

Elaeocarpus gaoligongshanensis and *E. dianxiensis* (Elaeocarpaceae), two new species from Yunnan, China

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We describe two new species, *Elaeocarpus gaoligongshanensis* Y. Tang & Z.L. Dao and *E. dianxiensis* Y. Tang & H. Li, from western Yunnan of China. Having two ovules per loculus, the new species belong to sect. *Elaeocarpus*. The distinguishing characteristics separating them from the morphologically closest relatives are discussed.

Elaeocarpus, the largest genus of the Elaeocarpaceae, comprises about 360 species. It is mainly an Old World tropical genus with some species extending to subtropical areas. The treatment of this genus in the *Flora of China* (Tang & Phengklai 2007) was completed in 1999, but was published only recently. The treatment recognizes 39 species, the majority of them from Yunnan of southwestern China. Examination of *Elaeocarpus* specimens from recent biodiversity surveys of the Gaoligongshan region of western Yunnan indicated eleven species including two previously undescribed species. We describe these two species in the present paper.

***Elaeocarpus gaoligongshanensis* Y. Tang & Z.L. Dao, sp. nova** (Fig. 1).

Arbor, 5–25 m alta. Ramulus adpresse fulvo-pubescentibus, gemmis terminalibus dense fulvo-

pubescentibus. Folia late oblanceolata usque anguste elliptica, 7–12 × 2.5–4 cm, basi cuneata vel acuta, apice acuminata; nervi laterales utrinque 7–8; petiolus 8–15 mm longus, adpresse fulvo-pubescentibus. Inflorescentia racemosa, axillaris, 8–15 cm longa, multiflora; pedunculus puberulus, pedicellis dense puberulis. Sepala 5, 5–6 mm, extus puberula, intus parce puberula. Petala 5, laciniata, laciniis circa 20. Stamina 30–32. Ovarium 3-loculare, tomentosum, stylo basi piloso. Fructus drupaceus, ellipsoideus, 3 cm longus, 2.5 cm latus, exocarpio obscuro in sicco brunneo-nigro, endocarpio profunde lacunoso.

HOLOTYPE: China. Yunnan Province, Gongshan County, Dulongjiang Township, west side of Gaoligongshan, North of Bapo along the east side of the Dulong River. 27°45'36"N, 98°20'46"E. Elevation 1510 m. In remnant of disturbed broad-leaved evergreen forest. Tree ca. 6 m tall. Petals green-white, fimbriate. Growing on a stream bank below the trail. 10.VII.2000 Li Heng et al. 12902 (KUN; isotypes KUN, CAS, E).

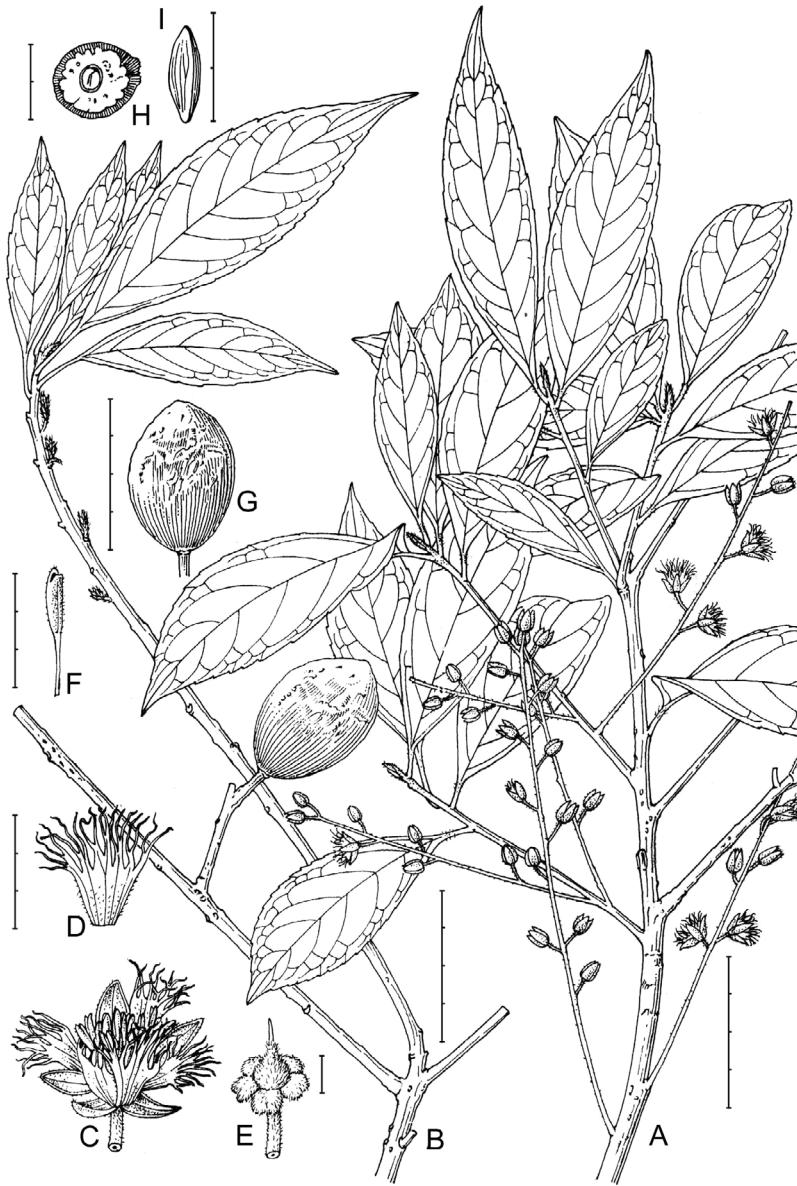


Fig. 1. *Elaeocarpus gaoligongshanensis* (A–F from the holotype, G and H from Li Heng et al. 30259, drawn by Xi-Ling Wu). — A: Flowering branch. — B: Fruiting branch. — C: Flower. — D: Inside of petal. — E: Ovary and disk. — F: Stamen. — G: Fruit. — H: Cross section of fruit. — I: Seed. Scale bars: A, B, G = 4 cm; C = 4 mm; D = 3 mm; E = 1 mm; F = 3 mm; H and I = 2 mm.

Evergreen small to large trees, 5–25 m tall. Young branchlets adpressed pubescent with yellow-brown hairs, terminal buds densely brown-yellow pubescent. Young leaves hairy, mature leaves glabrous, greenish or brown-green when dry; petiole 8–15 mm long, usually swollen at end, adpressed pubescent with yellow-brown hairs; leaf blade broadly oblanceolate to narrowly elliptic; 7–12 × 2.5–4 cm, mostly 8–10 × ca. 3 cm; lateral veins 7 or 8 per side, obscure

adaxially and prominently raised abaxially, mid-vein flat or slightly impressed adaxially and remarkably raised abaxially; base cuneate or acute, apex acuminate. Racemes mostly in axils of leaves, 8–15 cm long, 10–15-flowered; peduncle puberulent. Pedicel densely puberulous; bracts subulate, caducous. Sepals 5, 5–6 mm long, ca. 2 mm wide, pale puberulent on outside, more densely so along margins, sparsely puberulent on inside. Petals 5, 6 × 3 mm, puberulous

on lower part inside, ciliate on the margin, apex laciniate; lobes ca. 20. Stamens 30–32. Disk consisting of 5 obvious glands, tomentose. Ovary 3-loculed, tomentose; ovules 2 per loculus; styles glabrous on upper half. Drupe ellipsoid, ca. 3×2.5 cm, exocarp obscure, brown-black when dry, glabrous; endocarp deeply lacunose. Seed 1, straight, spindle-shaped, 19–21 mm long, 6–7 mm thick.

This species is similar to *E. harmandii* but differs in having shorter (8–15 vs. 15–30 mm) and puberulent (vs. nearly glabrous) petioles, smaller (7–12 vs. 11–19 cm) leaf blades and fewer (20 vs. 30) petal lobes. The leaves of *E. gaoligongshanensis* are similar to those of *E. prunifolioides*, but that species is a member of a section that differs in having awned anthers and much smaller and shiny fruit.

Elaeocarpus gaoligongshanensis is found in Baoshan and Tengchong counties on the west slopes of Gaoligongshan. It grows in the evergreen broad-leaved forest on the west side of the Gaoligongshan area at elevations of 1500–2200 m. It flowers in May to June and fruits in July.

ADDITIONAL SPECIMENS EXAMINED (paratypes, all KUN):

China. — Yunnan Province: Baoshan County, Lujiang Township, on the east side of Gaoligong Shan near the slope divide between the Salween and Irrawadi watersheds, $24^{\circ}49'51''\text{N}$, $98^{\circ}46'4''\text{E}$, 2200 m, trees ca. 25 m, growing in a moist forest, 21.X.1998 *Li Heng et al.* 10714; Tengchong County, Sanyun Township, 2260 m, 4.IX.2003 *Li Heng et al.* 18717; Shangying Township, 2050 m, 30.V.2005 *Li Heng et al.* 25201; Wuhe Township, 2190 m, 16.V.2005 *Li Heng et al.* 24943; Jietou Township, 1930 m, 12.V.2005 *Li Heng et al.* 30325.

***Elaeocarpus dianxiensis* Y. Tang & H. Li, sp. nova** (Fig. 2).

Arbor, 2–20 m alta. *Ramulus fulvo-puberulus*, *ramus glaber*. *Folia glabra, oblonga, elliptica usque late oblanceolata, saepe irregulariter leviter obliqua*, 8–11 cm longa, 2–4 cm lata; *nervi laterales utrinque 6–9, basi acuta usque cuneata, apice acuminata; petiolus fulvo-pubescent, glabrescent, 1–2 cm longus*. *Inflorescentia racemosa, axillaris, 6–11 cm longa, multiflora; pedunculus pubescens, pedicellis 4–6 mm longis dense pubescentibus*. *Sepala 5, dorso glabra vel leviter puberula, intus puberula, ad margi-*

nem ciliata. Petala 5, laciniata, laciniis 18–24, dorso vix glabra, intus basi pilosula, ad margine ciliata. Stamina 15–16. Discus tomentosus, glandulis 5 emarginatis. Ovarium 3-loculare, tomentosum, stylo basi tomentoso. Fructus drupaceus, ellipsoideus, $3.2\text{--}4.5 \times 2.5$ cm diametro, exocarpio in sicco nigro obscuro, endocarpio manifeste lacunoso.

HOLOTYPE: China. Yunnan Province, Baoshan County, Longyang Qu, Lujiang Township, Lihuipo area near Nankang village, east slope of Gaoligongshan near the crest of the range, just north of the new road from Baoshan to Tengchong via Nankang pass, $24^{\circ}50'8''\text{N}$, $98^{\circ}46'4''\text{E}$, 2210 m, tree, 15 m, 24.VIII.2003 *Li Heng et al.* 17718 (KUN; isotypes KUN, CAS, E).

Evergreen trees, small to large, 2–20 m tall. Branchlets yellowish puberulous, branches glabrescent. Petiole yellowish pubescent at upper end, glabrescent, 1–2 cm long; leaf blade oblong or elliptic to broadly oblanceolate, often irregularly and slightly oblique, $8\text{--}11 \times 2\text{--}4$ cm, glabrous; lateral veins 6–9 per side, usually domatia at axils of lateral veins; base acute to cuneate, margin slightly dentate, apex acuminate, acumen obtuse. Raceme in axils of leaves, 6–11 cm long, 12–15-flowered; peduncles pubescent. Pedicels 4–6 mm, densely pubescent, rarely glabrous. Sepals 5, 4.5–5 mm long, glabrous or slightly puberulous on outside, puberulous on inside, hairy on margin. Petals 5, $6\text{--}7 \times 3.5\text{--}4$ mm, glabrous inside and slightly hairy on lower part on outside, relatively densely hairy on lower inner surface, ciliate on margin, apex lacinate, lobes 18–24, in 5 larger lobes, each with numerous smaller lobes. Stamens 15 or 16, without awns and hairs at apices. Disk consists of 5 glands, each emarginate, white tomentose. Ovary 3-loculed, tomentose; ovules 2 per loculus; style tomentose on lower half. Drupe ellipsoid, $3.2\text{--}4.5 \times 2\text{--}2.5$ cm; exocarp black when dry, obscure; endocarp with 3 sutures, obviously lacunose. Seed 1, straight, spindle-like; 18–20 mm long, 6–7 mm thick.

Elaeocarpus dianxiensis is similar to *E. glabripetalus* and *E. poilanei*. *Elaeocarpus glabripetalus* differs in having glabrous branchlets, nearly sessile and glabrous petioles, fewer petal lobes (14–18 vs. 20–22) and more stamens (20–30 vs. 15 or 16). *Elaeocarpus poilanei* dif-

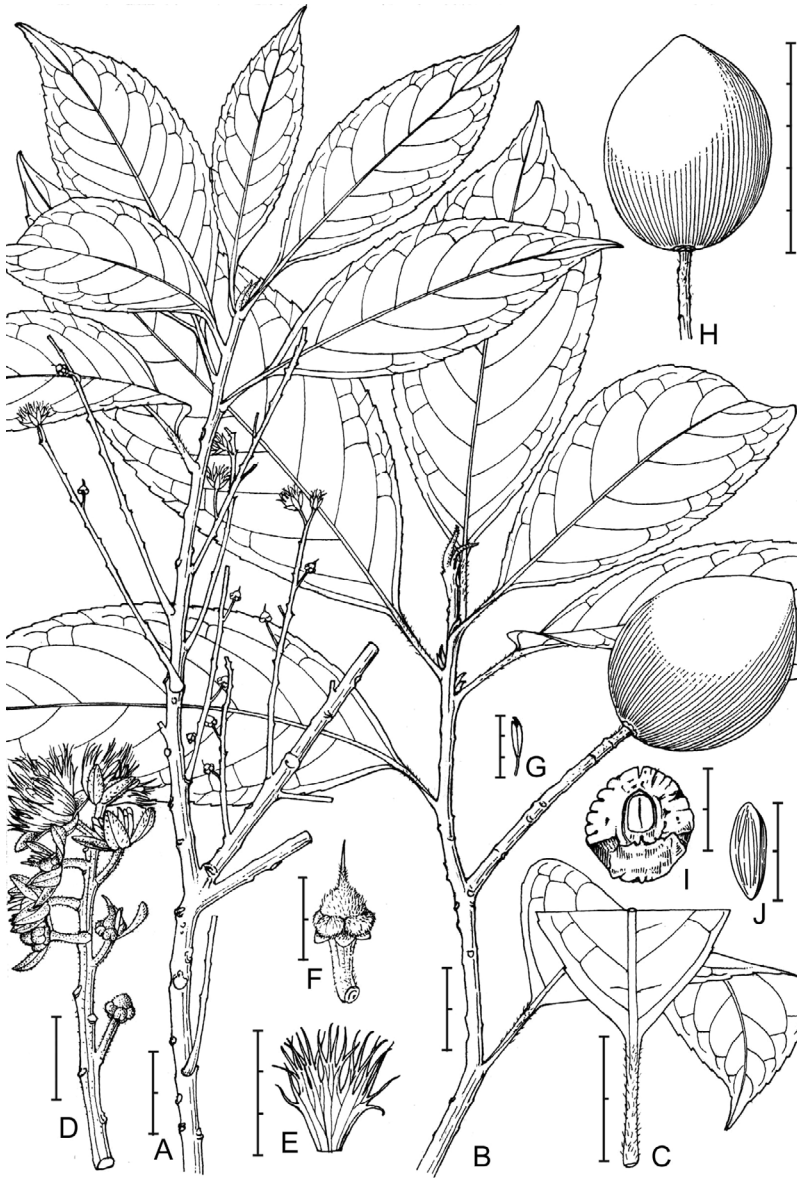


Fig. 2. *Elaeocarpus dianxiensis* (A–G from the holotype, H and I from Li Heng et al. 19454, drawn by Xi-Lin Wu). — A: Flowering branch. — B: Fruiting branch. — C: Petiole and leaf blade base. — D: Raceme. — E: Inside of petal. — F: Ovary and disk. — G: Stamen. — H: Fruit. — I: Cross section of fruit without exocarp. — J: Seed. Scale bars: A, B, C, D, I, J = 2 cm; E = 3 mm; F = 2 mm; G = 3 mm; H = 5 cm.

fers in having a shorter petiole (0.5 vs. 1–2 cm), shorter racemes (2.4 vs. 6–11 cm), glabrous (vs. hairy) peduncle, fewer petal lobes (7 vs. 18–20), and smaller fruit (1.5–1.8 vs. 4–5 cm long).

Elaeocarpus dianxiensis seems to be common and is found in Baoshan, Fugong, Longling, and Tengchong counties in western Yunnan. It grows in evergreen forests from 1650 to 2250 m. Its flower buds were seen in July, full blooming took place in late July, and young fruit was seen in late August to early September.

ADDITIONAL SPECIMENS EXAMINED (paratypes, all KUN): **China.** — Yunnan Province, Baoshan County, Puman Daoban, Bao Shiying et al. 702; Dasheyao, small tree 2–3 m tall. Bao Shiying et al. 746; Nankang Botany Garden (Lihuipo), 2050 m, tree 18 m tall, fruit green, Li Heng et al. 13106b. Fugong County, Lumadeng Township, 1675 m, tree 15 m tall, fruit green, 26.IV.2004 Li Heng et al. 19545; Longling County, Lujiang Township, Lihuipo area near Nankang Village, 2230 m, tree ca. 5 m tall, flowers white, young fruit green, 23.VIII.2003 Li Heng et al. 17560; Longjiang Township, Gucheng Shan, 2100 m, tree ca. 15 m tall. Young fruit green, 26.VIII.2003 Li Heng et al. 17983; Tengchong County, Dahaoping, 2200 m, Bao Shi-ying et al. 811, 812.

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Reference

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