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A new species of *Blakea* (Blakeae, Melastomataceae) from Ecuador

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Abstract

A new species, *Blakea nangaritzana* D. Fernández, C. Ulloa & Penneys from Nangaritzá canton, Zamora-Chinchipe, southern Ecuador is described and illustrated. It differs from all other species of the genus by the character combination of terrestrial trees up to 25 m tall, outer and inner floral bracts free, narrowly oblanceolate to linear, hypanthium ca. 7 × 8 mm, and calyx lobes 4–5 mm long.

Resumen

Se describe e ilustra una nueva especie, *Blakea nangaritzana* D. Fernández, C. Ulloa & Penneys, del cantón Nangaritzá, Zamora-Chinchipe, sur de Ecuador. Se diferencia de todas las demás especies del género por la combinación de caracteres de árboles terrestres de hasta 25 m de alto, brácteas florales externas e internas libres y estrechamente oblanceoladas a lineares, hipanto ca. 7 × 8 mm, y lóbulos del cáliz 4–5 mm de largo.

Keywords: *Blakea*, Melastomataceae, Ecuador, endemic

Introduction

The neotropical genus *Blakea* P. Browne (1756: 323), as currently understood (including *Topobea* Aublet 1775: 478), comprises ca. 180 described species (Penneys & Judd 2013a). The genus is morphologically characterized mostly by the prevalent but not exclusively hemiepiphytic habit, axillary, non-ramified truncate monotelic synflorescences, flowers subtended by two pairs of decussate bracts, external calyx teeth lacking, flowers zygomorphic due to the declinate androecium, and anthers laterally compressed (Penneys & Judd 2011). In Ecuador, *Blakea* is represented by 62 species of which 27 are endemic to the country (Wurdack 1980, Penneys & Cotton 2011). The southeastern cordillera and the provinces of Loja and Zamora-Chinchipe are unusually rich in Melastomataceae and several new species in this family have been described from that region in the last 15 years (Cotton & Matezki 2003, Michelangeli & Ulloa Ulloa 2013, Penneys *et al.* 2015, Ulloa Ulloa & Neill 2006, Ulloa Ulloa & Homeier 2008, Ulloa Ulloa *et al.* 2012). According to Cotton (2002), some 35% of all Ecuadorian melastomes occur in this region highlighting its importance.

Curation of the Melastomataceae collections at Ecuador's National Herbarium (QCNE) and the Missouri Botanical Garden in St. Louis (MO), along with the studies on the Blakeae (Penneys 2007, Penneys & Judd 2011, 2013a,b), and authors' field work in Ecuador revealed a new species of *Blakea* that is described, illustrated, and compared with allied taxa. Herbarium acronyms follow Thiers (2016).

Description of the new species

Blakea nangaritzana D. Fernández, C. Ulloa & Penneys, *sp. nov.*

Type:—ECUADOR. Zamora-Chinipe: Cantón Nangaritza, Cordillera del Cóndor region, upper río Nangaritza, “Área de Conservación Los Tepuyes”, on upper portion of sloping sandstone plateau southwest of Las Orquídeas, 04°15'32"S 78°41'04"W, 1620 m, 6 November 2006 (fl), D. Neill *et al.* 15311 (holotype: QCNE-207768!; isotypes: AAU!, CAS!, K!, MO-6638630!, NY!, USM!). Figures 1–3.

Diagnosis:—*Blakea nangaritzana* is similar to *Blakea campii* Wurdack, but distinguished from that species by being terrestrial trees 4–25 m tall (vs. mostly lianescent hemiepiphytes), hypanthium ca. 7 × 8 mm (vs. ca. 4 × 5 mm), and calyx lobes 4–5 mm long (vs. 0.5–1 mm long). *Blakea nangaritzana* is also similar to *B. calyprata* Gleason, but differs in having distinct, valvate calyx lobes (vs. calyx lobes completely united and calyprate).

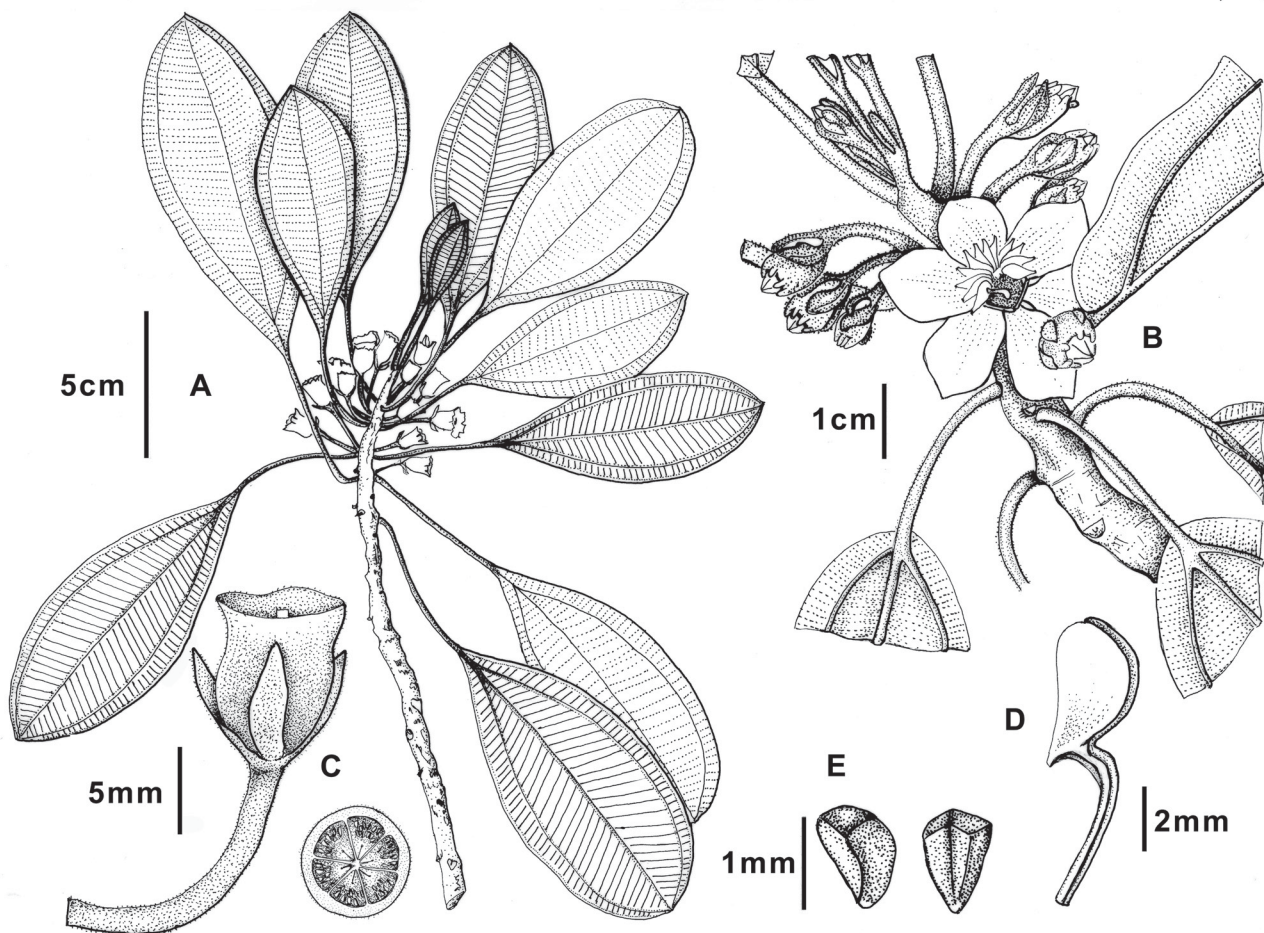


FIGURE 1. *Blakea nangaritzana*. A. Fruiting branch. B. Flowering branch. C. Young fruit with persistent bracts and cross section. D. Lateral view of stamen. E. Seeds. From Palacios & Neill 6675, Neill 15311, and field photographs. Illustrated by A.L. Arbeláez.

Trees 4–25 m tall; young stems flattened, quadrangular. Internodes 1–2 cm long. Young branches, inflorescences, floral bracts, hypanthium and abaxial leaf surface covered with minute, dendritic, brown trichomes. Mature leaves of a pair equal to somewhat unequal in size, isomorphic, opposite, decussate: Petioles terete, 3–6 cm long, reddish, flexible, glabrous when old. Leaf blades coriaceous, 9–13.5 × 3.7–6.2 cm, slightly obovate to elliptic; apex obtuse to rounded, mucronate, the mucron ca. 2 mm long; base acute, slightly decurrent; margin entire; adaxial surface dull olive-green to yellowish-green, glabrescent, with minute scattered dendritic trichomes; abaxial surface covered with a dense indumentum of brownish-silver lepidote trichomes, except the base of the primary nerves with minute, scattered, dendritic trichomes. Venation acrodromous, suprabasal, 5-nerved including the faint marginal pair; main nerve conspicuous and prominent above; the tertiary nerves closely parallel, 2–3.5 mm apart at widest portion of blade.



FIGURE 2. *Blakea nangaritzana*. Flowering branch and flower (note that anthetic flower appears 5-merous due to spider webs between two petals; 12 stamens can be counted). From *Homeier 5205*. Photograph courtesy of J. Homeier©.

Flowers erect, 2–4 in each leaf axil of uppermost branches; peduncles terete, 2.1–2.8 cm long, 1–1.5 mm thick. Floral bracts free, subcoriaceous, appressed to hypanthium, olive green to brown, persistent; outer floral bracts oblanceolate to spatulate, 8–11 × 3–4 mm, margin entire, 1-veined, the median vein moderately keeled; inner floral bracts narrowly oblanceolate, spatulate to linear, 7–9 × 1–1.5 mm, margin entire. Hypanthium campanulate, terete, 6–7 mm long to the torus × 6–8 mm wide, externally covered by a dense indumentum of minute, dendritic, brown trichomes; inner hypanthium glabrous, ridged. Calyx tube 2–3 mm long; calyx lobes 6, 4–5 × 5–6 mm, indumentum externally as on hypanthium, internally with similar, sparser trichomes distally and somewhat marginally, nearly glabrous proximally, broadly triangular and truncate, apically mucronate, sometimes irregularly and incompletely peeling laterally slightly above torus, external calyx teeth 1 mm long, apical, descending, callose thickenings. Corolla rotate: Petals 6, fleshy, glabrous, 14–15 × 9–10 mm, rhomboid, white, entire, apex acute to obtuse, base clawed. Stamens 12, isomorphic, declined to one side of the flower opposing the style; filaments adaxially keeled, laterally flanged, ca. 6 mm long, cream, glabrous; connective rugose, prolonged dorso-basal into a thick, triangular tooth ca. 1 mm long, yellow; anthers laterally connivent coherent, compressed, ca. 5 × 3 mm, mostly creamy white, with two apical pores, anther sacs completely separated, thecae surfaces smooth. Ovary inferior, 6-locular, glabrous, apex conic, ca. 2 mm high, placentation intruded axile. Style straight, apically tapering, glabrous, 10–11 mm long; stigma punctiform. Mature berry urceolate, 5–7 mm long; seeds numerous, pyramidal-cuneate, 1–1.2 mm long.

Habitat and Distribution:—*Blakea nangaritzana* is only known from a small area in Zamora-Chinchipe province, between 900 and 1840 m. The area is a dense wet forest on a sloping sandstone plateau in the Cordillera del Cóndor protected by the Bosque Protector Alto Nangaritzta, the Conservation Area of Los Tepuyes, and adjacent to the Podocarpus National Park. It is expected to occur across the border in Peru.

Conservation status:—The Area of Occurrence is of 36 km² and the Extension of Occurrence (EOO) of 20 km². The species has been collected over a 30 year period, but remained undescribed until now, stressing the importance of long-term exploration, detailed studies, well-maintained herbaria, and most importantly, well conserved forests. Based on our current knowledge, we assigned this taxon a provisional IUCN (2012) conservation status of Endangered (EN) because of the small size of the population.



FIGURE 3. *Blakea nangaritzana*. Flower in anthesis. Photograph courtesy of E. Cueva©.

Etymology:—The species name refers to the Nangaritzá river watershed where this species occurs.

Additional specimens examined (paratypes):—ECUADOR. Zamora-Chinchi: Cantón Nangaritzá, Tepui-like mountain crest close to the village of Las Orquideas (Río Nangaritzá), premontane forest, 04°15.8'S 78°41.5'W, 1840 m, 1 July 2014 (fl, fr), *J. Homeier* 5205 (GOET, HUTPL, MO, QCNE). Cordillera del Cóndor region, upper río Nangaritzá, “Área de Conservación Los Tepuyes”, on upper portion of sloping sandstone plateau southwest of Las Orquideas, 04°15'32"S 78°41'04"W, 1620 m, 6 November 2006 (fl), *D. Neill et al.* 15447 (MO, QCNE). Miazí, 04°18'S 78°40'W, 1100 m, 9 December 1990 (fr), *W. Palacios & D. Neill* 6675 (MO, QCNE, US); 04°16'S 78°42'W, 970 m, 20 October 1991 (fl), *W. Palacios, I. Vargas & M.M. Ruiz* 8508 (MO, QCNE, TEX, US). Centro Shuar Shaime, por la unión de los ríos Nangaritzá y Numpatakaime, cerca de la Cueva de los Tayos, 04°18'23"S 78°41'11"W, 1050 m, 25 August 2002 (fl), *W. Quizhpe et al.* 241 (FLAS, QCNE); confluencia del río Numpatakaime y el río Nangaritzá, 04°17'10"S 78°38'50"W, 900 m, 24 July 2002 (fl), *W. Quizhpe et al.* 630 (FLAS, QCNE).

Discussion

Blakea nangaritzana is notable for being a terrestrial tree 4–25 m tall, dimensions that place it among some of the largest members of the genus. The new species is also remarkable for the brownish-silver indument on the undersides of the leaves; floral bracts that are free, narrow, oblanceolate to spatulate or linear; hypanthium ca. 7 × 8 mm; calyx lobes 4–5 mm long and these sometimes irregularly peel laterally just above the torus; and white petals. *Blakea nangaritzana* is similar to another Ecuadorian species, *B. campii* (Wurdack 1967: 40), but the latter is a lianescent hemiepiphyte, has smaller flowers with the hypanthium measuring ca. 4 × 5 mm, and calyx lobes 0.5–1 mm long. *B. calyptrata* Gleason (1945: 388), a Colombian endemic, is also morphologically similar to the new species, but it has calyx lobes completely fused and perfectly dehiscent circumscissily. The rare, Venezuelan endemic, *B. longibracteata* Cogn. (1891: 1074) has foliar tertiary veins spaced about 1 mm apart, and floral bracts 20–25 mm long.

The type collection, *D. Neill et al.* 15311, states that *Blakea nangaritzana* is an epiphytic shrub. All six paratypes have labels indicating that the habit of this species is a terrestrial tree, and the description provided above is in agreement with that assessment. Labels on other collections made on the same day (*Neill et al.* 15316 & 15320) state that field notes were lost, thus errors may have occurred when reconstructing them from memory. Although species of *Blakea* are plastic in terms of their habit depending on local environmental conditions, it is unlikely that a large, terrestrial, arborescent species can also be an epiphytic shrub. General collectors rarely make careful observations of the root systems of hemiepiphytes attached to and descending host trunks, which might explain the habit given on the type collection, therefore further observations are needed to confirm such a growth form.

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References

- Aublet, F. (1775) *Histoire des plantes de la Guiane Française* Volume 1. Chez P.F. Didot jeune, Libraire de la Faculté de Médecine, Quai des Augustins. Paris, 621 pp.
- Browne, P. (1756) *The Civil and Natural History of Jamaica in Three Parts*. Printed for the author, and sold by T. Osborne and J. Shipton

- in Gray's-Inn. London, 503 pp.
- Cogniaux, C. (1891) *Melastomacées*. In: De Candolle, A. & De Candolle, C. (Eds.) *Monographiae phanerogamarum* 7. G. Masson, Paris, 1256 pp.
- Cotton, E. (2002) Melastomataceae en el sur de Ecuador. In: *Botánica austroecuatoriana-Estudios sobre los recursos vegetales en las provincias de El Oro, Loja y Zamora-Chinchipe*. Ediciones Abya Yala, Quito, pp. 137–158.
- Cotton, E. & Matezki, S. (2003) Ecuadorian novelties in *Blakea* and *Topobea* (Melastomataceae). *Brittonia* 55: 73–81.
[http://dx.doi.org/10.1663/0007-196X\(2003\)055\[0073:ENIBAT\]2.0.CO;2](http://dx.doi.org/10.1663/0007-196X(2003)055[0073:ENIBAT]2.0.CO;2)
- Gleason, H.A. (1945) On *Blakea* and *Topobea*. *Bulletin of the Torrey Botanical Club* 72: 385–393.
<http://dx.doi.org/10.2307/2481538>
- IUCN. (2012) *Guidelines for application of IUCN red list criteria at regional levels: version 3.1*. IUCN Species Survival Commission, IUCN, Gland, Switzerland and Cambridge, UK.
- Michelangeli, F.A. & Ulloa Ulloa, C. (2013) A new species of *Graffenrieda* (Melastomataceae) from the Andes in Southern Ecuador. *Phytotaxa* 77 (3): 43–48.
<http://dx.doi.org/10.11646/phytotaxa.77.3.2>
- Penneys, D.S. (2007) *Phylogeny and character evolution in the Blakeeae (Melastomataceae)*. PhD Thesis. University of Florida, USA.
- Penneys, D.S. & Cotton, E. (2011) Melastomataceae. In: León-Yáñez, S., Valencia, R., Pitman, N., Endara, L., Ulloa Ulloa, C. & Navarrete, H. (Eds.) *Libro rojo de las plantas endémicas del Ecuador, 2nd ed.* Herbario QCA, Pontificia Universidad Católica del Ecuador, Quito, Ecuador, pp. 393–423.
- Penneys, D.S. & Judd, W.S. (2011) Phylogenetics and morphology in the Blakeeae (Melastomataceae). *International Journal of Plant Sciences* 172: 78–106.
<http://dx.doi.org/10.1086/657284>
- Penneys, D.S. & Judd, W.S. (2013a) A revised circumscription for the Blakeeae (Melastomataceae) with associated nomenclatural adjustments. *PhytoKeys* 20: 17–32.
<http://dx.doi.org/10.3897/phytokeys.20.4344>
- Penneys, D.S. & Judd, W.S. (2013b) Combined molecular and morphological phylogenetic analyses of the Blakeeae (Melastomataceae). *International Journal of Plant Sciences* 174: 802–817.
<http://dx.doi.org/10.1086/670011>
- Penneys, D.S., Ulloa Ulloa C., Neill, D.A. & Fernandez, D. (2015) A new species of *Chalybea* from Ecuador. *Phytotaxa* 212 (4): 264–270.
<http://dx.doi.org/10.11646/phytotaxa.212.4.2>
- Thiers, B. (2016) *Index herbariorum: A global directory of public herbaria and associated staff*. New York Botanical Garden, Bronx, NY. Available from: <http://sweetgum.nybg.org/ih/> (accessed 10 August 2016)
- Ulloa Ulloa, C. & Neill, D.A. (2006) *Phainantha shuariorum* (Melastomataceae), una especie nueva de la Cordillera del Cóndor, Ecuador, disyunta de un género guayanés. *Novon* 16: 281–285.
[http://dx.doi.org/10.3417/1055-3177\(2006\)16\[281:PSMUEN\]2.0.CO;2](http://dx.doi.org/10.3417/1055-3177(2006)16[281:PSMUEN]2.0.CO;2)
- Ulloa Ulloa, C. & Homeier, J. (2008) *Meriania franciscana* (Melastomataceae), una especie nueva de los Andes de Ecuador. *Anales del Jardín Botánico de Madrid* 65 (2): 383–387.
- Ulloa Ulloa, C., Neill, D.A. & Dudek, O.A. (2012) A new species of *Miconia* (Melastomataceae, Miconieae) from the Ecuador-Peru border. *Phytokeys* 12: 35–46.
<https://doi.org/10.3897/phytokeys.12.3027>
- Wurdack, J.J. (1967) Plants collected in Ecuador by W. H. Camp—Melastomataceae. *Memoirs of the New York Botanical Garden* 16: 1–45.
- Wurdack, J.J. (1980) Melastomataceae. In: Harling, G. & Sparre, B. (Eds.) *Flora of Ecuador* 13. University of Göteborg and Riksmuseum, Stockholm, pp. 1–406.