TAXONOMIC NOTES ON THE GENUS RODGERSIA

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ABSTRACT. A preliminary revision of the genus *Rodgersia* (Saxifragaceae) is presented. Six species are recognised, of which one is new (*R. nepalensis* T. A. Cope) and represents a considerable extension westwards of the distributional area of the genus.

Rodgersia is a genus of tall, statuesque herbs belonging to the Tribe Astilbeae, Subfamily Saxifragoideae of the Saxifragaceae. It is closely related to both *Astilbe* and *Astilboides*, but differs in possessing palmate-digitate, pinnate or pseudo-pinnate leaves and in lacking petals. It became known to science with the opening up of Japan and China towards the end of the last century; various species were introduced into cultivation at that time, and quickly established themselves as valuable plants for damp, shady sites, where their large, divided, often bronze-tinged leaves and large panicles of small white, pink or reddish flowers made a striking effect. Several species, varieties and forms were described between 1870 and 1910, but no attempt has as yet been made to revise the genus taxonomically.

The present work was done intermittently between 1969 and 1973, firstly at Liverpool University Botanic Gardens, Ness, and subsequently at the Royal Botanic Garden, Edinburgh. During the course of the work Dr W. T. Stearn informed me that the genus had been studied at the British Museum by a vacation student from Manchester University, Mr T. A. Cope. Mr Cope was kind enough to compare notes with me, and we found that we had come to broadly the same conclusions. A new species from Nepal, discovered by Mr Cope in the BM material, and independently (and later) by myself in the Edinburgh collection, is described here for the first time. I am grateful to Mr Cope for allowing its publication in this paper. The materials used in the present study include herbarium specimens from the British Museum (BM), Edinburgh (E) and Kew (K), as well as a small number of specimens from Geneva (G), Leiden (L) and Katmandu (KATH), which were studied by Mr Cope. This herbarium material was supplemented by the study of living plants at Ness and Edinburgh.

In many ways Rodgersias are inconvenient plants for the herbarium: their rhizomes are thick, woody and very extensive; the basal leaves are often very large, with long petioles, and leaflets larger than the standard herbarium sheet; the panicles are also often extensive, and have to be cut to fit the mounting sheet. A good specimen may, in fact, have to be mounted on several sheets; not many collectors have gone to these lengths though the excellent series of specimens collected by George Forrest deserves special mention. In view of the inadequacy of many specimens, some knowledge of the living plant is essential, and makes possible the interpretation of the more scrappy herbarium specimens. Even so, a residue of indeterminable specimens remains.

Rodgersias are rhizomatous plants whose aerial parts die off in winter; the rhizomes spread extensively, and branch considerably, forming a dense,

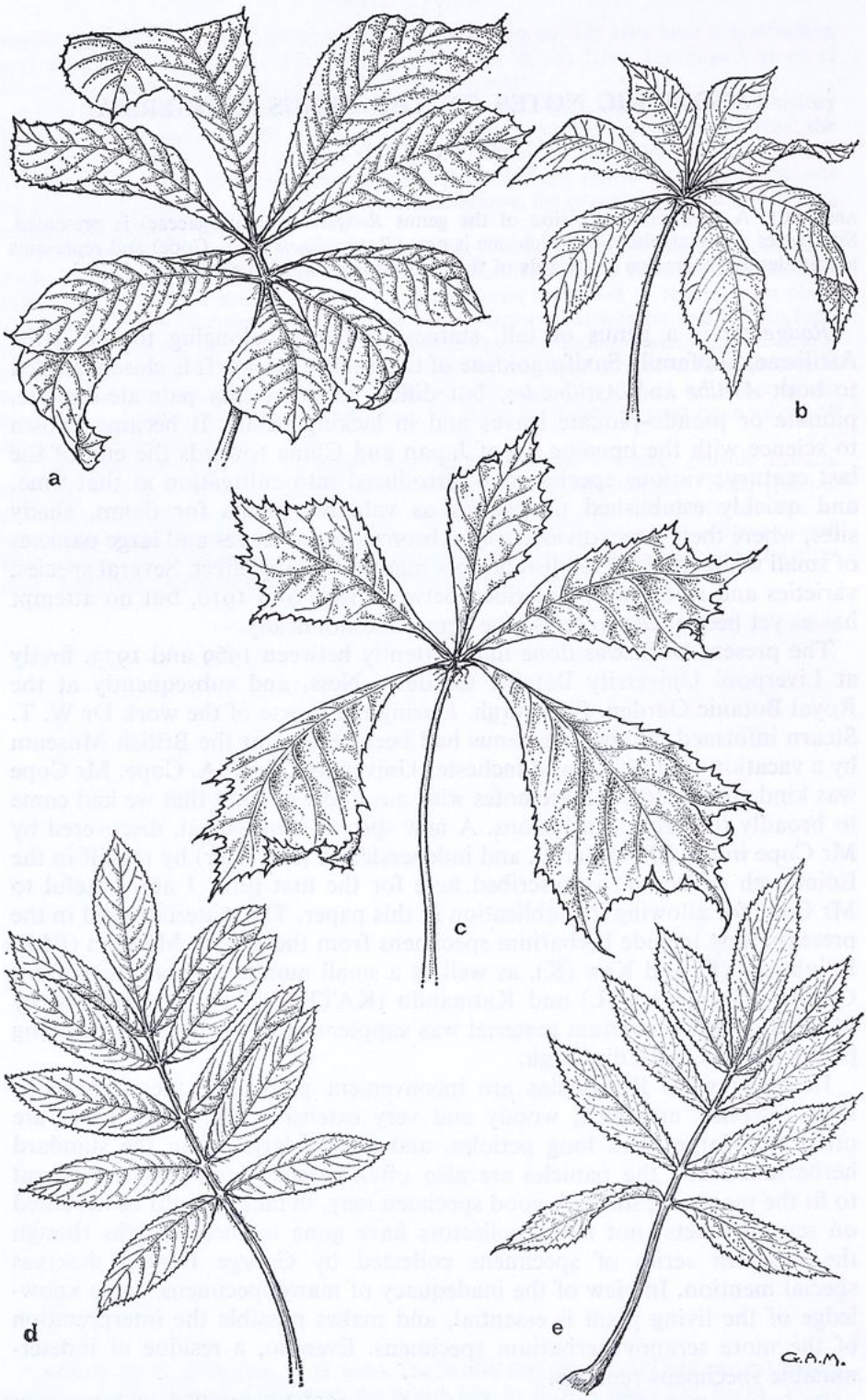

FIG. 1. Leaves of *Rodgersia* species: a, *R. pinnata*; b, *R. aesculifolia*; c, *R. podophylla*; d, *R. nepalensis*; e, *R. sambucifolia*.

intertwining, woody mass. The leaves and flowering stems develop from buds on the rhizomes, and the flowering stems bear scale leaves at the base which are often covered with a dense indumentum of rusty-brown, multicellular hairs. The leaves are mostly borne directly on the rhizomes and have long petioles which are sheathing at the base. Those on the flowering stems are few, distant and markedly reduced in size. The leaves of *R. aesculifolia*, *henricii* and *podophylla* are strictly palmate-digitate, with 5–9 leaflets spreading peltately from the apex of the petiole. Those of *R. pinnata* are pseudo-pinnate, i.e. with a variable number of leaflets staggered along a long or short rachis: the lowermost set of leaflets is most commonly 3 (more rarely 2, 4 or 5), and these are borne in an opposite plane to all the rest, of which there may be 3, 5 or 7 (see fig. 1a). The leaves of *R. sambucifolia* and *R. nepalensis* are strictly pinnate (a few, exceptional, pseudo-pinnate leaves occur in *R. sambucifolia*). The various leaf types are shown in fig. 1. The curious foliolation of *R. pinnata* was noticed by Franchet, in his original description of the species, and by Henry (Gard. Chron. ser. 3, 32:131–2, 1902), who used the term 'quasi-palmate' for it.

The leaflets themselves are large, serrate or irregularly doubly serrate, and shortly petiolulate, the petiolules being deeply channelled. In *R. podophylla* each leaflet is deeply trisect (or rarely 5-sect) at the apex; those of the other species are acute, acuminate or rounded. Indumentum on the leaflets is variable but is never entirely absent (it is often very dense when the leaves are young, but quickly deciduous), persisting usually on the undersides of the teeth and veins at least; the leaflets of *R. sambucifolia* are conspicuously strigose on the upper surface. Tufts of long, rusty-brown hairs are often present at the junction of the petiole and petiolules. The leaf teeth are at first gland-tipped, but the gland itself is soon deciduous; underneath each tooth there is a small swelling which appears to consist of crystals. The leaflets of all the species are somewhat leathery, those of *R. pinnata* particularly so: in this species the combination of leathery leaflets with rugose upper surfaces produces a characteristic facies; those of *R. aesculifolia*, *henricii* and *podophylla* are flat and spread horizontally, or droop, whereas those of *R. pinnata* and perhaps *R. sambucifolia* are somewhat folded about the midrib, and are held obliquely erect.

The inflorescence of all the species is a large, many-flowered panicle; the long branches are basically cymose, but often appear superficially racemose due to the secund disposition of the flowers and the suppression of many branches. The indumentum of the inflorescence is usually pronounced, and velutinous or floccose; it is found on the adaxial sides of the branches and on the side of the main axis opposite the branches themselves. Thus the axis is hairy on only one side in the lowermost part of the inflorescence, but, as more branches diverge at different angles, so the whole of the axis becomes hairy.

The flowers are without bracts or bracteoles, and have 5(–6) greenish, whitish, pink or red spreading sepals, which are often accrescent after fertilisation. There are usually 10 stamens (rarely 12), which are exserted; the anthers may be cream, pink or bluish-grey. The slightly inferior ovary is formed of 2 carpels, united below, with styles exceeding the sepals. The fruit is a capsule with numerous seeds (seed is rarely set in much garden material).

RODGERSIA A. Gray in Mem. Amer. Acad. 6:389 (1857)
Type species: *R. podophylla* A. Gray

1. Sepals with an indumentum of short-stalked glands outside; stamens 5·5 mm or more at anthesis; indumentum of inflorescence floccose; basal leaves strictly pinnate . 1. *nepalensis*
1. Sepals glabrous outside, rarely with 1 or 2 long-stalked glands near the base; stamens less than 5·5 mm at anthesis, sometimes extending to that length later; indumentum of inflorescence velutinous; basal leaves palmate, pseudopinnate or pinnate . 2
2. Basal and lower stem leaves pinnate or pseudopinnate (in cultivation at least some of them so divided) 3
2. Basal and lower stem leaves all strictly palmate . . . 4
3. Leaves markedly strigose above with reflexed, glandular hairs; stamens and styles equalling or shorter than sepals at anthesis; basal and median leaves usually pinnate, rarely pseudopinnate with (6–)8–11 leaflets . . . . . 2. *sambucifolia*
3. Leaves glabrous above, except rarely along the main vein; stamens and styles usually exceeding sepals at anthesis; basal and median leaves pseudopinnate or rarely palmate . . 3. *pinnata*
4. Leaflets 3(–5)-lobed at tips; sepals acuminate with straight tips . . . . . 6. *podophylla*
4. Leaflets not lobed at tips; sepals ovate, obtuse to rounded with usually reflexed tips 5
5. Sepals conspicuously accrescent after anthesis; leaves with indumentum along the main veins and also on the teeth beneath 4. *aesculifolia*
5. Sepals not or scarcely accrescent after anthesis; leaves with indumentum only along the veins beneath . . . 5. *henricii*

1. R. nepalensis T. A. Cope, **sp. nov.**

A *R. sambucifolia* inflorescentia floccosa, sepalis glanduloso-stipitatis, staminibus 5·5–7 mm longis differt.

Herba robusta. *Folia* imparipinnata (folio supremo 3-foliolato excepto), foliolis 7–11; rhachis squamis brunneis linearibus ad 30 mm longis praesertim ad insertionem foliolarum laxe vestita; foliola lateralia opposita, subsessilia, oblongo-elliptica, apice acuminata, margine copiose duplicato-serrata, basi rotundata, 12–21 × 4–7 cm, supra glabra, subtus secus costam squamis linearibus ad 20 mm longis, secus venas squamis parvis linearibus munita; foliolum terminale petiolulatum, obovatum, apice acuminatum, basi cuneatim angustatum, petiolulo c. 2·5 cm longa; stipulae anguste lanceolatae, acuminatae, 30–40 × 7–10 mm, brunneae, papyraceae. *Caulis florifer* c. 1 m altus; panicula laxe ramosa, 30–40 cm longa et lata, pedunculo leviter squamoso, ramis numerosis ascendentibus, inferioribus ad 20 cm longis, in parte inferiore supra floccosis sed subter subglabris pilis minutis glandulosis conspersis, pedicellis 2–10 mm longis glandulosis. *Calycis tubus* turbinatus anthesis 3 mm longus, fructifer 4 mm longus, glandulosus; sepala 5, patentia, triangularia, acuta vel subacuminata, c. 3·5–5 mm longa, 2–2·5 mm lata, extus glanduloso-stipitata, viridi-flava. *Stamina* 10; filamenta in vivo

viriduli-alba, 5–8 mm longa. *Capsula* 7–10 mm longa, parte seminifera superne in stylos paulum divergentes gradatim attenuata.
Type. E Nepal: Dudh Kosi above Lukla (27°30′ N, 86°45′ E), 3350 m, yellowish flowers, 8 vii 1964, *McCosh* 391 (holo. BM).
NEPAL. Dudh Kosi, Chaunri Kharka (27°38′ N, 86°41′ E), 2600 m, amongst secondary shrubs, height 3 ft, petals and filaments greenish white, 11 vi 1964, *Stainton* 4619 (BM); ibid., 27°30′ N, 86°40′ E, 2700 m, on rocky slopes among oak, height 3½ ft, 29 ix 1969, *Stainton* 6568 (BM); Tatey, 27°40′ N, 86°39′ E, 3350 m, greenish white, 1930, *Dhwoj* 0152 (BM, E); Dudh Kosi, 2700 m, on densely shaded wet rocky slopes by streamside in narrow gulley; dense mixed forest, very localised, only one colony recorded, herbaceous perennial to 2 ft tall, floral parts cream, leaves dark green, 1966, *Schilling* 915 (K); Ghat, 2800 m, 9 v 1952, *Zimmermann* (G); Painya Khola, 2700 m, on dense forest slope, large herbaceous perennial, vi 1966, *Banerji & Sakya* 5608 (KATH).
SIKKIM. Scree above Toong, 3000 m, 4 ft with woody stems and white flowers, 16 ix 1913, *Cooper* 888 (E).

R. nepalensis is widely separated geographically from the rest of the genus; it is also quite distinct morphologically, with its leaf rachis and stem with long brown scale-like hairs, floccose inflorescence branches, glandular sepals and long stamens. It is closest to *R. sambucifolia* in leaf characters, but differs considerably in other respects. It is not in cultivation.

The Zimmermann specimen cited above was referred to and briefly described in a paper by Baehni (Candollea 16:220, 1957–8), but was not formally proposed as a new species. Further specimens from Nepal (*Banerji* 1825), Sikkim (*Ribu & Rohmoo* 1681) and western Tibet (Chumbi valley, adjacent to Sikkim—*Searight* 21) are referred to in a paper by Banerji (Bull. Bot. Surv. Ind. 10, 2:233–4, 1968) as being very similar to *Stainton* 4619; these are probably also *R. nepalensis*.

2. R. sambucifolia Hemsley in Gard. Chron. ser. 3, 39:115 (1906).
Syn.: *Spiraea holorhodantha* Lévl. in Bull. Acad. Geog. Bot. 25:44 (1915).
Type. China: Yunnan, Yalong valley c. 100 miles west of Tatienlu, 2740–3040 m, vi 1904, *Wilson* (holo. K).
CHINA. Yunnan: vicinity of Yunnan-sen, *Maire* 2542 & 2544 (E); Tou Dza, près Se-tsong, 5 vi 1904, *J. B. Lo*, *Ducloux* 690 (E); rochers mousseaux mont de Pe long tsin, 3200 m, grande plante vivace, fl. blanches ou rosées, sur grappe rose, juin, *Maire* 898 (E); pass S of Yungning, 3350 m, fls. white flushed with pale pink in woods on the N-facing slope of the ridge, limestone rocks, 30 v 1921, *Kingdon Ward* 4117 (E); rochers des pics derrière Tong-tchouan, 2700 m, Spiraea vivace, fl. blanches, grappe rose, juillet, *Maire* 147 (E); ibid., 2800 m, *Maire* 1115 (E); rochers plateau de Se-ma-tchouan, 3200 m, Spirée vivace, fl. blanc ou rose avec pédoncules ou vertes ou roses, juillet, *Maire* 277 (E); Yunnan-sen, collines de Tsong chan, fleurs blanches, 19 vii 1908, unique, *Ducloux* 691 (E); rochers des mont à Kiao-me-ti, 3100 m, grande plante vivace, tige floral unique, rose, fl. blanc ou rose, juin, *Maire* 470 (type of *Spiraea holorhodantha* Lévl., E). Szechuan: austr. in pinetis inter Hunka et Woloho, 3200 m, 13 vi 1914, *Schneider* 3761 (E).

Hemsley distinguished *R. sambucifolia* from *R. pinnata* on the basis of its purely pinnate leaf division with numerous leaflets. Consideration of the available material shows that this character is not absolutely diagnostic, whereas those of the leaf indumentum and stamen and style size correlate well, and serve to distinguish the two easily. The field notes cited above show that the flowers may be white or pink in the same population. *R. sambucifolia* is usually somewhat smaller than the other species of the genus, and has a more delicate appearance. It was introduced into cultivation by Wilson, but does not now appear to be common in gardens. There is a good photograph of it in Parey's *Blümengärtnerei* 1:754 (1958).

3. R. pinnata Franchet in Nouv. Arch. Mus. Par. ser. 2, 10:176 (1888) & Pl. David. 2:214 (1888) in obs.
Syn.: *Astilbe pinnata* (Franchet) Franchet, Pl. Delav. 231 (1890).
Syntypes. (China, Yunnan) in monte Pi-iou-se supra Tapintze, 11 vi 1883 et ad collum eiusdem montis; fr. mat., 15 x 1886, *Delavay* 3675 (K); in umbrosis humidis ad pedem montis Tsang-chan, 26 vi 1886, *Delavay* 2457 (K); in silva San-tcha-ho, supra Mo-so-yn, 17 vi 1887, *Delavay* 2884 (K).
CHINA. Yunnan: NW Yunnan, *Mombeig* 102 (E); W Yunnan, E flank of Tali range, 25°40′ N, 3000–3600 m, viii–ix 1906, shady moist situations in and on margins of mixed pine forest, 2–4 ft, flowers cream, *Forrest* 5037 (E); inter Yungning et Mitichin, in silvis apertis in rupestribus, 2600 m, 23 vi 1914, *Schneider* 3606 (E); E flank of Lichiang snow range, 27°12′ N, 2700–3000 m, vi 1906, rocky shady situations in mixed woods in side valleys, flowers yellowish, white or pink according to situation, *Forrest* 2521 (E); Yangtze watershed, distr. Likiang, eastern slopes of Likiang snow range, v–x 1922, *Rock* 3787 & 4400 (E); E flank of Lichiang range, 25°12′ N, 2700–3000 m, vi 1906, shady or open moist situations in mixed woods and forests, 2–4 ft, flowers yellowish or pink according to situation, *Forrest* 2339 (E); Yangtze watershed, W slopes of Likiang snow range, 30 v–6 vi 1922, *Rock* 3921, 4600 & 4601 (E); E flank of Lichiang range, 27°15′ N, 3000–3400 m, v 1910, 2–3 ft, fls creamy white, damp shady situations in mixed forests, *Forrest* 5665 (E); Moku-ji pass, 3400–3650 m, 31 vii 1920, very abundant in glades and rocky places of the alpine zone, flowers in shades of pink, *Farrer* 1783 (E); Tali, top of Ma-mung mt, white flowers, *McLaren* B46 (E); Lou-choei-tang, 1920, fl. rubri, *Ten* 55 (E); E flank of Tali range, 25°40′ N, viii 1910, plant of 2½–4 ft, fls. pale rose, shady situations on the margins of mixed forests, *Forrest* 6855 (E); mid west Yunnan, sine loc., 1929, *Forrest* 28113 & 28735 (E). Szechuan: Mt Wu (Wu shan), 2100 m, v–vii 1903, *Wilson* 3611 (type of *R. pinnata* var. *alba*—K, see below).

The publication of the name *R. pinnata* is somewhat confusing. The name first appears in Franchet's *Plantae Davidianae* 2:214 (1888): after referring to a plant collected by David at Moupine, which Franchet then thought was *R. podophylla* but which is presumably *R. aesculifolia*, he states: '. . . dont un deuxième espèce *R. pinnata*, vient d'être découverte dans la région alpine de Yunnan'. A footnote referring to the name *R. pinnata* reads: 'Cette belle espèce, observée par M. l'abbé Delavay, est caractérisée surtout par ses feuilles composées-pinnées'. Later, in 1890 in *Plantae Delavayanae*, Franchet gave a more detailed description of the plant, and cited the Delavay material

on which it was based; unfortunately, under the influence of Baillon, he changed his mind about the generic placing of the species, and described it under *Astilbe*. It is perhaps questionable as to whether the publication in *Plantae Davidianae* is valid; but no one has recombined the name under *Rodgersia*, so I have treated the 1888 description as sufficient, and regard the 1890 publication as an expansion of it.

R. pinnata is a rather variable species, both in the wild and in gardens. It is, however, recognisable by its pseudopinnate leaves with very leathery, rugose leaflets. Variability in flower colour is particularly striking (see field notes cited above), and the nature of the calyx after flowering is also variable in a rather similar way to the variation of this character in *R. aesculifolia* and *R. henricii* (q.v.). The most frequently occurring variant has accrescent sepals, which are longer than the stamens and styles; most of the specimens cited above belong to this type, which includes the type specimen of *R. pinnata* var. *alba* (see below). The types of *R. pinnata* itself, together with two Forrest specimens (6855 & 28113) have accrescent sepals, but the stamens and styles are conspicuously longer. Finally, a few specimens (*Rock* 3921 & 4601, *Ten* 55 and *Forrest* 28735) have non-accrescent sepals. These three variants show no significant distribution patterns (*Rock* 4600 of the first type and 4601 of the third are from the same locality), and therefore do not seem worth formal recognition (cf. the rather different situation in *R. aesculifolia* and *R. henricii*).

Variability in flower colour has led to the recognition of three forms or cultivars: 'Alba', 'Elegans' and 'Superba'. These are treated in the older gardening literature as varieties.

'Alba' refers to a white flowered variant introduced by E. H. Wilson from Mt Wu in Szechuan. This was grown by Messrs Veitch and, on 20th June 1905, received an Award of Merit from the Royal Horticultural Society (*Gard. Chron.* ser. 3, 37:398, 1905; *Journ. Roy. Hort. Soc.* 31: cxxxii–cxxxiii, 1906), when exhibited as *R. pinnata* var. *alba*. At Kew a specimen of Wilson's, no. 3611, is annotated as the type of *R. pinnata* var. *alba* Duthie. I have not been able to trace a formal publication of this variety, nor have I found any link between the plant and J. F. Duthie. Fortunately, the variety is not worth recognition as such, but only as a cultivar, the brief description in the *Gardeners' Chronicle* (cited above), being sufficient validation.

'Elegans' refers to a pink-flowered variant; I have not been able to trace the earliest publication of this name.

'Superba' is dealt with under the section on hybridisation (p. 122).

4. R. aesculifolia Batalin in Acta Horti Petrop. 13:96 (1893).

Syntypes: China borealis: prov. Kansu orientale, trajectus inter pagos Mörping et Wuping, 27 vi 1885, *Potanin* (K); prov. Szetschuan septentrionale, vallis fl. Pei ho inter pagos Yung-hoa-tang et Hun-nei-Ku, 23 vii 1885, *Potanin*; Hupeh, Patung, Ichang, 1887, *Henry* (K); Szetschuan, S Wushan, 1889, *Henry* (K).

CHINA. Kansu: Siku, 1500–1700 m, cool mountain sides, 18 vi 1914, *Farrer & Purdom* 132 (E); Hupeh, 1885–1888, *Henry* 5711 (E); Szechuan, 1938, *McLaren* AC 81 (E); western Hupeh, *Wilson* 1054 (E).

SE TIBET. Kongbo prov. valley above Sang, 29°35′ N, 94°43′ E, 3200 m, 26 vi 1938, perianth lobes white, filaments white, anthers green, ovary white,

stigmas flushed pink, *Ludlow, Sherriff & Taylor* 4635b (E); Tsanang La near Paka, 29°15′ N, 94°15′ E, 3200 m, 15 vii 1938, 3–4 ft, corolla and filaments cream white, anthers very dark grey, ovary pale pink, on banks in mixed forest, *Ludlow, Sherriff & Taylor* 5836 (E).

R. aesculifolia is very similar to *R. henricii* and the two have often been confused. The differences between the two are slight, and the total variation parallels that found in *R. pinnata* (q.v.). However, *aesculifolia* and *henricii* are more or less geographically separated, *aesculifolia* being in general more northerly, *henricii* more southerly, with a small overlap in SE Tibet. Further material may well cause the two to be merged.

Ludlow et al. 4635b is of interest in that one leaflet of the uppermost leaf is trilobed at the apex, like those of the Japanese and Korean *R. podophylla* (q.v.).

5. R. henricii (Franchet) Franchet in Rev. Hort. 69:176 (1897).
Syn.: *Astilbe henricii* Franchet in Prince Henri d'Orléans, Du Tonkin aux Indes 378 (1896).
Type. (China) Habite le sud ouest de la province de Yunnan, 11 vi 1895, *Henri d'Orléans* (P; small fragment, photo and long description, K).
CHINA. Yunnan: hills NW of Tengyueh, 25°25′ N, 98°30′ E, 2750–3050 m, plant of 2 ft, flowers creamy yellow, on the margins of thickets, *Forrest* 26760 (E); Taron-Taru divide, valley of Bucahwang, 2600–2800 m, perennial, 2–3 ft, flowers pink, 3 ix 1938, *Yü* 20113 (E); upper Kiukiang, Clolung valley, Srowshiang, 2450 m, mountain slope, open grassy place, perennial, 2–3 ft, flowers and inflorescence pink, 4 viii 1938, *Yü* 19620 (E); W flank of Shweli-Salween divide, 25°20′ N, plant of 2½–3 ft, flowers creamy white tinged red on exterior, shady situations on the edges of thickets, viii 1912, *Forrest* 8969 (E); Chengkang, snow range, 2350 m, grassy slope, perennial, 3 ft, flowers pinkish red, 23 vii 1938, *Yü* 16905 (E).
UPPER BURMA. Hpimaw hills and pass, 2750–3200 m, 13 vi 1919, general in the cool high alpine woods of the Chimili and Hpimaw passes, flowers variable, at their best rich rosy pink, at their worst dull greenish rose, *Farrer* 1016 (E); valley of the Chang-ma-hka, 2400–2800 m, 3 vi 1919, on steep grassy slopes or in steep gullies in shade of bamboo and Rhodos, flowers bright pink, very fragrant, *Kingdon Ward* 3163 (E).
SE TIBET: between Laoting and Trulung, lat. 30°, long 94°55′, 2150 m, 5 v 1947, among boulders on edge of forest, *Ludlow, Sherriff & Elliott* 13024 (E).

R. henricii was originally characterised by Franchet by its long-acuminate leaflet tips and its red-purple flowers. Both of these characters are variable in the genus, and are not sufficiently diagnostic for the separation of species. However, examination of a small fragment of the type and photographs and a long description of it drawn up by J. R. Sealy, and kept in the herbarium at Kew, has convinced me that *henricii* can be separated from *aesculifolia* on the basis of flower and leaf characters and distribution. Admittedly the characters used are not strong, and further material may suggest that they be merged. Both appear to be in cultivation, though *R. henricii* appears to be much less common than *R. aesculifolia*.

6. R. podophylla A. Gray in Mem. Amer. Acad. 6:389 (1857).
Syn.: *R. japonica* Regel in Gartenflora t. 708 (1871).
Type. (Japan) Hakodate, 13 vi 1855, *Capt. Rodgers et al.* (iso. L*).
JAPAN. Nikko, 16 v 1877, *Bisset* (E); Asamayama, 3 vi 1880, *Bisset* (E); Wadatogi, vi 1880, *Bisset* (E); Kurusawi to Jukus-him, 30 v 1880, *Bisset* (E); Honshu, prov. Shinano, Mt Komagataka ascending route from Isedaki, 2000 m, 17 vii 1962, *Tamura* 9017 (E); Honshu, Mt Yatsugatake in Shinano, vii 1957, *Okamoto* 1367 (E); Nikko, Shinotsuke, 30 vi 1908, *Yokohama Nursery Co.* (E); Kaga, Mt Hakusai, viii 1908, *Yokohama Nursery Co.* (E); Shinano, Honzawa, 27 viii 1910, *Sakurai* (E); Hakodate, v 1928, *Kamanchi* (L); ibid., 1861, *Maximowicz* (L); Shibakurazawa, Mt Tanigawa, Tone Gum, Gumma pref. 700 m, 15 vii 1966, *Kanai et al.* (KATH).
KOREA. In silvis montium Ouen-San, vii 1906, *Faurie* 374 (E).

A very distinct species from Japan and Korea, recognised by its 3(–5)-sect leaf apices, and long acuminate sepals, much exceeded by the stamens. The flowers are always creamy white, at least in cultivation.

There is a number of specimens which, because of lack of leaves or open flowers, cannot be determined with accuracy. They are listed below with tentative identifications.
CHINA. Yunnan: Chungtien, Tehgoh, 3200 m, grassy slope, 3 ft, seeds deep brown, 22 x 1937, *Yü* 13813 (E—with fruits and stem, but no leaves); Yangtze watershed, E slope of Likiang snow range, v–x 1922, *Rock* 3662 (E—very young plant with young inflorescences; probably *R. pinnata*).
Szechuan: inter Knapie et Tahaoko, 2600 m, in locis humidis silvarum, 23 v 1914, *Schneider* 1380 (E—very young, probably *sambucifolia*).
Chihli: Tank Ho, Pei min ting mountain, 8 viii 1913, *Clemens* (E—one palmate leaf only).
SE TIBET. Kongbo prov. Lusha Chu, 29°18′ N, 94°37′ E, 3500 m, 15 vi 1938, *Ludlow, Sherriff & Taylor* 4635a (E—probably *henricii*, but too young and leaves poor); Tha-Chu valley, 2750 m, 1 vii 1950, shady woods, damp places, *Kingdon Ward* 19555 (E—upper part of inflorescence only); Chunmiya, Rong-Chu valley, 29°48′ N, 94°49′ E, 2750 m, 18 v 1947, flowers unopened, brownish green in bud, in *Picea* forest, *Ludlow, Sherriff & Taylor* 13709 (E—very young, probably *henricii*).

Hybridisation

There are no well-substantiated reports of hybrids in the genus, but a number of factors suggest that occasional hybridisations may have occurred in gardens. For instance, plants of the different species are often grown in close proximity and flower at much the same time, thus making it possible for accidental cross-pollination to occur relatively easily. Also, the occurrence of cultivated plants bearing both palmate and pseudopinnate leaves suggests the possibility of hybridisation between *R. pinnata* and *R. aesculifolia* or *henricii*.

* The specimens from Leiden (L) and Katmandu (KATH) have been examined by Mr T. A. Cope.

A further example is provided by a plant cultivated at Edinburgh under the name *R. purdomii*, a name which has not been effectively published (it is cited in ed. 10 of Zander's *Handwörterbuch der Pflanzennamen* as '*R. purdomii* Hort.'). The plant has leaves like *R. aesculifolia*, except that the tips of the leaflets show a very faint division in the manner of *R. podophylla*. This plant might well be a hybrid of the two species, but at the moment there is insufficient evidence to form a decision.

A rather similar instance is provided by the plant grown as *R. pinnata* 'Superba' or *R. pinnata* var. *superba*. This is a taxon in which the petioles, the margins of the young leaflets and the ripening carpels are red-suffused. Most of the leaves on this plant are palmate, but one or two generally show a short rachis and are very shortly pseudopinnate; all are very leathery and rugose. Besant (*New Flora and Silva* 5:94–96, 1933) remarked that, though distinct, the plant seemed to him to have nothing to do with *R. pinnata* on account of its almost entirely digitate leaves. However, it seems possible that this, too, is a hybrid of *pinnata* with *aesculifolia*. Like most other Rodgersias, it rarely sets seed in gardens in Britain, so accurate deductions about hybridity are not easy to make. Cytological studies may help to settle the problem.

There is no evidence of natural hybridisation in the genus, as far as this can be judged from herbarium material; but the relative incompleteness of many specimens leaves this matter open to doubt.

Doubtful Species

R. platyphylla Pax & Hoffm. in Feddes Rep. Beih. 12:393 (1922).

This species was described as having acuminate sepals, pilose outside. In all other respects (judging by the brief description) it is very similar to *R. aesculifolia* and *henricii*, but the type specimens ('E Tibet'—i.e. China, prov. Szechuan—Wen tschwan hsien, Tal von Tsao Po, bei Schu-lin-ku, 2400 m, *Limpricht* 1430; zwischen Schu-lin-ku und Tien-tsching-kwan, 2600 m, *Limpricht* 1486; im Tal des Orl ho unterhalb Ken-ta-tschian, 1800 m, *Limpricht* 1431) are not available, having been lost during the bombing of the Berlin herbarium. Handel-Mazzetti, who saw the specimens, decided that *platyphylla* was the same as *aesculifolia* (Symb. Sin. 7, 1:415, 1931), a view reinforced by Baehni (Candollea 16:220, 1957–8), who wrote: 'le *R. platyphylla* Pax & Hoffm. est certainment synonyme de *R. aesculifolia* Bat.' Geographical distribution suggests that *platyphylla* is more likely to be a synonym of *aesculifolia* than *henricii* but, unless isotypes turn up in some other herbarium, the name will remain somewhat dubious.

Excluded Species

Rodgersia tabularis (Hemsley) Komarov = *Astilboides tabularis* (Hemsl.) Engler.

R. prillieuxii Lévl. in Bull. Soc. Bot. Fr. 51: cxliii (1904) = *Astilbe rivularis* Buch.-Ham. ex Don (cf. Lauener in Notes R.B.G. Edinb. 30:283, 1970).

INDEX TO NUMBERED SPECIMENS CITED

Banerji & Sakya 5608, *nepalensis*.
Cooper 888, *nepalensis*.
Delavay 2457, *pinnata*; 2884, *pinnata*; 3675, *pinnata*.
Dhwoj 0152, *nepalensis*.
Ducloux 690, 691, *sambucifolia*.
Farrer 1016, *henricii*; 1783, *pinnata*.
Farrer & Purdom 132, *aesculifolia*.
Faurie 374, *podophylla*.
Forrest 2339, *pinnata*; 2521, *pinnata*; 5037, *pinnata*; 5665, *pinnata*; 6855, *pinnata*; 8969, *henricii*; 26760, *henricii*; 28113, *pinnata*; 28735, *pinnata*.
Henry 5711, *aesculifolia*.
Kanai et al. 10226, *podophylla*.
Kingdon-Ward 3163, *henricii*; 4117, *sambucifolia*; 19555, indet.
Ludlow, Sherriff & Elliott 13024, *henricii*.
Ludlow, Sherriff & Taylor 4635a, indet.; 4635b, *aesculifolia*; 5836, *aesculifolia*; 13709, indet.
McCosh 391, *nepalensis*.
McLaren AC 81, *aesculifolia*; B46, *pinnata*.
Maire 277, *sambucifolia*; 470, *sambucifolia*; 898, *sambucifolia*; 1115, *sambucifolia*; 1417, *sambucifolia*; 2542, *sambucifolia*; 2544, *sambucifolia*.
Mombeig 102, *pinnata*.
Rock 3662, indet.; 3787, *pinnata*; 4400, *pinnata*; 4600, 4601, *pinnata*.
Schilling 915, *nepalensis*.
Schneider 1380, indet.; 3606, *pinnata*.
Stainton 4619, *nepalensis;* 6568, *nepalensis*.
Ten 55, *pinnata*.
Wilson 1054, *aesculifolia*; 3611, *pinnata*.
Yü 13813, indet.; 16905, *henricii*; 19260, *henricii*; 20113, *henricii*.

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