

# NEW COMBINATIONS AND OTHER TAXONOMIC CHANGES FOR THE FORTHCOMING ‘FLORE DES MASCAREIGNES’ ORCHIDACEAE ACCOUNTS

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**ABSTRACT.** In preparation for the forthcoming orchid accounts of the *Flore des Mascareignes* lectotypifications are made for *Angraecum cadetii*, *A. cornigerum*, *A. corrugatum*, *A. costatum*, *A. eburneum*, *A. mauritianum*, *A. patens*, *A. pingue*, *A. tenuifolium*, *Benthamia erinacea*, *B. perfecundum*, *Bulbophyllum commersonii*, *B. compressum*, *B. conicum*, *B. cordemoyi*, *B. densum*, *B. pusillum*, *B. variegatum*, *Cynorkis arnottioides*, *C. calcarata*, *C. calcaripotens*, *C. cordemoyi*, *C. falcata*, *C. fastigiata*, *C. flexuosatis*, *C. graminea*, *C. lilacina*, *C. nervilabris*, *C. paradoxa*, *C. pleiadea*, *C. purpurascens*, *C. reticulate*, *C. squamosa*, *C. trilinguis*, *C. variegata*, *Disperis cordata*, *Gastrorchis villosa*, *Habenaria arachnoides*, *H. lancifolia*, *H. praealta*, *H. undulata*, *Platylepis densiflora*, *P. margartifera*, *P. oclusa*, *Oeceoclades analavelensis* and *O. pulchra*. Neotypifications are made for *Angraecum tenuifolium*, *Benthamia spiraloïdes*, *Cynorkis coccinelloïdes* and *C. constellata*. Clarification is provided of the taxonomy of *Angraecum crassifolium*, *A. tenellum*, *Benthamia erinacea*, *Bulbophyllum densum*, *B. elliotii*, *B. incurvum*, *B. pendulum*, *Cheirostylis boryi*, *C. gymnochiloides*, *C. nuda*, *Cynorkis calcarata*, *C. coccinelloïdes*, *C. falcata*, *C. flexuosatis*, *C. squamosa*, *Habenaria sigillum*, *Oeceoclades analavelensis*, *Platylepis densiflora*, *P. margaritifera* and *P. occulta*. New combinations are made for *Benthamia spiraloïdes*, *Bulbophyllum elliotii* var. *latibracteatum*, *Cheirostylis boryi*, *Cynorkis aristei* and *C. flexuosatis*.

**KEYWORDS/PALABRAS CLAVE:** Mauritius, new combinations, nuevas combinaciones, new synonyms, nuevos sinónimos, Reunion, Rodrigues, tipification, tipificación

**Introduction.** Taxonomic research on the orchid flora of the Mascarenes (Mauritius, Réunion and Rodrigues) has a long and rich history and the archipelago has been more intensively studied than the much larger neighbouring island of Madagascar. This is probably related to the position of Mauritius and Réunion on major trade routes and to their history during colonial times (Mauritius and Rodrigues were colonised at various times by the Dutch, French and British until 1968 and Réunion remains an overseas Département of France).

The earliest works were related to scientific expeditions, such as Jean-Baptiste Bory de Saint-Vincent’s ‘*Voyage dans les principales Îles des mers d’Afrique*’ (1804). Louis-Marie Aubert-Aubert du Petit-Thouars (Thouars henceforth) published the first accounts of the orchid flora of the islands, culminating in his extensively illustrated *Histoire particulière des Plantes Orchidées recueillies sur les trois Îles Australes d’Afrique* (1822). This was soon followed by Achille Richard’s

*Monographie des Orchidées des Îles de France et Bourbon* (1828) and Wenceslas Bojer’s *Hortus Mauritianus* (1837). Towards the end of the 19th century, Spencer Le Marchant Moore produced the orchid part for John Gilbert Baker’s *Flora of Mauritius and the Seychelles* (1877) while Eugène Jacob de Cordemoy (Cordemoy henceforth) published Charles Frappier de Montbenoit’s (Frappier henceforth) manuscript on orchids several years after Frappier’s death, as part of his *Flore de l’Île de la Réunion* (1895). The French botanist Jean Bosser sparked a renaissance of interest in the orchids in the 1960’s when he started work on the *Flore des Mascareignes*, especially in an extensive series *Contribution à l’Étude des Orchidaceae de Madagascar et des Mascareignes* published in *Adansonia* (1965–2007). Regretfully, Bosser was unable to complete his work but he left various manuscript notes on some of the genera; with his permission, these have been interpreted and incorporated in our own work and are fully acknowledged. Thérézien Cadet (1981)

and Janine Cadet (1989) were also active at the same time. Recently, there has been a surge in publications by amateur and professional botanists alike: David Roberts (Roberts 2001, Roberts *et al.* 2004), Jean-Bernard Castillon (2009, 2010, 2012, 2014), Claire Micheneau (Micheneau *et al.* 2008), Patrice Bernet (Bernet 2010a,b,c, 2011, Bernet & Castillon 2012), Michel Szelengowicz and Jean Maurice Tamon (Szelengowicz *et al.* 2012, Szelengowicz & Tamon 2013), Claudia Baider (2012a,b), Thierry Pailler and his colleagues at the University of Réunion (Pailler *et al.* 2013, 2018, Pailler & Henze 2020, Pailler & Baider 2020), Hermans and collaborators (Hermans *et al.* 2017, 2020a,b) and many others have all contributed greatly to the knowledge of taxonomy, conservation, pollination and biology of Mascarene orchids.

The *Flore des Mascareignes* project, initiated in 1970, covers the plant families of Mauritius, Réunion and Rodrigues in the Western Indian Ocean. It is published jointly by the Institut de Recherche pour le Développement (IRD), the Mauritius Sugar Industry Research Institute (MSIRI) and the Royal Botanic Gardens, Kew. Twenty-eight fascicules have been published so far with 2500 species described in 201 families. The final two volumes, on the Orchidaceae, are scheduled for publication in 2021–2022 and will contain an account of all the known species from the area, including detailed descriptions, keys, literature, specimen references and illustrations.

The orchid family is represented in the Mascarenes by some 165 species in 40 genera; with 88 recognised species in Mauritius, 152 in Réunion and 8 in Rodrigues. Their principal relationships are with the rich orchid flora of Madagascar (with a 44% overlap) and it is likely that they arrived in this more recently evolved volcanic archipelago by the dispersal of their light wind-blown seeds. There also is an overlap with the Comoros (15%), continental Africa (13.5%) and the Seychelles (7%) with just 5% having a more global distribution. A total of 74 species (*ca.* 45%) are endemic to the Mascarenes, with 7% endemic to Mauritius, 28.5% to Réunion and 0% for Rodrigues.

In preparation for the forthcoming accounts of the family Orchidaceae for the *Flore des Mascareignes*, several taxonomic changes were necessary and are validated here. Our aim is to confirm these changes to support ongoing research.

**Materials and methods.** Herbarium specimens of Mascarene and Madagascar in all the relevant herbaria have been systematically examined, photographed and databased. Where necessary, the critical specimens were dissected and drawn, notably the type collections. This archive now contains over 85,000 records. A comprehensive bibliography on the orchid flora of the region (J. & C. Hermans in Du Puy *et al.* 1999; updated in Hermans *et al.* 2007) kept up-to-date and now containing over 2200 references, has been an invaluable resource for this work.

Where necessary, field work in Madagascar and the Mascarenes has been undertaken and many type and other localities have been visited.

Following recommendations in the International Code of Nomenclature (Turland *et al.* 2018) and McNeill (2014), lectotypes have been recognised when more than one sheet of original material with the same collecting number has been located. The most representative sheet has been designated as lectotype and the others as isolectotypes or isotypes (article 9.5). In a few cases neotypes had to be selected when original material is missing or destroyed (article 9.8).

#### TAXONOMIC TREATMENT

##### 1. ANGRAECUM BORY

1. *Angraecum cadetii* Bosser, Bull. Mus. Nation. Hist. Nat. B., Adansonia, sér. 4, 9, 3: 252 (1987). Fig. 1.

TYPE: Réunion, Plaine des Affouches, Feb. 1971, Bosser 20690 (**lectotype designated here**: P00107185; isolectotype: P00107194).

*Hadrangis cadetii* (Bossler) Szlach., Mytnik & Grochocka, Biodiv. Rec. Conserv. 29: 14 (2013).

Bosser cited as the type his own collection (Bossler 20690) which comprises two sheets in P: P00107185, being the most complete and corresponding best to the description, is chosen here as the lectotype. The species is endemic to Mauritius and Réunion (Fig. 1).

2. *Angraecum cornigerum* Cordem., Rev. Gén. Bot. 9: 418, pl. 10 (1899). Fig. 2.

TYPE: Réunion, environs des eaux thermals, Cilaos, bras de Benjoin, *Cordemoy s.n.* (**lectotype designated here**: MARS with temporary barcode P00750178).



FIGURE 1. *Angraecum cadetii* in Réunion. Photograph by Rogier van Vugt.



FIGURE 2. Watercolour of *Angraecum cornigerum* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.

*Pseudojumellea cornigera* (Cordem.) Szlach., Mytnik & Grochocka, Biodivers. Res. Conservation 29: 21 (2013).

Following Bosser (in ms) we select here *Cordemoy s.n.* in MARS as the lectotype because it agrees well with Cordemoy's original description. It is endemic to Réunion.

3. *Angraecum corrugatum* (Cordem.) Micheneau, Molec. Phylogen. Evol. 46: 920. (2008). Fig. 3–4.

TYPE: **Lectotype designated here:** Fig 10, no. 20-23 in Cordemoy, Rev. Gén. Bot. 11. 1899).

*Bonniera corrugata* Cordem., Rev. Gén. Bot. 11: 426., fig. 20-23 (1899).

Cordemoy (1899) described and illustrated *Bonniera corrugata* from the 'Sommet de la Nouvelle Grande-Montée de la Plaine des Cafres' in Réunion but he did not indicate a specimen on which the description was based. No associated material has been found in the Cordemoy herbarium in MARS, P or in

REU. The description is accompanied by a drawing, based on a watercolour by Eudoxie de Cordemoy (MAU/MSIRI), her illustration is therefore chosen as the lectotype (Fig. 4). It is endemic to Réunion.

4. *Angraecum costatum* Frapp. in Cordem., Fl. Réunion: 211 (1895). Fig. 5–6.

TYPE: Réunion, *s. loc.*, Richard [663] (**neotype, designated here**: P00541652).

*Angraecum costatum* Frapp., Cat. Orchid. Réunion: 13 (1880), *nom. nud.*

*Angraecum longinode* Frapp., Cat. Orchid. Réunion: 13 (1880), *nom. nud.*

*Angraecum longinode* Frapp. in Cordem., Fl. Réunion: 210 (1895). TYPE: Réunion, Richard *s.n.* (not located).

*Angraecum pseudopetiolum* Frapp. in Cordem., Fl. Réunion: 207 (1895). TYPE: Réunion, Cordemoy 1 (**lectotype designated here**: K00306533).

*Mystacidium costatum* (Frapp. in Cordem.) Cordem., Rev. Gén. Bot. 11: 425 (1899).

*Mystacidium longinode* (Frapp. in Cordem.) Cordem., Rev. Gén. Bot. 11: 424 (1899).

*Mystacidium pseudopetiolum* (Frapp. in Cordem.) Cordem., Rev. Gén. Bot. 11: 425 (1899).

*Macroleptum costatum* (Frapp. in Cordem.) Finet, Mém. Soc. Bot. France 9: 25 (1907).

*Angraecum floribundum sensu* Szelengowicz & Tamon (2013: 92).

*Lemurangis costata* (Frapp. in Cordem.) Szlach., Mytnik & Grochocka, Biodiv. Rec. Conserv. 29: 16 (2013).

*Lemurangis longinodis* (Frapp. in Cordem.) Szlach., Mytnik & Grochocka, Biodivers. Res. Conservation 29: 16 (2013).

*Lemurangis pseudopetiolum* (Frapp. in Cordem.) Szlach., Mytnik & Grochocka, Biodivers. Res. Conservation 29: 16 (2013).

*Angraecum sp.* 2. Bernet, Orchid. Réunion: 318 (2010).

*Mystacidium scalare* var. *pectine?rum* *in sched.* in Herb. Cordemoy MARS087764

Frappier (1895) described *Angraecum costatum*, *A. longinode* and *A. pseudopetiolum* in Cordemoy’s *Flore de Réunion*. All three were illustrated on the same page by Cordemoy (1899: pl. 7, fig. 5, 9, 10). Garray (1973: 505) considered *Angraecum baronii* (Finet



FIGURE 3. Flower detail of *Angraecum corrugatum*. Photograph by Johan Hermans.

Schltr. from Madagascar to be the same species but this has a longer pendent stem, much shorter and narrower leaves, a different habit of the inflorescence and slightly larger flowers. *Angraecum longinode* and *A. pseudopetiolum* were synonymized with *A. costatum* by Pailler & Henze (2020: 48, 189) who selected the latter as the accepted name. It is endemic to Réunion.

A herbarium specimen exists in the Cordemoy herbarium in MARS that corresponds with the description but it has a damaged and indecipherable label; a lectotype was selected but not published by Bosser in his manuscript notes of 1987.

5. *Angraecum crassifolium* (Cordem.) Schltr., Beih. Bot. Centralbl. 33, 2: 433 (1915). Fig. 7–8.

TYPE: Réunion, Grand Bénard, Cordemoy 37 (holotype: MARS P00750177).

*Mystacidium crassifolium* Cordem., Rev. Gén. Bot. 11: 422 (1899).

*Angraecum cordemoyi* Schltr., Beih. Bot. Centralbl.



FIGURE 4. Watercolour of *Angraecum corrugatum* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.



FIGURE 5. Watercolour of *Angraecum costatum* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.



FIGURE 6. *Angraecum costatum* in Réunion. Photograph by Johan Hermans.

33, 2: 432 (1915) *syn. nov.*

*Angraecum acutipetalum* Schltr., Beih. Bot. Centralbl. 34, 2: 337 (1916) *syn. nov.* TYPE: Madagascar, Mt. Tsiafajavona, *Perrier* XXXIX (holotype: B<sup>+</sup>).

*Angraecum acutipetalum* var. *analabeensis* H. Perrier in H. Humbert ed., Fl. Madagasc. Orchid. 2: 229 (1941). Based upon: Madagascar, Analabe (N. Imerina), *Perrier* 18516 (P).

*Angraecum acutipetalum* var. *ankeranae* H. Perrier, Fl. Madagasc. Orchid. 2: 230 (1941). Based upon: Madagascar, Ankeramadinika, *François* in *Perrier* 18517 (P).

*Angraecum acutipetalum* var. *analabeensis* H. Perrier ex Hermans, Orchid. Madag. 28, 287 (2007), *syn. nov.* TYPE: Madagascar, Analabe (N. Imerina), *Perrier* 18516 (holotype: P).

*Angraecum acutipetalum* var. *ankeranae* H. Perrier ex Hermans, Orchid. Madag. 28, 287 (2007), *syn. nov.* TYPE: Madagascar, Ankeramadinika, *François* in *Perrier* 18517 (holotype: P).

*Gomphocentrum acutipetalum* (Schltr.) Szlach., Mytnik & Grochocka, Biodiv. Rec. Conserv. 29: 14 (2013).



FIGURE 7. *Angraecum crassifolium* in Madagascar. Photograph by Johan Hermans.

*Gomphocentrum cordemoyi* (Schltr.) Szlach., Mytnik & Grochocka, Biodivers. Res. Conservation 29: 14 (2013).

*Gomphocentrum crassifolium* (Cordem.) Szlach., Mytnik & Grochocka, Biodivers. Res. Conservation 29: 14 (2013).

*Mystacidium striatum* Cordem. (1899: 422), not *Angraecum striatum* Thouars (1809). TYPE: not known.

Cordemoy (1899) described *Mystacidium striatum* but because of the earlier *Angraecum striatum* Thouars (1822) the epithet is no longer available in *Angraecum*. Cordemoy described *Mystacidium crassifolium*, which is conspecific with *M. striatum*, in the same year; this has therefore the first available valid epithet. It occurs in Madagascar and Réunion.

6. *Angraecum eburneum* Bory, Voy. Îles Afrique 1: 359, t. 19 (1804). Fig. 9.

TYPE: Réunion, between plaine des Chicots and l'île à Guillaume, **lectotype designated here**: illustration t. 19 in Bory, Voy. Îles Afrique 1 (1804).





FIGURE 8. Watercolour of *Angraecum crassifolium* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.



FIGURE 9. *Angraecum eburneum* from Réunion. Photograph by Johan Hermans.

*Limodorum eburneum* (Bory) Willd., Sp. Pl. 4: 125 (1805).

*Angorkis eburnangis* Thouars, Nouv. Bull. Sci. Soc. Philom. Paris: Tabl. *Angorkis* (1809); Thouars, Hist. Orch.: Table 2: O. 15, t. 65 (1822), *nom. superfl.*

*Angraecum superbum* Thouars, Nouv. Bull. Sci. Soc. Philom. Paris: Tabl. *Angorkis* (1809). TYPE: Madagascar, *Thouars s.n.* (holotype: P0098777; isotype: BM000539230).

*Angorkis superbangis* Thouars, Nouv. Bull. Sci. Soc. Philom. Paris: Tabl. *Angorkis* (1809).

*Aerobion superbum* (Thouars) Spreng., Syst. Veg. 3: 718 (1826).

*Angraecum virens* Lindl., Edwards's Bot. Reg. 33: t. 19 (1847). TYPE: India, cult. Serampore B. G. (holotype: K).

*Angraecum brongniartianum* Rchb.f. ex Linden, Pescatorea 1: t. 16 (1854). TYPE: Bourbon, *Quesnel s.n.* (holotype: W).

*Angraecum eburneum* var. *virens* Hook., Curtis's Bot. Mag. 86: t. 5170 (1860).

*Angorchis eburnea* (Bory) Kuntze, Revis. Gen. Pl. 2: 651 (1891).



FIGURE 10. *Angraecum mauritianum* from Madagascar. Photograph by Johan Hermans.

- Angorchis brongniartiana* (Rchb.f. ex Linden) Kuntze, Revis. Gen. Pl. 2: 651 (1891).
- Angorchis superba* (Thouars) Kuntze, Revis. Gen. Pl. 2: 652 (1891).
- Angraecum comorense* Kraenzl., Bot. Jahrb. Syst. 17: 60 (1893), *non* (Rchb.f.) Finet. TYPE: Comoros, Schmidt 154 (not located).
- Angraecum voeltzkowianum* Kraenzl., Bot. Jahrb. Syst. 36: 116 (1905). TYPE: Comoro Islands, Grande Comore, Voeltzkow 193 (holotype not located).
- Angraecum superbum* var. *brongniartianum* (Rchb.f.) Finet, Bull. Soc. Bot. France 54, Mém. 9: 14 (1907).
- Angraecum eburneum* var. *brongniartianum* (Rchb.f. ex Linden) Schltr., Ann. Mus. Colon. Marseille, sér. 3, 1: 50 (1913).
- Angraecum eburneum* subsp. *typicum* H.Perrier in H. Humbert ed., Fl. Madagasc. Orchid. 2: 314 (1941), *nom. superfl.*
- Angraecum eburneum* subsp. *superbum* (Thouars) H.Perrier in Humbert ed., Fl. Madagasc. Orchid. 2: 315 (1941).
- Angraecum richardianum* A.Rich. *nom. invalid.* Based upon *Richard s.n.* (K-LINDL).

Bory (1804: 359) described and illustrated *Angraecum eburneum*, having found it between plaine des Chicots and l'îlet à Guillaume in Bourbon [Réunion]. In the English version (Bory, 1805: 98), he mentioned the same species growing at the bottom of a ravine towards l'îlet à Guillaume. Herbarium material in the Reichenbach herbarium in W, labelled from '*Les Crettes de l'ille aguillaume*' and indicated as originating from Bory, could be associated with the original collection of the species but it consists of a few fragments on a mixed sheet (W-R39268). A more representative sheet in the de Candolle herbarium at G (G00015997) is labelled from 'Bory, 1821' which is later than Bory's original collections. The engraving in Bory (1804) is chosen here as the most reliable and closely associated with the protologue.

The delimitation of this species; its subspecies, varieties and other forms has been debated for centuries with flower colour, lip shape, length of spur and column shape as the most frequently used characteristics (Lindley, 1832; Hooker, 1854; Rolfe, 1897; Senghas, 1979). It is a very widespread and variable

species found in a variety of habitats ranging from coastal cliffs, as an epiphyte in moist evergreen forest, a terrestrial in dry deciduous forest and on dry exposed rock. These factors undoubtedly have led to a great deal of variation. To ascertain its variability 220 herbarium specimens of the species and its variants from different localities were measured, tabulated and compared. Combined with photographic and field observations, we conclude that there is no obviously correlation between plant habit, the size and shape of the leaves and the flowers except in *Angraecum eburneum* subsp. *xerophilum* H.Perrier. Flowers from Madagascar show the greatest variability, both in lip shape and spur length ranging from 6 to 19 cm (and longer if *Angraecum longicalcar* is taken into account); flowers from Réunion have a lip that is fairly consistently a little longer than wide with a spur between 5 and 10 cm long, the limited number of plants from Mauritius seem similar to those from Madagascar. Flowers from the Comoros are similar to those from Madagascar but the spur is often longer, flowers from mainland Africa have a lip as long as wide and a short spur. The lip, often used as a distinguishing feature, is greatly variable in size and shape with individual plants and colonies having a rounded or angular lip. It has also been observed that the lip shape changes and becomes more angular as the flowers mature. The length of the spur is also very inconsistent with numerous intermediate forms between the extremes. Flower colour is also quite variable and changes as the flowers mature.

It has not been possible to find any reliable and consistent characteristics to distinguish *Angraecum eburneum* Bory and *A. superbum* Thouars, they are therefore considered conspecific with the former having priority. Some variants from Madagascar and the Seychelles are more consistent and can be formally recognised at infraspecific rank. It is found in Madagascar, the Comoros, the Seychelles (including Aldabra), and the Mascarenes (Mauritius and Réunion).

7. *Angraecum mauritianum* (Poir.) Frapp., Orchid. Réunion, Cat. Especies Indig.: 13 (1880). Fig. 10.

TYPE: Mauritius, Commerson 222 (**neotype designated here**: P00754625).

*Orchis mauritiana* Poir. in Lamarck, Tabl. Encycl. 4: 601 (1798).

*Orchis mauritiana* was described by Poirlet (1798)



FIGURE 11. *Angraecum patens* from Réunion. Photograph by Rogier van Vugt.

in Lamarck's *Encyclopaedia* as the ‘*Orchis des îles Maurice*’, and was seen by Commerson in the Lamarck herbarium. No herbarium material corresponding to the description has been found in the Lamarck herbarium in P. There are several extant Commerson specimens from Mauritius and Réunion but *Commerson 222* (P00754625) in the P general herbarium represents the species well; it has therefore been chosen as the neotype. It is found in Madagascar and the Mascarenes (Mauritius and Réunion), but records from the Comoros are dubious.

8. *Angraecum patens* Frapp. in Cordemoy, Fl. Réunion: 206 (1895). Fig. 11.

TYPE: Réunion, Cordemoy 22 (**neotype designated here**: MARS in REU).

*Angraecum paniculatum* Frapp., Cat. Orchid. Réunion: 13 (1880), *nom. nud.*

*Angraecum paniculatum* Frapp. in Cordem., Fl. Réunion: 215 (1895). TYPE: Réunion, Herb. J. M. C. Richard *s.n.* (holotype: not located).

Frappier described *Angraecum patens* in Cor-



FIGURE 12. *Angraecum pingue* from Madagascar. Photograph by Johan Hermans.

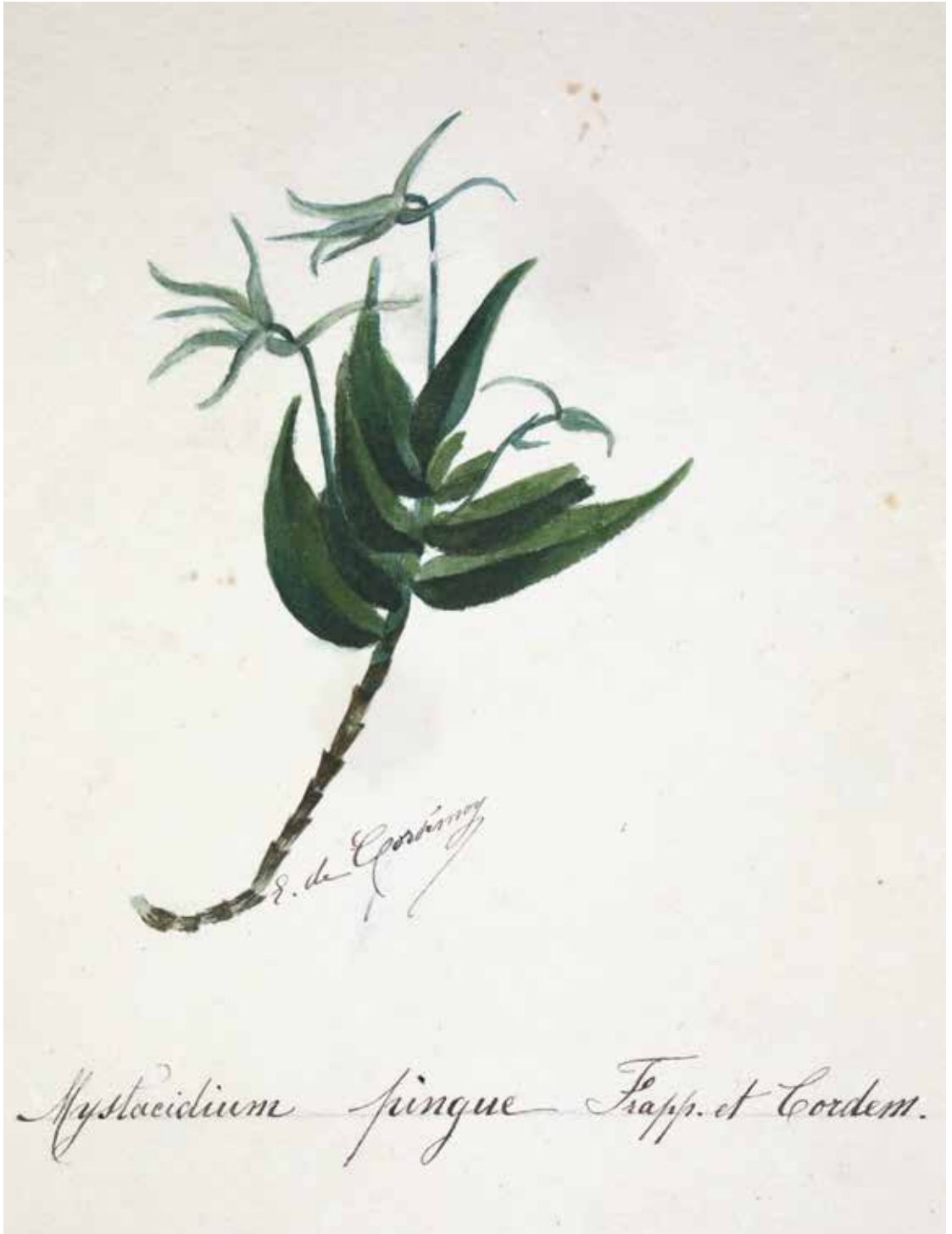


FIGURE 13. Lectotype of *Angraecum pingue*. Watercolour by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.

demoy (1895: 206), but did not mention herbarium material in his description, commenting that it was first found in 1881 by Hermann at 'St Pierre, bras de la Plaine' in Réunion where it is more or less abundant. No corresponding Commerson material has been found in P and MARS. Cordemoy (1899: 421) mistakenly considered both *Angraecum patens* and *A. paniculatum* as conspecific with *A. calceolus*, and this was followed by Garay (1973: 512). Bernet (2010a: 298) first included *Angraecum paniculatum* as a synonym of *A. patens*. It is endemic to Réunion.

9. *Angraecum pingue* Frapp. in Cordem. Fl. Réunion: 214 (1895). Fig. 12–13.

TYPE: Cordem., Rev. Gen. Pl. Bot.: pl. 7 no 8 (1899), **lectotype designated here:** as *Mystacidium pingue*, based on the watercolour by E. de Cordemoy in MAU. *Angraecum pingue* Frapp., Cat. Orchid. Réunion: 13 (1880), *nom. nud.*

*Mystacidium pingue* (Frapp.) Cordem., Rev. Gen. Pl. Bot.: 421 (1899).

*Angraecum nasutum* Schltr., Repert. Sp. Nov. Regni Veg. Beih. 33: 315 (1925). TYPES: Madagascar, Mt. Tsaratanana, *Perrier* 15307 (holotype: P00098451; isotype: P00098452).

*Angraecoides nasuta* (Schltr.) Szlach., Mytnik & Grochocka, Biodiv. Rec. Conserv. 29: 10 (2013).

*Angraecoides pinguis* (Frapp. in Cordem.) Szlach., Mytnik & Grochocka, Biodivers. Res. Conservation 29: 10 (2013).

As no herbarium material associated with Frappier has been located, Cordemoy's published illustration is selected as the lectotype here. It is a widespread species in Madagascar and the Mascarenes (rare in Mauritius, locally more common in Réunion).

10. *Angraecum tenellum* (Ridl.) Schltr., Beih. Bot. Centralbl. 33, 2: 438 (1915). Fig. 14–15.

TYPE: Madagascar, S. Betsileo, Ankafana, 1880, *Deans Cowan s.n.* (holotype: BM000539208).

*Saccolabium micromegas* Frapp., Orchid. Réunion, Cat. Espèces Indig.: 14 (1880), *nom. nud.*

*Mystacidium tenellum* Ridl., J. Linn. Soc., Bot. 21: 489 (1885).

*Epidorchis tenella* (Ridl.) Kuntze, Revis. Gen. Pl. 2: 660 (1891).

*Saccolabium microphyton* Frapp. in Cordem., Fl. Réunion: 195 (1895). TYPE: Réunion; Salazie; 1879, *Cordemoy s.n.* (**lectotype designated here:** MARS).

*Mystacidium spicatum* Cordem., Rev. Gén. Bot. 11: 423 (1899). **syn. nov.** TYPE: Réunion, Cilaos, Oct. 1896, *Hermann s.n.* (holotype: not located).

*Angraecum oberonia* Finet, Mém. Soc. Bot. France 9: 10 (1907). TYPE: Réunion, Hell-Bourg, 1875, *de L'Isle* 119 (P. W, syn.), 229 (P, syn.), 576 (P, syn).

*Angraecum microphyton* (Frapp.) Schltr., Beih. Bot. Centralbl. 33, 2: 435 (1915).

*Angraecum spicatum* (Cordemoy) Schltr., Beih. Bot. Centralbl. Abt 2, 33, 2: 437 (1915).

*Lesliegraecum oberonia* (Finet) Szlach., Mytnik & Grochocka, Biodivers. Res. Conservation 29: 17 (2013).

*Lesliegraecum tenellum* (Cordem.) Szlach., Mytnik & Grochocka, Biodiv. Rec. Conserv. 29: 18 (2013).

*Lesliegraecum spicatum* (Cordem.) Szlach., Mytnik & Grochocka, Biodivers. Res. Conservation 29: 18 (2013).

*Angraecum waterlotii* H.Perrier was considered a synonym of *A. tenellum* by Garay, (1973: 516) and this was followed by subsequent authors. There are considerable differences between these species: the Madagascan *Angraecum waterlotii* is distinguished by its longer and less fleshy leaves, a laxly and fewer-flowered inflorescence, different floral bract that envelop the pedicel, flowers that are a little larger, with a lip with an attenuate (vs. acute) apex and a very short and conical spur.

Pailler & Henze (2020: 191) considered *Angraecum spicatum* to be the same as *A. parvulum* but it corresponds better with the description and herbarium material of *A. tenellum* which occurs in both Madagascar and Réunion.

11. *Angraecum tenuifolium* Frapp. in Cordem., Fl. Réunion: 207 (1895). Fig. 16.

TYPE: Réunion, Cilaos, Grand Matarum, 1400 m, Jan. 1975, *T. Cadet* 4906 (**neotype designated here:** REU; isoneotypes: P00754653, P00754724).

*Lepervenchea tenuifolia* (Frapp. in Cordem.) Cordem., Rev. Gén. Bot. 11: 416 (1899). Szlachetko *et al.*, Biodiv. Res. Conserv. 29: 17 (2013).



FIGURE 14. *Angraecum tenuifolium* from Madagascar. Photograph by Johan Hermans.

*Angraecum tenuifolium*, which is endemic to Réunion, was first described by Frappier in Cordemoy (1895: 207) based upon a living plant as well as a fruiting herbarium specimen collected in 1873 by Potier but the latter has not been located. Szelengowicz & Tamon (2013: 121) listed *Bosser* 21695 (P) as the (neo)type but did not formally designate it. Both the illustration of this taxon in Cordemoy (1899: pl. 9 fig. 18) and Eudoxie de Cordemoy's watercolour of it in MAU/MSIRI lack clarity and detail; therefore *T. Cadet* 4906 (P & REU) has been designated here as the neotype as it is representative of the species and present in both P and REU.

## 2. BENTHAMIA A.Rich.

1. *Benthamia erinacea* (Cordem.) Hermans & P.J.Cribb, **comb. nov.** Fig. 17–18.

TYPE: Réunion, Plaine des Palmistes, Feb. 1883?,



FIGURE 15. Watercolour of *Angraecum tenuifolium* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.

(Herb. Cordemoy (**lectotype designated here:** MARS087704); Watercolour 55 by Eudoxie de Cordemoy (MAU/MSIRI, para.).

Basionym: *Habenaria erinacea* Cordem., Fl. Réunion: 261. (1895).

*Peristylus secundiflorus* S.Moore ex Boivin, J. Bot. 5: 293 (1876), **nom. nud.** TYPE: Réunion, *Boivin* 1063 (P).

*Peristylus erinaceus* Frapp., Cat. Orchid. Réunion: 9 (1880), **nom. nud.**

*Habenaria secundiflora* Cordem., Fl. Réunion: 260, 551 (1895).

*Benthamia nigrescens* Schltr., Beih. Bot. Centralbl., Abt. 2. 34, 2: 301 (1916), **syn. nov.** TYPE: Madagascar, 1350 m, March 1921, E. of Mt. Tsiafajavona, *Perrier* 13506 (holotype: P).

*Benthamia nigrescens* subsp. *typica* H.Perrier, Bull. Soc. Bot. France 81: 30 (1934).

*Benthamia nigrescens* subsp. *borbonica* H.Perrier, Bull. Soc. Bot. France 81: 31 (1934), **syn. nov.** Type not designated.

*Benthamia nigrescens* subsp. *secundiflora* (Frapp. in Cordem.) H.Perrier, Bull. Soc. Bot. France 81: 31 (1934), **syn. nov.** TYPE: Réunion, *Boivin* 1063 (holotype: P, syn.).



FIGURE 16. *Angraecum tenuifolium* in Réunion. Photograph by Johan Hermans.

*Benthamia nigrescens* subsp. *decaryana* H.Perrier, Bull. Soc. Bot. France 81: 31 (1934), *syn. nov.* TYPE: Madagascar, Ankaizina, Decary 1982 (holotype: P).

*Benthamia nigrescens* subsp. *humblotiana* H.Perrier, Bull. Soc. Bot. France 81: 31 (1934), *syn. nov.* TYPE: Madagascar, Mt. Tsaratanana, Perrier 16110 (holotype: P).

*Peristylus micranthus* A.Rich. & *Benthamia micrantha* A.Rich., *in sched.* Based upon: Bourbon [Réunion], ex Herb. Richard (K-LINDL.; P004742; W).

*Benthamia erinacea*, a widespread, relatively common and variable species in Madagascar and Réunion, was first identified by Achille Richard in the 1830's as *Peristylus* / *Benthamia micrantha* but was not formally described by him.

Moore (1876b) listed it as *Peristylus secundiflo-*



FIGURE 17. Watercolour of *Benthamia erinacea* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.

*rus* and Frappier (1880) followed him but both failed to formally describe it. Cordemoy (1895: 260) listed it without description as *Habenaria secundiflora* but added a note on p. 551 on the flowers being small, greenish-yellow and appearing in March. It was depicted by Eudoxie de Cordemoy's watercolour 58 (MAU/MSIRI) but there is herbarium material of it at MARS.

Cordemoy (1895: 261), in the same work described *Habenaria erinacea* Cordem.; “a small species from the high mountains, recognised by its bristly (*hérissonné*) appearance, created by the many very acute bracts which are twice as long as the flower”. Although short, this constitutes a valid description of the species. Furthermore, a herbarium sheet from Plaine des Palmistes in Réunion on Cordemoy's herbarium in MARS is labelled as this species and corresponds well with

the description and other material. In addition there is a contemporary watercolour by Eudoxie de Cordemoy in MAU/MSIRI (no. 55) which shows all the characteristics of the species (Fig. 17). Cordemoy's name is used here (over *Habenaria secundiflora*) because of its more complete and diagnostic description and the material associated with the protologue. The necessary combination is made above.

Schlechter (1916) later described it from Madagascar as *Benthamia nigrescens*. Perrier de la Bâthie (1934), in his revision of the genus added several subspecies, including two from the Mascarenes: subsp. *borbonica* differentiated by its small habit with small leaves and flowers and a shortly apiculate anther; and subsp. *secundiflora* differing in its tall habit, with larger leaves and a unilateral raceme with smaller flowers and a retuse anther. After examining all available herbarium material and examining plants in the field it is clear that there are many intermediate forms with the number and size of leaves varying greatly, as does the shape, arrangement and size of the flowers, even within colonies. Both subspecies are therefore considered here as the extremes of one variable species.

2. *Benthamia perfecunda* H.Perrier, Notul. Syst. (Paris) 14: 140 (1951).

TYPE: Madagascar, E. summit of Marojejy, *Humbert* 23754 (**lectotype designated here**: P00094564); *Humbert* 23755 (P0009565-6, syn.).

This seldom-seen species was described from the Marojejy massif in northern Madagascar. It is characterised by its long grass-like leaves and small flowers with a lip with blunt calceiform apex. *Humbert* 23754 is selected here as the lectotype. Photographic records from Réunion in Szelengowicz & Tamon (2013: 252) and Pailler *et al.* (2018: 70) do not match this species as the foliage appears different and the rachis is less dense. No herbarium material of this species has been located from Réunion and it therefore remains as an ambiguous species for the Mascarenes.

3. *Benthamia spiraloides* (Cordem.) Hermans & P.J.Cribb, **comb. nov.** Fig. 19–20.

TYPE: Réunion, Plaine des Palmistes, *Cordemoy* s.n. [not found], **neotype designated here**: Réunion, Plaine des Palmistes, path to Îlet Patience, 1100 m,



FIGURE 18. *Benthamia erinacea* in Réunion. Photograph by Rogier van Vugt.

April 2002, *Pailler* 48 (P).

Basionym: *Habenaria spiraloides* Cordem., Fl. Réunion: 551 (1895).

*Benthamia* sp. 1 *sensu* Bernet (2010a: 138).

Cordemoy (1895) described this species, as *Habenaria spiraloides*, in an appendix to his Flore account. He considered it close to Thouars's *Satyrium spirale* (*Benthamia africana*) but distinct by its double tuberooids, single leaf enveloping the stem base, three stem sheaths and flowers with more obtuse segments. Confusingly, he referred to the latter as '*Habenaria spiralis* Cordem.'; a watercolour by Eudoxie de Cordemoy (59 in MAU/MSIRI) resembles *H. spiraloides* but is labelled *H. spiralis* Cordemoy. The floral structure is typical for *Benthamia*.

No relevant material has been found in the Cordemoy herbarium in MARS; *Pailler* 48 has been chosen as the neotype because it represents the species well and comes from the same general locality mentioned by Cordemoy.

It resembles the widespread and variable *Benthamia africana* in its somewhat spiral raceme, narrow





FIGURE 19. *Benthamia spiralooides* in Réunion. Photograph by Johan Hermans.



FIGURE 20. *Benthamia spiralooides* in Réunion. Photograph by Johan Hermans.



FIGURE 21. *Bulbophyllum clavatum* in Réunion. Photograph by Johan Hermans.



FIGURE 22. Lectotype of *Bulbophyllum clavatum*. Thouars (1822).

leaves and small flowers but differs by the combination of one or two main leaves, several stem sheaths, the large pedicellate ovary, and flowers that do not open widely (vs. spreading lateral sepals) and have a lip with a shorter, thicker mid-lobe. The inflorescence and exterior of the flowers are generally reddish-brown but almost pure yellow forms have been observed. It is endemic to Réunion where several natural hybrids and hybrid swarms have been observed.

### 3. BULBOPHYLLUM Thouars

1. *Bulbophyllum clavatum* Thouars, Hist. Orchid.: Table 3 u. 6, t. 99 (1822). Fig. 21–22.

TYPE: Mauritius, Thouars, **lectotype designated here**: Hist. Pl. Orchid.: t. 99 (1822).

*Phyllorkis clavophyllis* Thouars, Hist. Orchid.: t. 99 (1822) [alternative name for *Bulbophyllum clavatum*].

*Bulbophyllum conicum* Thouars, Hist. Orchid.: Table 3, u7, t. 100 (t. 99 in other issues) (1922) (as *Bulbophyllum conitum*, in the Coleman (1979) reprint but other editions have different table numbers). TYPE: Mauritius, Thouars, **lectotype designated here**: Hist. Orchid.: t. 100 (1822).

*Phyllorkis coniphyllis* Thouars, Hist. Orchid.: t. 100 (1822) [alternative name for *Bulbophyllum conicum*].

*Bulbophyllum clavatum* Thouars var. *conicum* (Thouars), Spreng., Syst. Veg. ed. 10, 3: 732 (1826).

*Phyllorkis clavata* (Thouars) Kuntze, Revis. Gen. Pl. 2: 675 (1891).

Thouars (1822) illustrated *Bulbophyllum clavatum* (Fig. 22) and *B. conicum*, both from Mauritius: his short descriptions of their characteristics are very similar. There is little doubt that they are the same taxon but there is no certainty because no herbarium material associated with either name survives. Both *Bulbophyllum conicum* and *B. conitum* have been used in synonymy; the former spelling was used in Thouars’s descriptive table, while the latter on the illustration is almost certainly a typographical error. The name *Bulbophyllum conicum* has recently been used in error for plants referable to *B. cordemoyi*.

The name *Bulbophyllum clavatum* has been used

historically for plants with a thickened densely flowered rachis and fused lateral sepals. Thus, several literature and herbarium records include Madagascar and the Comoros in its distribution; there are a number of very similar species in Madagascar but the size and shape of the dorsal sepal, lip decorations and shape of the stelids are slightly different. Therefore, *Bulbophyllum clavatum*, the Mascarene plant, is considered to be a distinct endemic. In Mauritius it is found mainly in the centre and south-west of the island, in Réunion principally in the east.

2. *Bulbophyllum cordemoyi* Frapp. in Cordem., Fl. Réunion: 172 (1895). Fig. 23.

TYPE: Réunion, St-Benoît, *Cordemoy s.n.* (**lectotype designated here**: MARS).

*Bulbophyllum jacobi* Frapp., Cat. Orchid.: 16 (1880), *nom. nud.*

*B. conicum sensu* Bernet (2010a: 54).

*B. prismaticum sensu* Pailler *et al.* (2013: 37); Pailler *et al.* (2018: 84); Pailler & Henze (2020: 91).

*Bulbophyllum cordemoyi*, which is endemic to Réunion, was first described by Frappier in Cordemoy’s *Flora of Réunion* (1895: 172) based on a Cordemoy discovery and named for him. The same species had already been listed in 1880 by Frappier as *Bulbophyllum jacobi* but without description. Although a locally common plant, the species has been consistently misidentified as *Bulbophyllum conicum* (see details under *B. clavatum*). Herbarium material from the locality cited by Frappier in the protologue has recently been identified in Cordemoy’s collection at MARS. Together with Frappier’s detailed description it enables placement of this characteristic species in section *Ploiarium*: it has a very long scandent rhizome, a long inflorescence with a short, few-flowered rachis and flowers with strongly recurved dorsal sepal and petals.

3. *Bulbophyllum densum* Thouars, Hist. Orchid.: 3<sup>rd</sup> Table u.14, t. 108 (t. 107 in other issues) (1822). Fig. 24–25.

TYPE: Mauritius, *Thouars s.n.* (not located); **lectotype designated here**: Thouars, Hist. Orchid., t. 108 (1822) (in the Coleman (1979) reprint but other editions have different figure numbers).

*Phyllorkis densophyllis* Thouars, Hist. Orchid.: t. 108



FIGURE 23. *Bulbophyllum cordemoyi* in Réunion. Photograph by Johan Hermans.

(1822) [alternative name for *B. densum*].

*Bulbophyllum densum* (Thouars) Lindl., Gen. Sp. Orchid. Pl.: 52 (1830).

*Phyllorkis densa* (Thouars) Kuntze, Revis. Gen. Pl. 2: 675 (1891).

*Bulbophyllum* sp. 1 & sp. 2 *sensu* Bernet (2010a: 78-9).

*Bulbophyllum mascarenense* Pailler & Baider, in Pailler & Henze, Orchid. Réunion: 84, 194 (2020), *nom. nud.*

*Bulbophyllum mascarenense* Pailler & Baider, *Botany Letters*, <https://www.tandfonline.com/doi/full/10.1080/23818107.2020.1817145>: 2 (2020). TYPE: Réunion, St-Philippe, Basse Vallée, 1000 m, Feb. 2004, Pailler 122 (holotype: REU007926; isotypes: MAU ex REU007927) *syn. nov.*

Bosser (2010a), Szelengowicz & Tamon (2013) and Bernet & Castillon (2012) reviewed the identity of this enigmatic species; this is discussed further under *Bulbophyllum pendulum*. Thouars's short descrip-

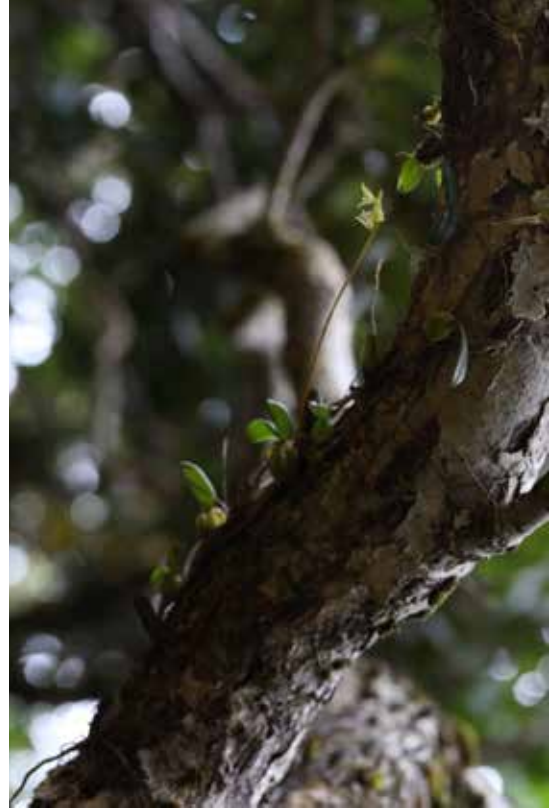


FIGURE 24. *Bulbophyllum densum* in Mauritius. Photograph by Johan Hermans.

tion and illustration are of a Mauritian plant c. 12 cm tall with oval pseudobulbs, two long leaves, and an inflorescence with a terminal raceme of small flowers with divided lateral sepals and an ovate lip. Richard (1828: 64) included *Bulbophyllum densum* with a short description, based on Thouars' plate but did not examine any plants of it. Moore in Baker (1877: 347) included *Bulbophyllum densum* and described it based on Thouars's illustration, citing two herbarium specimens: 'Bojer (not seen by Moore and not found since)' and 'Ayres!' from Quartier Militaire which is at K, together with a drawing by Moore showing a typical flower of *B. pendulum*. Some of the confusion over the identity of *Bulbophyllum densum* and *B. pendulum* may have originated from the interpretation of this specimen and drawing.

It has not been possible to find reliable herbarium material directly relating to *B. densum* but Thouars's description and drawing are clear and can be associated with plants known from Mauritius and Réunion to-



FIGURE 25. Lectotype of *Bulbophyllum densum*. Thouars (1822).



FIGURE 26. *Bulbophyllum elliotii* in Madagascar. Photograph by Johan Hermans.

day. The species is similar to *Bulbophyllum nutans* and has frequently been confused with it: thus, several herbarium specimens have been annotated by Bosser (Vaughan 200 & 3001) as being a little different from *B. nutans*. It was also illustrated as distinct by J. Cadet (1989, pl. 33) and Bernet (2010a: spp. 1 & 2). A drawing in Bosser's manuscript archive shows both species on one plate.

*Bulbophyllum nutans* is variable and common on Mauritius and Réunion but *B. densum* is distinct in having a long inflorescence with the peduncle at least twice as long as the densely flowered rachis and flowers in which the petals and sepals are usually more obtuse at the apex. Thouars's drawing (Fig. 25) of *Bulbophyllum densum* depicts a characteristic thick rhizome and ovoid pseudobulbs, and relatively long leaves but herbarium material of this species shows great variability in these features. Some forms have long and narrow leaves (e.g. Pailler 122 in REU, MAU & T. Cadet 4043 in P). Thouars (1822: t. 108) shows a plant with a straight inflorescence lacking the curved rachis often seen in the species but a straight rachis is not

unusual in herbarium material (e.g. Bosser 22471, Cadet 3139, Pailler 122). *Bulbophyllum mascarenense* corresponds well with all its characteristics. These specimens all have the typical peduncle sheaths, floral bracts and dense rachis, a lip with a very characteristic shape, including the undulate margin, and more or less acute tepals as shown in Thouars's sketchy drawing but well within the variability of the species.

*Bulbophyllum densum*, which is endemic to the Mascarenes (Mauritius and Réunion), is undoubtedly closely allied to *B. nutans* but further evidence is required to establish their exact relationship.

4. *Bulbophyllum elliotii* Rolfe, J. Linn. Soc., Bot. 29: 51 (1891).

TYPE: Madagascar, nr. Fort Dauphin, *Scott Elliot s.n.* (holotype: K; isotype: P).

*Bulbophyllum sambiranense* var. *typicum* H.Perrier, Notul. Syst. (Paris) 6, 2: 86 (1937), *nom. inval.*

*Bulbophyllum sambiranense* var. *ankeranense* H.Perrier, Notul. Syst. (Paris) 6, 2: 86 (1937), *nom. nud.*

*Bulbophyllum sambiranense* Jum. & H.Perrier, Ann. Fac. Sci. Marseille 21, 2: 214 (1912), *syn. nov.* TYPE: Madagascar, Manongarivo massif, *Perrier* 1916 (holotype: P).

*Bulbophyllum malawiense* B.Morris, Proc. Linn. Soc. London 179: 63 (1968). TYPE: Malawi, Cholo, *Morris* 172 (holotype: K).

The species has often been identified in recent literature as *Bulbophyllum sambiranense* (Hermans *et al.* 2007: 123, Cribb & Hermans 2009: 238, Bernet 2010a: 75, Bosser & Lecoufle 2011: 201, Hervouet 2018: 241, Pailler & Henze 2020: 92) but the plant and flowers of that species fall within the variation of those of the widespread *B. elliotii*. *Bulbophyllum pusillum*, also from the Mascarenes, is similar to this species but there are consistent differences.

var. *elliotii* Rolfe

Widespread in tropical E. and S. Africa and Madagascar but rare on the Mascarenes (Mauritius and Réunion). ( Fig. 26).

var. *latibracteatum* (H.Perrier ex Hermans) Hermans, *comb. nov.*

Basionym: *Bulbophyllum sambiranense* var. *lati-*

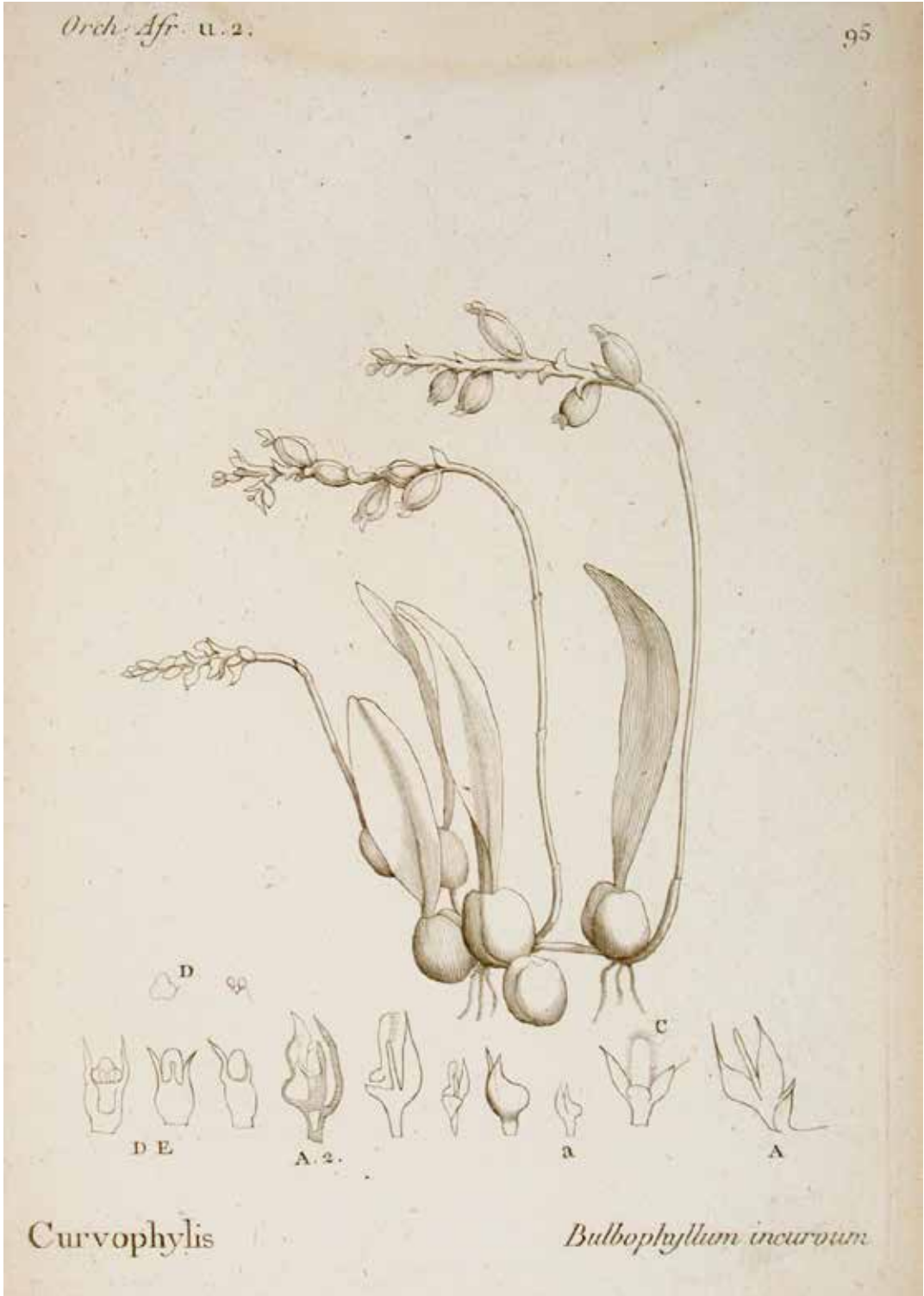


FIGURE 27. Lectotype of *Bulbophyllum incurvum*. Thouars (1822).



FIGURE 28. Lectotype of *Bulbophyllum pendulum*. Thouars (1822).

*bracteatum* H.Perrier ex Hermans in Hermans *et al.*, *Orchid. Madag.* ed. 2: 288 (2007). TYPE: Madagascar, Centre, Tampoketsa between the Ikopa and the Betsiboka, Aug. 1924, *Perrier* 16724 (holotype: P).

*Bulbophyllum sambiranense* var. *latibracteatum* H.Perrier, *Notul. Syst.* (Paris) 6, 2: 86 (1937), *nom. nud.*

This variety is Madagascan and does not occur in the Mascarenes. It has less angular orbicular pseudobulbs, wider leaves and broadly oval floral bracts that are longer than the flowers.

5. *Bulbophyllum incurvum* Thouars, *Hist. Orchid.*: Table 3 u.2., t. 95 (t. 94 in other editions) (1822). Fig. 27. TYPE: Mauritius, *Thouars s.n.* (holotype: P).

*Phyllorkis curvophyllis* Thouars, *Hist. Orchid.*: t. 95 (1822), *nom. superfl.* [alternative name for *Bulbophyllum incurvum*].

*Bulbophyllum commersonii* Thouars, *Hist. Orchid.*: Table 3, u.4., t. 97 (t. 96 in other issues) (1822), *syn. nov.* TYPE: Réunion, Thouars, **lectotype des-**



FIGURE 29. *Bulbophyllum pendulum* in Réunion. Photograph by Johan Hermans.

**ignated here:** *Hist. Orchid.*, t. 97 (in the Coleman (1979) reprint). (Fig. 27).

*Phyllorkis comersophyllis* Thouars, *Hist. Orchid.*: t. 97 (1822), *nom. superfl.* [alternative name for *Bulbophyllum commersonii*]

*Bolbophyllum incurvum* (Thouars) Lindl., *Gen. Sp. Orchid. Pl.* 52 (1830).

*Bolbophyllum commersonii* (Thouars) Lindl., *Gen. Sp. Orchid. Pl.* 52 (1830).

*Bulbophyllum thompsonii* Ridl., *J. Linn. Soc., Bot.* 21: 464 (1885), *syn. nov.* TYPE: Mascarenes, without exact provenance: *Thompson s.n.* (holotype: BM).

*Phyllorkis thompsonii* (Ridl.) Kuntze, *Revis. Gen. Pl.* 2: 678 (1891).

*Phyllorkis incurva* (Thouars) Kuntze, *Revis. Gen. Pl.* 2: 675 (1891).

*Phyllorkis commersonii* (Thouars) Kuntze, *Revis. Gen. Pl.* 2: 675 (1891).

In agreement with Bosser's manuscript notes we



treat *Bulbophyllum commersonii* as conspecific with *B. incurvum*. No herbarium specimens of the former are known but Thouars's drawing shows a plant with the same habit and proportions.

*Bulbophyllum thompsonii* Ridl. is also reduced here to synonymy. Its description and type specimen (*Thompson s.n.* BM) correspond well with this species. The type material is annotated 'Madagascar' in a different hand from Ridley's, it is likely to have come from Mauritius where John Vaughan Thompson spent most of his time (1814–1816) in the region, the BM specimens came via Robert Brown in the 1850's.

*Bulbophyllum incurvum*, endemic to the Mascarenes, including Rodrigues, is similar to *B. hildebrandtii* from Madagascar but the latter is more robust, its pseudobulbs are 2-leaved and both its petals and column are a different shape; it is also close to *B. erectum* from Madagascar but the flowers of that species are smaller and the lip and stelia a different shape.

6. *Bulbophyllum pendulum* Thouars, Hist. Orchid.: Table 3 u.11, t. 104 (1822). Fig. 28–29.

TYPE: Mauritius, Thouars, Hist. Pl. Orch., t. 104 (lectotype) (in the Coleman (1979) reprint) other editions have different numbers.

*Phyllorkis pendiphyllis* Thouars, Hist. Orchid.: t. 104 (1822). [alternative name for *Bulbophyllum pendulum*].

*Phyllorkis pendula* (Thouars) Kuntze, Revis. Gen. Pl. 2: 675 (1891), *nom. superfl.*

*Bulbophyllum densum sensu* Cadet (1989: pl. 27).

*Bulbophyllum bernadetteae* J.-B. Castillon in Bernet & Castillon, Richardiana 13: 19 (2012), *syn. nov.*

TYPE: Réunion, Forests de l'île, 700 m, March 2012, J.-B. Castillon 53 (holotype: P04021589).

*Bulbophyllum densum sensu* Pailler *et al.* (2018: 73); Pailler & Henze (2020: 80).

Thouars (1822) described and illustrated *Bulbophyllum pendulum* from Mauritius (Fig. 28). No specimens have been found that can be associated with this name and we therefore have to rely on Thouars's limited description and his relatively detailed engraving (1822: t. 104). The latter clearly shows an epiphyte with ovoid pseudobulbs with two long narrowly elliptic leaves and an arching inflorescence with the peduncle partly covered by sheaths and the rachis densely

flowered with the flowers slightly overlapping. The main characteristics are in the detailed floral dissection, showing the lateral sepals joined into boat-like synsepal (typical for section *Ploiarium*), fairly large petals and a characteristic sub-orbicular lip; the coloured version of the plate, although unreliable, shows yellow flowers marked with some red. Overall, this illustration corresponds very well with the plant found today in Mauritius and quite commonly in Réunion. The peduncle is fairly short and appears at first sight to be covered by sheaths while the rachis seems thin in the old inflorescence but these are all within the limits of Thouars's draughtsmanship and within the variability of the species (e.g. *Bosser* 21800, *Delteil s.n.* and *Lamusse* 21349, all at P, have short inflorescences and long sheaths). Reviewing all of the available herbarium material and field observations confirms that *Bulbophyllum pendulum*, which is endemic to Mauritius and Réunion, is a very variable species in plant size and habit, inflorescence length and flower colour.

It was recognised by Frappier in Cordemoy (1895) from Réunion where it was said to be abundant; there also is a herbarium specimen in MARS that matches the description.

*Bosser* (2010a), Bernet & Castillon (2012) and Szelengowicz & Tamon (2013), amongst others, have discussed the identity of the species with some of them considering it to be conspecific with *Bulbophyllum densum*, which was also described and illustrated by Thouars (1822). However, Thouars's illustration shows that while *Bulbophyllum densum* has a similar habit to *B. pendulum* and *B. nutans*, it differs in having an erect inflorescence, short peduncle sheaths with small flowers in which the lateral sepals are divided and divaricate: it belongs in a different section to *Bulbophyllum pendulum*.

The description and illustration of *Bulbophyllum bernadetteae* correspond very well with the main characteristics of *B. pendulum* and is undoubtedly conspecific.

7. *Bulbophyllum pusillum* Thouars, Hist. Orchid.: Tab. 3, u. 90, t. 102 in some editions, *s.n.* in others (1822). Fig. 30–32.

TYPE: Mauritius, Thouars; **lectotype designated here:** Hist. Orchid., t. 102 (in the Coleman (1979) reprint).

*Phyllorkis pusiphyllis* Thouars, Hist. Orchid.: t. 102



FIGURE 30. Lectotype of *Bulbophyllum pusillum*. Thouars (1822).



FIGURE 31. *Bulbophyllum pusillum* in Mauritius. Photograph by Johan Hermans.

(1822) [alternative name for *B. pusillum*].

*Bulbophyllum clavatum* Thouars var. *pusillum* (Thouars), Spreng., Syst. Veg. ed. 10, 3: 732 (1826).

*Phyllorkis pusilla* (Thouars) Kuntze, Revis. Gen. Pl. 2: 675 (1891).

*Bulbophyllum compressum* Frappier, Cat. Orch. Réunion: 16 (1880), *nom. nud.*; Frapp. in Cordem., Fl. Réunion: 172 (1895), *nom. illeg.*, *non* Teijsm. & Binn. (1862) from Sumatra. TYPE: Réunion, *Cordemoy s.n.* (**lectotype designated here**: MARS).

*Bulbophyllum frappieri* Schltr., Beih. Bot. Centralbl. 33, 2: 417 (1915), *nom. nov. pro B. compressum* Frappier.

*Bulbophyllum frappieri* Hawkes, Lloydia 19: 92 (1956), *nom. nov. pro B. compressum* Frappier, *nom. illeg.*

*Bulbophyllum elliotii sensu* Szelengowicz & Tamon

(2013: 182, 204).

*Bulbophyllum sambiranense sensu* Paillet *et al.* (2013: 38); Paillet *et al.* (2018: 85).

This species, which is endemic to Mauritius and Réunion, has frequently been confused in herbaria and in the literature with *Bulbophyllum sambiranense* (now *B. elliotii*). Thouars's description and illustration (Fig. 30) are minimal but the details of the plant and flower show the distinct morphology of the species that is still frequent on Mauritius and Réunion. The drawing of the lip does not show the hairs that are typical for the species, but this feature often effectively disappears quickly after drying. Bojer included it in his *Hortus Mauritianus* (1837: 322) from high elevations on Le Pouce and Pieter Both but new records disappear after this. Bosser, in his manuscript notes, considered that it could be a dwarf form of *Bulbophyllum clavatum* from an exposed position but the differences in size and habit are considerable. The species is undoubtedly close to *Bulbophyllum elliotii* but it is sufficiently distinct and geographically isolated to warrant specific status. In common with *Bulbophyllum elliotii*, the number of leaves per pseudobulb can be one, two or a mixture within one plant, it is therefore not a diagnostic feature. It differs in having a more compact habit, generally shorter inflorescence, smaller flowers that are almost entirely yellow (vs. extensively marked red-purple) and cleistogamous. This last feature is frequently found in isolated island populations and is well documented (Stebbins 1957; Roberts 2001).

The species described by Frappier in Cordemoy as *Bulbophyllum compressum* is undoubtedly conspecific, the Cordemoy herbarium material in MARS and a detailed watercolour (t. 25) by Eudoxie de Cordemoy in MAU/MSIRI, corresponds very well (Fig. 32). The name *Bulbophyllum compressum* was used previously for a Sumatran species, both Schlechter and Hawkes renaming it as *B. frappieri*.

8. *Bulbophyllum variegatum* Thouars, Hist. Orchid.: Table 3 u.12 & u.12bis, t. 105 & t. 106 (t. 107 & t. 108 in other editions) (1822). Fig. 33–34.

TYPE: Réunion, *Thouars s.n.* (not located); **lectotype designated here**: Thouars, Hist. Orchid., t. 105 (in the Coleman (1979) reprint) other editions have different table numbers (1822).



FIGURE 32. Watercolour of *Bulbophyllum pusillum* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium

*Phyllorkis variphylis* Thouars, Hist. Orchid.: t. 105 (1822) [alternative name for *Bulbophyllum variegatum*].

*Phyllorchis variegata* (Thouars) Kuntze, Revis. Gen. Pl.: 675 (1891).

This species is widespread in north-eastern and southern Madagascar and the Mascarenes (Réunion and Mauritius). No type specimen of it has been located and, therefore, we have chosen Thouars's plate as the lectotype (Fig. 34).

## 4. CALANTHE R.Br.

1. *Calanthe sylvatica* (Thouars) Lindl., Gen. Sp. Orchid. Pl.: 250 (1833). Fig. 35–37.

TYPE: Mauritius or Réunion, (*Thouars s.n. lecto-type designated here*: P00107344; isolectotype: P00107345; Herb. Smith, *Thouars* 250 (LINN-HS 1403.10)).

*Centrosia sylvatica* Thouars, Hist. Orchid.: t. 35 & t. 36 (1822).

*Alismorkis sylvatismis* Thouars, Hist. Orchid.: Table 1, 1., t. 35, t. 36 (1822) [alternative name for *Centrosia sylvatica*].

*Centrosia corymbosa* Thouars, Hist. Orchid.: t. 35 (1822), *nom. superfl.*

*Centrosia plantaginea* Thouars, Hist. Orchid.: t. 35 (1822), *nom. superfl.*

*Bletia sylvatica* (Thouars) Spreng., Syst. Veg. 3: 743 (1826); Bojer, Hortus Maurit.: 318 (1837).

*Centrosia auberti* A.Rich., Mém. Soc. Hist. nat. Paris, 4: 45, t. 7 (1828), *nom. illeg.*

*Calanthe sylvestris* Lindl. ex Steud., Nomencl. Bot., ed. 2, 1: 253 (1840), *orth. var.*

*Alismorkis centrosis* Steud., Nomencl. Bot., ed. 2, 1: 49 (1840).

*Calanthe sylvatica* var. *natalensis* Rchb.f., Linnaea 19: 374 (1846). Type from S. Africa.

*Calanthe natalensis* (Rchb.f.) Rchb.f., Bonplandia 4: 322 (1856).

*Calanthe corymbosa* Lindl., J. Linn. Soc., Bot. 6: 129 (1862). Type from Bioko (Fernando Po).

*Calanthe sanderiana* B.S.Williams, Nursery Cat. (Williams, 1887: 21); Rolfe, Gard. Chron., ser. 3, 12: 396 (1892). Type not located.

*Alismorkis natalensis* (Rchb.f.) Kuntze, Revis. Gen. Pl. 2: 650 (1891).

*Alismorkis plantaginea* (Thouars) Kuntze, Revis. Gen. Pl. 2: 650 (1891)

*Calanthe delphinioides* Kraenzl., Bot. Jahrb. Syst. 17: 55 (1893). Type from Cameroon.

*Calanthe sylvatica* var. *alba* Frapp. in Cordem., Fl. Réunion: 225 (1895). Type not located.

*Calanthe sylvatica* var. *purpurea* Frapp. in Cordem., Fl. Réunion: 225 (1895). Type not located.

*Calanthe sylvatica* var. *lilacina* Frapp. in Cordem., Fl. Réunion: 225 (1895). TYPE: Herb. *Cordemoy s.n.* MARS087657.



FIGURE 33. *Bulbophyllum variegatum* in Réunion. Photograph by Johan Hermans.

*Calanthe sylvatica* var. *iodes* Frapp. in Cordem., Fl. Réunion: 225 (1895). TYPE: Herb. *Cordemoy s.n.* MARS087661.

*Calanthe volkensii* Rolfe in Thiselton-Dyer, Fl. Trop. Afr. 7: 46 (1897). Type from Tanzania.

*Calanthe violacea* Rolfe, Kew Bull. 1913: 29 (1913). TYPE: Madagascar, cult. England (holotype: K, not found).

*Calanthe neglecta* Schltr., Bot. Jahrb. Syst. 53: 570 (1915). Type from Tanzania.

*Calanthe stolzii* Schltr., Bot. Jahrb. Syst. 53: 569 (1915). Type from Tanzania.

*Calanthe schliebenii* Mansfeld, Notizbl. Bot. Gart. Berlin 11: 808 (1933). Type from Tanzania.

*Calanthe sylvatica* var. *pallidipetala* Schltr., Repert. Sp. Nov. Regni Veg. Beih. 33: 166 (1924). TYPE: Madagascar, NE. of Inananonana, *Perrier* 8104 (holotype: P).

*Calanthe perrieri* Ursch & Genoud, Nat. Malg. 3, 2: 102 (1951), *nom. nud.* Based upon *Duran* 811 (P) from Madagascar.

*Calanthe sylvatica* forma *imerina* Ursch & Genoud, Nat. Malg. 3, 2: 108 (1951), *nom nud.* Based upon



FIGURE 34. Lectotype of *Bulbophyllum variegatum*. Thouars (1822).



FIGURE 35. Watercolour of *Calanthe sylvatica* variants by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.



FIGURE 36. *Calanthe sylvatica* in Réunion. Photograph by Johan Hermans.

*Ursch* 24 (P) from Madagascar.

*Calanthe sylvatica* forma *humberti* *Ursch* & Genoud, *Nat. Malg.* 3, 2: 108 (1951), *nom nud.* Based upon *Humbert s.n.* cult. Bot. Garden Antananarivo 808 (P) from Madagascar.

This is a very widespread and variable species in habit and flower size and colour. Frappier and others recognised a number of colour varieties but there are many intermediate colour forms.

#### 5. CHEIROSTYLIS Blume

The identities of *Cheirostylis boryi*, *C. gymnochiloides* and *C. nuda* have been historically confused, culminating in them, together with *Zeuxine gymnochiloides* and *Z. sambiranoensis*, being considered to be one widespread and variable species, *Cheirostylis nuda* which is the oldest name and has been considered to be a peloric form of the others (Ormerod, 2002). This concept was mainly based on interpretation of herbari-



FIGURE 37. *Calanthe sylvatica* in Réunion. Photograph by Johan Hermans.

um material at K; however, further examination of the available herbarium material along with field observations have identified three distinct taxa as follows:

1. *Cheirostylis boryi* from Réunion and mainland Africa, characterised by its creeping rhizome, petiolate leaves, terminal dense rachis, hirsute inflorescence and exterior of the petals and sepals, flowers that do not open much, and a transversally oblong lip slightly indented at the front with characteristic calli at the base.

2. *Cheirostylis gymnochiloides* from Madagascar and the Comoros which is very different from the above by its more open campanulate flowers with the segments more detached, and a lip with two hooked appendages at the base and more deeply divided anterior lobes.

3. *Cheirostylis nuda* from the Mascarenes with a more laxly racemose rachis, fewer hairs, and a lip with an oblong-ovate apex and a few small hairy appendages at the base.

*Zeuxine gymnochiloides* from Madagascar and *Z. sambiranoensis* from Madagascar and the Comoros



are distinct species with a dissimilar habit, and flowers with detached segments and of a different shape.

1. *Cheirostylis boryi* (Rchb.f.) Hermans & P.J.Cribb, **comb. nov.**

Basionym: *Monochilus boryi* Rchb.f., *Linnaea* 41: 60 (1877). TYPE: Réunion, *Bory s.n.* (holotype: W-R1201).

*Goodyera nuda sensu* Richard (1828: t.6).

*Zeuxine boryi* (Rchb.f.) Schltr., *Beih. Cot. Centralbl.* 33: 2: 410 (1915).

*Cheirostylis sarcopus* Schltr., *Bot. Jahrb. Syst.* 53: 558 (1915). TYPES: Tanzania, Nyassa Highlands, Kilambo to Mbaka, Aug. 1912, *Stolz* 1530 (M0103580, neo.; K, HBG, S, syn.).

*Cheirostylis gymnochiloides sensu* Fontaine *et al.* (2010: 108).

Reichenbach (1877) described *Monochilus boryi* from Réunion, based on a specimen collected by Bory. Schlechter (1915) described the same species as *Cheirostylis sarcopus* from mainland Africa. It is endemic to eastern and southern Africa and Réunion. Records from Madagascar (Candolle 1901: 557) are likely to be *Cheirostylis gymnochiloides*.

## 6. CYNORKIS THOUARS

Floral morphology in some *Cynorkis* species in the Mascarenes is often even more variable than that found in Madagascar and mainland Africa; within a single species the lip and spur especially can vary greatly in shape and size, the spur can sometimes be absent or vary within one inflorescence. This is undoubtedly due to pollinator interaction or the lack of it on these more recently emerged islands. Hybrid swarms are also not uncommon on all of the islands. This variation was recognised by Frappier (in Cordemoy, 1895) when he described a great number of species and varieties, many of them based on small differences in shape of the floral segments and spur. The phylogenetic position of some of the species in the genus was recently reviewed by Ngugi *et al.* (2020).

No other group of orchids from the western Indian Ocean has caused more nomenclatural confusion than the *Cynorkis* species with the lip uppermost, in section *Hemiperis*, all of which were placed in ‘*Amphorkis*’

by Frappier. They are widely distributed, locally common, very variable and often form hybrid swarms: this is well illustrated by Bernet (2010a: 176-). Much of the confusion stems from the misinterpretation of the descriptions and type herbarium material. Historical and recent literature, including Hermans *et al.* (2007), Cribb & Hermans (2009), Pailler *et al.* (2018) and Szelengowicz & Tamon (2013), and Bernet (2010a), have either accepted past misinterpretations or lacked access to the appropriate type materials. The type of *Orchis squamosa* Poir. had remained undiscovered in the Lamarck herbarium in Paris and, as a consequence, the validity of Thouars’s *Amphorkis calcarata* was ignored, we recognise the following:

*Cynorkis squamosa*, which is widespread in Madagascar and Réunion, and has often been confused with *C. ridleyi* and *C. reticulata*.

*Cynorkis calcarata* from Mauritius and Réunion which has generally been confused with *C. ridleyi*.

*Cynorkis discolor* which is more or less distinct and endemic to Réunion.

We consider *Cynorkis ridleyi* T.Durand & Schinz (1894) to be endemic to Madagascar and the Comoros: it has slightly different floral characteristics and particularly a different spur from *C. calcarata* and *C. discolor* but these species seem to have evolved on Réunion as a result of environmental and pollinator factors. There are a great number of obvious natural hybrids between the three species in the Mascarenes. More detailed comparisons are made under the individual species.

1. *Cynorkis aristei* (J.B.Castillon) P.J.Cribb & Hermans, **comb. et stat. nov.** Fig. 38.

TYPE: Réunion, Plaine des Palmistes, *Castillon* 1 (holotype: P; isotype: TAN).

Basionym: *Physoceras boryana* var. *aristei* J.B.Castillon, *Richardiana* 11, 1: 14, fig. 2 (2010).

*Cynorkis boryana* var. *aristei* (J.B.Castillon) Hermans & P.J.Cribb, *Kew Bull.* 72, 3, 38: 29 (2017).

*Physoceras mesophyllum sensu* Szelengowicz & Tamon (2013: 315).

*Cynorkis aristei*, which is endemic to Réunion, was described by Castillon (2010) as a variety of *C. boryana*; the floral morphology and colour and flower-



FIGURE 38. Watercolour of *Cynorkis aristei* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.

ing time are considerably different and it can therefore be considered a species in its own right.

2. *Cynorkis calcarata* (Thouars) T.Durand & Schinz, *Consp. Fl. Afr.* 5: 96 (1894). Fig. 39–40.

TYPE: **Lectotype designated here:** Thouars’s plate t. 4 in *Hist. Orchid.* (1822).

*Amphorkis calcarata* Thouars, *Hist. Orchid.*: t. 4 (1822), as *Amphorchis*.

*Orchis dubia* Thouars, *Hist. Orchid.*: table b 1 (1822).

*Habenaria amphorchis* Spreng., *Syst. Veg.* 3: 689 (1826), based on *Amphorkis calcarata*.

*Cynosorchis variegata* (Frapp. in Cordem.) Schltr. *Beih. Bot. Centralbl.* 33, 2: 403 (1915), **syn. nov.** TYPE: **lectotype designated here:** painting 46 by Eudoxie de Cordemoy at MAU/MSIRI (labelled *Cynorchis variegata*).

*Amphorkis variegata* Frapp. in Cordem., *Fl. Réunion:* 234 (1895), **syn. nov.**

*Amphorkis variegata* var. *digitata* Frapp. in Cordem., *Fl. Réunion:* 234 (1895), **syn. nov.** Type not located.

*Amphorkis variegata* var. *polymorpha* Frapp. in Cordem., *Fl. Réunion:* 234 (1895), **syn. nov.** Type not located.

*Cynorkis cylindrostachys* Kraenzl., *Orchid. Gen. Sp.* 1: 489 (1898), as *Cynosorkis*; Schlechter, *Beih. Bot. Centralbl.* 33: 399 (1915), **syn. nov.** TYPE: Île de France [Mauritius] *Commerson s.n.* (holotype: P00541673).

*Cynorkis squamosa sensu* Cadet (1989: pl. VI); *sensu* Benke (2004: 100); *sensu* Bernet (2010a: 165); *sensu* Szelengowicz & Tamon (2013: 289); *sensu* Pailler *et al.* (2013: 46); *sensu* Pailler *et al.* (2013: 109); *sensu* Pailler & Henze (2020: 120).

*Gymnadenia inversiflora* A.Rich. *nom. in sched.* [Herb. Delessert, *Néraud* 79 (G)].

This species was first described as ‘*Calcaramphis–Orchis–dubio*’ in Table 1 of Thouars’s *Hist. Orchid.* in 1822, and illustrated in plate 4 (Fig. 40), entitled ‘*Calcaramphis–Amphorchis calcarata*’, of which a plant and flower dissection were shown. The drawing clearly shows an elongate lanceolate leaf and non-resupinate flowers with a broad fan-shaped lip with small basal lobes and a short tubular spur. A Thouars herbarium specimen in P is labelled as *Amphorchis* and



FIGURE 39. *Cynorkis calcarata* in Réunion. Photograph by Johan Hermans.

bears a copy of his plate 4 but no other information; the specimen is in poor condition and incomplete. Another specimen in the Smith herbarium at LINN is labelled ‘Th.’ but it is difficult to associate it with Thouars. As it has a more immediate connection with the protologue, Thouars’s plate 4 has been chosen as the lectotype for the species.

*Amphorkis variegata* was described by Frappier in Cordemoy (1895) without reference to any herbarium material but his description corresponds well with *Cynorkis calcarata*. There is also a contemporary watercolour by Eudoxie de Cordemoy in MAU/MSIRI which represents this species. Frappier described several varieties of it based upon variations of the lip shape, but all fall within the variability range of *Cynorkis calcarata* except for the variety *hastata* which belongs to *C. squamosa*.

*Cynorkis cylindrostachys* was described by Kraenzlin in 1898 based on a Commerson specimen from Mauritius. Both the type (P00541673) and the description correspond well with Thouars’s *Cynorkis calcarata*.



FIGURE 40. Lectotype of *Cynorkis calcarata*. Thouars (1822).

*Cynorkis calcarata*, which is endemic to the Mascarenes (common on Réunion, scarcer on Mauritius), is similar to *C. ridleyi* from Madagascar but is distinct by the narrowly ovate to elliptical leaf (vs. broadly ovate-elliptic), divergent petals (vs. spreading) and short tubular spur (vs. thickened or sinuate).

3. *Cynorkis coccinelloides* (Frapp. in Cordem.) Schltr., Beih. Bot. Centralbl. 33, 2: 399 (1915). Fig. 41–42.

TYPE: Réunion, without exact provenance, 1897, *Cordemoy* 3 (**neotype designated here: K**).

*Camilleugenia coccinelloides* Frapp., Orchid. Réunion Cat.: 10 (1880), *nom. nud.*; Frapp. in Cordem., Fl. Réunion, 234 (1895).

*Cynorkis brachycentra* A.Rich. ex Kraenzl., Orchid. Gen. Sp.: 1, 8: 484 (1898), as *Cynosorchis brachycentra*, **syn. nov.** TYPE: Réunion, Grand Bénard, 1847–1852, *Boivin* 1072 (P00693006, *syn.*).

*Bicornella coccinelloides* (H.Perrier) Szlach. & Kras, Richardiana 6: 141 (2006).

Frappier cited three herbarium specimens from Réunion in his description of *Camilleugenia coccinelloides*, namely: St-Denis, ravine à Verdure in the J. M. C. Richard Herbarium, Plaine des Cafres in the Frappier Herbarium, and Côteau Maigre du Piton des Neiges in the J.-B. Potier herbarium. None of these can be identified with any certainty in existing herbaria. It was therefore necessary to select a neotype: *Cordemoy* 3 at K is chosen because it is closely associated with the author and corresponds well with the protologue. It is also similar to a watercolour by Eudoxie de Cordemoy in MAU/MSIRI.

*Cynorkis brachycentra*, described by Kraenzlin in 1898, was based on a Boivin herbarium sheet annotated by Achille Richard as *Cynosorchis brachycentra* and as *Gymnadenia brachycentra* Brogn. Although not indicated on the herbarium sheet, Kraenzlin cited it as coming from 'Comoren, Grand Bénard (Boivin N. 1072!)': Boivin's numbering corresponds to the sequence used when he was collecting on Réunion and 'Grand Bénard' is very likely to be a locality in central Réunion (Grand Bénare); the Comoro Island locality is therefore an error. It should not be confused with *Cynorkis brachycentra* (Frappier) Schltr. (1915: 399) which is a different species and based on different type material.

Although the description is sparse and the specimen poor, it is clear that *Cynorkis brachycentra* is the same as *C. coccinelloides* (Frapp. in Cordem.) Schltr. (1915: 399). Kraenzlin compared it with *Cynorkis elegans* Rchb.f. from Madagascar which has a similar marbled leaf but much larger flowers and a distinct lip. Kraenzlin described a 3-lobed lip but the Boivin type specimen has five lobes, two being tiny basal ones. The size and shape of the rachis, flowers, puberulous lip and spur correspond well with *Cynorkis coccinelloides* that Frappier described three years earlier.

This species is widespread in Madagascar but more common in Réunion.

4. *Cynorkis commersoniana* (A.Rich.) Kraenzl., Orchid. Gen. Sp. 1: 922-3 (1901). Fig. 43–44.

TYPE: Réunion [Bourbon], Bois du Gol, *Commerson* in Herb. Richard (holotype: P00689706).

*Gymnadenia commersoniana* A.Rich., Mém. Soc. Hist. nat. Paris, 4: 26 (1828) [as *Gymnadenia commersonii* in t. 4].

*Peristylis commersonianus* Lindl., Gen. Sp. Orchid. Pl.: 297 (1830).

*Platanthera commersoniana* Frapp., Cat. Orchid. Réunion: 10 (1880), *nom. nud.*

*Hemiparis tenella* Frapp. in Cordem., Fl. Réunion: 237 (1895); Frappier, Cat. Orchid. Réunion: *nom. nud.* (1880: 11), **syn. nov.**; *non Cynorkis tenella* Ridl., J. Linn. Soc., Bot. 22: 124 (1886).

*Habenaria commersoniana* (A.Rich.) T.Durand & Schinz, Consp. Fl. Afr. 5: 75 (1894).

*Cynorkis frappieri* Schltr., Beih. Bot. Centralbl. 33: 400 (1915), as *Cynosorchis frappieri*, **syn. nov.** TYPE: Réunion [Île Bourbon], Herb. Delteil (Herb. Drake) (P00693021, *neo. designated* by Hermans *et al.* (2020)).

*Cynosorchis raymondiana* H.Perrier, Arch. Bot. Bull. Mens. 5 (1931: 48) (unpublished); Perrier, Fl. Madagascar. Orchid. 1: 97 (1939). TYPES: Madagascar, nr. Fort-Dauphin, *Decary* 10142 (P00102022, *syn.*; *Decary* 10019 P00102023, *syn.*).

*Cynorkis raymondiana* H.Perrier ex Hermans *et al.*, Orchid. Madag. ed. 2: 292 (2007), **syn. nov.** TYPE: Madagascar, nr. Fort-Dauphin, *Decary* 10142 (lectotype: P00102022, designated by Hermans *et al.* (2020)); *Decary* 10019 (P00102023, *para.*).

*Bicornella raymondiana* (H.Perrier.) Szlach. & Kras,



FIGURE 41. Watercolour of *Cynorkis coccineloides* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.

Richardiana 6, 3; 145 (2006), *nom. inval.*

*Gymnadenia commersoniana* was described and illustrated by Achille Richard in 1828. Richard clearly designated the holotype at P by (*Gymnadenia commersoniana* Nob. *Orchid. Maurit. p.27 t. 4*). His drawing (t. 4) has caused much confusion: it shows the plant as in the herbarium specimen but the detail of the lip differs partly from his description and considerably from the herbarium material; the lip is shown as cuneiform with the front margin incurved. Dissection of the type material by Bosser and the first author clearly show an obcordate 5-lobed lip, 3-lobed at the front with a small triangular midlobe and small basal wings, floral details are otherwise correct. This may have led to some of the confusion in the nomenclature, especially by Kraenzlin (1901: 923) where he included it under *Species subdubiae v. dubiae*. When comparing the species with *Cynorkis frappieri* Schltr. (1915: 400) and its synonyms, it is obvious that they are conspecific. The nomenclature of *Cynorkis frappieri* is discussed by Hermans *et al.* (2020). *Cynorkis commersonii* Rchb.f. (1855: 213) has sometimes been listed as a valid species but Reichenbach clearly compared it with his *C. parviflora* and referred to the Richard species.

It is widespread in Madagascar and the Mascarenes



FIGURE 42. *Cynorkis coccineloides* in Réunion. Photograph by Rogier van Vugt.

being common in Réunion, but known from a single locality in western Mauritius.

5. *Cynorkis constellata* (Frapp. in Cordem.) Schltr., *Beih. Bot. Centralbl.* 33, 2: 399 (1915). Fig. 45–46.

TYPE: Réunion, Plaine des Cafres, 1852, *Cordemoy s.n.* (**neotype designated here: MARS**).

*Hemipervis constellata* Frapp., *Cat. Orchid. Réunion:* 11 (1880), *nom. nud.*

*Camilleugenia constellata* Frappier 134 (1852), *in sched.* (REU).



FIGURE 43. *Cynorkis commersoniana* in Réunion. Photograph by Rogier van Vugt.

*Hemiperis constellata* Frapp. in Cordem., Fl. Réunion: 246 (1895).

*Hemiperis clavata* Frapp. in Cordem., Fl. Réunion: 247 (1895), **syn. nov.** TYPE: Réunion, Cilaos, *Cordemoy s.n.* (holotype: REU or MARS)?

*Hemiperis ludens* Frapp. in Cordem., Fl. Réunion: 239 (1895), **syn. nov.**

*Hemiperis nitida* Frapp. in Cordem., Fl. Réunion: 245 (1895); Frappier, Cat. Orchid. Réunion: 11 (1880), *nom. nud.*

*Cynorkis clavata* (Frapp. in Cordem.) Schltr., Beih. Bot. Centralbl. 33, 2: 399 (1915) **syn. nov.**



FIGURE 44. *Cynorkis commersoniana* in Réunion. Photograph by Rogier van Vugt.

*Cynorkis ludens* (Frapp. in Cordem.) Schltr., Beih. Bot. Centralbl. 33, 2: 401 (1915), **syn. nov.** Type not located.

*Cynorkis nitida* (Frapp. in Cordem.) Schltr., Beih. Bot. Centralbl. 33, 2: 401 (1915), **syn. nov.**

Frappier (1895: 246), in his description of *Hemiperis constellata* cited three collections: Tampon, Cilaos (*Potier*) and Grand Bénard (Herb. Richard). However, no herbarium material has been found that match them. A specimen in the Cordemoy herbarium (MARS) bears a label ‘*c’est mon Hemiperis constella-*



FIGURE 45. Watercolour of *Cynorkis constellata* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.

*ta*, 1852' from Plaine des Cafres and has been selected as the neotype for the species because it is closely associated with the author and the protologue.

*Hemiparis clavata* was described by Frappier (1895: 247) but there is very little herbarium material that can be associated with the protologue. Frappier distinguished it from *Cynorkis constellata* by the peculiarities of the spur and especially the size and number of spots on the lip. It is considered here as part of *Cynorkis constellata*, a very variable species. They share the same habitat, general flower shape, habitat and flowering time. The plants are virtually identical while the flowers are the same size. The pubescence on the ovary and the back of flower can range from



FIGURE 46. *Cynorkis constellata* in Réunion. Photograph by Rogier van Vugt.

almost absent with just a few scattered hairs to densely hirsute-glandulose. The lip is always 3-lobed but the size and division of the lobes ranges from obscure to roundly-3-lobed; there being a full range of intermediate forms. The spur is also variable in shape and size: sometimes it is conical but generally clavate, the shape often varying within the same inflorescence. The lip pattern can range from almost suffused with fine spotting to just a few large red blotches.

*Hemiparis ludens* was described by Frappier in 1895, his text clearly referring to one of more glabrous variants of *Cynorkis constellata*. The shape of the leaves and flowers, colour of the flowers and especially the variable spur within one inflorescence are typical for the species. It was reported from le Tampon where it is abundant.

*Hemiparis nitida* was described by Frappier (1895) from le Piton des Neiges but no associated herbarium material has been found. The description clearly refers to one of more hirsute variants of *Cynorkis constellata*.

*Cynorkis constellata*, which is endemic to Réunion,





FIGURE 47. *Cynorkis falcata* in Réunion. Photograph by Rogier van Vugt.

is similar to *C. bimaculata* from Madagascar but the latter's spur is different (slightly hooked vs. clavate) and the shape and position of the lateral sepals is also distinct.

6. *Cynorkis falcata* (Frapp. in Cordem.) Schltr., Beih. Bot. Centralbl. 33: 400 (1915), as *Cynosorchis falcata*. Fig. 47–48.



FIGURE 48. *Cynorkis falcata* in Réunion. Photograph by Rogier van Vugt.

TYPE: Réunion, without exact provenance: *Cordemoy s.n.* (**lectotype designated here**: MARS087655).

*Peristylus sacculatus* Balf.f. & S.Moore, J. Bot. 14: 293 (1876), **syn. nov.** TYPE: Réunion, without exact provenance: *J. H. Balfour s.n.* (holotype: K).

*Hemiparis micrantha* Frapp., Cat. Orchid. Réunion: 11 (1880), *nom. nud.*

*Hemiparis micrantha* Frapp. in Cordem., Fl. Réunion: 239 (1895).

*Hemiparis falcata* Frapp. in Cordemoy, Fl. Réunion: 241 (1895); Frappier, Cat. Orchid. Réunion: 11 (1880), *nom. nud.*

*Cynorkis micrantha* (Frapp. in Cordem.) Schltr., Bot. Jahrb. Syst. 53: 488 (1915). TYPE: Réunion, *Cor-*

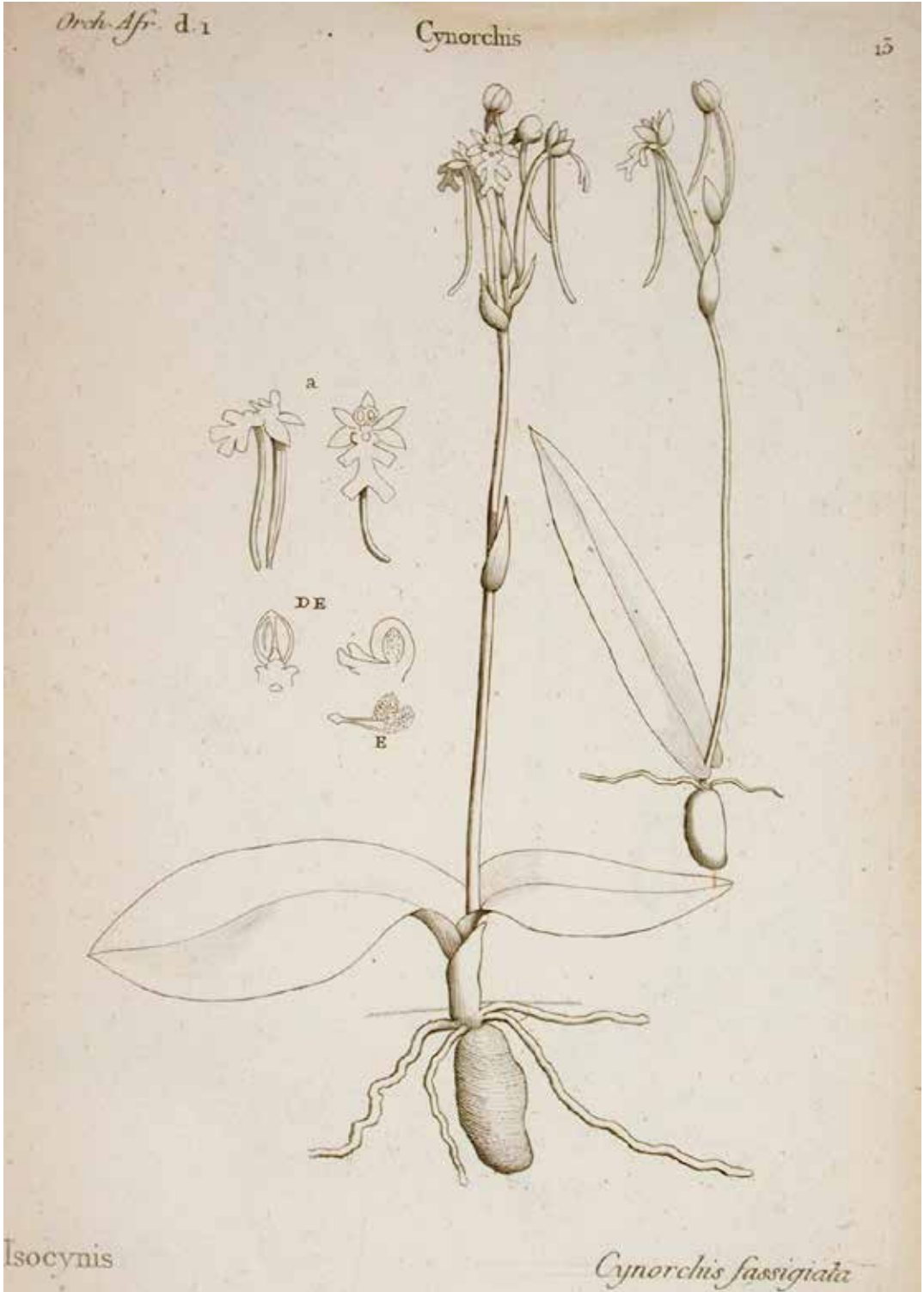


FIGURE 49. Lectotype of *Cynorkis fastigiata*. Thouars (1822).

- demoy* 9 (**lectotype designated here**: MARS; isolectotype, K).
- Hemiperis* (*Habenaria*) (*Bescherellia*) *aphylla* Cordem., *nom.* based upon *Cordemoy* 9 (MARS).
- Habenaria sacculata* (Balf.f. & S.Moore) T.Durand & Schinz, *Consp. Fl. Afr.* 5: 85 (1894), **syn. nov.**, *non* *Cynorkis sacculata* Schltr., *Beih. Bot. Centralbl.* 34, 2: 310 (1916).
- In 1876, Balfour & Moore described *Peristylis sacculatus* from Réunion based on material collected during the Transit of Venus Expedition of 1874-1875; the type is at K. It was later transferred to *Habenaria* by Durand & Schinz. In 1895 Frappier described *Hemiperis falcatus* from Réunion with the type in the Cordemoy herbarium at MARS. Comparison of the types and other associated material makes it clear that they are conspecific in the genus *Cynorkis*, Frappier's 1895 name being the next available, as the name *Cynorkis sacculata* had already been used by Schlechter in 1916 for a Madagascan species.
- Cordemoy saw the type of *Hemiperis micrantha*, collected by Frappier in the 'Herb. Mus. de la Réunion': it was said to be in poor condition, and it has not been possible to identify an exact matching specimen. A Cordemoy collection (MARS and K) is close to the description and both match more recent material; for clarity it is selected as lectotype. The material is annotated as *Hemiperis*, (*Habenaria*), (*Bescherellia*) *aphylla* but this name was never formally described. Bosser considered it to be a new species and described it in manuscript in P. Although their basionyms were published earlier in Frappier's 1895 work, the name *Cynorkis falcata* was chosen over *C. micrantha* in Pailler & Henze (2020: 196).
- It was thought to be endemic to Réunion but there are credible sight records from Madagascar (Angavokely) by Jean-Michel Hervouet (pers. comm. 2015).
7. *Cynorkis fastigiata* Thouars, *Hist. Orchid.*: Table 1, d 1, t. 13 (1822), *nom. cons.* (Hermans & Cribb 2006: 1042). Fig. 49–51. TYPE: without exact provenance: *Thouars s.n.* (**lectotype designated here**: P00102259).
- Orchis obcordata* Willem., *Usteri Ann. Bot.* 18: 52 (1796); Schlechter, *Beih. Bot. Centralbl.* 33: 401 (1915), *non* Buch-Ham. ex D.Don, *Prodr. Fl. Nepal.* 23 (1825). TYPE: Mauritius, *Commerson s.n.* (P00340443, neo).
- Cynorkis isocynis* Thouars, *Hist. Orchid.*: t. 13 (1822).
- Cynorkis triphylla* Thouars, *Hist. Orchid.*: Table 1, d.2., t. 14 (1822).
- Orchis triphylla* (Thouars) Spreng., *Syst. Veg.* 3: 687 (1826).
- Orchis fastigiata* (Thouars) Spreng., *Syst. Veg.* 3: 687 (1826).
- Gymnadenia triphylla* (Thouars) A.Rich., *Mém. Soc. Hist. nat. Paris*, 4: 26 (1828).
- Gymnadenia fastigiata* (Thouars) A.Rich., *Mém. Soc. Hist. nat. Paris*, 4: 23 (1828).
- Cynorkis triphylla* (Thouars) Lindl., *Gen. Sp. Orchid. Pl.*: 332 (1835).
- Orchis mauritiana* Sieber ex Lindl., *Gen. Sp. Orchid. Pl.*: 332 (1835). TYPE: Mauritius, *Sieber* 169 (holotype: K; isotypes: P, W).
- Cynorkis fastigiata* var. *triphylla* (Thouars) S.Moore in J.G.Baker, *Fl. Mauritius*: 337 (1877), **syn. nov.** TYPE: Mauritius, without exact location, **lectotype designated here**: Thouars t. 14 in *Hist. Orchid.* (1822).
- Cynorkis cordemoyi* Frapp. in Cordem., *Fl. Réunion*: 229 (1895), **syn. nov.** TYPE: watercolour by Eudoxie de Cordemoy (**lectotype designated here**: MAU/MSIRI, the painting showing 3 open flowers).
- Cynorkis obcordata* (Willem.) Schltr., *Beih. Bot. Centralbl.* 2, 34: 401 (1916).
- Cynosorchis hygrophila* Schltr., *Beih. Bot. Centralbl.* 34, 2: 309 (1916). TYPE: Madagascar, along the river Fandrazana (NE), *Perrier* 11398 (*Schlechter* 100) (holotype: B†; isotype: P).
- Cynosorchis diplorhyncha* Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 15: 325 (1918). TYPE: Madagascar, Ste-Marie, *Laggiara s.n.* (holotype: B†).
- Cynosorchis laggiarae* Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 15: 326 (1918). TYPE: Madagascar, *Laggiara s.n.* (holotype: B†)
- Cynosorchis laggiarae* var. *ecalcarata* Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 15: 326 (1918). TYPE: Madagascar, *Laggiara s.n.* (holotype: B†).
- Cynosorchis decolorata* Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 33: 46 (1924). TYPE: Madagascar, Sambirano mountains, *Perrier* 15713 (holotype: P).
- Habenaria cynosorchidacea* C.Schweinf., *Bernice Bi-*



FIGURE 50. *Cynorkis fastigiata* in Réunion. Photograph by Johan Hermans.



FIGURE 51. Watercolour of *Cynorkis fastigiata* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.

shop Mus. Bull. 141: 18 (1936). TYPE: from Fiji.

*Cynorkis fastigiata* var. *typica* H.Perrier in Humbert, Fl. Madagasc., Orchid. 1: 141 (1939), *nom. inval.*

*Cynorkis fastigiata* var. *decolorata* (Schltr.) H.Perrier in Humbert, Fl. Madagasc., Orchid. 1: 141 (1939) *nom. inval.*

*Cynorkis fastigiata* var. *diplohyntcha* (Schltr.) H.Perrier in Humbert Fl. Madagasc. Orchid. 1: 141 (1939) *nom. inval.*

*Cynorkis fastigiata* var. *hygrophila* (Schltr.) H.Perrier in Humbert, Fl. Madagasc., Orchid. 1: 140 (1939) *nom. inval.*

*Cynorkis fastigiata* var. *laggiaræ* (Schltr.) H.Perrier in Humbert, Fl. Madagasc., Orchid. 1: 141 (1939) *nom. inval.*

*Cynorkis seychellarum* Aver., Bot. Zhurn. 68, 11: 1566 (1983), *syn. nov.* TYPE: Seychelles, Praslin, Tzelev 318 (holotype: LE)

*Cynorkis fastigiata* is a very widespread and variable species in Madagascar, the Comoros, the Seychelles, Mauritius and Réunion: it sometimes has one leaf, more commonly two and occasionally three; the number of leaves is often inconsistent in individual colonies. Thouars named and illustrated *Cynorkis triphylla* from Mauritius which was considered a variety by Moore (1877: 337) but it falls within this phenotypically plastic species and the flowers are typical of *C. fastigiata*, it therefore is considered conspecific here. Flower shape and size also vary considerably: *Cynorkis seychellarum* Aver., is close to the typical form and does not warrant specific status.

*Cynorkis cordemoyi*, was described by Cordemoy in 1895 based on Frappier's manuscript notes. He noted that it was rare on the escarpments of the rivière des Marsouins and quite abundant on the talus on chemin de Bethléem. No type material has been lo-

cated but two watercolours by Eudoxie de Cordemoy are labelled as '*Cynorkis cordemoyi* Frapp.' in MAU/MSIRI (Fig. 51). One represents *Cynorkis fastigiata* but the other *C. purpurascens*, both being widespread in Réunion and quite variable: Frappier's description of *C. cordemoyi* agrees most closely with *C. fastigiata* in its number of flowers and the size of the leaf.

It occurs as a weed in Fiji and in orchid collections around the world.

8. *Cynorkis flexuosatis* (Thouars) Hermans, **comb. nov.** Fig. 52–54.

TYPE: Mauritius, Thouars, **lectotype designated here:** Hist. Orchid.: t. 7 (1822).

Basionym: *Satorkis flexuosatis* Thouars, Hist. Orchid.: Table 1, c.2 & t. 7 (1822) **syn. nov.**

*Satyrium flexuosum* Thouars, Hist. Orchid.: Table 1 c. 2, t. 7 & 12 (1822), *non Satyrium flexuosum* (L.) Thunb., Prodr. Pl. Cap.: 5 (1794) [= *Disa flexuosa* (L.) Sw., Kongl. Vetensk. Acad. Nya Handl. 21: 212 (1800)].

*Habenaria flexuosa* (Thouars) Spreng., Syst. Veg. 3: 690 (1826).

*Gymnadenia flexuosa* (Thouars) A.Rich., Mém. Soc. Hist. nat. Paris, 4: 25 (1828).

*Peristylus flexuosus* (Thouars) S.Moore, J. Bot. 5: 293 (1876).

*Hemiparis nervilabris* Frapp. Cat. Orchid. Réunion: 11 (1880), *nom. nud.*

*Habenaria thouarsii* T.Durand & Schinz, Consp. Fl. Afr. 5: 87 (1894), *nom. superfl.*

*Hemiparis nervilabris* Frapp. in Cordem., Fl. Réunion: 250 (1895).

*Hemiparis pleiadea* Frapp. in Cordem., Fl. Réunion: 243 (1895); Frappier in Cordemoy, Fl. Réunion: 11 (1895), *nom. nud.*

*Hemiparis trilinguis* Frapp. in Cordem., Fl. Réunion: 242 (1895); Frappier, Cat. Orchid. Réunion: 11 (1880), **syn. nov.**

*Cynorkis nervilabris* (Frapp. in Cordem.) Schltr., Beih. Bot. Centralbl. 33, 2: 401 (1915), **syn. nov.** TYPE: Bélouve, to Côte Monique, Feb. 1875, *de l'Isle 71* (**lectotype designated here:** P)

*Cynorkis trilinguis* (Frapp. in Cordem.) Schltr., Beih. Bot. Centralbl. 33, 2: 403 (1915), **syn. nov.** TYPE: Réunion, Îlet de Patience, 1900 m, *Cordemoy s.n.* (**lectotype designated here:** MARS with tempo-

rary number P00541671).

*Cynorkis pleiadea* (Frapp. in Cordem.) Schltr., Beih. Bot. Centralbl. 33, 2: 401 (1915), **syn. nov.** TYPE: **Lectotype designated here:** Eudoxie de Cordemoy watercolour 62, titled *Hemiparis pleiadea* Frapp. in MAU/MSIRI.

*Satyrium flexuosum* was described and illustrated by Thouars in 1822 (Fig. 52) but the name had already been used by Thunberg (1794), based on Linnaeus's *Orchis flexuosa* of 1760; it was therefore necessary to revert to Thouars's alternative name *Satorkis flexuosatis*. It should not be confused with *Cynorkis flexuosa*, described by Lindley (1835) which is an entirely different species common in Madagascar. No type material was found for Thouars's *Satorkis flexuosatis* /*Satyrium flexuosum*, so his plate 7 (1822) is selected here as it clearly shows the characteristics of plant and flowers. Neither *Hemiparis nervilabris* nor *H. trilinguis*, described by Frappier in 1895, have associated type material. To facilitate identification, neotypes have been designated: *de l'Isle 71* (P) for *Cynorkis nervilabris* because it is contemporary and close to the protologue; *Cordemoy s.n.* (P00541671) for *Cynorkis trilinguis* because of its association with the description and Cordemoy's manuscript label. The descriptions and related herbarium material refer to small glabrous plants with 1 to 2 leaves, flowers with a distinctly 3-lobed lip and a short spur; they both correspond well with Thouars's *Satyrium flexuosum*, especially considering the variability of this common species.

*Hemiparis pleiadea* was first described by Frappier in (Cordemoy, 1895) as a glabrous plant, up to 35 cm tall with 1 to 3, 5–15 cm long leaves, and slightly purple flowers with a noticeably 3-lobed lip with a large mid-lobe, the lip and part of the petals being unequal spotted violet (hence the name), and a short arched spur. He implied that it was common and widespread between 1100–1300 m on Réunion. Only one herbarium specimen has been found that was identified as such (*Delteil s.n.* P00693020) but this has a different habit and lip shape from the one described by Frappier and resembles more *Cynorkis constellata*. There is however a contemporary watercolour by Eudoxie de Cordemoy that shows the species in some detail (this has been chosen as the lectotype) (Fig. 53). Based upon this, and Frappier's description, we are

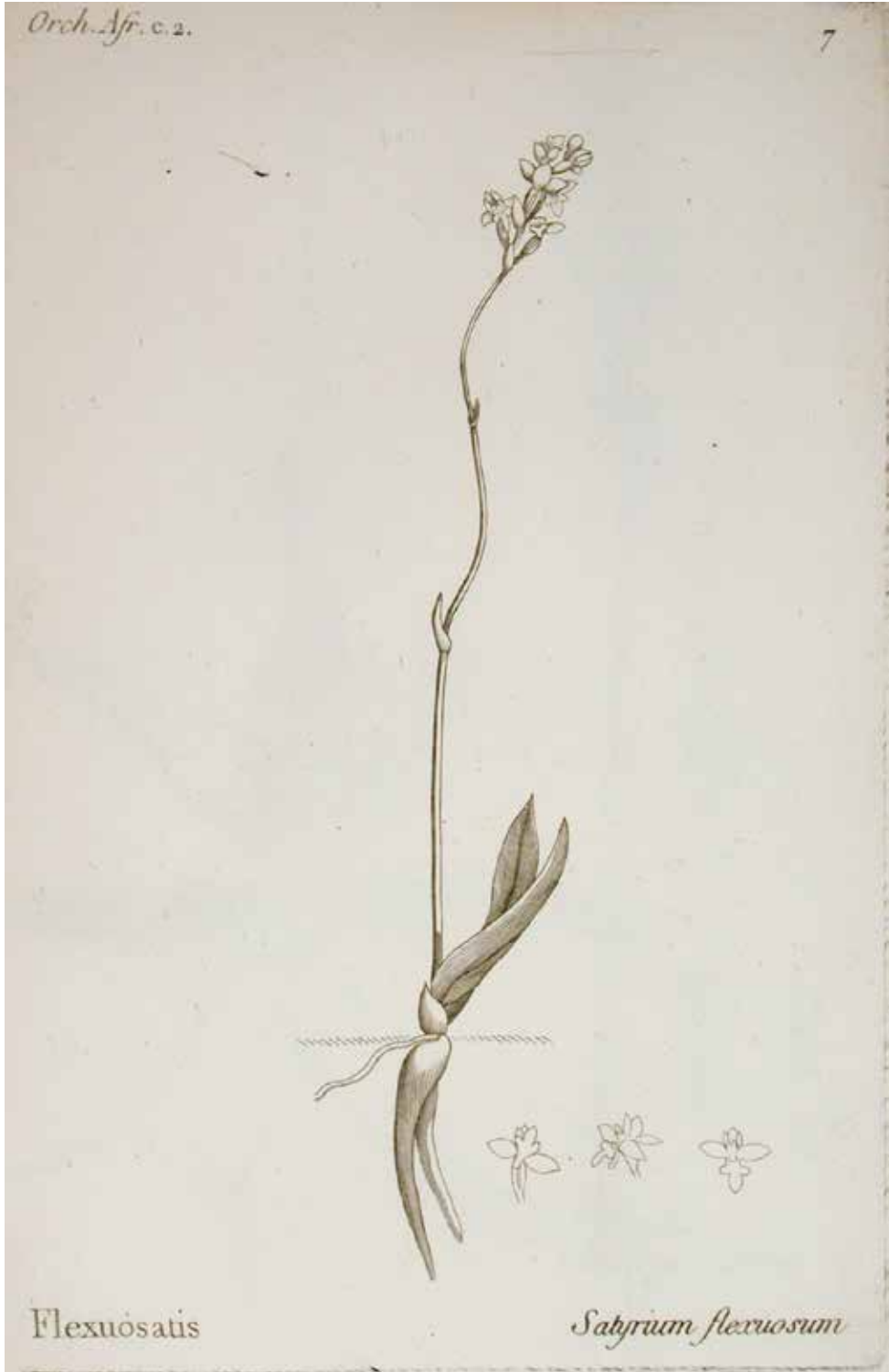


FIGURE 52. Lectotype of *Cynorkis flexuosatis*. Thouars (1822).



FIGURE 53. Watercolour of *Cynorkis flexuosatis* (as *Cynorkis pleiadea*) by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.

convinced that this is one of the many colour variants of *Cynorkis flexuosatis*.

It is a common and widespread in Réunion, but with only one record from Mauritius, where Moore (1877: 336) reported it 'at Moka and Quartier Militaire Bojer'. A single herbarium specimen from Mauritius has been found in the Reichenbach herbarium in W, but it has not been found since in Mauritius. There are similar species in Madagascar, including *Cynorkis andringitrana* Schltr. but the spur and plant habit differ slightly.

9. *Cynorkis graminea* (Thouars) Schltr., Repert. Spec. Nov. Regni Veg. Beih. 33: 51 (1924). Fig. 55–56.

TYPE: Madagascar, *Thouars s.n.* (not located); Thouars, **lectotype designated here**: Hist. Orchid.: t. 6 (1822).

*Satyrium gramineum* Thouars, Hist. Orchid.: table 1, c. 1, t. 6 (1822).

*Satorkis graminisatis* Thouars, Hist. Orchid.: t. 6 (1822).

*Habenaria graminea* (Thouars) Spreng., Syst. Veg. 3: 690 (1826).

*Platanthera graminea* (Thouars) Lindl., Gen. Sp. Orchid. Pl.: 292 (1835).

*Bicornella longifolia* Lindl., Gen. Sp. Orchid. Pl.: 335 (1838). TYPE: Madagascar, Herb. Lehmann *s.n.* (holotype: K).

*Peristylus gramineus* (Thouars) S.Moore in J.G.Baker, Fl. Mauritius: 336 (1877).

*Bicornella parviflora* Ridl., J. Linn. Soc., Bot. 21: 500 (1885). TYPES: Madagascar, Imerina, *Deans Cowan s.n.* (BM, syn.; *Hildebrandt* 3820 (BM, HBG, syn.; *Lyall* 308 (BM, syn.)).

*Bicornella similis* Schltr., Beih. Bot. Centralbl. 34, 2: 305 (1916). TYPE: Madagascar, Antsirabe, *Perrier* XXXIII (8125A) (holotype: B).

*Benthamia graminea* (Thouars) Schltr., Repert. Spec. Nov. Regni Veg. Beih. 33: 24 (1924).

*Cynosorchis similis* (Schltr.) Schltr., Repert. Spec. Nov. Regni Veg. Beih. 33: 71 (1924).

*Cynosorchis longifolia* (Lindl.) Schltr., Repert. Spec. Nov. Regni Veg. Beih. 33: 59 (1924).

*Bicornella graminea* (Thouars) Szlach. & Kras, Richardiana 6, 3: 144 (2006).

Szelengowicz & Tamon (2013: 271) typified the species in error with *Armange s.n.* (P00738407) which



FIGURE 54. *Cynorkis flexuosatis* in Réunion. Photograph by Johan Hermans.

is a *Benthamia*.

It is common and widespread in Madagascar, but rare in the Mascarenes with one historical collection from Mauritius and a handful from Réunion.

10. *Cynorkis inermis* (Thouars) Hermans & P.J.Cribb, Kew Bull. 72: 38, 28 (2017). Fig. 57–58.

TYPE: Mauritius or Réunion, *Thouars* 4 (holotype: P00693148).

*Amphorkis inermis* Thouars, Hist. Orchid.: Table 1, b.2. t. 5 (1822).

*Ophrys dubia* Thouars, Hist. Orchid.: t. 1 (1822).

*Amphorchis dubia* Thouars Hist. Orchid.: t. 5 (1822) [alternative name for *Ophrys dubia*].

*Inermamphis dubia* Thouars, Hist. Orchid.: Table 1 (1822) [alternative name for *Ophrys dubia*].

*Rodriguezia mascarenensis* Spreng. Syst. Veg. 3: 719 (1826).

*Amphorkis nilarmis* Steudel, Nom. Bot. 80 (1840).

*Cynorkis arnottioides* Rchb.f., Bonplandia (Hannover) 3: 213 (1855), **syn. nov.** TYPE: Réunion [Bourbon], 1849, *Giraudy s.n.* (**lectotype designated here**: W-R46815).

*Arnottia mauritiana* A.Rich., Mém. Soc. Hist. nat.



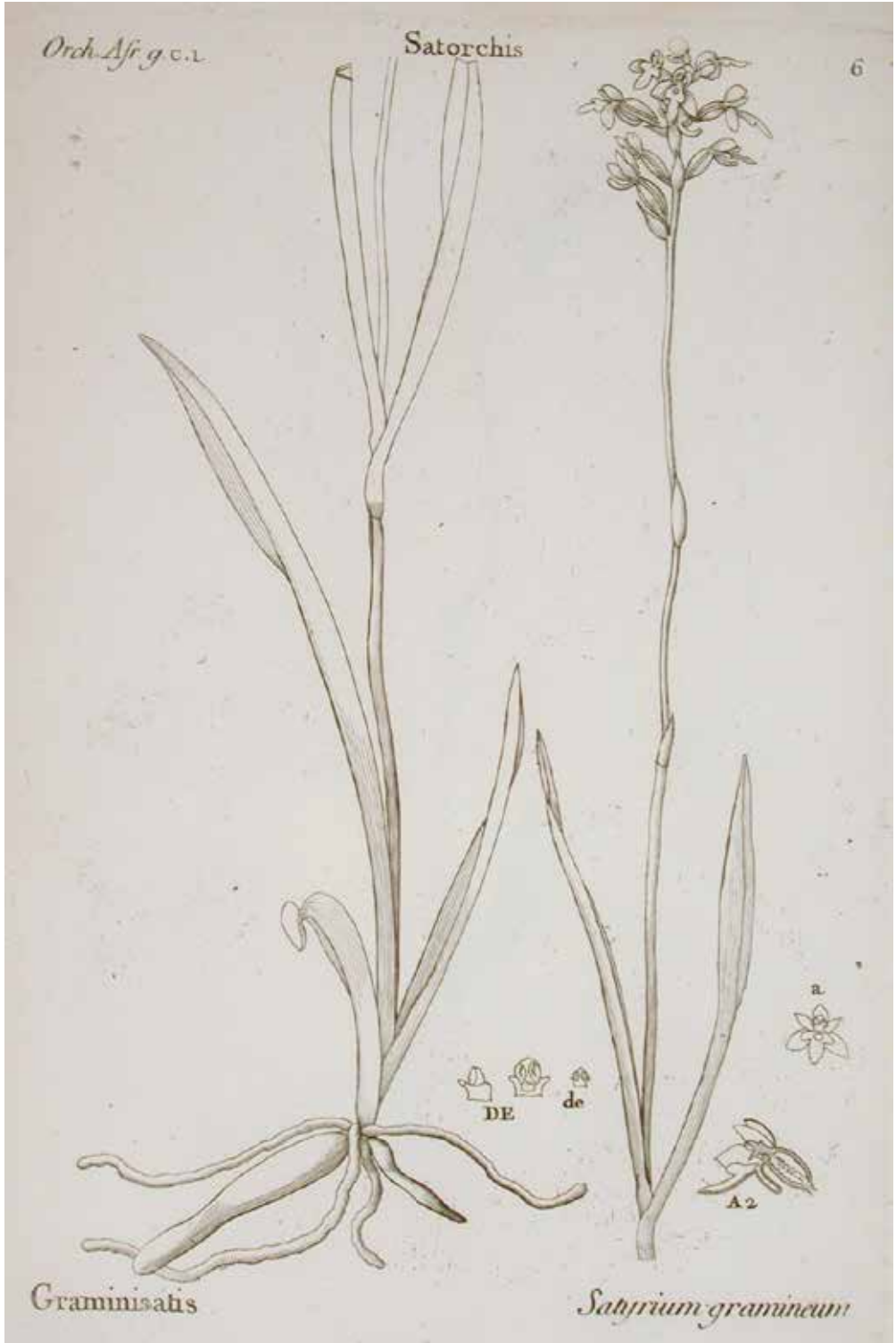


FIGURE 55. Lectotype of *Cynorkis graminea*. Thouars (1822).

Paris, 4: 30 (1828). TYPE: Bourbon [Réunion], Herb. Richard, *Commerçon s.n.*, 1771. (lectotype: P, selected by Hermans *et al.* 2017: 28).

*Arnottia inermis* (Thouars) Moore in Baker, Fl. Mauritius: 339 (1877).

*Arnottia silvicola* Kraenzlin *nom. nud.* based upon: Mauritius, 1835, *Bouton s.n.* (BR0000006410704).

Reichenbach (1855) established *Cynorkis arnotioides* from a collection by “M. Girandy (Giraudy)” from ‘Bourbon’, describing it as having lanceolate, acute leaves, cuneate at the base, and flowers with an oblong-ligulate lip with a very small conical spur. The Giraudy herbarium sheet in the Reichenbach herbarium in Vienna corresponds well with the description. There is no doubt that it is the same as Thouars’s *Cynorkis inermis*.

*Cynorkis inermis* could be considered part of the variable *C. nutans* (Ridl.) H.Perrier from Madagascar and the Comoros but the lack of a spur makes it distinct. A few plants of *Cynorkis inermis* have been found in Réunion that have a short remnant spur (Bernet 2010a: 122 & pers. comm. and Szelengowicz & Tamon 2013: 277) and recently plants with a much reduced spur have also been found in eastern Madagascar (Mme M. Izouard, pers. comm. 2019). The loss of (or reduction in the length of) the spur suggests a change in pollinator interaction and its endemism to the islands of Mauritius and Réunion warrant its recognition as a distinct species. A detailed analysis of the species is given by Hermans *et al.* (2020).

It is endemic to the Mascarene Islands (Mauritius and Réunion), but scarce on Mauritius.

11. *Cynorkis lilacina* Ridley, J. Linn. Soc., Bot. 21: 515 (1885). Fig. 59.

TYPE: Madagascar, Ankafana, *Deans Cowan s.n.* (lectotype designated here: BM00034792); former syntypes: *Baron 229* (K000415583; P00080967 syn.); & *Lyall s.n.* (K? syn., not located).

*Cynosorchis lilacina* (Ridl.) T.Durand & Schinz, *Consp. Fl. Afr.*: 5: 92 (1894).

*Hemiparis calcaripotens* Frapp. in Cordem., Fl. Réunion: 252 (1895). TYPE: Bourbon [Réunion], Herb. Drake, Herb. Delteil *s.n.* (lectotype designated here: P00693022).

*Cynorkis boiviniana* Kraenzl., *Orchid. Gen. Sp.* 1: 483



FIGURE 56. *Cynorkis graminea* in Madagascar. Photograph by Johan Hermans.

(1901). TYPE: Comoros, Grande Comore, *Boivin s.n.* (holotype: HBG500953; isotype: P00024638 in part).

*Cynorkis calcaripotens* (Frapp. in Cordem.) Schltr., *Beih. Bot. Centralbl.* 33, 2: 399 (1915).

*Cynorkis lilacina* var. *typica* H.Perrier in H. Humbert ed., *Fl. Madagasc. Orchid.* 1: 90 (1939), *nom. inval.*

*Cynorkis lilacina* var. *boiviniana* (Kraenzl.) H.Perrier in H. Humbert ed., *Fl. Madagasc. Orchid.* 1: 92 (1939), *syn. nov.*

*Bicornella lilacina* (Ridl.) Szlach. & Kras, *Richardiana* 6, 3: 145 (2006).

Deans Cowan’s specimen (BM) is chosen as the lectotype of *Cynorkis lilacina* because it corresponds well to the protologue and there is an associated drawing of it in his watercolour album at BM (Cowan 1880: fig. 74).

*Cynorkis lilacina* is a common and variable species from Madagascar and has only been reported from

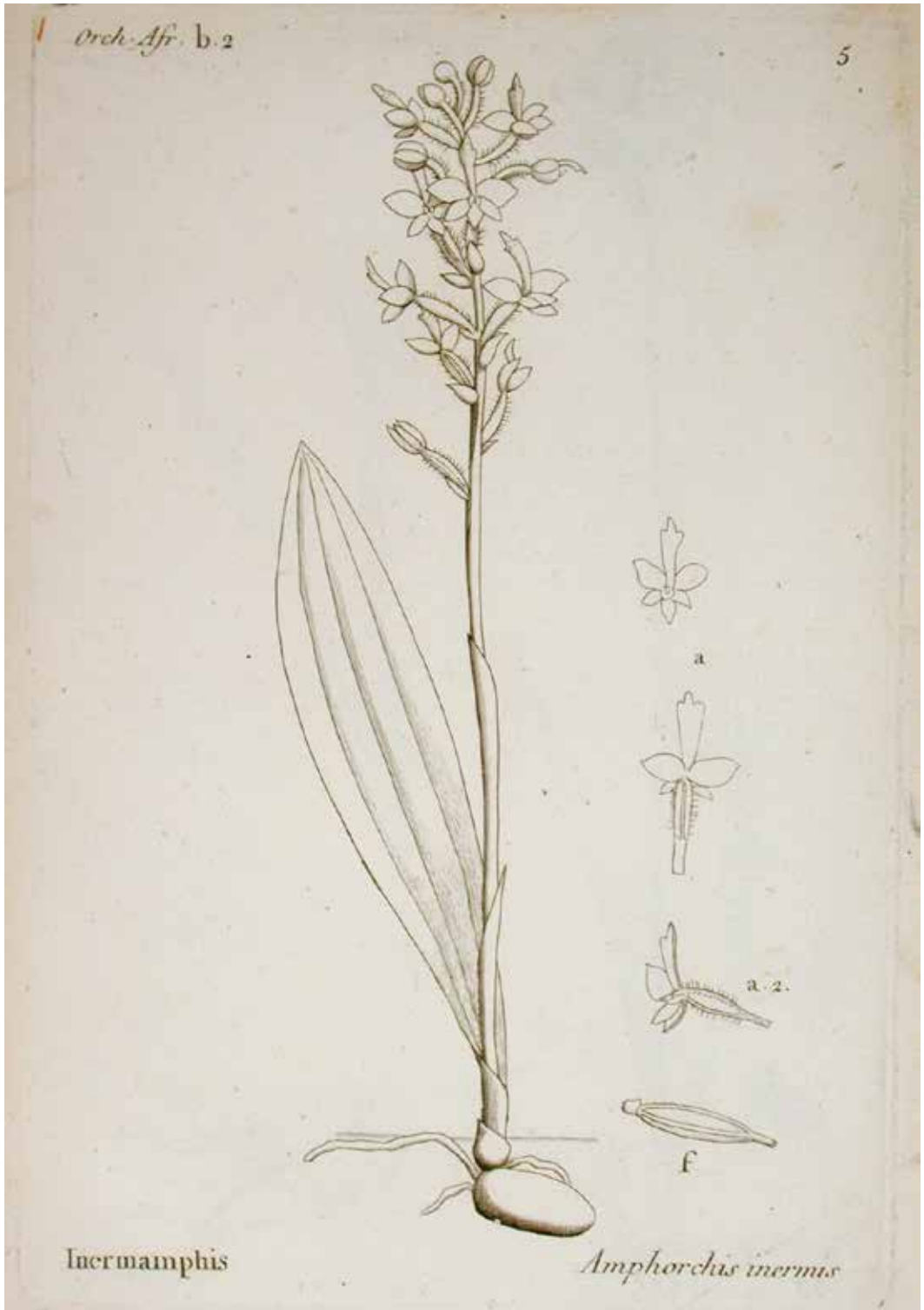


FIGURE 57. *Cynorkis inermis*. Thouars (1822).



FIGURE 58. *Cynorkis inermis* in Réunion. Photograph by Johan Hermans.

Réunion by Szelengowicz & Tamon (2013: 271) from a single locality at around 1200 m, the photographs confirming its identity.

*Cynorkis boiviniana*, based on a Boivin specimen from the Comoros and described in 1901 by Kraenzlin, was later considered a variety of the species. Its spur is over half the length of the ovary (as in most forms) and Kraenzlin differentiated it from *Cynorkis lilacina* by its more hirsute flowers, most forms of *C. lilacina* being somewhat hirsute. Examination of the type material shows a typical specimen of *Cynorkis lilacina*, the lip and spur falling well within the range of variation of that species. Photographs of the variety, discovered by J. Louise (Parc National de La Réunion) and included in Szelengowicz & Tamon (2013: 273 bottom right), resemble the typical form but no vouchers are available.

A photograph from Réunion (Szelengowicz & Tamon (2013: 273 bottom left) of *Cynorkis lilacina* Ridl. var. *comorensis* H.Perrier ex Hermans (2007: 288) resembles the variety with narrow angular lateral lobes of the lip but no verified herbarium material is available.

*Cynorkis calcaripotens*, described by Frappier



FIGURE 59. *Cynorkis lilacina* in Madagascar. Photograph by Johan Hermans.

(1895: 252) in *Hemiparis*, was reported from several localities in Réunion. Its main characteristics are a single elliptic or lanceolate leaf, distinct purple spots on the lateral sepals and the 3-lobed lip with a long funnel-shaped pendant spur. A herbarium specimen from Bourbon [Réunion] in the Drake Herbarium (P) is labelled *Hemiparis calcaripotens* and has been chosen as the lectotype. Frappier's description and the habit and floral details correspond well with those of *Cynorkis lilacina*, described from Madagascar ten years earlier by Ridley. Photographs labelled as *Cynorkis calcaripotens* in Szelengowicz & Tamon (2013 260) show *C. nutans*.

*Cynorkis lilacina*, which is widespread in Madagascar, very rare in Réunion where it is only known from photographic records and only known from old records from the Comoros, is similar to *Cynorkis kassneriana* Kraenzl. from mainland Africa, differing in details of the flower and spur shape.

12. *Cynorkis paradoxa* (Frapp. in Cordem.) Schltr., Beih. Bot. Centralbl. 33, 2: 401 (1915) (as *Cynosorchis*). Fig. 60.



FIGURE 60. *Cynorkis paradoxa* in Réunion. Photograph by Rogier van Vugt.

TYPE: Réunion, Plaine des Cafres, 1610 m, *Cordemoy* 1 (**lectotype designated here: K**).

*Acrostylia paradoxa* Frapp. in *Cordem.*, *Fl. Réunion*: 228 (1895).

*Acrostylia fissirostris* Frapp. in *Cordem.*, *Fl. Réunion*: 228 (1895); Frappier, *Cat. Orchid. Réunion*: 11 (1880), *nom. nud.*

*Microtheca madagascariensis* Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 33: 77 (1924).

*Cynorkis ×madagascariensis* (Schltr.) Hermans in Hermans *et al.*, *Orchid. Madag.* ed. 2: 156 (2007). TYPE: Madagascar, Mt. Tsiafajavona, *Perrier* 13504 (holotype: P).

Frappier (in *Cordemoy* 1895: 227) established the



FIGURE 61. Watercolour of *Cynorkis purpurascens* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.

monotypic genus *Acrostylia* based upon herbarium material in the J. M. C. Richard herbarium which he had provisionally named *Hemiperis fissirostris* but without further details; this was followed by his description of *Acrostylia paradoxa*. *Cordemoy*'s specimen no.1 at K, labelled from 'Réunion, Plaine des Cafres, 1610 m', is chosen as the lectotype because of its condition and its close association with the protologue. There are also specimens in poor condition in MARS (087761) and P (ex Herb. Delteil in Herb. Drake, P00693048) associated with Frappier's text. It has been assumed to be a hybrid of *Cynorkis lilacina* × *ridleyi* H.Perrier, the flowers being very variable, always sterile, the anther failing and the spur often missing, but, considering current nomenclature and distribution, it is more likely to be a natural hybrid of *Cynorkis lilacina* × *squamosa*. Its nomenclature was discussed in Bernet (2010c). It is endemic to Madagascar and Réunion.



FIGURE 62. *Cynorkis purpurascens* in Réunion. Photograph by Johan Hermans.

13. *Cynorkis purpurascens* Thouars, Hist. Orchid.: Table 1. d. 2, t. 15 (1822). Fig. 61–62.

TYPE: Mascarenes, *Richard* 497 (**lectotype designated here**: P00102238; isolectotypes: P00102236 and P00102237), *non Cynorkis purpurascens* Lindl., Gen. Sp. Orchid. Pl.: 331 (1835), *nom. illeg.*

*Cynorkis purpurocynis* Thouars, Hist. Orchid.: t. 15 (1822).

*Orchis purpurascens* (Thouars) Spreng., Syst. Veg. 3: 687 (1826).

*Gymnadenia purpurascens* (Thouars) A.Rich., Mém. Soc. Hist. nat. Paris, 4: 29, t. 6 (1828). Bojer, Hortus Mauriti.: 311 (1837).

*Cynosorchis purpurascens* var. *praecox* (Schltr.) Schltr., Ann. Mus. Col. Marseille, sér. 3, 1: 153 (1913).

*Cynosorchis praecox* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 33: 65 (1924). TYPES: Madagascar, Mt. Tsitondroina, nr. Maevatanana *Perrier* 425 (P, syn.) & Bemarivo, *Perrier* 1938 (33?) (P, syn.).

*Cynorkis multiflora* Rchb.f. *nom. in sched.* based upon: *Bojer s.n.* I.129 (W-RCHB).



FIGURE 63. *Cynorkis squamosa* from Madagascar. Photograph by Johan Hermans.

Several herbarium sheets of *Richard* 497, that historically have been considered the type of Thouars's *Cynorkis purpurascens*, exist in the herbarium of Louis Claude and Achille Richard (P). It is likely that they are connected to Thouars's collections: sheet P00102238 is selected here as lectotype as it is the most complete, and it complements Thouars's plate 15. It is widespread in Madagascar, the Comoros and Réunion, but only historical records exist from Mauritius.

14. *Cynorkis squamosa* (Poir.) Lindl., Gen. Sp. Orchid. Pl.: 332 (1835). Fig. 63–65.

TYPE: Réunion, Herb. Lamarck, *Comerson s.n.* (**lectotype designated here**: P00738540, right hand plants only).

*Orchis squamosa* Poir. in Lam., Encycl. 4: 601 (1798); Willd., Sp. Pl. 3: 42 (1805).

*Gymnadenia squamata* (Poir.) A.Rich., Mém. Soc. Hist. nat. Paris, 4: 22 (1828).

*Amphorkis squamosa* (Poir.) Frapp. in Cordem., Fl. Réunion: 231 (1895). Frappier, Cat. Orchid.



FIGURE 64. Watercolour of *Cynorkis squamosa* by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.

Réunion: 11 (1880), *nom. nud.*

*Amphorkis reticulata* Frapp. in Cordem., Fl. Réunion: 231 (1895). Frappier, Cat. Orchid. Réunion: 11 (1880), *nom. nud.*

*Amphorkis reticulata* var. *alba* Frapp. in Cordem., Fl. Réunion: 232 (1895), *syn. nov.* Type not located.

*Amphorkis reticulata* var. *rosea* Frapp. in Cordem., Fl. Réunion: 233 (1895), *syn. nov.* Type not located.

*Amphorkis reticulata* var. *appendiculata* Frapp. in Cordem., Fl. Réunion: 231 (1895), *syn. nov.* Type not located.

*Amphorkis reticulata* var. *exappendiculata* Frapp. in Cordem., Fl. Réunion: 232 (1895), *syn. nov.* Type not located.

*Amphorkis variegata* var. *hastata* Frapp. in Cordem., Fl. Réunion: 234 (1895), *syn. nov.* TYPE: Réunion, Entre Deux, Ravine Citrons, 800 m, Oct. 1881, *Cordemoy s.n.* (REU).



FIGURE 65. *Cynorkis squamosa* in Réunion. Photograph by Johan Hermans.

*Amphorkis variegata* var. *stenolabris* Frapp. in sched.

Based upon: Réunion, Brulé de St-Denis, *Potier s.n.* (P00693169).

*Cynorkis reticulata* (Frapp. in Cordem.) Schltr., Beih. Bot. Centralbl. 33, 2: 402 (1915), *syn. nov.* TYPE: **Lectotype designated here:** painting 45 by Eudoxie de Cordemoy in MAU/MSIRI, labelled *Cynorchis reticulata*.

*Cynorchis squammata* orth. var. *sensu* Friedmann (1988: 23), the illustration is of *Cynorkis calcarata*.

*Cynorkis variegata sensu* Pailler & Henze (2020: 122). *Orchis resupinata* Lehmann in sched. [in K-LINDL].

Poiret's description of *Orchis squamosa*, in 1798 in Lamarck's *Encyclopédia*, was short but specific: he wrote about a slender plant with two oval leaves, several caulinary sheaths, a lax rachis, floral bracts a third of the ovary, white flowers, lip (*pétale supérieur*) longer and narrower than the other segments, oval lateral

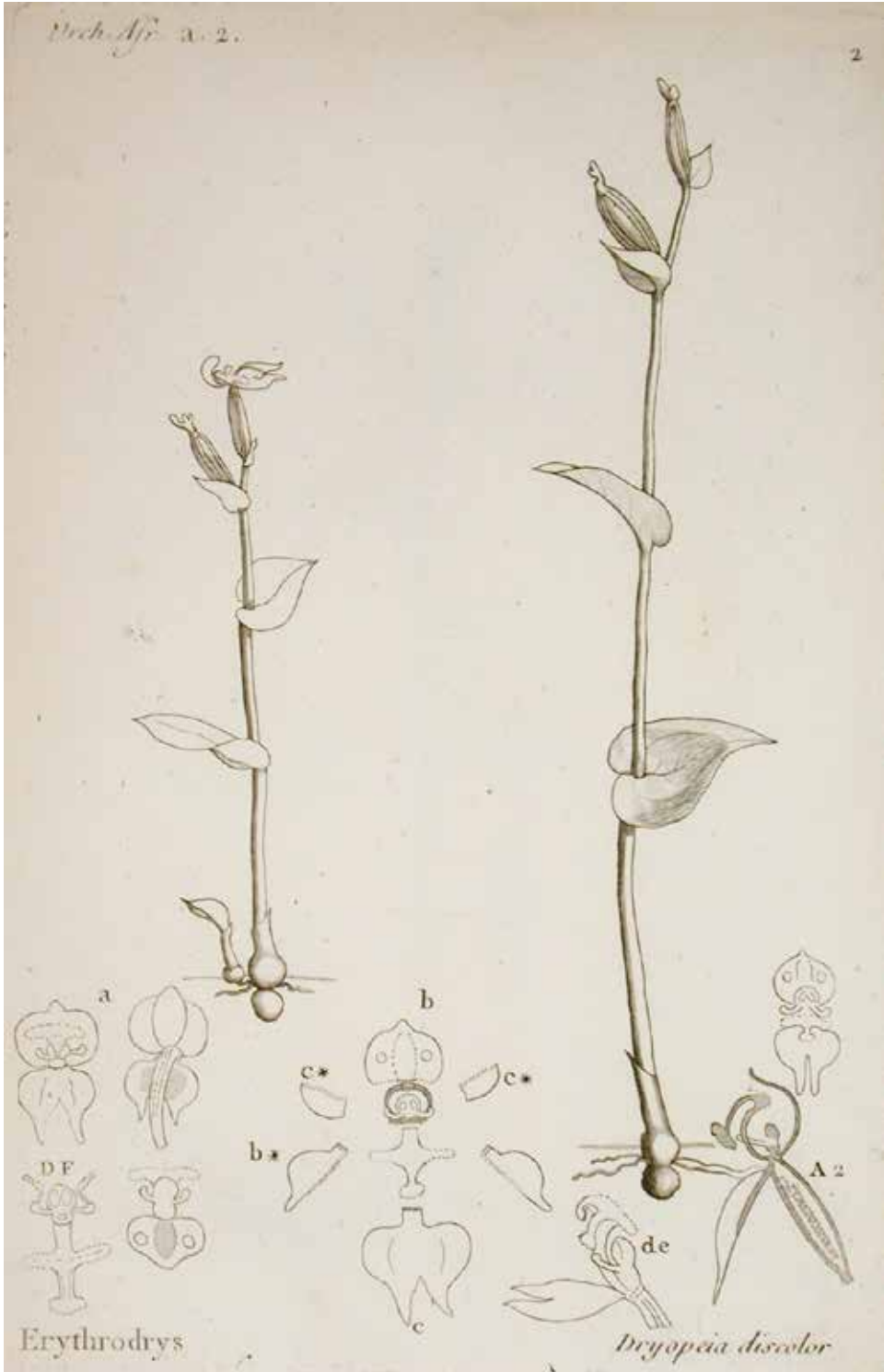


FIGURE 66. Lectotype of *Disperis cordata*. Thouars (1822).





FIGURE 67. *Disperis cordata* in Réunion. Photograph by Rogier van Vugt.

sepals, the lower petal (*pétale inférieur*) entire and a short obtuse spur c. 1/3<sup>rd</sup> of the ovary. It was collected by Commerson in Bourbon [Réunion] and was seen by the author in the Lamarck herbarium. A Commerson specimen from 'Isle de Bourbon' was found in the Lamarck herbarium in P, two plants of *Cynorkis fastigiata* are on the same sheet but the third specimen (P00738540) on the right of the sheet is chosen here as the type. The specimen matches the description very well, and it and the description combined give a very clear definition of the species. There are several other Commerson specimens representing this species in herbaria, especially P, including several in the de Jussieu herbarium, a few also contain specimens of *Cynorkis calcarata*. The species was placed in the genus *Cynorkis* by Lindley (1835: 332) who tentatively (and in error) considered Thouars's *Amphorchis calcarata* a synonym.



FIGURE 68. *Disperis cordata* in Réunion, detail of flower. Photograph by Rogier van Vugt.

Frappier (in Cordemoy, 1895) described *Amphorkis reticulata*, but did not cite herbarium material. His description corresponds well with *Cynorkis squamosa*, while there is also a contemporary watercolour of this species by Eudoxie de Cordemoy in MAU/MSIRI (Fig. 61). Frappier described several varieties of *Cynorkis reticulata* but they are merely colour forms or slight morphological aberrations, all falling within the range of variability found in *C. squamosa*. *Amphorkis variegata* var. *hastata*, described by Frappier as a common plant with the mid-lobe of the lip linear-oblong, corresponds well with *C. squamosa*, fragments of herbarium material of it can be seen at REU. *Amphorkis variegata* and its other varieties are included under *Cynorkis calcarata*.

This species, which is widespread in Madagascar and Réunion, is similar to *Cynorkis ridleyi* from Madagascar but is distinct in having a less dense raceme, lateral sepals with almost straight horizontal basal margins (vs. rounded), a lip with small angular lobes and a mid-lobe narrowly ovate to trullate and with an entire margin (vs. an obovate to broadly obovate midlobe).

with a crenate to serrate margin) and a short tubular spur (vs. thickened or sinuate).

#### 7. DISPERIS SW.

1. *Disperis cordata* Sw., Kongl. Vetensk. Acad. Nya Handl. 21: 218 (1800). Fig. 66–68.

TYPE: Mauritius, *Thouars s.n.* (holotype: P, not located; **lectotype designated here**: Thouars, Hist. Orchid.: t. 2 (1822), *Arethusa cordata* (Sw.) Poir. in Lamarck, Encycl., Suppl. 1: 444 (1811).

*Dryopeia discolor* Thouars, Hist. Orchid.: Tab.1, a. 1, t. 2 (1822). Type not known.

*Dryorkis erythrodrys* Thouars, Hist. Orchid.: t. 2 (1822), *nom. superfl.* [alternative name for *Dryopeia discolor*].

*Disperis discolor* (Thouars) Frapp. Cat. Orchid. Réunion: 10 (1880), *nom. nud.*

No herbarium material associated with Thouars's description has been found; it is therefore necessary to designate his 1822 drawing as the lectotype (Fig.66).

This small orchid has also recently been reported from northern Madagascar (Bernet 2010b: 72).

#### 8. GASTRORCHIS Schltr.

1. *Gastrorchis villosa* (Thouars) J.V.Stone & P.J.Cribb, Lady Tankerville's Legacy: 258 (2017). Fig. 69–71.

TYPE: Mauritius, Thouars, **lectotype designated here**: Hist. Orchid.: t. 32 (1822).

*Limodorum villosum* Thouars, Hist. Orchid.: Table 1, j., t. 32 (1822).

*Gastorkis villogastris* Thouars, Hist. Orchid.: Table 1, j., t. 32 (1822), [alternative name for *Limodorum villosum*].

*Bletia villosa* (Thouars) Spreng., Syst. Veg. 3: 743 (1826).

*Phaius villosus* (Thouars) Blume, Mus. Bot. 2: 182 (1856).

*Calanthe inaperta* Ayres *nom. nud.* & *Bletia lancifolia* S.Moore, J. Bot., 5: 290 (1876).

*Bletia bracteosa sensu* Boivin; Frappier, Cat. Orchid. Réunion: 12 (1880).

*Phaius stuppeus* Blume, Coll. Orchid. 14 (1858).

TYPE: Réunion, Herb. Richard 638 (P).

*Phaius villosus* var. *longibracteatus* S.Moore in

J.G.Baker, Fl. Mauritius: 349 (1877). TYPES: Mauritius, Le Pouce, *Ayres s.n.* (K, syn.); Grand Bassin, *Bouton s.n.* (K, syn.) & *Bojer s.n.* (K, syn.). *Phaius longibracteatus* (S.Moore) Frapp. in Cordem., Fl. Réunion: 226 (1895).

*Gastrorchis lutea* subsp. *longibracteata* (S.Moore) P.Bernet, Richardiana 12: 12 (2011).

*Gastrorchis lutea sensu* Pailler *et al.* (2018: 117).

*Calanthe villosagastris* (Thouars) M.W.Chase, Christenh. & Schuit., Phytotaxa 472(6): 166 (2020).

The only species of the genus found outside of Madagascar is unusual in that its yellowish flowers never fully open. Moreover, its floral bracts are exceptionally long, the basal ones up to 12 cm long but progressively shorter above. It is the only species of *Gastrorchis* in the Mascarenes, being found on both Réunion and Mauritius. Moore in Baker (1877: 349) recognised two variants of the species with var. *longibracteata* having longer bracts but this was based on a misunderstanding of Thouars's illustration (Fig. 69) and the herbarium material available to him. Bernet (2011: 12) treated it as subspecies of the Madagascan *Phaius luteus* but it is distinct in being a much taller plant, with floral bracts, much longer than the flowers, and in its self-pollinating flowers with an entire, yellow-green lip with dark purple markings and with three hairy longitudinal ridges running from the callus to the apex.

#### 9. HABENARIA Willd.

1. *Habenaria arachnoides* Thouars, Hist. Orchid.: Table 1, e. 3., t. 18 (1822). Fig. 72–73.

TYPE: Madagascar, Thouars, **lectotype designated here**: Hist. Orchid. t. 18 (1822).

*Habenorkis arachnabensis* Thouars, Hist. Orchid.: Table 1, e. 3 (1822) [*H. arachnabensis* t.18], [alternative name for *Habenaria arachnoides*].

*Habenaria ovalifolia* A.Rich., *nom. nud.* Based upon: 'Bourbon', *Commerson s.n.* (P00735328).

*Habenaria borbonica* Kraenzlin, *in sched.* Based upon: Réunion, without collector (HBG501012).

The species was first described from Madagascar but also occurs in Réunion and possibly Mauritius. It has not been possible to locate any herbarium material associated with Thouars's description; his plate 18 in

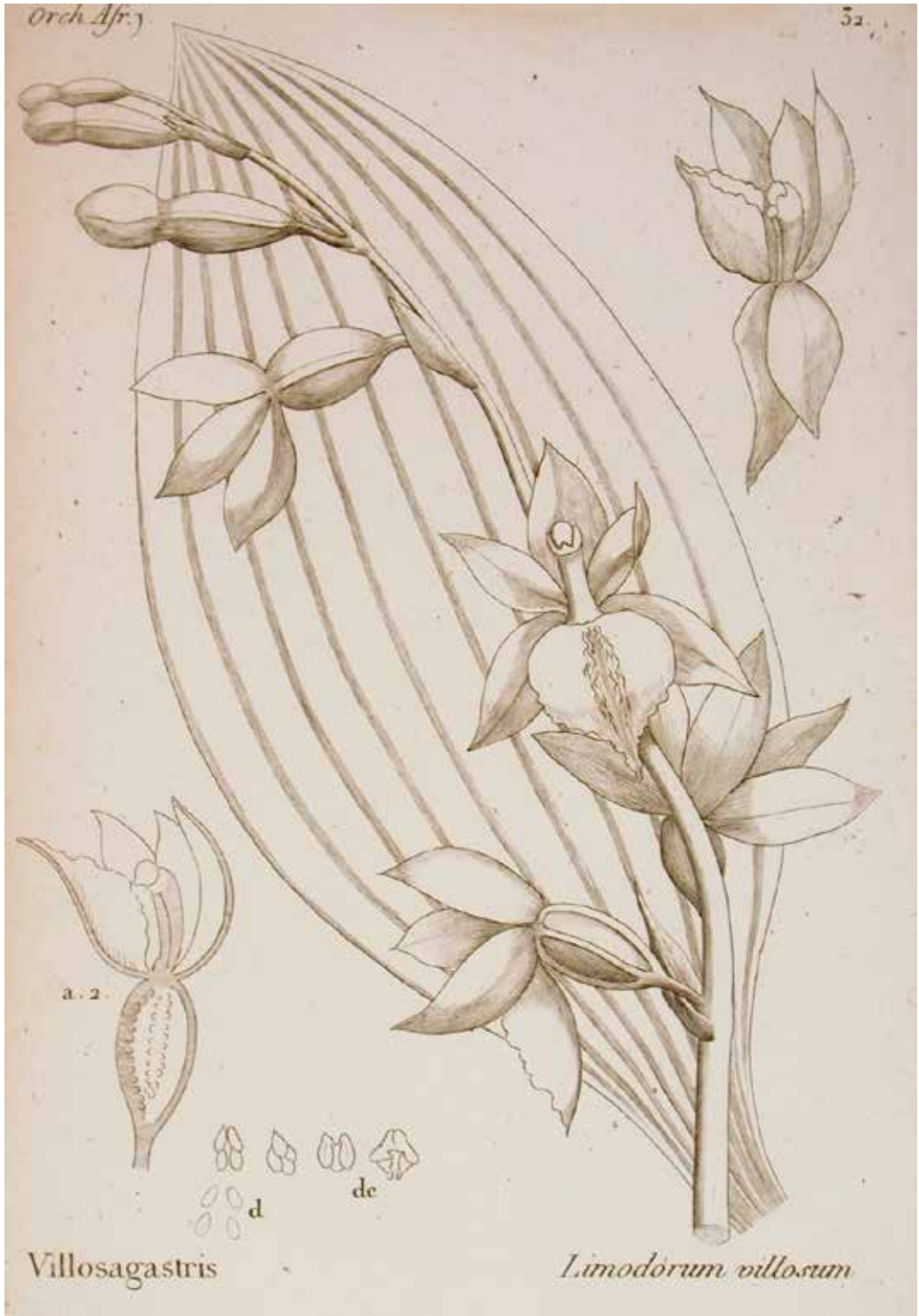


FIGURE 69. Lectotype of *Gastorchis villosa*. Thouars (1822).



FIGURE 70. *Gastrorchis villosa* in Réunion. Photograph by Rogier van Vugt.



FIGURE 71. *Gastrorchis villosa* in Réunion. Photograph by Rogier van Vugt.

Hist. Orchid. (1822) is therefore chosen as the lectotype (Fig. 73).

The name *Habenaria borbonica* appears on a few herbarium specimens in W & HBG, annotated by Kraenzlin as a new species, but it is not included in his 1892 monograph and it does not appear to have been described. The specimens correspond to our broad interpretation of *Habenaria arachnoides*.

2. *Habenaria lancifolia* A.Rich., Mém. Soc. Hist. nat. Paris, 4: 19 (1828).

TYPE: Mauritius, *Commerson s.n.* (**lectotype designated here:** P00112416).

Although holotype and isotype labels were later added to P herbarium sheets, they were not indicated by the author. Therefore, Commerson's specimen (P00112416) has been chosen as the lectotype because it corresponds with Richard's 1828 illustration.

The distribution and identity are tentative: most herbarium material refer to 'Ile de France', but P00112419 is annotated 'Bourbon', whereas part of the Montpellier (MPU) specimen is labelled Madagascar but these may be errors. Both Pailler *et al.* (2018: 122) and Szelenowicz & Tamon (2013: 301) repro-



FIGURE 72. *Habenaria arachnoides* in Madagascar. Photograph by Johan Hermans.

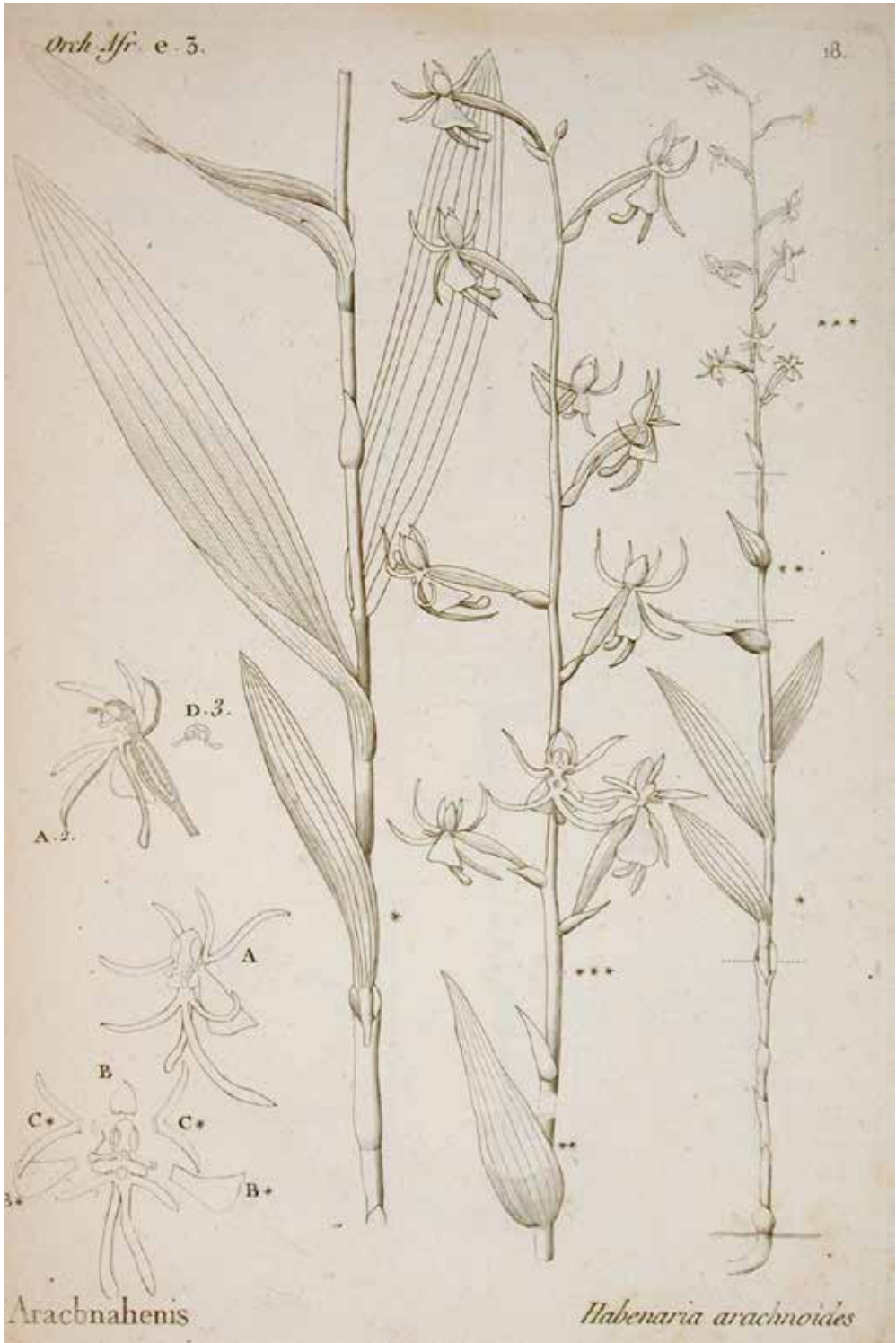


FIGURE 73. Lectotype of *Habenaria arachnoides*. Thouars (1822).



FIGURE 74. Lectotype of *Habenaria praealta*. Thouars (1822).



FIGURE 75. *Habenaria praealta* in Réunion. Photograph by Johan Hermans.

duce Richard’s description and illustration.

It is possibly endemic to Mauritius with unconfirmed records from Madagascar and Réunion.

3. *Habenaria praealta* (Thouars) Spreng., Syst. Veg., ed. 16 3: 691 (1826). Fig. 74–75.

TYPE: Thouars, **lectotype designated here**: Hist. Orchid., t. 11 (1922).

*Satyrium praealtum* Thouars, Hist. Orchid.: Table 1. c. 6. t. 11 & t. 12 (in part) (1822).

*Satorkis altisatis* Thouars, Hist. Orchid.: t. 11 (1822) [alternative name for *Satyrium praealtum*].

This large terrestrial is found in both Madagascar and Réunion. It has not been possible to locate herbarium material associated with Thouars’s description; his plate 11 in Hist. Orchid. (1822) is therefore chosen as the lectotype.

4. *Habenaria sigillum* Thouars, Hist. Orchid.: Table 1 e.4. t. 19 & 20 (1822). Fig. 76–77.



FIGURE 76. *Habenaria sigillum* Thouars (1822).



FIGURE 77. *Habenaria sigillum* in Réunion. Photograph by Rogier van Vugt.

TYPE: Réunion, *Thouars s.n.* (holotype: P00735313). *Habenorkis sigillahenis* Thouars, Hist. Orchid.: t. 20 (1822) [alternative name for *Satyrium sigillum*].

*Habenaria polyphylla* Boivin, *nom.* Based upon: Herb. Mus. Réunion. in Frappier in Cordemoy, Fl. Réunion: 258 (1895).

*Habenaria sigillum* var. *angusta* Frapp. in Cordem., Fl. Réunion: 258 (1895), *syn. nov.* Type not located.

*Habenaria sigillum* var. *lata* Frapp. in Cordem., Fl. Réunion: 258 (1895), *syn. nov.* Type not located.

*Habenaria sigillum* var. *cruenta* Frapp. in Cordem., Fl. Réunion: 258 (1895), *syn. nov.* Type not located.

*Habenaria disticha* Cordemoy, *nom.* based upon: Herb. Cordemoy (MARS).

Thouars's type of *Habenaria sigillum* in P is in fruit and has no other indication of its origin. His two plates (Hist. Orchid.: tt. 19 & 20) are more reliable, although the lower lobes of petals were confused for the basal lobes of the lip, making it appear 5-lobed, this was repeated in the description by Moore in Baker (1877: 333). The error was also noted by Kraenzlin (1892: 82) and Frappier (1895: 258).

The varieties mentioned in Cordemoy (1895: 258) are variants of the species: *angusta* with fewer narrow leaves, *lata* with wider leaves and *cruenta* with a brownish-red stem and leaves. These all fall within the range of variation of the species. It is endemic to Mascarenes.

5. *Habenaria undulata* Frapp. in Cordem., Fl. Réunion: 256 (1895). Fig. 78–79.

TYPE: Réunion, painting 60 by Eudoxie de Cordemoy (**lectotype designated here:** MAU/MSIRI).

*Habenaria richardii* Cordem., Fl. Réunion: 259 (1895), as *H. richardi*; Moore, J. Bot. 5: 293 (1876), as *H. richardiana*; Schlechter, Beih. Bot. Centralbl. 33: 406 (1915). TYPE: Réunion, *Richard* 496 (holotype: P).

*Platanthera richardi* Frapp., Cat. Orchid. Réunion: 10 (1880), *nom. nud.*

Cordemoy (1895: 256) described this species but failed to mention any collections. Herbarium specimens labelled as this species are found in Cordemoy's herbarium in MARS. One lacks flowers and the other two are in poor condition and may not be this species

and they post-date its publication. Because of the lack of reliable herbarium material, the contemporary watercolour painting by Eudoxie de Cordemoy in MAU/MSIRI has been chosen as the lectotype (Fig. 78).

*Platanthera richardi* was first listed by Frappier in 1880 and then mentioned without description by Cordemoy in 1895 as being in the 'Museum Herbarium' but without further detail. Moore in Balfour (1876b) also listed it from Réunion from the Richard Herbarium. A herbarium sheet in P (*Richard* 496, P00735317) labelled as '*Habenaria Richardiana sp. nova.*', but re-labelled *H. sigillum*, has a habit and flowers that correspond well with *H. undulata*. Two herbarium sheets, annotated as *Habenaria richardiana*, can be found in the Lindley herbarium at Kew; one as '*H. richardiana A. R. ms., Bourbon, Richard*', the other from Balfour, presented in 1875; both are *Habenaria undulata*. All these may well be connected to the name *Habenaria richardiana* but without certainty. It therefore remains as a *nomen nudum* attributable to *H. undulata*.

*Habenaria undulata*, which is endemic to Réunion, is very close to *Habenaria arachnoides* and *H. frappieri* but differs by the strongly undulate leaves, slightly larger flowers, the longer lower lobes of the petals and lobes of the lip about equal in size and a spur that is longer than the pedicellate ovary.

Pailler & Henze (2020: 198–) consider it conspecific with both *Habenaria sigillum* and *H. undulata* but it has a characteristic plant habit, longer floral segments and a longer spur.

#### 10. OECEOCLADES Lindl.

1. *Oeceoclades analavelensis* (H.Perrier) Garay & P.Taylor, Bot. Mus. Leaf. 24: 259 (1976). Fig. 80.

TYPE: Madagascar, Analavelona, N. of Fiherenana, 950–1250, March 1934, *Humbert* 14218 (**lectotype designated here:** P00109018; isolectotypes: P00109019, P00109020, B, G, K, TAN).

*Lissochilus analavelensis* H.Perrier, Not. Syst. (Paris) 8: 41 (1939); Perrier in *Humbert*, Fl. Madagasc., Orchid. 2: 23 (1941).

*Eulophidium analavelense* (H.Perrier) Summerh., Bull. Jard. Bot. Bruxelles 27: 395 (1957).

*Oeceoclades angustifolia* (Senghas) Garay & P.Taylor, Bot. Mus. Leaf. 24: 258 (1976); *syn. nov.* TYPE: Madagascar, nr. Diego Suarez, *Rauh & Buchloch*





FIGURE 78. Lectotype of *Habenaria undulata*, Watercolour by Eudoxie de Cordemoy. Courtesy MSIRI and the Mauritius Herbarium.



FIGURE 79. *Habenaria undulata* in Réunion. Photograph by Jean-Michel Hervouet.

7987 (holotype: HEID; isotype: P, not located).

*Eulophidium angustifolium* Senghas, *Adansonia*, sér. 2, 6: 557 (1967).

*Eulophidium angustifolium* subsp. *diphyllum* Senghas, *Adansonia*, sér. 2, 6: 561 (1967); **syn. nov.** TYPE: Madagascar, nr. Sakaraha, River Fiherenana, *Rauh* 10423 (holotype: HEID).

*Oeceoclades lavergneae* J.B.Castillon, *Richardiana* 12, 4: 159 (2012); **syn. nov.** TYPE: Réunion, Rivière des Galets, March 2012, *Castillon* 52 (holotype: P; isotype: REU).

*Eulophia analavelensis* (H.Perrier) M.W.Chase & Schuit., *Phytotaxa* 491(1): 50 (2021).

*Eulophia angustifolia* (Senghas) M.W.Chase & Schuit., *Phytotaxa* 491(1): 51 (2021).

*Eulophia lavergneae* (J.-B.Castillon) M.W.Chase & Schuit., *Phytotaxa* 491(1): 53 (2021).

Perrier (1939) described *Lissochilus analavelensis* from herbarium material collected by Humbert in south-western Madagascar. Subsequently, Senghas (1967: 561-) described *Eulophidium angustifolium*



FIGURE 80. *Oeceoclades analavelensis* from Madagascar. Photograph by Johan Hermans.



FIGURE 81. *Oeceoclades pulchra* from Madagascar. Photograph by Johan Hermans.

and its var. *diphyllum*, both collected by Rauh from the same area in Madagascar as *Lissochilus analavelensis*; since then both have been reported from other parts of Madagascar. Castillon (2012: 159) described *Oeceoclades lavergneae*, which he considered to be endemic, from Réunion. Examination of the type material of these and other collections, including spirit material, photographs by Rauh and others, and field observations make it clear that all the above belong to the same variable species. Plants can have one or two leaves; the type of *Oeceoclades analavelensis* has a mixture with the unifoliate and bifoliate plants, the former in the majority. The leaves are generally narrowly obovate with dark marbling on the upper surface. Branching of the rachis is also variable with the more mature plants often producing a few short branches but young plants having simple inflorescences. Flower colour, shape and size is also somewhat variable but the shapes of the segments, the lip callus and spur are consistent. It is widespread in Madagascar, but rare in Réunion.

2. *Oeceoclades pulchra* (Thouars) P.J.Cribb & M.A.Clements, in Clements, Austr. Orchid. Res. 1: 99 (1989). Fig. 81–82.

TYPE: Réunion, *Thouars s.n.* (**lectotype designated here**: BM000525727).

Basionym: *Limodorum pulchrum* Thouars, Hist. Orchid.: t. 43–44 (1822); Richard, Mém. Soc. Hist. nat. Paris, 4: 43 (1828); Bojer, Hortus Maurit.: 313 (1837). TYPE: Réunion, *Thouars s.n.* (holotype: not located).

This widespread species (tropical Africa and W. Pacific & Australia, Madagascar, the Comoros and the Mascarenes) was described by Thouars in 1822 from Réunion but little associated herbarium material remains, none was found in P but a few flowers were located in BM. The illustrations in Thouars', Hist. Orchid.: t. 43–44 (1822) are also clear.

#### 11. PLATYLEPIS A.Rich.

Mém. Soc. Hist. nat. Paris, 4: 34 (1828), *nom. cons.* TYPE: *Platylepis goodyeroides* A.Rich., *nom. illeg.* (basonym: *Goodyera occulta* Thouars).

*Erporkis* Thouars, Nouv. Bull. Sci. Soc. Phil. Paris 1: 317 (1809), as *Erporchis*, *nom. rej.*. Lectotype: *Goodyera occulta* Thouars.

*Notiophrys* Lindl., J. Linn. Soc., Bot. 1: 189 (1857), *nom. illeg.* TYPE: *Goodyera occulta* Thouars.

*Moerenhoutia* Blume, Fl. Javae n.s. 1: 99 (1858); Orchid. Arch. Ind.: 99, t. 28 fig. 3. TYPE: *M. plantaginea* Blume.

*Diplogastra* Welw. & Rchb.f., Flora 48: 183 (1865). TYPE: *D. angolensis* Welw. ex Rchb.f.

*Coralliokyphos* H. Fleischm. & Rech., Denkschr. Kaiserl. Akad. Wiss. Wien, Math.-Naturw. Kl. 85: 252 (1910). TYPE: *C. candidissimum* H. Fleischm. & Rech.

*Bathieorchis* Bosser & P.J.Cribb, Adansonia 25, 2: 229 (2003), *syn. nov.* TYPE: *B. rosea* (H.Perrier) Bosser & P.J.Cribb (basio.: *Gymnochilus roseum* H.Perrier).

1. *Platylepis densiflora* Rolfe, Bull. Misc. Inf. Kew: 378 (1906).

TYPE: Madagascar, North, rec.d Jan. 1892 *Baron* 6550 (**lectotype designated here**: K; isolectotype: P00094743).

*Platylepis bigibbosa* H.Perrier, Bull. Soc. Bot. France 83: 26 (1936); Perrier in Humbert, Fl. Madagasc., Orchid.: 1: 223 (1939), *syn. nov.* TYPES: Madagascar, Analamahitso, *Perrier* 7972 (P, *syn.*) & Manongarivo, *Perrier* 1949 (P, *syn.*).

*Platylepis densiflora* was described by Rolfe in 1906 based upon several specimens (*Warpur s.n.*, *Baron* 6550, 6753 from Madagascar, and *Ayres s.n.* from Mauritius). *Baron* 6550 is selected here as the lectotype because it corresponds well with the protologue, is in good condition and there are specimens at K and P. The *Warpur* specimen has leaves of a *Goodyera* or *Platylepis* but flowers of a *Liparis*, the *Ayres* sheet is representative and in good condition but was said by Rolfe to be in fruit only although it has many flowers.

*Platylepis bigibbosa* was described by Perrier de la Bâthie in 1936 from Madagascar and was said to be distinct by being bigibbose at the base of the lip and with distinct lip calli and floral bracts less than three times their width. Examination of the types and other herbarium material makes it clear that the lip shape and calli are somewhat variable and no consistent differences were found between it and *Platylepis densiflora*. The proportions of the floral bracts vary within the inflorescence. The similarity was observed by Bosser in

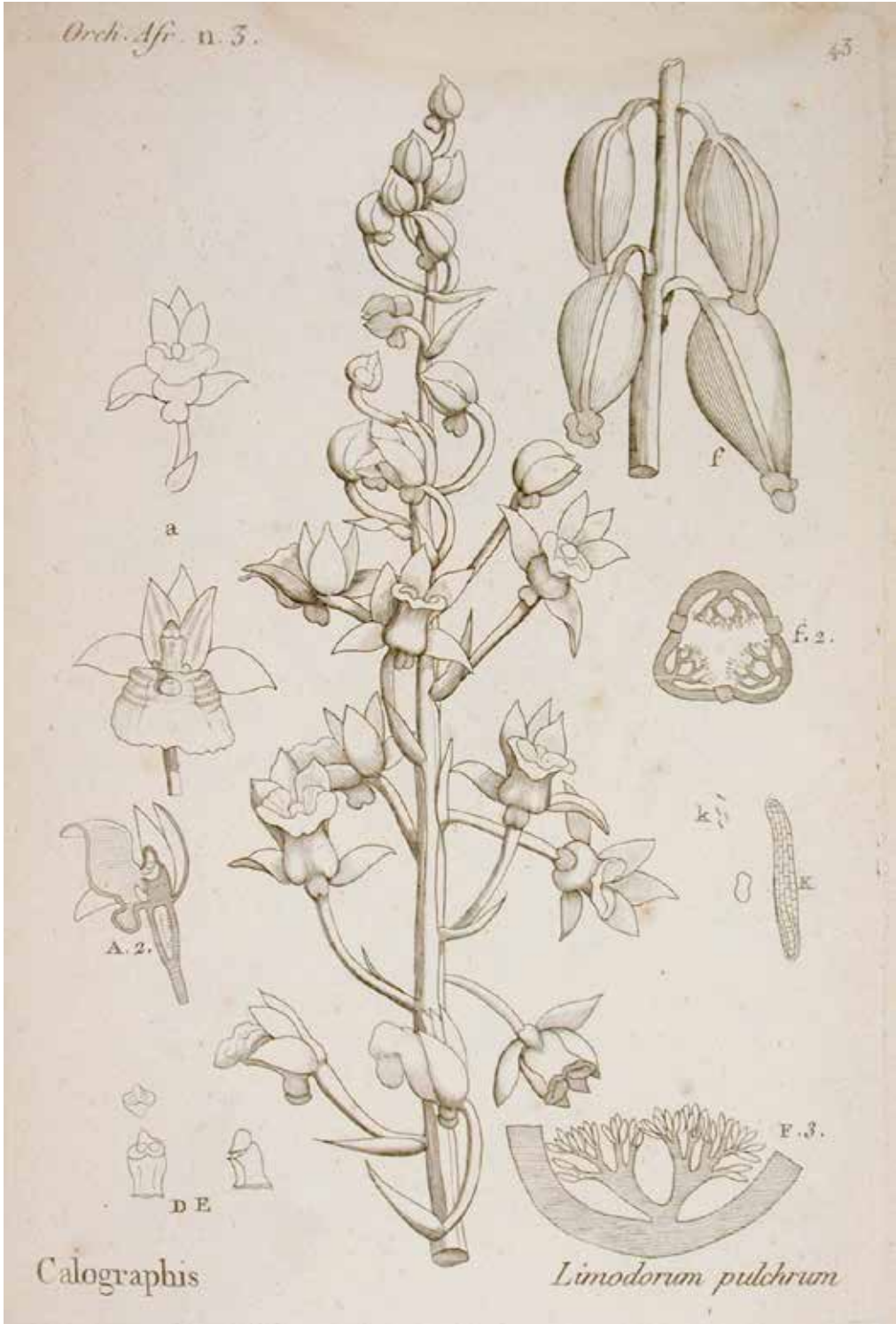


FIGURE 82. Lectotype of *Oeceoclades pulchra*. Thouars (1822).



FIGURE 83. *Platylepis margaritifera* from Madagascar. Photograph by Johan Hermans.

1999 (in his unpublished notes). It occurs in Madagascar and the Mascarenes (Mauritius and Réunion).

2. *Platylepis margaritifera* Schltr., Repert. Sp. Nov. Regni. Veg. Beih. 15: 328 (1918). Fig. 83.

TYPE: Madagascar, *Laggiara s.n.* (holotype B†; **lectotype designated here**: illustration by Schlechter in Mansfeld, Repert. Spec. Nov. Regni Veg. Beih. 68: Tafel 50 Nr. 200 (1932).

*Gymnochilus roseum* H.Perrier, Bull. Soc. Bot. France 83: 24 (1936); Perrier in Humbert, Fl. Madagascar, Orchid., 1: 218 (1939), **syn. nov.** TYPE: Madagascar, Maromizaha, Feb. 1924, *Perrier* 15694 (holotype: P).

*Bathieorchis rosea* (H.Perrier) Bosser & P.J.Cribb, Adansoniana 25, 2: 229 (2003) **syn. nov.**

*Goodyera rosea* (H.Perrier) Ormerod, Taiwaniana 51, 3: 158 (2006) **syn. nov.**

Schlechter described *Platylepis margaritifera* in 1918, based on a plant collected by Laggiara, very likely on the island of Sainte Marie [Nosy Boraha] off the north-east coast of Madagascar. Most of Schlech-



FIGURE 84. *Platylepis occulta* from Madagascar. Photograph by Johan Hermans.

ter's Berlin herbarium was destroyed (Butzin, 1981) and no specimen has been located to typify the species. His description, however, is clear and his drawing of it, published posthumously (Schlechter in Mansfeld (1932: t. 50 no. 299)), is chosen as the lectotype of the species because of its close link to the protologue.

Perrier described *Gymnochilus roseum* in 1936 from Eastern Madagascar but expressed doubt as to which genus it belonged, since then it has been transferred to *Bathieorchis* and *Goodyera* but with its typical broad floral bracts and lip with basal calli it clearly belongs in *Platylepis*. When comparing the descriptions, drawings and dissecting of herbarium material and field observations it is clear that this is the same as *Platylepis margaritifera*: habit, size of the leaves and flower size are well within the variability of the species, Schlechter's drawing shows a flower with the segments spreading instead of campanulate but this was undoubtedly distorted during the analysis. His drawing has the typical elongate lip with a small triangular epichile, two longitudinal keels at the base and the characteristic calli at the base, variously described as 'seven, pearl-like calli' by Schlechter and 'six to ten



FIGURE 85. *Platylepis occulta* from Madagascar. Photograph by Johan Hermans.



FIGURE 86. Lectotype of *Platylepis occulta*. Thouars (1822).

golden pedicellate glands' by Perrier; existing herbarium material confirms them to be more or less rounded calli. It occurs in Madagascar and Réunion.

3. *Platylepis occulta* (Thouars) Rchb.f., *Linnaea* 41: 62 (1877). Fig. 84–86.

TYPE: Mascarenes, Thouars, **lectotype designated here**: *Hist. Orchid.*: t. 28 (1822).

*Goodyera occulta* Thouars, *Hist. Orchid.*: t. 28 & 30 (1822), as *Goodiera*.

*Goodyera bracteata* Thouars, *Hist. Orchid.*: Table 1, i. 1, (1822), as *Goodiera*.

*Erporkis crypterpis* Thouars, *Hist. Orchid.*: 1, i. & t. 28 (1822) [alternative name for *Goodyera bracteata*].

*Platylepis goodyeroides* A.Rich. *Mém. Soc. Hist. nat. Paris*, 4: 34 (1828). TYPES: Mauritius, *Commerçon s.n.* (P, syn.) & Réunion, *Thouars s.n.* (P, syn.).

*Hetaeria occulta* (Thouars) Lindl., *Edwards's Bot. Reg.* 24: 94 (1838), as *Aetheria*.

*Notiophrys occulta* (Thouars) Lindl., *J. Linn. Soc.* 1: 189 (1857).

*Platylepis polyadenia* Rchb.f., *Flora* 68: 537 (1885), **syn. nov.** TYPE: Comoros, Grande Comore, *Humboldt* (1)427 (lectotype: W; isolectotype, P, chosen in Perrier (1936: 25).

*Orchiodes occultum* (Thouars) Kuntze, *Revis. Gen. Pl.* 2: 675 (1891).

*Erporkis bracteata* Kuntze, *Revis. Gen. Pl.* 2: 660 (1891), *nom. illeg.*

Only fragments of Thouars's material of this taxon has been located at BM (BM000077838) but their origin is uncertain. Thus, Thouars's plate 28 (1822) is selected here as the lectotype (Fig. 86).

*Platylepis polyadenia*, described by Reichenbach in 1885 and based on a specimen from the Comoros, was subsequently accepted as a more widespread species by several authors. The description and dissection

of the type and other associated material shows it to be identical with Thouars's *P. occulta*. Perrier (1936: 25) compared the two species but his comparison is based on material associated with *Platylepis densiflora* (*Commerçon s.n.* & *Delteil s.n.* in P).

It is found in Madagascar, the Comoros, the Seychelles and the Mascarenes (Mauritius and Réunion).

ACKNOWLEDGEMENTS. During regular visits to the herbarium of the Laboratoire de Phanérogamie in Paris since the 1970s, the authors had lengthy discussions and correspondence with the late Jean Bosser, the acknowledged authority on the orchids of the Mascarenes, who had intended to prepare the orchid volumes for the *Flore des Mascareignes*. In his later years we received encouragement and support from him to complete the *Flore*. Recently it has been a privilege to meet Catherine Boudier, Jean Bosser's daughter, who entrusted us with some of her father's manuscript notes and correspondence. It has been an honour to complete the work that he started. We are most grateful for their help to the directors, botanists and librarians of the herbaria at BM, BR, BRLU, CBNM, CGE, DUB, E, G, HEID, K, L, M, MARS, MAU, MO, P, SZU, TAN, TEF, W, WU, M, SZL, ZSS that we visited to examine collections from the Mascarenes and also relevant material from adjacent regions. In particular, we would like to thank the following: Jean-Claude Autrey, Martin Cheek and Frederick Friedmann, the editors of the *Flore des Mascareignes*, Marc Pignal in Paris; André Schuiteman at Kew; Kersley Pynee, Mario Allet and Kevin Ruhomaun of the National Parks and Conservation Service Mauritius; and Thierry Pailler, Bernard Reynaud, Pascale Chabanet, Jean-Maurice Tamon, Patrice Bernet, Veronique Lavergne in Réunion. We are grateful to the photographers; Jean-Michel Hervouet and Rogier Van Vugt and to MSIRI and the Mauritius Herbarium for permission to reproduce some of the Eudoxie de Cordemoy watercolours. We are much indebted to the two anonymous reviewers for their constructive comments and corrections.

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