

***Artabotrys scortechinii* (Annonaceae): an augmented species description and a new record for Singapore**

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ABSTRACT. *Artabotrys scortechinii* King was recently discovered as a new record for the native flora of Singapore. This poorly known species has been confused with *Artabotrys maingayi* Hook.f. & Thomson and its fruits and seeds have not been previously described. This paper presents an augmented description, including its fruit morphology and diagnostic floral characters, which distinguish it from its congeners. A key to the native *Artabotrys* R.Br. species in Singapore is provided.

Keywords. Bukit Timah Nature Reserve, Central Catchment Nature Reserve

Introduction

Until recently, the palaeotropical genus *Artabotrys* R.Br. (Annonaceae) was thought to be represented by five native species in Singapore (Ridley, 1922; Keng, 1990; Chong et al., 2009), viz. *A. costatus* King, *A. crassifolius* Hook.f. & Thomson, *A. maingayi* Hook.f. & Thomson, *A. suaveolens* (Blume) Blume and *A. wrayi* King. Specimens recently collected in the Central Catchment Reserve (Upper Seletar) and Bukit Timah Nature Reserve, as well as an older herbarium specimen from MacRitchie Nature Reserve, could not be matched to any of these species and were identified as *Artabotrys scortechinii* King, a species previously only known from two localities in Peninsular Malaysia.

The latest treatment of the genus in the Malay Peninsula dates back to Sinclair (1955), although updated descriptions for species that co-occur in Borneo or Sumatra are available (Nurainas, 2004; Turner, 2012). *Artabotrys scortechinii* may have been overlooked in the flora of Singapore because of the limited available material and the problematic treatment of *A. scortechinii* and *A. maingayi* by Sinclair (1955). Sinclair (1955: 260–61) stated that “King’s *A. scortechinii*, which is represented by a single miserable specimen (the petals are not present, only sepals) in the Singapore Herbarium and by similar scanty material collected by Scortechini in the Calcutta and Kew herbaria and of which the fruit is unknown, may be the same as *A. maingayi*. I am unable to prove this now but this is a problem for future investigation. The description

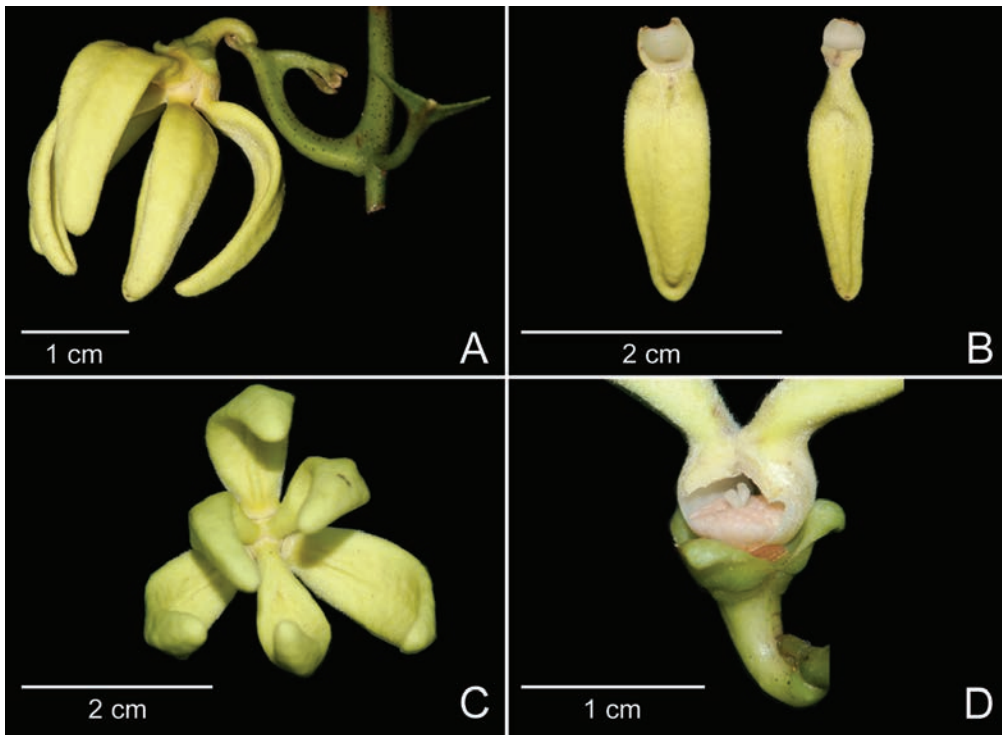


Fig. 1. *Artabotrys maingayi* Hook.f. & Thomson. **A.** Inflorescence. **B.** Outer (left) and inner petals (right). **C.** Flower. **D.** Flower with three outer petals and one inner petal removed, showing stamens and stigmas. All from *Thomas DCT 1005*. (Photos: D.C. Thomas)

of *A. scortechinii* given here is taken from King and I am not, for the lack of better material, able to improve it.” Sinclair (1955) provided a detailed description and a line drawing of the flowers of *Artabotrys maingayi*, but both the line drawing as well as the description of the petals match the type of *A. scortechinii* but are inconsistent with type material of *A. maingayi*. Our comparisons of the type material, the figures published by King (1893), and fresh flowering material of *A. maingayi* (Fig. 1) and *A. scortechinii* (Fig. 2) indicate that the two species are vegetatively similar but can be readily distinguished by flower morphology. Sinclair’s description of *Artabotrys scortechinii* was transcribed from King’s protologue, but his description of *A. maingayi* is erroneous, probably based on a mixture of specimens from the two species. A discussion and detailed comparison of the flower morphology and morphological differences of the two species and other closely related species is provided in the Taxonomy section below.

Artabotrys scortechinii is not included in the most recent checklist of Singapore’s vascular plant flora (Chong et al., 2009), and hence our report represents a new record for the Singapore flora. Moreover, an augmented description for *Artabotrys scortechinii* is provided, including a description of the fruits, which were previously unknown. In total, six native species of *Artabotrys* are now recognised in Singapore, and a key to the native species is provided here.

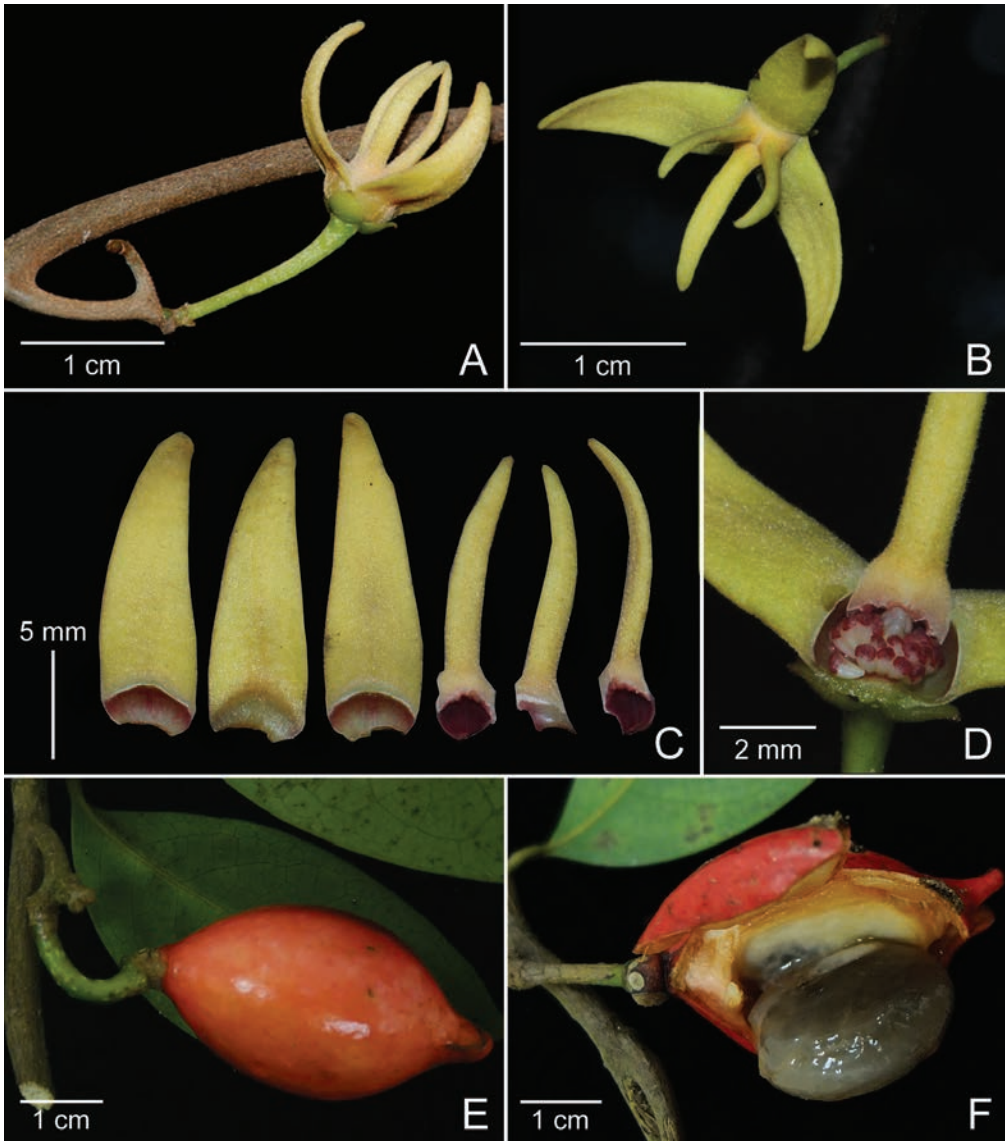


Fig. 2. *Artabotrys scortechinii* King. **A.** Inflorescence. **B.** Flower. **C.** Petals: outer petals (left), inner petals (right). **D.** Flower with one outer petal and two inner petals removed, showing stamens and stigmas. **E.** Fruit with a single attached monocarp. **F.** Monocarp opened to reveal seeds. A from *Thomas DCT 1003*; B–D from *J. Chen JH 65*; E & F from *Lua et al. SING 2017-083*. (Photos: A, D.C. Thomas; B–D, J. Chen; E: W.W. Seah; F, P.K.F. Leong)

Taxonomy

Artabotrys scortechinii King, *J. Asiat. Soc. Bengal*, Pt. 2, Nat. Hist. 61(2): 32 (1892).
 – TYPE: Peninsular Malaysia, Perak, *B. Scortechini s.n.* (lectotype K [K000381008], designated by Turner, 2016). (Fig. 2)

Woody climbers; twigs drying dark grey or grey-brown, glabrous. **Leaves:** petiole 3–9 × 1.4–2 mm, generally with transverse ring-like markings, glabrous; lamina chartaceous to thin-coriaceous, drying grey-brown, elliptic or ovate-lanceolate, 6.5–13.9 × 2.5–5.4 cm, glabrous both ab- and adaxially except for scattered appressed hairs on the abaxial midrib, base not decurrent to petiole, apex shortly acuminate; midrib flush to slightly raised above, prominent below; secondary veins 7 to 11 pairs per leaf, flush to slightly prominent adaxially, prominent abaxially; tertiary veins reticulate, visible adaxially, obscure abaxially. Inflorescence hooks recurved, laterally compressed, with up to 4 flowers. **Flowers:** pedicel 10–17 mm long, 0.8–1 mm in diameter, with scattered short hairs; torus flat; sepals 3, ovate to triangular, 2–5 × 2–4 mm, with scattered short hairs abaxially, glabrous adaxially, apex slightly reflexed, venation indistinct; outer petals 3, 12–16 × 3.5–5 mm, flat, venation indistinct, broadly triangular with little external distinction between blade and claw, densely hairy both ab- and adaxially except the adaxially glabrous claw, claw 1.3–1.8 × 2.5–3 mm; inner petals 3, 10–15 × 2.1–2.4 mm, venation indistinct, blade linear, densely hairy both ab- and adaxially except the adaxially glabrous claw, claw 1.4–1.8 × 2.1–2.4 mm; stamens 25–30, apex of connective truncate, glabrous; carpels c. 5, ovary narrowly ovoid, glabrous, stigma ovoid, glabrous. **Fruits:** pedicel 14–17 mm long, c. 2 mm thick, longitudinally striate; monocarp c. 2 per fruit, red when mature, subsessile, stipe c. 2 mm long, monocarp body ellipsoidal, c. 44 × 31 mm, strongly and sharply beaked, beak c. 6 mm long. **Seeds:** 2 in each monocarp, plano-convex, c. 20 × 16 × 7 mm, with circumferential groove.

Distribution. *Artabotrys scortechinii* is endemic to Peninsular Malaysia and Singapore.

Phenology. Flowering specimens collected in February–March and June–August; fruiting specimens collected in February and March.

Additional specimens examined. PENINSULAR MALAYSIA: **Perak:** *Scortechini* 488 (BM [BM000898101], CAL [CAL0000004270, CAL0000004271], SING [SING0096243]). SINGAPORE: **Central Catchment Nature Reserve:** MacRitchie Reservoir Park, 5 Jul 1948, *Sinclair* 4876 (SING [SING0200055], US); Upper Seletar, 8 Mar 2015, *Thomas DCT 1003* (SING); *ibid.*, 16 Feb 2016, *Chen et al. JH 38* (SING); *ibid.*, 13 Aug 2016, *Chen JH 65* (HKU); **Bukit Timah Nature Reserve:** Fern Valley, 21 Mar 2017, *Lua et al. SING 2017-083* (SING [SING0215486]); *ibid.*, 28 Mar 2017, *Lua et al. SING 2017-107* (SING [SING0241817, SING0241818]).

Notes. The lectotype material includes a single detached seed (c. 3 × 2 cm) with some adhering pericarp, which is circled on the sheet with a question mark next to it, apparently by King. Both King (1892) and Sinclair (1955) stated that the fruit is unknown, thus the seed is of dubious origin, and may be from a separate collection. In addition, the specimen ‘*Curtis 2644*’ from Langkawi was mistakenly identified as *Artabotrys scortechinii* by Sinclair (1955); it actually represents an *Anaxagorea* species.

Artabotrys scortechinii is easily distinguished from *A. maingayi* by its floral morphology. The petals are much shorter and narrower in *Artabotrys scortechinii* (outer 12–16 × 3.5–5 mm, inner 10–15 × 2.1–2.4 mm) than in *A. maingayi* (outer 16–20 × 6–7 mm, inner c. 15–18 × 4–5 mm). The petal blades are flat in *Artabotrys scortechinii* but centrally concave in *A. maingayi*, resembling ‘rabbit ears’. The petal apex also differs: acute in *Artabotrys scortechinii* but rounded in *A. maingayi*. In *Artabotrys scortechinii*, the inner petal blades are linear and the outer petal blades are triangular whereas in *A. maingayi*, the blades of the inner and outer petals are lanceolate. The outer petal claw differs between these two species: around twice as broad as long in *Artabotrys scortechinii* but of roughly equal length and width in *A. maingayi*.

Artabotrys gracilis King and *A. roseus* Boerl. are also comparable to *A. scortechinii* in having little external distinction between outer petal blade and claw (Turner, 2012), and filiform inner petal blades and much broader outer petal blades (Turner, 2009), but these species do not occur in Singapore. *Artabotrys roseus* (endemic to Borneo) differs from *A. scortechinii* by its greater number of flowers per inflorescence (up to 8), greater number of carpels per flower (c. 15), tomentose and generally longer (8–20 mm long) flowering pedicels, stipitate monocarps (stipe 2–6 mm long), and rounded monocarp apex. *Artabotrys gracilis* (from Peninsular Malaysia, Sumatra and Borneo) can be distinguished from *A. scortechinii* by its caudate leaf apices, a sunken midrib on the adaxial leaf lamina surface, shorter petals (outer 7–9 mm, inner 5–6 mm), and smaller monocarps (15–22 × 10–15 mm).

Key to the native *Artabotrys* species in Singapore

- 1a. Abaxial leaf surface densely hairy; monocarps up to 20 per fruit *A. wrayi*
- 1b. Abaxial leaf surface sparsely hairy or subglabrous; monocarps up to 8 per fruit
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- 2a. Secondary veins immersed on abaxial leaf surface; petiole up to 1 mm wide; leaf lamina invariably decurrent to petiole 3
- 2b. Secondary veins raised on abaxial leaf surface; petiole 1.4–3 mm wide; leaf lamina typically not decurrent to petiole 4

- 3a. Petal blades terete, c. 1 mm wide, white (in fresh material); monocarps 12–15 × 7–9 mm, sessile; pericarp less than 1 mm thick; seeds 10–14 × 5–6 mm
..... *A. suaveolens*
- 3b. Petal blades lanceolate, 4–7 mm wide, yellow (in fresh material); monocarps to 30–45 × 20–35 mm, with stipes c. 3 × 5 mm; pericarp 4–7 mm thick; seeds 16–25 × 12–15 mm *A. maingayi*

- 4a. Pedicels and flowers similar in length; monocarp apex strongly beaked (beak c. 6 mm long); leaf laminas $6.5\text{--}13.9 \times 2.5\text{--}5.4$ cm *A. scortechinii*
- 4b. Pedicels much shorter or longer than flowers; monocarp apex rounded or weakly beaked (beak up to 2 mm long); leaf laminas $9\text{--}26 \times 3\text{--}9.5$ cm 5
- 5a. Flowering pedicels 5–7 mm long; fruiting pedicels 8–10 mm long; flowering pedicels and abaxial surface of sepals with dense covering of yellow-brown hairs; sepals 8–15 mm long; petal blades 25–35 mm long; inner petals lanceolate; monocarps $25\text{--}43 \times 20\text{--}30$ mm *A. crassifolius*
- 5b. Flowering pedicels 25–30 mm long; fruiting pedicels 25–34 mm long; flowering pedicels and abaxial surface of sepals subglabrous; sepals 2–3 mm long; petal blades 6–7 mm long; inner blades terete; monocarps $28\text{--}30 \times 15\text{--}17$ mm
..... *A. costatus*

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