



Paralasianthus (Rubiaceae), a new genus from Southeast Asia

HUA ZHU*

Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Kunming 650223, P.R. China

*Author for correspondence: zhuh@xtbg.ac.cn

Abstract

The new genus *Paralasianthus* is described from South-East Asia. Five species are recognised in the genus, four of which required new combinations, *P. brevipes*, *P. dichotomus*, *P. lowianus* and *P. hainanensis*, and one is described as a new species, *P. zhengyanus*. A key to the species is presented.

Key words: *Paralasianthus*, new genus, Rubiaceae, South East Asia

Introduction

The circumscription of *Lasianthus* Jack (1823: 125) has been modified by different authors, especially with regards to the number of ovary locules or pyrenes (Zhu *et al.* 2012). Jack (1823) described *Lasianthus* with a 4-locular ovary and a single, erect, basal ovule in each locule, which normally develops into a drupe with 4 pyrenes. Based on Malesian species Blume (1826) expanded Jack's delimitation and defined *Lasianthus* as having 4–9-locular ovaries and drupes with 4–9 pyrenes. Korthals (1851) established *Mephitidia* subgen. *Dysosmia* (Korthals 1851: 224) based on a Javan species, *M. dichotoma* Korthals (1851: 224), which had a 2-locular ovary and a compressed, 2-pyrenate drupe with a thin wall. Miquel (1859) raised it to generic rank as *Dysosmia* (Korthals 1851: 224) Miquel (1859: 314), and returned *Lasianthus* Jack to Blume's definition. Boerlage reduced *Dysosmia* in synonymy with *Saprosma* (Boerlage 1891: 106). Baillon (1880) included the African genus *Saldinia* A. Richard ex de Candolle (1830: 483) into *Lasianthus* Jack, as a subgenus. *Saldinia* has a 2-locular ovary, which develops into a 1-pyrenate drupe with a hard wall. Baillon's classification was not used in the treatments of Asian *Lasianthus* by later authors. However, Bremekamp proposed the new combination *L. furcatus* (Miquel 1857: 252) Bremekamp (1957: 94), based on *Canthium furcatum* Miquel (1857: 252), and synonymized *Saprosma dichotomum* (Korthals 1851: 224) Boerlage (1891:142) with *L. furcatus* (Miquel) Bremekamp (1957: 94). *Dysosmia* Korthals (1851: 224) was again returned to *Lasianthus* because its type is *Saprosma dichotomum*. Bremekamp restored *Saldinia* and redefined *Lasianthus* as having 2 or more locules per ovary and drupes with 2 or more pyrenes with a relatively soft wall (compared with *Saldinia*). In revisions of *Lasianthus* for Southeast Asia (Zhu 2001), East Asia (Zhu 2002) and the Malesian region (Zhu *et al.* 2012), *Lasianthus* was defined as having a 3–9-locular ovary and drupes or pyrenes with a thick wall.

A group of closely-related Asian species, which are glabrous plants with leaves with looped venation, with ovaries commonly 2-locular, and drupes with 2 thin-walled pyrenes, have been included in several different genera. Some of them were treated as *Lasianthus*, some as *Saprosma* and others as *Amaracarpus*. This group of species does not match *Lasianthus*, as they normally have 2-pyrenate drupes with a thin wall. They are separated from *Saprosma* by the lack of conspicuous colleters at the base inside of the stipules and bracts (except very minute ones), petioles without articulation, and leaves with looped venation. They differ from *Amaracarpus* in being glabrous plants, having stipules without setae, bracteoles neither connate nor bifid, not forming a compact with stipules, and reduced leaves. This group of species thus has a combination of characters that separates it from similar genera; therefore, a new genus, *Paralasianthus* H. Zhu, is here proposed to accommodate this group of species.

Taxonomic treatment

Paralasianthus H. Zhu, *gen. nov.*

Type:—*Paralasianthus dichotomus* (Korthals 1851: 224) H. Zhu (Basionym: *Mephitidia dichotoma* Korthals).

Dysosmia (Korthals 1851: 224) Miquel (1859: 325). *Mephitidia* subgen. *Dysosmia* Korthals (1851: 224), non Roemer (1846)

Type:—*Dysosmia dichotoma* (Korthals) Miquel (1859: 326) [= *Paralasianthus dichotomus* (Korthals) H. Zhu]

Proximus *Saprosma* sed setis stipularum et bractearum inconspicuis vel minutis, venationibus brachidodromis, petiolis non-articulatis differt. Simile *Lasianthus*, sed ovariis bilocularis, pyrenis 2, pariete pyrenae tenui differt. A *Amaracarpus* simile sed plantis glabris, stipulis minutis, bracteis et bracteolis inconspicuis, cymis axillaribus vel sub axillaribus differt.

Shrubs or treelets, glabrous, 2–3 m tall; branchlets terete or compressed in the youngest internodes, or incrassate at nodes. Stipules usually very small, subulate or triangular, usually 1–3 mm long; with small colleters present on the inside at the base. Leaves petiolate; blades elliptic-oblong to lanceolate, chartaceous to coriaceous, the base acute, cuneate or subround, the apex cuspidate to caudate or mucronate; midribs and veins prominent beneath or on both surfaces; secondary veins joined near the leaf margin and forming a looped venation; tertiary venation reticulate or subparallel. Inflorescences subaxillary, cymose, pedunculate or sessile; bracts and bracteoles small, subulate. Flowers pedicelate or sessile. Calyx usually obconical, with 4–5 minute teeth; corolla tubular, glabrous outside, pubescent the upper half of throat, the lobes 4–5, pubescent inside; anthers 4–5; ovary 2(–3)-locular, with one ovule per locule. Drupes compressed, ovoid, 2(–3)-pyrenate; pyrenes wall thin or thick on adaxial side.

Distribution—Five species are recognised in this genus, ranging throughout tropical South East Asia, with one species widely distributed in South East Asia, one in western Malesia, and the other three endemic to the Philippines, Thailand and the Hainan Province of China.

Notes:—This genus differs from *Saprosma* in the lack of conspicuous colleters on the inside of the base of the stipules and bracts (except very minute ones), petioles without articulation, and leaves with looped venation. It differs from *Amaracarpus* by being glabrous plants, with axillary or subaxillary cymes, stipules subulate or triangular, free, entire bracteoles, not forming a compact structure with stipules and reduced leaves. It differs from *Lasianthus* in usually having a 2-locular ovary and drupes with 2 thin-walled pyrenes. Its unique combination of characters, i.e. glabrous plants with very small stipules, looped leaf venation, usually 2-locular ovary and 2-pyrenate drupes, clearly separates it from *Lasianthus*, *Saprosma* and *Amaracarpus*.

The systematic position of this new genus remains uncertain. Morphologically is positioned between *Saprosma* and *Lasianthus*. However, *Saprosma* was placed in the tribe Paederiae by Puff (1992) based on morphological characters, while *Lasianthus* was referred to the new tribe Lasiantheae by Bremer & Manen (2000), based on molecular evidence.

Key to the species of *Paralasianthus*

- 1a. Cymes pedunculate; flowers conspicuously pedicellate; drupes 2-pyrenate, surface rugose. 2
- 1b. Cymes sessile or subsessile; flowers subsessile; drupes 2(–3)-pyrenate, surface smooth or rugose. 4
- 2a. Peduncles 5–20 mm long. 1. *P. dichotomus*
- 2b. Peduncles 1–2 mm long. 3
- 3a. Leaf blades lanceolate, less than 2 cm wide, coriaceous, narrowly cuneate at base; secondary veins 5–6 each side of midrib (endemic to the Philippines). 2. *P. zhengyianus*
- 3b. Leaf blades oblong, 2.5–4.5 cm wide, chartaceous, subround at base; secondary veins 8–10 each side of the midrib (Thailand)..... 3. *P. brevipes*
- 4a. Leaf blades ovate-lanceolate to ovate-oblong, usually less than 12 cm long; petioles less than 6 mm long; drupes 2(–3)-pyrenate, surface smooth (southern Thailand, Malay peninsula and Sumatra)..... 4. *P. lowianus*
- 4b. Leaf blades lanceolate-oblong, 12–17 cm long; petioles 10–12 mm long; drupes 2-pyrenate, surface rugose (Vietnam and Hainan Province of China)..... 5. *P. hainanensis*

1. *Paralasianthus dichotomus* (Korthals) H. Zhu, *comb. nov.*

Basionym:—*Mephitidia* (sect. *Dysosmia* Korthals) *dichotoma* Korthals (1851: 224). *Dysosmia dichotoma* (Korthals) Miquel (1859: 326). *Saprosma dichotoma* (Korthals) Boerlage (1891: 142). Type:—INDONESIA. Java: Tjibodas, *P.W. Korthals s.n.* (Holotype, lost). Neotype: Java: Gede, s.d., *B.H. Danser 5877* (L 0310371, designated here).

Canthium furcatum Miquel (1859: 252). *Lasianthus furcatus* (Miq.) Bremekamp (1957: 94), *in adnot.* Syntypes:—INDONESIA. Without locality, s.d., *F.W. Junghuhn s.n.* L (L 0000683); s.d., *F.W. Junghuhn s.n.* (L (L 0000682)). Java: Gede Oenganan, Pengalengan, s.d., *H. Zollinger s.n.* (not seen).

Saprosma novo-guineense K. Schumann & C. Lauterbach (1900: 586). *syn. nov.* Type:—NEW GUINEA. Kaiser Wilhelmsland, s.d., *Kärnbach 76* (not seen).

Plectronia cyanea Elmer (1913: 1887). *Lasianthus cyaneus* (Elmer) Merrill (1923: 566). Type:—PHILIPPINES. Mindanao, s.d., *A.D.E. Elmer 13854* (holotype not found; isotype L!).

Geniostoma acuminatissimum Merrill (1922: 432). Type:—PHILIPPINES. Mindanao, s.d., *BS 38837* (*M. Ramos & G. Endano*) (holotype not found; isotype L!).

Lasianthus brevipes Valetton (1927: 110). *syn. nov.*

Syntypes:—NEW GUINEA. Without locality, s.d., *C.L. Ledermann 9303* (L!), *10310* (L!).

Distribution:—Thailand, Indonesia (Sumatra, Java, Less Sundas, Moluccas, Irian Jaya), the Philippines (Mindanao) and Papua New Guinea.

Notes:—The type of *Mephitidia dichotoma* Korthals has not been traced. It is probably lost. Therefore a neotype is here designated from a Javan specimen, which is well preserved and with flowers and fruits.

2. *Paralasianthus zhengyanus* H. Zhu, *sp. nov.* (Fig. 1)

A.P. dichotomo (Korthals) H. Zhu simile, sed pedunculis 1–2 mm longis, foliis lanceolatis nitidis 1.5–2 cm latis, apice mucronatis, venae secundariae et tertiariae supra et subtus proeminentibus differt. *A.P. brevipes* H. Zhu foliis lanceolatis 1.5–2 cm latis coriaceis basi angusti-cuneatis apice mucronatis, nervis 5–6 binatis differt.

Type:—PHILIPPINES. Mindanao: Mt. Candoon, s.d., *BS 38840* (*M. Ramos & G. Endano*) *0310376* (Holotype L (L 0310376)).

Shrubs or treelets, glabrous; branchlets terete or compressed in the youngest part, c. 1.5 mm in diam. Stipules very small, subulate ca. 1 mm long; colleters on the inside base of the stipules. Petioles ca. 5 mm long; leaf blades lanceolate, 6–8 × 1.5–2 cm, coriaceous, nitid on both surfaces, the base narrowly cuneate, the apex mucronate; midribs, secondary and tertiary venation prominent on both surfaces; secondary veins 5–6 on each side of midrib, ascending at an angle of 45–50°, curved toward the leaf margin, joined near the margin and forming a looped venation; tertiary venation reticulate. Inflorescences cymose, pedunculate; peduncles 1–2 mm long; bracts and bracteoles very small, subulate, less than 1 mm long. Flowers pedicellate; pedicels slender, ca. 2 mm long. Calyx obconical-campanulate, glabrous, tube obconical-campanulate, 1 mm long, ca. 1 mm long, with 4 minute teeth. Corolla tubular, glabrous outside. Immature drupes compressed, ovoid, verrucose; pyrenes 2, with thin walls.

Distribution—Endemic to the Philippines.

Notes:—This species differs from *P. dichotomus* in having short peduncles (1–2 mm long), lanceolate and nitid leaves, which are less than 2 cm broad, and mucronate at the apex, and distinct venation, prominent on both surfaces. It differs from *P. brevipes* in having lanceolate and coriaceous leaves, with 5–6 secondary veins on each side of midrib.

3. *Paralasianthus brevipes* (H. Zhu) H. Zhu, *comb. nov.*

Lasianthus brevipes Craib (1933: 20), *nom. illeg.*, non Valetton (1927). *Saprosma brevipes* H. Zhu (2001: 148). Type:—THAILAND. Nakawn Sritamarat, s.d., *A.F.G. Kerr 15641* (holotype K! (K 000777001), isotypes, BK!, BM!).

Distribution—Thailand.

Note.—*Lasianthus brevipes* Craib is an illegitimate name (homonym of *Lasianthus brevipes* Valetton). Zhu (2001: 148) attempted to make the new combination *Saprosma brevipes* based on *L. brevipes* Craib, which was also an invalid name. Zhu (2001: 148) inadvertently published the name *Saprosma brevipes* with a direct reference to Craib's (1933: 20) diagnosis and Latin description of *L. brevipes* Craib, and cited holotype and isotypes of the new taxon. Therefore, the correct name for this species is *P. brevipes* (H. Zhu) H. Zhu, which is based on *S. brevipes* H. Zhu.

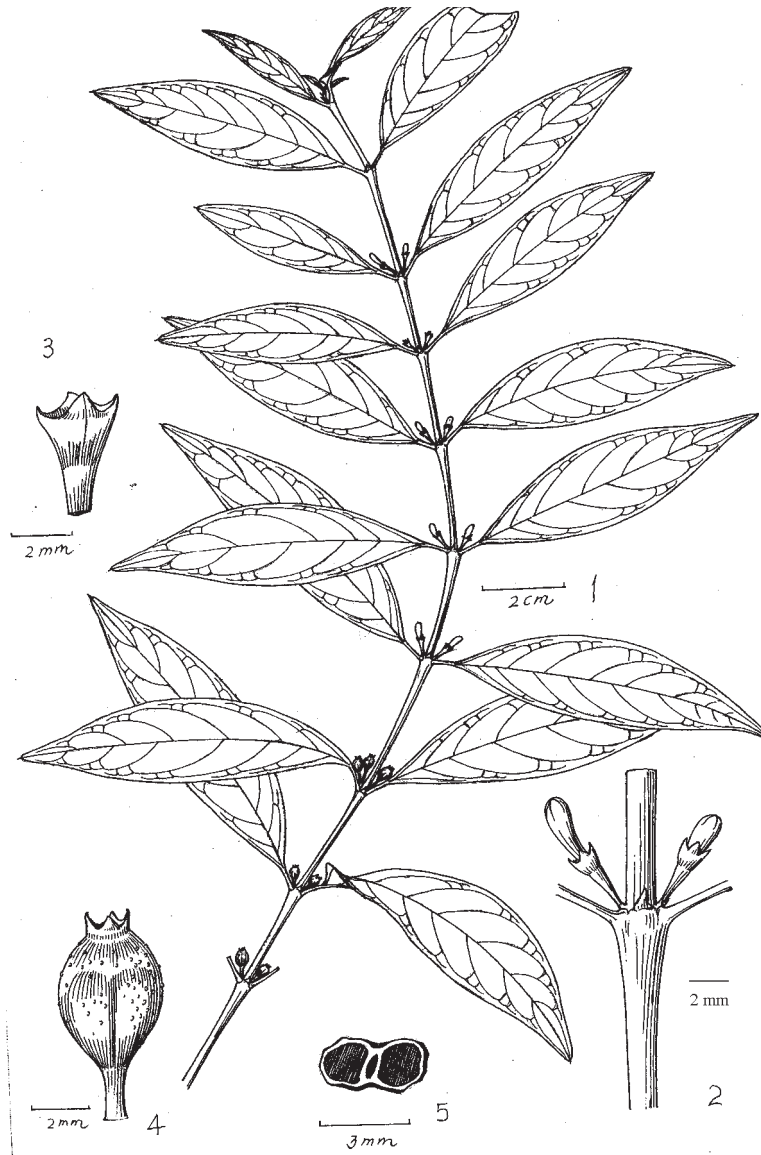


FIGURE 1. *Paralasianthus zhengyanus* H. Zhu. 1. Habit with inflorescences. 2. Enlarged node showing stipule and axillary inflorescence. 3. Calyx with pedicel. 4. Fruit. 5. Cross section of fruit. (from BS 38840 (*M. Ramos* & *G. Endano*) (holotype L). Drawn by Wu Xinning.

4. *Paralasianthus lowianus* (King & Gamble) H. Zhu, *comb. nov.*

Basionym.—*Lasianthus lowianus* King & Gamble (1909: 871). *Saprosma lowiana* (King & Gamble) H. Zhu (2001: 148). *Lasianthus lucidus* King & Gamble (1904: 132), *nom. illeg.*, non Blume (1826). **Lectotype**.—MALAY PENINSULA. Selangor, s.d., *King's College 2840* (L (L 0305973), here designated).

Syntypes.—MALAY PENINSULA. Selangor, *H.N. Ridley 8547* (K!); Malacca, s.d., *A.C. Maingay s.n.* (not seen); Penang, s.d., *C.C. Curtis 946* (K!); Kedah, *H.N. Ridley 5594* (not seen).

Lasianthus virgatus Craib (1933: 28). **Type**.—THAILAND. Trang, s.d. *A.F.G. Kerr 15226* (holotype K! (K 000764000)).

Distribution—South Thailand, Malaysia (Malay Peninsula) and Indonesia (Sumatra).

Notes.—This species has sessile cymes, 2(–3)-pyrenate drupes, and pyrenes somewhat cork-like, thickened on the adaxial side.

5. *Paralasianthus hainanensis* (Merrill) H. Zhu, *comb. nov.*

Basionym:—*Lasianthus hainanensis* Merrill (1922: 355). *Saprosma merrillii* Lo (1993: 15). Type:—CHINA. Hainan, Five Finger Mt., s.d., *F.A. McClure 8569* (holotype not found; isotypes SCBI!, US (00129845))

Distribution—China (Hainan).

Acknowledgements

This research was supported by the National Natural Science Foundation of China (No. 41471051, 41071040, 31170195) and a grant from NWO of the Netherlands (grant no. B 85-340). I am grateful to the National Herbarium of the Netherlands for use of their Herbarium, Library and research facilities. Prof. Richard Corlett helped improve the English of the article. I also thank the anonymous reviewers for their constructive comments on this article.

References

- Baillon, H. (1880) *Histoire des plantes*. Vol. 7. Hachette, Paris, 432 pp.
- Blume, C.L. (1823) *Catalogus van eenige der merkwaardigste zoo in- als uitheemse gewassen, te vinden in 's Lands Plantentuin te Buitenzorg s.l. n.d.*, 51 pp. [unknown publisher]
- Blume, C.L. (1826–1827) *Flora Nederlandsch Indie (Bijdragen)*. Ter Lands Drukkerij, Batavia, pp. 995–1001.
- Boerlage, J.G. (1891) *Handleiding tot de kennis der flora van Nederlandsch Indië*. Vol. 2. Boekhandel en Drukkerij, Leiden, pp. 106–108, 142.
- Bremekamp, C.E.B. (1957) Monographie du genre *Saldinia* A. Rich. (Rubiaceae). *Candollea* 16: 91–129.
- Bremer, B. & Manen, J.-F. (2000) Phylogeny and classification of the subfamily *Rubioideae* (Rubiaceae). *Plant Systematics and Evolution* 225: 43–72.
<http://dx.doi.org/10.1007/BF00985458>
- Craib, W.G. (1933) Contributions to the flora of Siam. Add. 38. *Kew Bulletin* 1933: 18–30.
- Craib, W.G. (1934) *Florae Siamensis Enumeratio*. 2(1). The Bangkok Times Press, Bangkok, pp. 207–220.
- Elmer, A.D.E. (1913) *Leaflets of Philippine Botany*. Vol. 5. Philippine Islands Press, Malina, 1887 pp.
- King, G. & Gamble, J.S. (1904) *Lasianthus* Jack. *Journal of the Asiatic Society of Bengal* 73: 106–133.
- King, G. & Gamble, J.S. (1909) Addend.-Corrig. *Journal of the Asiatic Society of Bengal*. Part 2. *Natural History* 74: 871.
- Korthals, P.W. (1851) *Mephitidia* sect. *Dysosmia* Korthals. *Nederlandsch Kruidkundig Archief. Verslangen en Mededelingen der Nederlandsche Botanische Vereeniging* 2 (2): 217–224.
- Lo, H.S. (1993) Materials for Chinese Rubiaceae (III). *Botanical Journal of South China* 1: 1–17.
- Merrill, E.D. (1922) Noteworthy Philippine Plants XVII. *Philippine Journal of Science* 20: 432.
- Merrill, E.D. (1923) *An Enumeration of Philippine Flowering Plants*. Vol. 3. Bureau of Printing, Malina, 566 pp.
- Miquel, F.A.W. (1859) *Flora van Nederlandsch Indië*. Vol. 2. Van der Post Jr., Amsterdam, pp. 314–326.
- Puff, C. (1992) On the correct tribe position of *Saprosma* Bl. (Rubiaceae). 2nd *Flora Malesiana Symposium*. Progr. & Summ., Yogyakarta, 34 pp.
- Richard, A. & Candolle, A.P. de (1830) *Saldinia*. *Prodromus Systematis Naturalis Regni Vegetabilis*. Vol. 4. Treuttel & Würtz, London, pp. 483–484.
- Ridley, H.N. (1918) New and rare Malayan plants X. *Journal of the Asiatic Society of Straits* 79: 85–86.
- Ridley, H.N. (1923) *The Flora of the Malay Peninsula*. Vol. 2. L. Reeve & Co. LTD., London, pp. 149–169.
- Schumann, K. & Lauterbach, K. (1900) *Die Flora der Deutschen Schutzgebiete in der Südsee*. Verlag Gebrüder Borntraeger, Leipzig, 586 pp.
- Valeton, T. (1909) *Dysosmia dichotoma* Miq. In: *Icones Bogorienses III*. Librairie et Imprimerie, Leiden, pp. 213–216.
- Valeton, T. (1927) Die Rubiaceae von Papuasien. II. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* lxi: 105–111.
- Wong, K.M. (1989) *Lasianthus* Jack. In: Whitmore, T.C. (Ed.) *Tree Flora of Malaya*. Vol. 4. Longman, London, pp. 367–373
- Zhu, H. (2001) A taxonomic revision of the genus *Lasianthus* Jack (Rubiaceae) from Thailand. *Acta Phytotaxonomica Sinica* 39 (2): 116–150.

- Zhu, H. (2002) A revision of the genus *Lasianthus* (Rubiaceae) from China. *Systematics and Geography of Plant* 72: 63–1109.
- Zhu, H, Roos, M.C. & Ridsdale, C.E. (2012) A taxonomic revision of the Malesian species of *Lasianthus* (Rubiaceae). *Blumea* 57: 1–102.
<http://dx.doi.org/10.3767/000651912X652012>

Identification list

The numbers following the collections are the species numbers as given below and in the taxonomic treatment of the species above. Specimens cited here are in Leiden except two where the acronym codes of a herbarium are indicated in brackets.

Paralasianthus:

- | | |
|---------------------------|---------------------------|
| 1 = <i>P. dichotomus</i> | 2 = <i>P. zhengyianus</i> |
| 3 = <i>P. brevipes</i> | 4 = <i>P. lowianus</i> |
| 5 = <i>P. hainanensis</i> | |

- Beusekom *et al.* 3301: 1; 890: 4; 872: 4; 2200: 3—Blume s.n.: 1—Boeea 6209: 4—BW (Indonesia) 13585: 1; BW13574: 1; BW10652: 1; BW10661: 1; BW10680: 1.
- Clemens *et al.* 1218: 1; 1063: 1; 1544: 1.
- Danser 5877: 1—De Vriese s.n.: 1.
- Hallier 350: 1—Hardial *et al.* 373: 4.
- Iwatsuki *et al.* T14605: 4.
- Junghuhn s.n.: 1.
- KEP-FRI series 22139: 4; 0793: 4; 13235: 4; 5655: 3; 023066: 4; 16056: 4;—Kerr 15942: 4—King's collector 2840: 4;—Kostermans 1620: 1; 1047: 1—Krukoff 4077: 4.
- Lörzing 1830: 1—LAE 58698: 1—Larsen *et al.* 46310 (AAU): 1; 46310: 1; 33530: 4; 32822: 4; 45981 (AAU): 4;—Laumonier TFB4317: 1—Ledermann 9552: 1—Lei 539: 5; 852: 5.
- Maxwell 81-136: 4; 77-174: 4.
- NGF41291:1—Niyomdham *et al.* 1430: 3
- Popta 1507: 1—Pullen 1536: 1.
- Ramlan 89: 1—Ramos & Edano 38840: 2.
- Van Royen & Sleumer 5739:1.
- Schlechter 18971: 1; 16951: 1;—Schmutz 5856: 1; 5886: 1—Stone 11055: 4.
- Tagawa *et al.* T4714: 4.
- Van Ooststroom 14062: 1—Verheijen 4781a: 1—Vinas & Nagari UPNG7609: 1.