

## A SYNOPSIS OF *RIVEA* (*CONVOLVULACEAE*)

G. W. STAPLES

A synopsis of *Rivea* Choisy (*Convolvulaceae*) accounts for all names published in the genus in a concise nomenclatural review. Three species are recognized; a key is provided to identify them. Excluded species are referred to the currently accepted names and an index of numbered specimens examined will allow curators to correctly name material in herbaria.

*Keywords.* *Convolvulaceae*, generic delimitation, nomenclature, *Rivea*.

### INTRODUCTION

This is the second in a series of papers that provides concise taxonomic accounts – synopses, reviews and checklists – for selected genera of tropical Asian *Convolvulaceae*. The series is modelled after the nomenclatural review of the genus *Erycibe* Roxb. (Hoogland, 1953) and a subsequent list of specimens examined (Hoogland, 1961). The first paper in the series is a synopsis of *Lepistemon* Blume in Australasia (Staples, in press). Hoogland's papers offer an excellent model for expedited biodiversity assessment in a family of plants for which there are numerous herbarium collections extant, coupled with a messy nomenclature and inconsistent taxonomic practice at the regional level (e.g. one species has multiple names in different geopolitical units within the tropical Asian region). All published names are accounted for, type specimens have been located wherever possible, nomenclature has been rectified, and the list of specimens examined provides a means for curators to correctly name duplicate material in herbaria. This approach affords a compromise that meets the need for a rapid biodiversity assessment, while simultaneously providing a foundation for thorough taxonomic revisions.

The development of the generic concept for *Rivea* Choisy was succinctly summarized by Van Ooststroom (1943: 354–355), who placed this genus in the context of generic delimitation among the Malesian *Argyreieae*. He concluded that *Rivea* should be brought back nearly to its original circumscription as given by Choisy (1834) when he erected the genus. Van Ooststroom (1943, 1957) defined *Rivea* as a tropical Asian genus of 5–7 species with large nocturnal flowers that are typically fragrant, have a salverform, white corolla, two stigmas that are longer than wide (rather than globose), and a hard-walled, dry and indehiscent fruit. Based upon this generic concept, all of the African and tropical American species described in or transferred into *Rivea* between 1834 and 1943 had to be assigned elsewhere (e.g.

*Argyreia* Lour., *Ipomoea* L., *Stictocardia* Hallier f., *Turbina* Raf.). These are accounted for in part II of this paper.

The genus *Rivea*, as narrowly circumscribed here, has a distinctive aspect: in addition to the morphological characters mentioned above, plants have leaf blades that are silvery or tawny pubescent beneath and with a pair of prominent dark glands at the apex of the petiole; the seeds are embedded in a spongy matrix that dries like cork inside the hard-shelled, woody, nut-like fruit. In the aggregate, these features give *Rivea* one of the most distinctive and readily recognizable aspects in the family. Morphological cladistic analysis (Wilkin, 1999) confirms this. Genuine *Rivea* (as defined herein) was not included in a recent, near-comprehensive molecular analysis of the family (Stefanovic *et al.*, 2002); the sample called *R. corymbosa* in that study is actually *Turbina corymbosa* (L.) Raf., a neotropical plant. Manos *et al.* (2001) included a single species of *Rivea* (*R. clarkeana* = *R. ornata*) in their study, which combined morphological characters and partial molecular data sets. Based on the small number of taxa sampled, *Rivea* was shown to be nested within *Argyreia*, which in turn was nested within the tribe *Ipomoeae*. Stefanovic *et al.* (2003) proposed a revised familial classification, which advocated that *Rivea*, along with several other spiny-pollen genera, should be subsumed into a much amplified *Ipomoea*. That course has not been followed here pending more comprehensive sampling of the Asian taxa.

The present paper resolves the species concepts through a nomenclatural revision based on study of the relevant type specimens and accounts for all the names heretofore published in the genus. Only three species can be well characterized and the following key, in combination with Fig. 1, should distinguish them.

#### *Key to the species*

- 1a. Sepals ovate to elliptic, c.8–10 mm long, apex typically rounded or obtusish  
 \_\_\_\_\_ **1. *R. hypocrateriformis***
- 1b. Sepals elliptic to oblong, 11–16 mm long, apex acute or acuminate \_\_\_\_\_ 2
- 2a. Sepals  $\pm$  concave, upper margins inrolled, apex reflexed slightly, tip often cucullate; corolla hairy outside on midpetaline bands; stems often twining \_\_\_\_\_  
 \_\_\_\_\_ **3. *R. wightiana***
- 2b. Sepals flat or slightly concave, margins weakly inrolled, tip inrolled or flat; corolla subglabrous outside except near apex; stems often erect, shrubby \_\_\_\_\_  
 \_\_\_\_\_ **2. *R. ornata***

#### I. ACCEPTED TAXA

Three species are accepted here. Brief synonymies are recorded for each; more details are provided for *Rivea hypocrateriformis*, which was not discussed by Mill (1996), who fully elaborated the nomenclature for *R. ornata* and *R. wightiana*.

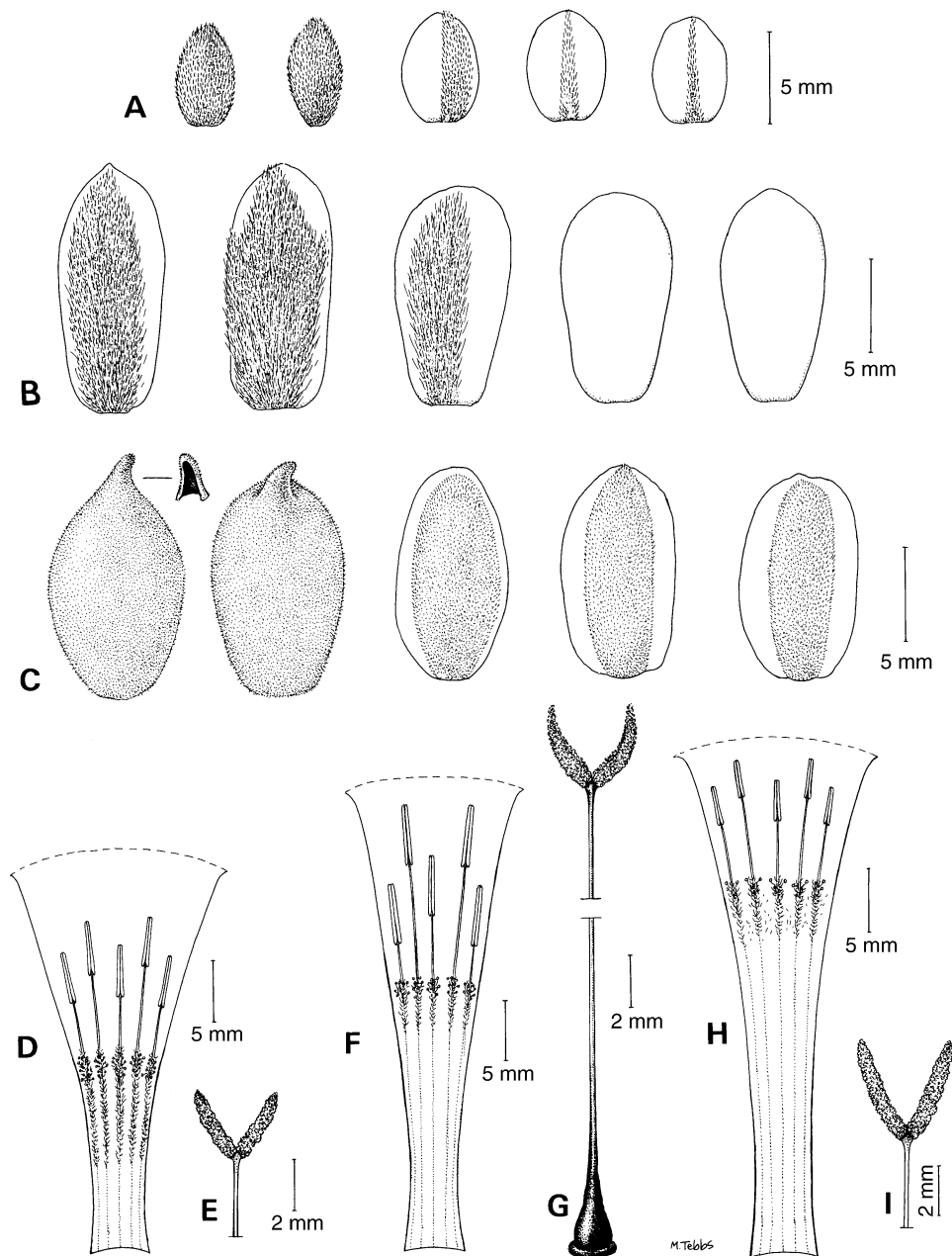


FIG. 1. Comparative characters for *Rivea* species: A–C, sepals in abaxial view, outermost (left) to innermost (right); D, F, H, opened corolla showing stamen insertion; E, G, I, stigmas/pistil. *R. hypocrateriformis*, A, D, E (all based on *Duthie* 4232); *R. ornata*, B (from *Winit* 767), F, G (from *Kerr* s.n., 19 v 1915); *R. wightiana*, C, H, I (all based on *Worthington* 1371). All voucher specimens in K.

**1. *Rivea hypocrateriformis*** (Desr.) Choisy, Mém. Soc. Phys. Genève 6: 408 [Conv. Or. 26] (1834). – *Convolvulus hypocrateriformis* Desr. in Lam., Encycl. 3: 561 (1792 [‘1789’, publ. 13 Feb 1792]). – Type: ‘Indies Orientale’ without provenance or date, *Sonnerat* s.n. (lecto P-Lamarck!, chosen here). **Fig. 1A, D, E.**

*Lettsomia uniflora* Roxb., Fl. Ind. 2: 85 (1824). – Type: Unpublished Roxburgh icone 568 (lecto K!, chosen here).

*Lettsomia bona-nox* Roxb., Fl. Ind. 2: 84 (1824). – *Rivea bona-nox* (Roxb.) Choisy, Mém. Soc. Phys. Genève 6: 409 [Conv. Or. 27] (1834). – Type: Unpublished Roxburgh icone 2038 (lecto K!, chosen here).

*Rivea fragrans* Nimmo in J. Graham, Cat. Pl. Bomb. 127 (1839). – Type: India, no specimen traced.

*Rivea ornata* auct. non Choisy (1834): Aitchison, Cat. Pl. Punjab Sindh 100 (1869).

*Distribution.* India, Pakistan.

*Notes on typifications.* Desrousseau based his description largely on the *Sonnerat* specimen here chosen as a lectotype. He also mentioned seeing another specimen (syntype) in the Jussieu herbarium. There are now two sheets conserved in the Jussieu herbarium as 6784 under the name *Convolvulus hypocrateriformis*: 6784A has the Desrousseau name on it and is certainly a *Rivea*, but it is sterile and cannot conclusively be identified to species. Sheet 6784B, which does not bear Desrousseau’s name, is a different species; it appears to be *Ipomoea asarifolia* (Desr.) Roem. & Schult.

Typification of the two Roxburgh names is problematic. Clarke (1883: 184) stated that no specimens of *Lettsomia bona-nox* were known to exist and thus Roxburgh’s unpublished plate formed the basis for Clarke’s, and subsequent, interpretations of *L. bona-nox*. However, the format of Choisy’s entry (in DC., Prodr. 9: 326, as *Rivea* #7. 1845 – the ‘v.s.’ at the end of the entry) indicates Choisy saw a specimen with this name on it. There is in the De Candolle herbarium at G a sheet (2903) with two *Rivea* collections pinned on it, one of which consists of two leaves and a flower that is affixed to a label with ‘bona-nox’ handwritten on it. This must be the specimen Choisy saw; he was gifted by Wallich with a set of duplicate *Convolvulaceae* from the East India Company Herbarium (the ‘Wallich Herbarium’) about 1830, when Choisy visited London. Wallich distributed Roxburgh specimens and this fragment could be type material for *Lettsomia bona-nox*, although there is nothing now present that could be used to authenticate it, the original wrappers and labels in Roxburgh’s hand having long since disappeared. Because no genuine type specimen has come to light I have chosen to follow Clarke’s judgement and designate the unpublished Roxburgh icone 2038 as the lectotype for *Lettsomia bona-nox* Roxb.

A similar situation exists with *Lettsomia uniflora* Roxb., for which another unpublished Roxburgh icone (568) has been chosen as a lectotype. The Roxburgh drawings have been well documented by Sealy (1956–1957), with additional information concerning Roxburgh specimens added by Forman (1997), who found

no *Rivea* specimens in BR, E, LIV or OXF. No specimens pertinent to these two Roxburgh names came to light in the J.E. Smith herbarium (LINN-Smith) either.

**2. *Rivea ornata* (Roxb.) Choisy**, Mém. Soc. Phys. Genève 6: 409 [Conv. Or. 27] (1834). – *Lettsomia ornata* Roxb., Fl. Ind. 2: 86 (1824). – *Rivea roxburghii* Prain ex Brandis, Indian Trees 484 (1906), nom. nov. – Type: India, Calcutta Bot. Gard., cultivated, *Wallich Cat.* 1369/2 (iso K-Wallich!, G!, G-DC!) [see Mill, 1996: 231 regarding typification issues]. **Fig. 1B, F, G.**

*Rivea ornata* var. *griffithii* C.B. Clarke, Fl. Brit. Ind. 4: 183 (1883). – Type: India, sine loco, *Falconer* s.n. (lecto K, chosen by Mill, 1996: 230).

*Rivea clarkeana* Craib, Bull. Misc. Inform. Kew 1922: 239 (1922). – Type: Thailand, Chiang Mai, cultivated from seeds collected near Lampang, *A.F.G. Kerr* 3383 (holo K!; iso P!).

*Rivea laotica* Ooststr., Blumea 8: 525 (1957). – Type: Laos, Vientiane vicinity, *Vidal* 2350 (holo TL; iso L!, P!).

*Distribution.* Eastern India, Nepal, Burma, Thailand, Laos. Absent from Bangladesh (Khan, 1985) and, seemingly, from Bhutan, though the species was included in the flora account by Mill (1999) based on specimens from the Sikkim terai.

*Notes on typifications.* Mill (1996: 231) noted that Wallich distribution 1369/2 is usually regarded as the nomenclatural type for *Rivea ornata*, but he declined to choose a lectotype from among the known duplicates; see there for an explanation of his reasoning. The problems of verifying authentic Roxburgh specimens from among the thousands distributed by Wallich are well documented.

**3. *Rivea wightiana* R.R. Mill**, Edinburgh J. Bot. 53: 241 (1996). – Type: Plate in Wight, Icon. Pl. Ind. Orient. 4: t. 1356 (1848). **Fig. 1C, H, I.**

*Distribution.* Southern India, Sri Lanka.

*Notes.* Mill (1996) relied heavily upon habit difference (erect and shrubby vs. stems twining) in characterizing his new species, *Rivea wightiana*. My own examination of the specimens seen by Mill, and many more besides, indicates that this habit character is unreliable. While there is a trend for *Rivea ornata* to be more erect and shrubby, and a trend towards *R. wightiana* being more twining, there are intermediates and exceptions aplenty. Furthermore, Mill's citation of specimens in his paper (1996) does not correspond with the few labels he affixed to the sheets: most specimens he studied were left un-annotated and when these were sorted out and compared with the descriptions in his paper it quickly became apparent that the stem character has little taxonomic value. A better character, that seems relatively constant, is the shape and indumentum of the sepals. As clearly shown in Wight's plate (see above), the cucullate or hooded apex on the outer two sepals, and the nearly continuous covering of fine hairs, are good characters for separating *Rivea wightiana* from the other two species. These characters are clearly visible in mature

flower buds, open flowers, and fruiting material; they are less easily discerned in young flower buds.

## II. EXCLUDED TAXA

The following list includes all epithets published or combined in *Rivea* that have not been accounted for in the preceding section, either as accepted names or synonyms. Five names at species rank and three names at varietal rank that are not included in the *International Plant Names Index* are included here, preceded with an asterisk (\*). The list is arranged alphabetically by epithet. Accepted names follow recent taxonomic literature, *inter alia* Van Ooststroom (1950, 1953), Verdcourt (1963), Lejoly & Lisowski (1986), Austin & Staples (1991), Austin & Huáman (1996), and Meeuse & Welman (2000).

- Rivea abutiloides* (Kunth) Hallier f., Bot. Jahrb. 18: 158 (1893), South America. = *Convolvulus abutiloides* Kunth in Humboldt, Bonpland & Kunth, Nov. Gen. Sp. 3: 83 [ed. 2°], 106 [ed. 4°] (1819). = **Turbina abutiloides** (Kunth) O'Donnell
- Rivea adenioides* (Schinz) Hallier f., Bot. Jahrb. 18: 156 (1893), Africa. = **Ipomoea adenioides** Schinz
- Rivea adenioides* (Schinz) Hallier f. var. *longifolia* Hallier f., Bot. Jahrb. 18: 156 (1893), Africa. = **Ipomoea adenioides** Schinz
- Rivea apoensis* Elmer, Leaflet Philipp. Bot. 7: 2604 (1915), Philippines. = **Argyria apoensis** (Elmer) Ooststr.
- \* *Rivea argentea* (Roxb.) Hallier f., Bull. Herb. Boiss. 7: 60 (1899), India. = *Lettsomia argentea* Roxb., Fl. Ind. ed. 1, 2: 79 (1824). = **Argyria argentea** (Roxb.) Sweet [see Manitz, 1983: 177]
- Rivea argyria* Mart. ex Choisy in DC., Prodr. 9: 327 (1845), Brazil. = **Ipomoea argyria** (Choisy) Meisn.
- Rivea argyrophylla* (Vatke) Hallier f., Bot. Jahrb. 18: 157 (1893), Africa. = **Ipomoea argyrophylla** Vatke
- Rivea barnesii* Merr., Publ. Bur. Sci. Gov. Lab. 17: 40 (1904), Philippines. = **Argyria barnesii** (Merr.) Ooststr.
- Rivea bernoulliana* (Peter) Hallier f., Bot. Jahrb. 18: 158 (1893), Guatemala. = *Ipomoea bernoulliana* Peter in Engl., Nat. Pflanzenfam. 4(3a): 30 (1891). = Unknown. [*Flora of Guatemala* (Standley & Williams, 1970: 85) considered this name a *nomen nudum*, which it is not, and did not consider it further. Likewise Austin & Huáman (1996). No specimens traced.]
- Rivea bracteata* (Rudolphi ex Ledeb.) Hallier f., Bot. Jahrb. 18: 158 (1893), nom. illeg., Cuba, Hispaniola. = **Turbina racemosa** (Poir.) D.F. Austin & Staples
- Rivea brasiliana* Mart. ex Choisy in DC., Prodr. 9: 326 (1845), Brazil. = **Ipomoea brasiliana** (Choisy) Meisn.
- Rivea campanulata* House, Muhlenbergia 5: 72 (1909), nom. illeg., India. = **Stictocardia tiliifolia** (Desr.) Hallier f.

- Rivea capitata* (Vahl) Hallier f., Meded. Rijks-Herb. 1: 26 (1911), nom. illeg., Asia. = **Argyreia capitiformis** (Poir.) Ooststr.
- Rivea cinerea* Elmer, Leafl. Philipp. Bot. 1: 335 (1908), Philippines. = **Argyreia barnesii** (Merr.) Ooststr.
- Rivea collinsae* Craib, Bull. Misc. Inform. 1916: 266 (1916), Thailand. = **Argyreia collinsae** (Craib) Na Songkhla & Traiperm.
- Rivea cordata* Choisy in DC., Prodr. 9: 326 (1845), South America. = **Turbina cordata** (Choisy) D.F.Austin & Staples
- Rivea corymbosa* (L.) Hallier f., Bot. Jahrb. 18: 157 (1894), Central America. = *Convolvulus corymbosus* L., Syst. Nat. ed. 10, 2: 923 (1759). = **Turbina corymbosa** (L.) Raf.
- \* *Rivea corymbosa* (L.) Hallier f. var. *mollissima* (Webb & Berth.) Hallier f., Bot. Jahrb. 18: 157 (1893), Canary Islands. = **Turbina corymbosa** (L.) Raf.
- Rivea corymbosa* (L.) Hallier f. var. *paniculata* Hassl., Repert. Spec. Nov. Regni Veg. 9: 151 (1911), Paraguay. = **Turbina corymbosa** (L.) Raf.
- Rivea cuneata* (Willd.) Wight, Icon. Pl. Ind. Orient. 3(2): 8, t. 890 (1844–1845), India. = *Convolvulus cuneatus* Willd., Sp. Pl. 1: 873 (1798). = **Argyreia cuneata** (Willd.) Ker Gawl.
- Rivea decora* Hallier f., Bot. Jahrb. 18: 156 (1893), nom. illeg., Africa. = **Ipomoea hildebrandtii** Vatke
- Rivea exaltata* Klotzsch in R.Schomburgh, Reis. Brit. Guiana 3: 1084 (1849 [‘1848’]), nom. nud., Guiana, no specimens traced
- Rivea glabra* (Choisy) Hallier f., Bull. Herb. Boiss. 6: 714 (1898), Lombok. = **Argyreia glabra** Choisy in Zollinger
- Rivea glabrata* Elmer, Leafl. Philipp. Bot. 1: 334 (1908), Philippines. = **Argyreia luzonensis** (Hallier f.) Ooststr.
- Rivea hartmanni* (Vatke & Rensch) Hallier f., Bot. Jahrb. 18: 156 (1893), Africa. = **Ipomoea hartmanni** Vatke & Rensch
- Rivea hastata* Klotzsch in R.Schomburgh, Reis. Brit. Guiana 3: 1152 (1849 [‘1848’]), nom. nud., Guiana, no specimens traced
- Rivea hirsuta* (Wight & Arn.) Wight, Icon. Pl. Ind. Orient. 3(2): 8, t. 891 (1844–1845), India. = **Argyreia hirsuta** Wight & Arn.
- Rivea holubii* (Baker) Hallier f., Meded. Rijks-Herb. 1: 26 (1911), Africa. = *Turbina holubii* (Baker) A.Meeuse = **Turbina holubii** Baker
- \* *Rivea hookeri* (C.B.Clarke) Hallier f., Bull. Herb. Boiss. 7: 60 (1899), India. = **Argyreia hookeri** C.B.Clarke
- Rivea kituiensis* (Vatke) Hallier f., Bot. Jahrb. 18: 156 (1893), Africa. = **Ipomoea kituiensis** Vatke
- Rivea leucocarpa* Elmer, Leafl. Philipp. Bot. 10: 3720 (1939), Philippines. = **Ehretia** sp. (*Boraginaceae*)
- Rivea lindenii* (M.Martens & Galeotti) Hallier f., Bot. Jahrb. 18: 158 (1893), Mexico. = **Ipomoea lindenii** M.Martens & Galeotti

- Rivea luzonensis* Hallier f., Bull. Herb. Boiss. 6: 714 (1898), Philippines. = **Argyreia luzonensis** (Hallier f.) Ooststr.
- \* *Rivea multiflora* (Roxb.) Hallier f., Bull. Herb. Boiss. 7: 60 (1899). = *Ipomoea multiflora* Roxb., Fl. Ind. 2: 89 (1824), non (Mill.) Roem. & Schult. (1819). = *Ipomoea roxburghii* Sweet, Hort. Brit. 129 (1827), India. = **Argyreia roxburghii** (Sweet) Choisy
- Rivea nana* Hallier f., Bot. Jahrb. 18: 157 (1893), Africa. = **Ipomoea jaegeri** Pilg.
- \* *Rivea nervosa* (Burm.f.) Hallier f., Bull. Herb. Boiss. 5: 381 (1897), India. = **Argyreia nervosa** (Burm.f.) Bojer
- Rivea ?obtecta* Choisy, Mém. Soc. Phys. Genève 6: 410 [Conv. Or. 28] (1834), Burma. = **Argyreia oblecta** (Choisy) C.B.Clarke
- Rivea oenotheroides* (L.f.) Hallier f., Bot. Jahrb. 18: 156 (1893), Africa. = *Turbina oenotheroides* (L.f.) A.Meeuse = **Ipomoea oenotheroides** (L.f.) A.Meeuse & Welman
- Rivea pomacea* Wight, Icon. Pl. Ind. Orient. 3(2): 8, t. 888 (1844–1845), nom. illeg.; Choisy, Mém. Soc. Phys. Genève 6: 413 [Conv. Or. 31] (1834), nom. illeg., Sri Lanka. = **Argyreia zeylanica** (Gaertn.) Voigt [see Manitz, 1983: 177]
- Rivea pringsheimiana* Dammer in Engl., Pflanzenw. Ost-Afrikas C: 334 (1895), Africa. = **Stictocardia laxiflora** (Baker) Hallier f.
- Rivea pyramidalis* (Hallier f.) Hallier f., Meded. Rijks-Herb. 1: 26 (1911), Africa. = **Ipomoea pyramidalis** Hallier f.
- Rivea racemosa* (Poir.) Hallier f., Bot. Jahrb. 18: 158 (1893), Hispaniola. = *Ipomoea racemosa* Poir. in Lam., Encycl. Suppl. 4: 633 (1816). = **Turbina racemosa** (Poir.) D.F.Austin
- Rivea shirensis* (Oliv.) Hallier f., Bot. Jahrb. 18: 157 (1893), Africa. = **Paralepistemon shirensis** (Oliv.) Lejoly & Lisowski
- Rivea sorsogonensis* Elmer, Leaflet. Philipp. Bot. 10: 3721 (1939), Philippines. = **Argyreia sorsogonensis** (Elmer) Ooststr.
- Rivea stenosphon* (Hallier f.) Hallier f., Jahrb. Hamb. Wiss. Anst. 16(Beih. 3): 15 (1899), Africa. = *Turbina stenosphon* (Hallier f.) A.Meeuse = **Ipomoea stenosphon** Hallier f.
- Rivea subincana* Choisy in DC., Prodr. 9: 325 (1845), Brazil. = **Ipomoea subincana** (Choisy) Meisn.
- Rivea suffruticosa* (Burch.) Hallier f., Bot. Jahrb. 18: 156 (1893), South Africa. = *Turbina suffruticosa* (Burch.) A.Meeuse = **Ipomoea suffruticosa** Burch.
- \* *Rivea sumbawana* Hallier f. in Elbert, Sunda-Exped. 2: 281 (1912), nom. nud., Sumbawa. = **Argyreia sumbawana** Ooststr.
- Rivea tiliaefolia* (Desr.) Choisy, Mém. Soc. Phys. Genève 6: 407 [Conv. Or. 25] (1834), Asia. = *Convolvulus tiliaefolius* Desr. = **Stictocardia tiliifolia** (Desr.) Hallier f.
- Rivea urbaniana* Dammer in Engl., Pflanzenw. Ost-Afrikas C: 334 (1895), Africa. = **Ipomoea urbaniana** (Dammer) Hallier f.



- Rivea urdanetensis* Elmer, Leaflet Philipp. Bot. 7: 2605 (1915), Philippines. = **Argyreia barnesii** var. **urdanetensis** (Elmer) Ooststr.
- Rivea zeylanica* (Gaertn.) Thwaites, Enum. Pl. Zeyl. 209 (1860), Sri Lanka. = **Argyreia zeylanica** (Gaertn.) Voigt
- \* *Rivea zeylanica* (Gaertn.) Thwaites var. *hirsuta* (Wight & Arn.) Thwaites, Enum. Pl. Zeyl. 209 (1860), Sri Lanka. = **Argyreia hirsuta** Wight & Arn.
- \* *Rivea zeylanica* (Gaertn.) Thwaites var. *populifolia* (Choisy) Thwaites, Enum. Pl. Zeyl. 209 (1860), Sri Lanka. = **Argyreia populifolia** Choisy

## ACKNOWLEDGEMENTS

Visits to herbaria and/or loans were facilitated by staff at A/GH, AAU, B, BK, BKF, C, CMU, E, G, K, KKU, L, P, QBG, S, SING and TCD. The illustration was prepared by Margaret Tebbs (K). Henry Noltie (E) provided information about types for Graham/Nimmo names and Wight catalogue numbers. Paul Wilkin (K) and Hermann Manitz (JE) critically reviewed the manuscript. This material is based upon work supported by the National Science Foundation under Grant No. 0212762.

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*Received 22 December 2006; accepted for publication 27 April 2007*

#### INDEX TO NUMBERED SPECIMENS EXAMINED

The specimen identifications are keyed to the species numbers used in the text. (T) signifies a type specimen; ? signifies a tentative identification (often sterile material).

BKF 38096 (2); Bourne & Bourne 1629 (3).

Clarke, C.B. 20717A (1), 34212 (1), 34392B (1), 34392A (1).

Drummond, J.R. 14698 (1), 23961 (1?), 24166 (1), 24167 (2), 24168 (2), 24169 (1), 24170 (1), 26017 (1), 26020 (1), 26021 (1), 26022 (1), 26023 (1); Duthie, J.F. 4232 (1).

Edgeworth, M.P. 446 (1); Elliot, W. 121 [H.F.C. Cleghorn herb.] (2).

Fosberg, F.R. & A.H.M. Jayasuriya 52745 (3).

Gamble, J.S. 939A (2), 3402B (2), 7599 (2), 10737 (1), 10871 (1), 15168 (3), 24040 (2), G-18469 (3); Griffith herb. 5854 (2) (T).

Haines, H.H. 257 (1), 2728 (1); Hamilton, F.B. 515 (1); Hooker, J.D. 439 (1).

Jafri, S.M.H. 2451 (1?); Jussieu herb. 6784A (1) (T).

Kamphovener, B.C. 1214 [Galathea Exped.] (1); Kerr, A.F.G. 1011 (2), 3383 (2) (T); Koelz, W. 18959 (2), 19201 (1).

Lace, J.H. 2532 (1); Larsen, K. & S.S. Larsen 34275 (2); Larsen, K. et al. 31916 (2).

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*Majumdar, R.B.* 12474 (1); *Malaise, R.* 398 (2); *Matthew, K.M.* RHT-20591 (3), RHT-41032 (3); *Matthew, K.M. et al.* RHT-19314 (1), RHT-43153 (3); *Meebold, A.* 8974 (2), 12736 (2); *Mooney, H.F.* 307 (2), 2062 (1), 3615 (1).

*Nafday, U.R.* 36 (1); native collector BKF-258 (2).

*Pinnin, S. et al.* 44 (2); *Pradit* 719 (2).

*Qaiser, M. et al.* 7173 (1).

*Ramamoorthy, T.P.* HFP-391 (1); *Ritchie, C. herb.* 1130 (2), 1130/2 (1); *Rogers, B.* 1 (2); *Rottler, J.P.* 172 [in LINN-Smith] (1) (T?).

*Schmid, B.* 531 (1); *Sedgwick, L.J. & T.R.D. Bell* 4142 (1), 4163 (1); *Singh, U.* 241 (2); *Smitinand, T.* 4518 (2?), 6985 [BKF 38096] (2); *Stocks, J.E.* 486 (1); *Subramanian, K.N.* 112 (3); *Suksathan, P.* 2644 (2).

*Thomson, T.* 1416 [Herb. Ind. Or. Hook.f. & Thoms.] (1); *Thwaites, C.P.* 1946 (3); *Tippan* 89 (2); *Tixier, P.* 55-13 (2).

*Vidal, J.E.* 1120 (2), 1120B (2), 2350 (2) (T), 4413 (2); *Voigt* 3014 (2).

*Wallich Cat.* 1368 [in G-DC] (3?), 1368.1a [in K-W] (1), 1368.1B [in K-W] (1), 1368/2 (1), 1368/3 (1), 1368.B (1), 1368.C p.p. (3), 1369/1 (2), 1369/2 (2) (T), 2253 (1); *Wight, R. herb. cat.* 1950 [K] (1), 1950 [C, L, P, S] (3), 1954 (3), 2248 (1), 2348 (2); *Williams & Stainton* 8204 (2); *Winit, K.* 767 (2); *Wood, J.* 278 (1); *Worthington, T.B.* 1371 (3).