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STUDIES ON THE GESNERIACEAE OF THE OLD WORLD XXIV: TENTATIVE KEYS TO THE TRIBES AND GENERA.

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These studies are yet far from completion and a final re-classification of the genera can only come at the end of the work. Nevertheless the publication of tentative keys to the tribes and genera likely to be adopted is justified, if only so that those working on specialized aspects of the group have a reasonable outline on which to arrange their data. In particular the cytological work of my colleague, Dr. J. Ratter, requires a more up-to-date taxonomic background than any at present available.

The words "of the Old World" included in the general title of this series of papers were never intended to give the studies a regional limitation: they were a forecast that the *Gesneriaceae* of this area would prove to form a definable taxonomic group. This view was in conflict with the major current classifications of Bentham (1873), C. B. Clarke (1883) and K. Fritsch (1893–94), but could be regarded as harking back towards the views of Lindley (1836) and De Candolle (1838, 1845), both of whom restricted *Gesneriaceae* to the New World genera and maintained *Cyrtandraceae*, consisting of the Old World genera, as a distinct family. Yet the division cannot quite be drawn geographically.

At present it seems likely that the New World subfamily, *Gesnerioideae* (as here understood) is represented in the Old World by two tribes, both southern in distribution. The tribe *Mitrarieae*, which has three monotypic genera in temperate South America, has a fourth monotypic genus, *Fieldia*, in New South Wales. The tribe *Coronanthereae* has 3–4 genera in New Caledonia, New Zealand and Lord Howe Island.

Both *Fieldia* and *Rhabdothamnus* (the only genus of *Coronanthereae* yet in cultivation) have seedlings with equal cotyledons and in this agree with the New World subfamily *Gesnerioideae*. All members of the Old World subfamily *Cyrtandroideae* that have been cultivated have had cotyledons which become unequal in size soon after germination: one enlarges, the other withers. The ultimate fate of the enlarged cotyledon varies and full discussion of this is reserved for a later paper; the essential fact is just the development of some inequality in size (anisocotyly).

Therefore I am proposing to group all the anisocotylous Old World genera under one subfamily (*Cyrtandroideae*), all the isocotylous New World genera, with the addition of *Coronanthereae* and *Fieldia*, under the other subfamily (*Gesnerioideae*).

This arrangement is more in accordance with the apparent affinities of the genera than either the purely geographical division, or the separation of the two subfamilies according to the position of the ovary, superior in *Cyrtandroideae* inferior in *Gesnerioideae*, as in both Genera Plantarum and Pflanzenfamilien.

It may be objected that the definition of a subfamily by a single feature of the seedling stage is bad taxonomy. It is certainly inconvenient taxonomy and every effort is being made to find characters of inflorescence, placenta, seed coat, pollen etc. to re-inforce it. All these are useful in some cases, but are less consistent than seedling morphology appears to be. This work is still going on and it is premature to attempt a full report.

Although the subfamilies and tribes are rather drastically remodelled, little change in nomenclature is needed. I am raising *Mitrarieae* to full tribal rank, as these genera seem as close to *Beslerieae* and *Columneae* in many respects as they are to *Coronanthereae*, under which Fritsch gave them subtribal status. Also, with considerable hesitation, I am giving full tribal rank to *Loxonieae*, despite being able to refer to it only three or four genera. The status of this group is certainly one point in the new classification which needs further investigation.

The other drastic change I have made to Fritsch's arrangement stems from the view that the great bulk of the Afro-Asian capsular *Cyrtandroideae* (other than the *Trichosporeae*) are not only rather closely interrelated, but interrelated in ways which we do not yet at all understand. Thus an enlarged concept of *Didymocarpeae* here embraces four other tribes distinguished by Fritsch, and recognition is also withdrawn from all the subtribal units.

The purpose of this paper is merely to give an outline of the classification in working use: not a full justification of it, nor a discussion of the features and views of affinity on which it is based. The keys which follow are far from perfect, but it is believed that they will work for most of the named species, and many that are yet unnamed. In the keys the genera have been numbered and following each key notes are given, where necessary, according to these generic numbers. Synonyms are not given in the enumeration but are included in the index.

It should be said that the tribes are arranged in this order because some order is unavoidable and this seems no less reasonable than any other. It implies nothing as to evolutionary sequence for the adequate reason that nothing is known.

The elaboration of this work into a more satisfactory memoir is under way and corrections to it will therefore be very welcome, as will specimens for examination and seeds or plants for growing.

Key to the Tribes of Gesneriaceae in the Old World

1a. Fruit indehiscent 2
1b. Fruit dehiscent 3

2a. Fruit-wall thin and smooth, the fleshy substance being in the enlarged placentae; seedlings isocotylous 7. *Gesnerioideae-Mitrarieae*

2b. Fruit wall crustaceous or fleshy, the placentae sometimes fleshy as well; seedlings (where known) becoming anisocotylous 1. *Cyrtandroideae-Cyrtandreae*

3a. Seeds with at least one hair or hair-like process at each end, or with one hair and capillary funicle 2. *Cyrtandroideae-Trichosporeae*

3b. Seeds not appendaged 4

4a. Flowers truly racemose, each pedicel strictly axillary to a bract. Genus anomalum . . 74. *Titanotrichum* Solereder

4b. Flowers cymose, if pseudo-racemose pedicels not strictly axillary to bracts 5

5a. Flowers pseudo-racemose or in a 2-ranked helicoid cyme or sub-capitate or in sessile groups on stalk and midrib of the solitary leaf; leaves alternate and often unequal-sided at base or plants unifoliate; forked hairs sometimes present; stem with medullary vascular bundles and secretory canals . 3. *Cyrtandroideae-Klugieae*

5b. Flowers in an open cyme, flowers 2 being borne at each dichotomy, rarely in axillary pairs or the pedunculate cyme reduced to a single flower; plants (so far as is known) without medullary vascular bundles or secretory canals 6

6a. Ovary ovoid or subspherical, style sharply marked off from it; leaves (except in the square-stemmed *Cyrtandromoea*) commonly very asymmetric at base and one member of each pair very much reduced . . . . 4. *Cyrtandroideae-Loxonieae*

6b. Ovary conical or linear, more or less gradually narrowed into the style; leaves not usually very asymmetric at base and (except when adult shoot is more or less unifoliate) both members of a pair well developed (though sometimes a little unequal) . . . 7

7a. Capsule variously dehiscent usually loculicidal, if septicidal the valves separating from the tips; acaulescent or caulescent herbs, scarcely shrubs; seedlings (where known) becoming anisocotylous; fertile stamens 5–2 . . 5. *Cyrtandroideae-Didymocarpeae*

7b. Capsule always short, septicidally dehiscent on both sides below the tip where the valves remain coherent; shrubs; seedlings (where known) isocotylous; fertile stamens 5–4 6. *Gesnerioideae-Coronanthereae*

Subfam. Cyrtandroideae Endl., Gen. Pl. 715 (1839).

Trib. 1, Cyrtandreae

Key to Genera of Cyrtandreae

1a. Fertile stamens 4 2

1b. Fertile stamens 2 4

2a. Anthers all 2-celled 3

2b. Shorter pair of anthers 1-celled only 1. *Hexatheca* C. B. Cl.

3a. Corolla tube not exceeding 6 mm. long . 2. *Rhynchotechum* Bl.
3b. Corolla tube at least 1 cm. long, shortly 4-lobed 3. *Protocyrtandra* Hosakawa
4a. Fertile stamens the postero-lateral pair 4. *Sepikaea* Schlechter
4b. Fertile stamens the antero-lateral pair 5. *Cyrtandra* J. R. & G. Forst.

Notes

1. *Hexatheca* C. B. Clarke has a fruit whose wall decays on the plant and liberates the seed, leaving the vascular structure behind. As this may be mistaken for old fruit valves and as the fruit is technically dehiscent the genus is also keyed out under *Didymocarpeae*.
2. *Rhynchotechum* Bl. includes *Isanthera* Nees (see Notes R.B.G. Edinb. xxiv, 35: 1962).
5. *Cyrtandra* J. R. & G. Forst. is a vast genus, yet must be enlarged to include *Cyrtandropsis* Lauterb., which was distinguished solely by its dioecious flowers (cf. Burtt in Kew Bull. 1936, 464). The necessary specific transfers are not yet made pending critical examination of material.

Trib. 2, Trichosporeae K. Fritsch in Engl. & Prantl, Natürl. Pflanzenfam. iv (3B), 152 (1895).

Syn.: Subtribus *Trichosporeae* G. Don, Gen. Syst. iv, 64 (1838); C. B. Clarke in DC., Mon. Phan. v (1), 18 (1883) et in Hook. fil., Fl. Brit. Ind. iv, 336 (1884).
Subtribus *Aeschynantheae* A.DC. in DC., Prodr. ix, 260 (1845); Bentham in Benth. & Hook. f., Gen. Pl. ii, 994 (1873).
Subtribus *Lysionoteae* A.DC. in DC., Prodr. ix, 263 (1845).

Key to Genera of Trichosporeae

1a. Corolla short, campanulate, not exceeding the calyx-lobes 6. *Micraeschynanthus* Ridley
1b. Corolla tubular, much exceeding the calyx . . . 2
2a. Anthers exserted (if scarcely so, then corolla bright red) . 3
2b. Anthers included, corolla never bright red . . . 7
3a. Leaves opposite or whorled, more or less equal, more or less entire, leathery or fleshy. 4
3b. Leaves very unequal or apparently alternate, often strongly toothed, herbaceous 6
4a. Calyx spathaceous, split abaxially . 7. *Oxychlamys* Schlechter
4b. Calyx split equally into 5 segments, or tubular or campanulate with short lobes. 5
5a. Terrestrial and erect . . . 8. *Euthamnus* Schlechter
5b. Epiphytic or scrambling on rocks . 9. *Aeschynanthus* Jack
6a. Corolla-tube arcuate, lobes directed forwards, anthers 2–4 10. *Agalmyla* Bl.
6b. Corolla-tube straight, lobes spreading, anthers 4 11. *Dichrotrichum* Reinw.

7a. Fertile stamens 2; anthers with hooked connective; leaves fleshy more or less equal, often whorled; corolla with yellow lines in throat . . . . . 12. *Lysionotus* G. Don

7b. Fertile stamens 4; anther-connective not hooked; leaves thin, very unequal, never whorled; corolla ventricose, spotted within 13. *Loxostigma* C. B. Cl.

Notes

8. *Euthamnus* Schlechter scarcely seems more than an anomalous *Aeschynanthus*, but not having seen any material I maintain it for the time being.

10. *Agalmyla* Bl. is not consistently diandrous as it is always said to be. Probably the type species itself, *A. parasitica* (Lam.) O. Kuntze (=*A. staminea* Bl.) can be tetrandrous on occasion (see material in herb. Leiden). Certainly *Dichrotrichum* section *Agalmylopsis* Schlechter (in Fedde Rep. Sp. Nov. xvi, 212: 1920) belongs here, as does Kränzlin's Bornean species *Cyrtandra dolichocarpa*. How many species there may be awaits critical investigation.

11. *Dichrotrichum* Reinw. See above under 10, *Agalmyla*.

13. *Loxostigma* C. B. Cl. The affinity of this genus with the rest of the tribe seems remote: see note on genus 30, *Briggsia*, for its affinity with *Didymocarpeae*.

N.B.—The genus *Tetradema* Schlechter is omitted from this key. It seems that *T. rubrum* (Merr.) Schlechter has best claim to be taken as the lectotype, since it was an examination of this species which was the starting point for Schlechter's recognition of the genus. Yet the vital diagnostic characteristic, the capillary funicle, was only observed in one of the four species, *T. praelongum* (Kraenzl.) Schlechter. The group is doubtfully homogeneous and can scarcely be given generic rank in the present state of knowledge. I have not been able to confirm the capillary funicle in material available to me.

Trib. 3, Klugieae K. Fritsch in Engler & Prantl, Natürl. Pflanzenfam. iv (3B), 143 (1893), 154 (1894).

Syn.: Subtrib. *Loxotieae* G. Don, Gen. Syst. iv, 664 (1838).
Subtrib. *Epithemeae* DC., Prodr. ix, 278 (1845).

Key to the Genera of Klugieae

1a. Fertile stamens 4 2

1b. Fertile stamens 2 4

2a. Plants unifoliate; flowers in 2-ranked helicoid cyme or arising from mid-rib and stalk of leaf. 3

2b. Plants caulescent, leaves usually alternate; inflorescence pseudo-racemose . . . . . 14. *Rhynchoglossum* Bl.

3a. Flowers in pedunculate cymes; calyx 5-lobed; fruit round, thin-walled, circumscissile or rupturing irregularly 15. *Monophyllaea* R.Br.

3b. Flowers arising on stalk and midrib of the leaf; calyx 4-lobed; fruit conical with solid tip . . 16. *Moultonia* Balf. f. & W. W. Sm.

4a. Fertile stamens the antero-lateral pair; corolla with an oblique limb,

more or less personate; inflorescence pseudo-racemose; bracts small, linear . . . . . 14. *Rhynchoglossum* Bl.

4b. Fertile stamens the postero-lateral pair; corolla almost regular; inflorescence capitate, enclosed by a leafy bract split on one side 17. *Epithema* Bl.

Notes

14. *Rhynchoglossum* Bl. includes *Klugia* Schlechtd. (see Notes R.B.G. Edinb. xxiv, 167: 1962). It is the only genus of *Cyrtandroideae* occurring on the American continent, where the presence of three species distinct from the Asiatic ones precludes any idea of its recent introduction.

16. *Moultonia* Balf. f. & W. W. Sm.: as recently suggested by van Steenis (in Blumea, xi, 133: 1961) this requires reinvestigation: it may not be distinct from *Monophyllaea*. Medullary vascular bundles are present in the stem.

17. *Epithema* Bl.: I do not think any anatomical observations on this genus have yet been published, but examination of a specimen (Barnes 928) from Southern India has shown the medullary vascular bundles and the secretory canals which Wonisch (1909) found characteristic of *Rhynchoglossum* and *Monophyllaea* and the medullary vascular bundles have been observed in the field in Sarawak.

Trib. 4, Loxonieae B. L. Burtt, **tribus nova.**

Syn.: Subtrib. *Loxonieae* A.DC. in DC., Prodr. ix, 274 (1845).

Key to Genera of Loxonieae

1a. Corolla tube short, not exceeding 5 mm., sometimes spurred at base 2

1b. Corolla tube long, exceeding 8 mm., not spurred at base . 3

2a. Stamens included; calyx plicate between the lobes; capsule breaking open irregularly near the middle . 18. *Stauranthera* Benth.

2b. Stamens exserted; calyx deeply 5-fid, lobes acuminate; capsule 2-valved . . . . . 19. *Loxonia* Jack

3a. Calyx small, divided almost to base; herbs with round stems and unequal leaves . . . 20. *Whytockia* W. W. Sm.

3b. Calyx long tubular, sharped toothed; square-stemmed herbs or subshrubs with equal leaves . . 21. *Cyrtandromoea* Zoll.

Notes

21. *Cyrtandromoea* Zoll. is included here for want of a better place. The genus needs a thorough re-investigation. Vegetatively it resembles some species of *Cyrtandra*, but calyx and capsule are against this affinity as well as the shape of ovary and style. In these it resembles not only the other members of *Loxonieae* but also *Rehmannia* and *Brookea*, two genera that seem best excluded from Gesneriaceae.

Trib. 5, Didymocarpeae Endl., Gen. Pl. 716 (1839); DC., Prodr. ix, 259 (1845); K. Fritsch in Pflanzenfam. iv (3B), 142 (1893), 145 (1894).

Syn.: Fam. *Didymocarpaceae* D. Don in Edinb. Phil. Journ. vii, 83 (1822).

Subtrib. *Didymocarpeae* G. Don, Gen. Syst. iv, 658 (1838); Bentham in Benth. & Hook. fil., Gen. Pl. ii, 995 (1873); C. B. Cl., Mon. 61 (1883) et in Hook. fil., Fl. Brit. Ind. iv, 336 (1884).
Subtrib. *Eudidymocarpeae* DC., Prodr. ix, 258 (1845).
Subtrib. *Liebigeae* A.DC. in DC., Prodr. ix, 259 (1845).
Subtrib. *Loxocarpeae* A.DC. in DC., Prodr. ix, 277 (1845).
Subtrib. *Ramondeae* A.DC. in DC., Prodr. ix, 272 (1845).
Subtrib. *Leptoboeae* C. B. Cl. in Hook. fil., Fl. Brit. Ind. iv, 336 (1884).
Trib. *Streptocarpeae* K. Fritsch in Pflanzenfam. iv (3B), 150 (1894).
Trib. *Hemiboeae* K. Fritsch in Pflanzenfam. iv (3B), 156 (1894).
Trib. *Ramondieae* K. Fritsch in Pflanzenfam. iv (3B), 144 (1893). .
Trib. *Championeae* K. Fritsch in Pflanzenfam. iv (3B), 143, 148 (1894).
Subtrib. *Conandrinae* K. Fritsch in Pflanzenfam. iv (3B), 145 (1894).
Subtrib. *Oreocharidineae* K. Fritsch in Pflanzenfam. iv (3B), 145 (1894).
Subtrib. *Roettlerineae* K. Fritsch in Pflanzenfam. iv (3B), 146 (1894).
Subtrib. *Championeae* K. Fritsch in Pflanzenfam. iv (3B), 148 (1894).
Subtrib. *Trisepalineae* K. Fritsch in Pflanzenfam. iv (3B), 149 (1894).

Key to Genera of Didymocarpeae

1a. Fertile stamens 5–4 2
1b. Fertile stamens 2 28
2a. Plants with short contracted stems, a rosette of basal leaves and axillary pedunculate inflorescences 3
2b. Stems distinctly caulescent with distinct internodes, or rarely the stalk topped by a single pair of very unequal leaves . . 19
3a. Fertile stamens 4–5, the same number as the corolla lobes . 4
3b. Fertile stamens 4; corolla lobes 5 7
4a. Anthers exserted from the rotate 5-lobed corolla forming a central cone, each anther with a long terminal appendage 22. *Conandron* Sieb. & Zucc.
4b. Anthers without terminal appendages 5
5a. Anthers exserted at mouth of corolla-tube . . . 6
5b. Anthers included; corolla-lobes erect, shorter than the tube 23. *Tengia* Chun
6a. Corolla-tube shorter than spreading lobes, mouth of tube with 4–5 patches of clavate unicellular hairs; anthers longer than filaments; fruit short, ovoid . . . . 24. *Ramonda* L. C. Rich.
6b. Corolla-tube longer than erect lobes, mouth naked; anthers shorter than filaments; fruit long, linear . . . 25. *Bournea* Oliv.
7a. (3) Anthers free 8
7b. Anthers cohering together or in pairs 12
8a. Anthers equalling filaments . . . 26. *Jankaea* Boiss.
8b. Anthers much shorter than filaments 9

9a. Anther-thecae parallel, not confluent on dehiscence . . 10
9b. Anther-thecae divergent at base, lines of dehiscence confluent at tip 11
10a. Anther-connective not bristly; disc annular, entire or shallowly lobed . . . . . 27. *Oreocharis* Benth.
10b. Anther-connective bristly on the back; disc deeply 5-partite 28. *Dasydesmus* Craib
11a. (9) Anthers exserted . . . 29. *Tremacron* Craib
11b. Anthers included, at first coherent in pairs but becoming free on dehiscence . . . . . 30. *Briggsia* Craib
12a. (7) Filaments coiling spirally after dehiscence of anthers; palate of corolla bearded . . . . . 31. *Corallodiscus* Batalin
12b. Filaments not becoming coiled 13
13a. Anthers all cohering together, longer filaments more or less terete and sharply bent in the middle . 32. *Beccarinda* O. Kuntze
13b. Anthers coherent in pairs, or if all 4 together the filaments flat, expanded 14
14a. Fruit short, ovoid 15
14b. Fruit elongate, pod-like 17
15a. Filaments flattened and expanded, the shorter with a marked downward appendage . . . . . 33. *Jerdonia* Wight
15b. Filaments slender, more or less terete 16
16a. Palate shortly bearded; calyx-lobes equal 34. *Haberlea* Friv.
16b. Palate not bearded: calyx-lobed unequal 35. *Cathayanthe* Chun
17a. (14) Corolla ventricose, lower lip larger than upper 30. *Briggsia* Craib
17b. Corolla tubular, lobes subequal 18
18a. Corolla-limb spreading, lobes subequal, tube not inflated on upperside . . . . . 36. *Isometrum* Craib
18b. Corolla limb not spreading, lobes unequal, tube slightly inflated on the upper side above the middle . 37. *Ancylostemon* Craib
19a. (2) Corolla with short tube usually less conspicuous than the limb 20
19b. Corolla with long, conspicuous tube 25
20a. Small rhizomatous herb, each shoot bearing a single pair of unequal leaves, corolla purple with short tube and flat 5-lobed limb 38. *Platystemma* Wall.
20b. Caulescent herbs or shrubby 21
21a. Anthers coherent by their tips, all together or in pairs; internodes short, leaves forming crown at top of short woody stem; plants generally unbranched 22
21b. Anthers free; filaments straight; internodes not congested; plants often branched 23
22a. Anthers of all stamens dithecous; fruit loculicidal 39. *Didissandra* C. B. Cl.
22b. Anthers of shorter stamens monothecous; fruit wall rupturing irregularly . . . . . 1. *Hexatheca* C. B. Cl.

23a. (21) Leaves opposite 24
23b. Leaves alternate . . . . . 40. *Boeica* C. B. Cl.

24a. Corolla 5-lobed, sub-bilabiate; shrubs 41. *Leptoboea* Benth.
24b. Corolla deeply 4-fid; herb from creeping rhizome 42. *Championia* Gardn.

25a. (19) Bracts orbicular, wholly enclosing the young inflorescence 43. *Anna* Pellegrin
25b. Bracts not orbicular 26

26a. Corolla strongly ventricose, spotted; stems erect fleshy with apical cluster of leaves, arising from scaly rhizome . 30. *Briggsia* Craib
26b. Corolla at most weakly ventricose, not spotted; erect or creeping herbs or sub-shrubs 27

27a. Glabrous subshrub . . . 44. *Raphiocarpus* Chun
27b. Hairy herbs, if woody at base usually unbranched 39. *Didissandra* C. B. Cl.

28a. (1) Fertile stamens the postero-lateral pair 45. *Opithandra* B. L. Burtt
28b. Fertile stamens the antero-lateral pair 29

29a. Fruits not spirally twisted when ripe 30
29b. Fruits spirally twisted when ripe (only through half a turn if the fruit is very short) 49

30a. Corolla dominated by the spreading limb; tube short . 31
30b. Corolla with well-developed tube 33

31a. Anther cells parallel . . . 46. *Petrocosmea* Oliv.
31b. Anther cells divergent 32

32a. Lower lip of corolla much exceeding upper, whole limb oblique; leaves membranous, those of a pair unequal 47. *Orchadocarpa* Ridl.
32b. Lower lip of corolla slightly larger than upper, whole limb flat; leaves rather fleshy, those of a pair more or less equal 48. *Saintpaulia* H. Wendl.

33a. (30) Placentae only half-fertile 34
33b. Placentae fully fertile 35

34a. Anther cells parallel . . . . 49. *Hemiboea* C. B. Cl.
34b. Anther cells strongly divergent . . 50. *Chirita* D. Don

35a. (33) Plants unifoliate 36
35b. Plants with more than one leaf 38

36a. Filaments toothed; fruit ovoid . 51. *Acanthonema* Hook.
36b. Filaments not toothed; fruit linear, terete . . . 37

37a. Flowers in long pedunculate open cyme . 52. *Trachystigma* C. B. Cl.
37b. Flowers clustered in leaf axils or arising from petiole 50. *Chirita* D. Don

38a. (35) Corolla actinomorphic . . 53. *Petrocodon* Hance
38b. Corolla zygomorphic 39

39a. Corolla-tube cylindric or infundibuliform; lobes spreading to form an oblique limb 40

39b. Corolla-tube short and broad, more conspicuous than the smallish lobes 44

40a. Petioles winged, lamina deeply sinuate-dentate . . 41

40b. Petioles not winged; lamina entire or toothed . . . 42

41a. Corolla-tube curved, ventricose; filaments curved 54. *Didymocarpus* Wall.

41b. Corolla-tube straight, cylindric; filaments straight 55. *Primulina* Hance

42a. (40) Stigma capitate . . 54. *Didymocarpus* Wall.

42b. Stigma oblique, often bilobed in the horizontal plane . 43

43a. Calyx equally 5 toothed or 5-fid. . 50. *Chirita* D. Don

43b. Calyx bilabiate, the upper lip 3 lobed, the lower 2 lobed 56. *Trisepalum* C. B. Cl.

44a. (39) Filaments spirally twisted . 57. *Tetraphyllum* C. B. Cl.

44b. Filaments not spirally twisted 45

45a. Capsule not or only slightly exceeding the calyx . . 46

45b. Capsule elongate 48

46a. Calyx herbaceous, bilabiate . . 58. *Phylloboea* Benth.

46b. Calyx small, divided to base into 5 linear lanceolate lobes . 47

47a. Fruit swollen on upper side at base . 59. *Loxocarpus* R. Br.

47b. Fruit not swollen on upper side at base . 60. *Linnaeopsis* Engl.

48a. (45) Corolla-tube not gibbous, lobes rounded, broad 61. *Paraboea* (C. B. Cl.) Ridl.

48b. Corolla gibbous, lobes tooth-like . 62. *Codonoboea* Ridl.

49a. (29) Corolla with bearded palate and circlet of thick hairs continuing right round the corolla-mouth 63. *Ornithoboea* C. B. Cl.

49b. Corolla lacking beard and circlet (although the palate is sometimes shortly hairy) 50

50a. Flowers arising in the leaf-axils in pairs; pedicels long and slender; anthers bearded; stems numerous, thin and woody 64. *Rhabdothamnopsis* Hemsl.

50b. Flowers in pedunculate cymes (rarely solitary on long peduncles); anthers not bearded 51

51a. Anthers large, yellow, held at mouth of corolla tube or shortly exserted . . . . . 65. *Boea* Lam.

51b. Anthers included, not bright yellow 52

52a. Calyx bilabiate, the upper lip 3-lobed, the lower divided almost to the base into 2 segments . . . 66. *Dichiloboea* Stapf

52b. Calyx equally 5-lobed, or usually 5-partite . . . 53

53a. Bracts large, enclosing young inflorescence, calyx-segments spathulate . . . . . 67. *Chlamydoboea* Stapf

53b. Bracts small, linear or lanceolate 54

54a. Leaves forming a regular rosette on a central woody axis, drying blackish; hairs on leaves with calcareous coating 65. *Boea* Lam.

54b. Caulescent or acaulescent or unifoliate herbs: if leaves forming a rosette the first one cotyledonary in origin and the remainder adventitious (no central woody axis); hairs without calcareous coating. . . . . 68. *Streptocarpus* Lindl.

Notes

30. *Briggsia* Craib. At 11b we are dealing only with *B. aurantiaca* B. L. Burtt which, in androecial characters, bridges the gap between *Briggsia* and *Oreocharis* (No. 26). The bulk of the genus keys out at 17a, but *B. kurzii* (C. B. Cl.) W. E. Evans (and *B. amabilis* (Diels) Craib, if distinct) comes down at 26a because of the caulescent habit. This species has an underground scaly rhizome and may be a terrestial ally of the epiphytic *Loxostigma* (No. 12, in *Trichosporeae*). Its seeds are very similar except that they end in short points instead of definite appendages, but the appendages of *L. cavaleriei* (Lévl.) B. L. Burtt are much shorter than those of the better known *L. griffithii* (Wight) C. B. Cl.

32. *Beccarinda* O. Kuntze. Plants that have been drawn up or have straggled enough to miss the rosette side of the key at 2a will end up at 22a in *Didissandra*. Whether the genera are really distinct, or whether part of *Didissandra* should go to *Beccarinda* rather than the latter being reduced, is yet uncertain. *Beccarinda* is a natural assemblage of species; its suggested tropical affinities (cf. Notes R.B.G. Edinb. xxii, 61: 1955) are confirmed by the discovery of unnamed species on Great Natuna Island and Sumatra.

39. *Didissandra* C. B. Cl. One of the big problems in the Malayan Gesneriaceae is to discover some criterion by which to decide whether the dwarf woody species with a crown of leaves at the top of a short unbranched stem are all closely interrelated or whether their present dispersal between *Didissandra*, *Didymocarpus*, *Paraboea* etc. is justified. For the present these genera are maintained, much as by Ridley (Fl. Malay, Penins. ii: 1923). Some specimens of *Beccarinda* may run down here, see note on that genus (No. 32).

44. *Raphiocarpus* Chun is a glabrous shrub of distinctive facies, but there seems little in the way of technical characters to exclude it from *Didissandra*. I have not yet seen material of this plant.

50. *Chirita* D. Don keys out at more than one place and is one of the most interesting and heterogeneous genera. At 34b it is only sect. *Gibbosaccus* C. B. Cl. that will come down. Sect. *Micromusa* will be found (in part) at 37b, while the bulk of the genus comes at 43a.

54. *Didymocarpus* Wall. is another very varied genus (in its present uncertain concept). Most of the genus, including sect. *Didymocarpus*, comes out at 42a, but part of sect. *Orthoboea* at 41a. See also note on No. 39, *Didissandra*.

56. *Trisepalum* C. B. Cl. will contain, in this key, Craib's genus *Damrongia*. The specific transfer has not been made, but I am at present at a loss to see how the genera can be kept apart.

58. *Phylloboea* Benth.—see Notes R.B.G. Edinb. xxiii, 89 (1960).

65. *Boea* Lam. The genus keys out at 51a except for the anomalous *B. clarkeana* Hemsl. which comes down next to *Streptocarpus* at 54a.

It may really belong there but it would be anomalous in that genus also, so I leave it in *Boea* for the time being. Despite Schlechter's remarks (in Engl. Bot. Jahrb. lviii, 255: 1923) and his revival of *Dorcoceras* Bunge, I feel bound to retain *Boea*, temporarily at least, in its wider concept.

Subfam. Gesnerioideae.

Trib. Coronanthereae K. Fritsch in Engler & Prantl, Natürl. Pflanzenfam. iv, 3B, 143 (1893), 160 (1894)—sub Subfam. *Cyrtandroideis.*

Key to Genera of Coronanthereae

1a. Fertile stamens 5; corolla regular . . 69. *Depanthus* S. Moore
1b. Fertile stamens 4; corolla somewhat irregular 2
2a. Leaves opposite 3
2b. Leaves alternate . . . . 70. *Negria* F. Muell.
3a. Flowers in pedunculate cymes; leaves leathery much longer than broad . . . . . 71. *Coronanthera* C. B. Cl.
3b. Flowers paired in the leaf-axils; leaves betuloid, not much longer than broad . . . . 72. *Rhabdothamnus* A. Cunn.

Notes

70. *Negria* F. Muell. is endemic to Lord Howe Island. Seed received as this plant has germinated at Edinburgh and produced seedlings in which the cotyledons became unequal. However after 3 years growth the plants have not yet begun to show any real resemblance to *Negria*. and until they come to flower the determination must be in doubt.

Tribe Mitrarieae B. L. Burtt, **tribus nova**

Syn.: Trib. *Coronanthereae* subtrib. *Mitrariineae* K. Fritsch in Engler & Prantl, Natürl. Pflanzenfam. iv (3B), 143 (1893), 161 (1894).

Key to Genera of Mitrarieae

1a. Fertile stamens 2 only, the postero-lateral pair; anthers exserted. S. America . . . . . *Sarmienta* Ruiz & Pavon*
1b. Fertile stamens 4 2
2a. Corolla-lobes more than half as long as the tube, unequal, forming a spreading bilabiate limb; anthers all coherent. S. America *Asteranthera* Klotsch & Hanst.
2b. Corolla-lobes much shorter than the tube, more or less equal 3
3a. Anthers held at mouth of corolla-tube between the lobes, not contiguous; fls. cream-coloured. Australia 73. *Fieldia* F. Muell.
3b. Anthers exserted, lightly coherent to one another; fls. bright red. S. America . . . . . *Mitraria* Cav.

Genus anomalum

74. *Titanotrichum* Solereder. There is a discussion on the affinities of

*Nomen ad conservandum a D.L. Denham propositum (Taxon, x, 246: 1961).

this genus by Sealy (in Bot. Mag. N.S. t. 78: 1949), to which, however, must be added the information that underground scaly rhizomes are found in the Himalayan *Briggsia kurzii*, *Platystemma violoides* and others. They do not, however, form the catkin-like structures of *Titanotrichum*. There is again, no knowledge of the seedling structure of this plant and attempts to get it to set fruit in cultivation have so far failed.

Genera excludenda*

Brookea Benth. was placed in Scrophulariaceae by its author and, to the best of my knowledge, only Hallier has wished to transfer it to Gesneriaceae. He gives no convincing reason, but the tubular bilabiate corolla with two raised yellow ridges on the lower lip is very much of a Gesneriaceous pattern. It is not possible, however, to find a close affinity for it in this family, where the racemose inflorescence is unusual; the need, mentioned above, for a careful comparison between *Brookea* and *Cyrtandromoea* being the only hint yet available. *Brookea* is at present best regarded as a slightly anomalous member of Scrophulariaceae, a family in which anomalous genera (cf. in E. Asia *Brandisia*, *Wightia*) are rather frequent and whose limits need a thorough overhaul.

Charadophila Marloth in Engl. Bot. Jahrb. xxvi, 358 (1899); K. Schum. in Just, Bot. Jahresb. xxvii (1), 542 (1899); Hiern in Harv. & Sond., Fl. Cap. iv (2), 370 (1904); K. Fritsch in Engl. & Prantl, Pflanzenfam. Nachtr. III zu iv (3B), 318 (1908); Marloth, Fl. S. Afr. iii (1), 115, 129, t. 29c (1932).

Originally placed in Scrophulariaceae by Marloth, Engler started the dispute about its position at once by adding a footnote to Marloth's paper to the effect that, despite its bilocular ovary, he considered *Charadophila* to belong to Gesneriaceae. Of later authors K. Schumann and Hiern have accepted the Scrophulariaceous position and it has been reiterated by Marloth. K. Fritsch followed Engler and added the genus to Gesneriaceae, placing it next to *Leptoboea*. If Gesneriaceous the affinity of *Charadrophila* must be with *Linnaeopsis*. I am, however, inclined to leave the genus in Schrophulariaceae where the bilocular ovary places it. It may be noted that there are no tetrandrous Gesneriaceae known from Africa and that *Charadrophila* does not have the cymose inflorescence of twinned flowers characteristic of the Old World members of the family. Examination of the seedlings would clinch the matter.

Periomphale Baill. was excluded from Gesneriaceae by K. Fritsch and the description of the plant seems to justify this although no one has yet suggested where it ought to be classified. I have seen no material of this genus.

Rehmannia Libosch. has been shuttled between Scrophulariaceae and Gesneriaceae with great frequency. Solereder, after careful study (see Ber. Deutsch. Bot. Ges. xxvii, 393: 1909), placed it in Gesneriaceae, but he was

*Only a few genera on which some comment needs to be made are mentioned here. A few more are in the index, but no attempt has been made to list all genera at one time or another placed in Gesneriaceae.

unaware of the importance of inflorescence and seedling morphology as criteria of Gesneriaceae–Cyrtandroideae. *Rehmannia* has a strict raceme and isocotylous seedlings; Solereder admitted that its anatomical features necessitated extending the description of the family. It seems likely that other studies will strengthen the evidence in favour of excluding it from Gesneriaceae, despite the unilocular ovary.

References

BENTHAM, G. (1873). Gesneriaceae, in Bentham & Hooker fil., *Genera Plantarum*, ii, 989–1025. London.

CLARKE, C. B. (1883). Cyrtandreae (Gesneracearum tribus), in A. & C. De Candolle, *Monographiae Phanerogamarum*, v, 1–303. Paris.

DE CANDOLLE, A. (1838). Gesneriaceae, in *Prodromus Regni Vegetabilis*, vii, 523. Paris.

—— (1845). Cyrtandraceae, in *Prodromus Regni Vegetabilis*, ix, 258, Paris.

FRITSCH, K. (1893–94). Gesneriaceae, in Engler & Prantl, *Die Natürliche Pflanzenfamilien*, iv (3B), 133–185. Leipzig.

LINDLEY, J. (1836). *Natural System of Botany*, ed. 2 (pp. 283, 286). London.

WONISCH, F. (1909). Die Sekretgänge von Monophyllaea, Klugia and Rhynchoglossum. Öst. Bot. Zeitschr. lix, 209–215.

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