

A New Species of *Camellia* Section *Piquetia* (Theaceae) from Vietnam

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ABSTRACT. A new species of *Camellia* (Theaceae) endemic to the Dalat Plateau in southern Vietnam is described and illustrated: *Camellia dongnaiensis*. The newly described species has large pendulous, narrowly obovate leaves; two whorled, waxy, pendulous flowers exhibiting emarginate, graduated yellow-apricot to intensely pink petals; peduncles distinctly wider at the proximal end; a compound style consisting of six parts that are fused at the base for one third of their length; persistent bracteoles; and a superior five-chambered ovary. The morphological evidence supports taxonomic placement in *Camellia* sect. *Piquetia* (Pierre) Sealy.

Key words: *Camellia dongnaiensis*, *Camellia piquetiana*, IUCN Conservation Status, Theaceae, Vietnam.

Camellia L. is a member of the tea family (Theaceae). This genus is well represented in Vietnam, and its species are located throughout most areas of the country. Vietnam is considered a major center of diversity for *Camellia*, having approximately 20% of all the species located within its boundaries (Sealy, 1958; Chang & Bartholomew, 1984). The genus *Camellia* is characterized within the family by having seeds without wings and capsules dehiscing from the apex (Sealy, 1958).

In this paper, a new species within *Camellia* sect. *Piquetia* (Pierre) Sealy from Vietnam is described. This section was originally established by Pierre in 1887 and contains one species only, *C. piquetiana* (Sealy, 1958; Chang & Bartholomew, 1984; T. Ninh, unpublished data, 2002). A concise description of *Camellia* sect. *Piquetia* follows:

Camellia* sect. *Piquetia (Pierre) Sealy, Rev. Gen. *Camellia*. 108. 1958. *Thea* sect. *Piquetia* Pierre, Fl. Forest. Cochinch. fasc. 8, t. 119. 1887. TYPE: *Camellia piquetiana* (Pierre) Sealy.

Perennial shrubs. Leaves 29–42 × 9.5–12.5 cm. Flowers borne on short shoots in the axils of the leaves, usually 3 to 5 flowers on a shoot, but sometimes 1 only. Flowers pedunculate, nodding; peduncle very stout, thickened upward, bracts 2 or 3, persistent; sepals 5, persistent; petals 8 or more,

stamens free above the union with the petals, puberulous inside, gynoecium densely pubescent; indumenta consistent; styles 5(or 6), free. Leaf blades 290–420 × 95–125 mm.

Camellia dongnaiensis Orel, sp. nov. TYPE: Vietnam. Lam Dong Prov.: unnamed tributary, the headwaters of Dong Nai river, 17 Jan. 2004, G. Orel, G. Richards, A. Curry & G. Wilkes 21148 (holotype, NSW; isotypes, NSW, HN). Figure 1.

Camelliae piquetianae affinis sed characteribus sequentibus differt: frutex mediocris; folia juvenilia minora aurantiaca vel cupreo-rubra; folia semper pendula costa ad angulum 45° ad petiolum portata; alabastra acute ellipsoidea plerumque virides pigmento vix suffusa; flores majores petalis rigidulis ceraceisque, luteolis ad armeniacis margine rosea.

Perennial, small to medium evergreen shrub to 2.5 m high; sparsely branched, sometimes multi-stemmed, semi-upright habit; twigs glabrous, green toward terminals, with brown-gray patches, turning entirely light brown on semimature branches; older branches and trunk light brown and slightly furrowed. Leaf petiole curved and concave, slightly flattened, thick, of same color as the leaf on all sides, to 20 × 8 mm, to 6 mm thick; petiole attached at 45° angle to midrib; leaf lamina continues as a 2-mm high ridge on each side of adaxial petiole; leaf buds light green, axillary, shiny, falcate with sharp, curved apex, 10–15 mm long; developing leaves soft and pendulous, dull green, with distinct orange-coppery sheen when fully developed but still young. Mature leaves irregularly serrate, undulate, to 44 × 14 cm; oblique on abaxial side; lamina coriaceous, narrowly obovate, leaf apex acute to cuspidate, base acute to partially rounded; adaxial leaf surface glabrous, deep green, shiny, lighter green and dull below; blade midrib to 8 mm proximally, less than 1 mm distally, light green and dull; venation pinnate, secondary veins brochidodromous, with up to 22 pairs of veins adaxially sunken, abaxially prominent; tertiary venation dense, craspedodromous (Roth-Nebelsick et al., 2001). Floral peduncle 25–30 mm long, glabrous, axillary, occasionally terminal, pendulous, dark green, wider at the proximal end; flowers axillary, solitary; flower buds

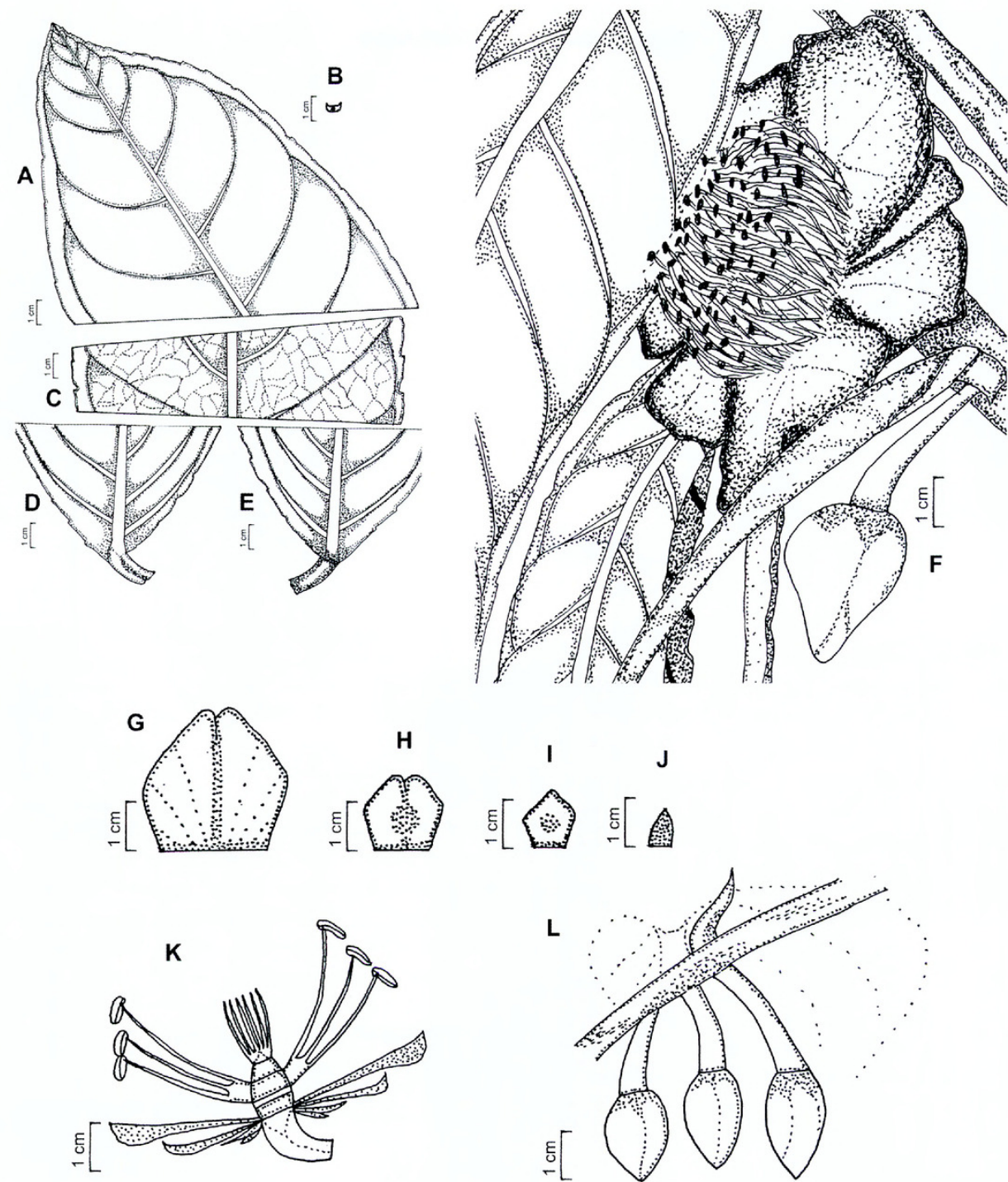


Figure 1. *Camellia dongnaiensis*. —A. Adult leaf, abaxial view. —B. Leaf petiole, transverse section. —C. Adult leaf, primary, secondary, and tertiary venation, abaxial view. —D. Adult leaf and leaf petiole, abaxial view. —E. Adult leaf and leaf petiole, adaxial view. —F. Holotype of *C. dongnaiensis*. —G. Petal, first whorl. —H. Petal, second whorl. —I. Sepal. —J. Bract. —K. Lateral view of adult flower, showing all flower parts. —L. Branch with flower buds and a leaf bud. Drawn from the holotype G. Orel *et al.* 21148.

pendulous, mostly green, in groups of 3 to 5 buds, seldom solitary; flowers 40–75 mm diam., waxy and rigid, petals emarginate, graduated yellow-apricot in color, with a distinct and intense pink margin 3–5 mm wide; petals arranged in 2 whorls of 5 and 3, respectively; first whorl with petals 30 × 30 mm, concave, sometimes asymmetric, of pentagonal shape,

emarginate, petal edges sometimes ruffled; petal striations slightly raised and of the same color as petal, not visible abaxially; petals overlapping, 3 on top, 2 partially obscured on the bottom of the whorl; second (3 petal) whorl with petals 15–20 × 15–20 mm, concave, sometimes asymmetric, of pentagonal shape, distinctly emarginate, petal edges with

ruffles; petal striations similar to first whorl; petals not overlapping; pink pigmentation present not only on the edges, but also diffused throughout the petal; sepals 3, pentagonal, not emarginate, dark green in the middle, with edges of lighter green, turning to light yellow, 12×12 mm; bracteoles 3, persistent, external to sepals; pentagonal, ca. 5×5 mm, dark green and tightly adpressed to sepals, bracteole bases arise from 0.2-mm deep indentation where attached to petiole; stamens are numerous (300) to very numerous (500), in a circular formation, 35–40 mm diam.; filaments 15–20 mm, yellow, fused in bottom third; anthers bright yellow, with a single dark brown-black line joining the distal and proximal ends; style is compound, proximally 6-parted, but fused at the base, 15 mm, bright yellow, each with an indistinct stigma of the same color; ovary superior, 5(6) carpellate, each carpel bilocular; gynoecium is $10\text{--}12 \times 8\text{--}10$ mm. Fruit and seed not seen.

Phenology. Collected in flower in January. Fruiting and seeding period unknown.

Etymology. The specific epithet refers to the geographical location of the find and is derived from the name of the river Dong-Nai situated on Dalat Plateau, southern Vietnam.

Distribution. Species known only from the type collection taken from a single individual. Species provenance details withheld for conservation reasons.

IUCN Conservation Status. Insufficiently known (K).

PHYTOGEOGRAPHIC AND TAXONOMIC REMARKS

This endemic species is only known from the type collection taken from single individual, which appears to be confined to a small mountainous area of dense rainforest. No paratypes exist. Further searching of the relevant area is required. The author was not able to find another specimen of *Camellia dongnaiensis* in any Vietnamese herbarium.

Morphologically the new species shares a number of characteristics with other Vietnamese *Camellia* species, e.g., waxy and rigid flowers like those of *C. amplexicaulis* (Pitard) Cohen-Stuart and the yellow-flowered species *C. cucphuongensis* Tran Ninh & J.-C. Rosmann and *C. impressinervis* H. T. Chang & S. Y. Liang (Ho, 1991; T. Ninh, unpublished data, 2002; Gao et al., 2005); emarginate petals like those of *C. vidalii* J.-C. Rosmann and *C. changii* C. X. Ye (including *C. azalea* C. F. Wei, Gao et al., 2005); and leaf size like that of *C. krempfii* (Gagnepain) Sealy (Chang & Bartholomew, 1984; T. Ninh, unpublished data, 2002). The pedunculate flowers with numerous filaments and persistent bracts, curved leaf petioles,

and pinnate leaf venation are characteristics shared with *C. piquetiana*, as is the habitat of tall, subtropical rainforest. Both species form a part of a dense understory layer and grow in low light, high humidity conditions in nutrient-poor soils.

However, the new species *Camellia dongnaiensis* is well distinguished from *Camellia piquetiana*, previously the sole species in section *Piquetia*, by a number of morphological characteristics. *Camellia dongnaiensis* is a medium-sized, semi-pendulous shrub 2.5 m tall (not a small, upright tree to 8 m), with juvenile leaves orange to coppery red (not dark purple to black) and mature leaves 440×140 mm (not 550×150 mm). The new species has consistently pendulous leaves, leaf petiole angled at 45° angle to midrib (not straight or slightly angled), flower buds pointed and ellipsoidal (not globose), flower buds mostly green, with small traces of pigment (not purple, almost black and heavily pigmented), flower diameters 40–75 mm (not 30–50 mm), flower color a graduated yellow-apricot with an intense pink margin (not a uniform dark purple-pink), and waxy and rigid flowers (not soft and lacking wax).

The newly described species also shares morphological affinity with *Camellia vidalii*; however, *C. dongnaiensis* differs from the latter in a number of key morphological characteristics. *Camellia dongnaiensis* is a small shrub to 2.5 m tall, not a larger shrub to 4.5 m (Rosmann, 1999; Gao et al., 2005). The curved, slightly flattened leaf petioles are attached at a 45° angle to midrib, a feature not observed in *C. vidalii*. The leaf size of *C. dongnaiensis* (440×140 mm) differs from the narrower blades of *C. vidalii* (360×60 mm). The narrowly obovate leaf shape (not elliptic-oblong elliptic), the variable acute to cuspidate leaf apex (not acuminate with a distinct 10 mm acumen), and the acute to partially rounded leaf base (not rounded or angular) clearly distinguishes *C. dongnaiensis* from *C. vidalii* (Rosmann, 1999). Furthermore, the peduncles of *C. dongnaiensis* are distinctly widened at their proximal end, a feature generally not observed in *C. vidalii*; this characteristic is best observed on unopened flower buds. The distinct flower color of *C. dongnaiensis* (graduated yellow-apricot with a distinct intense pink margin) is perhaps the most notable feature that distinguishes the newly described species from *C. vidalii*, the latter with flowers light or chromium yellow (Rosmann, 1999; Gao et al., 2005). There are three petals in the second whorl of *C. dongnaiensis* flowers and five in *C. vidalii* (Rosmann, 1999), a feature that further distinguishes the newly described species, *C. dongnaiensis*.

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