subsection *Selensia*.** Largely centred in Zone C with five taxa endemic to that zone. *R. esetulosum* also extends into Zone E and *R. hirtipes* is endemic to Zone B. *R. selense* is divided into four subspecies: subsp. *selense* and subsp. *setiferum* are more or less restricted to the northern parts of Zone C, subsp. *jucundum* is endemic to Area 16 in Zone C and subsp. *dasycladum* extends westwards from Zone C into Zone B.

**IX. Subsection *Glischra*.** This subsection is centred in the western parts of Zone C with a single outlying species, *R. adenosum*, endemic to Zone E.

**X. Subsection *Venatora*.** A single extremely local species from Area 5 in Zone B.

**XI. Subsection *Irrorata*.** A wide-ranging subsection with four taxa in Zones A and B, four taxa endemic to Zone C, one species, *R. tanastylum* predominantly in Zone C but also reaching the eastern part of Zone B, *R. aberconwayi* endemic to Zone D and three species endemic to Zone G. *R. irroratum* has three vicariant subspecies: subsp. *irroratum* links Zones C, D and E, subsp. *pogonostylum* is predominantly from Zone D and Area 33 in Zone G though it extends westward into Zone C and subsp. *kontumense* occurs in C Vietnam and Sumatra. Three further species also occur in tropical E Asia in an area extending from Vietnam to Sumatra.

**XII. Subsection *Pontica*.** *R. hyperythrum* is endemic to Taiwan. The remaining taxa occur outside the areas under consideration and have already been discussed.

**XIII. Subsection *Argyrophylla*.** A mainly eastern subsection with 14 taxa in Zones E and F, one species endemic to Taiwan and two further species endemic to S China (Zone G). A single species, *R. coryanum*, is endemic to Area 12 in Zone C.

**XIV. Subsection *Arborea*.** *R. arboreum* is a remarkably widespread species with five subspecies extending from NW India to Thailand and Guizhou in western China; two of these subspecies occur in S India and Sri Lanka. *R. niveum* is restricted to Zone A and *R. lanigerum* occurs in Zone B and the western parts of Zone C.

**XV. Subsection *Taliensia*.** A large bicentric subsection with 17 taxa endemic to Zone C and the western parts of Zone E and 15 taxa to Zone F and the eastern parts of Zone E (mainly Area 23). Three species are restricted to Zone B and a single aberrant species, *R. wightii*, is common to Zones A and B. *R. pubicostatum* is endemic to Zone D and *R. phaeochrysum* and *R. beesianum* are both centred in Zones C and E but also extend westwards into Zone B.

**XVI. Subsection *Fulva*.** The two species are centred on Zone C though both extend to the western parts of Zone E and *R. uvarifolium* also reaches Area 5 in Zone B.

**XVII. Subsection *Lanata*.** A west Himalayan subsection with two species common to Zones A and B and two species restricted to Zone B.

**XVIII. Subsection *Campanulata*.** Three taxa, all restricted to Zone A.

**XIX. Subsection *Griersoniana*.** A single species restricted to Area 15 in Zone C.

**XX. Subsection *Parishia*.** A widely scattered subsection: *R. parishii* occurs in Lower Burma, *R. elliotii* is restricted to Area 26 of Zone B, two species are centred in the western and southern parts of Zone C, and *R. stellistylum* is endemic to Area 27 of Zone E.

**XXI. Subsection *Barbata*.** An essentially western subsection with three species endemic to Zone A, one species restricted to Zone B and one species occurring in Zone B and adjacent parts of Zone C.

**XXII. Subsection *Neriiflora*.** This subsection is centred in Zone C with 31 taxa endemic to that zone. Four further taxa are endemic to Zone B. *R. neriiflorum* subsp. *phaedropum* extends through Zones A, B and C.

**XXIII. Subsection *Fulgensia*.** Two species are endemic to Zone B and one to Zone A.

**XXIV. Subsection *Thomsonia*.** Six taxa are endemic to Zone C and five to Zone

*B. R. cerasinum* is common to Zone B and the western part of Zone C (Areas 9 and 10) and *R. bonvalotti* is endemic to Area 23 in Zone E. *R. thomsonii* subsp. *thomsonii* is apparently almost entirely restricted to Zone A.

Of the unplaced species, *R. dimitrium* occurs in Area 16 of Zone C, *R. potaninii* and *R. purdomii* occur in Area 28 of Zone F and a new, imperfectly known species is restricted to Area 31 in Zone G.

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TABLE 6 (cont'd)

|                        | A   |   |   | B |   |   |   | C |   |    |    |    |    |    |    | D  |    |    | E  |    |    |    |    | B  |    | E  | F  |    | G  |    |    |    |            |
|------------------------|-----|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|------------|
|                        | 1   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33         |
| populare               |     |   |   | 4 |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| thomsonii subsp. b     |     |   |   | 4 |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| viscidifolium          |     |   |   | 4 |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| hirtipes               |     |   |   | 4 | 5 |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| dignabile              |     |   |   | 4 | 5 |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| chamaethomsonii var. c |     |   |   | 4 | 5 |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| principis              |     |   |   | 4 | 5 |   | 8 |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| hookeri                |     |   |   | 4 |   |   | 7 |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| ramsdensianum          |     |   |   |   | 5 |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| pomense                |     |   |   |   | 5 |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| lanatoides             |     |   |   |   | 5 |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| venator                |     |   |   |   | 5 |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| parmulatum             |     |   |   |   | 5 |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| forrestii subsp. b     |     |   |   |   | 5 |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| faucium                |     |   |   |   | 5 |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| subansiriense          |     |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 25 |    |    |    |    |    |    |    |            |
| wattii                 |     |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 26 |    |    |    |    |    |            |
| macabeanum             |     |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 26 |    |    |    |    |    |            |
| elliottii              |     |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 26 |    |    |    |    |    |            |
| campylocarpum subsp. b |     |   |   | 4 | 5 |   |   |   |   | 10 | 11 | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| exasperatum            |     |   |   | 4 |   |   |   |   |   | 9  | 10 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| cerasinum              |     |   |   |   | 5 | 6 |   |   |   | 9  | 10 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| lanigerum              |     |   |   |   | 5 |   |   |   |   | 9  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| rex subsp. c           |     |   |   |   |   |   | 7 |   | 9 | 10 | 11 |    | 13 |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| tanastylum             |     |   |   |   |   |   | 7 |   |   |    |    |    | 13 |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| selense subsp. b       |     |   |   |   |   |   |   | 8 |   |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| protistum              |     |   |   |   |   |   |   | 8 | 9 | 10 | 11 |    | 13 |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |            |
| wardii                 |     |   |   |   | 4 | 5 |   |   |   |    |    | 12 |    | 14 |    |    |    |    |    | 20 | 21 | 22 |    |    |    |    |    |    |    |    |    |    |            |
| arboreum subsp. c      | (3) |   | 4 |   |   |   | 7 |   |   |    | 11 | 12 |    | 14 |    | 16 |    | 18 |    |    |    |    |    |    |    |    |    |    |    |    |    |    | (Thailand) |
| uvarifolium            |     |   |   |   | 5 |   |   |   | 9 |    |    | 12 |    | 14 |    | 16 |    |    |    | 20 |    |    |    |    |    |    |    |    |    |    |    |    |            |

Endemic  
to BLinking  
B & C

TABLE 6 (Cont'd)

|                       | A |   |   | B |   |   |   |     | C |    |      |    |    |    |    |    | D  |    |    |    | E  |    |    |    | B  |    | E  | F  | G  |    |    |    |    |          |
|-----------------------|---|---|---|---|---|---|---|-----|---|----|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------|
|                       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8   | 9 | 10 | 11   | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |          |
| phaeochrysum          |   |   |   |   | 5 |   |   |     |   |    |      | 12 |    | 14 |    |    |    |    |    | 20 | 21 | 22 | 23 |    |    |    |    |    |    |    |    |    |    | Linking  |
| beesianum             |   |   |   |   |   |   |   | 8   |   |    | 11   | 12 |    | 14 |    |    |    |    |    | 20 | 21 |    |    |    |    |    |    |    |    |    |    |    |    | B, C & E |
| beanianum             |   |   |   |   |   |   |   |     | 9 |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| piercei               |   |   |   |   |   |   |   |     | 9 |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| sanguineum subsp. a   |   |   |   |   |   |   |   |     | 9 | 10 |      | 12 |    | 14 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| sinogrande            |   |   |   |   |   |   |   |     | 9 | 10 | 11   | 12 | 13 |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| hylaenum              |   |   |   |   |   |   |   |     | 9 | 10 |      |    | 13 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| stewartianum          |   |   |   |   |   |   |   |     | 9 |    |      | 12 | 13 |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| montroseanum          |   |   |   |   |   |   |   |     |   | 10 |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| magnificum            |   |   |   |   |   |   |   |     |   | 10 |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| recurvoides           |   |   |   |   |   |   |   |     |   | 10 |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| traillianum var. b    |   |   |   |   |   |   |   |     |   | 10 |      | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| forrestii subsp. a    |   |   |   |   |   |   |   |     |   | 10 | 11   | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| sidereum              |   |   |   |   |   |   |   |     |   | 10 | 11   |    | 13 |    |    | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| lukiangense           |   |   |   |   |   |   |   |     |   | 10 | (11) |    |    | 14 |    | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Endemic  |
| chamaethomsonii       |   |   |   |   |   |   |   |     |   |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | to C     |
| var. a & b            |   |   |   |   |   |   |   |     |   |    | 11   | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| spilotum              |   |   |   |   |   |   |   |     |   |    | 11   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| martinianum           |   |   |   |   |   |   |   |     |   |    | 11   | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| dichroanthum subsp. d |   |   |   |   |   |   |   |     |   |    | 11   | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| floccigerum           |   |   |   |   |   |   |   |     |   |    | 11   | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| sperabiloides         |   |   |   |   |   |   |   |     |   |    | 11   | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| coelicum              |   |   |   |   |   |   |   |     |   |    | 11   | 12 | 13 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| haematodes subsp. a   |   |   |   |   |   |   |   | (8) |   |    | 11   | 12 |    |    |    | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| kyawi                 |   |   |   |   |   |   |   |     |   |    | 11   |    | 13 |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| facetum               |   |   |   |   |   |   |   |     |   |    | 11   |    | 13 |    | 15 | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| neriiflorum subsp. a  |   |   |   |   |   |   |   |     |   |    | 11   |    | 13 |    | 15 | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| praestans             |   |   |   |   |   |   |   |     |   |    |      | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| rothschildii          |   |   |   |   |   |   |   |     |   |    |      | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |
| preptum               |   |   |   |   |   |   |   |     |   |    |      | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |          |

TABLE 6 (Cont'd)

|                     | A |   |   | B |   |   |     | C |     |    |    |    |    |    |    | D  |    |    | E  |    |    |    | B  |    | E  | F  |    | G  |    |    |    |    |    |
|---------------------|---|---|---|---|---|---|-----|---|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                     | 1 | 2 | 3 | 4 | 5 | 6 | 7   | 8 | 9   | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |
| coriaceum           |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| calvescens          |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| bainbridgeanum      |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| selense subsp. c    |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| glischrum subsp. c  |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| crinigerum          |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| leptocephalum       |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| coryanum            |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| codonanthum         |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| dumicola            |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| comisteum           |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| nakotiltum          |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| bathyphyllum        |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| pocophorum          |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| haematodes subsp. b |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| chionanthum         |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| citriniflorum       |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| microgynum          |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| sanguineum subsp. b |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| temenium            |   |   |   |   |   |   | (6) |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| eudoxum             |   |   |   |   |   |   |     |   | (9) |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| erastum             |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| sperabile           |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| albertsenianum      |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| eclectum            |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| euryisiphon         |   |   |   |   |   |   |     |   |     |    |    | 12 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| semnoides           |   |   |   |   |   |   |     |   |     |    |    | 12 | 13 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| glischrum subsp. a  |   |   |   |   |   |   |     |   |     |    |    | 12 | 13 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| catacosmum          |   |   |   |   |   |   |     |   |     |    |    | 12 | 13 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| aperantum           |   |   |   |   |   |   |     |   |     |    |    | 12 | 13 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

Endemic  
to C

TABLE 6 (Cont'd)

|                       | A |   |   | B |   |   |   | C |   |    |      |      |      |    |    | D  |    |    |    | E  |    |    |    | B  |    | E  | F  | G  |    |    |    |    |                     |
|-----------------------|---|---|---|---|---|---|---|---|---|----|------|------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------------|
|                       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11   | 12   | 13   | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33                  |
| prunum                |   |   |   |   |   |   |   |   |   |    |      | 12   |      | 14 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| glischrum subsp. b    |   |   |   |   |   |   |   |   |   |    |      |      | 13   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| neriiflorum subsp. b  |   |   |   |   |   |   |   |   |   |    |      |      | 13   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| basilicum             |   |   |   |   |   |   |   |   |   |    |      |      | 13   | 14 | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| araiophyllum          |   |   |   |   |   |   |   |   |   |    |      |      | 13   |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| mallotum              |   |   |   |   |   |   |   |   |   |    |      |      | 13   |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| dichroanthum subsp. c |   |   |   |   |   |   |   |   |   |    |      | (12) | 13   |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| meddianum             |   |   |   |   |   |   |   |   |   |    |      |      | 13   |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| callimorphum          |   |   |   |   |   |   |   |   |   |    |      |      | 13   |    | 15 | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| diaprepes             |   |   |   |   |   |   |   |   |   |    |      |      | (14) |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| habrotrichum          |   |   |   |   |   |   |   |   |   |    |      |      |      |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| diphrocalyx           |   |   |   |   |   |   |   |   |   |    |      |      |      |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| schistocalyx          |   |   |   |   |   |   |   |   |   |    |      |      |      |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| agastum               |   |   |   |   |   |   |   |   |   |    |      |      |      |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| griersonianum         |   |   |   |   |   |   |   |   |   |    |      |      |      |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| dichroanthum subsp. b |   |   |   |   |   |   |   |   |   |    | (11) |      |      |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| euchroum              |   |   |   |   |   |   |   |   |   |    |      |      |      |    | 15 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| selense subsp. d      |   |   |   |   |   |   |   |   |   |    |      |      |      |    |    | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| taliense              |   |   |   |   |   |   |   |   |   |    |      |      | (14) |    | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| lacteum               |   |   |   |   |   |   |   |   |   |    |      |      |      |    | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| dichroanthum subsp. a |   |   |   |   |   |   |   |   |   |    |      |      |      |    | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| dimitrium             |   |   |   |   |   |   |   |   |   |    |      |      |      |    | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| cyanocarpum           |   |   |   |   |   |   |   |   |   |    |      |      |      |    | 16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                     |
| bureavii              |   |   |   |   |   |   |   |   |   |    |      |      | 14   |    | 16 |    | 18 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | Linking<br>C & D    |
| decorum               |   |   |   |   |   |   |   |   |   |    |      | 12   | 13   | 14 | 15 | 16 |    | 18 |    |    | 21 | 22 | 23 |    |    |    | 27 |    |    |    |    |    |                     |
| anthosphaerum         |   |   |   |   |   |   |   |   |   |    |      | 12   | 13   | 14 | 15 | 16 |    |    | 19 | 20 |    |    |    |    |    |    |    |    |    |    |    |    | Linking<br>C, D & E |
| sphaeroblastum        |   |   |   |   |   |   |   |   |   |    |      |      | 12   |    | 14 |    |    | 18 |    | 20 | 21 |    |    |    |    |    |    |    |    |    |    |    |                     |
| irroratum subsp. a    |   |   |   |   |   |   |   |   |   |    |      |      |      | 14 | 16 |    | 18 | 19 | 20 | 21 |    |    |    |    |    |    | 27 |    |    |    |    |    |                     |



TABLE 6 (Cont'd)

|                    | A |   |   | B   |   |   |   |   | C  |    |    |    |    |    |    |    | D  |    |    | E      |        |    |    |    | B  |    | E  | F    | G  |    |    |    |                        |
|--------------------|---|---|---|-----|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|--------|--------|----|----|----|----|----|----|------|----|----|----|----|------------------------|
|                    | 1 | 2 | 3 | 4   | 5 | 6 | 7 | 8 | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20     | 21     | 22 | 23 | 24 | 25 | 26 | 27 | 28   | 29 | 30 | 31 | 32 | 33                     |
| irroratum subsp. b |   |   |   |     |   |   |   |   |    |    |    |    |    | 14 |    |    | 18 |    |    |        |        |    |    |    |    |    |    |      |    |    |    |    | 33 Linking<br>C, D & G |
| fulvum             |   |   |   | (5) |   |   |   |   | 9  | 10 |    | 12 | 13 | 14 | 15 |    |    |    |    |        | 21     |    |    |    |    |    |    |      |    |    |    |    |                        |
| alutaceum          |   |   |   |     |   |   |   |   |    | 10 |    | 12 |    |    |    |    |    |    |    | 20     |        |    |    |    |    |    |    |      |    |    |    |    |                        |
| vernicosum         |   |   |   |     |   |   |   |   |    | 10 |    | 12 |    |    |    |    |    |    |    |        | 21(22) |    |    |    |    |    |    | (29) |    |    |    |    |                        |
| aganniphum         |   |   |   |     |   |   |   |   | 10 |    |    | 12 |    | 14 |    |    |    |    |    | 20     | 21     |    | 23 |    |    |    |    |      |    |    |    |    |                        |
| rex subsp. b       |   |   |   |     |   |   |   |   |    |    |    | 12 |    | 14 |    |    |    |    |    | 20     |        |    |    |    |    |    |    |      |    |    |    |    | Linking<br>C & E       |
| traillianum var. a |   |   |   |     |   |   |   |   |    |    |    | 12 |    | 14 |    | 16 |    |    |    | 20     |        |    | 22 |    |    |    |    |      |    |    |    |    |                        |
| esetulosum         |   |   |   |     |   |   |   |   |    |    |    | 12 |    | 14 |    |    |    |    |    | 20     |        |    |    |    |    |    |    |      |    |    |    |    |                        |
| roxieanum          |   |   |   |     |   |   |   |   |    |    |    | 12 |    | 14 |    |    |    |    |    | 20     |        |    |    |    |    |    |    |      |    |    |    |    |                        |
| adenogynum         |   |   |   |     |   |   |   |   |    |    |    | 12 |    | 14 |    |    |    |    |    | 20     | 21     |    |    |    |    |    |    |      |    |    |    |    |                        |
| clementinae        |   |   |   |     |   |   |   |   |    |    |    | 12 |    | 14 |    |    |    |    |    | 20     | 21     |    |    |    |    |    |    |      |    |    |    |    |                        |
| proteoides         |   |   |   |     |   |   |   |   |    |    |    | 12 |    |    |    |    |    |    |    | 20     |        |    | 22 |    |    |    |    |      |    |    |    |    |                        |
| balfourianum       |   |   |   |     |   |   |   |   |    |    |    |    |    |    |    | 16 |    |    |    | 20     | 21     | 22 |    |    |    |    |    |      |    |    |    |    |                        |
| oreodoxa var. a    |   |   |   |     |   |   |   |   | 10 |    |    |    |    |    |    |    |    |    |    |        |        |    | 23 |    |    |    |    | 28   |    |    |    |    | Linking<br>C, E & F    |
| annae              |   |   |   |     |   |   |   |   |    |    |    |    |    | 14 | 15 |    |    |    |    |        |        |    |    |    |    |    |    |      |    | 30 |    |    | Linking C &<br>G       |
| aberconwayi        |   |   |   |     |   |   |   |   |    |    |    |    |    |    |    |    | 18 |    |    |        |        |    |    |    |    |    |    |      |    |    |    |    | Endemic<br>to D        |
| pubicostatum       |   |   |   |     |   |   |   |   |    |    |    |    |    |    |    |    | 18 |    |    |        |        |    |    |    |    |    |    |      |    |    |    |    |                        |
| elegantulum        |   |   |   |     |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 20     |        |    |    |    |    |    |    |      |    |    |    |    |                        |
| adenosum           |   |   |   |     |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |        | 21     |    |    |    |    |    |    |      |    |    |    |    |                        |
| dasycladoides      |   |   |   |     |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |        | 21     |    |    |    |    |    |    |      |    |    |    |    |                        |
| mimetes            |   |   |   |     |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |        | 21     |    |    |    |    |    |    |      |    |    |    |    |                        |
| simulans           |   |   |   |     |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |        | 21     |    |    |    |    |    |    |      |    |    |    |    | Endemic<br>to E        |
| rex subsp. a       |   |   |   |     |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | (20)21 |        |    |    |    |    |    | 27 |      |    |    |    |    |                        |
| souliei            |   |   |   |     |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 21     | 22     | 23 |    |    |    |    | 27 |      |    |    |    |    |                        |
| sikangense         |   |   |   |     |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |        | 21     |    | 23 |    |    |    |    |      |    |    |    |    |                        |
| asterochnoum       |   |   |   |     |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |        |        |    | 23 |    |    |    |    |      |    |    |    |    |                        |

TABLE 6 (Cont'd)

|                        | A |   |   | B |   |   |   |   | C |    |    |    |    |    |    |    | D  |    |    |    | E  |    |    |    | B  |    | E  | F  |    | G  |    |    |    |
|------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                        | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |
| hemsleyanum            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| watsonii               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| galactinum             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| williamsianum          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| longesquamatum         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| argyrophyllum subsp. c |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| insigne                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| thayeranum             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| nigroglandulosum       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| faberi subsp. a        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| subsp. b               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| wasonii                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| wiltonii               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| bonvalotii             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |    |    |    |    |    |    |
| davidii                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    | 27 |    |    |    |    |    |    |
| pachytrichum           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    | 27 |    |    |    |    |    |    |
| strigillosum           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    | 27 |    |    |    |    |    |    |
| pingianum              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    | ?? |    |    |    |    |    |    |
| floribundum            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    | 27 |    |    |    |    |    |    |
| glanduliferum          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 27 |    |    |    |    |    |    |
| denudatum              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 27 |    |    |    |    |    |    |
| farinosum              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 27 |    |    |    |    |    |    |
| stellistylum           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 27 |    |    |    |    |    |    |
| przewalskii            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    | 27 | 28 |    |    |    |    |    |
| calophytum             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    | 27 |    | 29 |    |    |    |    |
| ochraceum              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    | 27 |    | 29 |    |    |    |    |
| ririei                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    | 27 |    | 29 |    |    |    |    |
| longipes               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    | 27 |    | 29 |    |    |    |    |
| argyrophyllum subsp. a |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    | 27 |    | 29 |    |    |    |    |

Endemic  
to ELinking  
E & F

TABLE 6 (Cont'd)

|                         | A |   |   | B |   |   |   |   | C |    |    |    |    |    |    |    | D  |    |    |    | E  |    |    |    | B  |    | E    | F  |    | G  |    |    |    |          |
|-------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|------|----|----|----|----|----|----|----------|
|                         | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27   | 28 | 29 | 30 | 31 | 32 | 33 |          |
| argyrophyllum subsp. d  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |      | 29 |    |    |    |    |    | Linking  |
| oreodoxa var. b         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |      | 28 | 29 |    |    |    |    | E & F    |
| hunnewellianum subsp. a |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |      | 29 |    |    |    |    |    |          |
| huianum                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 27   | 29 |    |    |    |    |    |          |
| maculiferum subsp. a    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |      | 29 | 30 |    |    |    |    | Linking  |
| sutchuenense            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 27   | 28 |    | 30 |    |    |    | E, F & G |
| orbiculare subsp. a     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 23 |    |    |    |    |      |    |    | 30 |    |    |    | Linking  |
|                         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    |    |    |    |    | E & G    |
| oreodoxa var. c         |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      | 28 |    |    |    |    |    |          |
| rufum                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      | 28 |    |    |    |    |    |          |
| potaninii               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      | 28 |    |    |    |    |    | Endemic  |
| purdomii                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      | 28 |    |    |    |    |    | to F     |
| barkamense              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      | 28 |    |    |    |    |    |          |
| auriculatum             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    | 29 |    |    |    |    |          |
| praevernum              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    | 29 |    |    |    |    |          |
| platypodium             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    | 29 |    |    |    |    |          |
| hunnewellianum subsp. b |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    | 29 |    |    |    |    |          |
| adenopodium             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    | 29 |    |    |    |    | Endemic  |
| detersile               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    | 29 |    |    |    |    | to F     |
| roxieoides              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    | 29 |    |    |    |    |          |
| coeloneuron             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    | 29 |    |    |    |    |          |
| fortunei subsp. a       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    | 29 | 30 | 31 |    |    | Linking  |
| subsp. b                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | (27) | 29 | 30 | 31 |    |    |    | F & G    |
| faithae                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    | 30 |    |    |    |          |
| orbiculare subsp. b     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    | 30 |    |    |    |          |
| chihsinianum            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    | 30 |    |    |    | Endemic  |
| brevinerve              |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    | 30 |    |    |    | to G     |
| haofui                  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |    |    | 30 |    |    |    |          |



TABLE 7

DISTRIBUTION OF THE SUBSECTIONS ACCORDING TO THE ZONES  
GIVEN IN MAP 58 (39(i): 191) AND DISCUSSED ON pp. 463-465—SEE ALSO TABLE 6.

|            |                  | ZONES |     |       |    |     |       |    |     |       |       |     |       |     |   |    |     |       |     |    |     |    |
|------------|------------------|-------|-----|-------|----|-----|-------|----|-----|-------|-------|-----|-------|-----|---|----|-----|-------|-----|----|-----|----|
| SUBSECTION |                  | A     | A/B | A/B/C | B  | B/C | B/C/E | C  | C/D | C/D/E | C/D/G | C/E | C/E/F | C/G | D | E  | E/F | E/F/G | E/G | F  | F/G | G  |
| I.         | Fortunea         |       | 1   |       |    |     |       | 1  |     | 1     |       | 1   | 1     |     |   | 4  | 3   | 1     | 1   | 3  | 2   | 2  |
| II.        | Auriculata       |       |     |       |    |     |       |    |     |       |       |     |       |     |   |    |     |       |     |    |     |    |
| III.       | Grandia          |       | 1   |       | 4  | 1   |       | 5  |     |       |       |     |       |     |   | 1  |     |       | 1   |    | 1   |    |
| IV.        | Falconera        | 1     | 2   |       |    | 1   |       | 4  |     |       |       | 1   |       |     |   | 2  |     |       |     |    |     | 1  |
| V.         | Williamsiana     |       |     |       |    |     |       |    |     |       |       |     |       |     |   | 1  |     |       |     |    |     | 1  |
| VI.        | Campylocarpa     |       |     | 1     |    | 1   | 1     | 1  |     |       |       |     |       |     |   | 1  |     |       |     |    |     | 1  |
| VII.       | Maculifera       |       |     |       |    |     |       |    |     |       |       |     |       |     |   | 4  | 1   | 1     |     |    |     | 4  |
| VIII.      | Selsia           |       |     |       | 1  | 1   |       | 5  |     |       |       | 1   |       |     |   | 1  |     |       |     |    |     |    |
| IX.        | Glischra         |       |     |       |    |     |       | 7  |     |       |       |     |       |     |   | 1  |     |       |     |    |     |    |
| X.         | Venatora         |       |     |       | 1  |     |       |    |     |       |       |     |       |     |   |    |     |       |     |    |     |    |
| XI.        | Irrorata         | 1     | 2   | 1     | 1  | 1   |       | 4  |     | 1     | 1     |     |       |     | 2 | 1  |     |       |     |    |     | 3  |
| XII.       | Pontica          |       |     |       |    |     |       |    |     |       |       |     |       |     |   |    |     |       |     |    |     | 1  |
| XIII.      | Argyrophylla     |       |     |       |    |     |       | 1  |     |       |       |     |       |     |   | 7  | 5   |       | 2   |    |     | 3  |
| XIV.       | Arborea          | 3     |     |       |    | 1   | 1     |    |     |       |       |     |       |     |   |    |     |       |     |    |     |    |
| XV.        | Taliensia        |       | 1   |       | 3  |     | 2     | 9  | 1   | 1     |       | 8   |       |     | 1 | 8  | 1   |       | 5   |    |     |    |
| XVI.       | Fulva            |       |     |       |    |     | 1     |    |     |       |       | 1   |       |     |   |    |     |       |     |    |     |    |
| XVII.      | Lanata           |       | 2   |       | 2  |     |       |    |     |       |       |     |       |     |   |    |     |       |     |    |     |    |
| XVIII.     | Campanulata      | 3     |     |       |    |     |       |    |     |       |       |     |       |     |   |    |     |       |     |    |     |    |
| XIX.       | Griersoniana     |       |     |       |    |     |       | 1  |     |       |       |     |       |     |   |    |     |       |     |    |     |    |
| XX.        | Parishia         |       |     |       | 1  |     |       | 3  |     |       |       |     |       |     |   | 1  |     |       |     |    |     |    |
| XXI.       | Barbata          | 3     |     |       | 1  | 1   |       |    |     |       |       |     |       |     |   |    |     |       |     |    |     |    |
| XXII.      | Neriiflora       |       |     | 1     | 4  |     |       | 31 |     |       |       |     |       |     |   |    |     |       |     |    |     |    |
| XXIII.     | Fulgensia        | 1     |     |       | 2  |     |       |    |     |       |       |     |       |     |   |    |     |       |     |    |     |    |
| XXIV.      | Thomsonia        | 1     |     |       | 5  | 1   |       | 6  |     |       |       |     |       |     |   | 1  |     |       |     |    |     |    |
|            | Unplaced species |       |     |       |    |     |       | 2  |     |       |       |     |       |     |   |    |     |       | 2   |    |     | 1  |
|            | TOTAL            | 13    | 9   | 3     | 25 | 8   | 5     | 80 | 1   | 3     | 1     | 12  | 1     | 2   | 2 | 32 | 10  | 2     | 1   | 13 | 2   | 17 |

## APPENDIX : DESCRIPTIONS OF TAXA PUBLISHED IN THIS ACCOUNT

**R. oreodoxa** Franchet var. **shensiense** Chamberlain, var. nov. (subject. Fortunea). p. 240.

A *R. oreodoxa* var. *oreodoxa* pedicellis sparse rufo-tomentosis et corolla pro parte majore 5-loba recedit, sed ovarium glabrum cum var. *oreodoxa* congruens. CHINA. Shaanxi, ? Tai-pei Shan, 1955, Gao, S. T., s.n. [Beijing 370117] (holo. PE).

**Subject. Williamsiana** Chamberlain, subject. nov. p. 260.

A subsectio *Campylocarpa* affinis sed ramulis juvenilibus setoso-glandulosis et costa foliorum interdum ad paginem inferiorem setulosa.

Typus subsectionis: *R. williamsianum* Rehder & Wilson.

**R. roxieoides** Chamberlain, sp. nov. (subject. Taliensia). p. 347.

*R. roxieano* affinis sed floribus saturate roseis et stylis glandulosis.

Frutex, c.2.5m alta. *Rami* juveniles dense lanato-tomentosi. *Perulae* persistentes. *Folia* lineares, 6.5–7.5 × 1.3–1.8cm, apice acuminata, subtus indumento bistrato tecta, strato superiore spadiceo, dense lanato-tomentoso, strato inferiore compacto, albescente. *Petoli* c.5mm longa, dense lanato-tomentosi. *Inflorescentia* 12–16-floris; pedicellis c.7mm longis, dense tomentosis. *Calyx* c.1mm, tomentosa et stipitato-glandulosa. *Corolla* infundibuliformi-campanulata, c.30mm longa, saturate rosea, maculata. *Ovarium* indumento rufo et paucis glandis stylo infra medium glanduloso. *Capsula* ignota.

CHINA. E Sichuan, Wu Chan, Chao Yang Ping, Liang Feng Village, 2150 m, 3 v 1958, Yang, K. H. 57932 (holo. PE).

**R. barkamense** Chamberlain, sp. nov. (subject. Taliensia). p. 363.

*R. lacteo* affinis sed foliis et floribus minoribus et ovaris glabris.

Frutex, c.4.5 m alta. *Folia* ovata, 5.5–7 × 4–4.7cm, apiculata, basi cordato, ad paginem inferiorem velutino-tomentosa, indumento brunneo, radiato. *Petoli* c. 1cm longi, tomentosi. *Inflorescentia* c.7-floris, pedicellis 7–10mm longis, tomentosis. *Calyx* c.1mm, plus minusve glabra. *Corolla* verisimiliter recluso-campanulata, flavida, maculata, c.35mm longa. *Ovarium* glabrum stylo glabro. *Capsula* ignota.

CHINA. N Sichuan, Barkam Xian (Ma-erh-Kang), Gong Zhang Mts, 3800 m, 20 vi 1957, Li, X. 71626 (holo. PE).

**R. lanatoides** Chamberlain, sp. nov. (subject. Lanata). p. 370.

*R. lanato* affinis sed foliis angustioribus, acuminatis; indumento foliorum lanato; floribus albis roseo-suffusis.

Frutex, 2–4m alta. *Rami* juveniles dense tomentosi. *Folia* obovata vel oblonga, 9–11 × 2.1–2.7cm, acuminata, subtus indumento olivaceo denso lanato tecta. *Petoli* 1–1.5cm longi, dense tomentosi. *Inflorescentia* congesta, 10–15-floris, pedicellis 7–15mm longis, dense lanato-tomentosis. *Calyx* c.1mm, sparse tomentosa. *Corolla* campanulata, alba roseo-suffusa, vix maculata, 35–40mm longa. *Ovarium* eglandulosum, tomento brunneo denso stylo glabro. *Capsula* ignota.

CHINA. SE Xizang, Pomé, Tongyuk Dzong, 12000 ft (3700 m), 21 v 1947, Ludlow, Sherriff & Elliot 13746 (holo. E, iso. BM).

- Azalea makinoi* (Tagg) Makino, 311  
 var. *muranoana* Makino, 311  
*Hymenanthes* Blume, 219  
   *japonica* Blume, 309  
 Rhododendron  
   sect. *Leiorrhodium* Rehder, 219  
   sect. *Ponticum* G. Don, 219  
   ser. *Auriculatum* sensu Tagg, 240  
   ser. *Campanulatum* sensu Tagg, 368, 371  
   ser. *Falconeri* sensu Tagg, 251  
   ser. *Fortunei* sensu Tagg, 224  
   ser. *Fulvum* sensu Tagg, 366  
   ser. *Grande* sensu Tagg, 241  
   ser. *Griersonianum* Davidian, 374  
   ser. *Lacteam* sensu Tagg, 333  
   ser. *Nerijflorum* sensu Tagg, 384  
   ser. *Ponticum* sensu Tagg, 305  
   ser. *Taliense* sensu Tagg, 333  
   subgen. *Eurhododendron* auct. pl., 219  
   subgen. *Hymenanthes* (Blume) K. Koch, 219  
   subject. *Arborea* Sleumer, 328  
   subject. *Argyrophylla* Sleumer, 317  
   subject. *Auriculata* Sleumer, 240  
   subject. *Auriculata* Sleumer, 374  
   subject. *Barbata* Sleumer, 379  
   subject. *Barbata* sensu Sleumer, 283  
   subject. *Campanulata* Sleumer, 368, 371  
   subject. *Campylocarpa* Sleumer, 262  
   subject. *Falconera* Sleumer, 251  
   subject. *Floribunda* Sleumer, 317  
   subject. *Fortunea* Sleumer, 224  
   subject. *Fulgensia* Chamberlain, 414  
   subject. *Fulva* Sleumer, 366  
   subject. *Glischra* (Tagg) Chamberlain, 283  
   subject. *Grandia* Sleumer, 241  
   subject. *Griersoniana* [Davidian ex] Chamberlain, 374  
   subject. *Irrorata* Sleumer, 290  
   subject. *Lactea* Sleumer, 333  
   subject. *Lanata* Chamberlain, 368  
   subject. *Maculifera* Sleumer, 267  
   subject. *Martiniana* Sleumer, 274  
   subject. *Nerijflora* Sleumer, 384  
   subject. *Parishia* Sleumer, 375  
   subject. *Pontica* Sleumer, 305  
   subject. *Selensia* Sleumer, 274  
   subject. *Souliea* Sleumer, 262  
   subject. *Taliensia* Sleumer, 333  
   subject. *Thomsonia* Sleumer, 416  
   subject. *Venatora* Chamberlain, 290  
   subject. *Williamiana* Chamberlain, 260, 478  
   subser. *Arborea* sensu Tagg, 328  
   subser. *Argyrophyllum* sensu Tagg, 317  
   subser. *Barbatum* sensu Tagg, 379  
   subser. *Campylocarpum* sensu Tagg, 262  
   subser. *Cerasinum* Cowan & Davidian, 416  
   subser. *Glischrum* Tagg, 283  
   subser. *Irroratum* sensu Tagg, 290  
   subser. *Maculiferum* sensu Tagg, 267  
   subser. *Parishii* sensu Tagg, 375  
   subser. *Selense* sensu Tagg, 274  
   subser. *Souliei* sensu Tagg, 262  
   subser. *Thomsonii* sensu Tagg, 416  
   subser. *Williamsianum* Cowan & Davidian, 260  
*aberrans* Tagg & Forrest, 354  
*aberconwayi* Cowan, 293  
*adansonii* Pepin, 315  
*adenogynum* Diels, 340  
*adenophorum* Balfour f. & W.W. Smith, 340  
*adenopodium* Franchet, 318  
*adenostemonum* Balfour f. & W.W. Smith, 298  
*adenosum* Davidian, 284  
*admirabile* Balfour f. & Forrest, 299  
*adoxum* Balfour f. & Forrest, 230  
*adroserum* Balfour f. & Forrest, 299  
*aemulorum* Balfour f., 386  
*aeruginosum* Hooker f., 373,  
*aganniphum* Balfour f. & Kingdon Ward, 354  
   var. *aganniphum*, 356  
   var. *flavorufum* (Balfour f. & Forrest) Chamberlain, 357  
*agapetum* Balfour f. & Kingdon Ward, 377  
*agastum* Balfour f. & W.W. Smith, 301  
*agetum* Balfour f. & Forrest, 409  
*agglutinatum* Balfour f. & Forrest, 352  
*aiolopeplum* Balfour f. & Forrest, 353  
*aiolosalpinx* Balfour f. & Forrest, 426  
*aishropeplum* Balfour f. & Forrest, 344  
*albertsenianum* Forrest, 413  
*albicaule* Lévillé, 234  
*album* Buchanan-Hamilton, 331  
*algarvense* Page, 313  
*alutaceum* Balfour f. & W.W. Smith, 348  
   var. *alutaceum*, 349  
   var. *iodes* (Balfour f. & Forrest) Chamberlain, 350  
   var. *rusotinctum* (Balfour f. & Forrest) Chamberlain, 350  
*anhweiense* Wilson, 273  
*annae* Franchet, 293  
*anthosphaerum* Diels, 303  
*aperantum* Balfour f. & Kingdon Ward, 400  
*apodectum* Balfour f. & W.W. Smith, 394  
*araiophyllum* Balfour f. & W.W. Smith, 294  
*araliiforme* Balfour f. & Forrest, 230  
*arboresum* Smith, 328  
   subsp. *arboresum*, 329  
   subsp. *campbelliae* (Hooker f.) Tagg, 330  
   subsp. *cinnamomeum* (Lindley) Tagg, 329  
   var. *cinnamomeum*, 330  
   var. *roseum* Lindley, 331  
   subsp. *delavayi* (Franchet) Chamberlain, 331  
   var. *delavayi*, 331  
   var. *peramoenum* (Balfour f. & Forrest) Chamberlain, 331  
   subsp. *nilagiricum* (Zenker) Tagg, 331

- subsp. *zeylanicum* (Booth) Tagg, 332  
     var. *album* Wallich, 331  
*argenteum* Hooker f., 244  
*argipeplum* Balfour f. & Cooper, 381  
*argyrophyllum* Franchet, 325  
     subsp. *argyrophyllum*, 325  
     subsp. *hypoglaucom* (Hemsley) Chamberlain, 325  
     subsp. *nankingense* (Cowan) Chamberlain, 326  
     subsp. *omeiense* (Rehder & Wilson) Chamberlain, 325  
     var. *cupulare* Rehder & Wilson, 325  
     var. *leiandrum* Hutchinson, 326  
     var. *nankingense* Cowan, 326  
     var. *omeiense* Rehder & Wilson, 325  
*arizelum* Balfour f. & Forrest, 256  
*ashleyi* Coker, 316  
*asmenistum* Balfour f. & Forrest, 399  
*asteium* Balfour f. & Forrest, 403  
*astrochnoum* Diels, 229  
*astrocalyx* Balfour f. & Forrest, 265  
*atjehense* Sleumer, 298  
*aucklandii* Hooker f., 237  
*aureum* Georgi, 313  
     var. *aureum*, 313  
     var. *hypopitys* (Pojarkova) Chamberlain, 313  
*auriculatum* Hemsley, 241  
*axium* Balfour f. & Forrest, 278  
*baeticum* Boissier & Reuter, 313  
*bainbridgeanum* Tagg & Forrest, 277  
*balfourianum* Diels, 341  
     var. *aganniphoides* Tagg & Forrest, 341  
*barbatum* [Wallich ex] G. Don, 380  
*barkamense* Chamberlain, 363, 478  
*basilicum* Balfour f. & W.W. Smith, 253  
*batemannii* Hooker f., 374  
*bathyphyllum* Balfour f. & Forrest, 348  
*beanianum* Cowan, 386  
     var. *compactum* Cowan, 387  
*beesianum* Diels, 365  
*beimaense* Balfour f. & Forrest, 281  
*bijiangense* T. L. Ming, 410  
*blandulum* Balfour f. & W.W. Smith, 280  
*blumei* Nuttall, 430  
*bonvalotii* Bureau & Franchet, 418  
*brachyandrum* Balfour f. & Forrest, 425  
*brachycarpum* [D. Don ex] G. Don, 307  
     subsp. *brachycarpum*, 307  
     subsp. *fauriei* (Franchet) Chamberlain, 307  
     subsp. *tigerstedtii* Nitzelius, 307  
     var. *lutescens* Koidzumi, 313  
     var. *roseiflorum* Miyoshi, 307  
     var. *roseum* Koidzumi, 307  
*brettii* Hemsley & Wilson, 268  
*brevinerve* Chun & Fang, 292  
*brunneifolium* Balfour f. & Forrest, 403  
*bureavii* Franchet, 338  
*burriifolium* Balfour f. & Forrest, 287  
*californicum* Hooker f., 317  
*callimorphum* Balfour f. & W.W. Smith, 262  
     var. *callimorphum*, 263  
     var. *myiagram* (Balfour f. & Forrest) Chamberlain, 263  
*calophytum* Franchet, 228  
     var. *calophytum*, 229  
     var. *openshawianum* (Rehder & Wilson) Chamberlain, 229  
*caloxanthum* Balfour f. & Farrer, 264  
*calvescens* Balfour & Forrest, 275  
     var. *calvescens*, 275  
     var. *duseimatum* (Balfour f. & Forrest) Chamberlain, 275  
*campanulatum* D. Don, 372  
     subsp. *aeruginosum* (Hooker f.) Chamberlain, 373  
     subsp. *aeruginosum* × *wightii*, 373  
     subsp. *campanulatum*, 373  
     subsp. *campanulatum* × *wightii*, 373  
     var. *aeruginosum* [Hooker f. ex] Cowan & Davidian, 373  
     var. *campbellii* Millais, 374  
*campanulatum* × *arboresum*, 373  
*campbelliae* Hooker f., 330  
*campylocarpum* Hooker f., 263  
     subsp. *caloxanthum* (Balfour f. & Farrer) Chamberlain, 264  
     subsp. *campylocarpum*, 263  
     subsp. *telopeum* (Balfour f. & Forrest) Chamberlain, 264  
     × *candelabrum* Hooker f., 420  
*cardiobasis* Sleumer, 238  
*catacosmum* [Balfour f. ex] Tagg, 389  
*catawbiense* Michaux, 316  
*caucasicum* Pallas, 312  
     var. *stramineum* J. Hooker, 312  
*ceraceum* Balfour f. & W.W. Smith, 299  
*cerasinum* Tagg, 418  
*cerochitum* Balfour f. & Forrest, 301  
*chaetomallum* Balfour f. & Forrest, 391  
     var. *chamaephytum* Cowan, 408  
     var. *glaucescens* Tagg & Forrest, 391  
     var. *hemigynum* Tagg & Forrest, 389  
*chalarocladum* Balfour f. & Forrest, 278  
*chamaethomsonii* (Tagg & Forrest) Cowan & Davidian, 406  
     var. *chamaedoron* (Tagg & Forrest) Chamberlain, 406  
     var. *chamaethauma* (Tagg) Cowan & Davidian, 407  
     var. *chamaethomsonii*, 406  
*chawchiense* Balfour f. & Farrer, 303  
*chengianum* Fang, 235  
*chienianum* Fang, 319  
*chihsinianum* Chun & Fang, 241  
*chionanthum* Tagg & Forrest, 390  
*chionophyllum* Diels, 325  
*chlanidotum* Balfour f. & Forrest, 392  
*chlorops* Cowan, 430  
*chrysanthum* Pallas, 313  
     var. *nikamontanum* Komatsu, 313



- cinnamomeum* [Wallich ex] G. Don, 330  
*circinnatum* Cowan & Kingdon Ward, 370  
*citriniflorum* Balfour f. & Forrest, 392  
   subsp. *aureolum* Cowan, 392  
   var. *citriniflorum*, 392  
   var. *horaeum* (Balfour f. & Forrest)  
     Chamberlain, 392  
*citriniflorum* × *temenium*, 393  
*clementinae* Forrest, 358  
*cloiophorum* Balfour f. & Forrest, 398  
   subsp. *asmenistum* (Balfour f. & Forrest)  
     Tagg, 399  
*coccinocephalum* Balfour f. & Forrest, 346  
*codonanthum* Balfour f. & Forrest, 337  
*coelicum* Balfour f. & Farrer, 389  
*coeloneuron* Diels, 361  
*colletum* Balfour f. & Forrest, 365  
*comisteum* Balfour f. & Forrest, 346  
*cookeanum* Davidian, 271  
*cordatum* Lévêillé, 266  
*coriaceum* Franchet, 258  
*cornuscum* Ridley, 294  
*coryanum* Tagg & Forrest, 324  
*coryphaeum* Balfour f. & Forrest, 247  
*crinigerum* Franchet, 288  
   var. *crinigerum*, 288  
   var. *euadenium* Tagg & Forrest, 288  
*croceum* Balfour f. & W.W. Smith, 265  
*cruentum* Lévêillé, 338  
*cucullatum* Handel-Mazzetti, 345  
*cupressens* Nitzelius, 351  
*cyanocarpum* (Franchet) W.W. Smith, 423  
   var. *eriphyllum* (Balfour f. & W.W. Smith  
   ex] Tagg, 423  
*cyclium* Balfour f. & Forrest, 263  
*cymbomorphum* Balfour f. & Forrest, 281  
*dabanshanense* Fang & Wang, 360  
*dasycladoides* Handel-Mazzetti, 277  
*dasycladum* Balfour f. & W.W. Smith, 279  
*deviarii* Franchet, 228  
*decorum* Franchet, 230  
*degronianum* Carrière, 310  
   var. *yakushmanum* (Nakai) Kitamura, 311  
*delavayi*, 331  
*dendritrichum* Balfour f. & Forrest, 368  
*denudatum* Lévêillé, 321  
*detersile* Franchet, 337  
   × *detonsum* Balfour f. & Forrest, 341  
*diaprepes* Balfour f. & W.W. Smith, 233  
*dichroanthum* Diels, 393  
   subsp. *apodectum* (Balfour f. & W.W.  
   Smith) Cowan, 394  
   subsp. *dichroanthum*, 394  
   subsp. *herpesticum* (Balfour f. & Kingdon  
   Ward) Cowan, 394  
   subsp. *scypocalyx* (Balfour f. & Forrest)  
     Cowan, 394  
   subsp. *septiontriale* Cowan, 394  
*dichroplepium* Balfour f. & Forrest, 352  
*dictyotum* [Balfour f. ex] Tagg, 354  
*didymum* Balfour f. & Forrest, 399  
*dignabile* Cowan, 365  
*dimidiatum* Balfour f., 430  
*dimitrium* Balfour f. & Forrest, 428  
*diphrocalyx* Balfour f., 287  
*discolor* Franchet, 234  
*dolerum* Balfour f. & Forrest, 279  
*doshongense* Tagg, 357  
*dryophyllum* Balfour f. & Forrest, 351  
*dryophyllum* sensu Cowan & Davidian, 353  
*dubium* King & Gamble, 294  
*dumicola* Tagg & Forrest, 338  
*dumulosum* Balfour f. & Forrest, 352  
*duseimatum* Balfour f. & Forrest, 276  
*eclectum* Balfour f. & Forrest, 425  
   var. *bellatulum* [Balfour f. ex] Tagg, 425  
   var. *brachyandrum* (Balfour f. & Forrest)  
     Cowan & Davidian, 425  
   var. *eclectum*, 425  
*elegantulum* Tagg & Forrest, 339  
*elliottii* Watt, 379  
*emaculatum* Balfour f. & Forrest, 365  
*epapillatum* Balfour f. & Cooper, 304  
*epipastum* Balfour f. & Forrest, 403  
*erastum* Balfour f. & Forrest, 405  
*eriogynum* Balfour f. & W.W. Smith, 377  
*eritimum* Balfour f. & W.W. Smith, 303  
*erosum* Cowan, 382  
*erubescens* Hutchinson, 240  
*erythrocalyx* Balfour f. & Forrest  
   subsp. *docimum* [Balfour f. ex] Tagg, 281  
   × *erythrocalyx* Balfour f. & Forrest, 280  
*esetulosum* Balfour f., 281  
*euanthum* Balfour f. & W.W. Smith, 230  
*eucallum* Balfour f. & Forrest, 281  
*euchaites* Balfour f. & Forrest, 409  
*euchroum* Balfour f. & Kingdon Ward, 413  
*eudoxum* Balfour f. & Forrest, 401  
   subsp. *asteium* (Balfour f. & Forrest)  
     Tagg, 403  
   subsp. *brunneifolium* (Balfour f. &  
   Forrest) Tagg, 403  
   subsp. *epipastum* (Balfour f. & Forrest)  
     Tagg, 403  
   subsp. *glaphyrum* (Balfour f. & Forrest)  
     Tagg, 405  
   subsp. *mesopolium* (Balfour f. & Forrest)  
     Tagg, 403  
   subsp. *pothinum* (Balfour f. & Forrest)  
     Tagg, 404  
   subsp. *temenium* (Balfour f. & Forrest)  
     Tagg, 404  
   subsp. *trichomiscum* (Balfour f. & Forrest)  
     Tagg, 401  
   var. *brunneifolium* (Balfour f. & Forrest)  
     Chamberlain, 403  
   var. *eudoxum*, 401  
   var. *mesopolium* Balfour f. & Forrest, 403  
*euryisophon* Tagg & Forrest, 426  
*exasperatum* Tagg, 382  
*excelsum* Chevalier, 300  
*excimium* Nuttall, 260

- exquisitum* T.L. Ming, 272  
*faberi* Hemsley, 359  
   subsp. *faberi*, 359  
   subsp. *prattii* (Franchet) Chamberlain, 359  
*faberioides* Balfour f., 359  
*facetum* Balfour f. & Kingdon Ward, 377  
*faithae* Chun, 233  
*falconeri* Hooker f., 259  
   subsp. *eximium* (Nuttall) Chamberlain, 260  
   subsp. *falconeri*, 260  
*fargesii* Franchet, 240  
*farinosum* Lévêillé, 321  
*faucium* Chamberlain, 421  
*fauriei* Franchet, 307  
   var. *rufescens* Nakai, 307  
*fictolactum* Balfour f., 255  
*fissotectum* Balfour f. & Forrest, 356  
*flavorum* Balfour f. & Forrest, 357  
*flinckii* Davidian, 369  
*floccigerum* Franchet, 410  
   subsp. *appropinquans* (Tagg & Forrest) Chamberlain, 410  
   var. *appropinquans* Tagg & Forrest, 410  
*loribundum* Franchet, 320  
*fokiense* Franchet, 320  
*fordii* Hemsley, 320  
*formosanum* Hemsley, 324  
*forrestii* [Balfour f. ex] Diels, 407  
   subsp. *forrestii*, 407  
   subsp. *papillatum* Chamberlain, 408  
   var. *repens* (Balfour f. & Forrest) Cowan & Davidian, 407  
*forrestii* × *haematodes*, 408  
*fortunei* Lindley, 234  
   subsp. *discolor* (Franchet) Chamberlain, 234  
   subsp. *fortunei*, 234  
*foveolatum* Rehder & Wilson, 258  
*franchetianum* Lévêillé, 231  
*fulgens* Hooker f., 415  
*fulvastrum* Balfour f. & Forrest  
   subsp. *epipastum* (Balfour f. & Forrest) Cowan, 403  
   subsp. *mesopolium* (Balfour f. & Forrest) Cowan, 403  
   subsp. *trichomiscum* (Balfour f. & Forrest) Cowan, 402  
   subsp. *trichophlebium* (Balfour f. & Forrest) Cowan, 402  
*fulvoides* Balfour f. & Forrest, 366  
*fulvum* Balfour f. & W.W. Smith, 366  
*galactinum* [Balfour f. ex] Tagg, 257  
   × *geraldii* (Hutchinson) Ivens, 227  
*giganteum* [Forrest ex] Tagg, 250  
   var. *seminudum* Tagg & Forrest, 250  
*giraudissii* Lévêillé, 231  
*glanduliferum* Franchet, 229  
*glaphyrum* Balfour f. & Forrest, 405  
*glaucocephalum* Balfour f. & Forrest, 356  
*glischroides* Tagg & Forrest, 286  
*glischrum* Balfour f. & W.W. Smith, 284  
   subsp. *glischroides* (Tagg & Forrest) Chamberlain, 286  
   subsp. *glischrum*, 286  
   subsp. *rude* (Tagg & Forrest) Chamberlain, 286  
   var. *adenosum* Cowan & Davidian, 284  
*globigerum* Balfour f. & Forrest, 350  
*gloeoblastum* Balfour f. & Forrest, 266  
*gracilipes* Franchet, 325  
*grande* Wight, 244  
*gratum* T.L. Ming, 253  
*griersonianum* Balfour f. & Forrest, 374  
*griffithianum* Wight, 237  
   var. *aucklandii* (Hooker f.) Hooker f., 237  
*gymnanthum* Diels, 299  
*gymnocarpum* [Balfour f. ex] Tagg, 396  
*gymnogynum* Balfour f. & Forrest, 303  
*habrotrichum* Balfour f. & W.W. Smith, 287  
*haemaleum* Balfour f. & Forrest, 397  
*haematocheilum* Craib, 238  
*haematodes* Franchet, 390  
   subsp. *chaetomallum* (Balfour f. & Forrest) Chamberlain, 391  
   subsp. *haematodes*, 390  
   var. *calycinum* Franchet, 390  
   var. *hypoleucum* Franchet, 390  
*haofui* Chun & Fang, 320  
*hardingii* Tagg, 294  
*hedythamnium* Balfour f. & Forrest, 263  
   var. *eglandulosum* Handel-Mazzetti, 263, 423  
*helvolum* Balfour f. & Forrest, 353  
*hemidartum* [Balfour f. ex] Tagg, 387  
   × *hemigynum* (Tagg & Forrest) Chamberlain, 388  
*hemsleyanum* Wilson, 235  
*heptamerum* Balfour f., 303  
*herpesticum* Balfour f. & Kingdon Ward, 394  
*hexamerum* Handel-Mazzetti, 230  
   × *hillieri* Davidian, 393  
*himertum* Balfour f. & Forrest, 398  
   subsp. *poliocephalum* (Balfour f. & Forrest) Tagg, 398  
*hirtipes* Tagg, 283  
*hodgsonii* Hooker f., 259  
*hookeri* Nuttall, 422  
*horaeum* Balfour f. & Forrest, 392  
*houlstonii* Hemsley & Wilson, 234  
*huianum* Fang, 228  
*huidongense* T.L. Ming, 377  
*hunnewellianum* Rehder & Wilson, 322  
   subsp. *hunnewellianum*, 323  
   subsp. *rockii* (Wilson) Chamberlain, 323  
*hylaecum* Balfour f. & Farrer, 421  
*hylothreptum* Balfour f. & W.W. Smith, 303  
*hymenanthus* Makino, 309  
*hyperythrum* Hayata, 306  
*hypoglaucaum* Hemsley, 325  
*hypopitys* Pojarkova, 313  
*imberbe* Hutchinson, 430  
*inopinum* Balfour f., 431

- insigne Hemsley & Wilson, 327  
*intortum* Balfour f. & Forrest, 353  
*iodes* Balfour f. & Forrest, 350  
*irroratum* Franchet, 296  
    subsp. *irroratum*, 296  
    subsp. *kontumense* (Sleumer)  
        Chamberlain, 298  
    subsp. *pogonostylum* (Balfour f. & W.W. Smith) Chamberlain, 297  
*ixeunticum* Balfour f. & W.W. Smith, 288  
*jangtzwense* Balfour f. & Forrest, 394  
*japonicum* (Blume) Schneider, 308  
    var. *japonicum*, 309  
    var. *pentamerum* (Maximovicz)  
        Hutchinson, 310  
*jucundum* Balfour f. & W.W. Smith, 280  
*kansuense* Millais, 431  
*kendrickii* Nuttall, 302  
*kialense* Franchet, 360  
*kirkii* Millais, 234  
*kontumense* Sleumer, 298  
*korthalsii* Miquel, 296  
*kuluense* Chamberlain, 284  
*kwangfuense* Chun & Fang, 234  
*kyawi* Lace & W.W. Smith, 376  
*lactum* Franchet, 362  
    var. *macrophyllum* Franchet, 255  
*lamprophyllum* Balfour f. & Forrest, 346  
*lanatoides* Chamberlain, 370, 478  
*lanatum* Hooker f., 369  
    var. *luciferum* Cowan, 369  
*lancifolium* Hooker f., 380  
*lancifolium* Moench, 313  
*langbianense* [Chevalier ex] Dop, 298  
*lanigerum* Tagg, 332  
*lapidosum* T.L. Ming, 298  
*latifolium* Hoffmannsegg, 316  
*laxiflorum* Balfour f. & Forrest, 293  
*leei* Fang, 359  
*leishanicum* Fang & S.S. Chang, 261  
*leptopeplum* Balfour f. & Forrest, 302  
*leucolium* Diels, 323  
*leucopetalum* Balfour f. & Forrest, 399  
*levistratum* Balfour f. & Forrest, 352  
*liratum* Balfour f. & Forrest, 394  
*litiense* Balfour f. & Forrest, 266  
*longesquamatum* Schneider, 268  
*longiflorum* Nuttall, 244  
*longipes* Rehder & Wilson, 319  
    var. *chienianum* (Fang) Chamberlain, 319  
    var. *longipes*, 319  
*lophophorum* Balfour f. & Forrest, 352  
*lopsangianum* Cowan, 420  
*lucidum* Franchet, 230  
*luciferum* (Cowan) Cowan, 369  
*lukiangense* Franchet, 299  
*macabeum* [Watt ex] Balfour f., 251  
*macrophyllum* [D. Don ex] G. Don, 317  
*maculiferum* Franchet, 272  
    subsp. *anhweense* (Wilson) Chamberlain, 272  
    subsp. *maculiferum*, 272  
*magnificum* Kingdon Ward, 250  
*magorianum* Balfour f., 431  
*mairei* Léveillé, 362  
*makinoi* Tagg, 311  
*mallotum* Balfour f. & Kingdon Ward, 386  
*mandarinorum* Diels, 234  
*mannophorum* Balfour f. & Forrest, 399  
*manoporum* Balfour f. & Forrest, 281  
*martinianum* Balfour f. & Forrest, 281  
*maximowiczianum* Léveillé, 431  
*maximum* L., 316  
    var. *album* Pursh, 316  
    var. *purpureum* Pursh, 316  
*meddianum* Forrest, 423  
    var. *atrokermesinum* Tagg, 423  
    var. *meddianum*, 423  
*megaphyllum* Balfour f. & Forrest, 253  
*mengtszense* Balfour f. & W.W. Smith, 292  
*mesoprium* Balfour f. & Forrest, 403  
*metrium* Forrest, 278  
*metternichii* Siebold & Zuccarini, 309  
    subsp. *pentamerum* (Maximovicz)  
        Sugimoto, 310  
    subsp. *yakushmanum* (Nakai) Sugimoto, 311  
    var. *heptamerum* Maximovicz, 309  
    var. *hondoense* Nakai, 309  
    var. *intermedium* Sugimoto, 311  
    var. *kyomaruense* Yamazaki, 310  
    var. *micranthum* Nakai, 309  
    var. *pentamerum* Maximovicz, 310  
        f. *angustifolium* Makino, 311  
    var. *yakushmanum* (Nakai) Ohwi, 311  
*microgynum* Balfour f. & Forrest, 395  
*mimetes* Tagg & Forrest, 341  
    var. *simulans* Tagg & Forrest, 343  
*miniaturum* Cowan, 415  
*molyanum* Cowan & Davidian, 246  
*mombeigii* Rehder & Wilson, 368  
*monosematum* Hutchinson, 270  
*montroseanum* Davidian, 246  
*morii* Hayata, 273  
*morseadanium* Millais, 431  
*mussoi* Franchet, 265  
*myiagram* Balfour f. & Forrest, 263  
*nakaii* Komatsu, 310  
*nakotilum* Balfour f. & Forrest, 363  
*nankotaisanense* Hayata, 274  
*nanothamnium* Balfour f. & Forrest, 278  
*nebrities* Balfour f. & Forrest, 398  
*neriiflorum* Franchet, 408  
    subsp. *agetum* (Balfour f. & Forrest)  
        Tagg, 409  
    subsp. *euchaites* (Balfour f. & Forrest)  
        Tagg, 409  
    subsp. *neriiflorum*, 409  
    subsp. *phaedropum* (Balfour f. & Forrest)  
        Tagg, 409  
    subsp. *phoenicodum* (Balfour f. & Forrest)  
        Tagg, 409

- nhatrangense* Dop, 428  
*nigroglandulosum* Nitzelius, 340  
 $\times$  *nikomontanum* (Komatsu) Nakai, 313  
*nilagiricum* Zenker, 331  
*ninguenense* Handel-Mazzetti, 296  
*ninguenense* sensu Sleumer, 298  
*niphargum* Balfour f. & Kingdon Ward, 368  
*nipholobum* Balfour f. & Farrer, 426  
*nishiokae* Hara, 382  
*niveum* Hooker f., 332  
*nobile* Wallich, 373, 380  
*oblongum* Griffith, 237  
*ochraceum* Rehder & Wilson, 269  
*officinale* Salisbury, 313  
*ombrachares* Balfour f. & Kingdon Ward, 301  
*openshawianum* Rehder & Wilson, 229  
*orbiculare* Decaisne, 237  
     subsp. *cardiobasis* (Sleumer) Chamberlain, 238  
     subsp. *orbiculare*, 237  
*oreodoxa* Franchet, 238  
     var. *fargesii* (Franchet) Chamberlain, 238  
     var. *oreodoxa*, 238  
     var. *shensiense* Chamberlain, 240, 478  
*oresterum* Balfour f. & Forrest, 266  
*pachysanthum* Hayata, 274  
*pachytrichum* Franchet, 270  
*pagophilum* Balfour f. & Kingdon Ward, 278  
*pankimsense* Cowan & Kingdon Ward, 302  
*panteumorphum* Balfour f. & W.W. Smith, 281  
*papillatum* Balfour f. & Cooper, 304  
*paradoxum* Balfour f., 431  
*parishii* C.B. Clarke, 375  
*parmulatum* Cowan, 400  
*parviflorum* Dumont de Courset, 313  
*penninivium* Balfour f. & Forrest, 301  
*pentamerum* (Maximovicz) Matsumura, 310  
*peramoenum* Balfour f. & Forrest, 331  
*peregrinum* Tagg, 431  
*persicinum* Handel-Mazzetti, 303  
*perulatum* Balfour f. & Forrest, 395  
*petelotii* Dop, 301  
*phaedropum* (Balfour f. & Farrer) Tagg, 410  
*phaeochrysum* Balfour f. & W.W. Smith, 350  
     var. *agglutinatum* (Balfour f. & Forrest) Chamberlain, 352  
     var. *levistratum* (Balfour f. & Forrest) Chamberlain, 352  
     var. *phaeochrysum*, 351  
*phoenicodum* Balfour f. & Farrer, 409  
*piercei* Davidian, 387  
*pilovittatum* Balfour f. & W.W. Smith, 331  
*pingianum* Fang, 326  
*planetum* Balfour f., 432  
*platypodium* Diels, 236  
*pocophorum* [Balfour f. ex] Tagg, 387  
     var. *hemidartum* (Tagg) Chamberlain, 387  
     var. *pocophorum*, 387  
*poecilodermum* Balfour f. & Forrest, 344  
*pogonostylum* Balfour f. & W.W. Smith, 298  
*poliopeplum* Balfour f. & Forrest, 398  
*pomense* Cowan & Davidian, 363  
*poniticum* L., 313  
     subsp. *baeticum* (Boissier & Reuter) Handel-Mazzetti, 315  
     var. *brachycarpum* Boissier, 315  
*populare* Cowan, 419  
*porphyroblastum* Balfour f. & Forrest, 346  
*porphyrophyllum* Balfour f. & Forrest, 405  
*potaninii* Batalin, 428  
*pothinum* Balfour f. & Forrest, 404  
*praestans* Balfour f. & W.W. Smith, 247  
*praeteritum* Hutchinson, 240  
*praeavernum* Hutchinson, 227  
*prasinocalyx* Balfour f. & Forrest, 266  
*prattii* Franchet, 359  
*preptum* Balfour f. & Forrest, 257  
*principis* Bureau & Franchet, 357  
*probum* Balfour f. & Forrest, 278  
*procerum* Salisbury, 316  
*pronum* Tagg & Forrest, 358  
*prophantum* Balfour f. & Forrest, 377  
*proteoides* Balfour f. & W.W. Smith, 346  
*protistum* Balfour f. & Forrest, 248  
     var. *giganteum* (Tagg) Chamberlain, 250  
     var. *protistum*, 250  
*przewalskii* Maximowicz, 360  
*pseudochrysanthum* Hayata, 273  
*pubicostatum* T.L. Ming, 337  
*pudorosum* Cowan, 247  
*puniceum* Roxburgh, 329  
*puralbum* Balfour f. & W.W. Smith, 266  
*purdomii* Rehder & Wilson, 429  
*purpureum* (Pursh) G. Don, 316  
*purshii* G. Don, 316  
*pyrrhoanthum* Balfour f., 432  
*ramsdensianum* Cowan, 302  
*rarile* Balfour f. & W.W. Smith, 233  
*recurvoides* Tagg & Kingdon Ward, 288  
*recurvum* Balfour f. & Forrest, 344  
     var. *oreonastes* Balfour f. & Forrest, 344  
*regale* Balfour f. & Kingdon Ward, 253  
*reginaldii* Balfour f., 238  
*repens* Balfour f. & Forrest, 407  
     var. *chamaedoron* Tagg & Forrest, 408  
     var. *chamaethauma* Tagg, 407  
     var. *chamaethomsonii* Tagg & Forrest, 408  
*rex* Léveillé, 255  
     subsp. *arizelum* (Balfour f. & Forrest) Chamberlain, 256  
     subsp. *fictolacteam* (Balfour f.) Chamberlain, 255  
     subsp. *rex*, 255  
*rhaibocarpum* Balfour f. & W.W. Smith, 279  
*rhantum* Balfour f. & W.W. Smith, 230  
*ririei* Hemsley & Wilson, 328  
*rockii* Wilson, 323  
*roseotinctum* Balfour f. & Forrest, 399  
*rothschildii* Davidian, 252

- rotundifolium* David, 237  
*roxiceanum* Forrest, 344  
   var. *cuticulatum* (Handel-Mazzetti)  
     Chamberlain, 345  
   var. *globigerum* (Balfour f. & Forrest)  
     Chamberlain, 350  
   var. *roxiceanum*, 344  
*roxieoides* Chamberlain, 347, 478  
*rubropunctatum* Hayata, 306  
*rude* Tagg & Forrest, 286  
*rufum* Batalin, 361  
*russotinctum* Balfour f. & Forrest, 350  
*sanguineum* Franchet, 396  
   subsp. *aisoides* Cowan, 398  
   subsp. *cloiophorum* (Balfour f. & Forrest)  
     Cowan, 399  
   subsp. *consanguineum* Cowan, 399  
   subsp. *didymoides* (Tagg & Forrest)  
     Cowan, 399  
   subsp. *didymum* (Balfour f. & Forrest)  
     Cowan, 399  
   subsp. *haemaleum* (Balfour f. & Forrest)  
     Cowan, 398  
   subsp. *himertum* (Balfour f. & Forrest)  
     Cowan, 398  
   subsp. *leucopetalum* (Balfour f. & Forrest)  
     Cowan, 399  
   subsp. *mesaeum* [Balfour f. ex] Cowan,  
     398  
   subsp. *roseotinctum* (Balfour f. & Forrest)  
     Cowan, 399  
   subsp. *sanguineum*, 396  
     var. *cloiophorum* (Balfour f. & Forrest)  
       Chamberlain, 398  
     var. *didymoides* Tagg & Forrest, 399  
     var. *haemaleum* (Balfour f. & Forrest)  
       Chamberlain, 397  
     var. *himertum* (Balfour f. & Forrest)  
       Chamberlain, 398  
     var. *sanguineum*, 397  
   subsp. *sanguinioides* Cowan, 397  
*schistocalyx* Balfour f. & Forrest, 379  
*schizopeplum* Balfour f. & Forrest, 356  
*scyphocalyx* Balfour f. & Forrest, 394  
*selense* Franchet, 279  
   subsp. *dasycladum* (Balfour f. & W.W.  
     Smith) Chamberlain, 279  
   subsp. *duseimatum* (Balfour f. & Forrest)  
     Tagg, 276  
   subsp. *jucundum* (Balfour f. & W.W.  
     Smith) Chamberlain, 280  
   subsp. *selense*, 278  
   subsp. *setiferum* (Balfour f. & Forrest)  
     Chamberlain, 280  
   var. *duseimatum* (Balfour f. & Forrest)  
     Cowan & Davidian, 276  
   var. *pagophilum* (Balfour f. & Kingdon  
     Ward) Cowan & Davidian, 278  
   var. *probum* (Balfour f. & Forrest) Cowan  
     & Davidian, 278  
*seminoides* Tagg & Forrest, 253  
*seminum* Balfour f. & Forrest, 247  
*serotinum* Hutchinson, 432  
*serpens* Balfour f. & Forrest, 405  
*setiferum* Balfour f. & Forrest, 280  
*sheltonii* Hemsley & Wilson, 230  
*shensiense* R.C. Ching, 240  
*shepherdii* Nuttall, 302  
*sherriffii* Cowan, 416  
*sidereum* Balfour f., 246  
*sigillatum* Balfour f. & Forrest, 353  
*sikangense* Fang, 271  
*silvaticum* Cowan, 332  
*simiarum* Hance, 320  
   subsp. *youngae* (Fang) Chamberlain, 319  
*simulans* (Tagg & Forrest) Chamberlain, 343  
*sinofalconeri* Balfour f., 260  
*sinogrande* Balfour f. & W.W. Smith, 245  
   var. *boreale* Tagg & Forrest, 245  
*smirnowii* Trautvetter, 312  
*smithii* [Nuttall ex] Hooker f., 381  
   × *sochadzae* Char & Davlianidze, 315  
*souliei* Franchet, 266  
*spanotrichum* Balfour f. & W.W. Smith, 293  
*speciosum* Salisbury, 313  
*sperabile* Balfour f. & Farrer, 411  
   var. *sperabile*, 411  
   var. *weihsiense* Tagg & Forrest, 412  
*sperabiloides* Tagg & Forrest, 412  
*sphaeroblastum* Balfour f. & Forrest, 343  
*spilotum* Balfour f. & Farrer, 429  
*spooneri* Hemsley & Wilson, 231  
*stenophyllum* Makino, 311  
*stewartianum* Diels, 426  
   var. *aiolosalpinx* (Balfour f. & Farrer)  
     Cowan & Davidian, 426  
   var. *tantulum* Cowan & Davidian, 426  
*strigillosum* Franchet, 270  
*subansiriense* Chamberlain, 422  
*succothii* Davidian, 382  
*sutchuenense* Franchet, 226  
   var. *geraldii* Hutchinson, 227  
*syncollum* Balfour f. & Forrest, 352  
*taliense* Franchet, 343  
*tanastylum* Balfour & Kingdon Ward, 300  
   var. *pennivenium* (Balfour f. & Forrest)  
     Chamberlain, 301  
   var. *tanastylum*, 301  
*tawangense* Sahni & Naithani, 410  
*teleopeum* Balfour f. & Forrest, 264  
*temenium* Balfour f. & Forrest, 404  
   subsp. *albipetalum* Cowan, 402  
   subsp. *chrysanthum* Cowan, 404  
   subsp. *dealbatum* Cowan, 405  
   subsp. *gilvum* Cowan, 404  
   subsp. *glaphyrum* (Balfour f. & Forrest)  
     Cowan, 405  
   subsp. *pothinum* (Balfour f. & Forrest)  
     Cowan, 404  
   subsp. *rhodanthum* Cowan, 402  
   var. *dealbatum* (Cowan) Chamberlain, 405  
   var. *gilvum* (Cowan) Chamberlain, 404

- var. *temenium*, 404
- thayerianum* Rehder & Wilson, 323
- theiophyllum* Balfour f. & Forrest, 352
- thomsonii* Hooker f., 419
  - subsp. *candelabrum* (Hooker f.) Chamberlain, 420
  - subsp. *lopsangianum* (Cowan) Chamberlain, 420
  - subsp. *thomsonii*, 419
- var. *candelabrum* (Hooker f.) C.B. Clarke, 420
- var. *cyanocarpum* Franchet, 423
- var. *pallidum* Cowan, 420
- torquatum* Balfour f. & Farrer, 394
- traillianum* Forrest & W.W. Smith, 354
  - var. *dictyotum* (Tagg) Chamberlain, 354
  - var. *traillianum*, 354
- trichomiscum* Balfour f. & Forrest, 401
- trichophlebium* Balfour f. & Forrest, 401
- trilectorum* Cowan, 401
- triploaevium* Balfour f. & Forrest, 350
- tritifolium* Balfour f. & Forrest, 350
- truncatulum* Balfour f. & Forrest, 281
- tsariense* Cowan, 370
- ungernii* Trautvetter, 311
- uvarifolium* Diels, 368
- vellereum* Hutchinson, 358
- venator* Tagg, 290
- venosum* Nuttall, 432
- vernicosum* Franchet, 230
- versicolor* Chun & Fang, 320
- vesiculiferum* Tagg, 286
- vestitum* Tagg & Forrest, 280
- vicinum* Balfour f. & Forrest, 353
- viscidifolium* Davidian, 420
- wallaceanum* Millais, 432
- wallichii* Hooker f., 373
- wallichii* Hooker f.  $\times$  *arboresum* Smith, 374
- wardii* W.W. Smith, 265
  - var. *puralbum* (Balfour f. & W.W. Smith) Chamberlain, 266
  - var. *wardii*, 265
- wasonii* Hemsley & Wilson, 362
- watsonii* Hemsley & Wilson, 251
- wattii* Cowan, 242
- weldianum* Rehder & Wilson, 361
- wightii* Hooker f., 365
- williamsianum* Rehder & Wilson, 261
- wiltonii* Hemsley & Wilson, 362
- windsorii* Nuttall, 329
- wrayi* King & Gamble, 294
  - var. *ellipticum* Ridley, 294
  - var. *minor* Ridley, 294
- wuense* Balfour f., 359
- $\times$  *xanthanthum* Tagg & Forrest, 393
- xanthoneuron* L  veill  , 321
- yakushmanum* Nakai, 310
  - subsp. *makinoi* (Tagg) Chamberlain, 311
  - subsp. *yakushmanum*, 311
- youngae* Fang, 319
- zeylanicum* Booth, 332