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# A NEW SPECIES OF THE FAMILY Theaceae FROM CENTRAL VIETNAM

**Luu Hong Truong[1*], Tran Gioi[2], Nguyen Quoc Dat[1], Nguyen Hieu Cuong[1]**

[1]Southern Institute of Ecology, VAST
[2]Khanh Hoa Association for Conservation of Nature and Environment

**ABSTRACT**

*Camellia honbaensis* (sp. n.) is described as a new species of section *Piquetia* from Hon Ba Nature Reserve, Khanh Hoa province, Central Vietnam. The new taxon is close to *C. piquetiana,* but differs from the later by having ovate, slightly longitudinally striated and 3–4-locular ovaries and 3–4 styles connate at basal 1/5–1/3 part and glabrous on apical 1/4 part. A key to all known species of the section is given.

*Keywords*: Theaceae, *Camellia*, *Piquetia*, new species, Vietnam.

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[*]*Corresponding author email*: hongtruongluu@gmail.com

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## INTRODUCTION

*Camellia* L. is one of the largest genus of the Theaceae compring 120 to 300 species. One of its sections, *Piquetia* (Pierre) Sealy, is endemic to Vietnam and characterised by the following characters: large leaves (≥ 29 cm × ≥ 9.5 cm), (1)3–5 nodding and pedicellate flowers on short (8 mm long) shoots in the axils of the leaves; very stout and upwards thickened pedicel; 2–3 persistent bracteoles; 3–5 persistent sepals; ≥ 5 petals; stamens free above the union with the petals and puberulous inside; densely hairy gynoecium; 3–6 free styles (Chang, 1981; Chang & Bartholomew, 1984; Ming, 2000; Ming & Bartholomew, 2007; Orel & Curry, 2015; Richards et al., 2002 & 2003; Sealy, 1958). Prior to this paper, there have been five species described for this section, namely *C. dalatensis* Luong, Tran & Hakoda, *C. dongnaiensis* Orel, *C. longii* Orel & Luu, *C. piquetiana* (Pierre) Sealy and *C. sonthaiensis* Luu, Luong, Q. D. Nguyen & T. Q. T. Nguyen (Luong et al., 2015; Orel, 2006; Orel et al., 2016; Pham-hoang, 1991 & 2000; Pierre, 2887; Pitard, 1910; Sealy, 1958; Tran, 2002; Tran & Luong, 2012). In August 2012, the authors of this paper encountered a *Camellia* species with large leaves and very young fruits in Hon Ba Nature Reserve, Khanh Hoa province. Our subsequent visits to the reserve from 2013 to 2015 collected additional flowering and fruiting specimens. Our careful examination of its morphological characteristics indicated that the species belongs to *Camellia* sect. *Piquetia* but differs from all other known species in the section, and thus it is proposed here as a new species.

## MATERIALS AND METHODS

The studied material was collected from Hon Ba Nature Reserve, Khanh Hoa province. The new species was determined based on comparison of its morphological characteristics with its close congeners'.

## RESULTS AND DISCUSSION

**Key to all alredy known species of *Camellia* sect. *Piquetia* (based on [3, 7, 9, 10–16, 18])**

1a. Twigs hairy and leaves abaxially hairy……...***C. dalatensis***
1b. Twigs and leaves glabrous……**2**
2a. Petals yellow to graduated yellow apricot to intensely pink……..**3**
2b. Petals red……**4**
3a. Sepals 5; petals yellow……...***C. sonthaiensis***
3b. Sepals 3; petals graduated yellow apricot to intensely pink…….***C. dongnaiensis***
4a. Corolla campanulate....……...……...***C. longii***
4b. Corolla rotate……**5**
5a. Ovary discoid, 5–6-lobulate, 5–6-locular; styles 5–6……...***C. piquetiana***
5b. Ovary ovoid, slightly striated, 3–4-locular; styles 3–4……***C. honbaensis.***

**Description of the new species**

*C. honbaensis* Luu, Q. D. Nguyen & G. Tran, sp. n.

Allied to *C. piquetiana* in general appearance but different in having ovate, slightly longitudinally striated and 3–4-locular ovaries and 3–4 styles connate at basal 1/5–1/3 part and glabrous on apical 1/4 part (vs. discoid, 5–6-lobulate and 5–6-locular ovaries and 5–6 free and fully hairy styles).

Shrub 2 to 4 m high, evergreen, with arching stem, sparsely branched, branches slender; young branches green, glabrous, shiny; mature branches light brown. Leaves pendulous, glabrous, narrowly lanceolate to oblong-elliptic, obtuse at base, acuminate at apex, with shallowly toothed margin, coriaceous, adaxially light green, abaxially pale green, 26–43 cm long, 4.5–10.6 cm wide; midrib adaxially and abaxially prominent; secondary venation slightly brochidodromous, with 17–26 pairs of arched veins, adaxially slightly raised, abaxially prominent; tertiary venation adaxially and abaxially distinct; leaf petioles purple to light green and falcate when mature, partially obstructed by leaf lamina on adaxial side, glabrous, 2–2.2 cm long, 2.5–3.0 mm wide, thick. Flowers pedunculate, 1–3, pendulous, borne on a bracteate 0.4–0.6 mm long shoot in the axils; bracts (*sensu* Sealy 1958) 2–6, with 1–3 subtending the flowers, the others barren, unguiform, persistent; pedicels very stout, thickened upwards, slightly decurved, 25–29 mm long, 3 mm wide at the proximal end, 7 mm wide at distal end, shiny or crackled and corky, glabrous, bearing 2 or 3 bracteoles; bracteoles triangular, 2–2.5 mm long, 2–2.5 mm wide at base, abaxially pubescent, adaxially glabrous, appressed to and scattered along the pedicel, persistent; open flowers evenly circular, ca. 4–4.5 cm in diameter; sepals 5, yellowish green, 6–7 mm long, 7–9 mm wide, persistent, broadly ovate to suborbicular, concave, coriaceous, finely hairy on outer surface, with ciliate margin; petals 7–8, finely hairy on outer surface, ciliate at apex, red to purplish red, with white margin, 1.2–2.6 cm long, 1–2.8 cm wide, orbicular to obovate, concave, with margin becoming revolute, stamens around 300 and slightly shorter than styles, filaments 1.8–2.1 cm long, white to lightly yellow, arranged in 7–8 whorls, outer filaments glabrous, basally united to the petals for 3–5 mm, free above the union, inner filaments hairy on basal 2/5 part, glabrous above, basally united to each other for 4–10 mm; anthers yellow, 1.2 mm long, 0.7 mm wide, basifixed; ovary superior, ovoid, with slight longitudinal striations, yellow, white hairy, 3–4-locular, ca. 3–4 mm long, 3–4 mm in diameter, with 2 ovules per locule; styles 3–4, connate at basal 1/5–1/3 part, free above, yellowish, hairy on basal 3/4 part, glabrous on apical 1/4 part, 1.7–2.1 mm long, 1 mm wide

at base, 0.2 mm wide at apex, stigma flat. Mature fruits flattened-globose, 3–4 lobed, hairy, 4.5–5.0 cm in diameter, 2.5–3 cm high, with persistent sepals, dehiscing distally into 3–4 parts; columella stout, 0.8–1.2 cm long, 6–8 mm wide; seeds 2 per locule, piano-convex, about l.7–1.8 cm long and 1.3–1.4 cm wide (Fig. 1).


*Figure 1*. *Camellia honbaensis*. sp. n., A. Trunk. B. Young shoot and leaf. C. Flower buds with bracts and bracteoles. D. Open flower. E. Side view of flower. F. Arrangement of sepals and petals. G. Gynoecium. H: Nearly mature fruit. I: Nearly mature seeds

Typus: VIETNAM. Central Vietnam, Khanh Hoa province: Hon Ba Nature Reserve, approximate coordinates 12°06'41"N and 108°58'51" E, 650 m elevation, 22 January 2015, Luu Hong Truong and Tran Gioi *Luu 1101* (holotype SGN!, isotypes SGN!, VNMN!); 8 April 2013, Luu Hong Truong and Tran Gioi *KH1140* (paratype SGN!), 24 March 2014, Luu Hong Truong and Tran Gioi *KH1140b* (paratype SGN!).

**Etymology**

The species is named after the type location, Hon Ba Mountain.

**Proposed Vietnamese name**

Tra Yy Hon Ba.

**Ecology**

*C. honbaensis*, sp. n. was found in understorey of lowland tropical evergreen closed forests at around 650 m above the sea level. Flowering was seen in January and fruiting in April.

**Notes**

The new species appears to be very similar to many taxa of *Camellia*, especially to *C. piquetiana*, the type of the section, in most of the typical characteristics of habit, leaf size, flowers and fruits. However, *C. piquetiana* can be distinguished by its discoid and 5–6-locular ovaries and 5–6 free and fully hairy styles (Pham-hoang, 1991; Pierre, 1887; Pitard, 1910; Sealy, 1958). In the section, *C. longii* also has red petals and glabrous large leaves but it differs from the new species in its campanulate flowers, red sepals and peduncle, 4–6-carpellate discoid and lobulate ovaries and 4–6 apically glabrous styles proximally fused for ca. 5.0 mm (Orel et al., 2014). Besides, *C. dongnaiensis* is distinguishable from *C. honbaensis* in having 3 sepals and graduated yellow apricot to intensely pink petals (Orel, 2016). The new species is distinct from all the rest species of the section as they have yellow flowers (Table 1).

*Table 1*. Key morphological differences among *Camellia* sect. *Piquetia* species

| Characteristics | Leaves | Flowers | Sepals | Stamens | Ovary | Styles |
|---|---|---|---|---|---|---|
| *C. dongnaiensis* | glabrous | campanulate, graduated yellow apricot to intensely pink petals | 3 | 300–500 | ovoid, striated | 5–6, free, glabrous |
| *C. longii* | glabrous | campanulate, red | 5 | 250–300 | almost diamond shaped, slightly striated | 4–6, proximally finely pubescent, distally glabrous |
| *C. piquetiana* | glabrous | rotate, red | 5 | ? | discoid, 5–6-lobed | 5–6, free, fully hairy |
| *C. sonthaiensis* | glabrous | rotate, yellow | 5 | ~ 260 | ovoid, slightly striated, 3–4-lobed | 3–4, free, basally densely hairy |
| *C. honbaensis* | glabrous | rotate, red | 5 | ~ 300 | ovoid, slightly striated, 3–4-lobed | 3–4, connate at basal 1/5–1/3 part, basally densely hairy, glabrous on apical 1/4 part |
| *C. dalatensis* | abaxially hairy | rotate, yellow | 5 | > 300 | ovoid, slightly striated, 4–5-lobed | 4–5, free, fully hairy |

The red flowers and very large glabrous leaves of *C. honbaensis* also recalls those of several species assigned to other *Camellia* sections, namely *C. campanulata* Orel, Curry & Luu (sect. *Lecomtia* Orel), *C. cattienensis* Orel (sect. *Archecamellia* Sealy), *C. hongiaoensis* Orel & Curry (sect. *Dalatia* Orel) and *C. krempfii* (Gagnep.) Sealy (sect. *Archecamellia* Sealy) and but all these species, like *C. longii* and *C. dongnaiensis*, have campanulate and much larger flowers which make them readily different from the new taxon (Gagnepain, 1941; Orel & Curry, 2014; Orel & Curry, 2015; Orel & Wilson, 2012; Pham-hoang, 1991; Pierre, 1887; Pitard, 1910; Sealy, 1958). In fact, *C. campanulata*, *C. cattienensis*, *C. dongnaiensis* and *C. longii* do look alike and so do *C. hongiaoensis* and *C. krempfii*; however, these possible synonymities will be the subject for another paper.

The size of leaves and the structure of flowers in *C. honbaensis* are similar to those in *C. decora* Orel, Curry & Luu and *C. tadungensis* Orel, Curry & Luu (both of sect. *Dalatia*) but the two latter are different in having yellow to orange and pink flowers (Orel & Curry, 2015). In addition, *C. decora* has dark green and shiny leaves with round to cordate bases, around 200 basally pink and apically white filaments and reddish orange petals while *C. tadungensis* does apically pale light yellow and basally red petals, 5–6 styles with hairs on basal 1/2 part, basally red to purple and apically yellow filaments, and around 20-lobed fruits.

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