Abstract: In recent years significant advances have been made in the taxonomy and classification of the Gesneriaceae, mostly based on molecular-phylogenetic research. This has led to major changes in the classification of the family and the establishment, reestablishment, recircumscription and synonymyisation of many genera. Consequently, the treatment of the Gesneriaceae that was published in Kubitzki's *Families and Genera of Vascular Plants* (FGVP) (Weber, 2004). Since then, significant progress has been made on our understanding of relationships within the family, mainly due to the use of molecular data and phylogenetic analyses, which in turn has led to major changes in the delimitation of genera and the circumscription of infrafamilial taxa. The earliest deployment of molecular data in phylogenetic reconstruction in the Gesneriaceae was exploratory and did not result in changes in classification (e.g., Möller & Cronk, 1997, 2001; Smith & Carroll, 1997; Smith et al., 1997). The first major Old World group to be included in a molecular-phylogenetic analysis was the Epithemateae (Mayer et al., 2003) which is a group that has long been recognised (see Weber et al., 2013). From 2009 onwards, the focus of publications was on the much more speciose and complex group of Old World “Didymocarpoid Gesneriaceae” sensu Weber (2004) (e.g., Möller et al., 2009, 2011a; Weber et al., 2011a). These, and further studies on New World Gesneriaceae (e.g., Clark & Zimmer, 2003; Clark, 2005; Roalson et al., 2005a,b; Clark et al., 2006; Roalson & Clark, 2006; Smith & Clark, 2013), laid the foundation for a new formal classification of the family (Weber et al., 2013) and the establishment, reestablishment, redefinition and synonymyisation of many genera. The classification published in Weber et al. (2013) forms the basis of the present paper and is graphically summarised in Fig. 1. Changes in the number and delimitation of genera that have taken place since 2004 are summarised in Table 1.
In the FGVP treatment (Weber, 2004), keys to all formal and informal groups and all genera then recognised were provided. For the New World Gesneriaceae (“Gesnerioid Gesneriaceae”) keys to the genera were given for each of the tribes then recognised. For the Old World “Didymocarpoid Gesneriaceae” (now subfamily Didymocarpoideae, tribes Epithemateae and Trichosporeae), the genera that are now in Trichosporeae were split into geographical keys. Due to insights from molecular data and the very many changes in generic delimitation, those keys are now largely outdated and in need of revision, particularly for the Old World Gesneriaceae.

The keys provided here are artificial, meaning that they are intended to enable identification of the infrafamilial taxa and genera, but do not reflect phylogenetic affinities. As the taxonomic concepts of most genera are based on a combination of vegetative, floral and fruit characters, having fertile material is still a prerequisite for unambiguous identification.

In many cases, an accurate identification of a taxon can only be done based on an understanding of characters described with specialist terminology. Therefore, we have compiled a short glossary for a better understanding of terms that are uncommon and/or specific to Gesneriaceae, such as “chiritoid stigma” or “plagiocarpic capsule.” Users are encouraged to forward errors and/or inaccuracies in the keys to the authors. It is our intention to periodically update and improve this treatment in response to future changes in classification.

The keys cover all genera that were recognised and published by March 2020. However, we recognise that further research will continue to provide new data that will inevitably lead to a reconsideration of current delimitations. The high rate of species discovery in the family, particularly in Asia, with hitherto unknown morphological diversity, will continually test generic delimitations. The present paper is thus merely a snapshot of the Gesneriaceae at this moment in time.

Technical notes on the keys

(1) Bracketed keys are presented in a hierarchical manner. Firstly there is a key to the subfamilies, then the tribes are keyed out within their subfamilies, and then subtribes (when relevant) within their tribes. The genera are keyed out within their tribes or subtribes.

(2) In a number of places, infrafamilial taxa and genera, particularly heterogeneous ones, appear in a key or subkey in more than one place or in more than one subkey, and are then indicated as such with p.p. (pro parte), or p.p.maj. (pro parte majore). Where appropriate, the name(s) of the genus/genera is/are given for each lead, e.g., subtribe Gesneriinae p.p. (Gesneria, Rhytidophyllum).

(3) If a genus is monospecific, the name of the only species is given in brackets, e.g., Fieldia (only F. australis).

(4) In order to provide a bridge between current genus concepts and those of the FGVP treatment (Weber, 2004), reference is made to the synonymised genera both in Table 1 and in the keys, e.g., Gloxinia p.p. (the former monospecific genus Koellikeria).

(5) The authorships of the infrafamilial taxa (subfamilies, tribes, subtribes) are given in the notes preceding each key. No authorships of the generic or specific names are given in the keys and in the text. These can be found in Weber et al. (2013) and/or in Table 1 for the genera that have been described as new or have undergone substantial changes or synonymisation since 2013.

(6) In the keys the distribution of a genus is given when the genus is narrowly endemic or when geographical information offers an additional contrast in the keys.

(7) Botanical terms explained in the Glossary are marked by a superscript G (e.g., plagiocarpicG). These terms are either more or less specific to Gesneriaceae taxonomy or seldom used in keys or plant descriptions outside the family. Explanations for widely used terms can be found, for instance,
Fig. 1. Diagrammatic representation of the formal classification of Weber et al. (2013) [reproduced from Selbyana 31(2): 75, f.1. 2013; with permission].
Table 1. Survey of genera of Gesneriaceae that have been described as new, reestablished, redefined (bold), synonymised (in square brackets) or removed from the family (in square brackets and bold) since the treatment of Weber (2004).

| Genus          | Original publication | Systematic position (subfamily/tribe/subtribe according to Weber *et al.*, 2013)                                                                 | Kind of change                                                                 | References                                                                 |
|----------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| *Acanthonema*  | Curtis’ Bot. Mag. 88: t. 5339 (1862) | Didymocarpeae Trichosporeae Streptocarpinae                                                                                                        | Synonymised under *Streptocarpus*, together with all other African and Madagascan genera of Trichosporeae | Nishii *et al.* (2015)                                                   |
| *Alloplectus*  | Nov. Gen. Sp. Pl. 3: 53, t. 223 (1829) | Gesnerioideae Gesnerieae Columnneinae                                                                                                              | Redefined and species number reduced from >140 species to 5                 | Clark (2005); Clark *et al.* (2006)                                      |
| *Amalophyllon* | Univ. Calif. Publ. Bot. 6(4): 63 (1914) | Gesnerioideae Gesnerieae Gloxiniiinae                                                                                                              | Reestablished and segregated from *Phinaea*, most species of that genus now in *Amalophyllon* | Boggan *et al.* (2008)                                                   |
| *Ancylostemon* | Notes Roy. Bot. Gard. Edinburgh 11: 233, 257 (1919) | Didymocarpoideae Trichosporeae Didymocarpinae                                                                                                       | Synonymised under *Oreocharis*                                             | Möller *et al.* (2011b)                                                   |
| *Anodiscus*    | in Benth. & Hook. f., Gen. Pl. 2: 998 (1876) | Gesnerioideae-Gesnerieae Gloxiniiinae                                                                                                              | Synonymised under redefined *Gloxinia*                                      | Roalson *et al.* (2005a,b)                                                |
| *Billolivia*   | D.J.Middleton *et al.*, Phytotaxa 161(4): 255 (2014) | Didymocarpoideae Trichosporeae Didymocarpinae                                                                                                       | New genus, based on new collections                                          | Middleton *et al.* (2014)                                                 |
| *Boca*         | Encycl. Méth. 1: 401, fr. Béole (1783), ed. nouv. Padua 1: 396 (1785 [“1784”]) | Didymocarpoideae Trichosporeae Loxocarpinae                                                                                                        | Redefined; some species moved to *Damrongia* and *Dorcoceras*               | Puglisi *et al.* (2016)                                                  |
| *Bournea*      | in Hook.f., Icon. Pl. 23 (Ser. 4): t. 2254 (1893) | Didymocarpoideae Trichosporeae Didymocarpinae                                                                                                       | Synonymised under *Oreocharis*                                             | Möller *et al.* (2011b)                                                   |
| *Briggsia*     | Notes Roy. Bot. Gard. Edinburgh 11: 236 (1919) | Didymocarpoideae Trichosporeae Didymocarpinae                                                                                                       | Synonymised under *Oreocharis* (most species, including type), but some species placed in *Loxostigma*, and 2 spp. in the new genus *Glabrella*, see there | Möller *et al.* (2011b, 2014); Chen *et al.* (2014) |
| *Brookea*      | in Benth. & Hook. f., Gen. Pl. 2: 939 (1876) | Plantaginaceae (?)                                                                                                                                   | Listed under “Excluded genera” in Weber (2004); see discussion in Weber *et al.* (2013: p. 69); ending with “there is no specific evidence that it [Brookea] does belong to Gesneriaceae.” No recent morphological or molecular-phylogenetic studies are available | See discussion under “Problematic and excluded genera” in this paper |
| *Calcareoboea* | Acta Bot. Yunnan. 4: 241 (1982) | Didymocarpoideae Trichosporeae Didymocarpinae                                                                                                       | Synonymised under *Petrocodon*                                             | Wang Y.Z. *et al.* (2011); Weber *et al.* (2011b)                         |
| *Capanee*      | Fl. Serres Jard. Eur. 5: t. 499-500 (1849) | Gesnerioideae Gesnerieae Gloxiniiinae                                                                                                               | Synonymised under *Kohleria*                                               | Roalson *et al.* (2005a)                                                 |
| Genus                  | Author(s)                          | Status and Source                          | Description and Status                                                                 |
|-----------------------|------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------|
| Centrosolenia         | Benth.                             | Gesnerioideae Columnneinae                 | Reestablished after segregation from *Paradrymonia*                                     |
|                       |                                    |                                            | Mora & Clark (2016)                                                                    |
| [Charadrophila]       | Marloth                             | Stilbaceae                                 | Listed under “Excluded Genera” in Weber (2004); now generally referred to Stilbaceae  |
|                       |                                    |                                            | Kornhall (2004); Oxelman et al. (2005); Tank et al. (2006)                             |
| Chautemsia            | A.O.Araujo & V.C.Souza             | Gesnerioideae Gloxiniiinae                 | New genus with unusual character combination; DNA data (from 5 loci) place the genus as |
|                       |                                    |                                            | sister to a clade comprising *Mandirola* and *Goyazia*, or, alternatively, in a clade  |
|                       |                                    |                                            | with *Gloxiniopsis*.                                                                   |
|                       |                                    |                                            | Araujo et al. (2010)                                                                    |
| Chayamaritia          | D.J.Middleton & Mich.Möller         | Didymocarpoideae Trichosporeae Didymocarpinae | New genus, type species formerly in *Chirita* and *Henckelia*                          |
|                       |                                    |                                            | Middleton et al. (2015)                                                                 |
|                       |                                    |                                            |                                                                                       |
| [Chirita]             | Buch. -Ham. ex D.Don                | Didymocarpoideae Trichosporeae Didymocarpinae | Most species of *Chirita* sect. *Chirita* synonymised under *Henckelia*, most remaining |
|                       |                                    |                                            | species of the section moved to the resurrected genus *Damrongia*; *Chirita* sect.     |
|                       |                                    |                                            | *Liebigia* and *Chirita* sect. *Microchirita* raised to generic rank; *Chirita* sect.   |
|                       |                                    |                                            | *Gibbosaccus* synonymised under the hitherto monospecific genus *Primulina*. In        |
|                       |                                    |                                            | consequence, *Chirita* is no longer recognised as a genus                              |
|                       |                                    |                                            | Wang Y.Z. et al. (2011); Weber et al. (2011a)                                          |
| Christopheria         | J.F.Smith & J.L.Clark              | Gesnerioideae Columnneinae                 | New genus (the only species formerly in *Paradrymonia*);                              |
|                       |                                    |                                            | Smith & Clark (2013)                                                                   |
| Codonanthe            | (Mart.) Hanst.                     | Gesnerioideae Columnneinae                 | Redefined, no longer containing ant nest epiphytes                                     |
|                       |                                    |                                            | Chautems & Perret (2013)                                                               |
| Codonanthopsis        | Mansf.                             | Gesnerioideae Columnneinae                 | Redefined, containing ant nest epiphytes                                              |
|                       |                                    |                                            | Chautems & Perret (2013)                                                               |
| Codonoboea            | Ridl.                              | Didymocarpoideae Trichosporeae Didymocarpinae | Reestablished and greatly expanded. Formal transfer of the species of Peninsular       |
|                       |                                    |                                            | Malaysia by Kiew & Lim (2011); formal transfer of species outside of Peninsular         |
|                       |                                    |                                            | Malaysia by Middleton et al. (2013)                                                    |
|                       |                                    |                                            | Weber et al. (2011a)                                                                  |
| [Colpogyne]           | B.L. in Humbert & Leroy, Fl.        | Didymocarpoideae Trichosporeae Streptocarpinae | Synonymised under *Streptocarpus*, together with all other African and Madagascaran   |
|                       | Burtt                               |                                            | genera of Trichosporeae                                                               |
|                       |                                    |                                            | Nishii et al. (2015)                                                                  |
| Genus | Author and Date | Family | Segregation or Reestablishment | Authors and References |
|-------|-----------------|--------|---------------------------------|------------------------|
| **Crantzia** Scop. | | Gesnerioideae Gesnerieae Columnaeinae | Reestablished and redefined after segregation from *Alloplectus* | Clark (2005); Clark et al. (2006) |
| **[Cubitanthus** Barringer] | J. Arnold Arbor. 65: 145 (1984) | Linderniaceae | Listed under “Genera of uncertain familial affiliation” in Weber (2004); now recognised as a member of Linderniaceae | Rahmanzadeh et al. (2005); Perret et al. (2012) |
| **[Cyrtoandromoea** Zoll.] | Syst. Verz. Ind. Arch. 3: 55, 58 (1858) | Phrymaceae | Listed under “Excluded genera” in Weber (2004); now placed in Phrymaceae | Luna et al. (2019); Liu et al. (2020) |
| **Damrongia** Kerr ex Craib | Bull. Misc. Inform. Kew 1918: 364 (1918) | Didymocarpoideae Trichosporeae Loxocarpinae | Reestablished to include several species formerly placed in *Chirita* sect. *Chirita*; inclusion of the Asian species described under *Streptocarpus* | Triboun & Middleton (2010); Puglisi et al. (2016); Puglisi & Middleton (2017c) |
| **[Dayaoshania** W.T.Wang] | Acta Phytotax. Sin. 21: 319 (1983) | Didymocarpoideae Trichosporeae Didymocarpinae | Synonymised under *Oreocharis* | Möller et al. (2011b) |
| **[Deinocellos** W.T.Wang] | Guiliaa 6: 1 (1986) | Didymocarpoideae Trichosporeae Didymocarpinae | Synonymised under *Oreocharis* | Möller et al. (2011b) |
| **Deinosauria** W.T.Wang & Z.Y.Li | Acta Phytotax. Sin. 30(4): 356 (1992) | Didymocarpoideae Trichosporeae Didymocarpinae | Redefined and expanded (genus formerly monospecific); transfer of 5 species from *Primulina* | Möller et al. (2016, 2020) |
| **Didymocarpus** Wall. | Edinburgh Phil. J. 1: 378 (1819) | Didymocarpoideae Trichosporeae Didymocarpinae | Some species moved to *Petrocodon* | Weber et al. (2011b) |
| **[Dolicholoma** D.Fang & W.T.Wang] | Bull. Bot. Res., Harbin 1: 18 (1983) | Didymocarpoideae Trichosporeae Didymocarpinae | Synonymised under *Petrocodon* | Weber et al. (2011b) |
| **Dorcoceras** Bunge | Enum. Pl. China Bor.: 128 (1833 [“1832”]) | Didymocarpoideae Trichosporeae Loxocarpinae | Reestablished after segregation from *Boea*; Thai species revised | Puglisi et al. (2016); Puglisi & Middleton (2017a) |
| **Glabella** Mich. Möller & W.H.Chen | in Möller et al., Gard. Bull. Singapore 66(2): 198 (2014) | Didymocarpoideae Trichosporeae Didymocarpinae | New genus, established to accommodate 2 species of former *Briggsia* | Möller et al. (2014) |
| **Glossoloma** Hanst. | Linnaea 26: 191, 208, 209 (1854 [“1853”]) | Gesnerioideae Gesnerieae Columnaeinae | Reestablished after segregation from *Alloplectus* | Clark (2005, 2009); Clark et al. (2006) |
| **Gloxinella** (H.E.Moore) Roalson & Boggan | Selbyana 25(2): 227 (2005) | Gesnerioideae Gesnerieae Gloxiniae | New genus created by raising *Kohleria* sect. *Gloxinella* to generic rank; monospecific with *G. lindeniana* | Roalson et al. (2005a,b) |
| **Gloxinia** L’Hér. | in Aiton, Hort. Kew. 2: 331 (1789) | Gesnerioideae Gesnerieae Gloxiniae | Redefined and reduced from 15 to 3 species: type species (*G. maculata*, nom. illeg. = *G. perennis*) + inclusion of the two monospecific genera *Koellikeria* and *Anodiscus*, see there | Roalson et al. (2005a,b) |
| **Gloxiniopsis** Roalson & Boggan | Selbyana 25(2): 228 (2005) | Gesnerioideae Gesnerieae Gloxiniae | New genus, segregate of redefined *Gloxinia*, monospecific with *G. racemosa* | Roalson et al. (2005a,b) |
| **Hemiboea** C.B.Clarke | in Hooker's Icon. Pl. 18: t. 1798 (1888) | Didymocarpoideae Trichosporeae Didymocarpinae | Expanded to include *Metabriggsia* | Weber et al. (2011c) |
| Genus | Author | Publication | Synonymisation Notes | Author(s) |
|-------|---------|-------------|----------------------|-----------|
| **Hemiboeopsis** | W.T.Wang | Acta Bot. Yunnan. 6: 397 (1984) | Didymocarpoideae Trichosporeae Didymocarpinaceae | Weber et al. (2011a) |
| **Henckelia** | Spreng. | Anleit. 2: 402 (1817) | Didymocarpoideae Trichosporeae Didymocarpinaceae | Weber et al. (2011a); Middleton et al. (2013) |
| **Hovanella** | A.Weber & B.L.Burtt | Beitr. Biol. Pflanzen 70 (1998 “1997”) | Didymocarpoideae Trichosporeae Didymocarpinaceae | Nishii et al. (2015) |
| **Isometrum** | Craib | Notes Roy. Bot. Gard. Edinburgh 11: 250 (1919) | Didymocarpoideae Trichosporeae Didymocarpinaceae | Möller et al. (2011b) |
| **Jerdonia** | Wight | Icon. Pl. Ind. Orient. 4(2): 10, t. 1352 (1848) | Didymocarpoideae Trichosporeae Jerdoniinae | Möller et al. (2009); Weber et al. (2013) |
| **Koellikeria** | Regel | Index Sem. Hort. Bot. Turic. 4 (1847); Flora 31: 249 (1848) | Gesnerioideae–Gesneriaceae Gloxiniinae | Roalson et al. (2005a,b) |
| **Kohleria** | Regel | Index Sem. Hort. Bot. Turic. 4 (1847); Flora 31: 249 (1848) | Gesnerioideae–Gesneriaceae Gloxiniinae | Roalson et al. (2005a,b) |
| **Lagarosolen** | W.T.Wang | Acta Bot. Yunnan. 6: 11, fig. 1 (1984) | Didymocarpoideae Trichosporeae Didymocarpinaceae | Weber et al. (2011b) |
| **Lesia** | J.L. Clark & J.F.Smith | Syst. Bot. 38(2): 456 (2013) | Gesnerioideae Gesneriaceae Columnineae | Smith & Clark (2013) |
| **Liebigia** | Endl. | Gen. Pl. [Endlicher] 1407 (1841) | Didymocarpoideae Trichosporeae Didymocarpinaceae | Weber et al. (2011a) |
| **Linnaeopsis** | Engl. | Bot. Jahrb. Syst. 28: 482 (1900) | Didymocarpoideae Trichosporeae Streptocarpinaceae | Nishii et al. (2015) |
| **Litostigma** | Y.G. Wei, F.Wen & Mich.Möller | in Wei et al., Edinburgh J. Bot. 67(1): 178 (2010) | Didymocarpoideae Trichosporeae Litostigmataceae | Wei et al. (2010) |
| **Loxocarpus** | R.Br. | Cyrtandreae 120 (1839) | Didymocarpoideae Trichosporeae Loxocarpinaceae | Middleton et al. (2013) based on the results published in Weber et al. (2011a) |
| **Loxostigma** | C.B.Clarke | in A.DC. & C.DC., Monogr. Phan. 5(1): 59 (1883) | Didymocarpoideae Trichosporeae Didymocarpinaceae | Möller et al. (2014) |
| **Mandirola**<br>Decne. | Rev. Hort. 20, ser. 3, 2: 468 (1848) | Gesnerioideae Gesnerieae Gloxiniiinae | Reestablished to accommodate three Brazilian species formerly placed in *Gloxinia*; the three species are very similar to *Achimenes*, and were once included in that genus. However, *Mandirola* is phylogenetically closer to *Goyazia* than to *Gloxinia* or *Achimenes* | Roalson *et al.* (2005a,b); Luna *et al.* (2020) |
|---|---|---|---|---|
| *[Metabriggsia]* **W.T.Wang** | Guihaia 3: 1 (1983) | Didymocarpoideae Trichosporeae Didymocarpinae | Synonymised under *Hemiboea* | Weber *et al.* (2011c) |
| *[Microeschynanthus]* **Ridl.** | Fl. Malay Penins. 5, Suppl.: 324 (1925) | Didymocarpoideae Trichosporeae Didymocarpinae | Synonymised under *Aeschynanthus* | Middleton (2007) |
| **Microchirita**<br>(C.B.Clarke)<br>Yin Z.Wang | J. Syst. Evol. 49(1): 59 (2011) | Didymocarpoideae Trichosporeae Didymocarpinae | New genus after raising *Chirita* sect. *Microchirita* to generic rank | Wang *et al.* (2011) | Weber *et al.* (2011a); Puglisi & Middleton (2017d) |
| **Middletonia**<br>C.Puglisi | in Puglisi *et al.*, Taxon 65(2): 286 (2016) | Didymocarpoideae Trichosporeae Loxocarpinae | New genus (segregate of *Paraboea*) | Puglisi *et al.* (2016); Puglisi & Middleton (2017b) |
| **Neomortoninia**<br>Wiehler | Selbyana 1: 17 (1975) | Gesnerioideae-Gesnerieae Columnneinae | Redefined by segregation of *Pachycaulos* | Smith & Clark (2013) |
| *[Nodonema]* **B.L.Burtt** | Bull. Mus. Natl. Hist. Natl. Paris, 4e sér., 3, sect B, Adansonia 4: 415 (1982 [“1981”]) | Didymocarpoideae Trichosporeae Streptocarpinae | Synonymised under *Streptocarpus*, together with all other African and Madagascan genera of Trichosporeae | Nishii *et al.* (2015) |
| *[Opithandra]* **B.L.Burtt** | Baileya 4: 162 (1956) | Didymocarpoideae Trichosporeae Didymocarpinae | Synonymised under *Oreocharis* | Möller *et al.* (2011b) |
| **Oreocharis**<br>Benth. | in Benth. & Hook.f., Gen. Pl. 2: 1021 (1876) | Didymocarpoideae Trichosporeae Didymocarpinae | Redefined and considerably expanded through addition of species from 10 genera and through newly described species | Möller *et al.* (2011b, 2014); Middleton *et al.* (2013); Möller (2019); Wen *et al.* (2019) |
| **Pachycaulos**<br>J.L.Clark & J.F.Smith | Syst. Bot. 38(2): 458 (2013) | Gesnerioideae Gesnerieae Columnneinae | New monospecific genus, established for *P. nummularia*, a species formerly ascribed to various genera such as *Alloplectus*, *Columnnea*, *Hypocyrta*, and *Neomortoninia* | Smith & Clark (2013) |
| **Pagothyra**<br>(Leeuwenb.)<br>J.F.Smith & J.L.Clark | Syst. Bot. 38(2): 461 (2013) | Gesnerioideae Gesnerieae Columnneinae | New monospecific genus created by the raising of *Episcia* sect. *Pagothyra* to generic rank | Smith & Clark (2013) |
| Paraboea                      | J. Straits Branch Roy. Asiatic Soc. 44: 63 (1905) | Didymocarpoideae Trichosporeae Loxocarpaceae | Redefined by inclusion of Phylloboea and Trisepalum; segregation of Middletonia, and description of more than 20 new species | Puglisi et al. (2011, 2016) Triboun & Middleton (2012) |
|-----------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Paradrymonia                | Linnaea 26: 180, 207 (1854 [“1853”])           | Gesnerioideae Gesnerioidae Gesnerieae Columnneinae | Redefined after segregation and reestablishment of Trichodyrmonia and Centrosolenia                              | Mora & Clark (2016)                                    |
| [Paraisometrum] W.T.Wang    | in Weitzman et al., Novon 7: 431 (1998 [“1997”]) | Didymocarpoideae Trichosporeae Didymocarpinae | Synonymised under Oreocharis                                                                                     | Möller et al. (2011b)                                  |
| Paralagarosolen Y.G.Wei     | Acta Phytotax. Sin. 42(6): 528 (2004)          | Didymocarpoideae Trichosporeae Didymocarpinae | Synonymised under Petrocodon                                                                                   | Wang Y.Z. et al. (2011); Weber et al. (2011b)          |
| Petrocodon Hance            | J. Bot. 21: 167 (1883)                         | Didymocarpoideae Trichosporeae Didymocarpinae | Redefined and expanded to include Calcareoboea, Dolicholoma, Paralagarosolen, Tengia, and some species of Didymocarpus | Wang Y.Z. et al. (2011); Weber et al. (2011b)          |
| Phinaea Benth.              | in Benth. & Hook.f., Gen. Pl. 2: 997 (1876)    | Gesnerioideae Gesnerieae Gloxininae            | Reduced to 3 species, the large remainder transferred to the reestablished genus Amalophyllon                   | Boggan et al. (2008)                                  |
| [Phylloboea Benth.]          | in Benth. & Hook.f., Gen. Pl. 2: 102 (1876) (“Phylloboea”) | Didymocarpoideae Trichosporeae Loxocarpinae | Synonymised under Paraboea                                                                                     | Puglisi et al. (2011)                                  |
| Primulina Hance             | J. Bot. 21: 169 (1883)                         | Didymocarpoideae Trichosporeae Didymocarpinae | Redefined and enormously expanded by the inclusion of species hitherto placed in Chirita sect. Gibbosacus, Chiritopsis and Wentiaiopea p.p. and many newly described species | Wang Y.Z. et al. (2011); Weber et al. (2011a); Möller (2019); Wen et al. (2019) |
| Rachunia D.J.Middleton & C.Puglisi | Nordic J. Bot. 36(11)-e01992: 4 (2018)     | Didymocarpoideae Trichosporeae Didymocarpinae | New genus, based on new collections                                                                               | Middleton et al. (2018)                                |
| Rehmannia Libosch. ex Fisch. & C.A.Mey. | Index Sem. Hort. Petrop. 1: 36 (1835)       | Orobanchaceae                                  | Listed under “Excluded genera” in Weber (2014); early molecular-phylogenetic studies suggested a placement in Phrymaceae; Xia et al. (2009) found that Rehmannia + Triacophora are sister to Lindenbergia + Orobanchaceae. Finally, APG IV enlarged Orobanchaceae to include Rehmannia, Triacophora and Lindenbergia as the only non-parasitic members of the family. | Xia et al. (2009); APG IV (2016) |
| [Saintpaulia H.Wendl.]      | Gartenflora, 42: 321, t. 1391 (1893)          | Didymocarpoideae Trichosporeae Streptocarpinae | Synonymised under Streptocarpus, together with all other African and Madagascan genera of Trichosporeae              | Christenhusz (2012); Nishii et al. (2015)              |
| Sanango Bunting & Duke      | Ann. Missouri Bot. Gard. 48: 270 (1961)        | Sanangoideae                                   | Included in Gesnerieae and accommodated in a third subfamily, Sanangoideae                                      | Weber et al. (2013)                                    |
| Genus | Notes | Synonymised under | Reestablished/Segregated From | Reeffected from | New Genera/Based On New Collections |
|-------|-------|-------------------|------------------------------|----------------|-----------------------------------|
| Schizoboea (Fritsch) B.L.Burtt | Notes Roy. Bot. Gard. Edinburgh 33: 266 (1974) | Streptocarpus | Synonymised under Streptocarpus | Nishii et al. (2015) | Synonymised under Streptocarpus |
| Seemania Regel | Gartenflora 4: 183 (1855) | Streptocarpus | Reestablished after segregation from the redefined genus Gloxinia (see there) | (2005a,b) | New genus, based on new collections |
| Shuaria D.A.Neill & J.L.Clark | in Clark et al., Syst. Bot. 35(3): 670 (2010) | Streptocarpus | New genus, based on new collections | Clark et al. (2010) | New genus, based on new collections |
| Somrania D.J. Middleton | in Middleton & Triboun, Thai Forest Bull., Bot. 40: 9–13 (2012) | Streptocarpus | New genus, based on new collections | Middleton & Triboun (2012, 2013) | New genus, based on new collections |
| Sphaerorrhiza Roalson & Boggan | Selbyana 25(2): 236 (2005) | Streptocarpus | New genus, segregate of redefined Gloxinia | Roalson et al. (2005a) | New genus, segregate of redefined Gloxinia |
| Streptocarpus Lindl. | Bot. Reg. 14, t. 1173 (1828) | Streptocarpus | Redefined and expanded to include all (9) genera of Trichosporeae from Africa and Madagascar; Asian species moved to Damrongia | Nishii et al. (2015); Puglisi et al. (2016); revision of Thai Damrongia spp.: Puglisi & Middleton (2017c) | New name for Tetraphyllum (because thought to be an earlier homonym of a fossil angiosperm), but now considered superfluous |
| [Tengia Chun] | Sunyatsenia 6: 279 (1946) | Didymocarpinae | Synonymised under Petrocodon | Wang Y.Z. et al. (2011); Weber et al. (2011b) | Synonymised under Petrocodon |
| [Tetraphylioides Doweld] | Phytotaxa 329(3): 293 (2017) | Didymocarpinae | New name for Tetraphyllum | Doweld (2017); Bertling (2019) | Didymocarpinae |
| [Thamnocharis W.T.Wang] | Acta Phytotax. Sin. 19: 485 (1981) | Didymocarpinae | Didymocarpinae | Möller et al. (2011b) | Didymocarpinae |
| Titanotrichum Soler. | Ber. Deutsch. Bot. Ges. 27: 393 (1909) | Didymocarpinae | Synonymised under Oreocharis | Wang C.N. et al. (2004b); Perret et al. (2012); Weber et al. (2013) | Didymocarpinae |
| [Trachystigma C.B.Clarke] | in A.DC. & C.DC., Monogr. Phan. 5/1: 131 (1883) | Didymocarpinae | Synonymised under Streptocarpus, together with all other African and Madagascan genera of Trichosporeae | Nishii et al. (2015) | Didymocarpinae |
| [Tremacron Craib] | Notes Roy. Bot. Gard. Edinburgh 10: 217 (1918) | Didymocarpinae | Synonymised under Petrocodon | Möller et al. (2011b) | Didymocarpinae |
| Tribounia Middleton | in Middleton & Möller, Taxon 61(6): 1287–1288 (2012) | Didymocarpinae | New genus, type species formerly in Didymocarpus | Middleton & Möller (2012) | Didymocarpinae |
| Trichodyrmonia Oerst. | Centralamer. Gesner. 38 (1858) | Didymocarpinae | Reestablished after segregation from Paradrymonia | Mora & Clark (2016) | Didymocarpinae |
| [Trisespalum C.B.Clarke] | in A.DC. & C.DC., Monogr. Phan. 5: 138 (1883) | Didymocarpinae | Synonymised under Paraboea | Puglisi et al. (2011) | Didymocarpinae |
| [Wentsialboea D.Fang & D.H.Qin] | Acta Phytotax. Sin. 42(6): 533 (2004) | Didymocarpinae | Synonymised under Primulina, although some species transferred to Petrocodon | Weber et al. (2011a,b) | Didymocarpinae |
in the online “Glossary of botanical terms” (https://en.wikipedia.org/wiki/Glossary_of_botanical_terms). As a first-class botanical dictionary William Stearn’s classic *Botanical Latin* (last ed. 2004) is highly recommended.

**Key to the subfamilies of Gesneriaceae**

1. Hard-wood trees, to 15 m tall; inflorescences terminal bracteose G thyrses; corolla white, tubular, slightly curved and slightly gibbous near base, limb subactinomorphic, lobes triangular, pointed; nectary cup-shaped, large, ± as high as the globose ovary and enveloping it almost completely; fruit a bony capsule ....

......................... 1. **Subfam. Sanangoideae**

1. Predominantly perennial herbs, rarely trees, shrubs, subshrubs, lianas, climbers or annual herbs, if tree-like, wood soft to brittle; inflorescences emerging from the axils of the foliage leaves or bracts, rarely a terminal bracteose G thyrse or bracteose raceme; corolla of variable colour and shape, usually distinctly zygomorphic, rarely subactinomorphic or actinomorphic, lobes variable; nectary of various forms, if cup-shaped, surrounding the ovary base only; fruit not a bony capsule .... 2

2. Seedlings isocotylous G; fertile stamens 4, rarely 5 or 2 (only *Sarmienta*); nectary annular or divided into 1–5 separate glands, or nectary inconspicuous and adnate to the base of the ovary (tribe Coronanthereae), or lacking; ovary superior, semi–inferior or inferior; fruit a dry (never twisted) or fleshy capsule or an indehiscent (never sclerocarpous) or rupturing berry; Neotropics and southern hemisphere (temperate S America, SW Pacific and NE Australia, and E Asia (SE China, Taiwan and S Japan)).

......................... 2. **Subfam. Gesnerioideae**

2. Seedlings usually anisocotylous G; fertile stamens 2, less often 4, very rarely 1, rarely 5 (in taxa with actinomorphic flowers); nectary, if present, ring– or cup-shaped, occasionally lobed, rarely unilateral and tongue-like, never consisting of separate glands; sometimes lacking; ovary always superior; fruit usually a dry, cylindrical or less commonly ovoid-globose capsule, sometimes twisted (subtribes *Loxocarpinae* p.p. and *Streptocarpinae* p.p.), rarely indehiscent (a sclerocarpous or fleshy berry); Old World: Asia, Malesia, Pacific, Africa, a few genera/species in Europe and Australia, only one species of the SE Asian–Malesian genus *Rhynchoglossum* in the Neotropics (*R. azureum*) ........................................

......................... 3. **Subfam. Didymocarpoideae**

1. **Subfamily Sanangoideae**

Subfam. Sanangoideae A.Weber, J.L.Clark & Mich.Möller was established in Weber et al. (2013). The subfamily is monospecific with only *Sanango racemosum* from Peru and SE Ecuador. The reasons for including *Sanango* in Gesneriaceae are given in Weber et al. (2013). Recent comprehensive molecular-phylogenetic work (Luna et al., 2019) confirmed this treatment.

2. **Subfamily Gesnerioideae**

Subfam. Gesnerioideae Burnett corresponds largely to the traditionally delimited Gesnerioideae, but was restructured and expanded by Weber et al. (2013) to include the tribes Titanotricheae and Coronanthereae. The distribution thus includes Central America, tropical and temperate S America, SW Pacific and NE Australia, and E Asia (SE China, Taiwan and S Japan). The subfamily includes c. 77 genera with currently 1215 species (Clark et al., this issue).

**Key to the tribes of subfamily Gesnerioideae**

1. Plants mostly reproducing asexually by means of tiny propagules (“bulbils”) produced in masses above the flowering region; E Asia (SE China, Taiwan, S Japan) .........................

............ **Tribe Titanotricheae** (only genus and species *Titanotrichum oldhamii*) (see Table 1)

1. Plants mostly reproducing sexually, bulbils absent (not to be confused with the
subterranean scaly rhizomes of Gesneriaceae-Gloxiniinae); New World tropics and southern hemisphere 2

2. Nectary absent; corolla subactinomorphic and ephemeral; fruit a capsule, enclosed in a persistent calyx; plants terrestrial, leaves in a basal rosette; stomata clustered on mounds on leaf underside Tribe Napeantheae (only Napeanthus)

2.1. Tribe Titanotricheae

The monospecific tribe Titanotricheae T. Yamaz. ex W.T. Wang et al. was formerly assigned to subfam. Didymocarpoideae (synonym: Cyrtandroideae) when considered to belong to Gesneriaceae at all (see Weber, 2004). Following studies by Wang C.N. et al. (2004b), it is now assigned to subfam. Gesnerioideae. It contains only the genus Titanotrichum, with the single species T. oldhamii. This is the only genus/species of Gesnerioideae found in Asia (SE China, Taiwan, S Japan). It is unique in its prolific production of small propagules ("bulbils") in the inflorescence that serve for vegetative reproduction (Wang C.N. & Cronk, 2003; Wang C.N. et al., 2004a).

2.2. Tribe Napeantheae

Tribe Napeantheae Wiehler was established by Wiehler (1983) to accommodate the single genus Napeanthus, with c. 20 species distributed throughout the Neotropics. The plants are characterised by a rosette habit and nearly actinomorphic white, pale pink or pale blue flowers. Recent molecular data with increased taxon sampling strongly support Napeantheae and Beslerieae being basal lineages within the Gesnerioideae (Serrano-Serrano et al., 2017) or Napeantheae being the basal clade and sister to all other Gesnerioideae (Clark et al., 2010).

2.3. Tribe Beslerieae

Tribe Beslerieae Bartl. was first reestablished by Wiehler (1983) and this was adopted by Weber (2004) and Weber et al. (2013). In the latter paper the tribe was subdivided into two subtribes, following molecular-systematic work by Roalson & Clark (2006). Distribution is throughout the Neotropics. The tribe includes nine genera with more than 250 species.

Key to the subtribes of Beslerieae

1. Seed surface striate; fruit an indehiscent or rupturing berry, or a dry 2-valved capsule dehiscing loculicidally, sometimes dehiscing tardily into 4 valves, or fruit dehiscing irregularly Subtr. Beslerinae

1. Seed surface primarily reticulate, testa cells often with thin, sinuate side walls, outer walls flat or ± pouch to form a “papillate” or...
“pustulate” seed surface; fruit a dry 2-valved capsule dehiscing septicidally, sometimes dehiscing tardily into 4 valves .................................................. Subtr. Anetanthinae

2.3.1. Subtribe Besleriinae

Subtribe Besleriinae G.Don was reestablished in Weber et al. (2013). Of the four genera included (with a total of more than 240 species), the most speciose genus is Besleria with some 165 species. Distribution is throughout the Neotropics.

Key to the genera of subtribe Besleriinae
1. Fruit a globose, fleshy berry, with pulp of placental tissue, or a rupturing berry (with the carpel walls splitting regularly or irregularly, curving back and exposing a globose mass of placentae and seeds) ........................................... Besleria
   1. Fruit a dehiscent semi-fleshy or dry capsule 2
   2. Capsules semi-fleshy ...................... Gasteranthus
   2. Capsules dry, valves often membranous ...... 3
   3. Leaves opposite; nectary annular or semi-annular ........................................... Cremosperma
   3. Leaves alternate; nectary a single dorsal bilobed gland ............................................. Reldia

2.3.2. Subtribe Anetanthinae

Subtribe Anetanthinae A.Weber & J.L.Clark was established in Weber et al. (2013). The five genera are each limited to fewer than five species, Shuaria and Tylopsacas are monospecific. Distribution is restricted to tropical South America.

Key to the genera of subtribe Anetanthinae
1. Leaves alternate, clustered on short shoots .. 2
   1. Leaves opposite, arranged on elongate shoots ........................................................................ 3
   2. Leaves in a basal rosette; inflorescences with peduncles less than 5 cm; nectary ring-shaped, with 2 dorsal enlarged lobes; seed surface pustulate, side walls of testa cells straight; Guayana Highlands ................................................................. Tylopsacas (only T. cuneata)
2. Leaves in a basal rosette or clustered apically on short shoots; inflorescences with peduncle more than 5 cm; nectary ring-shaped, without enlarged lobes; seed surface smooth, side walls of testa cells sinuate; Colombia and Venezuela ................................................... Resia
3. Trees, 3–5(–8) m tall, with lepidote trichomes on vegetative and floral parts ....................... Shuaria (only S. ecuadorica) (see Table 1)
3. Perennial herbs or subshrubs, without lepidote trichomes ........................................................................ 4
4. Bracteoles G absent; calyx ± actinomorphic; nectary a lobed sheath surrounding the ovary; capsules dehiscing septicidally, occasionally secondarily dehiscing loculicidally from the tips; seeds narrowly winged, surface smooth, side walls of testa cells sinuate .... Anetanthus
4. Bracteoles G present; calyx zygomorphic, becoming more so in fruit (3 to 4 lobes usually lanceolate and the remaining 1 or 2 much wider and ovate, often variable within the same inflorescence); nectary annular, often higher on both sides of ovary and low or absent between; capsules dehiscing loculicidally; seeds broadly winged, surface papillate ........................................... Cremospermopsis

2.4. Tribe Coronanthereae

Tribe Coronanthereae Fritsch corresponds to subfam. Coronantheroideae of Wiehler (1983) and the “Coronantheroid Gesneriaceae” of Weber (2004). Burtt (1963) differentiated the following two tribes: Coronanthereae (Australia, SW Pacific) and Mitrarieae (temperate South America). The subdivision of a single tribe into three subtribes in Weber et al. (2013) followed Woo et al. (2011) who suggested that there had been multiple migrations from S America to the
SW Pacific and Australia. Nine genera with 28 species.

Key to the subtribes of Coronanthereae

1. Epiphytic creepers and subshrubs to 1 m tall, weak-stemmed and straggling; flowers solitary in leaf axils; fruit an indehiscent berry; temperate S America and E & SE Australia ......................... **Subtr. Mitrariinae**

1. Trees and shrubs, 2–15 m tall; inflorescences axillary cymes, comprising usually 3 to 8 (rarely one) flowers; fruit dehiscent or indehiscent; SW Pacific and Australia ......................... 2

2. Fruit a dry capsule, dehiscing by 2 or 4 valves (dehiscence septi- plus loculicidal), dehiscence starting from the capsule base, the valves remaining coherent at the apex; New Caledonia and New Zealand ......................... **Subtr. Coronantherinae**

2. Fruit bivalved (dehiscing septicidally), dehiscence starting from the apex, or fruit fleshy and indehiscent (*Lenbrassia*); New Caledonia, Lord Howe Island and NE Australia ......................... **Subtr. Negriinae**

2.4.1. Subtribe Coronantherinae

Subtribe Coronantherinae Fritsch was revived by *Woo et al.* (2011) and adopted in *Weber et al.* (2013). The subtribe is restricted to the SW Pacific. It includes two genera, *Coronanthera*, with c. 20 species, and *Rhabdothamnus*, which is monospecific.

Key to the genera of subtribe Coronantherinae

1. Flowers in few to many-flowered axillary cymes; corolla greenish-yellowish; New Caledonia and the Solomon Islands ................ **Coronanthera**

1. Flowers solitary in leaf axils; corolla red; New Zealand (North Island) ...................... **Rhabdothamnus** (only *R. solandri*)

2.4.2. Subtribe Mitrariinae

Subtribe Mitrariinae Hanst. was reestablished by *Woo et al.* (2011) and adopted by *Weber et al.* (2013). Apart from the three temperate S American genera *Asteranthera*, *Mitraria* and *Sarmienta*, formerly constituting the tribe Mitrarieae, it also includes *Fieldia* from SE Australia. All four genera are monospecific.

Key to the genera of subtribe Mitrariinae

1. Corolla pale yellow, tubular; Australia ....................... **Fieldia** (only *F. australis*)

1. Corolla bright red, if tubular, then with conspicuous constrictions at base and below the limb; temperate S America ..................... **Asteranthera** (only *A. ovata*)

2. Flowers erect; corolla strongly zygomorphic, with a prominent galeate upper lip and 3 lower lobes ................ **Asteranthera** (only *A. ovata*)

2. Flowers pendulous; corolla tubular, sharply constricted at base and (less prominently) below the limb, lobes (sub)equal ................ **Mitraria** (only *M. coccinea*)

3. Flowers with conspicuous bracteoles below the calyx, embracing the calyx and forming a broad deltoid sheath; fertile stamens 4; leaf margins coarsely crenate; Chile and adjacent Argentina ................ **Mitraria** (only *M. coccinea*)

2.4.3. Subtribe Negriinae

Subtribe Negriinae V.L.Woo, J.F.Smith & Garn.-Jones was established in *Woo et al.* (2011) and adopted by *Weber et al.* (2013). The subtribe includes plants of NE Australia and the SW Pacific. Two of the three genera are monospecific, one (*Depanthus*) includes two species.

Key to the genera of subtribe Negriinae

1. Fruit a fleshy berry; NE Australia ....................... **Lenbrassia** (only *L. australiana*)
1. Fruit a 2 or 4-valved capsule; SW Pacific .... 2
2. Corolla (sub)actinomorphic; stamens 5, anthers free; fruit a 2-valved capsule; New Caledonia ....................................................... Depanthus

2. Corolla zygomorphic; stamens 4, anthers coherent; fruit a 4-valved capsule; Lord Howe Island (SW Pacific) ........................ Negria (only N. rhabdothamnoides)

2.5. Tribe Gesnerieae

Tribe Gesnerieae Dumort. was considerably enlarged by Weber et al. (2013) due to the inclusion of the Episcieae, Gloxinieae, Sphaerorrhizinae, Sinningieae and Gesnerieae, each of which was instead recognised at the rank of subtribe. It is the largest tribe of Gesnerioideae, with some 57 genera and over 950 species. Distribution is throughout the Neotropics.

Key to the subtribes of tribe Gesnerieae

1. Ovary superior; plants terrestrial or epiphytic ................................................................. 2

1. Ovary semi–inferior or inferior; plants terrestrial .......................................................... 3

2. Woody, often spiny, terrestrial shrubs; corolla white, lobes spreading and truncate, actinomorphic; stamens 5, exserted; filaments very short; anthers exserted, forming a cone in the flower centre, thecae dehiscing by apical pores; nectary absent; fruit a dry, bivalved capsule; Caribbean ..........................................

2. Plants usually epiphytic herbs, less frequently terrestrial, with fibrous roots or rarely with a small tuber (Lembocarpus, Rhoogen, some species of Chrysothemis and Nautilocalyx), or shrubs or vines, plants never spiny; corolla of various colours and shapes, usually oblique relative to the calyx, especially when spurred; stamens 4, usually included, filaments long, anthers never forming a central cone, thecae dehiscing longitudinally, rarely poricidally (e.g., most spp. of Drymonia); nectary usually consisting of a single, bilobed gland, rarely of 5 separate glands or other configurations; fruit a fleshy bivalved capsule or indehiscent berry; widespread in the Neotropics ...................... ................................. Subtr. Columneneinae

3. Ovary inferior; leaves alternate (except a few spp. of Gesneria); Caribbean, rarely in C & S America ........................................ Subtr. Gesneriinae p.p. (Gesneria, Rhytidophyllum)

3. Ovary usually semi-inferior, rarely superior or inferior; leaves opposite; Neotropics, Caribbean, N Argentina ....................................... 4

4. Nectary annular; leaves of a pair with petiole bases joined across the nodes; the Caribbean ........ Subtr. Gesneriinae p.p. (Pheidonocarpa)

4. Nectary of 2–5 separate glands, rarely annular; leaves of a pair not joined across the nodes; Neotropics and the Caribbean ........ 5

5. Tubers usually present, if absent, then basal part of stem swollen and succulent (Sinningia p.p.) or with perennial stems and then strictly confined to SE Brazil (Paliavana, Vanhouttea), never with scaly rhizomes\(^G\); C America to N Argentina, but mainly S & SE Brazil .............. ................................. Subtr. Ligeriinae

5. Tubers absent; plants with or (rarely) without scaly\(^G\) or stringy rhizomes\(^G\); Neotropics including Brazil .................................................................. 6

6. Subshrubs, shrubs, or small trees, without scaly\(^G\) or stringy rhizomes\(^G\); Mexico and C America ..................... Subtr. Gloxiniiinae p.p. (Moussonia, Solenophora)

6. Herbs with scaly\(^G\) or stringy rhizomes\(^G\); Neotropics including Brazil ......................... 7

7. Herbs with scaly rhizomes\(^G\) (in Seemannia the scaly rhizomes produced at the tip of stringy rhizomes); widespread in the Neotropics ....... ................................. Subtr. Gloxiniiinae p.p.maj.

7. Herbs with stringy rhizomes\(^G\), scaly rhizomes\(^G\) lacking; Brazil (restricted to the Cerrado
20 Gesneriaceae identification keys

domain) .................. Subtr. Sphaerorrhizinae (only Sphaerorrhiza) (see Table 1)

2.5.1. Subtribe Gesneriinae

Subtribe Gesneriinae Oerst. was reestablished by Weber et al. (2013) to include the genera previously included in tribe Gesnerieae. They are mostly found in the Caribbean and adjacent C and S America. Wiehler (1983) addressed the weak distinction of Gesneria and Rhytidophyllum, but to date the two genera are still recognised as distinct. Four genera with more than 100 species.

Key to the genera of subtribe Gesneriinae

1. Woody, often spiny shrubs; leaves opposite; corolla actinomorphic, lobes spreading, white, lobes almost free to base, rounded or truncate; fertile stamens 5, exserted; filaments short; anthers free, yellow, upright–connivent and forming a cone in the flower centre, thecae dehiscing by apical pores; nectary absent; ovary superior ............................................ Bellonia

1. Plants woody or herbaceous, never spiny; leaves opposite or alternate; corolla zygomorphic, tubular or campanulate, red, yellow or greenish; fertile stamens 4, included or exserted; filaments long; anthers coherent in pairs, never forming a central cone; colour variable; thecae dehiscing by longitudinal slits; nectary present, annular or lobed; ovary semi–inferior or inferior ............................................ 2

2. Leaves opposite, petiole bases joined across the stem; ovary semi–inferior; capsules rostrate, rostrum long and curved .... Pheidonocarpa

2. Leaves usually alternate, if opposite then petiole bases not joined across the stem; ovary inferior; capsules not rostrate ............................................ 3

3. Capsules with or without prominent ribs, or warty, glabrous; filaments free and not fused to corolla tube; base of filaments densely pubescent; leaves smooth, rarely bullate, glabrous, scabrous or pilose .......... Gesneria

3. Capsules lacking ribs, usually villous; filaments adnate for 1–2 mm along base of corolla tube; base of filaments glabrous; leaves areolate, tomentose–hirsute, rarely glabrescent .......... Rhytidophyllum

2.5.2. Subtribe Gloxiniinae

Subtribe Gloxiniinae G.Don includes the genera previously included in tribe Gloxinieae although the genera themselves have undergone substantial realignment (Roalson et al., 2005a,b, 2008). In addition to the genera treated in Weber (2004), seven genera have been reestablished or described as new (Amalophyllon, Chautemsia, Gloxinella, Gloxiniiopsis, Mandirola, Seemannia, and Sphaerorrhiza), while three genera (Anodiscus, Capanea and Koellikeria) have been sunk into synonymy (see Table 1). Gloxinia has experienced a most drastic redefinition, with reduction of the c. 15 species to the type species and inclusion of the monospecific genera Anodiscus and Koellikeria. Currently 21 genera with altogether more than 200 species are recognised. Distribution is throughout the Neotropics. A key with a different structure and more detailed information (e.g., anatomical characters, chromosome numbers, distribution, given for all genera) was presented in Roalson et al. (2005a). Parallel use of their key and the following key is recommended.

Key to the genera of subtribe Gloxiniinae

1. Flowers in terminal racemes, arising singly from the axils of bracts; plants with scaly rhizomesG .......................................................... 2

1. Flowers in cymes or arising singly from the axis of foliage leaves, plants with or (rarely) without scaly rhizomesG ............................................ 7

2. Bracts and their axillary flowers in an alternate or irregular arrangement; upper and lower bracts mostly equal is size, inflorescences thus sharply demarcated from the vegetative region ............................................ 3
2. Bracts and their axillary flowers opposite; lower bracts usually larger than upper ones, inflorescences thus not sharply demarcated from the vegetative region ........................... 5

3. Plants small, less than 1 m tall, with leaves basally clustered; upper leaf surface white-dotted ........................... **Gloxinia** p.p. (the former monospecific genus *Koellikeria*, see Table 1) 3. Plants large, to 1 m tall, with distinct stem and evenly spaced opposite leaves; upper leaf surface not white-dotted .............................. 4

4. Flowers with elongate narrow tube, broadening apically, slightly curved, colourful, often red-yellow, lobes often spotted, rarely white; nectary annular or shallowly 5-lobed; leaves green or red-marbled; Mexico ............ ................................................... **Smithiantha**

4. Flowers campanulate, white; nectary reduced; leaves green; Andes of Ecuador and Peru ........... ........................... **Gloxinia** p.p. (the former monospecific genus *Anodiscus*, see Table 1)

5. Small, delicate herbs; indumentum hirsute or villous; corolla tubular or funnel-shaped, white, sometimes with purple markings on lobes; nectary of 5 glands, long, finger-like or sometimes connate with 2–3 glands .............. ............................... **Diastema**

5. Robust, large and somewhat fleshy herbs; indumentum inconspicuous; corolla short- and broad-tubed, campanulate, blue or whitish; nectary much reduced or absent ................... 6

6. Corolla with distinct gibbosity at base; bearing a dark violet osmophore on the inner side .... ......................... **Gloxinia** p.p. (*G. perennis* = *G. maculata*, nom. illeg., type of *Gloxinia*)

6. Corolla without basal gibbosity; osmophore absent .... ......................... **Gloxiniopsis** (only *G. racemosa*) (see Table 1)

7. Corolla with short tube, flat-faced, rotate or subrotate, limb almost actinomorphic, white (rarely pinkish or yellowish); nectary reduced or absent ................... 8

7. Corolla with elongate tube, tubular, funnel-shaped or campanulate, limb zygomorphic, coloured, if white, with purple lines, dots or similar markings inside; nectary present.... 10

8. Filaments as long as or shorter than the anthers, straight; fruit a dry rostrate capsule with a fringe of stiff trichomes on the inner margins of the valves; leaves sometimes with purplish (never white or silver) veins ............................... **Niphaea**

8. Filaments longer than the anthers, those of the anterior stamens curved inwards; fruit a fleshy or membranous capsule, not rostrate, valves without stiff trichomes; leaves sometimes with white or silvery veins ........................................... 9

9. Fruit held erect above the foliage, fleshy at dehiscence, valves splitting broadly (to 180°), with sticky seeds adhering to valves ................................. ........................................... **Phinaea** (see Table 1)

9. Fruit held on a slender curving pedicels, often placed below the leaves, valves membranous, opening only slightly, with the seeds falling freely (salt-shaker style) .......................................................... **Amalophyllon** (see Table 1)

10. Fruit a fleshy globose orange capsule, often rupturing when mature, crowned by the persistent calyx (with calyx lobes connate at least halfway), opening irregularly and exposing the placenta and seeds for animal-dispersal; nectary a large double-connate dorsal gland; branched shrubs to small trees with soft woody stems; scaly rhizomes lacking; Mexico to northern Guatemala (*S. calycosa* extends into Panama) .................................................................. **Solenophora**

10. Fruit a fleshy or dry capsule; not crowned by a persistent calyx, opening loculicidally; nectary annular, or divided into separate glands, or absent; unbranched terrestrial shrubs or herbs, rarely epiphytic; scaly rhizomes usually present, rarely absent; Central & South America .................................................................. 11

11. Fruit a fleshy, green capsule, dehiscing dorsally, held horizontally with seeds exposed to rain ..........................
11. Fruit a dry or fleshy, often rostrate, capsule, dehiscing loculicidally into two valves .... 14
12. Capsules ovoid to elliptic; nectary annular to slightly 5-lobed; corolla bluish, lobes sometimes whitish, without a yellow blotch in the throat ........................... **Gloxinella** (only *G. lindeniana*, the former *Kohleria lindeniana*) (see Table 1)

13. Leaves strongly anisophyllous; hooked trichomes usually present on calyx and hypanthium ........................................... **Monopyle**
13. Leaves (sub)isophyllous; hooked trichomes on calyx and hypanthium absent .... **Nomopyle**
14. Nectary annular, sometimes shallowly 5-lobed .............................................. 15
14. Nectary composed of 2–5 individual glands, sometimes the two dorsal ones connate into a single bilobed gland .............................................. 21
15. Herbs with wiry stems; leaves leathery, lateral veins reaching the margin and forming a marginal vein; ovary superior; C Brazil.............. ........................................................... **Goyazia**
15. Herbs with non-wiry erect stems; leaves membranous, lateral veins not reaching the margin and forming a marginal vein; ovary semi- to completely inferior; C and S America, not restricted to C Brazil ............ 16

16. Anthers free .................................. **Heppiella**
16. Anthers coherent ................................ 17
17. Subshrubs or shrubs, without scaly rhizomes ........................................... **Moussonia**
17. Herbs with scaly rhizomes .................................. 18
18. Scaly rhizomes usually produced at the tips of long stringy rhizomes; corolla with barrel-shaped multicellular hairs at mouth; stigma pointed .................... **Seemannia** (see Table 1)
18. Long stringy rhizomes not present; corolla without barrel-shaped multicellular hairs at mouth; stigma bilobed, stomatomorphic or cup-shaped, not pointed ........................................ 19
19. Stems and leaves densely lanate-villous; corolla campanulate or broad-tubed; Mexico ......................................................... **Eucodonia**
19. Stems and leaves without woolly indumentum; corolla of various shapes; South and Central America................................. 20
20. Flowers usually solitary in leaf axils, rarely in cymes; margins of corolla lobes usually entire; C America (mainly Mexico) and West Indies ........................................................... **Achimenes**
20. Flowers usually in axillary cymes, rarely solitary; margins of corolla lobes toothed or fimbriate; Brazil ...... **Mandirola** (see Table 1)
21. Nectar glands finger-like; flowers solitary in leaf axils; fruit a fleshy plagiocarpic capsule, dehiscing only on the dorsal side ............................... .......................... 22
21. Nectar glands globose; flowers in axillary cymes; fruit a fleshy, membranous or dry orthocarpic capsule, dehiscing by 2 valves .. ..................................................... 22
22. Capsules dehisce on both sides, fully reflexed and bivalved; corolla tubular or funnel-shaped, often distinctly to strongly pouched (hypocyrtoid) or balloon-shaped with constricted mouth; stamens included; corolla never campanulate, greenish-yellowish and brown-spotted within and with exserted anthers and stigma; plants terrestrial, never epiphytic; with scaly rhizomes, occasionally with stolons ........................................ ............................... **Pearcea**
22. Capsules dehisce by a single longitudinal slit, never reflexed; corolla broad tubular or funnel-shaped, not pouched, never balloon-shaped and with constricted mouth; plants terrestrial or epiphyte (*Kohleria tigrina* and *K. grandiflora*); scaly rhizomes present; or corolla broadly campanulate, greenish-yellow, with brown
spots inside, anthers and stigma slightly exserted (in the former genus Capanea, see Table 1); plants epiphytic, scaly rhizomes absent ............................................ Kohleria

25.3. Subtribe Columneinae

Subtribe Columneinae Hanst. was reestablished by Weber et al. (2013) and corresponds to the tribe Episcieae in previous works. It is the largest group of Gesnerioideae, presently comprising 28 genera and more than 560 species (particularly due to the speciose genus Columnea). Eleven genera have been reestablished, newly described or redefined since the Gesneriaceae treatment of Weber (2004): Alloplectus, Centroserenia, Christopheria, Codonanthe, Codonanthopsis, Crantzzia, Glossoloma, Neomortonia, Pachycaulos, Pagothyra, Trichodrymonia (see Table 1). Crantzzia and Glossoloma are well separated by molecular data and geography, but are difficult to define morphologically (Clark, 2005, 2009). Moreover, both have resupinate flowers, but in each genus there is one species with non-resupinate flowers. Their treatment in the below key (couplets 22 and 23) must remain unsatisfactory at present. When redefining Codonanthe and Codonanthopsis, only the latter proved to include ant epiphytes (Chautems & Perret, 2013). Distribution of the subtribe is throughout the Neotropics.

Key to the genera of subtribe Columneinae

1. Fruit an indehiscent, fleshy berry ................. 2
2. Plants terrestrial; axillary inflorescences pedunculate; flowers umbellate or congested into heads; calyx lobes cuculate, with reflexed margins ................................................. Corytoplectus
3. Berry orange ................................................. 4
4. Berry white, pink, red, purple, or lavender........6
5. Berry laterally compressed; corolla campanulate, lobes pink suffused with white, margins fimbriate ................................................. Neomortonia (see Table 1)
6. Corolla campanulate to funnel-shaped, mostly white; stems not swollen; restricted to the Brazilian Atlantic forests .......... Codonanthe (sensu Chautems & Perret, 2013) (see Table 1)
7. Corolla strongly hypocyrtoid2, bright red; stems swollen; Mexico to N Peru ................. Pachycaulos (only P. nummularia) (see Table 1)
8. Corolla tubular and elongate (> than 20 mm), if shorter, then with a narrow limb; from Mexico south to Ecuador and Bolivia, and east to Brazi ............................................ Columnea (in the traditional, wide sense; including the genera Bucinellina, Dalbergaria, Pentadenia and Trichantha sensu Wiehler, 1983; see Smith & Clark, 2013)
9. Corolla with white lower lobes and reddish upper lobes; berry globose or depressed ......... .................................................. Rufodorsia
10. Corolla white throughout or reddish; berry ovoid, pointed .................... Oerstedina
11. Fruit a dry capsule ...................................... 9
12. Fruit a fleshy capsule .................................. 10
13. Capsule wall robust; the valves opening to 180°; calyx not star-shaped, without a basal tube; lobes lanceolate, unequal, the lateral ones broader than the dorsal one (this is the one adjacent to the spur); corolla salverform; nectary annular, more prominent at the dorsal side; French Guiana ........................................... Cremersia
9. Capsule wall thin, papyraceous, valves opening to an angle of c. 90°; calyx star-shaped, with a short pentagonal-campanulate tube; lobes broadly triangular, spreading; corolla tubular, without a dorsal spur; nectary a single, slightly emarginate dorsal gland; endemic to the region of Cobán, Alta Verapaz, Guatemala.............. Cobananthus (only C. calochlamys)

10. Plants with a subterranean tuber ................ 11

10. Plants without a tuber ................................. 14

11. Calyx lobes connate for at least 3/4 of their length, forming a plicate cup or tube .............. Chrysothemis

11. Calyx lobes free or nearly so ....................... 12

12. Stems elongate; tuber perennial; cymes short- or epedunculate, or reduced to single flowers; capsule valves opening by c. 90°; S America ..... Nautilocalyx p.p. (species with a tuber)

12. Leaves in a basal rosette (rarely only two or few leaves) arising from a small, annual underground tuber; cymes long-pedunculate, scapose; capsule valves opening to 180°; S America, restricted to Guiana shield .......... 13

13. Corolla orange or red; nectary a single dorsal emarginate gland; Guyana .......... Rhoogeton

13. Corolla pale blue or white; nectary a thin, non-functional ring or completely reduced; Suriname and French Guiana .................. Lembocarpus (only L. amoenus)

14. Plants with stolons arising from the leaf axils ...................................................... 15

14. Plants without stolons .................................. 17

15. Plants with one stolon per node ........ Alsobia

15. Plants with two stolons per node ............... 16

16. Corolla white, blue, purple or red; Nicaragua to tropical S America ................. Episcia

16. Corolla pale yellow; Guiana shield (Guyana and French Guiana) .......... Christopheria (only C. xantha) (see Table 1)

17. Plants obligate epiphytes, often growing in ant gardens; anthers occasionally horned; base of corolla with spur; Central America, Caribbean, NW South America, Amazon basin ............... Codonanthopsis (sensu Chautems & Perret, 2013) (see Table 1)

17. Plants terrestrial or facultative epiphytes; not associated with ant gardens; anthers not horned; base of corolla without spur; NW South America ........................................ 18

18. Plants terrestrial, rosulate; inflorescences long-pedunculate, much longer than leaf tuft; flowers in a unilateral (scorpioid) cyme; nectary consisting of 2 large glands, a ventral and a dorsal one; Guyana .................................................. Lampadaria (only L. rupestris)

18. Plants terrestrial or epiphytic, stem with distinct internodes between leaf pairs; inflorescences short-pedunculate or peduncle almost lacking (but pedicels sometimes much elongated, e.g., in Nematanthus species with pendent flowers); nectary annular or of a single dorsal gland; plants not restricted to Guyana .................. 19

19. Facultative epiphytic subshrubs to 4 m tall; calyx lobes ovate and auriculate at base, margin strongly and coarsely dentate in the lower part and entire at the apex (Lesia savannarum) or lacking serrations and entire (L. tepuiensis) .................. Lesia (see Table 1)

19. Terrestrial subshrubs (not facultative) or epiphytic herbs; calyx lobes not as above, usually linear or lanceolate ............... 20

20. Epiphytic climbing vines; inflorescences bracteate unilateral cymes (cincinnus, scorpioid cyme); mouth of corolla occluded throughout anthesis by the upfolded ventral corolla lobe .. Pagothyra (only P. maculata) (see Table 1)

20. Plants epiphytic or terrestrial, rarely vines or climbers; inflorescences not bracteate, unilateral cymes; mouth of corolla not occluded by the ventral corolla lobe .......... 21
21. Leaf blade ± succulent, with a hypodermis; Atlantic coastal forests in Brazil.................................................. Nematanthus

21. Leaf blade not succulent and without a hypodermis; C and S America, except Atlantic coastal forest in Brazil ........................................... 22

22. Flowers resupinate$^G$ (except Crantzia tigrina and Glossoloma anomalum, see species descriptions in Clark, 2009 and Clark, 2005, respectively) ........................................... 23

22. Flowers not resupinate$^G$ ........................................... 24

23. Plants epiphytic (only terrestrial in Crantzia tigrina); Lesser Antilles, coastal Venezuela, and the Guiana Shield ...... Crantzia (see Table 1)

23. Plants terrestrial (only epiphytic in 3 Andean species); southern Mexico to Panama, NW South America, and south to Bolivia ...................... ......................................... Glossoloma (see Table 1)

24. Obligate terrestrial herbs ........................................... 25

24. Facultative epiphytic herbs, subshrubs or vines .......................................................................................................................... 26

25. Stems ± fleshy, erect or creeping and rooting at the nodes; corolla infundibuliform, trumpet shaped or salverform, usually with tube less than 4 times longer than broad .............................................................. Nautilocalyx p.p.

25. Stems ± fleshy, decumbent and rooting at the nodes; corolla narrow-tubular and elongate, tube about 5 times longer than broad ........... ............................................................ Centrosolenia (see Table 1)

26. The four anthers coherent by their inwards-facing thecae, forming a column-like “salt-shaker”, thecae elongate, sagittate, usually dehiscing by basal pores, with pores upside; pollen dry, powdery; or thecae rarely (by reversal) opening by longitudinal slits ............... ............................................................ Drymonia

26. The four anthers coherent into flat rectangles, squares, or into pairs; thecae not elongate and sagittate, dehiscing by longitudinal slits; pollen usually sticky .................................................. 27

27. Anthers with an apical tuft of trichomes (“bearded”) ......................... Paradrymonia

27. Anthers glabrous ........................................... 28

28. Terrestrial herbs or vines, with elongate shoots and evenly spaced leaves, or epiphytes, with reduced shoots and apically clustered leaves, plants often resembling tank bromeliads; fibrous roots absent; leaves with prominent secondary venation; calyx lobes linear to lanceolate; corolla funnelform or trumpet-shaped, spurred at the base, rarely pouch; throughout the Neotropics except SE Brazil, with a centre of diversity in Colombia .................. Trichodymonia (see Table 1)

28. Epiphytic subshrubs with branched stems; fibrous roots present; leaves with inconspicuous secondary venation (at least when dry); calyx lobes ovate; corolla pouch below the mouth; Costa Rica to Peru, centre of diversity in the southern Andes of Colombia .................................. Alloplectus (see Table 1)

2.5.4. Subtribe Sphaerorrhizinae

Subtribe Sphaerorrhizinae A.Weber & J.L.Clark was established in Weber et al. (2013). It corresponds to tribe Sphaerorrhizeae Roalson and Boggan, described in Roalson et al. (2005a). It comprises only one genus, Sphaerorrhiza, with four species, two of them only recently described (Araujo et al., 2016). Distribution is restricted to Brazil (Cerrado domain). Morphologically, the most significant character is the presence of stringy rhizomes$^G$ with a succession of small tuber-like swellings.

2.5.5. Subtribe Ligeriinae

Subtribe Ligeriinae Hanst. was reestablished by Weber et al. (2013). It corresponds to the tribe Sinningieae of earlier works (e.g., Wiehler, 1983; Burtt & Wiehler, 1995) and comprises three genera with more than 90 species. Its main distribution is in SE Brazil. In analyses based on six plastid DNA regions and nuclear ncpGS, Perret
et al. (2003) showed that Vanhouttea and Paliavana nest in Sinningia and those five lineages can be recognised in the genus. To date, however, this has not resulted in nomenclatural changes. The genera recognised here, consequently, do not reflect the phylogeny.

Key to the genera of subtribe Ligeriinae

1. Herbs, rarely shrubs, mostly with tubers, if without tubers, then stem fleshy and flowers white ........................................ Sinningia
1. Shrubs without tubers ................................... 2
2. Corolla tubular, cylindrical, red ...................... Vanhouttea
2. Corolla campanulate or funnel-shaped, variously coloured, but not red ..... Paliavana

3. Subfamily Didymocarpoideae

Subfam. Didymocarpoideae Arn. (formerly subfam. Cyrtandroideae) has seen several, rather unsatisfactory, attempts to subdivide the group into natural entities. The morphological work of Weber (1975, 1976a,b,c, 1977a,b, 1978a,b, 1982) provided evidence that the genera now placed in tribe Epithemateae could be sister to the rest of the subfamily. This was confirmed in a molecular phylogenetic study by Mayer et al. (2003). Later studies by Möller et al. (2009, 2011a,b, 2016), Middleton and Möller (2012) and Middleton et al. (2014, 2015, 2018) clarified the relationships of the remaining genera which are here included in tribe Trichosporeae. Distribution of the subfamily is in tropical Asia, except one species of Rhynchoglossum (C and S America) and one species of Epithema (W and E Africa).

Key to the subtribes of tribe Epithemateae

1. Calyx lobes ovate to suborbicular, aestivation imbricate, inner surfaces with chalk-secreting glands; ovary/fruit bilocular G, with axile placentae .......... Subtr. Monophyllaeinae
1. Calyx lobes triangular, pointed, aestivation valvate, inner surfaces without glands; ovary/fruit unilocular G, with parietal placentae ..... 2
2. Leaves alterniphyllous G, arranged in two rows, blades strongly asymmetrical at base; inflorescences terminal, one-sided racemes with two rows of flowers; corolla with upper lip much smaller than the lower lip .......... Subtr. Loxotidinae (only Rhynchoglossum)
2. Leaves iso- to strongly anisophyllous or only one leaf (enlarged macrocotyledon) present; inflorescences branched (thyrse or cymes), flowers lax or congested; corolla with upper lip not much smaller than the lower lip ....... 3

3. Lowermost cauline leaf (above large, transient macrocotyledon) solitary, upper leaves in 1–2 (sub)isophyllous pairs; inflorescences pedunculate, many-flowered, dense and (seemingly) terminal heads, flowers in 4 dense rows; sepals not plicate, spreading in fruit; fertile stamens 2 (but with two large staminodes); fruit a circumscissile capsule ........... Subtr. Epithematinae (only Epithema)

3. Plant of different structure, without a solitary cauline leaf, leaves (sub)isophyllous (Gyrogyne) or strongly anisophyllous; inflorescences dense terminal heads (Gyrogyne) or branched thyrse, terminal or placed opposite to the large leaf; fertile stamens 4; fruit a 4-valved capsule or irregularly breaking into pieces, fruit unknown in Gyrogyne ......................... Subtr. Loxoniinae

3.1.1. Subtribe Loxotidinae

Subtribe Loxotidinae G.Don was revived by Weber et al. (2013) to accommodate the single genus Rhynchoglossum (incl. Klugia, Burtt, 1962). In Asia there are about 10 species. *Rhynchoglossum azureum* is the only species in the subfamily to be found in the New World. Recent regional revisions are available for Thailand (Pattharahirantwic, 2014) and Malesia (Kartonegoro, 2013). Distribution is in S and SE Asia, from India to New Guinea, one species (*R. azureum*) in central and tropical South America.

3.1.2. Subtribe Monophyllaeinae

Subtribe Monophyllaeinae A.Weber & Mich. Möller was established by Weber et al. (2013). Even though the two included genera, Monophyllaea and Whytockia, are rather dissimilar, a close relationship was predicted by Weber (1976b) based on a detailed morphological analysis. The relationship was confirmed in a molecular phylogenetic study by Mayer et al. (2003). Nomenclatural notes on Whytockia species were given by Wang Y.Z. (2003). At present, 6–8 species are recognised in Whytockia and almost 40 in Monophyllaea.

Key to the genera of subtribe Monophyllaeinae

1. Plants caulescent, with several strongly anisophyllous leaf pairs; lamina of leaves strongly asymmetrical at base; inflorescences from the axils of the large leaves; S China, Taiwan .................................................. Whytockia

2. Leaves ± isophyllous; inflorescences dense, few-flowered terminal heads; S China ........... Gyrogyne (only G. subaequifolia; subtribal position uncertain)

3.1.3. Subtribe Loxoniinae

Subtribe Loxoniinae A.DC. was resurrected by Weber et al. (2013) for three genera, two of them (Loxonia, 3 species; Stauranthera, c. 7 species) having a similar strongly anisophyllous habit, a sympodial shoot organisation and an alternicladic-thyrsic inflorescence structure (Weber, 1977b). Distribution is China, S and SE Asia. The position of the little known monospecific Chinese genus *Gyrogyne* is uncertain, both with respect to the tribal and subtribal position. Unfortunately, no molecular data for *Gyrogyne* are available and the only species in the genus may now be extinct.

Key to the genera of subtribe Loxoniinae

1. Leaves strongly anisophyllous; inflorescences anisocladic thyrses, terminal, but (especially in Loxonia) seemingly arising from the axils of the small leaves; tropical SE Asia ................. 2
2. Leaves ± densely studded with hooked hairs, grey-green; calyx not plicate; corolla greenish-white, with a distinctly bilabiate limb, not spurred .............................................. Loxonia

2. Leaves sparsely hairy, green, like the stems somewhat succulent; calyx plicate; corolla white-blue, with an orange-yellow hairy blotch on the palate, or white with a blue centre, broadly campanulate or (sub)rotate, with (S. grandifolia) or without (remaining species) a thick conical spur at the base ........ Stauranthera

### 3.1.4. Subtribe Epithematinae

Subtribe Epithematinae DC. ex Meisn. was reestablished by Weber et al. (2013) to accommodate the single genus Epithema. A revision of this genus was recently published by Bransgrove and Middleton (2015), who recognised 20 species. Distribution is in Africa (E. tenue), S, E and SE Asia, Malesia and extending to the Solomon Islands.

### 3.2. Tribe Trichosporeae

Tribe Trichosporeae Nees was reestablished by Weber et al. (2013) and corresponds to the “Didymocarpoid Gesneriaceae” of Weber (2004), an informal name used in many papers on Old World Gesneriaceae published before 2013. Based on the molecular data of Möller et al. then available (2009, 2011a), a preliminary subdivision into 10 subtribes was suggested by Weber et al. (2013). This subdivision is unbalanced and difficult to handle. There are five subtribes that consist only of a single genus, so that the subtribal characters are de facto identical with those of the genera. The largest subtribe is Didymocarpinae, followed by the Loxocarpinae. Future molecular work might indicate where alliances lie and what characters can be found to define natural groups in this subtribe. Distribution of the tribe is from Europe through Africa and S and SE Asia to the Pacific. The tribe currently includes 71 genera with some 2400 species.

#### Key to the subtribes of tribe Trichosporeae

1. Fruit a septicidally dehiscent capsule, never twisted; E and W Europe .................................

   .............................................. Subtr. Ramondinae

1. Fruit dehiscing in various ways, very rarely septicidally (Corallodiscus conchifolius, a small, stolon-bearing and mat-forming plant from SW China), twisted or not, or fruit indehiscent (a hard or fleshy berry); Africa, Madagascar, Asia and the Pacific ................................. 2

2. Fruit dehiscent with straight or twisted capsule, when fruit straight then seeds always verruculoseG, when fruit twisted then seeds reticulateG or verruculoseG, indumentum variable, but very rarely of branched or glandular hairs or white-silver mattedG or arachnoidG; Africa, Madagascar and/or the Comoro Islands ....... Subtr. Streptocarpinae

3. Corolla actinomorphic, 5 or 4-merous; fertile stamens equalling the number of corolla lobes ........................................................................ 4

3. Corolla slightly to strongly zygomorphic, 5-merous; fertile stamens 4 or 2 ....................... 5

4. Calyx 5-merous, corolla 4-merous; Sri Lanka ............ Subtr. Leptoboeinae p.p. (Championia)

4. Calyx and corolla 5 or 4-merous, calyx lobes equalling the number of corolla lobes; S and E China, Japan and Taiwan ..........................
Subtr. Didymocarpinae p.p. (Conandron, Oreocharis p.p., Petrocodon p.p., the species with radially symmetrical flowers)

5. Fertile stamens 4 ............................................. 6
5. Fertile stamens 2 ............................................. 13

6. Plants with stem bearing a tetramerous (pseudo)whorl of leaves at apex and pairs of cataphylls below; corolla broadly funnel-shaped, flowers almost sessile and crowded at stem apex; NE India, Bangladesh, Myanmar, Thailand ............ Subtr. Tetraphyllinae (only Tetraphyllum)

6. Plants acaulescentG or caulescentG with distinct internodes between leaf pairs or whorls; corolla of various shapes, flowers not sessile and crowded at stem apex ........................................ 7

7. Corolla campanulate, shallowly campanulate or flat-faced ........................................ 8

7. Corolla tubular or infundibuliform, straight or (rarely) arcuate ........................................ 9

8. Plants with woody stem and tufted, long-hairy leaves at apex; capsules plagiocarpicG, opening only dorsally; Borneo ........................................ Subtr. Didymocarpinae p.p. (acaulescentG genera with tetrandrous flowers)

8. Plants of various habits: small, unifoliateG (Platystemma), acaulescentG or caulescentG, with opposite (Leptoboea) or alternate leaves (Boeica); fruit indehiscent, berry-like (Rhynchotechum) or capsular, orthocarpicG or (Beccarinda) plagiocarpicG; mainland Asia and Sumatra ................ Subtr. Leptoboeinae p.p. (all genera excl. Championia)

9 Plants acaulescentG ............................................. 10
9 Plants caulescentG ............................................. 12

10. Corolla tubular, bearded on lower lip; bracteolesG in cymes lacking; leaves rhomboid to suborbicular, strongly wrinkled; lower elevation to alpine N, NE and S India, Bhutan, S China and Thailand ........................................ Subtr. Corallodiscinae (only Corallodiscus)

10. Corolla of various shapes; bracteolesG in cymes usually present; leaves of various shapes and textures; lower elevation to montane elevations ........................................ 11

11. Upper side of corolla with a prominent dorsal bossG; upper lip emarginate; filaments flattened, the upper pair hooded at the top, the lower pair with a broad appendage above the insertion, all four anthers coherent; SW India .... Subtr. Jerdoniinae (only Jerdonia indica)

11. Corolla without a dorsal bossG; upper lip bilobed; filaments not flattened and/or appended; anthers free or cohering in pairs ................ Subtr. Didymocarpinae p.p. (acaulescentG genera with tetrandrous flowers)

12. Capsules longitudinally ribbed, tardily dehiscent; plants terrestrial; Borneo ................ Subtr. Didissandrinae p.p. (all species except Didissandra triflora and Tribounia, with diandrous flowers)

12. Capsules not ribbed, not tardily dehiscent; plants of various habits, including epiphytes and climbers; widespread in Asia and Malesia ................ Subtr. Didymocarpinae p.p. (caulescentG genera with tetrandrous flowers)

13. Fruit indehiscent, a sclerocarpous or fleshy berry ................ Subtr. Didymocarpinae p.p. (Cyrtandra, Billolivia, Sepikea)

13. Fruit a capsule ............................................. 14

14. Capsules twisted ... Subtr. Loxocarpinae p.p.

14. Capsules straight ............................................. 15

15. Stigma disciform or crateriform; tiny rosette plants; flowers large in relation to the leaves, emerging singly from leaf axils; capsules 4-valved; S China ........................................ Subtr. Litostigminae (only Litostigma)

15. Stigma capitate, bilobedG or chiritoidG; plant habit variable; flowers and leaves variable;
16. Capsules tardily dehiscent, longitudinally ribbed, finally disintegrating into several strands ........................................... 16

Capsules variable; plants widespread in Asia ................................................................. 16

17. Corolla funnelform, with a prominent dorsal boss; capsules pendulous and with a distinct stipe. Subtr. Didissandrinae p.p. (Tribounia)

17. Corolla variable, dorsal boss absent or not prominent; capsules variable ........................................... 18

18. Plants terrestrial, lithophytic or epiphytic, usually lacking a silvery-white smooth, matted and arachnoid or very sticky indumentum, never with branched hairs; corolla mostly tubular or campanulate, only rarely flat-faced; stigma mostly capitate, rarely chiritoid ................................. Subtr. Didymocarpinae p.p.

18. Plants mostly lithophytic, more rarely terrestrial but not epiphytic, often with a silvery-white smooth, matted and arachnoid or very sticky indumentum, hairs rarely branched; corolla tubular, campanulate, shallowly campanulate or flat-faced; stigma mostly capitate, rarely chiritoid ................................. Subtr. Loxocarpinae p.p.

3.2.01. Subtribe Jerdoniinae

Subtribe Jerdoniinae A.Weber & Mich. Möller includes only the genus Jerdonia, with the single species J. indica, a rosette plant endemic to SW India (Nilgiri and Anamalai Hills) (Janeesa & Nampy, 2014). According to Möller et al. (2009), Jerdonia is the basalmost lineage and sister to all other members of tribe Trichosporeae.

3.2.02. Subtribe Corallodiscinae

Subtribe Corallodiscinae A. Weber & Mich. Möller comprises a single genus, Corallodiscus. The species number is unclear but is around five, of which three species are given in the Flora of China (Wang W.T. et al., 1998). The uncertainty in number of species is mainly explained by discontinuities in distribution and great variation in gross morphology due to the ancient history of the genus. This involved expansion/contraction cycles that allowed secondary contacts, hybridization and polyploidisation, and resulted in blurred species boundaries (Zhou et al., 2017). Corallodiscus includes rosette plants found in N and NE India, Bhutan, China, Nepal and Thailand and was recently recorded also from W India (Kamble et al., 2006), and most recently from S India (Padal et al., 2020).

3.2.03. Subtribe Tetraphyllinae

Subtribe Tetraphyllinae A. Weber & Mich. Möller is the third of the basalmost clades within Trichosporeae. It comprises a single genus, Tetraphyllum Griff. ex C. B. Clarke, with three species known from NE India, Bangladesh, Myanmar and Thailand. The long stems bear a tetramerous pseudowhorl at the apex, while the lower part bears pairs of small cataphylls.

In a recent paper, Doweld (2017) claimed that Tetraphyllum in the Gesneriaceae was a later homonym of the fossil genus Tetraphyllum Hosius & von der Mark and proposed a replacement of the genus and subtribe names with Tetraphylloides and Tetraphylloidinae, respectively. However, Berding (2019) suggested that Dowell’s names were superfluous because Tetraphyllum Hosius & von der Mark was not definitively a plant and was not, therefore, governed under the ICN (Turland et al., 2018).

3.2.04. Subtribe Leptoboeinae

Subtribe Leptoboeinae C. B. Clarke was reestablished by Weber et al. (2013) to accommodate a morphologically rather heterogeneous group of genera. The core genera are Boeica and Leptoboea (if they are generically distinct – the only difference seems to be the alternate vs. opposite leaf arrangement). Boeica is heterogeneous due to the
inclusion of *B. brachyandra*, *B. nutans* and *B. guileana*, differing in habit considerably from the species around the type, *B. fulva* (Burtt, 1977). *Rhynchotechum* (recently revised by Anderson & Middleton, 2013), and particularly *Beccarinda* and *Platystemma*, are morphologically somewhat out of place in this alliance, their position here rests entirely on molecular data. The inclusion of *Championia* needs molecular confirmation. Distribution of the most widespread genus, *Rhynchotechum*, is from India and China through SE Asia and Malesia to Papua Guinea. If *Championia* is included, subtr. *Leptoboeinae* comprises six genera with more than 40 species.

**Key to the genera of subtribe**

**Leptoboeinae**

1. Fruit indehiscent, berry-like, white
   ............................... *Rhynchotechum*

2. Plants acaulescent or subacaulescent, leaves basal; fruit a plagiocarpic capsule, dehiscing dorsally only; mainly N India to Vietnam.....
   ...................................................... *Beccarinda*

3. Stem slender, bearing a single small and hairy leaf at its apex; flowers 1(–3) emerging from the axil of the leaf; corolla with short tube and wide limb, violet-like in form and colour; capsules ovoid, dehiscing loculicidally
   ............................... *Platystemma* (only *P. violoides*)

4. Plant without this habit; flowers variable; capsules variable
   ...................................................... *Boeica*

5. Subshrubs calyx and corolla 5-merous, limb slightly zygomorphic, with rounded lobes; capsules 2(sometimes 4)-valved; mainland Asia
   ............................... *Leptoboea*

3.2.05. Subtribe Ramondinae

Subtribe Ramondinae DC. ex Meisn. was reestablished in *Weber et al.* (2013) and includes all European representatives of Gesneriaceae. Molecular data place *Jancaea* in *Ramonda* (*Petrova et al.* 2015), but no formal action has yet been taken. Altogether, the 2(–3) genera of the subtribe include 5 species.

**Key to the genera of subtribe**

**Ramondinae**

1. Corolla tubular, limb zygomorphic, 5-lobed; stamens 4, didynamous, anthers cohering in pairs; disc present, annular
   ...................................................... *Haberlea*
   (only *H. rhodopensis*, incl. *H. ferdinandi-coburgii*, Strid, 1991; *Petrova et al.*, 2014)

2. Corolla flat-rotate or campanulate, lobes and stamens matching in number 5 or 4; stamens of equal length, anthers free; disc reduced ...
   ............................... *Ramonda*

3. Plant without this habit; flowers variable; capsules variable
   ...................................................... *Jancaea* (only *J. heldreichii*)

3.2.06. Subtribe Litostigminae

Subtribe Litostigminae A. Weber & Mich. Möller was established in *Weber et al.* (2013). The subtribe comprises only the genus *Litostigma*, described in *Wei et al.* (2010), with two species from southern China.

3.2.07. Subtribe Streptocarpinae

Subtribe Streptocarpinae Ivanina was reestablished in *Weber et al.* (2013). It comprises only the genus *Streptocarpus* in the wide sense of *Nishii et al.* (2015)
with c. 180 species (Möller et al., 2019). It now includes all didymocarpoid genera formerly recognised in Africa, Madagascar and the Comoro Islands: Acanthonema, Colpogyne, Hovanella, Linmaeopsis, Nodonema, Saintpaulia, Schizoboea, Streptocarpus and Trachystigma (see Table 1). The four Asian species formerly referred to Streptocarpus are now in the genus Damrongia (subtribe Loxocarpinae) (Puglisi et al., 2016).

The large-scale study by Nishii et al. (2015) provided strong evidence that all African, Madagascan and Comoro Islands genera unequivocally form a monophyletic clade, with the genera mentioned above (with straight, untwisted fruits) nested in Streptocarpus (with twisted fruits) as formerly defined. Of the two options, (1) to divide Streptocarpus into several, newly (but some very weakly) defined genera, or (2) to greatly widen the concept of Streptocarpus and establish 12 well-defined sections within the two subgenera, the authors decided to adopt the second option.

3.2.08. Subtribe Didissandrinae

Subtribe Didissandrinae A.Webber & Mich.Möller was established in Weber et al. (2013). Morphologically, the two genera included in this subtribe look like they should belong in subtribe Didymocarpinae. However, the limited available molecular data places them as sister to subtribe Loxocarpinae (Möller et al., 2009, 2011a; Middleton & Möller, 2012). Whether this position is justified will need to be tested with additional molecular data. Distribution is in Thailand (Tribounia, 2 species) and the western part of Malesia (Didissandra, 8 species).

Key to the genera of subtribe Didissandrinae

1. Fruit a long slender cylindrical capsule, longitudinally ribbed when ripe, tardily loculicidally dehiscent, the valves finally disintegrating into strands along the sclerified vascular bundles, without a stipe, not pendulous; stamens 4, of equal or (D. anisanthera) unequal length, or stamens 2 (D. triflora); western Malesia .......... Didissandra

1. Fruit a loculicidally dehiscent capsule, not ribbed, with a long stipe at the base, pendulous; stamens 2; Thailand ...................... Tribounia

3.2.09. Subtribe Loxocarpinae

Subtribe Loxocarpinae A.DC was reestablished in Weber et al. (2013). Presently, 14 genera are recognised. Since Weber (2004), five have been reestablished or described as new (Damrongia, Dorcoceras, Loxocarpus, Middletonia, Somrania), two were synonymised (Phylloboea, Trisepalum) and two greatly redefined (Boea, Paraboea) (see Table 1). The subtribe is morphologically somewhat heterogeneous. Important characters include the twisted fruits (otherwise only found in Streptocarpus p.p. in subtribe Streptocarpinae) and the glandular, silvery-white, matted or arachnoid indumentum (occasionally with branched hairs) of the vegetative plant parts in a number of genera (for indumentum details see Xu et al., 2008). In some genera, species with twisted and straight fruits can both be found (e.g., Damrongia, Kaisupeea, Paraboea). Important recent work on the group was done by Puglisi et al. (2011, 2016), recent revisions relate to the Thai species of Damrongia (Puglisi & Middleton, 2017c), Dorcoceras (Puglisi & Middleton, 2017a), Middletonia (Puglisi & Middleton, 2017b) and the genus Ornithoboea (Scott & Middleton, 2014). The distribution of the subtribe is from NE India, Indochina, southeastwards throughout SE Asia extending into Australia and the Solomon Islands, with a total of more than 210 species.

Key to the genera of subtribe Loxocarpinae

1. Fruit a twisted capsule ........................................... 2
1. Fruit a straight capsule .......................................... 12

2. Plants acaulescentg; leaves thin and delicate; indumentum of long, sticky hairs, not sericeous; plants often growing at the entrance
of limestone caves; plants restricted to Peninsular Malaysia

2. Plants caulescent\textsuperscript{G} or acaulescent\textsuperscript{G}; leaves robust; indumentum often sericeous, if composed of sticky hairs then plants caulescent\textsuperscript{G}; plants at cave entrances or not; widespread

3. Capsules short-cylindrical, with several turns over its length; corolla flat-faced, usually resupinate\textsuperscript{G}, lobes reflexed; upper lip with hairs, lower lip glabrous

\textit{Senyumia}

3. Capsules ovoid, thin-walled, slightly twisted, with one turn over its length, sometimes almost straight; corolla campanulate; margin of upper lip with glandular hairs, otherwise glabrous

\textit{Spelaeanthus} (only \textit{S. chinii})

4. Plants caulescent\textsuperscript{G}; upper lip of corolla much smaller than lower lip, with a ring of tissue and often with hairs around the corolla throat, usually with a dense patch of hairs at base of lower lip

\textit{Ornithoboea}

4. Plants acaulescent\textsuperscript{G} or caulescent\textsuperscript{G}; upper lip of corolla usually distinct even if smaller than lower lip, no well-demarcated ring of tissue and hairs around corolla throat, if lower lip hairy, not obviously with a clear and dense patch at base

5. Leaves with densely matted\textsuperscript{G} hairs on the lower surface, often also with arachnoid\textsuperscript{G} additional hairs

\textit{Paraboea} p.p.

5. Leaves glabrous or pubescent, sometimes densely so, but not matted\textsuperscript{G} and arachnoid\textsuperscript{G} additional hairs absent

6. Anthers connate, filaments bent upwards; ovary without sessile glands ...

\textit{Paraboea} p.p.

6. Anthers coherent only at the beginning of anthesis, free later on, filaments straight, erect; ovary with sessile glands ...

\textit{Middletonia} p.p.

7. Stigma capitate or chiritoid\textsuperscript{G}

8. Corolla distinctly tubular; plants caulescent\textsuperscript{G}

9. Corolla flat-faced or campanulate; plants caulescent\textsuperscript{G} or acaulescent\textsuperscript{G}

9. Plants of shrubby and twiggy habit, branching at the base and producing several, to 50 cm long stems; flowers emerging singly from the leaf axils; stigma capitate; S China

\textit{Rhabdothamnopsis} (only \textit{R. sinensis})

10. Corolla flat-faced

\textit{Boea}

10. Corolla campanulate

11. Plants caulescent\textsuperscript{G}

\textit{Kaisupeeca} p.p.

11. Plants acaulescent\textsuperscript{G}

\textit{Dorcoceras}

12. Branched hairs present at least on lower leaf surface, often also elsewhere on the plant (use a lens)

\textit{Paraboea} p.p.

12. Branched hairs absent

13. Corolla flat-faced

\textit{Paraboea} p.p.

13. Corolla tubular

\textit{Somrania}

14. Fruit globose-ovoid, not exceeding the calyx; endemic to Peninsular Malaysia

\textit{Orchadocarpa} (only \textit{O. lilacina})

14. Fruit ovoid to cylindrical, exceeding the calyx; widespread

15. Leaves with densely matted\textsuperscript{G} hairs on the lower leaf surface, often also with arachnoid\textsuperscript{G} additional hairs, if not densely matted\textsuperscript{G} then stigma lingulate\textsuperscript{G}

\textit{Paraboea} p.p.

15. Leaves glabrous or pubescent, sometimes densely so but not matted\textsuperscript{G} and arachnoid\textsuperscript{G} additional hairs absent, stigma never lingulate\textsuperscript{G}
16. Plants caulescent\textsuperscript{c}; upper lip of corolla much smaller than lower lip, with a ring of tissue and hairs around the corolla throat ........................................... Ornithoboea \textit{p.p.}

16. Plants acaulescent\textsuperscript{c} or caulescent\textsuperscript{c}; upper lip of corolla usually distinct even if smaller than lower lip, no well-demarcated ring of tissue and hairs around corolla throat ................... 17

17. Upper lip of corolla tightly studded with oil-secreting glands consisting of a 1-celled stalk and a multicellular head; plants delicate, growing at entrance of limestone caves; Peninsular Malaysia ................................................................. Emahendia (only \textit{E. bettiana})

17. Upper lip without these glands; plants delicate or not, growing in a wide range of habitats; widespread ................................................... 18

18. Ovary with sessile glands; corolla almost flat-faced ........................................... Middletonia \textit{p.p.}

18. Ovary without sessile glands; corolla flat-faced or campanulate ........................................... 19

19. Fruit plagiocarpic\textsuperscript{G}, held horizontally and opening only along upper side ........................................... Loxocarpus

19. Fruit orthocarpic\textsuperscript{G}, held straight and dehiscing into two valves ........................................... 20

20. Corolla distinctly tubular ..... Damrongia \textit{p.p.}

20. Corolla shallowly campanulate ..... Kaisupeea

3.2.10. Subtribe Didymocarpinae

Subtribe Didymocarpinae G.Don was reestablished by Weber \textit{et al.} (2013). It is by far the largest subtribe in subfam. Didymocarpoideae and in the Gesneriaceae, comprising 35 genera with well over 1900 species and with a distribution from India to the Pacific and from China to Java. It is morphologically very heterogeneous and the relationships between the genera are still little understood. Since the treatment by Weber (2004), eight genera have been reestablished or described as new (\textit{Billolivia, Chayamaritia, Codonoboea, Glabrella, Liebigia, Microchirita, Primulina, Rachunia}, see Table 1), and 21 genera have been synonymised (including large genera such as \textit{Briggsia} and \textit{Chirita}) (see Table 1). Recircumscriptions have led to quite radical redefinitions and/or expansions of some genera (e.g., \textit{Deinostigma, Oreocharis, Petrocodon, and Primulina}). In \textit{Petrocodon}, which until recently was known only to include one penta- and more than 20 diandrous species, now also includes three tetrandrous species (Yu \textit{et al.}, 2015; Li \textit{et al.}, 2019; Zhang \textit{et al.}, 2019). Evidently, much work is still necessary before we have a satisfactory understanding of all genera to then be reflected in a satisfactory classification. As the subtribe is so large, we present here the genera in four subkeys based on two easily observable characters: the stamen number and habit. Many genera are extremely heterogeneous, occurring more than once in a subkey, or in more than one subkey.

**Key to the subkeys of subtribe Didymocarpine**

1. Flowers with 5 fertile stamens ......... Subkey 1

1. Flowers with 4 fertile stamens ......... Subkey 2

1. Flowers with 2 fertile stamens .............. 2

2. Plants acaulescent\textsuperscript{G} ........................................... Subkey 3

2. Plants caulescent\textsuperscript{G} ........................................... Subkey 4

**Subkey 1: Genera of subtribe Didymocarpinae with 5 fertile stamens and actinomorphic flowers**

1. Stamens combined into a tube surrounding the style; connectives with long apical projections; corolla blue ................................................................. Conandron (only \textit{C. ramondiioides})

1. Stamens not forming a central tube; connectives without projections; corolla of various colours, including blue .............. 2

2. Corolla urceolate, lobes triangular, pointed, white or tinged pink; stamens included;
capsules 4-valved ............................................. 35
................. Petrocodon p.p. (P. scopulorum, the only species of the former genus Tengia, see Table 1; the species with 4 and 2 stamens are covered in Subkeys 2 and 3, respectively)

2. Corolla flat-faced or campanulate, lobes rounded, white or purple to blue; stamens exserted; capsules 2-valved ............................................. 2

................. Oreocharis p.p. (O. leiophylla, the former Bournea leiophylla, and O. esquirolei, the only species of the former genus Thamnocharis; in the latter the flowers are variable and include 5 and 4-merous forms; see Table 1; the Oreocharis species with 4 and 2 stamens are covered in Subkeys 2 and 3, respectively)

Subkey 2: Genera of subtribe Didymocarpinae with 4 fertile stamens

1. Flowers actinomorphic, calyx and corolla 4-merous ...................................... Oreocharis p.p. (O. sinensis, the former Bournea sinensis, and O. esquirolei, the only species of the former genus Thamnocharis; in the latter the flowers are variable and include 5- and 4-merous forms; see Table 1; the Oreocharis species with 5 and 2 stamens are covered in Subkeys 1 and 3, respectively)

1. Flowers slightly to strongly zygomorphic, calyx and corolla 5-merous ..................... 2

2. Calyx zygomorphic, 2-lipped, upper (adaxial) lip consisting of a single lobe (fused halfway with the remaining lobes), lower (abaxial) lip 4-lobed (fused to ¾ to upper lip); disc tubular; capsules narrowly ellipsoid; Hainan Island (China) ............. Cathayanthe (only C. biflora)

2. Calyx usually actinomorphic, if zygomorphic then with 3 upper lobes and 2 lower lobes, lobes free to base or connate; disc ring-like or (rarely) cup-shaped or rudimentary; capsules elongate, rarely conical or ovoid ......................... 3

3. Ovary bilocularc, only adaxial locule fertile; placent 1, axile; capsules plagiocarpicc; cymes 1–3-flowered ......................................................... 3

................. Briggsiopsis (only B. delavayi)

3. Ovary unilocularc; placentae 2, parietal; capsules orthocarpicc; cymes 1 to many-flowered ......................................................... 4

4. Anthers of the two lower stamens dithecous, those of the upper pair monothecous; fruit cylindrical, subcarnose, breaking irregularly into pieces; Borneo ...................... Hexatheca

4. Anthers all dithecous; fruit dehiscing loculicidally (rarely septicidally or both); widespread .................................................. 5

5. Plants climbing or epiphytic, rarely epilithic; corolla long- or short-tubular, usually arcuate; frequently red, also yellow or other colours .. .......................................................... 6

5. Plants terrestrial; corolla broadly tubular, narrowing abruptly towards the base or infundibuliform; usually light-coloured, not red .................................................. 7

6. Plants climbing (one of the c. 100 species terrestrial), rooting in the soil and clinging to the bark of trees by means of short adhesive roots generated along the nodes and internodes; leaves herbaceous, lateral veins clearly visible ........................................ Agalmyla p.p.

6. Plants usually epiphytic, rarely epilithic, rooting at nodes only; leaves leathery-fleshy, with a several-layered hypodermis on lower leaf side, lateral veins ± invisible ...................... Aeschynanthus

7. Plants with a single, strongly anisophyllousc leaf pair on stem apex ........................................ Raphiocarpus p.p. (R. sesquifolius)

7. Plants caulescentc or of acaulescent rosette or tufted habit; all or several leaves capable of producing axillary flowers or inflorescences ........................................................................................................................................ 8

8. Plants caulescentc, with long stem and distinct internodes ............................................. 9
8. Acaulescent rosette plants or plants with short stem and tuft of alternate leaves at stem apex ................................................................. 11

9. Corolla long- and broad-tubed, somewhat ventricose on abaxial side, spotted inside, with two ridges in the throat; seeds with or without a hair-like appendage on each end ....................................................... 10

9. Corolla infundibuliform, rarely campanulate or flat-faced, with two or several longitudinal streaks; seeds without hair-like appendages, but sometimes with a long tapering brown apex at each end ................................................... 10

10. Seeds with a long tapering brown apex at each end ........................................ Anna

10. Seeds ellipsoid, without appendages ......................................................... Raphiocarpus p.p. (species other than R. sesquifolius)

11. Capsules dehiscing on upper side only; stigma lingulate, formed by the lower carpel only; corolla broad-tubular (Ridleyandra sect. Ridleyandra) or campanulate to flat-faced (R. sect. Stilpnothrix); S Thailand, Malay Peninsula, Borneo ......................................................... Ridleyandra

11. Capsules 2 or 4-valved; stigma capitate or bilobed (with upper and lower lobe); corolla variable; N Thailand, Vietnam, Myanmar, NE India, Bhutan, S China, and Japan ........................................ 12

12. Capsules 4-valved; stigma capitate; corolla infundibuliform .................. Petrocodon p.p. (P. hunanensis, P. longitubus, and P. tongziensis (recently discovered species with 4 stamens instead of 5 or 2; for the latter two conditions see Subkeys 1 and 3, respectively)

12. Capsules 2-valved, valves often remaining joined along ventral suture; stigma usually bilobed; corolla of various shapes, rarely infundibuliform ..................................................... 13

13. Rosette or tufted plants with indistinct stem, petioles and leaves usually hairy; corolla morphology very variable ........................................

................. Oreocharis p.p. maj. (sensu Möller et al. 2011b; the species with 4 stamens, including those of the former genera Ancylostemon, Briggsia p.p. (incl. type), Isometrum, Paraisometrum and Tremacron; see Table 1; the Oreocharis species with 5 and 2 stamens are covered in Subkeys 1 and 3, respectively)

13. Plants with short (5–6 cm long) stem, petioles and leaves glabrous; corolla broadly tubular, gibbous abaxially ...... Glabrella (see Table 1)

Subkey 3: Genera of subtribe Didymocarpinae with 2 fertile stamens, plants of acaulescent habit

1. Fertile stamens the posterior pair .................................................. Oreocharis p.p. (the species of the former genus Opithandra, see Table 1; the Oreocharis species with 2 stamens in anterior position are covered in the present Subkey, the species with 5 and 4 stamens are covered in Subkeys 1 and 2, respectively)

2. Upper lip of corolla 4-lobed, lower lip undivided ............................................ 3

2. Upper lip of corolla 2-lobed or entire, lower lip 3-lobed, lobes rounded or triangular-acute ................................................................. 4

3. Corolla lobes triangular-acute; corolla bowl-shaped or campanulate, white ....... Allocheilos

3. Adaxial corolla lobes deltoid, abaxial lobes broadly triangular; corolla narrowly funnelform-tubular, red ...... Petrocodon p.p. (P. coccineus, the former Calcareoboea coccinea, see Table 1; species with 5 and 4 stamens are covered in Subkeys 1 and 2)

4. Upper lip of corolla entire, triangular-obtuse or semi-orbicular ....................................... 5

4. Upper corolla lip shortly incised or distinctly 2-lobed ........................................ 6
5. Corolla tubular to tubular-funnelform, much longer than limb; calyx lobes free to base, oblong or linear; stamens exerted; leaf blade elliptical, base truncate ............................................................................. **Oreocharis** p.p. (the former genus **Deinocheilos**, see Table 1; the species with 5 and 4 stamens are covered in Subkeys 1 and 2, respectively)

5. Corolla tube broadly tubular-campanulate, nearly equalling limb; calyx campanulate, lobes connate, blunt; stamens included; leaf blade cordate or kidney-shaped ........... **Gyrocheilos**

6. Upper corolla lip shortly incised at apex ................. **Petrocosmea** p.p. (P. sect. **Anisocheilos**; see also couplet 12)

6. Upper corolla lip distinctly 2-lobed ................ 7

7. Upper corolla lobes fused ± to half....................... **Petrocosmea** p.p. (see also couplet 12)

7. Upper corolla lobes free or almost free to mouth............................................................................. 8

8. Lobes of upper lip usually larger than those of lower lip, lower lip with 3 or (by reduction of the middle lobe) 2 lobes; all corolla lobes broadly triangular–acute; corolla with short narrow tube and large, ± flat limb, pink, darker in the centre; stamens sometimes reduced to 1; stigma bilobed \(g\), with equal upper and lower lobe ............................................. **Oreocharis** p.p. (the former monospecific genus **Dayaoshania** (see Table 1; the **Oreocharis** species with 5 and 4 stamens are covered in Subkeys 1 and 2, respectively)

8. Lobes of upper lip equal or smaller than those of lower lip; lobes rounded or triangular; corolla variable, rarely pink; stamens always 2; stigma capitate or chiritoid \(g\) ............................................. 9

9. Capsules orthocarpic \(g\) ............................................ 10

9. Capsules plagiocarpic \(g\) .......................................... 14

10. Stigma capitate, globose or punctiform .... 11

10. Stigma chiritoid \(g\) .................................................. 13

11. Corolla with ± long tube, limb often small in relation to tube, exhibiting a wide spectrum of forms (including urceolate, tubular, infundibuliform, salverform, lobes triangular-pointed, rarely rounded) ........................................**Petrocodon** p.p.maj. (see Table 1; the species with 2 stamens; species with 5 and 4 stamens are covered in Subkeys 1 and 2)

11. Corolla flat-faced or campanulate, with short- and broad-tube, limb large in relation to tube, lobes rounded .................................................. 12

12. Corolla flat-faced, tube broad and shorter than limb, blue, purple or white; anthers not villous, thecae parallel; capsules narrowly elliptoid to ovoid ...........................................................................

**Petrocosmea** p.p. (see also couplet 7)

12. Corolla campanulate to short- and broad-tubed, tube longer than limb, white or bluish, with longitudinal streaks on lower side; anthers villous, thecae widely divaricate; capsules globose ..........................................................................

**Metapetrocosmea** (only **M. peltata**)

13. Leaves opposite (at least in young plants); calyx divided to base or sometimes basally connate to form a short tube, valvate, lobes ± equal; S China, Vietnam ...........................................

**Primulina** p.p.maj. (see Table 1)

13. Leaves alternate; calyx with 5 lobes divided to base, strongly imbricate, upper lobe distinctly larger; Thailand, Laos ...............................................

**Chayamaritia** (see Table 1)

14. Stigma capitate ......................**Codonoboea** p.p. (most species caulescent \(g\) and with spaced leaf pairs, but some, particularly the former **Didymocarpus**/**Henckelia** sect. **Heteroboea** producing tufts of alternate leaves near ground) (see Table 1)

14. Stigma chiritoid \(g\) ............................................. 15

15. Many plant parts, particularly the pedicels, with hooked hairs; S China and Vietnam .............

**Deinostigma** p.p.
15. Plants without hooked hairs .................................. 16

16. Ovary bilocular, with only the upper carpel fertile; leaves in a rosette; S China, Vietnam .... ................................................. Primulina p.p. (some species around P. dryas; otherwise in the genus fruit orthocarpic and both carpels fertile) (see Table 1)

16. Ovary unilocular, with both carpels fertile; leaves in a basal rosette or arising singly from a small tuber; S & SW India, Nepal, Sri Lanka ........................................ Henckelia p.p. (“core Henckelia”, Henckelia sect. Henckelia sensu Weber & Burtt, 1998 [“1997”]) (see Table 1)

Subkey 4: Genera of subtribe Didymocarpinae with 2 fertile stamens, plants of caulescent habit (stems erect, ascending or creeping)

1. Plants climbing or epiphytic, more rarely lithophytic but then distinctly climbing or scrambling ............................................... 2

1. Plants terrestrial or epilithic, stem elongated with distinct internodes, or short, with leaves crowded near the ground (but with distinct internodes), erect, ascending or creeping .... 3

2. Plants climbing (usually on trees, occasionally on rocks); corolla bright red, yellow, green or combination of these colours. Agalmyla p.p. (the few species with 2 stamens; the species with 4 stamens are covered by Subkey 2)

2. Plants epiphytic, if terrestrial or epilithic then scrambling, not climbing; corolla white or light-coloured ......................... Lysionotus

3. Plants creeping ............................................... 4

3. Plants erect or ascending .............................. 5

4. Stigma lingulate or chiritoid; leaves strongly anisophyllous; flowers small campanulate or large infundibuliform; creeping stem with long or short internodes; India, Sri Lanka and mainland Asia to S China .................................................. Henckelia p.p. (the non-creeping Henckelia species are covered below and the caulescent species in Subkey 3)

4. Stigma capitate; leaves ± isophyllous; flowers usually large and infundibuliform; creeping stem with distinct internodes; Malesia, particularly Malay peninsula ........ Codonoboea p.p. (C. reptans and similar species; the erect species are covered below and the acaulescent species in Subkey 3)

5. Plants small and delicate; comprising a single internode and a single leaf (rarely 2 or more leaves) .............................................. 6

5. Plants large and robust; with several to many leaves or leaf pairs ......................................... 7

6. (Sub)unifoliate habit inherent; plants annual or perennial-rhizomatous; leaves solitary (macrocotyledon?), rarely 2 or more; N & NW India, Thailand and Myanmar ................................................................. Henckelia p.p. (caulescent unifoliate species, cf. Sirimongkol et al., 2019; the caulescent species of Henckelia are covered below and by Subkeys 3 respectively)

6. Unifoliate habit facultative; plants annual and principally caulescent; with a solitary leaf (macrocotyledon?) below and spaced leaf pairs above, but starting to flower in an early stage of development, with the flower(s) arising from the axil of the macrocotyledon; under special conditions the plants persist in this stage until they fruit and die; from S China to Java ........ Microchirita p.p. (see also couplet 19)

7. Fruit indehiscent, a hard (sclerocarpous) or fleshy berry; large terrestrial herbs or subshrubs ........................................ 8

7. Fruit a dehiscent, dry capsule; habit variable................................. 10

8. Posterior stamen pair fertile; leaves opposite; New Guinea (Sepik area) .......... Sepikea
(only *S. cylindrocarpa*; genus doubtful, description of stamen position perhaps erroneous and genus probably congeneric with *Cyrtandra*; Burtt, 2001)

8. Anterior G stamen pair fertile; leaves opposite or alternate ................................................. 9

9. Leaves opposite; isophyllous G to strongly anisophyllous G (small leaves reduced to stipule-like scales); Nicobar Islands, Thailand and Taiwan through Malesia and the S Pacific to the Hawaiian Islands, S Japan, but not occurring in mainland China, Vietnam and Cambodia ....................... *Cyrtandra*

9. Leaves alternate, without stipule-like scales opposing the leaves; S Vietnam (southern Annamite range) and possibly neighbouring Cambodia .................... *Billolivia* (see Table 1)

10. Stigma undivided, capitate, truncate or clavate ................................................................. 11

10. Stigma bilobed G or chiritoid G ............... 14

11. Capsules orthocarpic G ................................. 12

11. Capsules plagiocarpic G ............................... 13

12. Lowermost pair of bracteoles G large, boat shaped; stem wiry; calyx lobes free, imbricate; corolla campanulate; stigma clavate; Thailand ....................... *Rachunia* (only *R. cymbiformis*) (see Table 1)

12. Lowermost pair of bracteoles G small, unremarkable; stem not wiry; calyx lobes free or connate, valvate; corolla usually tubular or infundibuliform, stigma capitata; S China and N & NE India to the N of Peninsular Malaysia and N Sumatra) .......................... *Didymocarpus*

13. Ovary/fruit unilocular G, placentae 2, parietal-lateral; capsules usually straight; stigma capitata; leaves opposite or alternate; (mainly western) Malesia: Sumatra, S Thailand, Peninsular Malaysia, Borneo, few spp. further east ................. *Codonoboea* (see Table 1)

13. Ovary/fruit bilocular G, placenta 1, axilemedian; capsules usually curved; stigma capitate or truncate; leaves opposite; China, Vietnam, Taiwan, and S Japan .................... *Hemiboea* (including the former monospecific genus *Metabriggsia*; see Table 1)

14. Stigma bilobed G ........................................ 15

14. Stigma chiritoid G ...................................... 17

15. Stigma lobes of equal size, oblate or semi-orbicular; plants annual; stems squareangled; stamens adnate to corolla tube near mouth ................. *Didymostigma*

15. Stigma lobes of unequal size, the upper one distinctly smaller; plants perennial; stems square-angled or terete; stamens adnate to the corolla in the middle of the tube .......... 16

16. Stems square-angled; indumentum pubescent; calyx narrow, with linear-lanceolate lobes; corolla white to lavender; anthers apically coherent; S China ............ *Allostigma* (only *A. guangxiense*)

16. Stems terete, indumentum sericeous; calyx campanulate, with rounded lobes; corolla white; anthers coherent face to face; S China, N Vietnam ............ *Pseudochirita* (only *P. guangxiensis*)

17. Capsules plagiocarpic G; ovary/fruit bilocular G throughout or in the lower part; plants, especially the inflorescence axes and pedicels, with hooked hairs; S China and Vietnam ...... .................. *Deinostigma* (see Table 1)

17. Capsules orthocarpic G; ovary/fruit unilocular G throughout; plants without hooked hairs; widely distributed ........................................ 18

18. Plants large, coarse perennial herbs or subshrubs, stems to 2 m tall; leaves asperous on upper side; ovary and fruit with a short stipe; Sumatra, Java and Bali .............. *Liebigia* (the former *Chirita* sect. *Liebigia*) (see Table 1)

18. Plants much smaller, herbaceous, not subshrubby; leaves not asperous; ovary and fruit without a stipe; ranging from S China to Java ......................................................... 19
19. Plants usually annual-monocarpic, stem and leaves fleshy-juicy; inflorescences (one to) several in leaf axils, sometimes forming a conspicuous series of flower pairs ("crested inflorescence"); India, Myanmar, S China, Thailand, Vietnam, Laos, Cambodia, Sumatra, Java and Borneo ......................... **Microchirita** (the former Chirita sect. Microchirita) (see Table 1)

19. Plants perennial, stem and leaves usually not fleshy-juicy; inflorescences never crested; Sri Lanka, NE India, Nepal, S China, N Thailand, Myanmar, and Vietnam ............ **Henckelia** p.p. (most species of the former Chirita sect. Chirita and including the former monospecific genus Hemiboeopsis, for the species of the acaulescentG “core Henckelia” see Subkey 3)

**Problematic and excluded genera**

Weber (2004) included two annexes to the treatment of the genera of Gesneriaceae, entitled ‘Genera of uncertain affiliation’ and ‘Excluded genera’. The former included the genera Sanango, Cubitanthus, and Jerdonia, the latter Brookea, Charadrophila, Cyrtandromoea, Rehmannia, and Titanotrichum (see Table 1). Three of them, Sanango, Jerdonia and Titanotrichum, each comprising only a single species, are now definitely included in the Gesneriaceae: Sanango is placed in a subfamily of its own (Sanangoideae), Jerdonia is on the first branching lineage within Didymocarpoideae-Trichosporeae and is formally recognised as subtribe Jerdoniinae, and Titanotrichum is placed in subfamily Gesnerioideae, tribe Titanotricheae and is the only Asian taxon in the subfamily (see also notes under the respective subtribes).

Due to the radical reorganisation of the Scrophulariaceae and the restructuring of the order Lamiales (now containing 26 families), a much more precise placement of the excluded genera is now possible compared to 2004. Cubitanthus is now placed in Linderniaceae, Charadrophila in Stilbaceae, Cyrtandromoea in Phrymaceae, and Rehmannia in Orobanchaceae (for further details and references see Table 1) (summarised and discussed in Luna et al., 2019).

The only genus for which no progress can be reported is Brookea. This was assigned to the Gesneriaceae by Hallier (1903), while other authors (including Burtt, 1963) considered it to belong to Scrophulariaceae. Fischer (2004) placed Brookea in Scrophulariaceae–Bowkerieae/Stilbaceae, where it is both morphologically and geographically isolated. To the best of the authors’ knowledge, the genus has not yet been included in any molecular-phylogenetic study. Nevertheless, the chance that this Bornean genus of four tree species belongs in the Gesneriaceae is remote.

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**Glossary**

**Acaulescent**: Stem absent or indistinct, plants of rosette habit or leaves forming a tuft at ground level; contrasting to → acaulescent.

**Alterniclady** (adj. alternicladic): Alternate position of axillary shoots (particularly inflorescences) in → anisophyllous or alterniphyllous shoots.

**Alterniphyllous** (adj. alterniphyllous): Extreme form of → anisophyllous, with the small leaf of a leaf pair being completely reduced. The remaining large leaves form two rows recalling a distichous leaf arrangement (pseudo-distichy, e.g. Rhynchoglossum).

**Anisoclady** (adj. anisocladic): Axillary shoots of an → anisophyllous leaf pair of different size. The extreme form of anisoclady is → alterniclady.

**Anisocotyly** (adj. anisocotylous): In contrast to à isocotyly of Sanangoideae and Gesnerioideae, the two cotyledons behave differently in the Didymocarpoideae. One, the “microcotyledon”, stops growth at a very early point of time and later withers away, while the other, the
“macrocotyledon”, does not stop growing and reaches a much larger size than the microcotyledon. It may grow to the size and form of a normal foliage leaf (e.g. Microchirita) or may grow to a huge leaf that remains the only leaf of the plant (Monophyllaea, Streptocarpus p.p.). Anisocotyly is not known outside of Gesneriaceae (see also Jong, 1970, 1978; Jong & Burtt, 1975; Nishii et al., 2010, 2017). For functional aspects of anisocotyly see Burtt (1970).

**Anisophylly** (adj. anisophyllous): In plants with opposite leaf arrangement, the two leaves of a pair being unequal in size. In the case of slight or moderate anisophylly the smaller leaves are only reduced in size, in the case of strong anisophylly the smaller leaves may also take on a different leaf form (scale-like, stipule-like; e.g. Cyrtandra p.p., Henckelia p.p.). Complete reduction of the small leaves results in à alterniphylly.

**Anterior stamens**: The two lateral stamens in abaxial (lower or front) position within the flower; contrast → posterior stamens.

**Arachnoid indumentum**: Spiderweb-like hair-cover. It never forms a dense layer (like in the à matted indumentum) and the hairs are very thin and loosely interwoven with each other (see Xu et al., 2008).

**Bilobed stigma**: Stigma consisting of 2 lobes. In the case of Gesneriaceae a more specific definition is necessary, as the lobes may either represent the lobes of the upper and lower carpel (common in Didymocarpoideae) or fused carpel halves (left- and right position of stigma lobes; found in many Gesnerioideae). In the former type, reduction of the upper lobe may result in a → lingulate or → chiritoid stigma.

**Bilocular ovary**: Ovary completely divided into two locules by the presence of a septum. In Gesneriaceae bilocular ovaries are rare. Examples include Deinostigma poinieri, Monophyllaea, Whytokia and a few other species in Didymocarpaceae; here both carpels are fertile and produce a central, axile placenta. Moreover, bilocular ovaries are characteristic of genera in which the abaxial carpel is reduced and infertile. Here only the upper carpel produces a placenta in axile-adaxial position (Hemiboea, spp. of Primulina). Contrast: → unilocular ovary.

**Boss**: A prominent swelling or inflation of the dorsal region of a corolla, typical for a few genera in Gesneriaceae, such as species in Hemiboea and Tribounia, and Jordania indica (see Middleton & Möller, 2012).

**Bracteole(s)**: Bract(s) within the cyme, subtending consecutive cyme units, or if cyme reduced to a solitary flower, bract(s) placed at base of pedicel.

**Bracteose thyrse/raceme**: Thyrse/raceme with the lateral cymes/solitary flowers emerging from the axils of bracts.

**Caulescent habit**: Plant with distinct stem and distinct internodes, leaves or leaf pairs/whorls thus distinctly spaced. The stem can be erect, ascending or creeping: Contrast: → acaulescent.

**Chiritoid stigma**: Typical stigma form of the former genus Chiritia: upper stigma lobe absent, lower lobe enlarged and usually emarginate to bifid. Now known to occur in many genera of Didymocarpoideae-Trichosporeae.

**Hypocytroid**: Referring to the corolla form of some Neotropical Gesneriaceae (based on the former genus Hypocrypta): corolla strongly pouched on the dorsal or the ventral side and mouth much constricted: (e.g. Drymonia p.p., Gasteranthus p.p., Nematanthus p.p., Pachycaulos, Pearcea). The large pouch is the most prominent and conspicuous part of the corolla, while the mouth is reduced to a small opening. An extreme form of the hypocytroid corolla is the balloon-shaped flower of some Pearcea species.

**Isocotylous** (adj. isocotyle): Equal size and very limited growth of the two cotyledons after germination. Compare to → anisocotyly.

**Isophyllous** (adj. isophyllous): Equal size of the two leaves of a pair in shoots with opposite leaf arrangement.

**Lingulate stigma**: Stigma form with upper stigma lobe absent and lower lip tongue-like (not emarginated or bifid).

**Macrocotyledon, microcotyledon**: → Anisocotylous.

**Matted indumentum**: Dense white silvery hair-cover found particularly in genera of Loxocarpinae, looking like a layer of matted cashmere wool-like hair; → arachnoid indumentum.

**Orthocarpic** (adj. orthocarpic): Term relating to the ovary and fruit position in the flower: in orthocarpic fruits, the fruit is positioned in straight continuation of the pedicel, in → plagiocarpic fruits the fruit is held at a distinct angle to the pedicel.

**Pair-flowered cyme**: Special type of cyme found in Gesneriaceae, Calceolariaceae and Plantaginaceae. Each cyme unit appears to end in a flower pair instead of a single flower (for details and interpretation see Weber, 2013).

**Phyllomorphic** (adj. phyllomorphic): A leaf-stem construct to describe the anomalous development of species in Streptocarpus and other genera of Old World Gesneriaceae. It is a leaf-stem construct that consists of a lamina and petioloide (a petiole transitional to and functioning as a stem). A trinity of meristems (petioloide, basal and groove meristem) located at the junction between lamina and petioloide governs the growth of the phyllomorph and the plant, respectively (see also Jong 1970, 1978; Jong & Burtt, 1975; Nishii et al., 2015, 2017; this issue).
Plagiocarpy (adj. plagiocarpic): Term relating to the ovary and fruit position. In contrast to orthocarpic fruits, in plagiocarpic fruits the fruit forms a distinct angle (135° to 90°) with the pedicel (see Weber, 2004).

Posterior stamens: The two stamens in adaxial (upper or rear) position within the flower; contrast: anterior stamens.

Resupination (adj. resupinate): Upside-down orientation of zygomorphic flowers. The reverse position can be reached in two ways: (1) twisting of the pedicel by 180° (e.g., many species of Alloplectus, Crantzia, Glossoloma and Nematanthus, all belonging to Gesnerioideae; resupination is rare in the Didymocarpoideae: Senymania), (2) back-flipping of the flowers (species of Oreocharis).

Reticulate seed surface: Testa cells polygonal, with the thickened lateral cell walls forming a raised reticulum. Reticulate seeds are common in Didymocarpoideae (see Beaufort-Murphy, 1983).

Scaly rhizome: Subterranean, usually several cm long stolons consisting of a thin central axis and densely packed pairs or whorls of small fleshy leaf scales. They survive in the ground when the above-ground plant parts die back in the dry period and sprout when favourable conditions return. This special type of rhizome is found in most genera of Gloxiniae (monocarpic) plants (e.g., Monophyllaea, & Streptocarpus or a solitary foliage leaf in the successive seasonal shoot units of perennial plants (e.g., Platystemma, Raphiocarpus sesquifolius).

Stipe: Thin, stalk-like and sterile basal part of the ovary and fruit, respectively (e.g., Liebghia, Tribounia, some spp. of Didymocarpos).

Stomatomorphic stigma: A mouth-shaped stigma, with stigma lobes arranged like lips.

Striata seed surface: Seeds with thickened walls of testa cells, cells narrow and elongated, forming straight or more frequently spiral rows around the seed body; compare with reticulate and verruculose seeds.

Stringy rhizome: Rhizome type characteristic of the genus Sphaerorrhiza: subterranean stolons with a succession of tuber-like swellings, often breaking apart and each propagule giving rise to a new plant. Stringy rhizomes are also found in Serranium, here in combination with scaly rhizomes. The latter are produced at the tips of long stringy rhizomes.

Unifoliate: Plant producing a single leaf only. This may represent a macrocotyledon in short-lived (monocarpic) plants (e.g., Monophyllae, phyllomorphic spp. of Streptocarpus) or a solitary foliage leaf in the successive seasonal shoot units of perennial plants (e.g., Platystemma, Raphiocarpus sesquifolius).

Unilocular ovary: Interior of ovary not divided by a septum. In most Gesneriaceae, the ovary is unilocular for most of its length with parietal intrusive bifid recurving placenta (with a short bilocular part often being found at the base), but there are genera in which the ovary is à bilocular.

Verruculose seed surface: Seed surface reticulate, with a special type of ornamentation: the outer surface of each testa cell has a large central ± hemispherical protrusion or papilla (see Beaufort-Murphy, 1983). This seed type is found in many species of Streptocarpus (sensu Nishii et al., 2015), particularly of subg. Streptocarpella.

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