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New species, variety, record and combination of *Memecylon* (Melastomataceae) from Thailand

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ABSTRACT

In preparation for the Flora of Thailand account for part of the Melastomataceae (former Memecylaceae), three new species, one new variety, one newly recorded species for Thailand in the genus *Memecylon* are presented. The new taxa are: *M. aurantifolium*, *M. khimao*, *M. bailek*, and *M. corticosum* var. *parvifolium*.

KEYWORDS: Melastomataceae, Memecylaceae, *Memecylon*, taxonomy, Myrtales, Thailand.

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INTRODUCTION

The Memecylaceae, also known as subfamily Olisbeoideae is in the Melastomataceae, is a tropical to subtropical family of trees and shrubs. Phylogenetic studies have shown that it is the basal most group of the Melastomataceae (Clausing & Renner, 2001; Stone, 2006, 2014). The closest group related to the Memecylaceae is the genus *Pternandra* Jack, which shares similar anther characters. Of the two Memecylaceae genera found in Thailand, *Memecylon* L. and *Lijnedia* L., contain over 350 and 15 species, respectively, of small trees and shrubs and they are found in the old-world tropics (Stone, 2012, 2014; Amarasinghe *et al.*, 2021). As Memecylaceae was considered a different family at the time, it was excluded from the Flora of Thailand account for the Melastomataceae. This paper is in preparation for an account of the Memecylaceae for the Flora of Thailand.

The recent account for Memecylaceae in the Flora of Peninsular Malaysia reported 31 species of which 25 were reported to occur in Thailand, mostly Southern Thailand (Hughes & Wijedasa, 2012; Hughes, 2013a). Recent taxonomic works has led to the description of *Memecylon maxwellii* Wijedasa as a unique and rare limestone endemic plant in memory of James Franklin Maxwell's contributions to the taxonomy of Melastomataceae in Southeast Asia (Webb *et al.*, 2016; Wijedasa, 2017a, 2017b). *Memecylon maxwellii* and *M. khimao* Wijedasa, described here, were both first collected by Maxwell. Work in surrounding regions has shown wider distributions for *M. corticosum* Ridl. var. *kratense* (Craib) Wijedasa and the description of *M. bokorensis* Tagane in adjacent Cambodia (Tagane *et al.*, 2015a, 2015b) and the description of *M. pseudomegacarpum* M.Hughes in Peninsular Malaysia (Hughes, 2013b). Here, we describe three new range restricted species (*M. aurantifolium* Wijedasa, *M. khimao* Wijedasa and *M. bailek* Wijedasa) and one new variety (*M. corticosum* Ridl. var. *parvifolium* Wijedasa).

TAXONOMY

Memecylon aurantifolium Wijedasa, **sp. nov.**

Memecylon aurantifolium has leaves and flowers covered in a thick mealy coating similar to *M. minutiflorum* Miq. The flowers of both species differ in *M. aurantifolium* not having a clear constriction above the ovary, J-shaped anther connective and the mealy coating being yellow once dry compared to *M. minutiflorum* having a clear constriction above

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the ovary, a C-shaped anther connective and the mealy coating being cream once dry. Type: Thailand, Nakhon Ratchasima Province, Pak Thong Chai ("TREND Camp"), eastern part of Khao Yai National Park, 500 m, 8 Aug 1968, with flowers, *Larsen, Santisuk & Warncke 3112* (holotype **K!**, isotypes **AAU!** [3 sheets], **C!**, **L!**, **PSU!**). Figs. 1–3.

Tree, 12 m tall. *Branchlets* when young drying light brown, rough, terete; internodes (2–)3–4.5 cm apart. *Leaves* opposite; lamina spear-shaped, 5.5–9.5 × 2.8–4.4 cm, chartaceous, tapering towards apex with an acuminate tip, base decurrent, mature leaves drying chocolate brown above and golden green below, becoming stiff and brittle; midvein sunken above and raised below, drying golden yellow below; secondary veins distinct above, slightly visible below; petiole 5–6 mm long, 1–1.5 mm diam., chocolate brown above and light green below when dry. *Inflorescences* axillary in few-flowered cymes with second order branching; primary axis 0.5–0.8 mm long; secondary axes 0.3–0.4 mm long, golden-green. *Flowers* 12–15, greenish when young, drying golden green; pedicels 1–2 mm long; calyx (including hypanthium) golden-green with mealy texture, 2–3 mm in diam., margin slightly undulating with no distinct lobes; ovary distinct from pedicel; petals 4, ovate, 5–6 × 3–4 mm, both upper and lower surfaces white with purple colour at base on upper surface; extra-ovarial cavity wings distinct and connecting the calyx rim to the stigma in a straight line; stamens 8, erect, surrounding style; filaments 8–12 mm long, brown when dry; anther 1–1.5 cm long, with J-shaped connective with the lower end pointed downwards, blue when fresh drying brown, anther locules centrally placed, anther gland brown when dry; style 10–12 mm long, white when dry. *Fruits* unknown.

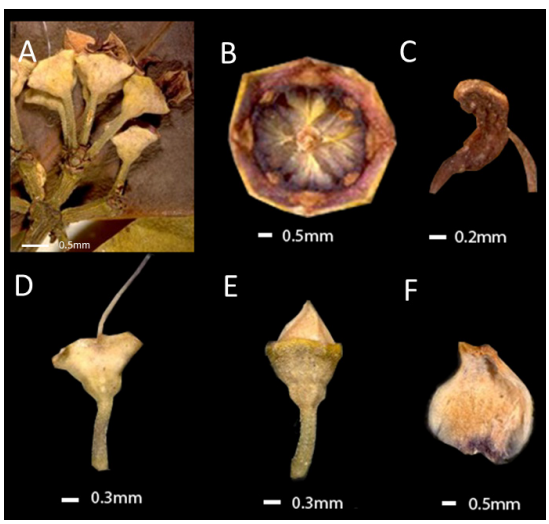

Figure 1. Inflorescence and flower characters of *Memecylon aurantifolium* Wijedasa: A. inflorescence; B. extra-ovarial cavity; C. anther connective; D. hypanthocalyx; E. flower bud; F. petal upper side. (*Larsen, Santisuk & Warncke 3112*, isotype **PSU**).

Thailand.— EASTERN: Nakhon Ratchasima [Khao Yai National Park].

Distribution.— Endemic to Thailand.

Ecology.— Evergreen forest.

Vernacular.— Phlong thong (พลองทอง) (Proposed here) – Golden *Memecylon*.

Etymology.— The specific epithet '*aurantifolium*' is chosen for the golden-green colour of the leaves and dry flowers.

IUCN conservation assessment.— The species is only known from the type collected in 1968 in Khao Yai National Park. As per the IUCN Red List Criteria (IUCN, 2012), the species is only known from the holotype and should be considered Data Deficient (DD).

Notes.— Carlo Hansen (formerly studying Melastomataceae in South East Asia) appears to have realized that this may have been a new species. There were series of sketched flowers of the species accompanied some specimens from AAU. It is highly likely that he intended to describe this as a new species prior to his untimely death in Brunei Darussalam in 1991 (Friis & Hansen, 1992).

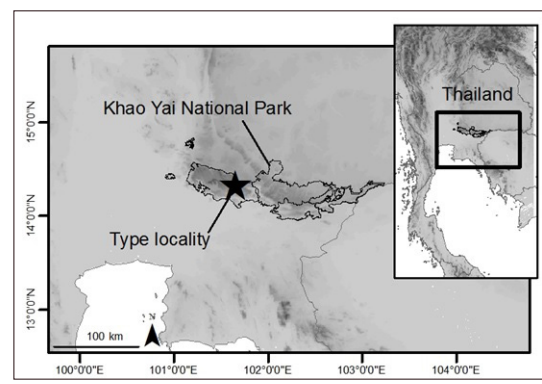

Figure 2. Distribution map of *Memecylon aurantifolium* Wijedasa.

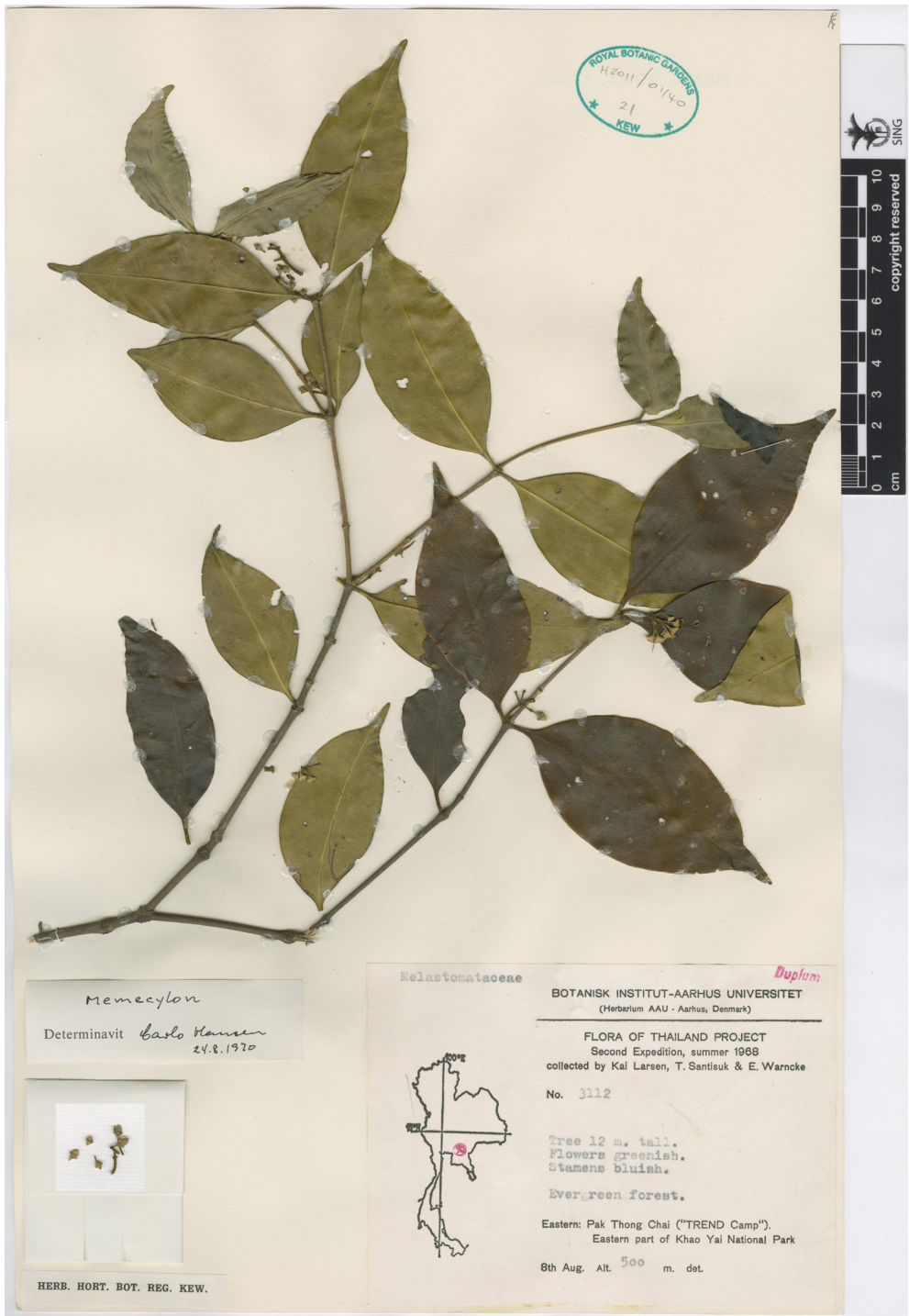

Figure 3. *Memecylon aurantifolium* Wijedasa (*Larsen, Santisuk & Warncke 3112*, holotype **K**).

Memecylon bailek Wijedasa, **sp. nov.**

Memecylon bailek has small leaves similar in size, but not shape (lanceolate), to *M. pauciflorum* Blume (rhomboid), *M. scutellatum* (Lour.) Hook. & Arn. (rhomboid) and *M. maxwellii* (amplexicaul leaf base). *Memecylon bailek* has a long primary peduncle (0.6–1.1 cm) and straight anther connective compared to *M. pauciflorum* with a short primary peduncle (1–2 mm) and C-shaped anther connective. *Memecylon bailek* has a smooth calyx and fruit, calyx rim having pointed extensions and thin leaves compared to *M. scutellatum* which as a rough calyx and fruit covered in a yellow waxy layer, calyx rim flat and thick leaves which are brittle when dry. The species also has a long primary peduncle, larger flower (3–4 mm) and fruits (5–8 × 6–8 mm) and acute leaf base compared to *M. maxwellii* which has a short primary peduncle (1 mm), small flower (1–3 mm) and small fruit (1–1.5 × 1–1.2 mm). Type: Thailand, Chanthaburi Province, Soi Dao, Khao Soi Dao Wildlife Sanctuary, Khao Soi Dao Nuea, 300 m, 5 May 2010 (pers. comm.), *Harwood 2096*. (holotype **BKF!** (specimen on the left only), isotypes **C!**, **CMUB!**). Figs. 4–6.

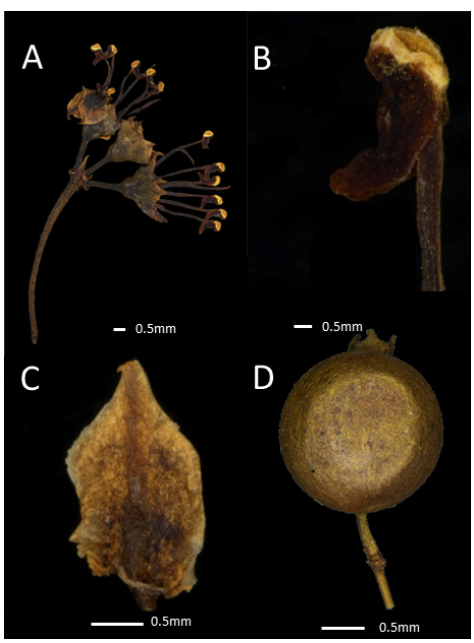

Figure 4. Inflorescence and flower characters of *Memecylon bailek* Wijedasa: A. inflorescence; B. anther connective; C. petal; D. fruit (*Harwood 2096*, isotype **C**).

Tree, up to 6 m tall. *Branchlets* when young light grey, smooth, waxy, with distinct adaxial and abaxial groove, waxy surface flaking off when old and becoming rough and grey-brown; internodes 1.5–3 cm apart. *Leaves* opposite, hair like structures at inter-petiolar line; lamina lanceolate, 3.5–5 × 0.8–2.7 cm, chartaceous, tapering towards apex with acuminate tip, decurrent leaf base, mature leaves drying brownish green to dark brown above and greenish brown to light brown below; midvein sunken above, raised below and drying yellow-green below; 6 or 7 secondary veins per side distinct barely visible above and invisible below; petiole 1–3 mm long, 0.5–1 mm in diam., drying yellow-green. *Inflorescences* at apex and in axils; cymes 6-flowered, with single order branching; primary axis 0.6–1.1 cm long, peduncles greyish green, each peduncle with hair-like structures where flowers arise. *Flowers* purple; pedicels 1–3 mm long; pedicels and calyx (including hypanthium) light brown, latter with distinctly pointed lobes, 3–4 mm in diam.; ovary distinct from calyx; petals 4, lanceolate, 2–3 × 2–3 mm, outer and inner surface drying brownish cream with a dark brown base; stamens 8, erect, surrounding style; filaments 3–4 mm long, drying dark brown; anther 0.5–0.8 mm long, anther thecae only on top part of J-shaped anther connective, drying light to dark brown, centrally placed anther gland drying light to dark brown; style 4–5 mm long. *Fruit* circular, smooth, 5–8 × 6–8 mm, drying grey green; pedicels 3–4 mm long; calyx remnant distinctly raised, 2–3 × 1–2 mm, distinctly pointed calyx lobes persistent.

Thailand.— SOUTH-EASTERN: Chanthaburi [Soi Dao, 400 m, 8 June 1963, *Larsen 9886* (**AAU**, **C**); Khao Soi Dao Nuea, Khao Soi Dao Wildlife

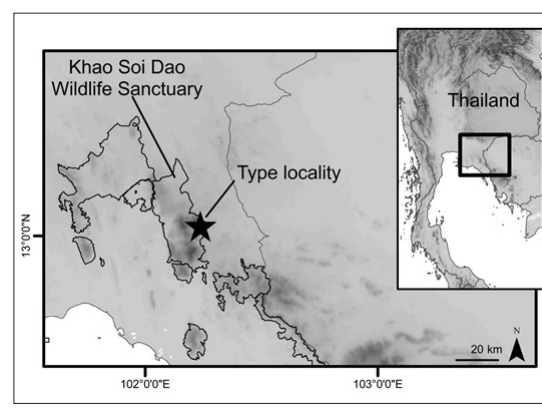

Figure 5. Distribution map of *Memecylon bailek* Wijedasa.

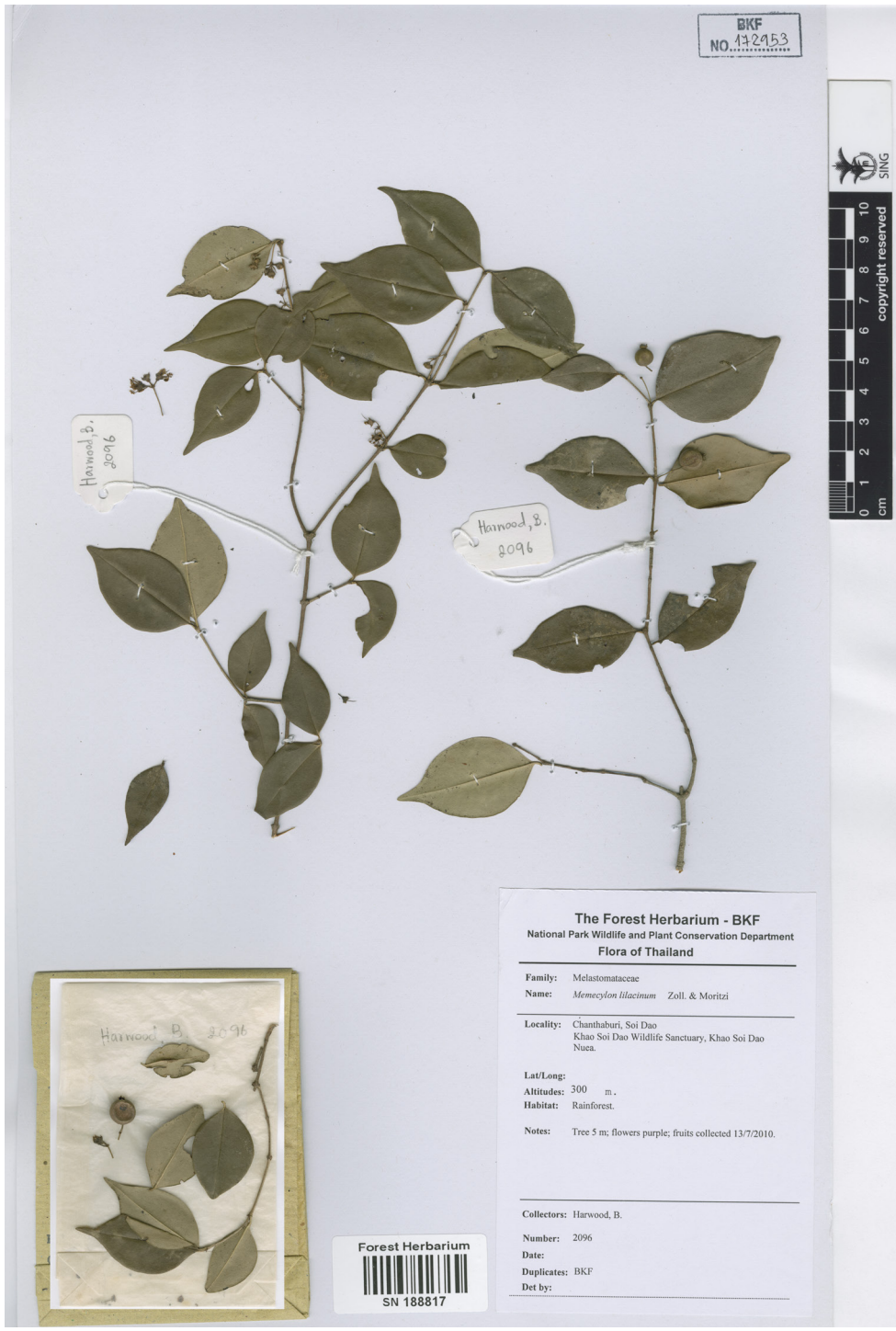

Figure 6. *Memecylon bailek* Wijedasa (*Harwood 2096*, holotype **BKF**).

Sanctuary, 300 m, 5 May 2010, *Harwood 2096* (**BKF**) specimen on the left; ibid., 13 July 2010 (**BKF**) specimen on the right]; Chon Buri [Khao Kampang, Bo Thong, 400 m, 14 July 1999, *Puudjaa & Cholkulchana 597* (**BKF**)].

Distribution.— Endemic to Thailand.

Ecology.— Evergreen forest, up to 400 m elevation.

Vernacular.— Phlong bai lek (พลองใบเล็ก) (Proposed here) – small-leaved *Memecylon*.

Etymology.— The specific epithet 'bai lek' refers to the small leaves in the Thai language.

IUCN conservation assessment.— As per the IUCN Red List Criteria (IUCN, 2012), the extent of occurrence (EOO) of this species is conservatively considered to cover the 744 km^2 of the Khao Soi Dao Wildlife Sanctuary. However, population size and potential declines are not known. The species should be considered Near Threatened (NT) based on low EOO and potential decline due to deforestation outside of the protected area.

Memecylon khimao Wijedasa, **sp. nov.**

Memecylon khimao has a lanceolate leaf shape and distinct leaf stalk similar to that of *M. ovatum* Sm. The species has a thin leaf, 10-20 flowered inflorescence, flowers with a long pedicel (5–8 mm), a flat calyx rim, a C-shaped anther connective and an ovate fruit compared to *M. ovatum* which has a thick leaf, many flowered (>50) infloresence, flowers with a short pedicel (1–2 mm), a calyx rim with pointed protrusions, a straight anther connective and a circular fruit. *Memecylon khimao* is known from a single lowland forest location compared to *M. ovatum* which is common in coastal habitats. Type: Thailand, Nakhon Si Thammarat Province, Gahrome Falls, Khao Luang National Park, 300 m, 18 May 1985, with flowers, *Maxwell 85-501* (holotype **PSU!**, isotypes **BKF!**, **L**). Figs. 7–9.

Tree, up to 6 m tall with a bole diameter up to 8 cm. *Branchlets* when young white, smooth, waxy, terete, drying rough and grey-brown when old; internodes 5–6 cm apart. *Leaves* lamina elliptic when young, changing to ovate when old, 2.6–5.5 × 7.7–13 cm, chartaceous, tapering towards apex with acuminate tip, decurrent leaf base, mature leaves dark green above, drying dark brown above and lighter brown below, becoming stiff and brittle; midvein flat above, raised below, drying darker than lamina below; 5–7 secondary veins per side distinct above and below; petiole 3–5 mm long, 1–2 mm diam., drying dark brown. *Inflorescences* in axils of leaves; many flowered cyme with second order branching; primary axis 1–2 cm long; secondary axes 0.2–0.8 cm long; all peduncles green, each peduncle with 3–6 flowers. *Flowers* whitish lilac; pedicels 0.5–0.8 cm long; pedicels and calyx green with no distinct lobes, 2–3 mm in diam.; ovary

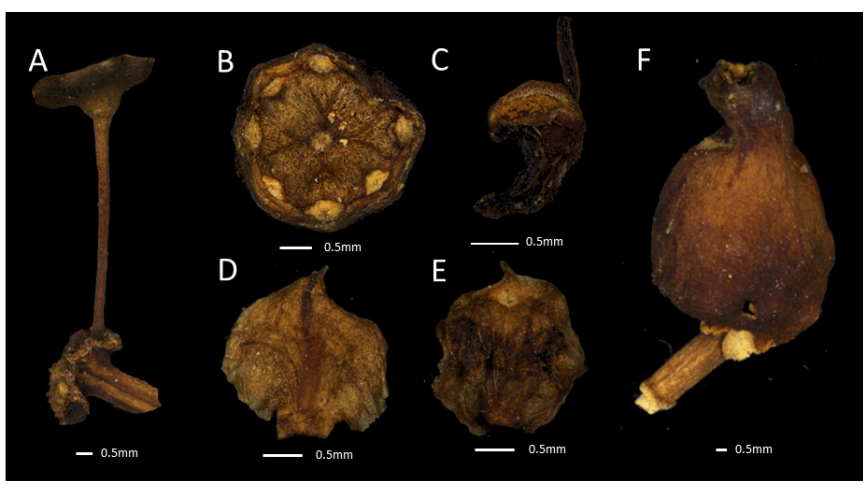

Figure 7. Inflorescence and flower characters of *Memecylon khimao* Wijedasa: A. flower; B. extra-ovarial cavity; C. anther connective; D. petal upper side; E. petal lower side; F. fruit. (*Maxwell 85-501*, holotype **PSU**).

indistinct from pedicel; petals 4, ovate, 7–8 × 7–8 mm, outer surface whitish-lilac, inner surface dark blue; stamens 8, erect, surrounding style; filaments 1.5–2 mm long, dark blue; anther 1–2.5 mm long, C-shaped anther connective, dark blue, anther locules cream, centrally placed anther gland brown; style 2–4 mm long. *Fruit* oblong, smooth, ca 6 × 8 mm, drying reddish; calyx remnant as wide as fruit, ca 2 mm long.

Thailand.— PENINSULAR: Nakhon Si Thammarat [Khao Luang National Park].

Distribution.— Endemic to Thailand.

Ecology.— In shaded place among bamboo. Primary evergreen forest near rivers at 300 m elevation.

Phenology.— Flowering and fruiting in May.

Vernacular.— Phlong khi mao (พลองขี้เมา) (Proposed here) – Confused *Memecylon*, like a drunken man.

Etymology.— The specific epithet '*khimao*' referring to the Thai word for drunken man is chosen because of the more than 30 years of misidentification of this species as the more widely distributed *Memecylon ovatum*.

IUCN conservation assessment.— The only known collection of this species is inside Khao Luang National Park. The species was never collected elsewhere, which was confirmed after discussion with J.F. Maxwell. As per the IUCN Red List Criteria (IUCN, 2012), the extent of occurrence (EOO) of this species is conservatively considered to cover the 570 km^2 of the National Park. However, population size and potential declines are not known though part of the landscape has been converted to rubber plantations in the last few decades. The species should be considered Near Threatened (NT) based on low EOO and potential decline due to deforestation outside of the National Park.

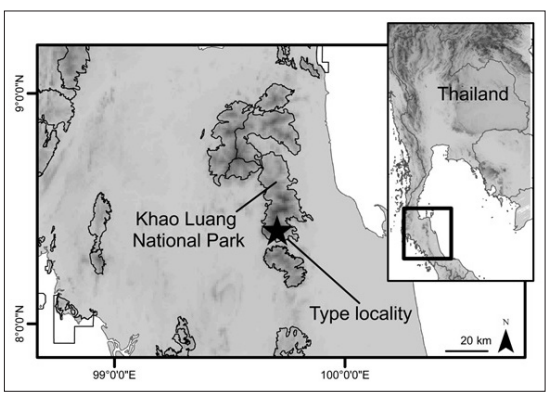

Figure 8. Distribution map of *Memecylon khimao* Wijedasa.

Memecylon corticosum Ridl., J. Fed. Malay States Mus. 10: 92. 1920. Type: Thailand, Chumphon, Tasan, *C.B. Kloss 7027* (lectotype **K!** designated by Wijedasa and Hughes (2012)).

— *M. caudatum* Craib, Bull. Misc. Inform. Kew 1930 (7): 324. 1930. Type: Thailand, Kanchanaburi, Wangka, 700 m, 2 Feb. 1926, *Kerr 10433* (lectotype **K!**, designated by Wijedasa & Hughes (2012), isolectotypes **ABD!**, **BM!**, **K!**)

— *M. kratense* Craib, Bull. Misc. Inform. Kew 1930(7): 326. 1930. Type: Thailand, Chanthaburi, Krat, Kao Saming, 23 Jan. 1927, *Put 531* (lectotype **ABD!**, designated by Wijedasa & Hughes (2012), isolectotypes **BK!**, **K!**).

— *M. sphaerothrysum* O.Schwartz, Mitt. Inst. Allg. Bot. Hamburg 7: 257. 1931. Type: Indonesia, West Kalimantan, Bukit Mehipit, 500 m, 8 Dec. 1924, *Winkler 659* (holotype **HBG!**).

var. **parvifolium** Wijedasa, **var. nov.**

The variety *M. corticosum* var. *parvifolium* has inflorescences arising from young slender branchlets with a distinct peduncle, and small leaf blades (4–8 × 1–2 cm long) compared to *M. corticosum* var. *corticosum* and *M. corticosum* var. *kratense* where infloresences arise from calluses on older branches and large leaf blades (11–27 × 2–6 cm long). Type: Thailand, Surat Thani, Phanom, 300 m, 18 Feb 1930, *Kerr 18319* (holotype **K!**, isotypes **BK!**, **C!**, **L**). Fig. 10.

Shrub. *Branchlets* internodes 2–3 cm apart, pale straw-coloured, 4 conspicuous wings in young branchlets, fragile and rapidly becoming worn, branchlets terete with age. *Leaves* lamina lanceolate to elongate or linear-lanceolate, 4–8 × 1–2 cm, base truncate, apex acuminate, grey grown above, slightly paler below; midrib sunken above, prominent and

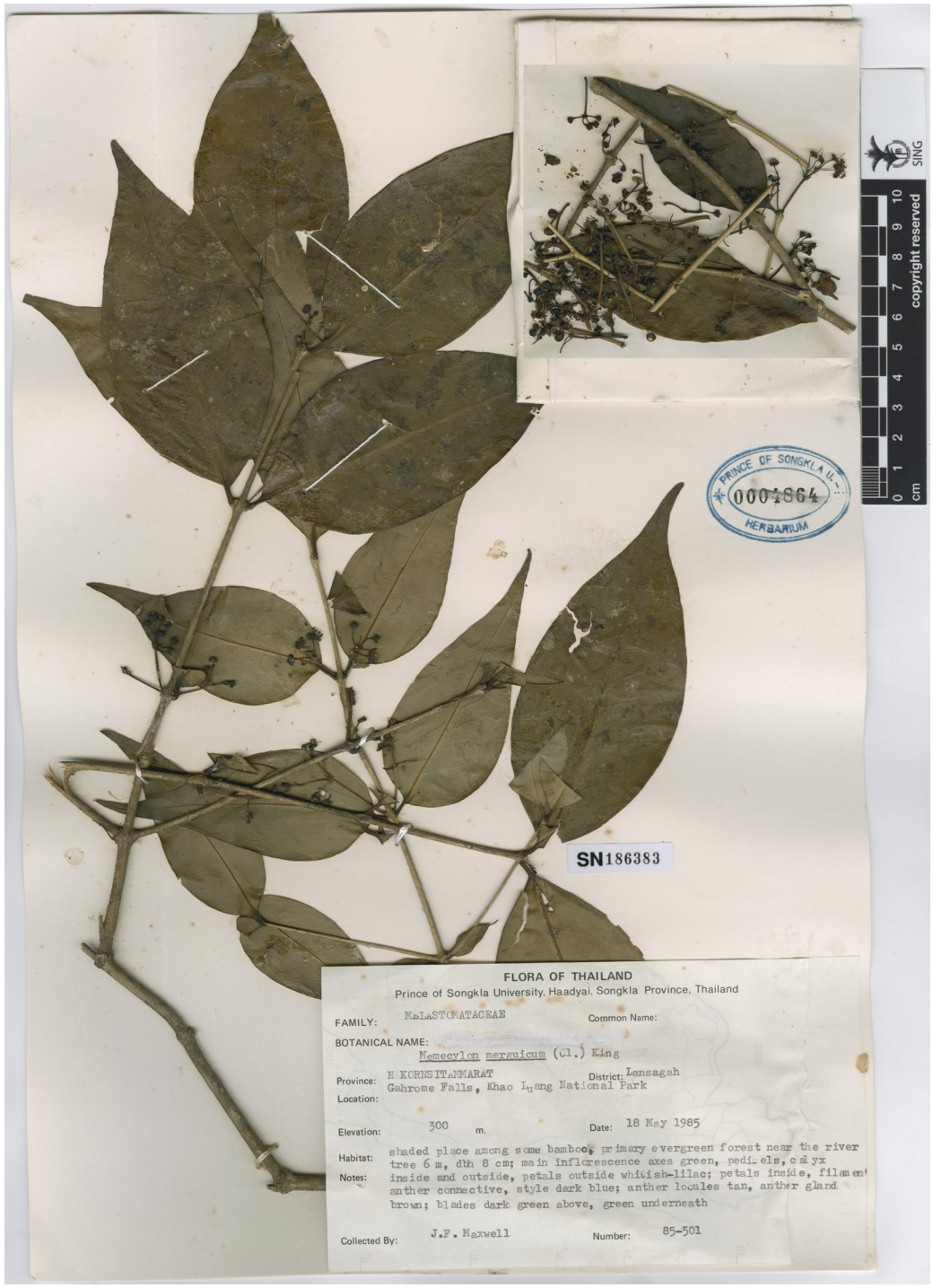

Figure 9. *Memecylon khimao* Wijedasa (*Maxwell 85-501*, holotype **PSU**).

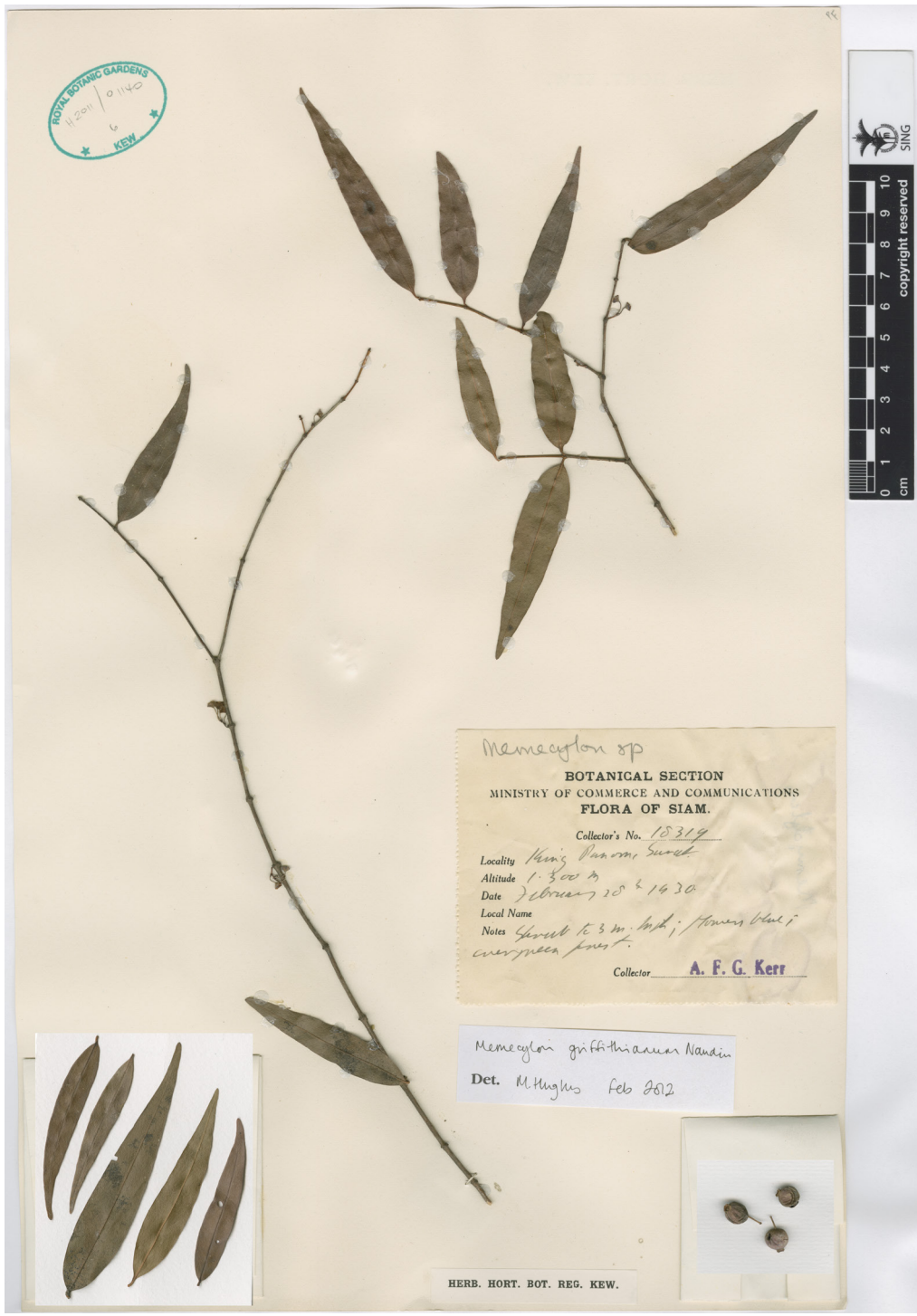

Figure 10. *Memecylon corticosum* Ridl. var. *parvifolium* Wijedasa (*Kerr 18319*, holotype **K**).

lighter brown below; venation indistinct; marginal vein indistinct; petioles ca 2 mm long. *Inflorescence* in the axils of leaves on slender branchlets, 2–4 cm long; peduncle distinct, 0.5–2 cm long, with second order branching; flowers 4–6.

Distribution.— Southern Thailand.

Ecology.— In primary lowland forest up to 500(–1,000) m elevation.

Note.— The taxonomy of *Memecylon corticosum* in Thailand has been recently reviewed with the acknowledgement of two varieties based on identical flowers, flowers almost sessile and arising from woody calluses on old wood but having distinct leaf morphologies (Wijedasa & Hughes, 2012). *Memecylon corticosum* var. *corticosum* and *M. corticosum* var. *kratense* both have similar sized leaves but differ in the texture and whether leaf venation is sunken and visible or invisible. A list of specimens for *M. corticosum* var. *corticosum* and *M. corticosum* var. *kratense* studied is given in Wijedasa & Hughes (2012).

KEY TO THE VARIETIES

1. Leaves 2–4 cm long, flowers arising from distinct inflorescences on young branchlets — var. **parvifolium**
1. Leaves 11–27 cm long, flowers arising on calluses (i.e. brachyblasts) on old wood
  2. Leaves 11–18 cm long, lanceolate to elongate-lanceolate, veins sunken above and prominent below — var. **corticosum**
  2. Leaves 11–27 cm long, elongate-lanceolate to linear-lanceolate, veins indistinct on both surfaces — var. **kratense**

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