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REVISION OF THE MALESIAN SPECIES OF MICROCOCCA (EUPHORBIACEAE)

VERNIE G. SAGUN[1] & PETER C. VAN WELZEN[2]

SUMMARY

Micrococca is a rare genus represented in the Malesian region by only three species. *Micrococca mercurialis* (L.) Benth. is widespread, but in Malesia it is found only in Peninsular Malaysia. *Micrococca malaccensis* Airy Shaw and *M. johorica* Airy Shaw are both endemic to Johore. *Micrococca* can be distinguished from its close allies, *Erythrococca* and *Claoxylon*, by its interrupted racemes (with long internodes), pistillate flowers with elongated (strap-like) disc lobes, and a deeply 3-lobed, thinly crustaceous capsule dehiscing both septicidally and loculicidally. *Micrococca mercurialis* is a small-leaved shrub, while the other two species are trees with much larger leaves. *Micrococca johorica* has glands on the leaf bases, narrow leaves, and short inflorescences, whereas *M. malaccensis* lacks glands on the leaf bases, has wider leaves, and longer inflorescences.

Key words: *Claoxylon*, *Erythrococca*, Euphorbiaceae, *Micrococca*, Malesia, taxonomy.

INTRODUCTION

Micrococca was established by Bentham (1849) to accommodate the exceptional *Tragia mercurialis* of Linnaeus (1753), a species reminiscent of the genus *Mercurialis* (Plukenet, 1692, 1696) but with alternate leaves and a different floral structure. *Tragia mercurialis* has always been difficult to classify. Thwaites (1861) placed it in *Claoxylon* and Dalzell & Gibson (1861) erroneously classified it in *Microstachys*, referring to De Jussieu (1824), where, however, the binomial *Microstachys mercurialis* was not mentioned. Thwaites' placement of *Micrococca* in *Claoxylon* was followed by a number of authors, including Müller (1866), Hooker (1890), Trimen (1898), Hiern (1900) and Cooke (1908). Other authors such as Engler (1895), Pax (1899), and Prain (1911) followed the treatment of Bentham (1849).

In his review of the genera *Claoxylon* A. Juss., *Erythrococca* Benth. and *Micrococca*, Prain (1911) summarised the characters to discriminate *Micrococca* from its close allies, *Erythrococca* and *Claoxylon*. *Micrococca* has interrupted racemes (long internodes), pistillate flowers with elongated (strap-like) disc lobes, and a deeply 3-lobed, thinly crustaceous capsule dehiscing both septicidally and loculicidally. *Erythrococca* and *Claoxylon* usually have continuously floriferous racemes (short internodes), pistillate flowers with the disc lobes broader than long and subglobose coriaceous capsules dehiscing loculicidally only. Webster (1994) added the absence of bud scales and

1) Philippine National Herbarium, National Museum of the Philippines, P.O. Box 2659, Manila 1000, The Philippines; e-mail: vsagun@uplb.alumni.net
2) Nationaal Herbarium Nederland, Universiteit Leiden branch, P.O. Box 9514, 2300 RA Leiden, The Netherlands; e-mail: welzen@nhn.leidenuniv.nl

caducous stipules (scales present and stipules persistent in *Erythrococca*) as additional characters. He also mentions the presence of stipellae as typical for *Micrococca*. However, we never observed stipellae in this genus. Prain's delimitation[1] of the three genera extended the circumscription of *Micrococca*, which Bentham considered to be monotypic. In a recent classification by Webster (1994), *Micrococca* is placed in subfamily Acalyphoideae, tribe Acalypheae, subtribe Claoxylinae on the basis of a shrub or tree habit; simple indumentum; free stamens; thecae parted to the connective, but not vermiform; colporate pollen; unlobed styles; and ecarunculate seeds. Note that the interstaminal disc, mentioned as typical for the Claoxylinae by Webster (1994) was not observed. *Micrococca* comprises c. 12 species, two of which lately discovered by Airy Shaw (1971), making a total of three species in Peninsular Malaysia.

MICROCOCCA

Micrococca Benth. (1849) 503; Baill. (1858) 436; Müll.Arg. (1866) 789; Benth. & Hook.f. (1883) 309; Engl. (1895) 238; Prain (1911) 628; (1913) 876; Pax & K. Hoffm. (1914) 131; Gamble (1925) 1327; Prain (1925) 460; Pax & K. Hoffm. (1931) 112; Robyns (1948) 458; Hutch. & Dalziel (1958) 402; Whitmore (1973) 118; Airy Shaw (1975) 5, 20; R.A. Dyer (1975) 315; Radcl.-Sm. (1987) 260; G.L. Webster (1994) 88. — *Claoxylon* A. Juss. sect. *Micrococca* Müll. Arg. (1865) 166. — Type species: *Micrococca mercurialis* (L.) Benth.

Mercurialis sect. *Erythrante* Baill. (1858) 490. — Type species: *Mercurialis alternifolia* Lam. [= *Micrococca mercurialis* (L.) Benth.].

Herbs or shrubs; erect, monoecious or dioecious. *Indumentum* of simple hairs only. *Stem* terete, glabrous to hairy. *Stipules* hairy or glabrous, early caducous, narrowly triangular. *Leaves* simple, alternate, or sometimes the lowermost leaves opposite; petioles adaxially channelled, glabrous to slightly hairy; blade ovate to obovate, symmetric, papery, base often with 2 glands adaxially; margin entire or crenate (often with glands and hairs in the sinuses) or denticulate (then often with glands apically on teeth); apex acuminate; adaxial surface glabrous to slightly hairy, abaxial surface glabrous to sparsely hairy on midrib; venation pinnate, only midrib prominent abaxially, secondary nerves 3–10 per leaf half, looped and closed near margin, veins slightly scalariform, inconspicuous, veinlets reticulate, indistinct. *Inflorescences* axillary, panicles or usually racemes, with several staminate flowers (of which one flowering at a time) and a single pistillate flower per node, internodes 5–20 mm long; bracts ovate to elliptic, glabrous to sparsely hairy. *Flowers* unisexual, actinomorphic; sepals 3 or 4; petals absent. *Staminate flowers*: pedicels glabrous to slightly hairy; sepals ovate, glabrous to slightly hairy outside; disc absent; stamens 3–66, filaments glabrous, anthers basifixed, thecae 2, separate, basally attached to the very short connective, opening latrorsely with longitudinal slits; pistillode absent. *Pistillate flowers*: pedicel hairy; calyx basally connate, lobes ovate, hairy outside; disc lobes 3, longer than wide, strap-like, alternating with carpels; ovary 3- or 4-locular, globular, covered with hairs; 1 ovule per locule; style absent, stigmas 3, undivided, smooth or papillate adaxially. *Fruits* lobed capsules, glabrous to sparsely hairy, dehiscing loculicidally and septicidally; wall thin, crustaceous; columella slightly widened apically. *Seeds* smooth, globose to ellipsoid, glabrous.

1) It is interesting to note that Prain used the name *Claoxylon mercurialis* instead of *Micrococca mercurialis* in his Bengal Plants (1963), long after his delimitation of the three genera.

Distribution — 13 species in Africa, Madagascar, India, northern Australia, and Malesia (3 spp. in Peninsular Malaysia only).

KEY TO THE SPECIES

1a. Herbs. Leaf blade 2–5 by 1–2.5 cm, margin crenate, often with glands and hairs in sinuses, nerves c. 5 per side. Stamens 3–9 ..... **3. M. mercurialis**
b. Shrubs. Leaf blade 11–25.5 by 2–8 cm, margin laxly denticulate, with glands on apex of teeth, nerves 7–19 per side. Stamens 18–66 2
2a. Leaf index (length/width ratio) 3.3–5. Basal leaf glands present. Inflorescences 7–12.5 cm long, peduncle 1–2 cm long, internodes 5–6 mm long. Stamens 54–66, anthers erect, thecae attached to a short, undifferentiated connective, not lobed ..... **1. M. johorica**
b. Leaf index (length/width ratio) 2.5–3. Basal leaf glands absent. Inflorescences 9–16 cm long, peduncle 2–5 cm long, internodes 1–2 cm long. Stamens 18–40, anthers pendulous, thecae attached to a V-shaped connective, 2-lobed ..... **2. M. malaccensis**

1. Micrococca johorica Airy Shaw — Fig. 1g, h

Micrococca johorica Airy Shaw (1971) 525; Whitmore (1973) 118. — Type: *KEP FRI (Whitmore) 160* (holo SING), Malaysia, Johore, State Land, 13 km S of Labis Forest Reserve.

Shrub, c. 1 m tall, dioecious; fruiting branches 3–5 mm in diameter, hairy. *Stipules* c. 0.75 mm long. *Leaves*: petioles 3–47 mm long, glabrous to hairy; blade narrowly obovate, 11–25.5 by 2.2–7.7 cm, length/width ratio 3.3–5, base acute, with 2 glands above; margin laxly denticulate, often with glands apically on teeth; apex acuminate; adaxial surface glabrous, abaxial surface with sparse hairs only on midrib and veins; nerves 7–19 per side. *Inflorescences* axillary racemes or panicles, 7–12.5 cm long, peduncle 1–2 cm long, internodes 5–6 mm long, bracts ovate to elliptic, 0.75–3 by 0.3–1.5 mm, glabrous to sparsely hairy. *Staminate flowers* c. 1.5 mm in diameter; pedicels 2–4 mm long, glabrous to sparsely hairy; sepals ovate, 1.5–1.75 by 1.25–1.5 mm, hairy outside; stamens 54–66, filaments 0.3–0.4 mm long, thecae 0.25–0.3 by c. 0.2 mm. *Pistillate flowers* not seen. *Fruits* 5–7 by 10–13 mm, glabrous. *Seed* c. 5 by 5 mm.

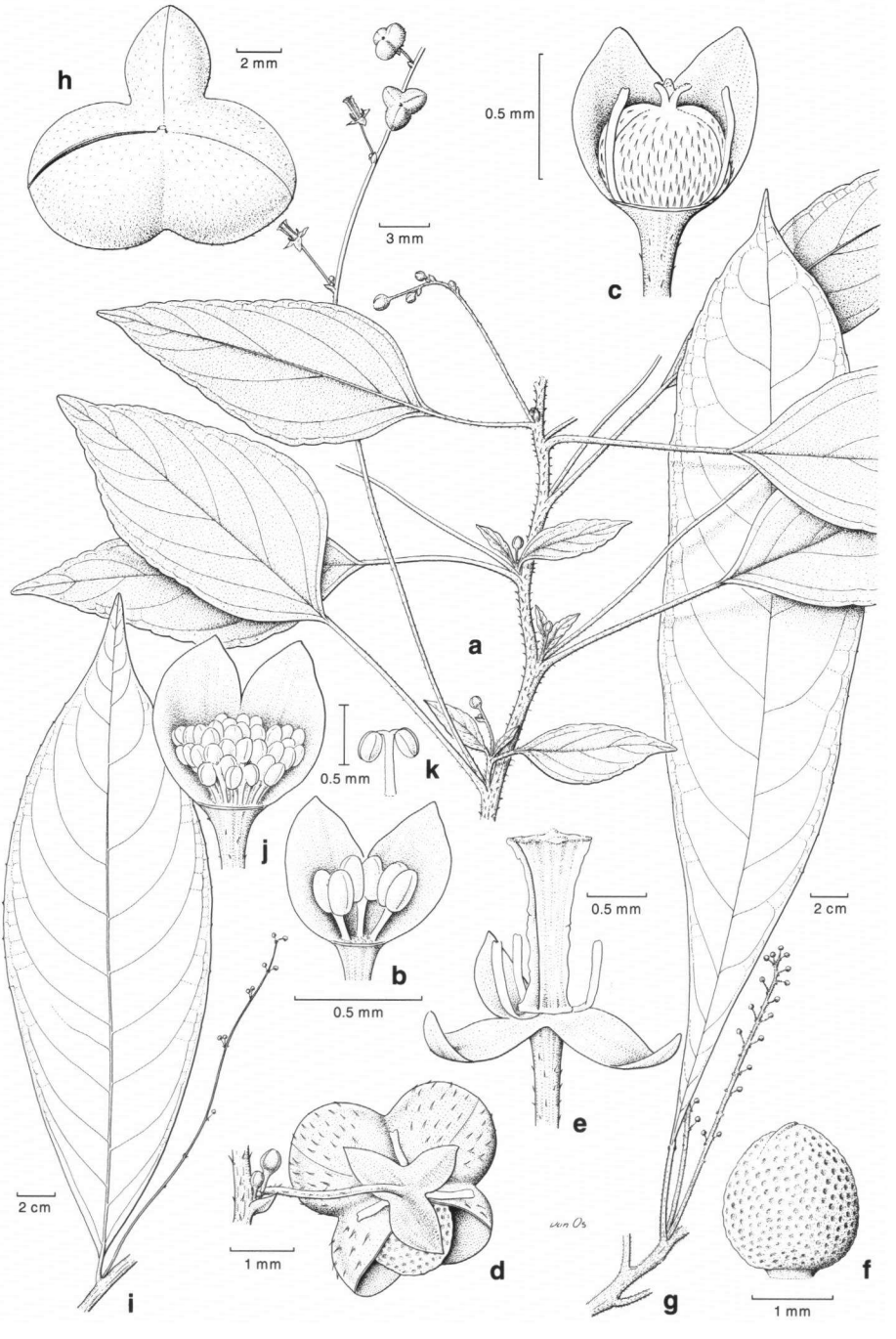
Distribution — Malaysia: Johore State: Kluang Forest Reserve; Sungai Sedili, below Mawai.

Habitat & Ecology — Flowering from February to April; fruiting in July.

2. Micrococca malaccensis Airy Shaw — Fig. 1i–k

Micrococca malaccensis Airy Shaw (1971) 524; Whitmore (1973) 118. — Type: *SF (Kiah) 37230* (holo SING), Malacca, Batang Malaka Forest Reserve.

Shrub, c. 3 m tall, dioecious; flowering branches 2–5 mm in diameter, hairy. *Stipules* c. 1 mm long. *Leaves*: petioles 5–10 by 1.5–2 mm, hairy; blade elliptic to narrowly obovate, 12.4–17.2 by 5–5.7 cm, length/width ratio 2.5–3; base rounded to acute, glands absent; margin laxly denticulate, often with glands apically on teeth, usually involute; apex acuminate; adaxial surface glabrous, abaxial surface hairy only on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midrib and veins; nerves 8–10 per side. *Staminate inflorescence* axillary panicles, 9–16 cm long; peduncle 22–50 mm long, internodes 1–2 cm long, bracts ovate, c. 0.75 by 0.75 mm, hairy outside. *Staminate flowers* c. 2 mm in diameter; pedicels 1–2 mm long; sepals ovate to elliptic, 1–1.75 by 0.5–1 mm, hairy outside; stamens 18–40, filaments 0.4–0.5 mm long, thecae c. 0.25 by 0.25 mm, 2-lobed, connective V-shaped. *Pistillate flowers* and *fruits* not seen.

Distribution — Malaysia: Malacca (Batang Malaka), NW Johore (Ulu Segamat).

Habitat & Ecology — Altitude c. 300 m. Flowering from April to September.

3. Micrococca mercurialis (L.) Benth. — Fig. 1a–f

Micrococca mercurialis (L.) Benth (1849) 503; Trimen (1885) 82; Engl. (1895) 238; Pax (1899) 50; De Wild. & T. Durand (1900) 57; Prain (1911) 631; (1913) 876; Pax & K. Hoffm. (1914) 133; A. Chev. (1920) 576; Gamble (1925) 1328; Robyns (1948) 458; Whitmore (1973) 118; S.M. Almeida (1985) 238; Radcl.-Sm. (1987) 261. — *Tragia mercurialis* L. (1753) 980, 1391; Willd. (1805) 324; Moon (1824) 62; Roxb. (1824) 576; J. Graham (1839) 186; Prain (1963) 710. — *Claoxylon mercurialis* Thwaites (1861) 271; Müll.Arg. (1866) 790; Hook.f. (1890) 412; Trimen (1898) 63; Woodrow (1899) 372; Hiern (1900) 976; T. Cooke (1908) 609; T. Durand & H. Durand (1909) 492; Prain (1963) 710; Vartak (1966) 94. — *Microstachys mercurialis* (L.) Dalzell & A. Gibson (1861) 227. — Lectotype (Radcliffe-Smith, 1987): Plukenet, 1692: t. 205/4; 1696: 248.

Mercurialis alternifolia Lam. (1797) 120, Baill. (1860) 76, 125, 279. — Type: *Adanson s.n.* (P-JU), Senegal.

Herb, 13–34 cm tall, monoecious; flowering stem 2–4 mm in diameter, sparsely hairy. *Stipules* 0.3–1.75 mm long. *Leaves*: petioles 5–20 mm long, slightly hairy, with glands at the base; blade ovate to elliptic, 18–53 by 10–26 mm, length/width ratio 1.7–2.5, base attenuate to rounded, with 2 glands above; margin crenate, often with glands and hairs in sinuses; apex acuminate; adaxial surface glabrous to slightly hairy, abaxial surface sparsely hairy; nerves c. 5 per side. *Inflorescences* axillary racemes, 17–70 mm long, peduncle 5–43 mm long, internodes 5–13 mm long, bracts ovate to elliptic, 1–1.75 by 0.3–1 mm, glabrous to sparsely hairy. *Staminate flowers* 0.5–1.5 mm in diameter; pedicels 0.5–2 mm long, glabrous; sepals ovate, 0.3–1 by 0.3–0.75 mm, glabrous to slightly hairy outside; stamens 3 or 4 (see note), filaments 0.1–0.3 mm long, thecae 0.2–0.4 by 0.1–0.2 mm. *Pistillate flowers* 1–2 mm in diameter; pedicels 1–15 mm long, hairy; calyx lobes ovate, 1–1.75 by 0.75–0.8 mm, hairy outside; disc lobes 0.5–1 by 0.1–0.25 mm; ovary globose, c. 0.5 mm in diameter, hairy; stigmas 0.2–0.75 mm long, undivided, smooth or papillate. *Fruits* 3–5 mm in diameter, glabrous to sparsely hairy, columella 1–2 mm long. *Seed* 1.5–2 by 1.5–2 mm in diameter.

Fig. 1. *Micrococca* Benth. — a–f: *M. mercurialis* (L.) Benth.: a. Habit; b. staminate flower with part of sepals removed, few stamens (compare with j); c. pistillate flower with part of sepals removed showing disc lobes and ovary; d. fruit and part of inflorescence with staminate buds; e. fruit columella after dehiscence with persistent disc lobes and sepals; f. seed. — g & h: *M. johorica* Airy Shaw: g. Leaf with glands at leaf bases; h. fruit. — i–k: *M. malaccensis* Airy Shaw: i. Leaf; j. staminate flower with part of sepals removed, many stamens (compare with b); k. stamen (a–f: *Teruya 2333*, SING; g: *KEP FRI (Whitmore) 160*, KEP; h: *SF (Corner) 36981*, SING; i–k: *SF (Kiah) 37230*, SING).

Distribution — Malaysia: Penang, Perak, Trengganu; Singapore. Africa to India.

Habitat & Ecology — Open sandy places near the coast. Uncommon. Flowering and fruiting throughout the year.

Uses — Eaten as a vegetable in Gabon. In Congo (Brazzaville) the plant is used to treat children with fever and the plant-sap is instilled into the nose, eyes or ears to treat headache, filariasis of the eye or otitis, respectively (Burkill, 1994).

Note — African specimens usually have 9 stamens, the Asian specimens 3 or 4.

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REFERENCES

Airy Shaw, H.K. 1971. Notes on Malesian and other Asiatic Euphorbiaceae: CXX–CXLVIII. Kew Bull. 25: 524–526.

Airy Shaw, H.K. 1975. The Euphorbiaceae of Borneo. Kew Bull. Add. Ser. 4: 5, 20

Almeida, S.M., A.R. Kulkarni & S.R. Yadav. 1985. Notes on Micrococca mercurialis (L.) Benth. J. Bombay Nat. Hist. Soc. 82: 238–240.

Baillon, H. 1858. Étude Générale du Groupe des Euphorbiacées: 436, 490. Victor Masson, Paris.

Baillon, H. 1860. Recueil d'Observations Botaniques. Adansonia 1: 76, 125, 279.

Bentham, G. 1849. Euphorbiaceae. In: J.D. Hooker (ed.), Niger Flora: 503–504. Hippolyte Bailliere, London.

Bentham, G. & J.D. Hooker. 1883. Genera Plantarum 3: 309. Reeve & Co., London.

Burkill, H.M. 1994. The useful plants of West Tropical Africa, 2nd ed., 2: 115–116. Royal Botanic Gardens, Kew, London.

Chevalier, M.A. 1920. Exploration Botanique de l'Afrique Occidentale Française: 576. Paul Lechevalier, Paris.

Cooke, T. 1908. The Flora of the Presidency of Bombay 2: 609. Taylor & Francis, London.

Dalzell, N.A. & A. Gibson. 1861. The Bombay Flora: 227. Education Society's Press, Byculla, Bombay.

De Jussieu, A. 1824. De Euphorbiacearum Generibus Medisque Earumdem Viribus Tentamen: 48. Didot, Paris.

De Lamarck, J.B.A.P.M. 1797. Encyclopédie Méthodique Botanique 4: 120. H. Agasse, Paris.

De Wildeman, E.M. & T. Durand. 1900. Contributions à la Flore du Congo. Ann. Mus. Congo, sér. 2, Bot. 1.2: 57.

Durand, T. & H. Durand. 1909. Sylloge Florae Congolanae (Phanerogamae): 492. Maison Albert De Boeck, Bruxelles.

Dyer, R.A. 1975. The genera of southern African flowering plants 1: 315. Department of Agricultural Technical Services, Pretoria.

Engler, A. 1895. Die Pflanzenwelt Ost-Afrikas und der Nachbargebiete: 238. Geographische Verlagshandlung Dietrich Reimer, Berlin.

Gamble, J.S. 1925. Flora of the Presidency of Madras 7: 1327–1328. Secretary of State for India in Council, London.

Graham, J. 1839. A catalogue of the plants growing in Bombay and its vicinity: 186. Government Press, Bombay.

Hiern, W.P. 1900. Catalogue of the African plants 4: 976. Longmans & Co., London.

Hooker, J.D. 1890. Flora of British India 5: 412. Reeve & Co., London.
Hutchinson, J. & J.M. Dalziel. 1958. Flora of West Tropical Africa 1: 402. Crown Agents for Oversea Governments and Administrations, London.
Linnaeus, C. 1753. Species Plantarum 2: 980–981, 1391. Laurentii Salvii, Holmiae.
Moon, A. 1824. A catalogue of the indigenous and exotic plants growing in Ceylon: 62. Wesleyan Mission Press, Colombo.
Müller Argoviensis, J. 1865. Euphorbiaceae. Linnaea 34: 166.
Müller Argoviensis, J. 1866. Euphorbiaceae. In: A.L.P.P. de Candolle (ed.), Prodromus Systematis Naturalis Regni Vegetabilis 15, 2: 781–790. Victoris Masson et Filii, Parisiis.
Pax, F. 1899. Euphorbiaceae. In: E.M. de Wildeman & T. Durand (eds.), Contributions à la Flore du Congo. Ann. Mus. Congo, sér. 2, Bot. 1.1: 50.
Pax, F. & K. Hoffmann. 1914. Euphorbiaceae–Acalypheae–Mercurialinae. In: A. Engler, Pflanzenreich IV.147.vii: 131–133. Engelmann, Leipzig, Berlin.
Pax, F. & K. Hoffmann. 1931. Euphorbiaceae. In: A. Engler & H. Harms, Die natürlichen Pflanzenfamilien, ed. 2, 19c: 112. Leipzig.
Plukenet, L. 1692. Phytographia (appendix 3): t. 205/4. G. & J. Innys, Londini.
Plukenet, L. 1696. Almagestum botanicum: 248. Plukenet, Londini.
Prain, D. 1911. A review of the genera Erythrococca and Micrococca. Ann. Bot. (London) 25: 575–638.
Prain, D. 1913. Euphorbiaceae. In: W.T.T. Dyer (ed.), Flora of Tropical Africa 6: 876–877. Reeve & Co., London.
Prain, D. 1925. Euphorbiaceae. In: W.T.T. Dyer (ed.), Flora Capensis 5: 460. Reeve & Co., London.
Prain, D. 1963. Bengal Plants 2: 710. Botanical Survey of India, Calcutta.
Radcliffe-Smith, A. 1987. Euphorbiaceae 1. In: R.M. Polhill (ed.), Flora of Tropical East Africa: 260–263. A.A. Balkema, Rotterdam.
Robyns, W. 1948. Flore des Spermatophytes du Parc National Albert 1: 458–459. Institut des Parcs Nationaux du Congo Belge, Bruxelles.
Roxburgh, W. 1824. Flora Indica 3: 576–577. Thacker & Co., Calcutta.
Thwaites, G.H.K. 1861. Enumeratio Plantarum Zeylaniae: 271. Dulao & Co., London.
Trimen, H. 1885. A systematic catalogue of the flowering plants and ferns indigenous to or growing wild in Ceylon: 82. George J.A. Skeen, Colombo.
Trimen, H. 1898. A handbook to the flora of Ceylon 4: 63. Dulao & Co., London.
Vartak, V.D. 1966. Enumeration of plants from Gomatak, India: 94. Maharashtra Association for the Cultivation of Science, India.
Webster, G.L. 1994. Synopsis of the genera and suprageneric taxa of Euphorbiaceae. Ann. Missouri Bot. Gard. 81: 88
Whitmore, T.C. 1973. Tree Flora of Malaya 2: 118. Longman, London.
Willdenow, C.L. 1805. Species Plantarum 4: 324. G.C. Nauk, Berlin.
Woodrow, G.M. 1899. The Flora of Western India. J. Bombay Nat. Hist. Soc. 12: 372.

IDENTIFICATION LIST

Only those specimens with a clearly identified collector and collection number are listed. The numbers after the collectors and their collecting numbers refer to:

1 = *Micrococca johorica* Airy Shaw
2 = *Micrococca malaccensis* Airy Shaw
3 = *Micrococca mercurialis* (L.) Benth.

Carpenter 327: 3 — Curtis 1985: 3.
KEP series 97998: 1 — KEP FRI series 160:1; 20382: 3.
SF series 2333: 3; 36981: 1; 37230: 2; 37425: 3; 38879: 3; 39822: 3 — Shah & Samsuri MS 2437: 2.