

## A NEW SPECIES OF SECAMONE (APOCYNACEAE, SECAMONOIDEAE) FROM BORNEO

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### SUMMARY

A new species of *Secamone* (Apocynaceae, Secamonoideae), *S. badia* Klack. from Sarawak, Malaysia, is described and illustrated. The distinctness of the genera *Toxocarpus* and *Genianthus* in relation to *Secamone* is also discussed.

**Key words:** Apocynaceae, *Secamone*, *Toxocarpus*, Borneo, new species.

### INTRODUCTION

During a worldwide revision of subfamily Secamonoideae (Apocynaceae) I came across a specimen from Borneo that does not fit into any known taxon and must be described as a new species of *Secamone* R.Br. *Secamone* consists of suffrutescent twiners or small scrambling herbs to rarely erect shrublets with usually white to yellow small flowers. The genus is distributed in southern and tropical Africa as well as in Madagascar and on several smaller islands in the Indian Ocean. In Asia it is found in Sri Lanka and southern India to the Himalayas, and from southern China in the northwest through South East Asia to eastern Australia and New Caledonia (Goyder, 1992; Klackenberg, 1992a, b, 2001).

Asian Secamonoideae have not been the object of more comprehensive taxonomic work on subfamily (tribe) level since Tsiang (1939) revised this group. Secamonoideae are characterized by translators bearing four pollinia, not two as in Asclepiadoideae, nor furnished with a spoon-like pollen carrier as in Periplocoideae (see Endress & Bruyns (2000) for a classification of Apocynaceae with Asclepiadaceae included). In Asia four genera have been recognized in Secamonoideae, viz. *Genianthus*, *Goniostemma*, *Secamone* and *Toxocarpus*. The delimitation between them, however, is not distinct. The characters of the new species here described fit best with those of Malagasy *Secamone*, among Asian taxa with those of *Toxocarpus*. There are, however, reasons to believe that *Genianthus*, *Goniostemma* and *Toxocarpus* should be merged into *Secamone*, being advanced ingroups in this genus. I will here discuss *Toxocarpus* and, more briefly, *Genianthus*.

The generic delimitation of *Toxocarpus* in relation to *Secamone* has been discussed several times (Decaisne, 1844: 505; Bentham, 1876: 732; Schumann, 1895: 261; Brown, 1902: 286; Schlechter, 1907: 35, 1913: 90; Choux, 1914: 412; Tsiang, 1939:

54; Forster, 1991: 541; Klackenberg, 1992a: 8, 1992b: 597, 1995b: 411, 2001: 319). In most papers both genera have been accepted. For example, Tsiang (1939), based on studies of Asian Secamonoideae, considered *Secamone* to be readily separated from *Toxocarpus* by a host of characters. Klackenberg (1992a), however, argued that Malagasy *Secamone* exhibit such a wide morphologic variation that none of these characters holds true when studying also non-Asian Secamonoideae. Forster (1991) stated that style heads of certain Apocynaceae might vary considerably within populations or subspecies, and that the style head elongation seen in *Toxocarpus* would appear to be a trivial character upon which to distinguish a genus. Klackenberg (2001) pointed out, that a variable nature of the corona lobe morphology in *Secamone* is also seen, when plotting the shape of the corona on a molecular phylogenetic tree. On that account, the two most often used diagnostic characters for *Toxocarpus* in relation to *Secamone*, viz. the dorsiventrally versus laterally compressed corona lobes as well as long versus short style heads, are not reliable and are of limited taxonomic value at generic level in this group. Consequently, I agree with Forster (1991) who argued that these genera should be merged, an idea first proposed by Schumann (1895). In almost all flora treatments, however, both genera have been accepted, Flora of Australia excepted (Forster, 1996). In accordance with this, the new species discussed below is described in *Secamone*. This placement is even more justified as the new taxon, although displaying characters typical of Asian *Toxocarpus*, lacks the cleft corona lobes, and is in flower structure more similar to several Malagasy *Secamone*. All non-Asian species of *Toxocarpus* have already recently been transferred to other genera in subfamily Secamonoideae, viz. to *Secamone*, *Calyptanthra* and *Pervillaea* (Klackenberg, 1992a, 1995a, 1996a, b, 1997, 2001).

In addition to the long style head and dorsiventrally flattened corona lobes of variable morphology discussed above, *Toxocarpus*, as it has been circumscribed in Asia, is characterized also by the presence of colleters at the very base of the leaf lamina above, and also by the corona lobes being more or less cleft in an inner and an outer portion. These features are considered to be apomorphic. They are not present in *Secamone* s.str., neither in possible outgroups, e.g. *Calyptanthra*, *Pervillaea* and *Secamonopsis* (*Calyptanthra* sometimes has one or two large colleters) (Civeyrel, 1996; Klackenberg, 1996a). However, no apomorphy for *Secamone* s.str. in relation to *Toxocarpus* is known, and the Asian *Toxocarpus* seem to form an advanced ingroup in the mainly Malagasy and African *Secamone*.

In the same way as *Toxocarpus* is thought to be an ingroup in *Secamone*, *Genianthus* probably is an ingroup in *Toxocarpus*. *Genianthus* shares with *Toxocarpus* the derived characters mentioned above (double corona lobes and colleters at the base of the leaf lamina), but is distinguished from this genus by having adaxially hairy corolla lobes. Some species (sect. *Brachyblastus*) also have spike-like thyrses. Both these characters are derived within Secamonoideae and not seen in other taxa (Klackenberg, 1995b). A synapomorphy for *Toxocarpus*, however, in relation to *Genianthus*, is wanting, and *Genianthus* is probably an advanced ingroup in *Toxocarpus*, hence also in *Secamone*.

The name alludes to the dense reddish brown indumentum on the inflorescences and on the leaves underneath.

**Secamone badia** Klack., *spec. nov.* — Fig. 1

Species haec diagnoscenda foliis subtus indumento ferrugineo valde densis, lobis coronae non duplicibus, et ad ramulis inflorescentiae apicem versus floribus in fasciculos dispositis. — Typus: *Haviland 2171* (holo K; iso BM), [Malaysia, Sarawak] Borneo, Kuching, 1893.

Suffrutescent twiner; younger branches densely covered with reddish brown curled hairs. *Leaves* somewhat coriaceous; blade 6–12.5 by 2.5–5 cm, elliptic to slightly obovate, cuneate at base, acuminate to apiculate at apex, glabrescent above but with  $\pm$  remaining hairs along basal part of midrib, densely reddish brown hairy below, with 5–10 colleters at the very base above, venation pinnate, faintly looped when dry, midrib when dry mostly  $\pm$  even with lamina but slightly impressed at lower part above, raised below; petiole 15–23 mm long, densely hairy as lamina. *Inflorescences* extra-axillary, shorter to longer than the adjacent leaves, 3–10 cm long, densely covered with reddish brown hairs; cymes lax with clusters of flowers on 0.5–1 cm long lateral axes on a (usually basally forked) distinct central thicker branch, many-flowered; pedicels c. 1 mm long; bracts broadly triangular, up to 1 mm long. *Calyx* lobes slightly longer than the corolla tube, ovate, 1.1–1.2 by 0.6–1 mm, rounded at the apex, densely covered with reddish brown and curled hairs outside, glabrous inside. *Corolla* contorted with the left lobe margin overlapping and with the lobes fused only at the very base for 1/13–1/9 of their length into a tube, twisted, with some reddish hairs outside, hairy at the upper half of tube inside and at the base of each lobe, yellow; tube short and cylindric, 0.6–1.1 mm long; lobes curved, narrowly elliptic, 8–9.1 by 0.9–1.1 mm, obtuse at the apex. *Staminal column* c. 0.9 mm high. *Staminal corona* lobes simple, slightly laterally compressed and narrow but broadened and dorsiventrally compressed at the apex and with flat back near the base, truncate at apex, inclining towards the style head, slightly projecting above the thecae. *Anther wings* twice as long as thecae, c. 0.8 mm long. *Pollinia* c. 0.1 mm long, ellipsoidal. *Ovary* at top with some reddish hairs. *Style head* projecting slightly more than twice as long as the staminal column, distinctly exerted from the corolla tube, apical portion c. 3 times as long as the basal portion, 1.9–2 mm long, slightly bifid at the very apex, cylindric. *Fruits* not seen.

*Distribution* — Known only from the type locality.

*Habit & Ecology* — No information. Flowering in January.

*Notes* — This species does not show close affinity to any described species of *Secamone*/*Toxocarpus* known from Borneo. It is easily recognized by its dense reddish brown indumentum of rather short curled and irregularly branched multi-cellular hairs on the leaves underneath, and by the inflorescence of shortly pedicelled flowers in clusters on longer axes that are situated along a thick elongated main axis. Furthermore, the corona lobes are not cleft in an outer and an inner portion. In fact the simple corona lobes in combination with elongate style head have not been observed in Asian *Secamone*, but is common in Madagascar.

In addition to the paratype mentioned below, there is also one sterile collection, *Sinclair 10464*, 1960 (E), from Badas swamps in Brunei, that probably belongs to this species. It was collected in peat swamp forest. It has more broadly ovate leaves up to 7 cm wide with 2.5 cm long petioles.

Paratype: MALAYSIA: *Haviland & Hose 3493*, Borneo, Sarawak, Kuching, 1895 (K, L).

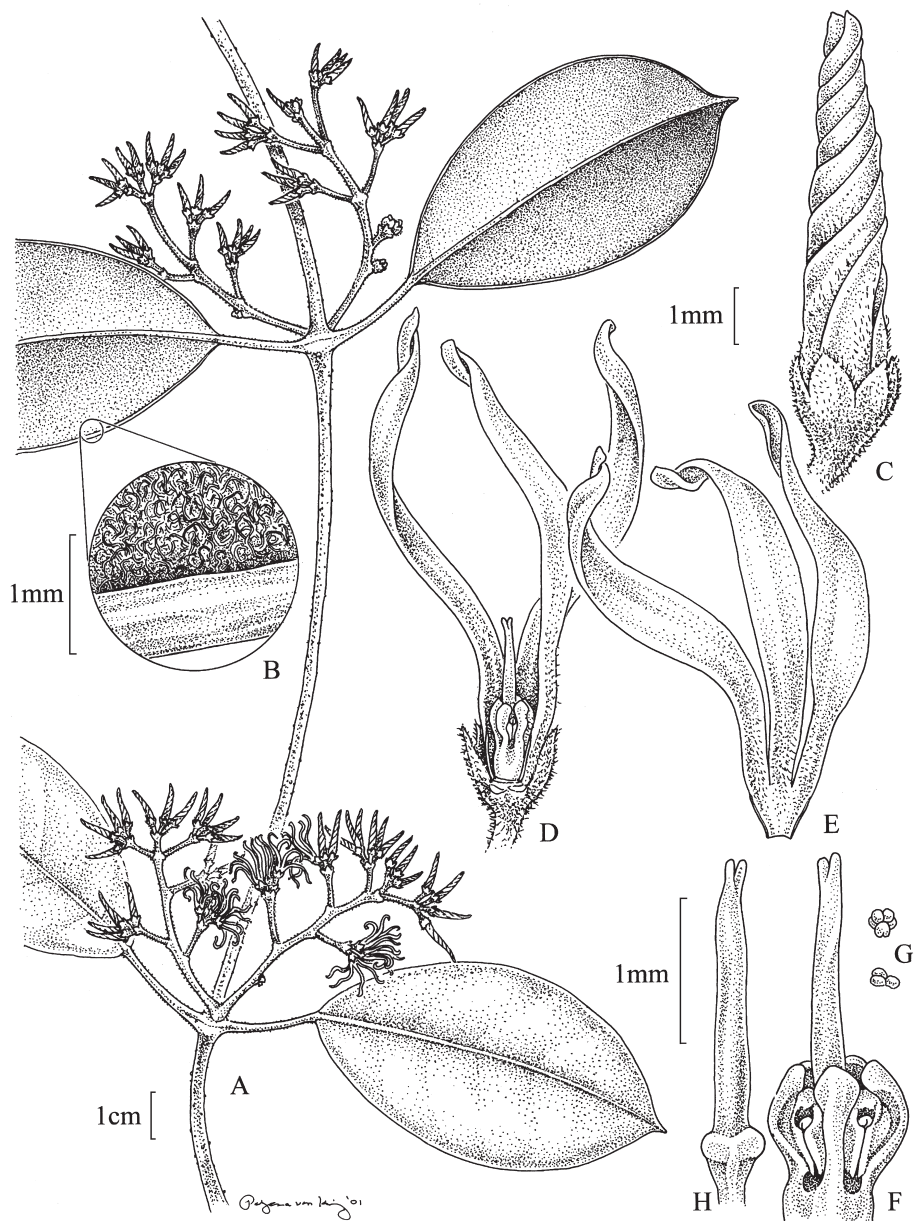


Fig. 1. *Secamone badia* Klack. A. Habit; B. hairy lower surface of leaf magnified; C. flower in bud; D. flower with two calyx and corolla lobes removed; E. portion of corolla from within; F. gynostegium; G. pollinia; H. style head (A: Haviland & Hose 3493; B–H: Haviland 2171). — Drawn by P. von Knorring.

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