

Mangifera quadrifida (Anacardiaceae), a new record for Singapore

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Abstract. *Mangifera quadrifida* Jack is newly recorded for Singapore from remnant mixed dipterocarp forest in the Central Catchment Nature Reserve. The new record is described and notes on distribution, ecology and conservation status are given. This species is assessed as Critically Endangered for Singapore.

Key words. flora, distribution, ecology, conservation assessment

INTRODUCTION

The genus *Mangifera* L. comprises of about 70 species and is distributed in Sri Lanka, India, Myanmar, Thailand, Indo-China, south China, Malesia, and the Solomon Islands (Kostermans & Bompard, 1993). An introduction to the *Mangifera* species in Singapore is found in Ganesan (2018b). Records of new species, aspects of identification and illustration of several Singapore mangoes species are found in Ganesan (2003), Ganesan (2005), Khoo et al. (2018), Ganesan & Ali Ibrahim (2018), and Ganesan (2018a). As part of ongoing research into the Anacardiaceae for the ‘Flora of Singapore’ project, examination of herbarium specimens at the Singapore Herbarium (SING) revealed the presence of *Mangifera quadrifida* Jack in Singapore. This species had not been recorded in previous floristic work in Singapore (i.e., Ridley, 1900; Keng, 1990; Chong et al., 2009) and therefore constitutes a new record. In addition to existing herbarium specimens, through fieldwork we have also located two trees of *Mangifera quadrifida* in remnant mixed dipterocarp forest in Singapore and herbarium specimens of these have been vouchered. This new species record for Singapore is described here.

The Singaporean specimens have a combination of the following characters that identify them as *Mangifera quadrifida* Jack and that are unlike that of any other *Mangifera* species in Singapore: leaves that are broad-lanceolate, long petioles which are convex above, leaf apices that are attenuate or acuminate, leaf margins that are entire, reticulations that are prominent on both leaf surfaces, and fruits that are globose.

A NEW SPECIES RECORD IN SINGAPORE

Mangifera quadrifida Jack in Roxb., Fl. Ind. [Carey & Wallich ed.] 2 (1824) 440 (Anacardiaceae) (Fig. 1a–e)

Description. Tree up to 30 m tall; buttresses absent. Bark reddish-brown, smooth to irregularly shallowly fissured, with scattered lenticels. Twigs stout, terete, grey, and glabrous. Leaves spirally arranged, widely spaced; petiole convex above, thickened at base, 1.0–10.0 cm long (up to 21 cm long in saplings), glabrous; blade thinly coriaceous, broadly lanceolate or elliptic, 12.9–29.0 × 4.5–9.0 cm (up to 46 × 11.0 cm in saplings), drying greenish-brown, glabrous on both surfaces, base obtuse or cuneate, apex attenuate or acuminate, margin entire, midrib visible and slightly raised above, prominent below, 2–3 mm wide, secondary veins 13–19–(22) pairs, slender, with short intermediary veins, reticulations prominent on both surfaces. Inflorescences terminal and axillary, lax, up to 3 orders of branching, flowers sparse; peduncle up to 14 cm long, c. 3 mm wide, glabrous or sparsely pubescent, drying dark brown or reddish brown; inflorescence branches as above for peduncle except up to up to 9 cm long; bracts caducous, awl shaped, c. 0.5 mm long, pedicels 2–2.5 mm long; flowers male or bisexual on same tree. Bisexual flowers fragrant; sepals 4, pale green when fresh, drying brown, glabrous on both sides, lobes ovate, 1.5 × 0.7–1.0 mm; petals 4, cream-white when fresh drying light-brown, ovate-oblong, glabrous, 2.0–2.5 × 0.7–1.0 mm, margin entire, three ridges inside, slightly reflexed; fertile stamen 1, filament glabrous, free, c. 1.5 mm long, anther purple when fresh drying black, dorsifixed, oblong, c. 0.7 mm long, staminodes 3 filiform, c. 0.7 mm long; disk pulvinate, slightly 4-lobed, glabrous, 1.0–1.5 diameter; ovary 1, glabrous, globose, c. 1.5 mm diameter, style eccentric, 2–3 mm long, stigma 1, capitate. Male flower as above except: disk distinctly 4-lobed; pistil rudimentary, c. 0.7 mm long. Drupe globose, glabrous, c. 6 × 5 cm, light green ripening purplish-black, skin leathery c. 2 mm thick, pulp fibrous, pale yellow, watery, sweet; stone single, stone single ellipsoid, leathery, fibrous, c. 5 × 3 cm, not on a fibrous stipe proximally; seed single, not labyrinthine.



Fig. 1a. Habit of *Mangifera quadrifida* Jack. from S.K. Ganesan & Ali Ibrahim SKG 453. (Photograph by: S.K. Ganesan).



Fig. 1b. Bark of *Mangifera quadrifida* Jack. from S.K. Ganesan & Ali Ibrahim SKG 454. (Photograph by: S.K. Ganesan).



Fig. 1c. Leaves of *Mangifera quadrifida* Jack. from S.K.Ganesan & Ali Ibrahim SKG 454. (Photograph by: S.K. Ganesan).



Fig. 1d. Fruit of *Mangifera quadrifida* Jack. from specimen Mohd. Shah & Mohd. Ali MS 3881 (Photograph by: S.K. Ganesan).



Fig. 1e. Habitat of *Mangifera quadrifida* Jack in Singapore. (Photograph by: S.K. Ganesan).

Etymology. Latin, *quadrifida* = split into four parts; with reference to the flower having four petals and four sepals.

Vernacular names. *asam kumbang, kolah* (Malay).

Distribution. Thailand, Peninsular Malaysia, Sumatra, Borneo, Sulawesi, Lesser Sunda Islands (Sumba), and the Moluccas. In Singapore currently known from two specimens in Central Catchment Nature Reserve; MacRitchie (Ganesan, S.K. & Ali Ibrahim, SKG 453, 25 July 2018 [SING]; Ganesan, S.K. & Ali Ibrahim, SKG 454, 25 July 2018 [SING]). There are two other collection from the above locality that are more than 20 years old (Corner, E.J.H. s.n., 26 April 1938 [SING]; Mohd. Shah & Mohd. Ali, MS 3881, 30 June 1976 [SING]). Formerly also found in Tanjong Kling (Sinclair, J. SF 38919, 25 June 1950 [SING]).

Ecology. Mixed dipterocarp forest.

Uses. The fruits are sweet and edible.

Conservation assessment. Globally this species is considered in the IUCN Red List as Least Concern (Rhodes & Maxted, 2016). In Singapore this species is Critically Endangered as there are less than 50 mature individuals in the wild.

Additional specimens examined. PENINSULAR MALAYSIA: Johor, Sungei Sedili, 28 March 1937, Corner, E.J.H. SF 32436 (SING); *ibid*: Kedah, Ulu Muda, 4 January 1930, Dolman, H.C. FMS 21503 (SING).

Notes. At present there is no Singaporean material in flower. Therefore, for the description of the flowers above, Peninsular Malaysian material has been used.

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