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A REVISION OF ICHNOCARPUS (APOCYNACEAE)

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SUMMARY

The genus *Ichnocarpus* is revised. A total of 12 species are recognised, of which one new species is described. Three new combinations in *Ichnocarpus* and one in *Anodendron* are made. *Micrechites* and *Lamechites* are treated as synonyms of *Ichnocarpus*. Nomina nuda and species exclusae have been given as well as an index of exsiccatae.

INTRODUCTION

The genus *Ichnocarpus* was first described by R. Brown (1810) based on the species *Apocynum frutescens* L. Unfortunately Brown never made the necessary combination to validate the specific name of *Ichnocarpus frutescens* which was done by W.T. Aiton a year later. Subsequently the number of species described grew rapidly with the exploration of south-eastern Asia. The species of *Ichnocarpus* described from Africa have since all been referred to the Asclepiadaceae.

Ichnocarpus was a conserved name against the earlier name *Quirivelia* Poir. However, the latter name is illegitimate making the *nom. cons.* superfluous.

Micrechites was first described by Miquel in 1857 based on *Tabernaemontana polyantha* Blume from Java. A number of species were then described from the Himalayas, China, South-East Asia and New Guinea. Although there has been difficulty in identifying specimens as either *Ichnocarpus* or *Micrechites*, there have been only a limited number of formal transfers of species between the two. Markgraf (1927) described *Micrechites radicans* based on the type of *Ichnocarpus radicans* Wall. nom. nud., Kerr (1939) transferred *Ichnocarpus pubiflorus* to *Micrechites* and Lý (1986) transferred *Micrechites baillonii* to *Ichnocarpus*. Lý (1986), however, also continued to recognise *Micrechites* and it was Forster (1992) who was the first to unite the two genera, transferring the type species of *Micrechites*, *M. polyantha* (Blume) Miq., to *Ichnocarpus* and making two new combinations in *Ichnocarpus* for the Papuasian species of *Micrechites*. He argued persuasively that there were no characters or suites of characters which could satisfactorily separate the two genera.

Papuechites novoguineensis (K. Schum.) Markgr. was originally described as a species of *Micrechites* (Schumann, 1905). Markgraf (1927) transferred it to his genus *Papuechites* on the basis of its corona. However, examination of the material of this species, and the closely related *Papuechites wariana* (Schltr.) Markgr., show that the so-called corona of both species is actually simply a thickening of the corolla throat and very different from the small clearly defined corona lobes of *Papuechites aambe*

(Warb.) Markgr., the type species of *Papuechites*. The seeds of *Papuechites aambe* also have a long beak reminiscent of the seeds of *Anodendron* which are quite different from the unbeaked seeds of *P. novoguineensis*. Indeed, *Papuechites novoguineensis* shows a remarkable similarity to *Ichnocarpus archboldianus* (Merr. & L.M. Perry) P.I. Forst. Both *P. novoguineensis* and *P. wariana* are transferred to *Ichnocarpus*.

Ichnocarpus has been placed in various groups in different authors' subclassifications of the family. Bentham & Hooker (1876) constructed the tribe Echitideae with the subtribe Ichnocarpeae which contained *Ichnocarpus*, *Apocynum* and *Epigynum*. Later, Hooker (1882) put *Ichnocarpus* in his subtribe Euechitideae with a large number of other genera. Pichon (1950) placed it in the tribe Ichnocarpeae of the subfamily Apocynoideae and Tsiang & Li (1977) in the Ecdysanthereae. Bentham and Hooker (1876) included *Aganosma* within *Ichnocarpus* and divided the genus into three sections with *Ichnocarpus*, as now delimited, as section *Euichnocarpus*. Pichon (1950) suggested each of these sections was a separate genus and placed each in separate tribes of the Apocynoideae. Lý (1986) also proposed a complete subclassification of the Apocynaceae which differs from Pichon's system in a number of ways. Within the Apocynoideae he included the tribes Alstonieae and Holarrheneae, previously included in the Plumerioideae, and altered the other tribes which Pichon recognised quite considerably. However, my studies in the Apocynaceae do not bear out the placement of some of his genera, particularly in his new tribe Anodendreae. He did, however, combine Pichon's Ichnocarpeae and Ecdysanthereae, thereby bringing together *Ichnocarpus* and *Micrechites* into the same tribe, Ichnocarpeae. The classification of the Apocynoideae is still in need of review.

The genus now includes 12 species from Pakistan to Vietnam and from China to Malesia and Northern Australia.

The name *Ichnocarpus* derives from the Greek for vestige and for fruit in reference to the slender follicles of *Ichnocarpus frutescens*.

MATERIALS AND METHODS

Herbarium material was studied from the following herbaria: A, AAU, ABD, B, BH, BK, BKF, BM, BR, BRI, C, CAL, CGE, E, FI, G, GH, IBSC, K, KEP, KUN, L, LAE, LIV, M, MEL, MO, NY, OXF, P, PE, PSU, S, SING, TCD, TI, U, US, W, WAG, Z. The measurements are for dried material except for stamen and ovary characters which are based on flowers which have been rehydrated by boiling in water.

ICHNOCARPUS

Ichnocarpus R. Br., On the Asclepiadeae (1810) 50, a preprint of Mem. Wern. Soc. 1 (1811) 61; G. Don, Gen. Syst. 4 (1837) 78; A. DC., Prod. 8 (1844) 434; Benth. & Hook. f., Gen. Pl. 2 (1876) 717; K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. 4, 2 (1895) 178; Pichon, Mém. Mus. Nat. Hist. Nat. sér. B, Bot. 1 (1950) 102. — *Ichnocarpus* sect. *Euichnocarpus* Benth. & Hook. f., Gen. Pl. 2 (1876) 717. — Type species: *Ichnocarpus frutescens* (L.) W.T. Aiton.

Quirivelia Poir. in Lam., Encycl. 4 (1804) 42, nom. illeg.

Springia Müll. Arg. in Van Heurck, Obs. Bot. Pl. Nov. (1871) 142. — Type species: *Springia indica* Müll. Arg. (= *I. frutescens*).

Otopetalum Miq., Fl. Ind. Bat. 2 (1857) 400. — Type species: *Otopetalum micranthum* Miq. (= *I. serpyllifolius*).

Microchites Miq., Fl. Ind. Bat. 2 (1857) 457; Benth. & Hook. f., Gen. Pl. 2 (1876) 714; K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. 4, 2 (1895) 163; Pichon, Mém. Mus. Nat. Hist. Nat. sér. B, Bot. 1 (1950) 34. — *Microchites* Hook. f., Fl. Brit. India 3 (1882) 670, orth. var. — Type species: *Microchites polyantha* (Blume) Miq. (= *I. polyanthus*).

Lamechites Markgr., Nova Guinea 14 (1926) 290. — Type species: *Lamechites schlechteri* Markgr. (= *I. rhombifolius*).

Woody climbers or scramblers, producing white latex. *Leaves* opposite, those of a pair equal, petiolate; petioles connected by a straight rim around the stem; colleters often present in leaf axils and on rim; blade papery to coriaceous. *Inflorescence* of a terminal and/or axillary elongate rachis bearing sessile or short peduncled cymes (thyrsoid), of small axillary cymes or paniculate; peduncles and pedicels often puberulent, villous or tomentose, more rarely glabrous; bracts ovate. *Flowers* 5-merous, fairly small, actinomorphic, fragrant or not. *Sepal* lobes free; colleters present or absent. *Corolla:* lobes in bud overlapping to the right; consisting of a narrow cylindrical lower tube which then widens very slightly at the point of stamen insertion into the upper tube, somewhat constricted again at the throat or not, throat sometimes thickened inside forming a raised ring; lobes asymmetrical with a slant or projection to the right as viewed from the inside, spreading in mature flower. *Stamens* included in the corolla tube or slightly exserted, attached in a ring to the pistil head; filament short, sometimes with small projections to the sides; anthers elliptic or narrow triangular, apex mucronate or acuminate, base short sagittate and sterile. *Disk* of 5 narrow lobes as long as or longer than the ovary, often somewhat bulging on top, or entire and 5-dentate or 5-crenate, or of 5 wide separate lobes. *Ovary* of 2 separate carpels united into a common style, superior, ovoid, usually pubescent, very rarely glabrous; style glabrous or, rarely, pubescent; base of pistil head more or less spherical or cup-shaped; stigmoid apex a long narrow point or cylindrical. *Fruit* of 2 follicles; slightly spreading or not; linear and narrow or fusiform; longitudinally dehiscent. *Seeds* narrow lanceolate or linear, glabrous and with an apical unbeaked coma.

KEY TO THE SPECIES

1a. Disk lobes free and narrow, 1–2.2 × as long as ovary; base of pistil head globose; anthers appearing elliptic 2
b. Disk entire, 5-lobed or 5-crenate or of 5 separate lobes 0.2–1.1 × as long as ovary; base of pistil head cup-shaped; anthers narrow triangular 4
2a. Stems, leaves and inflorescence densely rufous tomentose; corolla lobes shorter than corolla tube ..... **3. I. fulvus**
b. Stems, leaves and inflorescence glabrous, puberulent or shortly tomentose; corolla lobes longer than corolla tube 3
3a. Leaves elliptic or ovate, < 4.5 × as long as wide; inflorescence 1.5–13 cm long; corolla throat densely villous ..... **2. I. frutescens**
b. Leaves linear-oblong, > 4.5 × as long as wide; inflorescence 0.7–1.5 cm long; corolla throat glabrous or sparsely pubescent ..... **11. I. uliginosus**

4a. Ovary ± glabrous; stems, underside of leaves and inflorescence densely rufous tomentose; China, Vietnam ..... **5. I. jacquetii**
b. Ovary densely pubescent; indumentum variable; widespread 5
5a. Leaves > 25 cm long ..... **6. I. malipoensis**
b. Leaves < 20 cm long 6
6a. Head of corolla in bud much narrower than tube; corolla lobes < 0.6 × as long as tube ..... **10. I. serpyllifolius**
b. Head of corolla in bud as wide as or wider than tube, if narrower only slightly so and then flat topped; corolla lobes > 0.6 × tube length 7
7a. Head of corolla bud wider than tube, rounded; stamens included or exserted in mature flower ..... **9. I. rhombifolius**
b. Head of corolla bud not noticeably wider than tube, ± flat-topped; stamens included 8
8a. Inflorescence thyrsoid; filaments without projections at the sides; throat of corolla without a thick ring; continental Asia to Java ..... **8. I. polyanthus**
b. Inflorescence a loose or congested panicle; filaments with small projections at the sides; throat of corolla with a thickening; New Guinea 9
9a. Corolla tube glabrous outside ..... **1. I. archboldianus**
b. Corolla tube pubescent outside 10
10a. Corolla tube 5.7–6.6 mm long ..... **4. I. grandiflorus**
b. Corolla tube 1.4–4 mm long 11
11a. Inflorescence a loose panicle, not robust; bracts deciduous **7. I. novoguineensis**
b. Inflorescence congested, robust; bracts usually persistent ... **12. I. wariana**

1. Ichnocarpus archboldianus (Merr. & L.M. Perry) P.I. Forst.

Ichnocarpus archboldianus (Merr. & L.M. Perry) P.I. Forst., Austral. Syst. Bot. 5 (1992) 541. — *Micrechites archboldiana* Merr. & L.M. Perry, J. Arnold Arbor. 24 (1943) 214. — Type: *Brass 13401* (A lecto, designated by Forster, 1992; BM, BO, BRI, L, LAE iso), Indonesia, Irian Jaya, 4 km SW of Bernhard Camp, Idenburg River.

Climber. *Branches* puberulent when young, becoming glabrous. *Leaves:* petiole 1–1.5 cm long; blade ovate, elliptic or obovate, 1.8–3.1 × as long as wide, 8.4–16 × 2.5–9 cm, apex long acuminate, base rounded to cuneate; glabrous or sparsely puberulent on midrib beneath; 7–11 pairs of lateral nerves. *Inflorescence* of axillary and terminal panicles; 7.5–17 cm long; peduncle glabrous or sparsely puberulent; pedicels sparsely puberulent, 1.1–1.5 mm long. *Sepals* ovate, apex obtuse to rounded; 1.1–1.4 × as long as wide, 0.9–1.5 × 0.8–1.1 mm; very sparsely puberulent or glabrous, ciliate; no colleters seen. *Corolla* yellow with red lobes; in bud the tube is cylindrical with head about the same width; tube 3–3.4 mm long, glabrous outside, with a thick row of hairs at the throat; lobes 0.8–1 × as long as tube, 2.3–3.1 mm long, glabrous. *Stamens* inserted 1.2–1.3 mm from base, 0.3–0.4 of tube length; filament 0.5–0.7 mm long, with projections at the sides; anthers 3.2–4 × as long as wide, 1.2–1.6 × 0.3–0.5 mm; narrow triangular, apex acuminate, base sagittate; included in the corolla tube. *Disk* of 5 oblong lobes, slightly narrower at the top, 0.8–1 × as long as the ovary, 0.7 mm long. *Ovary* 0.7–0.9 mm long, pubescent; style 0.9 mm long;

pistil head 0.6–0.8 mm long with a cup-shaped base. *Fruit* (immature) fusiform; warty lenticellate; 3.7–8.9 cm long, 4.5–6 mm wide.

Distribution – New Guinea (Irian Jaya; 2 collections).

Habitat & Ecology – The two known collections are from rain forest at 850 m altitude.

2. Ichnocarpus frutescens (L.) W.T. Aiton

Ichnocarpus frutescens (L.) W.T. Aiton, Hort. Kew ed. 2, 2 (1811) 69; Spreng., Syst. Veg. 1 (1824) 635; G. Don, Gen. Syst. 4 (1838) 78; A. DC., Prod. 8 (1844) 435; Miq., Fl. Ind. Bat. 2 (1857) 448; Thwaites, Enum. Pl. Zeyl. (1864) 194; Benth., Fl. Austral. 4 (1869) 315; Kurz, J. As. Soc. Beng. 46 (1877) 256; For. Fl. Burma 2 (1877) 185; Hook. f., Fl. Brit. India 3 (1882) 669; Warb., Fl. Kaiser Wilhelmsland (1889) 407; Coll. & Hemsl., J. Linn. Soc. 28 (1890) 86; Trimen, Handb. Fl. Ceyl. 3 (1895) 142; F.M. Bailey, Queensland Fl. 3 (1900) 994; King & Gamble, J. As. Soc. Beng. 74 (1907) 493; Cooke, Fl. Bombay 2 (1908) 142; Craib, Contr. Fl. Siam (1912) 131; Haines, Bot. Bihar & Orissa (1922) 546; Gamble, Fl. Madras (1923) 820; Ridley, Fl. Mal. Pen. 2 (1923) 364; Markgr., Bot. Jahrb. 61 (1927) 207; Pitard, Fl. Gén. Indo-Chine 3 (1933) 1255; Kerr, Fl. Siam. Enum. 2 (1939) 466; Bakh. f., Blumea 6 (1950) 387; Backer & Bakh. f., Fl. Java 2 (1965) 239; Stewart, Fl. West Pakistan (1972) 564; Huber, Fl. Ceylon 1, 1 (1973) 27; Ramaswamy & Razi, Fl. Bangalore Dist. (1973) 450; Saldanha & Nicolson, Fl. Hassan Dist., Karnataka, India (1976) 435; Tsiang & P.T. Li, Fl. Reip. Pop. Sin. 63 (1977) 225; Chater, Enum. Flow. Pl. Nepal 3 (1982) 83; Streimann, Pl. Upper Watut Watershed P.N.G. (1983) 86; Huber, Fl. Ceylon 4 (1983) 71; Lý, Feddes Repert. 97 (1986) 675; Seshagiri Rao, Fl. Goa, Diu, Daman, Dadra & Nagarhaveli 2 (1986) 257; Singh, Fl. Eastern Karnataka 1 (1988) 403; Elliot & Jones, Encycl. Austral. Pl. 5 (1990) 413; P.T. Li, J. South China Agric. Univ. 11 (1990) 32; P.I. Forst., Austral. Syst. Bot. 5 (1992) 536. — *Apocynum frutescens* L., Sp. Pl. (1753) 213; Willd., Sp. Pl. 1 (1798) 1260. — *Echites frutescens* [Wall., Cat. no. 1674] Roxb., Fl. Ind. 2 (1832) 12. — *Ichnocarpus frutescens* var. *genuina* Kurz, J. As. Soc. Beng. 46 (1877) 256. — *Apocynum crassifolium* Salisb., Prod. (1796) 149, nom. illeg. — Type: Herb. Hermann no. 114, vol. 3, fol. 29 (BM holo; BRI, TCD photos), Sri Lanka.

Gardenia volubilis Lour., Fl. Cochinch. (1790) 148. — *Ichnocarpus volubilis* (Lour.) Merr., Philipp. J. Sci. 21 (1922) 506; Enum. Philipp. Flow. Pl. 3 (1923) 336; Markgr., Nova Guinea 14 (1926) 288; Merr., Pl. Elm. Born. (1929) 255; Trans. Amer. Phil. Soc. n.s. 24, 2 (1935) 313; Kerr, Fl. Siam. Enum. 2 (1939) 468; Backer & Bakh. f., Fl. Java 2 (1965) 240; Lý, Feddes Repert. 97 (1986) 675. — Type: *Loureiro s.n.* (P holo; A photo).

Quirivelia zeylanica Poir. in Lam., Encycl. 6 (1804) 42, nom. illeg.

Tabernaemontana parviflora Poir. in Lam., Encycl. Suppl. 5 (1817) 276. — Type: *Commerson s.n.* in Herb. Desfontaines (FI-W holo; A photo).

Periploca palvalli Dennst., Schlüssel zum Hortus Indicus Malabaricus (1818) 14, 24, 35. — Type: Rheede, Hortus Indicus Malabaricus vol. 9: t. 12.

Echites affinis Roem. & Schult., Syst. Veg. 4 (1819) 393. — *Aganosma affinis* (Roem. & Schult.) G. Don, Gen. Syst. 4 (1837) 77. — *Ichnocarpus affinis* (Roem. & Schult.) K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. 4, 2 (1895) 179. — *Echites caryophyllata* Roth, Nov. Pl. Sp. (1821) 133. — Type: *Heyne* (untraced, probably destroyed in B).

Echites ferruginea Horsf. in Roem. & Schult., Syst. Veg. 4 (1819) 796. — Type: untraced.

Echites bantamensis Blume, Bijdr. (1826) 1040. — *Chonemorpha bantamensis* (Blume) G. Don, Gen. Syst. 4 (1838) 76. — *Ichnocarpus bantamensis* (Blume) Miq., Fl. Ind. Bat. 2 (1857) 449. — *Quirivelia bantamensis* (Blume) Williams, Bull. Herb. Bois. ser. 2, 5 (1905) 949. — Type: *Blume 4514* (L lecto, designated here; U iso), Java.

Echites caudata Blanco, Fl. Filip. (1837) 106; ed. 2 (1845) 77; non L. — Type: not preserved. Merrill (1918) has designated *Merrill Sp. Blanco. 456* (A, K, L, MO, P) from Luzon, Philippines an illustrative example whilst recognising that it is a synonym of *Ichnocarpus frutescens.*

Ichnocarpus ovatifolius A. DC., Prod. 8 (1844) 435; Miq., Fl. Ind. Bat. 2 (1857) 449; Hook. f., Fl. Brit. India 3 (1882) 670; Vidal, Rev. Pl. Vasc. Filip. (1886) 186; Koord., Versl. Bot. Dienstreis Minahasa (1898) 528; Prain, Beng. Pl. (1903) 680; King & Gamble, J. As. Soc. Beng. 74 (1907) 494; Merr., Sp. Blanc. (1918) 313; Haines, Bot. Bihar & Orissa (1922) 546; Ridley, Fl. Mal. Pen. 2 (1923) 364; Pitard, Fl. Gén. Indo-Chine 3 (1933) 1254. — *Ichnocarpus frutescens* (L.) W.T. Aiton var. *ovatifolius* (A. DC.) D.B. Deb, Fl. Tripura State 2 (1983) 18. — Type: *Cuming 1809* (BM lecto, designated here; G, K, MO, OXF, TCD, W iso), Philippines.

Ichnocarpus moluccanus Miq., Fl. Ind. Bat. 2 (1857) 448. — Type: *Zippelius s.n.* (L holo), Indonesia, Timor. This is also the type of *Echites trichonema* Zipp., Linnaea 15 (1841) 324, nom. nud.

Ichnocarpus dasycalyx Miq., Fl. Ind. Bat. 2 (1857) 449. — Type: *Horsfield s.n.* (K lecto, designated here; L, K, U iso), Indonesia, Java.

Ichnocarpus leptodictyus F. Muell., Fragm. 6 (1868) 118. — *Ichnocarpus frutescens* var. *leptodictyus* (F. Muell.) Domin, Bibl. Bot. 89 (1928) 528. — Type: *J. Dallachy s.n.* (MEL lecto, designated by Forster, 1992; BO iso), Australia, Queensland.

Gardenia sinensis Gomes, Mem. Acad. Sci. Lisb. Sl. Sci. Pol. Mer. Bel. n.s. 4, 1 (1868) 28. — Type: *Loureiro s.n.* (P holo).

Springia indica Müll. Arg. in Van Heurck., Obs. Bot. Pl. Nov. (1871) 143. — Type: *Griffith 973* (BM lecto, designated here; E iso), India, Assam.

Ichnocarpus frutescens var. *pubescens* Kurz, J. As. Soc. Beng. 46 (1877) 256; For. Fl. Burma 2 (1877) 185. — Type: untraced.

Ichnocarpus navesii Rolfe, J. Linn. Soc. 21 (1884) 313, nom. nud. — Type: type is that of *Ichnocarpus frutescens* sensu Naves which was probably not preserved. *Ichnocarpus? frutescens?* Naves is accompanied by a picture but is not analysed and is therefore not validly published under Art. 42.2 (ICBN). *Ichnocarpus navesii* Rolfe is simply a nom. nov. for this taxon and carries no description and is also, therefore, invalid.

Ichnocarpus frutescens var. *parvifolia* Hook. f., Fl. Brit. India 3 (1882) 670. — Type: *Wight 1881* (K lecto, designated here; A, BRI, K, L, M, MEL, P, S, W iso), India, Tamil Nadu, Coimbatore.

Carruthersia daronensis Elmer, Leafl. Philipp. Bot. 4 (1912) 1450. — Type: *Elmer 11099* (K lecto, designated here; BO, E, L, Z iso), Philippines, Mindanao, Davao, Todaya, Mt Apo.

Toxocarpus makilingensis Elmer ex Merr., Enum. Philipp. Flow. Pl. 3 (1923) 336, nom. illeg., in synonymy of *Ichnocarpus volubilis* (Lour.) Merr.; Elmer, Leafl. Philipp. Bot. 10 (1939) 3810, in synonymy of *Ichnocarpus ovatifolius* A. DC. — Type: *Elmer 17716* (A, L, S, U, Z), Philippines, Laguna, Los Baños.

Ichnocarpus sogerensis Wernham ex S. Moore, J. Bot. 61, Suppl. (1923) 33. — *Ichnocarpus volubilis* f. *sogerensis* (Wernham ex S. Moore) Markgr., Nova Guinea 14 (1926) 288. — *Ichnocarpus frutescens* f. *sogerensis* (Wernham ex S. Moore) Markgr., Bot. Jahrb. 61 (1927) 207. — Type: *Forbes 944* (BM lecto, designated by Forster, 1992; K iso; A photo & fragment), Papua New Guinea, Sogere.

Ichnocarpus frutescens f. *pubescens* Markgr., Bot. Jahrb. 61 (1927) 208, nom. illeg.; Tsiang, Sunyatsenia 3 (1936) 156; Streimann, Pl. Upper Watut Watershed P.N.G. (1983) 86; Tsiang & P.T. Li, Fl. Reip. Pop. Sin. 63 (1977) 227. — Type: *Schlechter 12771* (untraced, probably destroyed in B).

Micrechites sinensis Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 11 (1931) 215. — Type: *S.S. Sin & Whang 730* (untraced).

Ichnocarpus oxypetalus Pitard, Fl. Gén. Indo-Chine 3 (1933) 1256. — Type: *Poilane 119* (P lecto, designated here; A, P iso), Vietnam, Phan-ri, Song-long-song.

Ichnocarpus microcalyx Pitard, Fl. Gén. Indo-Chine 3 (1933) 1254; Kerr, Fl. Siam. Enum. 2 (1939) 467. — Type: *Pierre 4469* (P holo), Thailand, Phetchaburi.

Climber or trailing shrub to 20 m. *Branchlets* glabrous, puberulent only around nodes, puberulent all over or shortly tomentose, frequently becoming glabrous and

sparsely lenticellate with age. *Leaves:* petiole glabrous, puberulent or tomentose, 4.5–29 mm long; blade elliptic or ovate, rarely obovate, 1.3–4.4 × as long as wide, 1.3–15 × 0.4–8.5 cm, apex usually short acuminate, more rarely acute or obtuse, base cuneate to rounded; papery or subcoriaceous; puberulent only on midrib beneath, sparsely to densely tomentose all over beneath and sparsely so above or glabrous; 4–8 pairs of lateral nerves. *Inflorescences* axillary and terminal; 0.8–17 cm long; peduncle and pedicels puberulent or short tomentose, more rarely glabrous; bracts ovate, deciduous; pedicels 1–5 mm long. *Sepals* ovate, apex acute or, more rarely, acuminate or obtuse; 1.1–3.7 × as long as wide, 0.6–2.4 × 0.3–1.1 mm; puberulent or almost glabrous; often appearing somewhat urceolate; colleters few or absent. *Corolla* white or yellow, sometimes with a darker centre; tube 2–4 mm long, outside glabrous to densely puberulent, glabrous or pubescent inside in upper part of tube; lobes 1–2.2 × as long as the tube, 2.6–6.2 mm long, ciliate, outside glabrous or puberulent on that part exposed in bud, villous at tube throat. *Stamens* inserted 0.9–1.7 mm from base, 0.4–0.7 of tube length; filaments 0.2–0.5 mm long, anthers 2.2–4 × as long as wide, 0.9–1.7 × 0.3–0.5 mm; elliptic, apex mucronate, base short sagittate; included in corolla tube. *Disk* lobes narrow, separate, 1–2.2 × as long as ovary, 0.5–1 mm long, slightly bulging on top. *Ovary* 0.3–0.7 mm long, pubescent; style 0.4–1.7 mm long; pistil head 0.7–1.8 mm long with a globular base. *Fruit* tomentose, sometimes becoming glabrous; 0.5–17.1 cm long, 1–5 mm wide. *Seeds* elliptic or linear; 0.7–2.6 cm long, 0.8–2 mm wide; coma fawn, cream or white, 1.8–3.8 cm long.

Distribution – From approximately 860 collections studied: Pakistan (Khaipur), India (Andhra Pradesh, Assam, Bihar, Delhi, Goa, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Orissa, Punjab, Tamil Nadu, Uttar Pradesh, West Bengal, Nicobar Islands), Nepal, Bhutan, Bangladesh, Sri Lanka, Burma, China (Yunnan, Guangxi, Guizhou, Guangdong, Hainan, Hong Kong), Thailand, Vietnam, Laos, Cambodia, Malaysia (Peninsular and Bornean), Indonesia (Aru, Buru, Flores, Halmahera, Irian Jaya, Java, Kalimantan, Seram, Sulawesi, Sumatra, Sumbawa, Tanimber, Timor, Wetar), Philippines (Bohol, Busuanga, Leyte, Luzon, Masbate, Mindanao, Mindoro, Negros, Palawan, Panay), Papua New Guinea (including New Britain and New Ireland), Australia (Queensland, Northern Territory, Western Australia).

Habitat & Ecology – This species grows in a wide variety of habitats, most often in moist to dry evergreen or deciduous forest but also sometimes in thorn scrub or as a ground cover creeper in open areas.

3. Ichnocarpus fulvus Kerr

Ichnocarpus fulvus Kerr, Kew Bull. 1937 (1937) 91; Fl. Siam. Enum. 2 (1939) 467. — Type: *Marcan 1361* (K lecto, designated here; K iso), Thailand, Si Racha, Chon Buri.

Climber or trailing shrub. *Branchlets* densely brown tomentose. *Leaves:* petiole tomentose, 2.5–9 mm long; blade elliptic, ovate or oblong, 2.2–3.6 × as long as wide, 3.5–10.6 × 1.6–4.3 cm, acuminate or, rarely, rounded at the apex, rounded or weakly cordate at the base; papery; densely tomentose beneath, tomentose above,

becoming glabrous; 5–10 pairs of lateral nerves. *Inflorescences* terminal and axillary; 1–3 cm long; peduncle and pedicels tomentose; bracts ovate, often persistent during flowering; pedicels 1.6–3.5 mm long. *Sepals* ovate, apex obtuse or rounded, rarely acute; 1.2–2 × as long as wide, 1.7–3 × 1–1.8 mm; tomentose; no colleters seen. *Corolla* white or yellow; tube 2.6–3.5 mm long, outside puberulent or glabrous, glabrous in throat and glabrous inside; lobes 0.6–0.9 × as long as the tube, 1.8–2.8 mm long, glabrous or puberulent outside on that part of the lobes exposed in bud. *Stamens* inserted at 1.2–1.6 mm from the base, 0.4–0.6 of tube length; filaments 0.2–0.4 mm long; anthers 1.9–2.3 × as long as wide, 1.5–1.8 × 0.7–0.8 mm, elliptic, apex mucronate, base short sagittate; included in the corolla tube. *Disk* 1.2–1.6 × as long as the ovary, 0.7–0.9 mm long. *Ovary* 0.5–0.6 mm long, pubescent; style 0.4–0.5 mm long; pistil head 1.7–2.4 mm long with a globular base. *Fruits* glabrous; lenticellate; sometimes somewhat torulose; 5.7–19 cm long, 3.6 mm wide. *Seeds* elliptic, glabrous; 18 mm long, 3 mm wide; coma cream, 2–3 cm long.

Distribution – SE Thailand (from 8 collections studied).

Habitat & Ecology – Climber in deciduous or evergreen forest or trailing in open areas. Fl. Feb.–Sept.; fr. Jan.

4. **Ichnocarpus grandiflorus** D.J. Middleton, *spec. nov.*

Similis *Ichnocarpus novoguineensis* sed inflorescentia robustiore, floribus flavidis et notabiliter majoribus. Frutex scandens. Rami tomentosi. Folia ovata, apice acuminata et basi obtusi, 9.1–14.1 cm longa et 5.5–8.7 cm lata. Inflorescentia robusta, 10.5–17 cm longa. Corolla flavida, tubus 5.7–6.6 mm longus, lobi 4.6–5 mm longi. — Typus: *Brass 28217* (L holo; K iso), Papua New Guinea, Sudest Island, Rambuso.

Climbing shrub. *Branches* densely tomentose with longer hispid hairs. *Leaves:* petiole tomentose, 1.6–2.6 cm long; blade ovate, 1.3–1.7 × as long as wide, 9.1–14.1 × 5.5–8.7 cm, apex acuminate, base obtuse; subcoriaceous; densely tomentose beneath, becoming glabrous above; 10–13 pairs of lateral nerves. *Inflorescences* terminal and axillary forming a panicle; 7.1–12 cm long; tomentose with longer hispid hairs; pedicels 2–2.6 mm long. *Sepals* ovate, apex obtuse; 1.9 × as long as wide, 3 × 1.6 mm; densely tomentose; no colleters seen. *Corolla* yellow; in bud tube cylindrical with head about the same width; tube 5.7–6.6 mm long, outside densely pubescent, pubescent in throat and inside; lobes 0.8 × as long as the tube, 4.6–5 mm long, densely pubescent on part of lobes exposed in bud. *Stamens* inserted at c. 2.1 mm from base, c. 0.3 of tube length; filaments 0.9 mm long, with projections from the side; anthers 5.6 × as long as wide, 3.9 × 0.7 mm, narrow triangular, apex acuminate, base sagittate; included in the corolla tube. *Disk* of 5 oblong lobes; 0.6 × as long as the ovary, 0.6 mm long. *Ovary* 1 mm long, pubescent; style 1.8 mm long; pistil head 1 mm long, base cup shaped. *Fruit* unknown.

Distribution – Papua New Guinea.

Note – This species is undoubtedly closely related to *Ichnocarpus novoguineensis* from which it is easily distinguished by its very much larger flowers. It is so far known only from the type collection.

5. Ichnocarpus jacquetii (Pierre ex Spire) D.J. Middleton

Ichnocarpus jacquetii (Pierre ex Spire) D.J. Middleton, Novon 4 (1994) 152. — *Micrechites jacquetii* Pierre ex Spire, Contr. Apocyn. (1905) 48; Pitard, Fl. Gén. Indo-Chine 3 (1933) 1258. — Type: *Spire 5* (P lecto, designated here; K, P iso), Laos.

Ichnocarpus oliganthus Tsiang, Sunyatsenia 3 (1936) 156. — Type: *F. C. How 73570* (IBSC lecto, designated here; A, BM, G, P iso), China, Hainan, Po-ting.

Climber. *Branches* densely rufous tomentose. *Leaves:* petiole rufous tomentose, 0.5–1.6 cm long; blade elliptic to ovate, 1.5–2.8 × as long as wide, 4.3–7.2 × 1.6–3.2 cm, apex acuminate to acute, base cuneate to rounded; coriaceous; densely tomentose beneath, sparsely so above; 6–8 pairs of lateral nerves. *Inflorescence* axillary; 1.5–5 cm long; peduncle and pedicels densely tomentose. *Sepals* ovate, apex acute; 2.5–3 × as long as wide, 2–3 × 0.8–1 mm; tomentose; colleters present. *Corolla* red; tube 3–4 mm long, outside glabrous, pubescent inside; lobes 0.7–1 × as long as tube, 3 mm long, glabrous outside, pubescent at throat inside. *Stamens* inserted at 2 mm from base, 0.5 of tube length; anthers subsessile, 2.2–5 × as long as wide, 1.1–2 × 0.4–0.5 mm; narrow triangular, apex acuminate, base sagittate; included in the tube. *Disk* of 5 separate lobes, 0.5–0.7 × as long as the ovary, 0.2–0.4 mm long. *Ovary* 0.4–0.6 mm long, glabrous; style 0.9 mm long; pistil head 0.4–0.7 mm long with a cup-shaped base. *Fruit* densely brown tomentose; 10–19.5 cm long, 4.5–5.2 mm wide. *Seeds* linear, 12–17.5 mm long, 1–1.8 mm wide; coma fawn, 3.3 cm long.

Distribution – China (Hainan), Vietnam, Laos; 3 collections studied.

Note – I have seen this species represented only by three collections. The type of *Micrechites jacquetii* bears only fruit and the type of *Ichnocarpus oliganthus* has very few flowers, being largely a fruiting specimen. Therefore the description is somewhat narrow and further collections are needed for a fuller description. Two more collections were given in the original description of *I. oliganthus* but I have been unable to obtain these specimens.

6. Ichnocarpus malipoensis (Tsiang & P.T. Li) D.J. Middleton

Ichnocarpus malipoensis (Tsiang & P.T. Li) D.J. Middleton, Novon 4 (1994) 152. — *Micrechites malipoensis* Tsiang & P.T. Li, Acta Phytotax. Sin. 11 (1973) 381; Fl. Reip. Pop. Sin. 63 (1977) 192. — Type: *Feng 13377* (PE holo, n.v.; A iso), China, Yunnan, Ma-Li-Po, Tung-Ting.

Branches sparsely puberulent, becoming glabrous. *Leaves:* petiole glabrous, 1.1–1.3 cm long; blade oblong, 4–4.2 × as long as wide, 28–30 × 6.7–7.5 cm, apex caudate, base cuneate; papery; glabrous; 17–20 pairs of lateral nerves. *Inflorescence* axillary; 1.5–3 cm long; peduncle puberulent; pedicels puberulent, 2.5–3.2 mm long. *Sepals* ovate, apex acute; 1.9–2 × as long as wide, 2.2–2.5 × 1.1–1.3 mm; very sparsely puberulent; colleters present. *Corolla* in bud with cylindrical tube and a slightly wider head; tube 6–6.5 mm long, glabrous outside, pubescent inside; lobes 0.8–1.1 × as long as the tube, 5–7.2 mm long, outside glabrous, densely pubescent in tube throat. *Stamens* inserted at 2 mm from base, 0.3 of tube length; anthers subsessile, 4.4 × as long as wide, 3.1 × 0.7 mm, narrow triangular, apex acuminate, base sagittate; included in the corolla tube. *Disk* entire with 5 thick lobes, 0.5 × as long as ovary, 0.7

mm long. *Ovary* 1.4 mm long, pubescent; style 1.1 mm long; pistil head 0.8 mm long with a cup-shaped base. *Fruit* unknown.

Distribution – China (Yunnan).

Note – This species would appear to be closely related to *I. polyanthus* from which it differs primarily in the very much larger leaves and flowers, the fewer flowered inflorescence and the papery leaves. It is only known from the type collection.

7. **Ichnocarpus novoguineensis** (K. Schum.) D.J. Middleton, *comb. nov*

Micrechites novoguineensis K. Schum. in K. Schum. & Laut., Nachtr. Fl. deutsch. Schutzgeb. Südsee (1905) 350. — *Papuechites novoguineensis* (K. Schum.) Markgr., Bot. Jahrb. 61 (1927) 210. — Type: *Schlechter 14609* (untraced, probably destroyed in B). Neotype: *Schlechter 16928* (A neo; BM, BRI, G, L, MO iso), Papua New Guinea, Madang Province, Djamu River.

Ichnocarpus xanthogalax Schltr., Kautschukexp. Kaiser Wilhelmsland (1911) 126. — Type: No type was given in the original publication and there does not appear to be an extant specimen indicated as such. Markgraf (1927), however, made this a synonym of *Papuechites novoguineensis* and reported that he had Schlechter's agreement on this.

Climber. *Branches* tomentose with longer hispid hairs, often becoming glabrous. *Leaves:* petiole 0.5–2 cm long; blade ovate to elliptic, 1.3–3.3 × as long as wide, 3.7–12.6 × 1.7–8.7 cm, apex acuminate, rarely to obtuse, base obtuse to weakly cordate; tomentose above and beneath, tomentose beneath and glabrous above or, rarely, glabrous on both surfaces; 7–15 pairs of lateral nerves. *Inflorescence* of terminal and axillary panicles; 3.4–14.7 cm long; peduncle tomentose; pedicels tomentose, 0.8–4.5 mm long. *Sepals* ovate, apex obtuse or rounded; 1.1–2.2 × as long as wide, 0.9–1.8 × 0.5–1.2 mm; sparsely to densely tomentose or puberulent. *Corolla* pink; in bud the tube is cylindrical and the head about the same width; tube 1.4–4 mm long, outside densely pubescent, rarely sparsely so, pubescent to glabrous in throat and inside tube; lobes 0.7–1.4 × as long as tube, 2–3.8 mm long, outside pubescent on parts exposed in bud. *Stamens* inserted at 0.7–1.7 mm from base, 0.3–0.4 of tube length; filaments with projections at the sides; anthers 3–4.3 × as long as wide, 1.2–1.7 × 0.3–0.5 mm; narrow triangular, apex acuminate, base sagittate; included in corolla tube. *Disk* of 5 elliptic or oblong lobes; 0.6–1.1 × as long as ovary, 0.3–1 mm long. *Ovary* 0.5–1.2 mm long, pubescent; style 0.7–1.1 mm long; pistil head 0.5–1.2 mm long with a cup-shaped base. *Fruit* fusiform; weakly tomentose; 3.2–4.7 cm long, 1.3–1.8 cm wide. *Seed* 8–9 mm long, 3.7–4.4 mm wide; coma brownish, 1–2 cm long.

Distribution – Papua New Guinea (Central, Madang, Milne Bay and Morobe Provinces); 8 collections studied.

Habitat & Ecology – In forest to 1000 m altitude.

Note – The specimen cited by Forster (1992) as being a taxon of uncertain status (*Henty NGF 16964*) belongs to this species.

8. **Ichnocarpus polyanthus** (Blume) P.I. Forst.

Ichnocarpus polyanthus (Blume) P.I. Forst., Austral. Syst. Bot. 5 (1992) 544. — *Tabernaemontana polyantha* Blume, Bijdr. (1826) 1029. — *Micrechites polyantha* (Blume) Miq., Fl. Ind. Bat. 2 (1857) 457; Hook. f., Fl. Brit. India 3 (1882) 671; Tsiang, Sunyatsenia 2 (1934) 126; Backer &

Bakh. f., Fl. Java. 2 (1965) 234; Tsiang & P.T. Li, Fl. Reip. Pop. Sin. 63 (1977) 194. — Type: *Blume s.n.* (L, sh 898.111-50, lecto, designated by Forster, 1992; L, P iso), Java.

Micrechites radicans Markgr., Bot. Jahrb. 61 (1927) 205. — Type: *Wallich 1676* (K-WALL lecto, designated here; K iso), India.

Micrechites elliptica Hook. f., Fl. Brit. India 3 (1882) 671. — Type: *Hooker & Thomson s.n.* (K lecto, designated here; BM, G, GH, L, TCD iso), India, Meghalaya, Khasia Hills.

Ichnocarpus pubiflorus Hook. f., Fl. Brit. India 3 (1882) 670. — *Micrechites pubiflora* (Hook. f.) Kerr, Fl. Siam. Enum. 2 (1939) 462. — Type: *Griffith s.n.* (K lecto, designated here; CGE, M, P iso), India, Meghalaya, Khasia Hills.

Micrechites baillonii Pierre, Rev. Cult. Col. 11 (1902) 229; Spire, Contr. Apocyn. (1905) 48; Pitard, Fl. Gén. Indo-Chine 3 (1933) 1260. — *Ichnocarpus baillonii* (Pierre) Lý in Fedde, Repert. 97 (1986) 675. — Type: *Balansa 2084* (P lecto, designated here; G, K iso), Vietnam, Hanoi, Mont Bavi.

Micrechites elliptica var. *scortechinii* King & Gamble, J. As. Soc. Beng. 74 (1907) 505. — *Micrechites scortechinii* (King & Gamble) Ridley, J. Roy. As. Soc. Str. Br. 79 (1918) 95; Fl. Mal. Pen. 2 (1923) 368. — Type: *Scortechini s.n.* (K holo), Malaysia, Perak.

Micrechites ferruginea Pitard, Fl. Gén. Indo-Chine 3 (1933) 1260; Lý, Feddes Repert. 97 (1986) 673. — Type: *Poilane 1894* (HM iecto, n.v., designated by Lý, 1986; P iso), Laos, Sam-neua Province, Muong-pun.

Micrechites lachnocarpa Tsiang, Bull. Fan Mem. Inst. Biol. Peiping, Bot. ser. 9 (1939) 22; Tsiang & P.T. Li, Fl. Reip. Pop. Sin. 63 (1977) 189; Lý, Feddes Repert. 97 (1986) 673. — Type: *Wang 79164* (IBSC holo; A iso), China, Yunnan, Che-li, Jah-Leei.

Micrechites rehderiana Tsiang, Bull. Fan Mem. Inst. Biol. Peiping, Bot. ser. 9 (1939) 23; Tsiang & P.T. Li, Fl. Reip. Pop. Sin. 63 (1977) 194. — Type: *Tsang 22409* (SYS holo, n.v.; A iso).

Ichnocarpus himalaicus T. Yamaz., J. Jap. Bot. 46, 2 (1971) 49; Chater, Enum. Flow. Pl. Nepal 3 (1982) 83. — Type: *Hara et al. 10196* (TI holo; BM, TI iso), Nepal, Ghatte-Khebang.

Micrechites malipoensis var. *parvifolia* Tsiang & P.T. Li, Acta Phytotax. Sin. 11 (1973) 383. — Type: *Feng 22691* (KUN holo), China, Yunnan, Ma-Li-Po.

Branches glabrous or puberulent, becoming glabrous. *Leaves:* petiole glabrous or, rarely, with a few small hairs, 0.3–2.1 cm long; blade elliptic, rarely obovate, 1.6–4.2 × as long as wide, 1.7–17.2 × 0.8–6.1 cm, apex sharp acuminate to caudate, rarely to rounded, base cuneate, rarely to rounded; coriaceous; mostly glabrous, sometimes very sparsely puberulent on midrib beneath or all over beneath; 6–21 pairs of lateral nerves. *Inflorescence* axillary and terminal; 1–16.5 cm long; peduncle glabrous to tomentose; pedicels glabrous to tomentose, 1–3.5 mm long. *Sepals* ovate to oblong, apex acute to rounded; 1.1–3 × as long as wide, 1–3.4 × 0.7–1.5 mm; glabrous to tomentose; colleters present. *Corolla* yellow or white; in bud the tube is cylindric and the head not much wider, not very constricted at throat; tube 2–4.6 mm long, outside glabrous or, rarely, very sparsely puberulent, inside pubescent; lobes 0.74–1.7 × as long as tube, 2–7.2 mm long, outside glabrous, densely pubescent in tube throat. *Stamens* inserted 0.7–1.6 mm from base, 0.2–0.5 of tube length; anthers subsessile, 3.5–9 × as long as wide, 1.5–2.9 × 0.2–0.6 mm, narrow triangular, apex acuminate, base sagittate; included in the corolla tube. *Disk* entire with 5 thick lobes; 0.2–0.5 × as long as the ovary, 0.2–0.5 mm long. *Ovary* 0.6–1.4 mm long, pubescent; style 0.3–1.3 mm long, glabrous or pubescent; pistil head 0.5–1.3 mm long with a cup-shaped base. *Fruit* villous to glabrous; 10–27 cm long, 2.3–7 mm wide. *Seed* 1.9–2.5 cm long, 2.1–5 mm wide; coma 2.3–3.2 cm long.

Distribution – India (Assam, Meghalaya, Sikkim), Nepal, Bhutan, Burma, China (Yunnan, Hainan, Guangxi), Thailand, Vietnam, Laos, Malaysia (Kedah), Indonesia (Java, Sumatra); approx. 110 collections studied.

Notes – 1. This species is extremely variable particularly in leaf shape and size and in indumentum. There is a large overlap in combinations of these characters and any separation into species or taxa of infraspecific rank would be largely artificial.

2. *Micrechites radicans* Markgr. may be a youth form of this species. Youth forms are known in *I. serpyllifolius* and in *I. rhombifolius* but are not commonly reported in *I. polyanthus*.

9. Ichnocarpus rhombifolius (Markgr.) D.J. Middleton, *comb. nov.*

Micrechites rhombifolia Markgr., Bot. Jahrb. 61 (1927) 206. — Type: *Ledermann 10411* (L lecto, B specimen destroyed), Papua New Guinea, West Sepik Prov.

Micrechites rhombifolia var. *lanceolata* Markgr., Bot. Jahrb. 61 (1927) 206. — Type: *Ledermann 7200* (L lecto, designated here, B specimen destroyed; SING iso), Papua New Guinea, West Sepik Prov.

Lamechites schlechteri Markgr., Nova Guinea 14 (1926) 290, t. 32; Bot. Jahrb. 61 (1927) 212. — Type: *Schlechter 17266* (A lecto, designated here; BM, BRI, G, K, L, S iso), Papua New Guinea, Madang Prov., Minjem Tor.

Ichnocarpus salomonensis C.T. White, J. Arnold Arbor. 31 (1950) 112. — Type: *Walker & White BSIP 117* (BRI lecto, designated by Forster, 1992; A, CANB, K, L iso), Solomon Islands, Malaita, near Heho River.

Ichnocarpus serpyllifolius auct. non (Blume) P.I. Forst., quoad specimen.

Climber to 40 m. *Branchlets* puberulent or, rarely, tomentose, usually becoming glabrous with age. *Leaves:* petiole glabrous or puberulent, 0.4–2.5 cm long, blade orbicular, obovate or elliptic, 1.1–3.6 × as long as wide, (1.2–)1.6–11 × 0.6–6.2 cm; apex rounded to short blunt acuminate, base cuneate, rarely obtuse; coriaceous; tomentose, puberulent or glabrous above and beneath; 5–13 pairs of lateral nerves. *Inflorescence* axillary and terminal; 1–13 cm long; peduncle puberulent to densely pale tomentose; pedicels pale tomentose, 1–6 mm long. *Sepals* oblong, obtuse to rounded; 0.7–1.8 × as long as wide, 0.7–4.3 × 0.9–2.4 mm; tomentose; many colleters. *Corolla* cream; in bud tube narrow with a large rounded head; tube 2.4–7.5 mm long, outside glabrous or pubescent, densely pubescent at tube throat; lobes 1–1.7 × as long as tube, 2.5–7.5 mm long, outside glabrous or puberulent on part exposed in bud, inside pubescent at base and in throat. *Stamens* inserted 1.7–3 mm from base, 0.4–0.7 of tube length; anthers subsessile, 3.7–8.3 × as long as wide, 2–2.7 × 0.3–0.6 mm, narrow triangular, apex acuminate, base sagittate; included or exserted. *Disk* entire, 5-lobed, 0.2–0.6 × as long as ovary, 0.3–0.7 mm long. *Ovary* 0.7–1.2 mm long, pubescent; pistil head 0.7–1.3 mm long with a cup-shaped base. *Fruit* glabrous to tomentose; 8.4–30 cm long, 2.8–20 mm wide. *Seeds* linear; 2 cm long, 1.4 mm wide; coma fawn, 2.9–3 cm long.

Distribution – Indonesia (Aru, Bacan, Buru, Irian Jaya, Seram, Sulawesi), Papua New Guinea (including New Britain and Bougainville), Solomon Islands (Guadalcanal, San Cristobal, Malalta, Tetipari, Rendova), Australia (Queensland); approx. 70 collections studied.

Note – This species has been included in *Ichnocarpus serpyllifolius* (Blume) P.I. Forst. by Forster (1992). He described the marked dimorphism of the immature and canopy foliage observed in Australia and in Malesia and agreed with Kostermans (Reinwardtia 5, 1960, 246) that the younger form, originally described by Blume as

Ficus serpyllifolia, was conspecific with the more familiar and fertile mature form. Blume's *Ficus serpyllifolia* is described from Javanese material and it is indeed impossible to tell West Malesian and Papuasian immature material apart. However, the mature fertile material is quite markedly different. The most clear difference is in the corolla lobes which are very small in the western Indonesian, Malay and Thai material and as long as to much longer than the corolla tube in all the material from Seram eastwards. Also the Papuasian material appears very different in bud. The buds of the western material have a somewhat inflated tube and a very small, almost inconspicuous head. The buds of the Papuasian material have a narrower tube and a large, quite noticeable head. Forster (1992) has warned against the use of corolla tube swelling as a taxonomic character from dried material but it is a general and consistent observation which can be made in the material of this group. The other flower parts tend to be larger in the Papuasian material although there is a large overlap. The scant Sulawesi material appears to belong to both species although in this case it then becomes difficult to assign the immature material to one or the other.

10. Ichnocarpus serpyllifolius (Blume) P.I. Forst.

Ichnocarpus serpyllifolius (Blume) P.I. Forst., Austral. Syst. Bot. 5 (1992) 539, quoad comb. — *Ficus serpyllifolia* Blume, Bijdr. 1 (1825) 443. — *Micrechites serpyllifolia* (Blume) Kosterm., Reinwardtia 5 (1960) 246. — Type: *Blume s.n.* (L, sh 908.188-2695, lecto; BO, L iso), Java.

Otopetalum micranthum Miq., Fl. Ind. Bat. 2 (1857) 400. — *Micrechites micrantha* (Miq.) Hallier, Jahrb. Hamb. Wiss. Anst. 17 (1900) 156; Backer & Bakh. f., Fl. Java 2 (1965) 234. — Type: unknown collector (U, 53765, holo), Java.

Ecdysanthera schrieckii Van Heurck & Müll. Arg. in Van Heurck, Obs. Bot. Pl. Nov. (1871) 191. — *Micrechites schrieckii* (Van Heurck & Müll. Arg.) Rolfe, J. Bot. 23 (1885) 214; Merr., Enum. Philipp. Flow. Pl. 3 (1923) 332; Tsiang, Sunyatsenia 2 (1934) 126. — Type: *Cuming 910* (K lecto, designated here; A, BM, CGE, E, G, K, L, M, MEL, MO, P, W iso), Philippines, Luzon.

Micrechites polyantha auct. non Miq.: King & Gamble, J. As. Soc. Beng. 74 (1907) 504.

Trachelospermum philippinense Elmer, Leafl. Philipp. Bot. 2 (1908) 488. — Type: *Elmer 9135* (K lecto, designated here; A, E, G, MO, W, Z iso), Philippines, Luzon, Tabayas Prov., Lucban.

Micrechites furcata Ridley, J. Roy. As. Soc. Str. Br. 79 (1918) 95; Fl. Mal. Pen. 2 (1923) 368. — Type: *King's collector 8859* (K lecto, designated here; BM, K iso), Malaysia, Perak, Bernam River.

Micrechites tenuifolia Ridley, J. Roy. As. Soc. Str. Br. 79 (1918) 96; Fl. Mal. Pen. 2 (1923) 369. — Type: *Maingay 3394* (K holo), Malay Peninsula.

Micrechites brachypetala Ridley, J. Roy. As. Soc. Str. Br. 79 (1918) 96; Fl. Mal. Pen. 2 (1923) 368. — Type: *Curtis 850* (K lecto, designated here; BM, SING iso), Malay Peninsula.

Branchlets sparsely villous, puberulent or glabrous, becoming glabrous with age; often sparsely lenticellate. *Leaves:* petiole glabrous or puberulent, (0.4–)0.6–1.6 cm long; blade orbicular, elliptic or obovate, 1.1–3.3 × as long as wide, (0.6–)3–11.5 × (0.3–)1–5.6 cm, apex usually short blunt acuminate, sometimes obtuse or rounded, base cuneate to rounded; coriaceous, rarely subcoriaceous; very sparsely puberulent on midrib beneath, sparsely puberulent all over beneath, completely glabrous or, rarely, sparsely villous beneath; 5–16 pairs of lateral nerves. *Inflorescence* axillary and terminal; 1.2–12 cm long; peduncle tomentose or puberulent, rarely glabrous; pedicels tomentose or puberulent, 0.4–2.1 mm long. *Sepals* ovate, apex obtuse to

rounded; 0.7–2 × as long as wide, 0.8–1.5 × 0.6–1.1 mm; tomentose or puberulent; colleters few or many. *Corolla* cream; in bud tube somewhat inflated and with a small narrow head; tube 2.1–5 mm long, outside glabrous or rarely puberulent, pubescent inside in upper part of tube; lobes 0.3–0.6 × as long as the tube, 0.7–2.1 mm long, outside glabrous or rarely puberulent, densely pubescent in tube throat. *Stamens* inserted 1.2–2.3 mm from base, 0.4–0.6 of tube length; anthers subsessile, 3.6–5.3 × as long as wide, 1.3–2.5 × 0.3–0.7 mm, narrow triangular, apex acuminate, base sagittate; included in the corolla tube or very slightly exserted. *Disk* entire, broadly 5-lobed, 0.2–0.5 × as long as ovary, 0.2–0.5 mm long. *Ovary* 0.6–1.2 mm long, pubescent; style 0.5–1.2 mm long; pistil head 0.6–1 mm long with a cup-shaped base. *Fruit* glabrous; 1.8–7.2 cm long, 2.5–5.6 mm wide. *Seeds* linear; 1.2–2.9 cm long, 1.3–2.3 mm wide; coma fawn, 1.8–4.6 cm long.

Distribution – Thailand (Peninsular), Malaysia (Peninsular and Bornean), Singapore, Indonesia (Java, Sumatra, Kalimantan, Sulawesi), Philippines (Basilan, Leyte, Luzon, Mindanao); approx. 85 collections studied.

Habitat & Ecology – Climber in forest to 1300 m altitude.

11. Ichnocarpus uliginosus Kerr

Ichnocarpus uliginosus Kerr, Kew Bull. 1937 (1937) 92; Fl. Siam. Enum. 2 (1939) 467. — Type: *Kerr 2979* (K lecto, designated here; BM, E, K, L, MO, P, SING, TCD iso), Thailand, Kamphaeng Phet, Khao Padang.

Branchlets puberulent. *Leaves:* petiole glabrous or sparsely puberulent, 1.2–2.3 mm long; blade linear-oblong, 4.8–6.7 × as long as wide, 1.7–8.5 × 0.3–1.3 cm, apex acute, base cuneate; papery; glabrous or puberulent at the base beneath; 4–6 pairs of lateral nerves. *Inflorescences* axillary and terminal, 0.7–1.5 cm long; peduncle and pedicels short tomentose; bracts narrow ovate, persistent during flowering; pedicels 0.6–1.1 mm long. *Sepals* ovate, apex acute or acuminate; 1.3–1.4 × as long as wide, 0.9–1 × 0.7 mm; sparsely puberulent on tips; colleters few or absent. *Corolla* white; tube 1.8–2.7 mm long, outside glabrous, glabrous or sparsely puberulent in throat, glabrous inside; lobes 1.3–2 × as long as the tube, 3–5.5 mm long, glabrous. *Stamens* inserted at 1–1.1 mm from base, 0.4–0.6 of tube length; filaments 0.2–0.3 mm long; anthers 2.2–2.4 × as long as wide, 0.9–1.2 × 0.4–0.5 mm; elliptic, apex mucronate, base short sagittate; included in corolla tube. *Disk* lobes narrow, separate, 1–1.5 × as long as ovary, 0.5–0.6 mm long. *Ovary* 0.4–0.5 mm long, pubescent; style 0.4–0.5 mm long; pistil head 1–1.3 mm long with a globular base. *Fruit* unknown.

Distribution – Northern Thailand; 2 collections studied.

Habitat & Ecology – Recorded as climbing on low bushes around a marsh at 120 m altitude.

12. Ichnocarpus wariana (Schltr.) D.J. Middleton, *comb. nov.*

Parameria wariana Schltr., Kautschukexp. Kaiser Wilhelmsland (1911) 127, 71. — *Papuechites wariana* (Schltr.) Markgr., Bot. Jahrb. 61 (1927) 210. — Type: *Schlechter 17474* (K lecto, B specimen destroyed, designated here; G iso), Papua New Guinea, Morobe Prov., Goromia.

Branches glabrous to tomentose. *Leaves:* petiole 5–16 mm long; blade elliptic to ovate, 1.2–4 × as long as wide, 3–12.2 × 1.2–6.1 cm, apex acuminate, base acute to rounded; coriaceous; sparsely puberulent on midrib beneath; 8–11 pairs of lateral nerves. *Inflorescence* terminal and axillary panicles, rather congested; 5.5–10 cm long; densely tomentose; pedicels 1–2.5 mm long. *Sepals* ovate, apex obtuse to rounded; 1.1–1.7 × as long as wide, 1.6–2.2 × 1.2–1.7 mm; tomentose; no colleters seen. *Corolla* cream coloured or pinkish; in bud with cylindrical tube and head about same width; tube 2.4–3.4 mm long, outside pubescent, pubescent in throat and pubescent inside; lobes 0.7–0.9 × as long as the tube, 2–2.8 mm long, pubescent on parts exposed in bud. *Stamens* inserted at 1.6–1.9 mm from base, 0.4–0.5 of tube length; filament 0.3–0.5 mm long with projections from the side; anthers 3.7–5.7 × as long as wide, 1.5–1.7 × 0.3–0.4 mm; narrow triangular, apex acuminate, base sagittate; included in the corolla tube. *Disk* of 5 elliptic or oblong lobes joined at base, 0.6–1 × as long as ovary, 0.6–0.9 mm long. *Ovary* 0.8–1 mm long, pubescent; style 1–1.4 mm long; pistil head 0.7–1 mm long, base cup-shaped. *Fruits* (immature) terete and densely tomentose.

Distribution – Papua New Guinea; 6 collections studied.

Habitat & Ecology – Climber in forest at 100–600 m altitude.

Note – The specimen cited by Forster (1992) as being a taxon of uncertain status (*Clemens 1504a*) belongs to this species.

NOTE

Ichnocarpus morlae Eggers and *Ichnocarpus pruinosus* O.G. Petersen which appear in Index Kewensis Supplement I were both actually published as species of *Ischnosiphon* in the Marantaceae and not as species of *Ichnocarpus*.

INSUFFICIENTLY KNOWN SPECIES

Micrechites andamanica Gang. & T. Chakrab., J. Econ. Tax. Bot. 16 (1992) 42.
I have been unable to obtain type material from CAL.

Micrechites parkinsonii Gang. & T. Chakrab., J. Econ. Tax. Bot. 16 (1992) 44.
I have been unable to obtain type material from CAL.

Micrechites sabitae De & Narayan., Indian For. 66 (1940) 332.

Micrechites sabitae De & Narayan. var. *laxiflora* De & Narayan., Indian For. 66 (1940) 333.

I have been unable to obtain type material of this species and its variety which are deposited in the herbarium in Shillong, India. The authors acknowledge that their new species, *Micrechites sabitae*, has affinities with *M. elliptica* and from the description it would appear that both the species and the variety fall within the range of variation of *Ichnocarpus polyanthus*. Both were collected in the Khasi and Jaintia Hills of India.

NOMINA NUDA

Ichnocarpus inflatus Buch.-Ham. ex Wall., Cat. no. (1829) 1675 = **Trachelospermum lucidum** (D. Don) K. Schum.

Ichnocarpus latifolius Buch.-Ham. ex Wall., Cat. no. (1829) 1652 = **Ichnocarpus frutescens** (L.) W.T. Aiton.

Ichnocarpus paniculatus Moon, Cat. Pl. Ceylon (1824) 20 = **Anodendron paniculatum** A. DC.).
Huber, Fl. Ceylon 4 (1983) has this species as a synonym of *Anodendron manubriatum* Merr.

Ichnocarpus radicans Wall., Cat. no. (1929) 1676 = **Ichnocarpus polyanthus** (Blume) P.I. Forst.

Micrechites ovalifolia Ridley, J. Straits Med. Assoc. 5 (1897) 137 = ? (no description or type material at all).

SPECIES EXCLUSAE

Ichnocarpus acuminatus Fern.-Vill., Nov. App. Fl. Philipp. (1880) 131 = **Aganosma marginata** (Roxb.) G. Don.

Ichnocarpus africanus (Lour.) Woodson, Ann. Missouri Bot. Gard. 17 (1930) 144 **Cryptolepis sp.**
See Merrill (1935: 316–317).

Ichnocarpus afzeli Schult. in Roem. & Schult., Syst. Veg. 4 (1819) 399 = **Secamone afzelii** (Schult.) K. Schum.

Ichnocarpus bertieroides Wernham ex S. Moore, J. Bot. 61, Suppl. (1923) 33 = **Papuechites aambe** (Warb.) Markgr.

Ichnocarpus fragrans Wall. ex G. Don, Gen. Syst. 4 (1837) 78 = **Trachelospermum lucidum** (D. Don) K. Schum.

Ichnocarpus loureiri Spreng., Syst. 1 (1824) 635 = **Cryptolepis sp.**
See Merrill (1935: 316–317).

Ichnocarpus macrocarpus Fern.-Vill., Nov. App. Fl. Philipp. (1880) 131 = **Aganosma marginata** (Roxb.) G. Don.

Ichnocarpus velutinus Fern.-Vill., Nov. App. Fl. Philipp. (1880) 131 = **Aganosma marginata** (Roxb.) G. Don.

Micrechites borneensis (King & Gamble) P.T. Li, J. South China Agric. Univ. 11 (1990) 34 = **Cleghornia borneensis** King & Gamble.

Micrechites formicina Tsiang & P.T. Li, Acta Phytotax. Sin. 11 (1973) 385 = **Anodendron formicina** (Tsiang & P.T. Li) D.J. Middleton, Novon 4 (1994) 152.

Micrechites gracilis (King & Gamble) P.T. Li, J. South China Agric. Univ. 11 (1990) 34 = **Cleghornia gracilis** King & Gamble.

Micrechites minutiflora (Pierre) P.T. Li, J. South China Agric. Univ. 15 (1994) 64 = **Urceola minutiflora** (Pierre) D.J. Middleton.

Micrechites napeensis Quint., Compt. Rend. As. Sci. (1902) 438. — *Ecdysanthera napeensis* (Quint.) Pierre, Rev. Cult. Col. 11 (1902) 228. — *Parabarium napeensis* (Quint.) Pierre ex Spire, Contr. Apocyn. (1905) 33. — *Xylinabariopsis napeensis* (Quint.) Metcalfe, J. Arnold Arbor. 26 (1945) 202 = **Urceola napeensis** (Quint.) D.J. Middleton, Kew Bull. 49 (4).

Micrechites tubulosa Ridley, Fl. Mal. Pen. 5 (1925) 321 = **Anodendron tubulosum** (Ridley) D.J. Middleton, *comb. nov.*

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I would like to thank the Royal Society in London and the Royal Irish Academy in Dublin for their financial support for this work; the directors of the herbaria which lent material or allowed me to work in their herbarium; John Parnell for comments on the manuscript and Marcella Campbell for help with the curation of the material.

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Umbai KL 850 (pol).

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Waas 240, 350, 1012, 1266 (fru) — Wali 75 (fru) — Walker 1241 (fru) — Walker & White BSIP 117 (rho) — Wallau 9055 (fru) — Wallich 1652, 1674, 1831 (fru) — Walsh 257 (ser) — Wang 33214, 37060 (fru), 73735, 74316 (pol), 74584, 74978 (fru), 75359 (pol), 75512, 77165, 77475, 77755 (fru), 79088, 79164 (pol), 79614, 80632 (fru) — Wanntorp 2625 (fru) — Warburg 21298 (fru) — Waterhouse 972 (fru) — Watt 7404, 12939 (fru) — Webb & Tracey 5702, 6601, 6651, 6791, 7483, 7537, 7841, 7901, 8627 (fru), 8685 (rho), 8764, 8811, 9035, 9766, 9906, 10494, 10978 (fru), 11361 (rho), 11625, 12323, 12324 (fru) — Wenzel 1, 339 (fru), 1245 (ser), 1341, 1397, 2676 (fru), 3403 (ser) — White 1419 (fru), NGF 10140 (rho) — Whitmore BSIP 1905 (rho) — Widjaja 1376 (fru) — Wight 45, 535, 561, 1881, 2257, 2258, 2259, 2555, 2557, 2558 (fru) — de Wilde & de Wilde-Duyfjes 18051, 19235 (fru), 19802 (ser) — Williams 654 (fru) — Wirawan 309 (ser) — Womersley (all NGF) 5284 (rho), 7867, 9060 (fru), 12377 (rho), 17679 (fru), 19158 (nov), 24827, 37467 (rho), 43885 (fru) — J.J. Wood 8 (fru) — Wood et al. A.4434 (fru), A.4658 (ser) — Wray 2604 (ser).
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(Ichnocarpus)
inflatus Buch.-Ham. ex Wall. (nn)
jacqueti (Pierre ex Spire) D.J. Middleton (jac 5)
latifolius Buch.-Ham. ex Wall. (nn)
leptodictyus F. Muell. (fru 2)
loureiri Sprengel (x)
macrocarpus F. Villar (x)
malipoensis (Tsiang & P.T. Li) D.J. Middleton (mal 6)
microcalyx Pitard (fru 2)
moluccanus Miq. (fru 2)
morlae Eggers (en)
navesii Rolfe (fru 2)
novoguineensis (K. Schum.) D.J. Middleton (nov 7)
oliganthus Tsiang (jac 5)
ovatifolius A. DC. (fru 2)
oxypetalus Pitard (fru 2)
paniculatus Moon (nn)
polyanthus (Blume) P.I. Forst. (pol 8)
pruinosus O.G. Petersen (en)
pubiflorus Hook. f. (pol 8)
radicans Wall. (nn)
rhombifolius (Markgr.) D.J. Middleton (rho 9)
salomonensis C. T. White (rho 9)
serpyllifolius (Blume) P.I. Forst. (ser 10)
sogerensis Wernham ex Moore (fru 2)
uliginosus Kerr (uli 11)
velutinus F. Villar (x)
volubilis (Lour.) Merr. (fru 2)
forma *sogerensis* (Wernham ex S. Moore) Markgr. (fru 2)
wariana (Schltr.) D.J. Middleton (war 12)
xanthogalax Schltr. (nov 7)
Lamechites Markgr. (genus)
schlechteri Markgr. (rho 9)
Micrechites Miq. (genus)
andamanica Gang. & T. Chakrab. (*)
archboldiana Merr. & Perry (arc 1)
baillonii Pierre (pol 8)
borneensis (King & Gamble) P.Y. Li (x)
brachypetala Ridley (ser 10)
elliptica Hook. f (pol 8)
var. *scortechinii* King & Gamble (pol 8)
ferruginea Pitard (pol 8)
formicina Tsiang & P.T. Li (x)
furcata Ridley (ser 10)
gracilis (King & Gamble) P.T. Li (x)
jacquetii Pierre (jac 5)

(*Micrechites*)
lachnocarpa Tsiang (pol 8)
malipoensis Tsiang & P.T. Li (mal 6)
var. *parvifolia* Tsiang & P.T. Li (pol 8)
micrantha (Miq.) Hallier (ser 10)
minutiflora (Pierre) P.T. Li (x)
napeensis Quint. (x)
novoguineensis K. Schum. (nov 7)
ovalifolia Ridley (nn)
parkinsonii Gang. & T. Chakrab. (*)
polyantha (Blume) Miq. (pol 8)
pubiflora (Hook. f.) Kerr (pol 8)
radicans Markgr. (pol 8)
rehderiana Tsiang (pol 8)
rhombifolia Markgr. (rho 9)
var. *lanceolata* Markgr. (rho 9)
sabitae De & Narayan. (*)
var. laxiflora De & Narayan. (*)
schrieckii (Van Heurck & Müll. Arg.) Rolfe (ser 10)
scortechini (King & Gamble) Ridley (pol 8)
serpyllifolius (Blume) Kosterm. (ser 10)
sinensis Markgr. (fru 2)
tenuifolia Ridley (ser 10)
tubulosa Ridley (x)
Microchites Hook. f. (genus)
Otopetalum Miq. (genus)
micranthum Miq. (ser 10)
Papuechites aambe (Warb.) Markgr. (x)
archboldiana (Merr. & Perry) D.J. Middleton (arc 1)
novoguineensis (K. Schum.) Markgr. (nov 7)
wariana Schltr. (war 12)
Parabarium *napeensis* (Quint.) Pierre ex Spire (x)
Parameria *wariana* Schltr. (war 12)
Periploca *palvalli* Dennst. (fru 2)
Quirivelia Poir. (genus)
bantamensis (Blume) Williams (fru 2)
zeylanica Poir. (fru 2)
Secamone afzelii (Schult.) K. Schum. (x)
Springia Müll. Arg. (genus)
indica Müll. Arg. in Van Heurck (fru 2)
Tabernaemontana *parviflora* Poir (fru 2)
polyantha Blume (pol 8)
Toxocarpus *makilingensis* Elm. ex Merr. (fru 2)
Trachelospermum *philippinense* Elm. (ser 10)
lucidum (D. Don) K. Schum. (x)
Urceola minutiflora (Pierre) D.J. Middleton (x)
napeensis (Quint.) D.J. Middleton (x)
Xylinabariopsis napeensis (Quint.) Metcalfe (x)