

Novitates Bruneienses, 8. *Macrosolen brunsing* (Loranthaceae), a new hemiparasitic shrub from Brunei Darussalam

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ABSTRACT. *Macrosolen brunsing* Y.W.Low & Ariffin is described and illustrated here as a new species of aerial hemiparasite based on two collections from the Ladan Hills Forest Reserve, Tutong, Brunei Darussalam. The new species differs from all *Macrosolen* taxa enumerated in Borneo by its distinct linear leaves ((4–)8–14.5 cm long, 0.1–0.2(–0.25) cm wide).

Keywords. Borneo, endemic, linear-leaved, Malesia, new species

Introduction

The presence of aerial hemiparasitic shrubs of the Loranthaceae in tropical rainforests is often overlooked, even when they are flowering, as they are generally concealed high-up in the canopy of their host. Although many species produce very spectacular inflorescences, often their presence is only revealed by their withered flowers littered on forest floor, usually around the base of the trunk of their host. On a recent botanical excursion to the Nyamokning Dam construction site in the Ladan Hills Forest Reserve, a sterile but striking hemiparasitic shrub with linear leaves (*Y.W. Low et al. LYW 1059*) was collected from a species of *Hydnocarpus* Gaertn. (Achariaceae) host growing on a ridge at about 150 m asl. Later, the same hemiparasite was spotted in flower and fruit (*Y.W. Low et al. LYW 1081*) on a species of *Mallotus* Lour. (Euphorbiaceae) host, just above the campsite on the same trip. These two collections were closely examined in BRUN and SING (herbaria acronyms follow Thiers, (continuously updated)).

The Ladan Hills plant readily keys to *Macrosolen* Blume in the *Flora Malesiana* account for Loranthaceae (Barlow, 1997). Based on fieldwork carried out for the Brunei Checklist Project, Kirkup (1996) enumerated nine taxa, of which two were unidentified. These are *Macrosolen beccarii* Tiegh. ex Becc., *M. borneanus* Danser, *M. cochinchinensis* (Lour.) Tiegh., *M. crassus* Danser, *M. curvinervis* Danser, *M. aff. formosus* (Blume) Miq., *M. retusus* (Jack) Miq., *M. sp. A* and *M. sp. B*. Of the nine taxa listed by Kirkup (1996), only six were recognised by Barlow (1997) in his revision of the genus for Malesia, as *M. borneanus* is considered a synonym of *M. beccarii*, and

M. curvinervis is a synonym of *M. macrophyllus* (Korth.) Miq. However, we were unable to match the Ladan Hills taxon to any of the *Macrosolen* species preserved in BO, BRUN and SING. Barlow (1997) enumerated 24 species of *Macrosolen* in Malesia, and a survey of all the species listed in his revision reveals that only one taxon, *Macrosolen brevitubus* Barlow was reported to have linear leaves, but only at a juvenile stage. The leaf width measurement recorded for *Macrosolen brevitubus* at the juvenile stage was 0.5–1 cm wide (Barlow, 1995, 1997), while the Ladan Hills taxon differs in having much narrower leaf width at 0.1–0.2(–0.25) cm wide. Hence, the Ladan Hills population which maintains this extremely narrow leaf even when mature is distinct and described here as a new species.

Materials and Methods

A review of all the Bornean *Macrosolen* species was conducted based on herbarium specimens preserved in BO, BRUN and SING. Conventional methods employed in herbarium taxonomy were applied in this study. All measurements for vegetative characters were taken from dried herbarium specimens, while measurements of reproductive structures were taken from materials preserved in spirit collection. Photographic documentation was taken in the field. Type materials present at SING were examined, as well as type images of all Malesian *Macrosolen* species available at JSTOR® Global Plants website (<http://plants.jstor.org>). Botanical terms used in this study largely follow Beentje (2012). Provisional conservation assessments are made using the methodology proposed by IUCN (2012).

New species

***Macrosolen brunsing* Y.W.Low & Ariffin, sp. nov.**

Similar to *Macrosolen brevitubus* Barlow but differs in having narrow linear leaves ((4–)8–14.5 cm long, 0.1–0.2(–0.25) cm wide), and inflorescence a raceme of two opposite pairs of flowers. – TYPE: Brunei, Tutong District, Rambai, Ladan Hills Forest Reserve, Nyamokning Dam, BRUN-SING botanical exploration campsite on the edge of forest near water body, lowland mixed dipterocarp forest on yellow sandy clay soils, 04°23'35.6"N 114°48'58.6"E, 75 m asl, 22 August 2016, Y.W. Low, M.I. Siti Nur Bazilah, A.K. Muhd. Ariffin, A. Watu, E. Jangarun, P. Azlan, K. Muhd. Khairul Nizam & Z.A. Muhd. Wafiuiddin LYW 1081 (holotype BRUN (including spirit material as part of a single specimen); isotypes E, K, L, SAN, SAR, SING [[SING0166300] & spirit material [SING0202921]). (Fig. 1, 2)

Aerial stem hemiparasitic shrub with epicortical runners bearing secondary haustoria, glabrous. **Leaves** opposite, rarely sub-opposite; petioles 1–2 mm long; lamina narrowly linear, (4–)8–14.5 cm long, 0.1–0.2(–0.25) cm wide, base truncate, apex narrowly acute, coriaceous; midrib inconspicuous and sunken above, prominent and



Fig. 1. *Macrosolen brunsing* Y.W.Low & Ariffin displaying aggressive epicortical runners bearing secondary haustoria along the branch of a *Mallotus* sp. (Euphorbiaceae). From type material Y.W. Low *et al.* LYW 1081. (Photo: Y.W. Low)

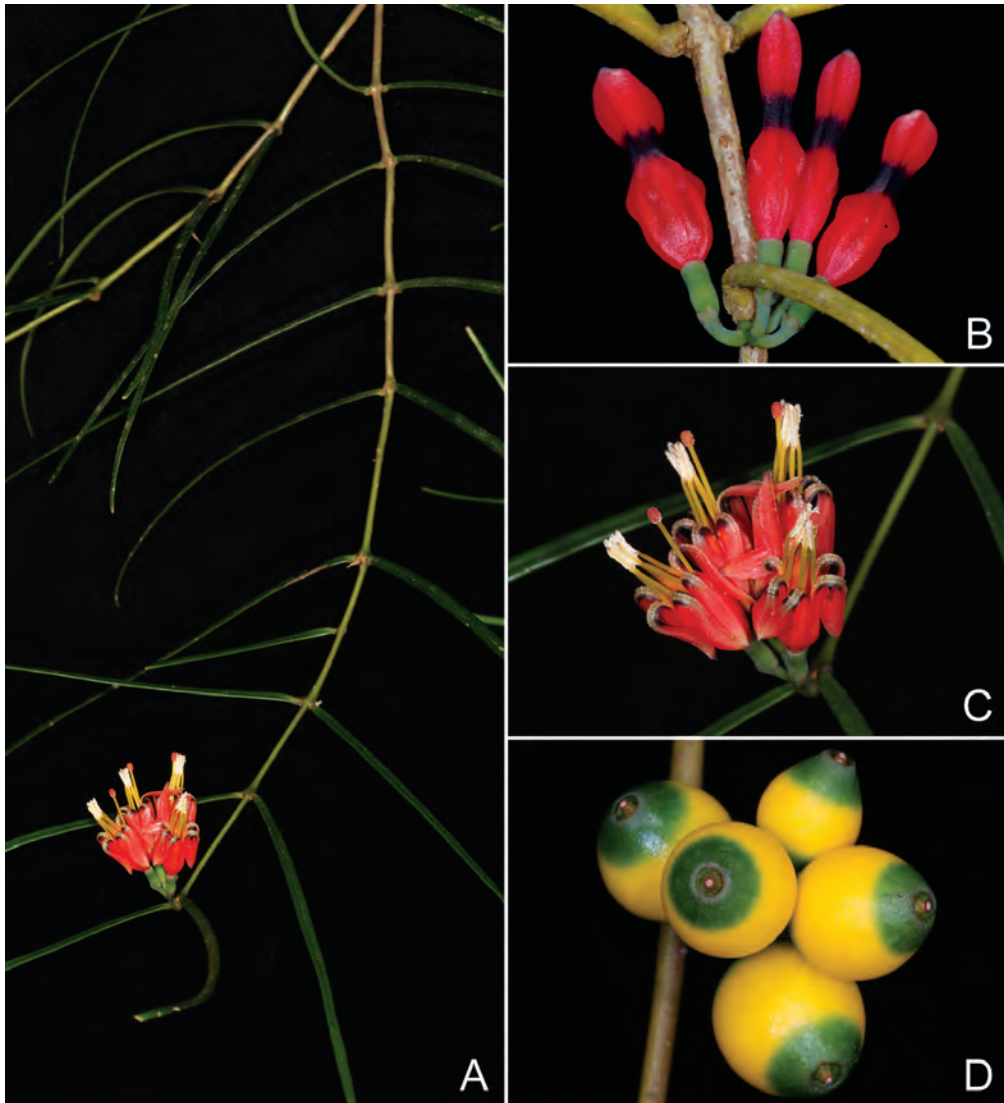


Fig. 2. *Macrosolen brunsing* Y.W.Low & Ariffin. **A.** Pendulous flowering branch showing distichous almost needle-like linear leaves and a terminal inflorescence. **B.** Close-up of mature flower buds that somewhat resemble bowling pins. **C.** Close-up of open flowers. **D.** Close-up of fruits. All from type Y.W. Low *et al.* LYW 1081. (Photos: Y.W. Low)

raised below; secondary and tertiary veins inconspicuous on both sides. **Inflorescences** axillary or rarely terminal, a raceme of 2 opposite decussate pairs of flowers; peduncle 1–3 mm long; pedicels c. 1.5 mm long. **Bracts** 3 under each flower, connate and forming a cup. **Ovary** cylindrical, c. 0.3 cm long, mostly pale green except for the darker green apex, smooth; calyx limb cylindrical, c. 1 mm long, truncate. **Corolla** 6-merous, gamopetalous, in mature bud with 6 prominent keels or wings below the



Fig. 3. Habitat of *Macrosolen brunsing* Y.W.Low & Ariffin in the lowland mixed dipterocarp forest of the Nyamoking Dam, Ladan Hills Forest Reserve. Foreground is the blue roof campsite at the edge of lake. (Photo: A.K. Muhammad Ariffin)

point of reflexion along the sutures of the lobes extending above the neck to the apex of the bud, somewhat zygomorphic, 17–21 mm long, inflated in the lower part, winged below the middle, clavate above a long neck and acute at apex, mostly red with a thick black band at neck and a black spot at apex; tube in open flowers 9–11 mm long with the narrowly spatulate lobes reflexed c. 3 mm above the margin of the throat. **Stamens** 6, inserted slightly below the throat of the corolla tube, at the middle of the corolla lobes, greenish yellow, basifixed, immobile; filaments c. 5 mm long, c. 3 mm protruding out from the corolla-tube mouth; anthers 3–4 mm long, base obtuse, apex acute. **Style** c. 1.8 cm long, greenish yellow, glabrous; stigma club-shaped, c. 1 mm long, red. **Fruit** broadly prolate to globose, c. 0.8–0.9 cm long, 0.6–0.7 cm wide, mostly bright yellow except for the green apex, smooth.

Additional specimen examined. BORNEO: **Brunei:** Tutong District, Rambai, Ladan Hills Forest Reserve, Nyamokning Dam, Hulu Sungai Tutong, ridge of lowland mixed dipterocarp forest on yellow sandy clay soils, 04°20'14.2"N 114°49'076"E, 152 m asl, 20 Aug 2016, Y.W. Low, M.I. Siti Nur Bazilah, A.K. Muhd. Ariffin, A. Watu, P. Azlan, K. Muhd. Khairul Nizam & Z.A. Muhd. Wafuuddin LYW 1059, sterile (BRUN, SING).

Distribution and Habitat. *Macrosolen brunsing* Y.W.Low & Ariffin is so far known only from the Ladan Hills Forest Reserve, in the lowland mixed dipterocarp forest on yellow sandy clay soils. (Fig. 3, 4)

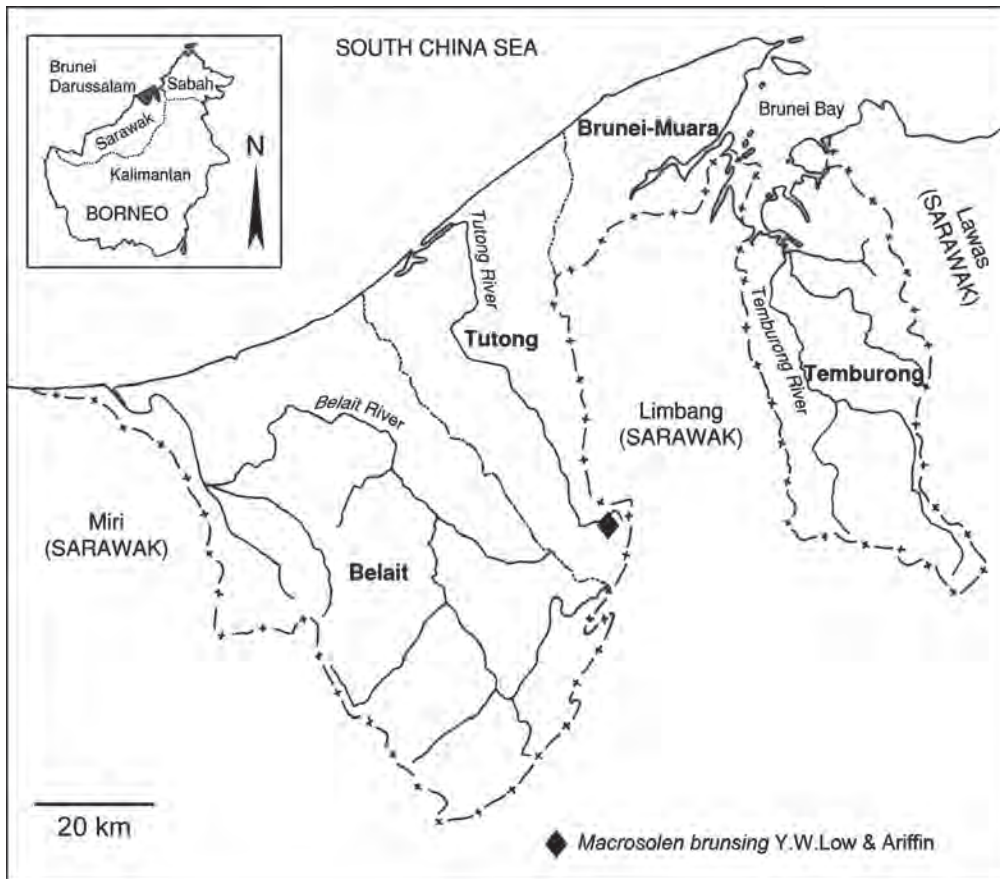


Fig. 4. Distribution of *Macrosolen brunsing* Y.W.Low & Ariffin.

Etymology. The epithet *brunsing* is composed by merging two herbaria acronyms together, namely BRUN (the Brunei National Herbarium) and SING (Herbarium of the Singapore Botanic Gardens). This new species is named for the two herbaria to celebrate the close working relationship between the two herbaria that can be traced back to the early 80's. The on-going MoU programme “*The Botanical Survey of Brunei Darussalam*” continues this cooperation.

Proposed IUCN Conservation Assessment. *Macrosolen brunsing* Y.W.Low & Ariffin is so far known only from two locations in the almost complete Nyamokning Dam, Ladan Hills Forest Reserve. The IUCN status proposed here for *Macrosolen brunsing* is Data Deficient (DD) as the species is only known from two collections, both within the same locality. Generally, the Ladan Hills Forest Reserve is considered to be poorly explored botanically. In this area at least *Macrosolen brunsing* is not under any imminent threats due to human activity as the species is protected in a forest reserve. The Brunei Government officially announced that logging will be phased out in all forest reserves in 2014 (Hamit, 2014).

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