

Four new records of Celastraceae for Brunei

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ABSTRACT. Four species belonging to three genera in the Celastraceae are reported here as new records for Brunei, *Celastrus monospermus* Roxb., *Euonymus javanicus* Blume, *Salacia korthalsiana* Miq. and *S. maingayi* M.A.Lawson. One species, *Celastrus monospermus*, is also the first record for Malesia. These species are discussed and details of the herbarium specimens in BRUN are provided.

Keywords. Borneo, *Celastrus monospermus*, *Euonymus javanicus*, *Flora Malesiana*, *Salacia korthalsiana*, *Salacia maingayi*,

Introduction

The Celastraceae, a medium sized family of angiosperms, consists of almost 100 genera and approximately 1350 species (Simmons, 2004). Southeast Asia is one of the main centres of diversity in the family. According to the revision of Celastraceae for *Flora Malesiana* (Ding Hou, 1962, 1964), there are 17 genera and 112 species in the region. In the Checklist by Coode et al. (1996), 30 species in 9 genera are listed for Brunei, among them seven undetermined species with remarks such as “sp. indet.”, “sp. nov.” and “sp.”. On examination of unidentified specimens of Celastraceae in the BRUN herbarium, I have identified *Celastrus monospermus* Roxb., collected from Belait district, *Euonymus javanicus* Blume, collected from Temburong district, *Salacia korthalsiana* Miq., collected from Temburong district, and *Salacia maingayi* M.A.Lawson, collected from Belait district as new for Brunei. These species were not previously recorded from Brunei in the relevant literature (Coode et al., 1996), although in the work by Ding Hou (1962, 1964), general maps of distribution for some of the species enumerated above include northern Borneo but with insufficient detail to say if Brunei is included.

There is a second herbarium in Brunei, UBD Herbarium (UBDH), and recently a review of new plant records for Brunei based on the collections of this herbarium was published by Zamri & Slik (2018). Two species of Celastraceae were published by them as new records for Brunei, *Euonymus indicus* B.Heyne ex Wall. and *Lophopetalum pachyphyllum* King. The specimens have been digitised and are available online.

Materials and methods

During the 11th Flora Malesiana Symposium (Brunei Darussalam, 30 June–05 July 2019), I had the opportunity to examine the collections at the Brunei National Herbarium (BRUN). Critical study of all available specimens of the Celastraceae (207 specimens, not including the genus *Bhesa* which has been transferred to the Centroplocaceae) enabled the identification of new records for the flora of Brunei from amongst previously unnamed material. Examination, identification and description of the specimens were done following standard taxonomic methods and consultation of the relevant literature (Blakelock, 1951; Ding Hou, 1955, 1962, 1964; Ma, 2001), which resulted in four new angiosperm records for the country. One species, *Celastrus monospermus*, is also the first record for Malesia.

New records

Celastrus monospermus Roxb., Fl. Ind. 2: 394 (1824). – TYPE: India, *Desilva s.n.* (lectotype NY [NY00337329], designated by Ding Hou (1955: 244)). (Fig. 1)

Specimens examined. BRUNEI: **Belait:** Bkt Sawat, Kpg Singap, Jln Kecil Singap., 4°33'N 114°35'E, 1 Aug 2008, *Azlan BRUN 22409* (BRUN [BRUN031015]). **Belait:** Along Sungai Topi., 4°07'N 114°41'E, Alt. 25 m, 24 Aug 1995, *Ariffin Kalat BRUN 17052* (BRUN [BRUN007343]).

Notes. *Celastrus monospermus* differs from the closely related species *Celastrus monospermoides* Loes. in its stipitate fruit bases (the basal part strongly constricted and stipitate for 1–3 mm), the one-seeded capsules 17–20 mm long vs. 5–14 mm long in *C. monospermoides*, and the large cylindrical seeds about 15 mm long and 8 mm wide vs. about 9 mm long and 5 mm wide in *C. monospermoides*. Both sheets of *Celastrus monospermus* in BRUN are in fruit. The two species also differ from each other in flower structure: a discoid disc in *Celastrus monospermus* vs. a flat disc in *C. monospermoides* (Ding Hou, 1955; Ding Hou et al., 2010). These characters may be useful in future field studies in Brunei. Another useful character is that the branchlets are often slightly zigzag in *Celastrus monospermus* vs. straight in *Celastrus monospermoides* (Ding Hou et al., 2010). The character is clearly visible on one of the specimens in BRUN (Fig. 1).

The closest published record of *Celastrus monospermus* to Brunei is a record from Southern Thailand (Phuket, Yala, Narathiwat – Ding Hou et al., 2010).

Euonymus javanicus Blume, Bijdr. Fl. Ned. Ind. 1146 (1827). – TYPE: Indonesia, Java, *Blume s.n.* (lectotype A! [A: 00049796], designated by Ma (2001: 171)).

Specimen examined. BRUNEI: **Temburong:** Amo, Ulu Temburong NP, Base Camp, 9 Aug 2014, *Low et al. LYW 727* (BRUN, two sheets [BRUN041553]).



Fig. 1. Herbarium specimen of *Celastrus monospermus* Roxb., Ariffin Kalat BRUN 17052 (BRUN) (Photo: BRUN staff).

Notes. The main differences between *Euonymus javanicus* and *E. indicus* B. Heyne ex Wall. are the number of flowers in the inflorescence (1 vs. 1–3), the position of the peduncles in the leaf axil (solitary/in pairs in *E. javanicus* vs. in cymes in *E. indicus*), and in the leaves (leaves generally flat in *E. javanicus* vs. veins often impressed above on leaves in *E. indicus*). Both species always have an “elaborate design” (using the term coined by Endress & Matthews, 2006) of flower parts (a fimbriate margin to the petals). Many characters are variable and the differences between these two species (Blakelock, 1951: 256–257) are disputable, leading to some authors deciding to unite them (Ma, 2001; Ding Hou et al., 2010). Here I recognise them as distinct although note that if they are united that *Euonymus indicus* has priority. It has previously been reported only from SE Borneo (Téwe R.) (Ding Hou, 1962).

The specimen identified as *Euonymus indicus*? in UBDH (Brunei: Tutong, S.J. Davies L.814), cited by Zamri & Slik (2018), and identified as “*E. cf. javanicus* Bl.” on the sheet label, has no flowers or fruits and its identification is uncertain.

Salacia korthalsiana Miq., Ann. Mus. Bot. Lugduno-Batavi 4: 152 (1869). – TYPE: *Korthals s.n.* (lectotype L [L0015409], designated by Ding Hou (1964: 407)).

Specimen examined. BRUNEI: **Temburong:** Temburong river just downstream from Kuala Belalong, 25 Jun 1989, Wong WKM 1264 (BRUN [BRUN007166]).

Notes. The species has distinctly peduncled axillary cymes (in contrast to the very short cymes for other species), a distinctly 5-lobed calyx (in contrast to an unlobed calyx in other species) and big elliptic or ovate-oblong leaves. In the past it was collected from Sarawak and Sabah states, and from the eastern part of Borneo in Kalimantan.

Salacia maingayi M.A. Lawson in Hooker, Fl. Brit. Ind. 1: 626 (1875). – TYPE: *Maingay 398* (lectotype K [K000669970], designated by Ding Hou (1964: 417)).

Specimen examined. BRUNEI: **Belait:** Liang, Andulau FR (Sg Liang), 4°37'N 114°32'E, 23 Apr 2012, Ariffin Kalat 23199 (BRUN [BRUN031368]).

Notes. The species usually has 1 or 2 flowers in a leaf axil, clearly acuminate shining leaves, a large oblong 3-celled fruit, 4–6 cm diam. and several seeds (usually 6). It has previously been reported from Sarawak and Sabah (Ding Hou, 1964).

ACKNOWLEDGEMENTS. The author is grateful to the authorities at BRUN for giving permission for the study of their preserved specimens of Celastraceae, and personally to Joffre A. Ahmad, and also to the Organising Committee of the 11th Flora Malesiana Symposium for partial financial support for his visit to Brunei Darussalam. Many thanks also to the management of the Moscow State University of Food Production for supporting the visit to Brunei.

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