

THREE NEW SPECIES OF *CHILOCARPUS* (*APOCYNACEAE* – *RAUVOLFIOIDEAE*) FROM MALESIA

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Three new species of *Chilocarpus* (*Apocynaceae* – *Rauvolfioideae*) from Malesia are described: *Chilocarpus hirtus* D.J.Middleton, *Chilocarpus pubescens* D.J.Middleton and *Chilocarpus sarawakensis* D.J.Middleton. Preliminary conservation assessments are proposed.

Keywords. *Apocynaceae*, *Chilocarpus*, Malesia, *Rauvolfioideae*.

INTRODUCTION

The genus *Chilocarpus* Blume was recently revised and included 13 species in India, Burma, Indochina and Malesia (Leeuwenberg, 2002). I will shortly publish an account of the genus as part of the *Apocynaceae*, subfamilies *Rauvolfioideae* and *Apocynoideae*, for *Flora Malesiana* in which extensive differences in species delimitation between the two accounts will be apparent. The different species concepts also necessitate the description of three new species. Preliminary conservation assessments are proposed following the criteria set out by the IUCN (2001).

An accurate taxonomic revision of the genus *Chilocarpus* is somewhat impeded by the paucity of good flowering material. Living plants of *Chilocarpus* are very rarely found with open flowers and, on herbarium specimens, what open flowers may be present fall off very easily and are often lost. Two of the new species described here suffer from a lack of mature corollas. Although this is unfortunate and describing taxa without mature corollas is hardly ideal, there is no doubt that these taxa are distinct and names for them are required for the *Flora Malesiana* account.

Markgraf (1971) and Leeuwenberg (2002) both included all *Chilocarpus* specimens with pubescent leaves within *Chilocarpus steenisianus* Markgr. These are found in Borneo and Sumatra. However, closer examination of the material reveals that there are three quite distinct and easily delimited taxa within this group, of which two are not yet described. *Chilocarpus steenisianus*, with its new delimitation, is confined to Borneo. I also suspect that the three species are not necessarily the most closely related to each other, as the newly described *Chilocarpus hirtus* bears similarities to *Chilocarpus rostratus* Markgr., and *Chilocarpus pubescens* seems rather isolated.

The third newly described species, *Chilocarpus sarawakensis*, is known from just three collections which have previously been variously included in *Chilocarpus*

costatus Miq. and *Chilocarpus vernicosus* Blume. I suspect its affinities are rather more likely to be to *Chilocarpus beccarianus* Pierre with which it shares a similar inflorescence structure and pubescence on the outside of the corolla lobes.

***Chilocarpus hirtus* D.J.Middleton, sp. nov. Fig. 1.**

A *Chilocarpo steenisiano* Markgr. inflorescentiis brevioribus magis congestis, pilis in caulibus foliisque multo longioribus, foliis in facie superiore pubescentibus et corolla glabra recedit. – Type: Malaysia, Sarawak, 7th Division, Batang Balleh, Sungei Melatai, Nanga Berkakap, 320 m, 16 iv 1985, *Yii Puan Ching* S48375 (holo L; iso K, KEP, MO, SAN).

Woody climber to 20 m high, with white latex. *Branchlets* densely pubescent with long soft brown hairs. *Leaves* opposite; petiole 7–13 mm long, densely pubescent with long soft brown hairs; blade spatulate or obovate, 2.5–7.5 × 1.6–3.4 cm, 1.6–2.2 times as long as wide, apex retuse to rounded or apiculate, base cuneate, pubescent beneath with long soft brown hairs, more sparsely so above but denser on midrib, punctate beneath, secondary veins 14–17 pairs, prominent beneath, weakly prominent above, tertiary venation parallel to the secondary veins, often anastomosing before the intramarginal vein. *Inflorescence* a short axillary cyme, mostly in both axils of opposite leaves, c.1 cm long, few-flowered; peduncle up to 2 mm long, densely puberulent; pedicels 1.5–2 mm long, sparsely puberulent to glabrous, bracteoles few at base. *Calyx* 1.2–1.4 mm long, connate at the base, lobes 0.8–1 × 1.1 mm, 0.7–0.9 times as long as wide, glabrous, ciliate. *Corolla* (immature) orange, salverform; tube c.5 mm long, glabrous outside, pubescent inside below stamens; lobes known only in bud but have an acuminate apex, glabrous inside and outside. *Stamens* inserted at c.2.1 mm from corolla base; filaments c.0.5 mm long; anthers c.1.3 × 0.5 mm. *Ovary* c.1.3 mm high; style and style head c.1.6 mm long. *Fruit* unknown.

Distribution. Known from only four widely scattered collections. Two of these are close to each other in Riau, Sumatra. The other two are one each from Sarawak and Brunei in Borneo.

Habitat and ecology. In primary forest to 320 m altitude.

Proposed IUCN conservation status. Vulnerable due to fragmented and declining area (VU B1).

This species was included in *Chilocarpus steenisianus* by Leeuwenberg (2002). Despite the lack of mature flowers it clearly differs from that species in the shorter, more congested inflorescences, the much longer hairs on the stems and leaves, the pubescence on the upper surface of the leaves, and the glabrous corolla. It is similar to *Chilocarpus rostratus* but differs in the pubescence on the stems and leaves. The corolla dimensions given above must be treated with caution as it is not clear just how immature the corollas are and they may be much larger when mature. To a lesser extent this is also true for the stamen and gynoecium characters.

FIG. 1. Holotype of *Chilocarpus hirtus* D.J.Middleton.

Additional specimens examined. INDONESIA. **Sumatra Riau:** Indragiri, Kuala Belilas, 27 iv 1939, *Buwalda* 6709 (L); Indragiri, Danau Mangkoang, *Buwalda* 6613 (L).

BRUNEI DARUSSALAM. **Kuala Belait:** Andalau Forest Reserve, *Wood, Smythies & Ashton* SAN17538 (A, L).

***Chilocarpus pubescens* D.J.Middleton, sp. nov. Fig. 2.**

A *Chilocarpo steenisiano* Markgr. inflorescentia terminali, corolla magis dense pubescenti et fructu fusiformi differt. – Type: Malaysia, Sabah, Beaufort District, Mile 58, 20 xii 1989, *Ag. Amin* SAN115314 (holo L; iso SAN).

Woody climber (probably with copious white latex but this not reported). *Branchlets* minutely and densely puberulent, glabrescent with age. *Leaves* opposite; petiole 15–21 mm long, densely puberulent; blade ovate to elliptic, 6–18.9 × 3.8–8.2 cm, 1.5–2.6 times as long as wide, apex short acuminate, base rounded to obtuse, glabrous above, puberulent beneath, more densely so on midrib and veins, punctate beneath, secondary veins 18–24 pairs, with weaker interstitial veins, anastomosing into an intramarginal vein. *Inflorescence* a terminal panicle, flowers densely clustered, 9.5–14.4 cm long; peduncle 2.5–9.5 cm long, minutely and densely puberulent; pedicels 1.5–2 mm long, minutely and densely puberulent, bracteoles absent. *Calyx* 1–2.2 mm long, connate at base, lobes c.0.7–1 × 1–1.7 mm, 0.6–0.7 times as long as wide, apex rounded, densely pubescent. *Corolla* (slightly immature) yellow or purple, salverform; tube 8–9 mm long, c.4.1 times as long as calyx, c.1.5 times as long as lobes, densely pubescent outside except at very base, pubescent inside only below stamens; lobes falcate, c.6 × 2.2 mm, apex acuminate, pubescent outside on parts of lobes exposed in bud, glabrous inside. *Stamens* inserted at 2.3–2.7 mm from corolla base which is c.0.3 of tube length; filaments 0.6–0.8 mm long; anthers 1.2 × 0.4–0.5 mm. *Ovary* 1.3–1.4 mm long; style and style head 1.2–1.7 mm long. *Fruit* narrowly fusiform, 9.4 cm long, 1.4 cm wide (immature).

Distribution. Malaysia: Sabah, Sarawak.

Habitat and ecology. In swamp forest at low altitude.

Proposed IUCN conservation status. Endangered due to habitat loss (EN A1c).

This species is known from only three collections, two from swamp forest in the Beaufort district of Sabah and one labelled only ‘Sarawak’. It was included in *Chilocarpus steenisianus* by Leeuwenberg (2002) but is quite distinct from that species by the terminal, branched inflorescence, the densely pubescent outside to the corolla, and the fusiform fruit. It differs from the other species of *Chilocarpus* with terminal inflorescences by the pubescent leaves and pubescent corolla.

Additional specimens examined. MALAYSIA. **Sabah:** Beaufort District, Bukit Bendira, 35 m, 27 ix 1990, *Ag. Amin Sigun* SAN127339 (L). **Sarawak:** Sine loc., *Beccari* 1659 (K).

***Chilocarpus sarawakensis* D.J.Middleton, sp. nov. Fig. 3.**

A *Chilocarpo costato* Miq. sepalis, corollae tubi parte distali et lorum corollae partibus in alabastra expositis pubescentibus differt. A *Chilocarpo beccariano* Pierre

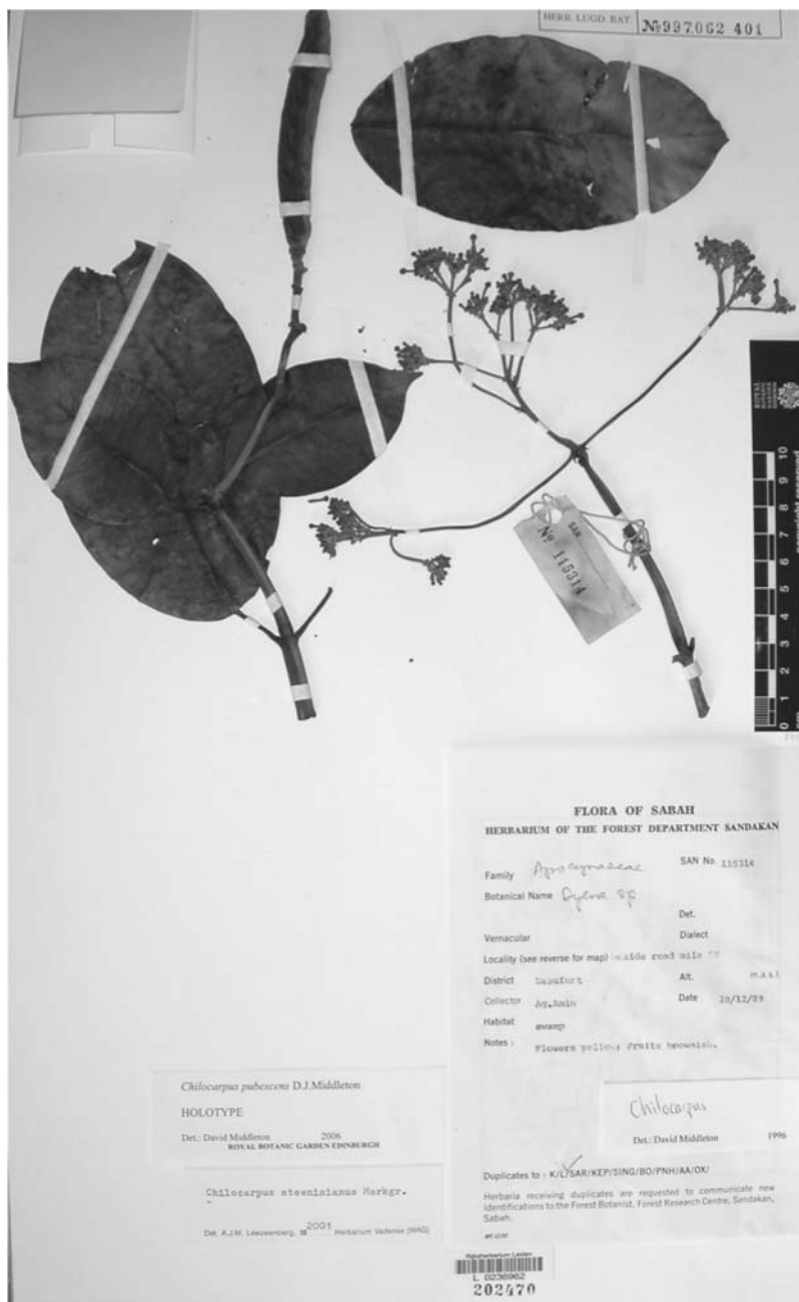


FIG. 2. Holotype of *Chilocarpus pubescens* D.J.Middleton.

inflorescentiis floribusque multo robustioribus et staminibus in tubo corollae altioribus insertis recedit. – Type: Malaysia, Sarawak, 5th Division, Route from Bakelalan to Gunung Murud, above S. Konap, c.4°N, 115°38'E, c.4400 ft [c.1340 m], *Burt & Martin* B.5183 (holo E).

Woody climber, reported to 27 m high. *Branchlets* glabrous. *Leaves* opposite; petiole 12–21 mm long; blade elliptic, 7.4–17 × 3.7–8.7 cm, 1.8–2.5 times as long as wide, apex

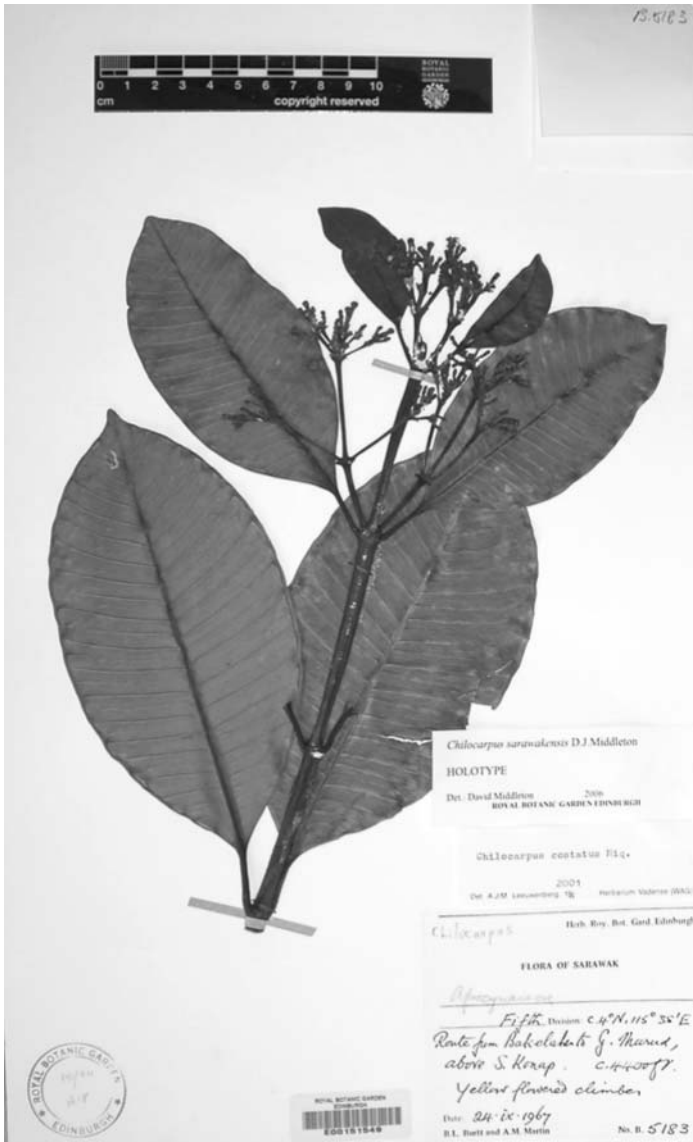


FIG. 3. Holotype of *Chilocarpus sarawakensis* D.J.Middleton.

short acuminate, apiculate, obtuse or rounded, base acute to cuneate, glabrous above and beneath, punctate beneath, secondary veins 19–24 pairs, these strongly prominent beneath, intercalated tertiary veins weaker, parallel and branched, all anastomosing into an intramarginal vein. *Inflorescences* axillary, robust, 4.6–8.5 cm long; peduncle 1.6–2.5 cm long, sparsely puberulent; pedicels 1–6 mm long, sparsely puberulent, with one or two bracteoles. *Calyx* 1.7–2 mm long, connate at the base, lobes 0.8–1 × 1.2–1.3 mm, 0.6–0.8 times as long as wide, puberulent, apex obtuse. *Corolla* yellow, salverform; tube c.8.4 mm long, 4.2 times as long as sepals, 1.1 times as long as lobes, glabrous outside except at very top of tube, densely pubescent inside beneath stamens; lobes falcate, c.7.5 × 2.2 mm, 3.4 times as long as wide, apex acute, pubescent on part exposed in bud outside, glabrous inside. *Stamens* inserted at c.4 mm from corolla base which is 0.5 of tube length; filaments c.0.7 mm long; anthers c.1.3 × 0.6 mm. *Ovary* c.1.2 mm long; style and style head c.2.8 mm long. *Fruit* unknown.

Distribution. Malaysia: Sarawak.

Habitat and ecology. In primary forest at 1020–1340 m altitude.

Proposed IUCN conservation status. Vulnerable due to fragmented and declining area (VU B1).

This species is closest to *Chilocarpus beccarianus* Pierre but differs from it in the much more robust inflorescences, the larger leaves with more prominent venation, the pubescent inflorescence axes, the longer corolla tube and the stamens inserted higher in the tube. It looks somewhat similar to *Chilocarpus costatus* but differs in the pubescence on the sepals, the top part of the corolla tube and the parts of the corolla lobes which are exposed in bud.

Additional specimens examined. MALAYSIA. **Sarawak:** 3rd Division, Kapit, Melinau, Ulu Sampurau, Bukit Salong, 4000 ft [1220 m], 20 viii 1967, *Ilias Paie* S.25889 (L); 5th Division, Limbang, G. Pagon, lower slope of G. Pagon Periuk, 1020 m, 13 viii 1984, *D. Awa & B. Lee* S.47857 (L).

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