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REVISION OF THE GENUS RENNELLIA KORTH. (RUBIACEAE–RUBIOIDEAE)

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SUMMARY

In this revision of the genus *Rennellia* Korth. four species are recognized: *R. elliptica* Korth., *R. amoena* (Bremek.) J.T. Johansson comb. nov., *R. speciosa* (Wall. ex Kurz) J.D. Hooker, and *R. morindiformis* (Korth.) Ridley. *Rennellia* includes shrubs and small trees with white to pale bluish or pale violet flowers in panicle-, umbel-, or spike-like cymes. The pedicels and ovaries are nearly always connate. *Rennellia* is confined to tropical rain forests in SE Asia, Sumatra, and Borneo. The genus is closely related to *Gentingia, Motleyia,* and *Prismatomeris,* but differs from these genera in, e.g., inflorescence morphology and colour of the flowers. A key to the species is presented, and all species are illustrated with line drawings and their distributions mapped.

INTRODUCTION

When Korthals (1851) described the genus *Rennellia,* he included two species, *R. elliptica* and *R. ovalis,* of which the original material seems to have been lost. In the same paper he also described the genus *Tribrachya* with the single species *T. morindaeformis* Korth., which was said to differ from *Rennellia* above all through the racemose inflorescence, 5-merous flowers, and the entire stigma. This treatment was followed by Miquel (1856/57, 1860/61) and in principle by Boerlage (1891). Miquel (1869) later included *Tribrachya* and *Rennellia* in the genus *Morinda,* describing the two species *M. korthalsiana* and *M. sumatrana. Morinda speciosa,* which was originally listed only as a name in Wallich's Catalogue (1847), was formally described by Kurz (1875) and later recombined by Hooker (1880) under *Rennellia.* Schumann (1891) maintained the opinion that *Rennellia* and *Tribrachya* could not be distinguished from *Morinda,* whereas Baillon (1879), King & Gamble (1904), and Ridley (1920, 1923, 1939) kept *Morinda* separate from *Rennellia.* The latter view was also held by authors like Pitard (1924) and Craib (1934). Ridley (1939) finally united *Tribrachya* and *Rennellia* and even Merrill (1929) previously suggested a uniting of these two genera, but did not make any formal recombination.

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The last revision of *Rennellia* was made by Wong (1984). He recognized four species, viz. *R. elongata* (King & Gamble) Ridley, *R. paniculata* King & Gamble (comprising two varieties), '*R. speciosa* Hk. f.' and '*Rennellia sp.*'.

In the present revision I have recognized the following four species of *Rennellia*, including *Didymoecium amoenum* which was described by Bremekamp (1935): *R. elliptica*, *R. amoena*, *R. speciosa*, and *R. morindiformis*. *Rennellia prismatomeriformis* Merrill (1929) is conspecific with *Prismatomeris beccariana* and was included in that species by Johansson (1987b).

Rennellia is closely allied to *Gentingia*, *Motleyia*, and *Prismatomeris* in the tribe Morindeae (Rubioideae). These four genera are characterized by a combination of the following features: corolla salver-shaped, glabrous inside; corolla lobes with an adaxial median longitudinal ridge; anthers included or only partially exserted, erect; pollen grains with narrow apertures and reticulate sexine with large to fairly small lumina; style filiform; stigma erect or almost so; ovary bilocular; locules uniovular; seed globose to hemispherical, with a hollow on the side facing the dissepiment; endosperm corneous; embryo basal-lateral. A comparison of the four genera has recently been given by Johansson and Wong (1988). *Rennellia* differs from the other three genera in having violet to bluish-white corolla and usually connate ovaries and elongated inflorescence. *Rennellia* is further distinguished from *Motleyia* and *Prismatomeris* for instance in the terete grey branchlets and sheathing stipules, and from *Motleyia* in the larger pollen grains with smaller and more numerous lumina. *Rennellia* differs from *Gentingia* also in its compound multiflorous inflorescence and its connate ovaries which develop into syncarps.

MATERIAL

462 specimens representing 243 collections from the following herbaria have been investigated (abbreviations are according to Holmgren et al., 1981): A, BISH, BK, BKF, BO, BRI, CAL, E, G, HBG, K, KEP, L, LE, M, MICH, MO, NY, S, SAR, SING, U, UC, US, W. One species, *R. elliptica*, has been studied in the field.

MORPHOLOGY

Rennellia consists of shrubs and small trees reaching a height of up to at least 8 m. The terete branches are fairly rough except for the youngest distal parts which are smooth and more or less puberulous.

The stipules are connate sheathing the stem and branches. They are either triangular and acute or obtuse, entire or bidentate at the apex, or bifid to deeply divided into lobes. The stipular lobes are interpetiolar or sometimes developed at the leaf axils, thus appearing intrapetiolar. The length of the stipules varies considerably, from less than 3 mm up to at least 18 mm.

The leaves are usually elliptic or obovate and acuminate or sometimes acute and are fairly uniform in shape throughout the genus.

The unspecialized epidermal cells of the adaxial side of the leaves have straight or slightly curved walls, whereas the cell walls of the abaxial epidermis are either

straight or usually more or less curved or sinuate. The cuticle of the adaxial leaf side is usually striate with the striae more or less parallel and anastomosing. On the abaxial side of the leaves the cuticle lacks striation. The stomata are paracytic and c. 20–40 μm long and provided with two to several subsidiary cells. Domatia are lacking in all investigated specimens.

Colleters, which are usually elongate in outline, occur in large number on the lower parts of the adaxial side of the stipules and bracts. Both elongate and more rounded shorter colleters are abundant inside the base of the calyx tube. The colleters are of the common 'standard type' of the Rubiaceae (Lersten, 1974a, 1974b, 1975) and consist of elongate or rounded axial cells and palisade-like epidermal cells.

Papillar unicellular epidermal hairs, c. 10–60 μm long, are numerous on the inflorescence. They occur densely on the main axis, branches, bracts, ovaries, and calyces, and are dense or sparse on the outer side of the corolla. The inside of the corolla is completely glabrous. In. *R. speciosa* and *R. morindiformis* the leaves are glabrous, whereas in *R. amoena* and most specimens of *R. elliptica* the petioles and abaxial side of the leaves are covered with unicellular papillar hairs, c. 20–60 μm long, at least basally and on the main veins. The hairs have usually a densely or sparsely granular surface.

The inflorescences are terminal on main and lateral shoots or, very rarely, emanating from the axils of the second node immediately below the shoot apex. The basic type consists of a central more or less carnose rachis with lateral and distal, either pedunculate or sessile partial inflorescences. The flowers are usually aggregated, 2–9 together in capitula with their ovaries connate, or they are sometimes simple on pedicels which are only partially connate. The partial inflorescences are either inserted on the rachis more or less close together in verticillate groups, or they are almost evenly dispersed along the rachis. The number of capitula per inflorescence varies from a few to almost 40 in specimens of *R. elliptica*. In *R. speciosa* the capitula are often concentrated in a distal umbel-like cyme, the lower parts of the rachis then lacking flowers. The length of the rachis varies extensively, particularly in *R. elliptica*, where it may be one or a few cm up to 17 cm. The peduncles or the sessile capitula are subtended by triangular, acute or obtuse, tiny, puberulous bracts.

The erect calyx tube varies in length between 0.4 and 2.1 mm. The calyx teeth are very small, rarely exceeding 0.2 mm in length. The diameter of the calyx varies slightly between the species, being a fairly weak diagnostic character. The corolla is violet, bluish-violet, or pinkish in bud, obtaining a paler colour as the corolla expands and elongates during anthesis. The inside of the corolla is white to very pale violet. It is very similar in shape to the corolla in e.g. *Prismatomeris*. Thus the lobes have a median longitudinal adaxial ridge running from the apex approximately 2/3 to 3/4 the length of the lobe. The lengths of tube and lobes vary remarkably within the species and do not present any useful characters.

The pollen morphology of *Rennellia*, which is fairly uniform, has been described by Johansson (1987a). The pollen grains are isopolar, radially symmetrical, 3-colporate, spheroidal, 29–44 × 29–45 μm, circular in equatorial view and rounded to rounded-triangular in polar view. The colpi are narrow (1–2 μm wide) and the ora are lalongate (5–7 × 12–15 μm). The reticulate sexine is 1.5–3 μm thick and the

nexine 1–2 μm thick at the centre of mesocolpia. The rounded or angular lumina, which range in size from less than 1 μm up to 5 μm in diam. in *R. elliptica* or up to 9 μm in diam. in *R. morindiformis*, are provided with a varying number of processes.

At least *R. speciosa* and *R. elliptica* are diheterostylous. This is probably also true of *R. amoena* and *R. morindiformis*. In longistylous flowers the style is somewhat shorter than to slightly exceeding the corolla tube; the stamens are inserted below the throat at a distance of approximately one third to half the length of the corolla tube; the stigma is usually fairly short. The style in brevistylous flowers is one sixth to one third the length of the corolla tube; the stamens are inserted below the throat at a distance of one seventh to one third the length of the corolla tube; the stigma is, at an average, slightly longer than the stigma in longistylous specimens.

The ovaries are nearly always completely fused 2–6(–9) together and develop into syncarps. Free ovaries with only partially connate pedicels have been observed only in a few flowers of *R. amoena, R. speciosa,* and *R. elliptica*. The exo- and mesocarps of the fused ovaries form a common carnose envelope surrounding the pyrenes. Usually only one pyrene in each syncarp reaches maturity, whereas the remaining ovules with their endocarps abort. The morphology of the seed agrees in all essential details with that in the closely related genera *Prismatomeris* and *Gentingia*. Thus it is globose or almost so, and has a large hollow on the side facing the dissepiment. The testa is dark brown (on herbarium specimens) and the horny endosperm surrounds a basal-lateral embryo.

PHYTOGEOGRAPHY

The distribution of the four species of *Rennellia* is shown in Figs. 2, 4, and 6. The genus is restricted to the humid parts of West Malesia (Borneo, Sumatra, and Peninsular Malaysia) reaching northwards to the western coast of Peninsular Thailand and Tenasserim District, Burma. All species inhabit tropical evergreen forests, mainly in the lowlands.

RENNELLIA

Rennellia Korthals (1851) 255; Miquel (1856/1857) 248; Hooker (1873) 23, 118; Hooker (1880) 158; King & Gamble (1904) 89; Ridley (1923) 119; Pitard (1924) 426; Ridley (1939) 607; Wong (1984) 193. — T y p e: *Rennellia elliptica* Korth. (lecto, selected here).

Tribrachya Korthals (1851) 254; Miquel (1856/1857) 247; Hooker (1873) 23, 118; non *Tribrachia* Lindley. — T y p e: *Tribrachya morindaeformis* Korth. [= *Rennellia morindiformis* (Korth.) Ridley].

Didymoecium Bremekamp (1935) 425. — T y p e: *Didymoecium amoenum* Bremek. [= *Rennellia amoena* (Bremek.) J.T. Johansson].

Trees or shrubs; branchlets terete, puberulous or glabrous, green to greenish-violet if young, light grey to yellowish-grey or brownish-grey if old; xylem whitish to pale brownish-white to yellowish-grey. *Raphides* abundant. *Stipules* interpetiolar or falsely intrapetiolar, caducous, usually sheathing, triangular or narrowly triangular or ovate, entire or slightly to deeply bilobate, purplish violet to green, puberulous or glabrous, with numerous colleters on adaxial side. *Leaves* decussate on vertical

branches, distichous on horizontal branches, petiolate, chartaceous to somewhat coriaceous, glabrous and dark glossy green on adaxial side, glabrous or puberulous and paler green to glaucous on abaxial side; base narrowly cuneate; venation brochidodromous; domatia absent. *Inflorescence* terminal, erect, spike-like or panicle-like to umbel-like, violet to purplish or greenish, puberulous. *Flowers* 4- or 5-merous, diheterostylous, fragrant; bracts c. 0.5–1 mm long, triangular or ovate, acute or obtuse, entire or denticulate, with elongate colleters on adaxial side and on margin; pedicels lacking or completely or rarely partially connate; calyx campanulate, erect or almost so, denticulate or truncate, green to greenish-violet, puberulous or sometimes glabrous, with basal elongate or rounded colleters; calyx teeth triangular, acute or obtuse; aestivation valvate; corolla hypocrateriform, carnose, in bud violet or purplish to bluish, at maturity pale violet to bluish-white or pinkish-white outside, white inside, puberulous or glabrous outside, glabrous inside; corolla lobes concave below, with an adaxial median longitudinal ridge above, recurved at anthesis; filaments linear, white, glabrous, inserted in upper part of corolla tube; anthers narrowly oblong, erect, included in corolla tube or slightly exserted, dorsifixed below middle, introrse, dehiscing by longitudinal slits, yellow, glabrous; disc annular, puberulous or glabrous, persistent in fruit; style filiform, white, glabrous; stigma bilobate, included in corolla tube or slightly exserted; stigmatic lobes ovate or narrowly ovate, obtuse or acute, erect or almost so, minutely papillose, white. *Ovaries* inferior, connate 2–9 together or rarely simple, bilocular, with locules uniovular; funicle inserted approximately at middle of dissepiment; ovules anatropous, apotropous, ascending. *Fruit* a syncarp or rarely a drupe, globose or subglobose, 1- to few-seeded, bluish-black to purplish-black; mesocarp carnose; endocarp thin. *Seed* globose or subglobose, with a hollow on funicular side; testa membranous, brown with dark spots, endosperm corneous, whitish; embryo basal-lateral.

KEY TO THE SPECIES

1a. Inflorescence spike-like; capitula usually sessile, sometimes subsessile; calyx tube 0.8–2.1 mm long, 2–3 mm in diam. . . . . **1. R. elliptica**
b. Inflorescence panicle-like or umbel-like; capitula pedunculate or rarely subsessile 2
2a. Leaves puberulous on abaxial side . . . . . **2. R. amoena**
b. Leaves glabrous 3
3a. Peduncles of capitula (1–)3–7 mm long at anthesis; calyx tube 0.4–0.6 mm long, 1.5–2.5 mm in diam. . . . . **3. R. speciosa**
b. Peduncles of capitula (8–)12–40 mm long at anthesis; calyx tube 0.7–1.6 mm long, 2.5–3.5 mm in diam. . . . . **4. R. morindiformis**

1. Rennellia elliptica Korth. – Fig. 1.

Rennellia elliptica Korthals (1851) 257; Miquel (1856/1857) 248; Miquel (1860/1861) 220; Boerlage (1891) 137. — T y p e: *Korthals s.n.*, 'Sumatra occidentalis, in sylvis' (L, neo, selected here).

Morinda sumatrana Miquel (1869) 213. — T y p e: *Korthals s.n.* (L, lecto, selected here; L, U).

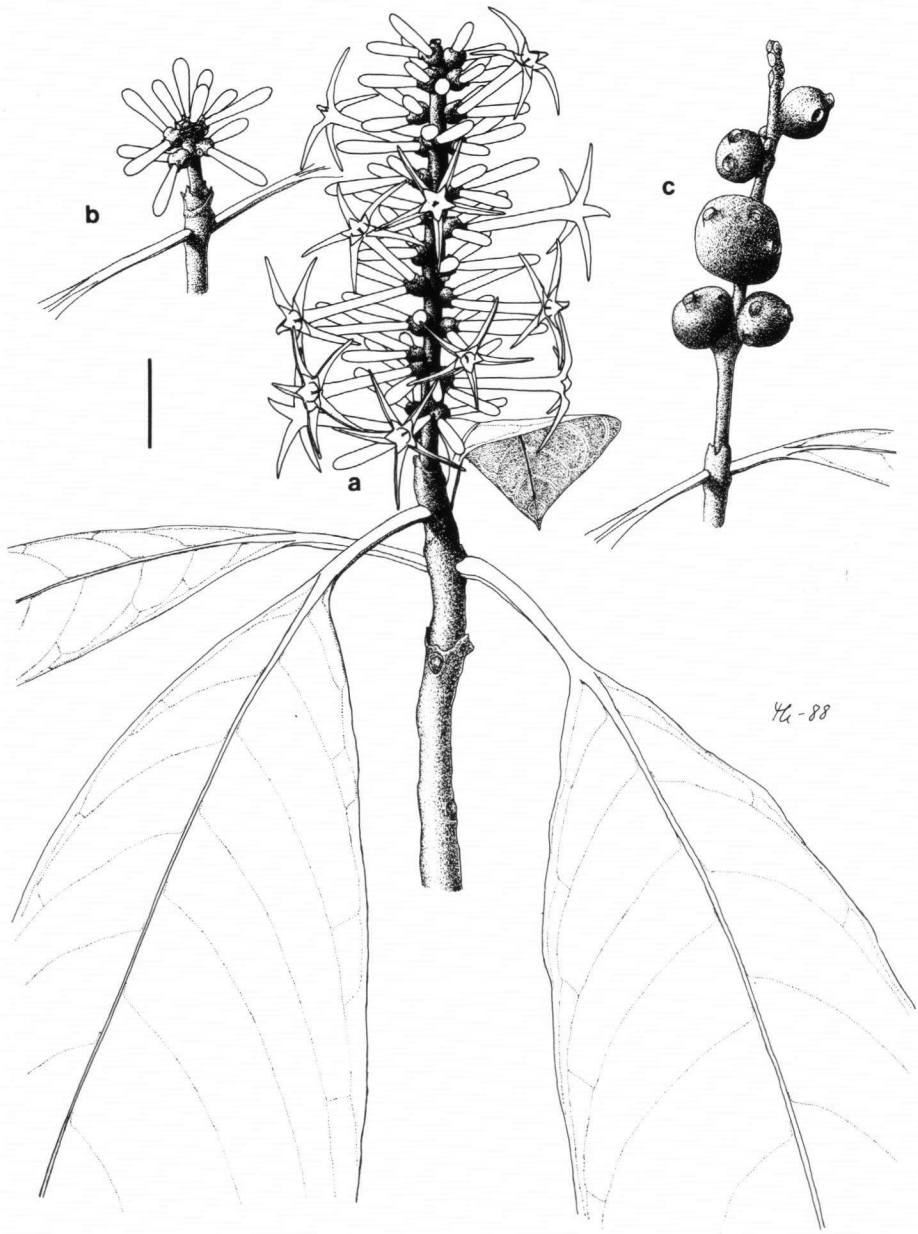

Fig. 1. *Rennellia elliptica* Korth. a. Distal part of flowering branch (*Chai S 33845*, L); b. inflorescence in bud (*Scortechini 668*, K); c. infructescence (*Chai S 19771*, K). – Scale bar 20 mm.

Rennellia borneensis Baillon (1879) 205; Ridley (1939) 609. — *Morinda borneensis* (Baillon) Schumann (1891) 138; Merrill (1921) 582. — T y p e: *Beccari 2060*, Borneo, Sarawak, 1865–1868 (K, lecto, selected by Ridley, 1939).

Rennellia speciosa (Wall. ex Kurz) J.D. Hooker var. *elongata* King & Gamble (1904) 90; Ridley (1923) 120. — *Rennellia elongata* (King & Gamble) Ridley (1939) 608. — T y p e: *Ridley 5834*, Malay Peninsula, Pahang, Tahan River, 1893 (SING, lecto, selected by Wong, 1984).

Rennellia paniculata King & Gamble var. *condensa* Wong (1984) 196. — T y p e: *Curtis s.n.*, Malay Peninsula, Perak, G. Bujong, Malacca, Dec. 1895 (SING, holo).

Tree or shrub, up to 8 m. *Stipules* 4.5–14 mm long. *Petiole* (8–)10–60 mm long, usually densely or sparsely puberulous, rarely glabrous. *Lamina* (8–)11.5–41 × (2.2–)3.2–17 cm, usually obovate or elliptic, sometimes narrowly obovate or narrowly elliptic, glabrous on adaxial side, usually densely to sparsely puberulous or rarely glabrous on abaxial side; apex acute or acuminate with acumen up to 20 mm long; pairs of secondary veins (7–)8–13. *Inflorescences* usually single, rarely two or three together, spike-like, with rachis (1.0–)1.5–17 cm long, 2.5–5 mm in diam.; capitula 7–39 in each inflorescence; flowers 2–6 together in each capitulum, with ovaries connate, or rarely not connate; capitula usually sessile, sometimes on peduncles up to 3 mm long, 1–1.5 mm in diam.; calyx tube 0.8–2.1 mm long, 2–3 mm in diam.; calyx teeth up to 0.2 mm long; corolla tube (15–)17–30 mm long, 1.5–2 mm in diam.; corolla lobes 4 or 5 (rarely 6), 8–17 mm long, 1.5–2 mm wide near base, narrowly triangular, acute. *Stamens* 4 or 5 (rarely 6); filaments 0.6–1.3 mm long, inserted in corolla tube at 6–15 mm (longistylous flowers) or 3–6 mm (brevistylous flowers) below throat; anthers 3.5–6.5 mm long. *Style* 14–32 mm (longistylous flowers) or 5–8 mm (brevistylous flowers) long; stigma 1.5–2.3 mm (longistylous flowers) or 1.8–3.2 mm (brevistylous flowers) long. *Fruit* 15–20 mm in diam., with 1–3 pyrenes; seed c. 8 mm in diam.

D i s t r i b u t i o n. Southernmost Burma (Tenasserim), Peninsular Malaysia, Sumatra, Borneo. Fig. 2.

E c o l o g y. Rain forest from near sea-level to at least 1500 m. Flowering during the whole year.

N o t e s. *Rennellia elliptica* is distinguished from the other three species by the spike-like inflorescence with usually sessile capitula. The abaxial side of the leaf is as a rule provided with unicellular papillar hairs. They are usually abundant both on veins and intercostal areas, but may be sparse and restricted to the main veins.

The length of the inflorescence rachis varies extensively. It is usually several cm up to at least 17 cm long at anthesis, but may be only one or a few cm long. Some specimens with short rachis and more or less reduced inflorescence internodes have been described by Wong (1984) as *Rennellia paniculata* var. *condensa*. The variation in rachis length is continuous and, moreover, the specimens agree with *R. elliptica* in all other characters. Due to this I have not found any reason to retain them as taxonomically distinct.

The specimens on which Korthals based his descriptions of *Rennellia elliptica* and *R. ovalis* (Korthals, 1851) appear to have been in flower, since he writes in his diagnoses 'corollae tubo abbreviato' and 'corollae tubo elongato', respectively, with-

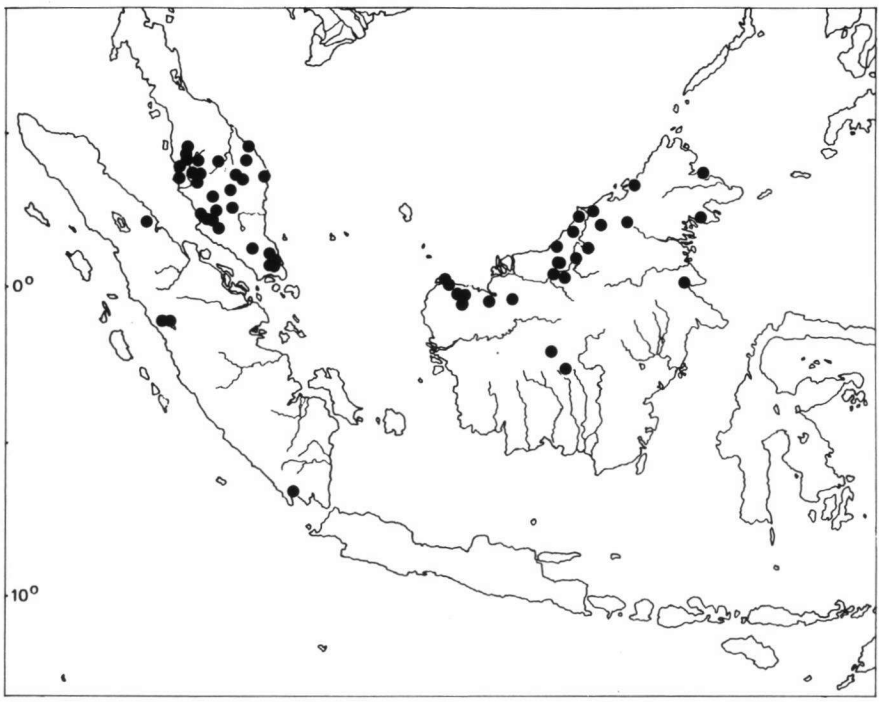

Fig. 2. Collecting sites of *Rennellia elliptica* Korth.

out any descriptions of fruit characters. However, I have not been able to trace any original material in flower. As was indicated by Miquel (1869), *Morinda sumatrana* most certainly corresponds to *Rennellia elliptica* Korth. (and possibly also to *R. ovalis* Korth.). The material which was collected by Korthals and used by Miquel for his description of *Morinda sumatrana* lacks flowers and has only young unripe fruits. This specimen, which bears Miquel's handwriting, has been selected here both as lectotype of *Morinda sumatrana* and as neotype of *Rennellia elliptica,* since it also agrees with Korthals's descriptions of *Rennellia* ('Inflorescentia terminalis, spicata.') and *R. elliptica.*

Rennellia borneensis was originally described by Baillon (1879), who gave only a brief diagnosis, and later recombined under *Morinda* by Schumann (1891). Ridley (1939) made a detailed Latin description based on three specimens. It is said to be characterized by 'the pustulate branches, petiole and calyx, lanceolate stiff leaves and smaller corolla with shorter thicker blunt lobes' (Ridley, 1939) but leaf shape and corolla size are features that vary extensively and it is not possible to keep *R. borneensis* separate from *R. elliptica.* The leaves on the type material are glabrous, but this is also a variable character and cannot be used solely as a distinguishing feature.

The only collection known from Burma is *Parker 2552,* Mergui Dist., Tenasserim, 6 Febr. 1927 (K, UC).

2. Rennellia amoena (Bremek.) J.T. Johansson, *comb. nov.*

Didymoecium amoenum Bremek., Bull. Jard. Bot. Buitenzorg, sér. III, 13 (1935) 428, fig. 1. — T y p e: *de Voogd 1178*, Sumatra, Benkoelen (Bengkulu), Kepahiang, 600 m, 16 Oct. 1931 (BO, holo; L).

Shrub, up to 1 m. *Stipules* 12–17 mm long. Petiole 25–35 mm long, puberulous. *Lamina* 20–29 × 7–12 cm, elliptic or ovate, glabrous on adaxial side, densely puberulous on abaxial side; apex acute or acuminate with acumen up to at least 15 mm long; pairs of secondary veins c. 7–9. *Inflorescence* single, umbel-like, 2 cm long; pedicels 5–7 mm long, partially or completely connate 2 or 3 together; ovaries partially or not connate; calyx tube 0.8–0.9 mm long, 2 mm in diam.; calyx teeth up to 0.2 mm long; corolla tube 29–30 mm long (26–35 mm long, according to Bremekamp); 1.5 mm in diam.; corolla lobes 4, 9–10 mm long (7.5–10 mm long, according to Bremekamp), 1.5 mm wide near base, narrowly ovate to elliptic, obtuse. *Stamens* 4; filaments 1.2–1.3 mm long (0.8 mm long, according to Bremekamp), inserted in corolla tube at 7.5 mm below throat; anthers 4.8–5.1 mm long. Style 4.5–4.6 mm long; stigma 2.8–2.9 mm long (1.5 mm long, according to Bremekamp). *Fruit* unkown.

D i s t r i b u t i o n. Known only from one locality on SW Sumatra. Fig. 4.

E c o l o g y. Rain forest (?) at 600 m. Flowering specimen collected in October.

N o t e s. This species is known from one single collection and was described by Bremekamp (1935) under the monotypic genus *Didymoecium*. This was said to be characterized mainly by the unique combination of the two characters intrapetiolar stipules and connate ovaries. Stipules of a similar type have been seen in several specimens of both *R. elliptica* and *R. speciosa*, although they are shorter in these species. I have interpreted these stipules as being interpetiolar, sheathing and bilobate with the lobes fused pairwise in the leaf axils, thus being falsely intrapetiolar. Only some of the flowers have completely connate pedicels and partly connate ovaries. Simple flowers may occur rarely in *R. speciosa* and *R. elliptica*, and thus it is no character typical of *R. amoena*. Umbel-like inflorescences are common also in *R. speciosa*, which differs in having glabrous leaves. *Rennellia amoena* agrees with the other species of the genus in all principal characters and I can see no reason to separate this single species in a distinct genus. The pollen grains of the type specimen of *R. amoena* have basically the same morphology as those in the other investigated specimens of *Rennellia* as well as *Prismatomeris* and *Gentingia* (Johansson, 1987a, 1987b; Johansson & Wong, 1988).

3. Rennellia speciosa (Wall. ex Kurz) J.D. Hooker – Fig. 3.

Rennellia speciosa (Wall. ex Kurz) J.D. Hooker (1880) 158; Boerlage (1891) 137; King & Gamble (1904) 89; Brandis (1906) 392; Ridley (1920) 96; Merrill (1921) 581; Foxworthy (1922) 203; Ridley (1923) 120; Pitard (1924) 427; Merrill (1929) 295; Craib (1934) 181; Wong (1984) 197. — *Morinda speciosa* [Wallich 1847, no. 8436, nom. nud.] ex Kurz (1875) 60, in clavi; Kurz (1877) 62; Williams (1905) 956; Heyne (1927) 1411. — T y p e: Wallich Cat. no. *8436*, Burma, Tenasserim, Chappedong Hills, 1827 (K-W, lecto; K, LE, P, W).

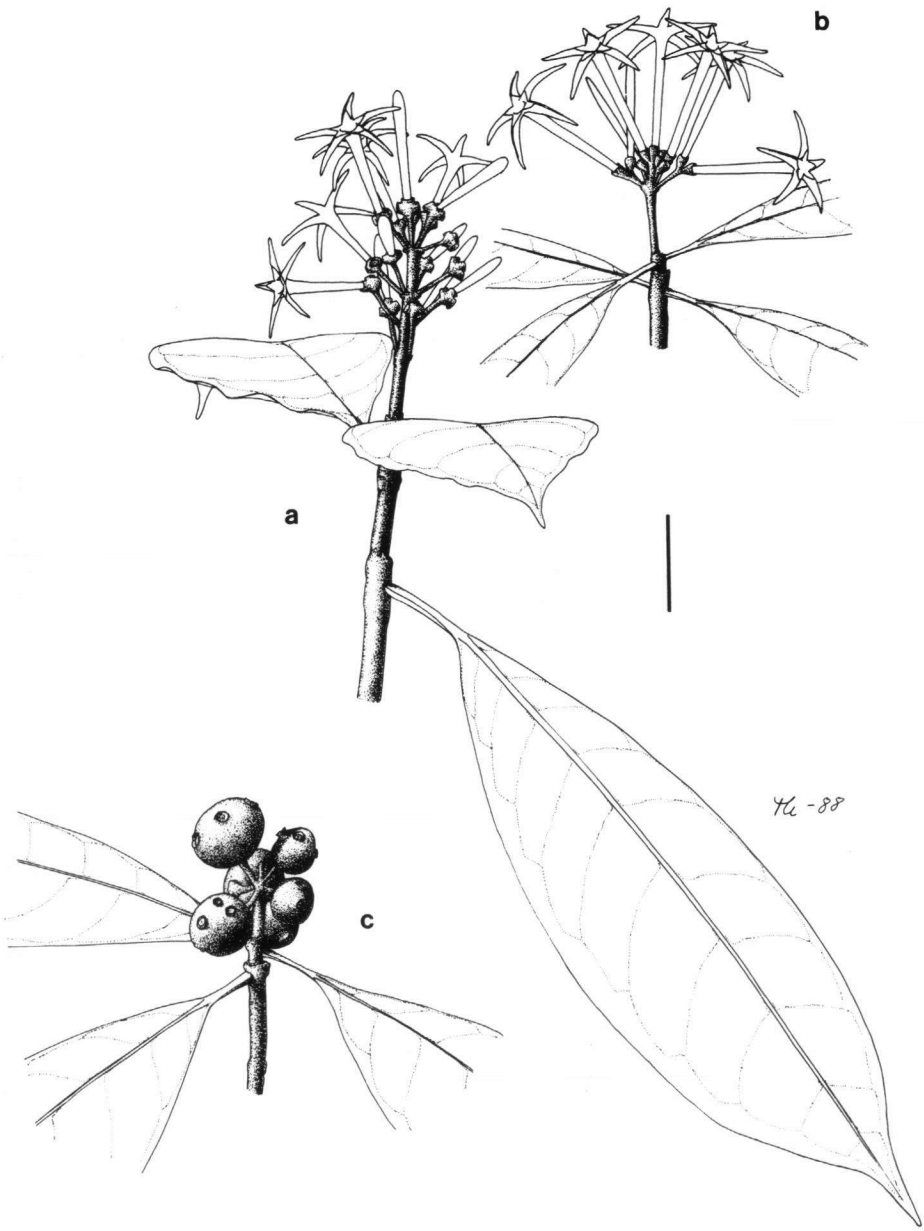

Fig. 3. *Rennellia speciosa* (Wall. ex Kurz) J.D. Hooker. a. Distal part of flowering branch (*Forest Department 3*, CAL); b. inflorescence (*Kiah SF 32309*, SING); c. infructescence (*Sinclair & Kiah bin Salleh SF 39886*, SING). – Scale bar 20 mm.

Tree or shrub, up to 7 m. *Stipules* 3.7–7 mm long. Petiole 7–30 mm long, glabrous. *Lamina* 8.5–22 × 2.3–5.5 cm, usually obovate or elliptic, sometimes ovate or narrowly elliptic, glabrous; apex acuminate with acumen up to 20 mm long; pairs of secondary veins 9–15. *Inflorescence* single, panicle- or umbel-like, with rachis 1–5 cm long, 1.5–2.5 mm in diam.; capitula 8–16 in each inflorescence; flowers 2–9 together in each capitulum with ovaries connate, or rarely with pedicels only partially connate 2 or 3 together and with ovaries not connate; peduncle (1–)3–7 mm long and 0.8–1 mm in diam. in flower, up to 13 mm long and 2 mm in diam. in fruit; calyx tube 0.4–0.6 mm long, 1.5–2.5 mm in diam.; calyx teeth up to 0.2 mm long; corolla tube 15–26 mm long, 1.5–2 mm in diam.; corolla lobes 4 or 5, 7–12(–14) mm long, 1.5–2 mm wide near base, narrowly ovate or narrowly triangular, acute or obtuse. *Stamens* 4 or 5; filaments 0.8–1.4 mm long, inserted in corolla tube at 5–11 mm (longistylous flowers) or 4.5–5.5 mm (brevistylous flowers) below throat; anthers 2.8–4.6 mm long. *Style* 19–24 mm (longistylous flowers) or 4.3–6.5 mm (brevistylous flowers) long; stigma 1.9–2.5 mm (longistylous flowers) or 2.8–5 mm (brevistylous flowers) long. *Fruit* 10–20 mm in diam., with 1–4 mm pyrenes; seed c. 8 mm in diam.

Distribution. Peninsular Burma, Peninsular Thailand and Peninsular Malaysia. One specimen said to have been collected on 'Sumatra', but without further notes on locality, *Junghuhn s.n.* (U). Fig. 4.

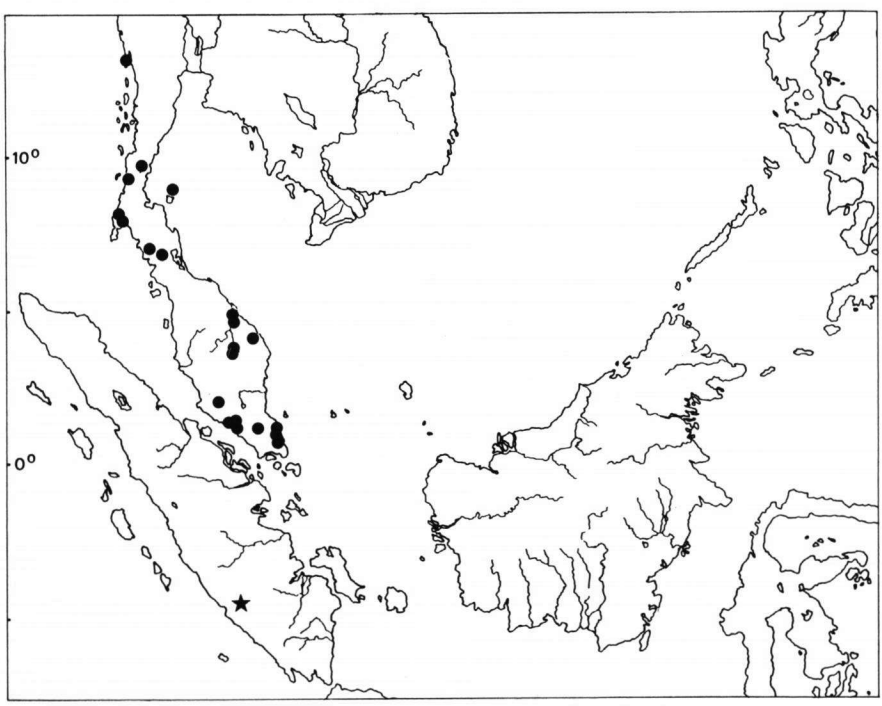

Fig. 4. Collecting sites of *Rennellia speciosa* (Wall. ex Kurz) J.D. Hooker (dots) and *R. amoena* (Bremek.) J.T. Johansson (star).

E c o l o g y. Rain forest and other types of evergreen forest from near sea-level to at least 800 m. Probably flowering during the whole year.

N o t e s. *Rennellia speciosa* is closely related to *R. morindiformis* but is distinguished from this species by the shorter peduncles and smaller calyx. The inflorescence varies in shape from panicle-like to umbel-like, in that some or all of the peduncles and capitula except for the uppermost ones may be eliminated.

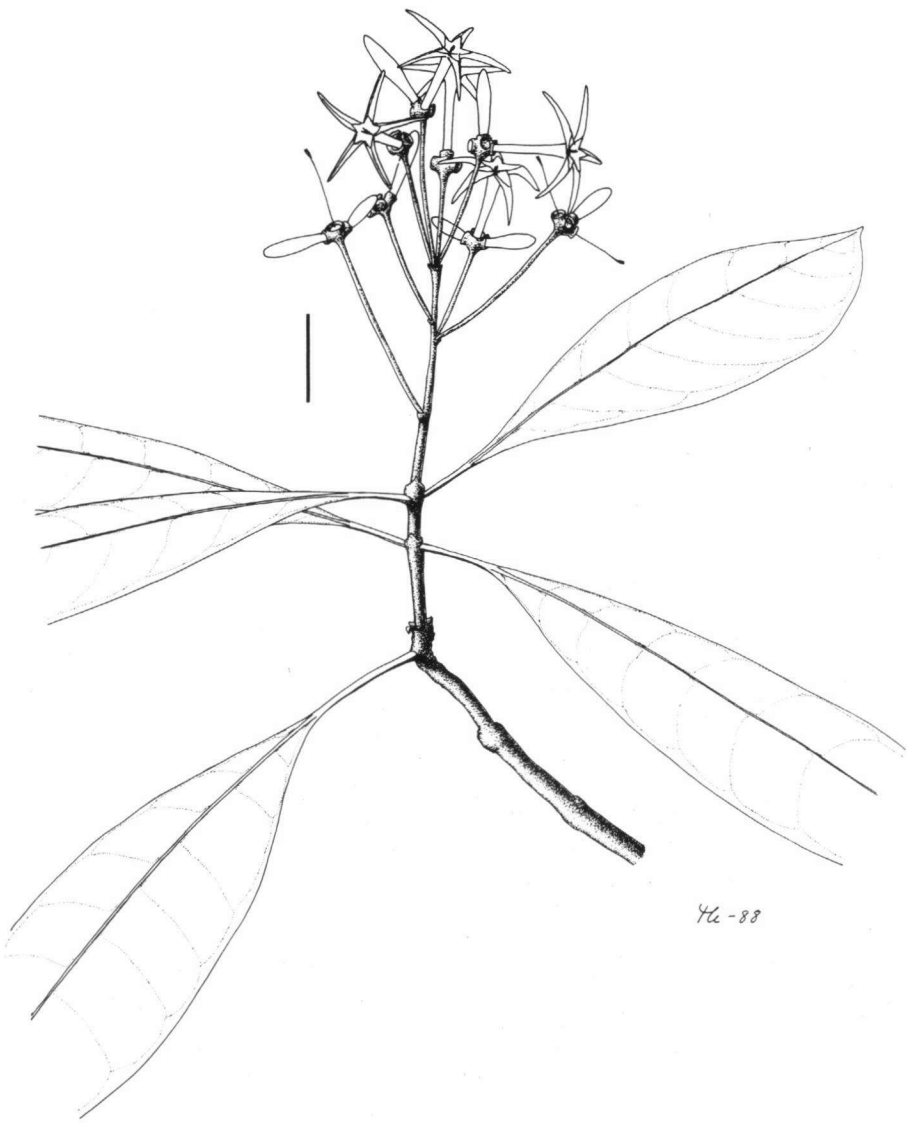

Fig. 5. *Rennellia morindiformis* (Korth.) Ridley (*Purseglove P 4311*, K). – Scale bar 20 mm.

4. Rennellia morindiformis (Korth.) Ridley – Fig. 5.

Rennellia morindiformis (Korth.) Ridley (1939) 609. — *Tribrachya morindaeformis* Korthals (1851) 255; Miquel (1856/1857) 247; Miquel (1860/1861) 220; Boerlage (1891) 137. — *Morinda korthalsiana* Miquel (1869) 212. — *Morinda tribrachya* Schumann (1891) 138. — Type: *Korthals s.n.*, Sumatra, G. Singgalang (L, lecto, selected by Wong, 1984; K, L, LE, P, S, U).
Rennellia paniculata King & Gamble (1904) 89; Ridley (1923) 119; Wong (1984) 196. — Type: *King's coll. 2592*, Malay Peninsula, Perak, Larut, 1000–1300 m, Dec. 1881 (K, lecto, selected by Wong, 1984; CAL).
Rennellia sp. Wong (1984) 197.

Tree or shrub, up to 8 m. *Stipules* 2.8–11(–18) mm long. Petiole (6–)16–39 mm, glabrous. *Lamina* 10–26 × 3.5–11 cm, usually obovate or elliptic, sometimes narrowly obovate, glabrous; apex acuminate with acumen up to 20 mm long; pairs of secondary veins 9–15. *Inflorescence* single, panicle-like, with rachis 1.5–7.5 cm long and 1.5–2 mm in diam. in flower, up to 10.5 cm long and 2.5 mm in diam. in fruit; capitula 6–13 in each inflorescence; flowers 2–5 together in each capitulum with ovaries connate; peduncle (8–)12–40 mm long and 1–1.5 mm in diam. in flower, up to 2 mm in diam. in fruit; calyx tube 0.7–1.6 mm long, 2.5–3.5 mm in diam.; calyx teeth up to 0.3 mm long; corolla tube 17–19 mm long, 2 mm in diam.; corolla lobes 4 or 5, 12–16 mm long, 2–2.5 mm wide near base, narrowly ovate or narrowly triangular, acute or obtuse. *Stamens* 4 or 5; filaments 2–2.2 mm long,

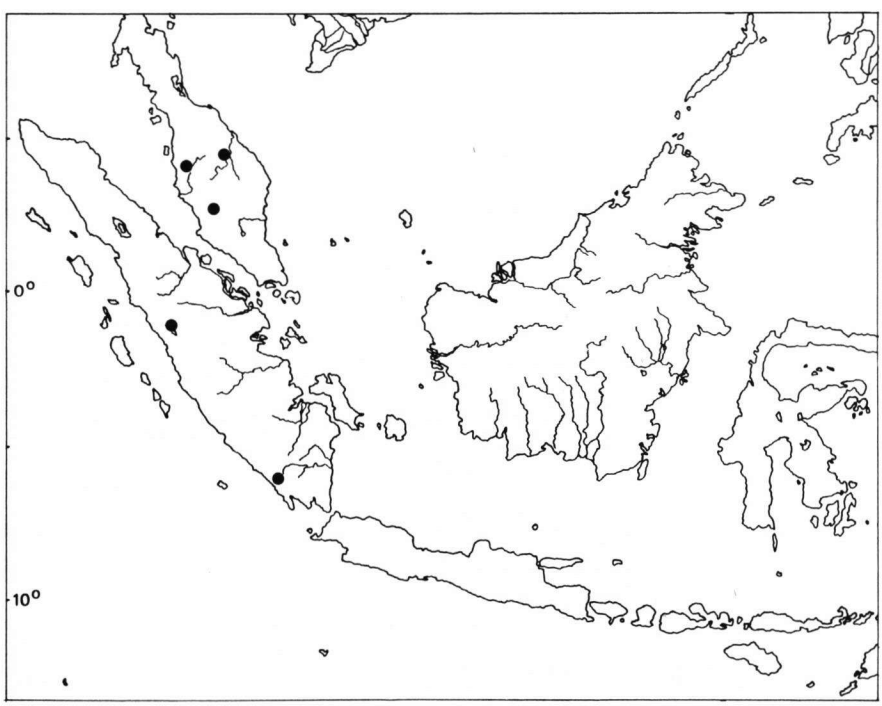

Fig. 6. Collecting sites of *Rennellia morindiformis* (Korth.) Ridley.

inserted in corolla tube at 6–7 mm (longistylous flowers?) below throat; anthers 3.4–4.9 mm long. Style 14–21 mm (longistylous flowers?) long; stigma 1.6–2 mm (longistylous flowers?) long. *Fruit* 12–15 mm in diam., with 1 pyrene (one fruit seen); seed c. 8 mm in diam.

Distribution. Peninsular Malaysia, Sumatra. Fig. 6.

Ecology. Rain forest from below 100 m to c. 1500 m. Probably flowering during the whole year.

Notes. *Rennellia morindiformis* differs from *R. speciosa* in having longer (up to at least 40 mm long) peduncles and larger calyx. The stipules vary widely in length and shape: from a few mm long, triangular, and acute or bifid to 10–18 mm long, bilobed or almost truncate, and surrounding the internode as an elongated sheath.

I have not seen any brevistylous specimen of *Rennellia morindiformis,* but it seems most probable that the species is diheterostylous like *R. speciosa* and *R. elliptica.*

When Korthals (1851) described the genus *Tribrachya,* he included only *T. morindaeformis.* This species was later transferred by Miquel (1896) to *Morinda* under the name *M. korthalsiana.* Schumann (1891), who did not recognize either *Rennellia* or *Tribrachya* as genera separate from *Morinda,* named the species *M. tribrachya.* Finally, Ridley (1939) recombined it under *Rennellia* as *R. morindiformis.* All these names are based on the same original material. The species was typified by Wong (1984, as 'holotype').

Rennellia paniculata, described by King & Gamble (1904), agrees in all essential characters with *R. morindiformis* and cannot be treated as a separate species.

DUBIOUS NAMES

Rennellia ovalis Korthals (1851) 257; Miquel (1856/1857) 248; Miquel (1860/1861) 220; Boerlage (1891) 137.
This entity is probably conspecific with *R. elliptica* Korth.

Rennellia speciosa (Wall. ex Kurz) J.D. Hooker var. *angustifolia* Ridley (1923) 120.— Type: *Kloss,* Malay Peninsula, Kedah, Gunong Bintang (not seen).
This taxon should probably be included in *R. elliptica* Korth.

EXCLUDED NAME

Rennellia prismatomeriformis Merrill (1929) 296 = *Prismatomeris beccariana* (Baillon) Johansson (1987b) 57.

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