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Bauhinia proboscidea* (Fabaceae: Cercidoideae), a new species from Costa Rica and Panama, with notes on *B. beguinotii*, *B. gorgonae* and *B. pansamalana

PEDRO JUÁREZ¹, RODOLFO FLORES² & MARIO A. BLANCO^{3,4}

¹Investigador Asociado, Herbario Nacional de Costa Rica. Departamento de Historia Natural, Museo Nacional de Costa Rica, Apdo. 749-1000, San José, Costa Rica; e-mail: pedrojuarezr@gmail.com

²Programa de Maestría en Biología Vegetal, Universidad Autónoma de Chiriquí, República de Panamá; e-mail: rflores1184@hotmail.com

³Jardín Botánico Lankester, Universidad de Costa Rica, Apdo. 302-7050, Cartago, Costa Rica; e-mail: mario.blancocoto@ucr.ac.cr

⁴Escuela de Biología, Universidad de Costa Rica, Ciudad Universitaria Rodrigo Facio, Apdo. 11501-2060, San José, Costa Rica. ORCID ID: orcid.org/0000-0001-7369-5411

Abstract

Bauhinia proboscidea, a new species from Costa Rica and Panama, is described and illustrated, and compared to the closely related *B. pansamalana* of southern Mexico, Guatemala and Honduras. It is also compared with *B. beguinotii*, with which has been confused in herbaria. *Bauhinia gorgonae*, endemic to Gorgona Island in Colombia and which has been classified as a variety of *B. beguinotii*, is here considered a separate species. A key to the Neotropical species of *Bauhinia* with three fertile stamens is provided. Some observations on the morphology and reproductive biology of *B. proboscidea* are presented. Global-level assessments of the conservation status according to IUCN Red List criteria indicate that *B. proboscidea* and *B. beguinotii* (which was previously assessed using some misidentified records) should both be considered as species of Least Concern (LC), *B. gorgonae* should be considered as Endangered (EN), and *B. pansamalana* should be considered Not Threatened (NT). Country-level conservation assessments are also provided for all four species. The homology of the “intra-stipular spines” of *Bauhinia* is briefly discussed.

Resumen

Se describe e ilustra *Bauhinia proboscidea*, una nueva especie de Costa Rica y Panamá, y se compara con la cercanamente emparentada *B. pansamalana* del sur de México, Guatemala y Honduras. También se compara con *B. beguinotii*, con la cual se ha confundido en los herbarios. *Bauhinia gorgonae*, endémica de la Isla Gorgona en Colombia, se considera aquí como una especie independiente de *B. beguinotii*, de la cual se ha clasificado como una variedad. Se brinda una clave para las especies neotropicales de *Bauhinia* con tres estambres fértiles. Se presentan algunas observaciones sobre la morfología y biología reproductiva de *B. proboscidea*. Evaluaciones a nivel global del estado de conservación de acuerdo con los criterios de la Lista Roja de UICN, indica que tanto *B. proboscidea* como *B. beguinotii* (que había sido previamente evaluada usando algunos registros mal identificados) deben ser consideradas como especies de Preocupación Menor (LC), *B. gorgonae* debe considerarse como En Peligro (EN), y *B. pansamalana* debe considerarse como No Amenazada (NT). También se presentan evaluaciones de conservación a nivel de país para las cuatro especies. Se discute brevemente la homología de las “espinas intraestipulares” de *Bauhinia*.

Key words: Central America, conservation, intra-stipular spines, IUCN Red List categories, taxonomy, reproductive biology

Introduction

The delimitation of the genus *Bauhinia* Linnaeus (1753: 374), the largest in subfamily Cercidoideae Legume Phylogeny Working Group (2017: 68; formerly tribe Cercideae Bronn 1822: 131), has been controversial (see summaries by Wunderlin *et al.* 1981, Lewis & Forest 2005, Sinou *et al.* 2009). In its widest circumscription (*e.g.*, Wunderlin *et al.* 1981, 1987, *i.e.*, *Bauhinia sensu lato*, or *s.l.*), it contains ca. 350–400 species of pantropical distribution (but absent

from the south Pacific islands). Numerous generic segregates of *Bauhinia s.l.* have been proposed. Of these, *Barklya* Mueller (1859: 158), *Gigasiphon* Drake del Castillo (1902: 88), *Lasiobema* (Korthals 1841: 84) Miquel (1855: 71), *Lysiphyllum* (Benth. in Bentham & Hooker 1865: 576) de Wit (1956: 431), *Phanera* Loureiro (1790: 37), *Piliostigma* Hochstetter (1846: 598) and *Tylosema* (Schweinfurth 1868: 17) Torre & Hillcoat in Exell & Mendonça (1955: 38) were recognized by Lewis & Forest (2005). Later, Wunderlin (2010) recognized those genera plus *Schnella* Raddi (1820: 32) and minus *Lasiobema* (which he synonymized with *Phanera*), based on the molecular phylogenetic results of Sinou *et al.* (2009). Wunderlin's (2010) phylogenetic classification has gained general acceptance (*e.g.*, Legume Phylogeny Working Group 2017). *Bauhinia sensu stricto (s.s.)*, *i.e.*, in Wunderlin's (2010) circumscription (more or less equivalent to the “*Bauhinia* group” in Wunderlin, 1983, and to *Bauhinia* subgenus *Bauhinia* in Wunderlin 1987), is still pantropical, with ca. 160 species of trees, shrubs, or rarely semiscandent plants, with entire or bilobed leaves (usually interpreted as formed by two partially or completely fused leaflets, see Urban 1885, van der Pijl 1951, Dubey *et al.* 1990; truly bifoliolate leaves, *i.e.*, with two free leaflets, are rare in *Bauhinia s.s.*), often with “intra-stipular spines” (see comments below), devoid of tendrils, and with a calyx that lacks apical nectaries, either spathaceous or divided into 2–5 lobes at anthesis.

In southern Central America (Costa Rica and Panama), there are 18 documented native species of *Bauhinia s.l.*, 10 of which are members of *Bauhinia s.s.* (including the one described here). For Panama, Correa *et al.* (2004) reported 13 native species of *Bauhinia s.l.*, eight of which are members of *Bauhinia s.s.*; these authors included *B. multinervia* (Kunth 1823: 316) de Candolle (1825: 515) as native to Panama (probably based on Caballero 32, F), but that species occurs naturally only in northeastern South America and the Lesser Antilles (Wunderlin 1983), and is only occasionally cultivated in Costa Rica and Panama. For Costa Rica, Zamora (2010) reported 13 native species of *Bauhinia s.l.*, seven of which are members of *Bauhinia s.s.* Zamora (2010) listed two undescribed species of *Bauhinia s.l.* for Costa Rica: the lianescent “*Bauhinia* sp. A”, later described as *Schnella bahiachalensis* Zamora (2013: 1–6), and the arborescent “*Bauhinia* sp. B”, which is formally described below (as *B. proboscidea* P. Juárez, R. Flores & M.A. Blanco).

Because of their remarkable vegetative similarity and the commonly poor preservation of their delicate flowers upon pressing, herbarium specimens of the new species described here have been frequently misidentified as *Bauhinia beguinotii* Cufodontis (1933: 192). Thus, we provide a detailed comparison between both taxa. Also, we take the opportunity to compare *B. beguinotii* with *B. gorgonae* Killip ex R.S. Cowan (1961: 281–282, f. 2c–d), the latter of which has been considered a variety of the former (Wunderlin 1973, 1976, 1983, 1986, Quiñones 2005, Castellanos & Lewis 2012).

Finally, we provide conservation assessments based on the International Union for Conservation of Nature (IUCN) Red List criteria for *B. beguinotii*, *B. gorgonae*, *B. pansamalana* Donnell Smith (1888: 27–28; a closely-related species to the one described here as new) and *B. proboscidea*.

Material and Methods

Specimens (or their photographic images) determined as *Bauhinia beguinotii*, *B. gorgonae* and *B. pansamalana*, and *Bauhinia* specimens from Mexico and Central America not determined to species level, were studied from the following herbaria: AAH, BC, BM, COL, CR, CR-INB, EAP, F, GH, K, MEXU, MO, NY, P, PH, PMA, SCZ, TEFH, UCH, US, USE, USJ and W. Herbarium acronyms cited above and elsewhere in this paper follow Thiers (2018) with the exception of CR-INB, which denotes specimens deposited in the former INB herbarium, now nominally incorporated in CR but still housed in the off-site building, formerly of the Instituto Nacional de Biodiversidad, in Santo Domingo de Heredia, Costa Rica. Measurements of vegetative and reproductive structures were made both from herbarium specimens and from a living, cultivated plant of *B. proboscidea* (see below).

A morphological species concept was adopted for practical delimitation, so that apparent gaps in morphological variation (especially if associated with geographical disjunction) were used to distinguish species (*i.e.*, a phenetic species concept *sensu* Judd *et al.* 2016). Resulting species circumscriptions were compared to type specimens and to protologue descriptions to verify the proper application of names. The resulting taxa are assumed to represent independent evolutionary lineages (*i.e.*, evolutionary or phylogenetic species definitions, *sensu* Judd *et al.* 2016).

Clarifying comments and a complete list of specimens examined are provided for each taxon. For herbarium collections that did not include geographical coordinates, these were found or inferred using the Missouri Botanical Garden's Gazetteer of Costa Rican Plant Collecting Locales (<http://www.mobot.org/MOBOT/Research/costaricagaz.shtml#B>) or other sources; for those specimens, the corresponding geographical coordinates are indicated in brackets. For some specimens with unprecise locality data, geographical coordinates could not be inferred with certainty.

Red List conservation assessments were performed for *B. beguinotii*, *B. gorgonae*, *B. pansamalana* and *B. proboscidea*, according to the methodology of the International Union for Conservation of Nature (IUCN; IUCN Standards and Petitions Subcommittee 2017), to determine their corresponding IUCN Red List category of extinction risk (IUCN Species Survival Commission 2012). We lack precise information on population data and dynamics for either taxa, and we assume a stable current population trend. The extent of occurrence (EOO) and area of occupancy (AOO) aspects of the geographic range of the assessed taxa were obtained with the software GeoCAT (Bachman *et al.* 2011) using the geographical coordinates of herbarium specimens (standardized to decimal degrees). In order to avoid misidentified records, the specimens cited in this paper (which we were able to study directly or through photographic images) were used as the only primary occurrence data. We performed both global-level and national-level assessments for each taxon. These assessments will be submitted to the IUCN Red List Unit upon acceptance of publication of this paper.

Results and Discussion

Bauhinia proboscidea P. Juárez, R. Flores & M.A. Blanco, *sp. nov.* (Figs. 1, 2)

Similar to *Bauhinia pansamalana* but differs from that species by its shorter petioles, more elongate leaf blades, inflorescences with 2 (rarely up to 8) flowers, larger flowers, longer fruits and allopatric, more southern geographic distribution.

Type.—COSTA RICA. Prov. Puntarenas: cantón Osa, distrito Drake, poblado Rancho Quemado, cerca de la toma de agua, bosque primario, ribera de una quebrada, 210 m, 8°40'58.30" N, 83°33'36.85" W, 4 May 2014 (fr.), Juárez 420 (holotype: USJ!; isotypes: CR!, MO!).

Shrubs or small trees (occasionally reportedly semiscandent), conforming to Troll's architectural model, 4–12(–21) m tall (but see comments) × 10–25 cm at breast height when reproductive, andromonoecious. **Stems** plagiotropic, with distichous, alternate phyllotaxy; green, slightly compressed, fractiflex and glabrous when young; becoming cylindrical with age; bark smooth to striate, lenticelate, light brownish-gray. **Leaves** simple; petiole bituminous, 10–20 × 1–3 mm; blade chartaceous, entire, ovate, (2.5–) 5–30 × (1.2) 2–9 cm, basally cuneate to rounded, sub-truncate, obtuse, or slightly acute, apically acuminate or bifid, glabrous on both surfaces, margin entire; venation acrodromous, primary nerves 5, the 3 central ones reaching the blade apex, secondary nerves irregularly perpendicular to the primaries, tertiary venation reticulate; stipules ovate, subulate, acute, up to 1 × 0.5 mm, early-caducous; intrastipular spines subconical, acute, up to 1.5 mm long × 0.4 mm in diameter on the dorsal (upper) side of branches, up to 2.5 mm long × 0.8 mm in diameter on the ventral (lower) side of branches. **Inflorescences** both axillary and terminal; terminal ones occasionally displaced laterally by the axillary branch of the last leaf and thus appearing leaf-opposed, racemose, rarely branched, sequentially flowered, with 1–2 (–8) flowers, usually only the first flower hermaphroditic, the subsequent flowers staminate; rachis 1–3 cm long; floral bracts broadly triangular, 1 × 3 mm, minutely strigose; bracteoles ovate, 1.5 × 1.3 mm, minutely strigose, located at the base of the pedicel, adjacent to the floral bract. **Flowers** zygomorphic to slightly asymmetric, either hermaphroditic or staminate. Pedicel 3–6 mm long × 1.5–2.5 mm in diameter, minutely strigose. Flower buds botuliform, up to 5 cm long × 4–5 mm in diameter just before anthesis, pale green. Hypanthium tubular, 8–15 mm long × 4.5–5 mm in diameter externally, 7 mm long × 2 mm in diameter internally. Calyx spathaceous, formed by 5 connate sepals, 2.5–5.5 × 0.6–1.2 cm, straight or reflex, minutely striate, minutely strigose abaxially, glabrous adaxially, dehiscing along one or two sepal margins (usually one of the lowermost 3 sepals, and thus opening obliquely in relation to the rest of the flower), occasionally dehiscing along an additional sepal margin, and frequently splitting incompletely along the basal margins of other sepals. Petals 5, erect to suberect, subequal or the 2 lowermost ones smaller, 28–63 × 1.5–5 mm, narrowly spatulate, apically acute, glabrous, white with a green middle vein and yellowish secondary veins, becoming pink on the second day of anthesis. Stamens 10, heterodynamous, in 2 whorls of 5 each; the 3 lowermost of the external whorl fertile, the rest staminodial; filaments dark red, glabrous, connate, forming a staminal tube 15–20 mm long × 3–3.5 mm in diameter; filaments of fertile stamens projecting 30–42 mm beyond staminal tube, those of hermaphroditic flowers strongly recurved to coiled so that the anthers lie under (or to the side of) staminal tube, those of staminate flowers straight, slightly incurved apically so that the anthers face the tip of the pistillode; filaments of staminodes projecting 1–11 mm beyond staminal tube; fertile anthers linear, dorsifixed, introrsely longicidal, margins minutely villous, grayish pink externally, white internally, 7 × 1 mm each, connate, forming an oblong pseudosynanther 7 × 3 mm; abortive anthers (of staminodia) narrowly ellipsoid to sagittate or absent, minutely villous when present, up to 1.5 × 0.5 mm; pollen white. Gynoecium of 1 carpel, stipitate; fertile pistil

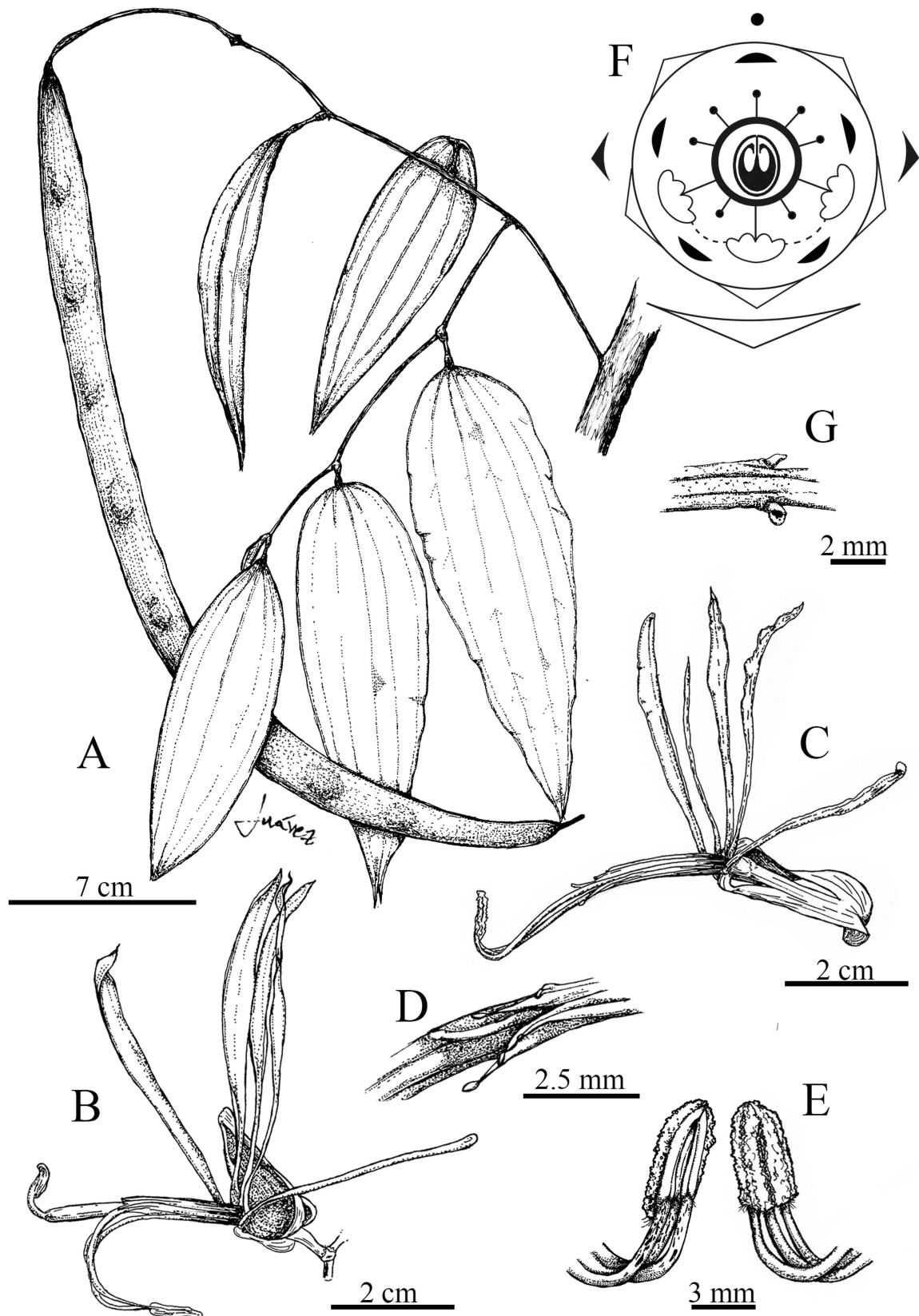


FIGURE 1. *Bauhinia proboscidea*. **A.** Fruiting branch. **B.** Perfect (hermaphrodite) flower; note recurved fertile stamens and incurved style. **C.** Staminate flower; note apically incurved fertile stamens. **D.** Apex of staminodes and bases of free portion of filaments of fertile stamens in staminate flower. **E.** Apex of fertile stamen filaments and anthers of staminate flower. **F.** Floral diagram of perfect flower. **G.** Pair of intrastipular spines at a node (leaf scar on opposite side of stem, not visible), with liquid secretion. A based on type specimen (Juárez 420, USJ, CR, MO); B–F based on photographs of Juárez 1241 (USJ). Drawn by P. Juárez.

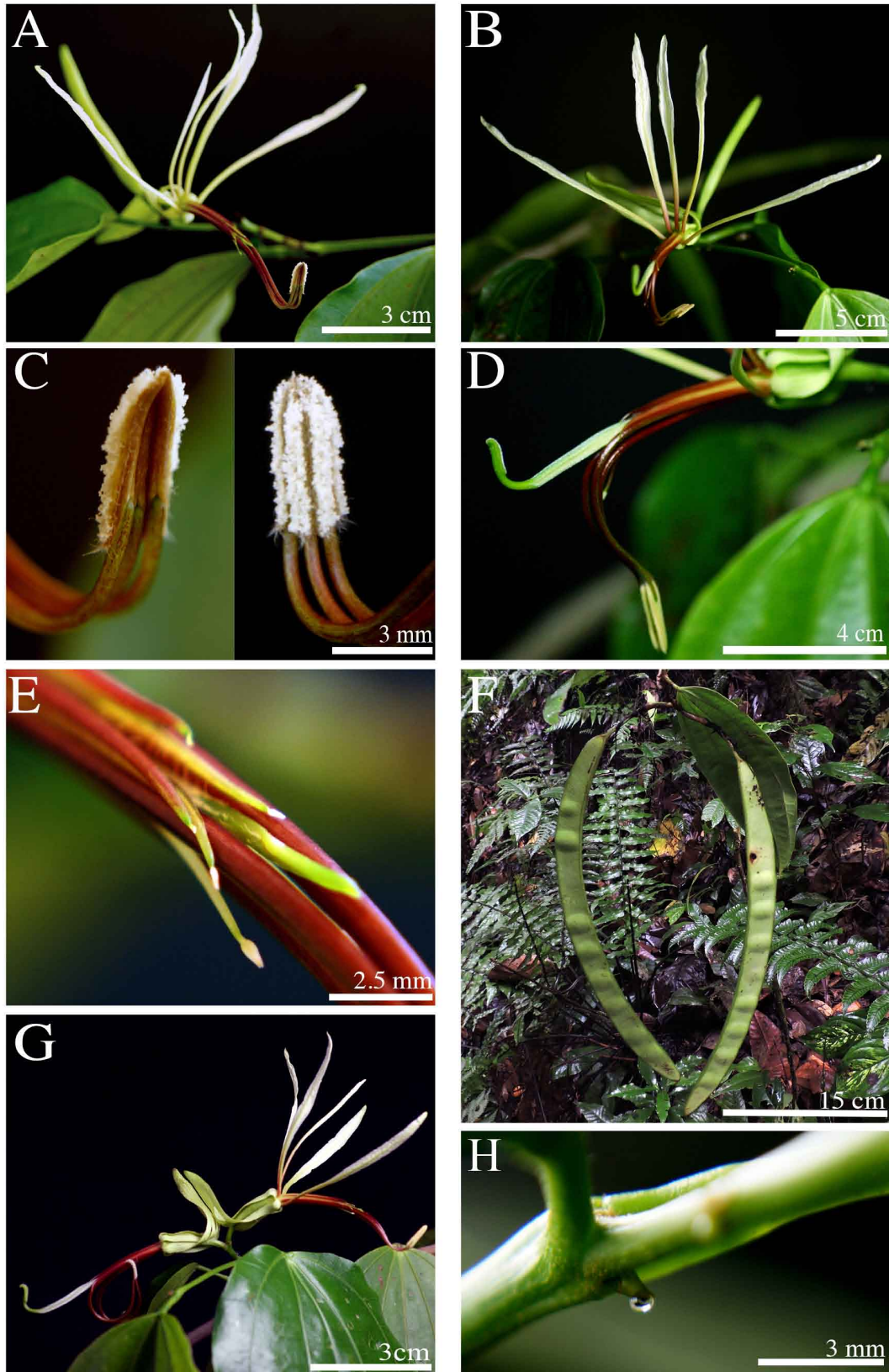


FIGURE 2. *Bauhinia proboscidea*. **A.** Staminate flower. **B.** Perfect (hermaphrodite) flower. **C.** Apex of fertile stamens of staminate flower with incurved filaments and open anthers. **D.** Detail of perfect flower, showing recurved fertile anthers and pistil with incurved style. **E.** Detail of staminodes (red and yellow, with white abortive anthers), filaments of fertile stamens (dark red) and pistillode (green) in staminate flower. **F.** Immature fruits. **G.** Two-flowered inflorescence, with one perfect flower and one staminate flower; the perfect flower (left) has already shed its petals. **H.** Detail of stem node showing intrastipular spine with liquid secretion. F from Flores *et al.* 3835 (PMA) by R. Flores; all other photos from Juárez 1241 (USJ) by P. Juárez.

(of hermaphroditic flowers) 30–62 mm long; gynophore ca. 10 mm long, glabrate; ovary narrowly oblong, strigillose, whitish, 18–20 × 2–3 mm deep × 1 mm thick; style ca. 5 mm, glabrate, incurved; stigma facing the flower base due to the curvature of the style, oblong, green, ventrally papillose, dorsally glabrous, 6–7 × 2 mm; pistillode (of staminate flowers) linear, whitish with green margins, 15–30 × 1.5–2 mm. **Fruits** ensiform to falcate, flattened, basally obtuse to acute, stipitate (gynophore 2.5–3 cm), apically rostrate with the persistent style, (12–)20–35 × 3 cm, glabrous, pendulous, green when immature, drying brown to blackish when mature, with 8–12 seeds, dehiscing through both the ventral and dorsal sutures, valves becoming helically coiled. **Seeds** sub-elliptic, slightly lenticular, ca. 1.5–2 × 1–1.5 cm, dark brownish, shiny. **Seedling** erect; cotyledons unknown; eophylls (first leaves after cotyledons) opposite, blade chartaceous, sub-quadrate, 4.2–4.5 × 5.1–5.3 cm, 5-nerved, each of the 4 lateral nerves terminating in a 2.2–3.5 cm long acumen extending from the blade, the central nerve terminating in a 1–2 mm long apiculus.

Distribution and habitat:—*Bauhinia proboscidea* occurs on the Pacific slope of central and southern Costa Rica and extreme western Panama. It has been collected in many localities in the Costa Rican provinces of Puntarenas and San José, and from a single locality in the Panamanian province of Chiriquí, in the Burica Peninsula, adjacent to the Costa Rican border (Figure 3). Unaware of the recent Panamanian collections, Zamora (2010) considered *B. proboscidea* (as *Bauhinia* sp. B) as a Costa Rican endemic. *Bauhinia proboscidea* grows in primary and secondary moist forest and rain forest at elevations of 200–1300 m, frequently near streams.

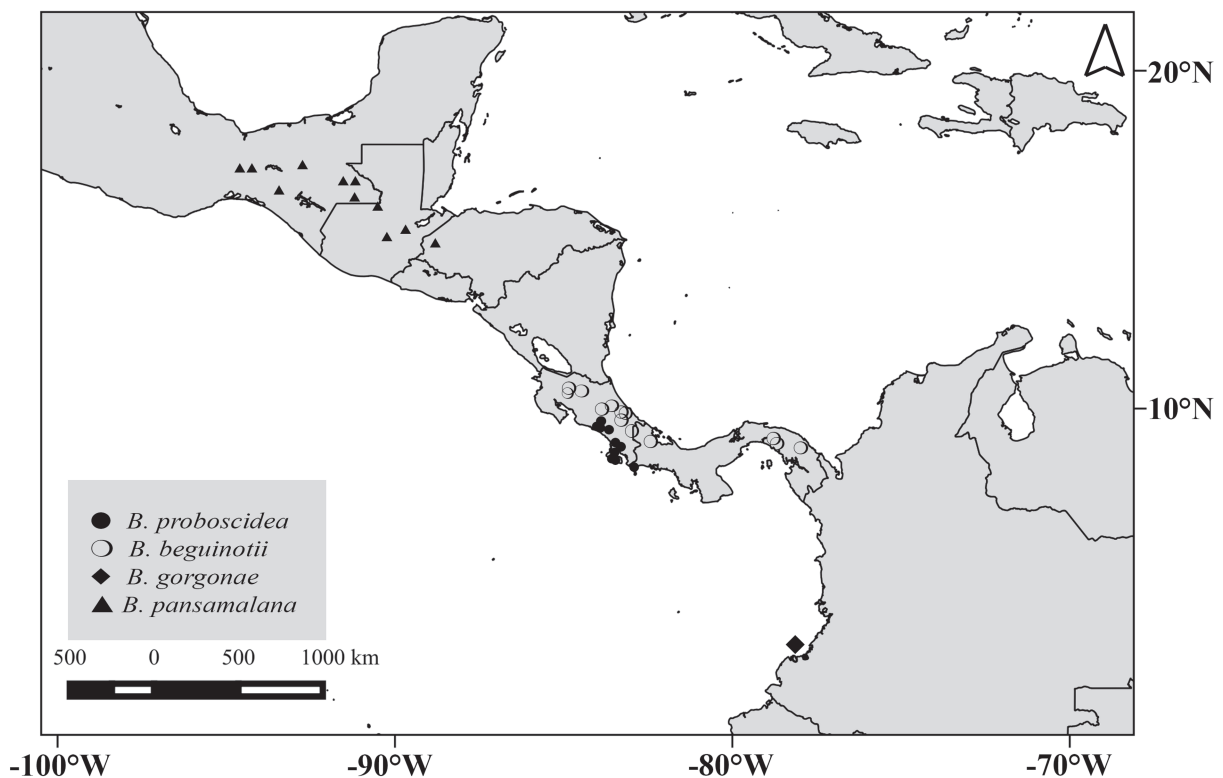


FIGURE 3. Distribution map of *Bauhinia beguinotii*, *B. gorgonae*, *B. pansamalana* and *B. proboscidea*, according to the localities of available herbarium collections with geographic coordinates (indicated or inferred, see text).

Phenology:—Flowering has been recorded during both dry and rainy seasons, from January to May and August to September. Fruiting specimens have been collected from January to August. A small tree now in cultivation at Lankester Botanic Garden has flowered more or less continuously after reaching a height of ca. 70 cm. Presence of seedlings has been documented in July (based on the seedling included in *Valverde 1060*, US).

Observations on reproductive biology:—Anthesis apparently begins during the night or just before dawn. The petals stay erect and in good condition for ca. 15–20 h (if protected from the sun or heavy rain), and then shrivel, turning pinkish or magenta before falling (in hermaphroditic flowers). On the second day of anthesis the anthers (in hermaphrodite flowers) shrivel, but the stigma remains in good condition and apparently receptive. Flowers abscise on the third day of anthesis.

Most inflorescences in *Bauhinia proboscidea* are two-flowered. Observations made on numerous inflorescences produced by the small tree cultivated at Lankester Botanic Garden indicate that most flowers are staminate, and when hermaphroditic flowers are produced, they are usually the first of the pair to open. Very rarely two hermaphroditic flowers are produced on the same inflorescence.

Pollinators are unknown, but the floral morphology suggests adaptation to either hawk-moths or hummingbirds. Flowers of the related *Bauhinia pansamalana*, which have the same basic morphology, are visited by hummingbirds, according to *Wendt et al.* 3399 (MEXU). *Bauhinia curvula* Bentham in Martius (1870: 194), which has flowers with a similar morphology, is pollinated by hawk-moths in Brazil (Munin *et al.* 2008). As in other species of *Bauhinia*, fruits of *B. proboscidea* are explosively dehiscent, and several herbarium specimens show open fruits with coiled valves.

Etymology:—The specific epithet refers to the prominent staminal tube and the projecting pistil (the latter in hermaphroditic flowers), which together resemble a snout or proboscis of an animal. The recurved fertile stamens of hermaphroditic flowers also bear a superficial resemblance to the tusks of elephants *Loxodonta* spp., order Proboscidea).

Comments:—Although at least two dozen previous Costa Rican herbarium collections of *Bauhinia proboscidea* are known, the earliest dating from 1989, few of them have flowers and these are poorly preserved. During a plant collecting trip to the Osa Peninsula in 2014, a fruiting specimen of this taxon was collected (*P. Juárez* 420). One seed of that specimen was planted and eventually grew; two years later the young plant (vouchered by *Juárez* 1241) started blooming, and provided plenty of flower material for a detailed description. This plant is now in cultivation at Lankester Botanic Garden of the University of Costa Rica.

Bauhinia proboscidea is apparently not rare, judging from the quantity of available herbarium specimens. As in other arborescent species of *Bauhinia*, the vegetative morphology and development of *B. proboscidea* conform to Troll's architectural model (Hallé *et al.* 1978). *Valverde 1060* describes the plant as a 21 m tree, which would make it one of the tallest arborescent *Bauhinia* in Central America; however, we suspect this could be an error, as all other specimens of *B. proboscidea* describe the plant height as 4–12 m. The seedling description is based on the one included with the specimen *Valverde 1060* at US (image available at <https://collections.nmnh.si.edu/search/botany/>).

The “inrastipular spines” of *Bauhinia proboscidea* and those of some other species of *Bauhinia* s.s. are glandular and secrete tiny drops of nectar (van der Pijl 1951, Dubey *et al.* 1990, Rezende *et al.* 1994, *P. Juárez* & M.A. Blanco, personal observation), possibly as a reward for ants that defend the plants against herbivores. Marazzi *et al.* (2012: Fig. 2) documented this phenomenon for *B. macranthera* Bentham ex Hemsley (1880: 49) but confused the structures with stipules. In his detailed review of the morphology of *Bauhinia* s.l., Urban (1885: 82–85) stated that these projections, seemingly unique among seed plants, originate from the axil of the true stipules (which are often caducous), and considered them to be derived from the intrastipular trichomes (colleters) present in other species of the genus. However, González & Marazzi (2018) showed that the corresponding structures (which they call prickles) in *B. forficata* Link (1821: 404) subsp. *pruinosa* (Vogel 1839: 301) Fortunato & Wunderlin (in Fortunato 1986: 550) do not arise from the axils of the stipules (which are occupied by colleters), but arise from each side of the leaf base instead, just below the stipules. Thus, the homology of the “inrastipular spines” of *Bauhinia* remains unsettled. In this regard, it is interesting to note that similar, paired, spinescent projections borne from either side of the petiole base, adjacent to stipules (and often confused with them), occur in some unrelated members of Fabaceae (*e.g.*, *Prosopis juliflora* (Swartz 1788: 85) de Candolle (1825: 447) and most other species of *Prosopis* section *Algarobia* de Candolle (1825: 446), *Robinia pseudoacacia* Linnaeus (1753: 722), *Vachellia seyal* (Delile 1813: 286) Hurter (in Mabberley 2008: 1021); Burkart 1937, Bell & Bryan 2008, Sharma & Kumar 2012), and may represent modified short, leafless shoots produced by accessory, collateral, displaced axillary buds (*sensu* Bell & Bryan 2008; also Burkart 1937).

As in other species of *Bauhinia*, *B. proboscidea* produces both hermaphroditic and staminate flowers (see Wunderlin 1983, Tucker 1988, Torres Colín 1999). *Bauhinia* s.l. shows a variety of floral morphologies and arrangements of stamens and staminodes (Urban 1885, Endress 1994); we provide a floral diagram of *B. proboscidea* (Fig. 1F) for comparison with Figs. 11–19 in Urban (1885). The petals of *B. proboscidea* fall easily if the flower-bearing branch is cut; this probably explains why herbarium collections with complete flowers in good condition are scarce in this species.

Conservation status:—With an EOO of 8,347.21 km², an AOO of 52 km², and known from 11 localities (10 in Costa Rica, one in Panama), of which four are protected areas (three in Costa Rica, one in Panama), our global-level assessment for *Bauhinia proboscidea* shows that this species fits the category of Least Concern (LC) of the IUCN Red List. Our national-level assessment for Costa Rica also places it in the LC category (EOO= 6,075.06 km², AOO= 48 km²).

For Panama, however, the national-level assessment categorizes this species as Endangered [EN B2ab (ii, iii, iv)] because of its restricted AOO (4 km²) and the severe threats facing its only known population. The El Chorogo forest, which extends for ca. 10 km in a narrow strip on the Panamanian side of the Burica Peninsula along the border with Costa Rica, is in an isolated hilly area (150–689 m elevation) and contains the largest forest remnant (ca. 800 ha) of the Pacific slope lowlands in extreme western Panama (Flores *et al.* 2016). This is the only place in Panama where 12 species of birds globally restricted to the South Central American Pacific Slope Endemic Bird Area (BirdLife International 2017) occur; thus, it has been designated a National and Global Important Bird Area (Angehr 2003). It also contains a population of the similarly restricted and globally endangered Red-Backed (or Central American) Squirrel Monkey (Angehr 2003). The only part of this forest under official protection is that within the Audubon-El Chorogo (178 ha) and San Bartolo (105 ha) Private Nature Reserves. The remaining forest is privately owned by various farmers, has no formal protection and is in danger of being deforested for cattle ranching and other agricultural pursuits, or for selective logging.

Additional specimens examined (paratypes):—COSTA RICA. **Cultivated:** [Germinated from seeds of the type collection; cultivated at San Rafael de Heredia, later planted at Lankester Botanic Garden], 1 July 2016, *Juárez 1241* (USJ-spirit). **Puntarenas:** Buenos Aires, Cuenca Térraba-Sierpe, Potrero Grande, La Lucha, alrededores de Rancho Amuo, 1000–1100 m, 9°06' N, 83°06' W, 18 February 2008 (fr.), *Santamaría 6989* (CR, CR-INB, PMA); same locality, 3 November 2010 (sterile), *González et al. 1862* (CR-INB); same locality, 3 November 2010 (sterile), *González et al. 1863* (CR-INB); same locality, 3 November 2010 (sterile), *González et al. 1864* (CR-INB); same locality, 3 November 2010 (sterile), *González et al. 1865* (CR-INB); Bueno Aires, Cuenca Térraba-Sierpe, Potrero Grande, Lodge Monte Amou, La Lucha, Sendero Quiero a 2.5 km de La Lucha, 1100 m, 9°06' N, 83°06' W, 22 February 2000 (fl., fr.), *Aguilar 5989* (CR, CR-INB, MO); Golfito, Dos Brazos de Río Tigre, Jiménez, Cerro Müller, bajando por la fila a los afluentes de Río Niño, 400–744 m, 8°30' N, 83°28' W, 30 August 1990 (fr.), *Herrera & Fallas 4173* (CR, CR-INB, MO); Osa, Parque Nacional Corcovado, Sirena, Los Patos, Mirador Trail, 200–300 m, 8°41'40" N, 83°34'48" W, 26 October 1989 (fl.), *Kernan 1303* (CR-INB, K); Osa, Aguabuena, cuenca superior de la Quebrada El Campo, Rincón, 300 m, 8°42'35" N, 83°31'50" W, 1 October 1990 (fl., fr.), *Herrera 4421* (CR, K, USJ); Osa, Rancho Quemado, Sierpe, siguiendo el camino a Drake, cabeceras de Río Drake, 400 m, 8°41' N, 83°35' W, 18 June 1990 (fr.), *Herrera 4204* (CR, CR-INB, MEXU, USJ); Osa, Reserva Forestal Golfo Dulce, Rancho Quemado centro, 300 m, 8°41'40" N, 83°33'35" W, 15 December 1991 (fr.), *Aguilar 751* (CR, CR-INB, MO); Osa, Sierpe, Agua Buena, bosques al Noreste de la Fundación Neotrópica, 290 m, 8°42'36.31" N, 83°31'21.30" W, 15 September 2013 (sterile), *Jiménez & Juárez 1733* (USJ); Osa, Sierpe, Campo de Aguabuena, Parcela Proyecto BDEF, 95 m, 8°42'11" N, 83°31'05" W, 30 January 2013 (sterile), *Chacón et al. 1613* (USJ); Osa, Palmar Norte, bosque aledaño a la toma de agua potable, faldas de Fila Retinto, 700 m, 08°57'36" N, 83°27'36" W, 13 May 1992 (fl., fr.), *Jiménez 1077* (CR, CR-INB, MEXU, MO, USJ). **San José:** Acosta, cuenca del Pirris-Damas, Fila Ayarales, falda NE, Quebrada Ayarales, camino al Cornelio, 1250–1300 m, 9°43' N, 84°12' W, 13 May 2001 (fl.), *Morales 8050* (CR-INB, K, MO, USJ); Acosta, Fila Bustamante, 3 km NO Hacienda Tiquires, Cerro El Cornelio, faldas Fila Aguabuena, 1300 m, 9°42' N, 84°13' W, 16 December 1994 (sterile), *Jiménez 1699* (CR, CR-INB); Acosta, Fila Bustamante, Tiquires, bosque primario en el camino a Zoncuaco, cerca del paso sobre la quebrada El Ayaral, hasta cerca del cruce, 1100–1250 m, [9°43' N 84°12' W], 4 June 1995 (sterile), *Morales 4343* (CR-INB, MO); Aguirre, Londres, estribaciones de Cerro Nara, 800 m, 9°29'30" N, 84°01'30" W, 13 May 1994 (fr.), *Herrera 7030* (CR); Aserrí, cuenca del Pirris-Damas, Fila Agua Buena, Quebrada Laja, 1100–1200 m, 9°40' N, 84°11' W, 23 January 2003 (fr.), *Morales & Hammel 9060* (CR-INB); Aserrí, cuenca del Pirris-Damas, entre Escuadra y Zoncuano por Hacienda Tiquires, 1000–1500 m, 9°40' N, 84°11' W, 28 June 1995 (fr.), *Hammel 19896* (CR, CR-INB, K, MO); Dota, San Isidro, Zona Protectora Cerros Nara, 900–1000 m, 9°29'40" N, 84°00'50" W, 21 July 1998 (fl., fr.), *Valverde 1060* (CR, US, USJ); Dota, Copey, área no protegida, La Chaqueta, márgenes de Río Savegre, 750 m, 9°29'55" N, 83°54'50" W, 16 May 2002 (fr.), *Estrada & Bustamante 3271* (CR, K, MO, US); Tarrazú, San Lorenzo, área no protegida, Cerro Diamante, 600–900 m, 9°32'40" N, 82°02'30" W [erroneous coordinates; actual approximate coordinates: 9.554985 -84.043280], 9 February 1992 (fr.), *Estrada 2097* (CR); Tarrazú, cuenca del Naranjo y Paquita, 2.5 Sur de Napoles, sobre la carretera de San Marcos de Quepos, 1300 m, 9°35' N, 84°04' W, 17 February 1998 (fl., fr.), *Rodríguez et al. 3039* (CR, CR-INB, MO). PANAMA. **Chiriquí:** Distrito de Barú, Corregimiento de Puerto Armuelles, Reserva Natural Privada Audubon-El Chorogo, 547 m, 8°17'26.4" N, 82°59'52.4" W, 1 April 2016 (fl, fr) *Flores et al. 3835* (PMA, SCZ, UCH); same locality, 1 April 2016 (sterile), *Flores et al. 3836* (PMA, SCZ); Punta Burica, El Chorogo, desde la finca de Fernando Chavarría hacia la trocha en límite fronterizo, altos de la Laguna, Finca Audubon, 16 May 2007 (fr.), *Aranda et al. 3921* (SCZ).

Bauhinia pansamalana Donnell Smith (1888: 27–28). *Casparia pansamalana* (Donn. Sm.) Britton & Rose (1930: 216).

Type:—GUATEMALA. [Alta Verapaz]: River banks of Pansamalá and Sacolol, Pansamalá, [ca. 15°28'26" N, 90°18'40" W], alt. 37–3800 ft, June 1885 (fl., fr.), *H. von Tuerckheim 681* (holotype: US!, isotypes: GH!, K!, NY!, P!, US!).

Distribution and habitat:—*Bauhinia pansamalana* occurs on the Caribbean slopes of southern Mexico (Chiapas, Tabasco and Veracruz states), Guatemala and western Honduras, at elevations of 30–1600 m (see also Standley & Steyermark 1946, Wunderlin 1986, Nelson-Sutherland 2008; Fig. 3). Available specimens consistently describe the habitat as evergreen montane forest (selva alta perennifolia), and occasionally on limestone-based, rocky soils.

Comments:—*Bauhinia pansamalana* and *B. proboscidea* appear to be sister species. *Bauhinia proboscidea* differs from *B. pansamalana* in its shorter petioles (1–2 vs. 3–6 cm, respectively), more elongate leaf blades (length-to-width ratio 2.5–3.3 vs. 1.3–2.8), inflorescences with fewer flowers (1–8 vs. 20–40), longer petals (28–63 vs. 20–25 mm), longer fertile stamen filaments (45–62 vs. 20–25 mm), longer anthers (7 vs. 4–5 mm) and somewhat longer fruits (20–35 vs. 10.7–29 cm). The leaves of *B. pansamalana* are occasionally bifid to markedly bilobed apically (even on the same plant, as in *Pittier 333* US no. 292494), while those of *B. proboscidea* are either entire or only slightly bifid apically. Also, both species are markedly allopatric.

In his unpublished revision of *Bauhinia s.l.* for Mesoamerica, Torres Colín (1999) reported the occurrence of *B. pansamalana* in Costa Rica based on three collections of *B. proboscidea* (*Aguilar 751*, *Herrera & Fallas 4173* [as *Herrera 4173*] and *Herrera 4204*); even his illustration of *B. pansamalana* was based on a collection of *B. proboscidea* (*Herrera 4204*). Because the description of *B. pansamalana* by Torres Colín (1999) represents an amalgamation of both species, the dimensions reported here for both species are taken directly from herbarium specimens or their images.

According to the classification of tribe Cercideae of Wunderlin *et al.* (1987), both *Bauhinia pansamalana* and *B. proboscidea* belong in series *Triandrae* Wunderlin, Larsen & Larsen (1987: 14, characterized by three fertile stamens separated from each other by a staminode) of subgenus *Bauhinia* section *Amaria* (S. Mutis ex Caldas 1810: 25) Endlicher (1840: 1318). More recently, Wunderlin (2006: 97) synonymized series *Triandrae* with series *Remotae* Wunderlin, Larsen & Larsen (1987: 12) of section *Bauhinia*.

Conservation status:—The conservation status of *Bauhinia pansamalana* was previously assessed by Walter & Gillett (1998: 349), who placed it, without an explicit rationale, in the Rare (R) category (based on herbarium records from Guatemala and Mexico only). With an EOO of 43,191.97 km², an AOO of 40 km², and known from at least 15 localities (10 in Mexico, four in Guatemala, one in Honduras), of which at least two are protected areas (Reserva de la Biosfera Montes Azules in Chiapas, Mexico, and Parque Nacional Cerro Azul, Honduras), our global-level assessment places this species in the Not Threatened (NT) category.

Our national-level assessment for Mexico places *Bauhinia pansamalana* in the Least Concern (LC) category (EOO= 23,643.92 km², AOO= 28 km²), also considering its occurrence in one protected area. Our national-level assessment for Guatemala places this species in the Endangered (EN B2ab (ii, iii, iv)) category (AOO= 8 km²); however, we had only two collections with inferred geographical coordinates (we were unable to infer with certainty the precise locality and corresponding geographical coordinates of four other herbarium collections), which made it impossible to calculate the EOO and likely underestimated the AOO. *Bauhinia pansamalana* has not been collected in any protected area in Guatemala. Finally, our national-level assessment for Honduras places this species in the Vulnerable [VU B2ab (ii, iii, iv)] category (AOO= 4 km²), considering its occurrence in a protected area.

Additional specimens examined:—GUATEMALA. **Alta Verapaz:** Between Sepacuité and Secoyocté, 1100 m, [ca. 15°25'59" N, 89°45'07" W], 24 May 1905 (fl., fr.), *Pittier 333* (MO, US [2 sheets]); Near Chirriacté, on the Petén highway, 900 m, 9 April 1941 (fl.?), *Standley 91659* (US); Near the finca Sepacuite, April 1902 (fl., fr.), *Cook & Greggs 581* (US [2 sheets]); Pansamalá, alt. 2800 pp, April 1889 (fl., fr.), *Donnell Smith 1631* (PH, US [2 sheets]). **Izabal:** Along Río Bonita, 30–150 m, 21 December 1941 (st.), *Steyermark 41738* (AAH). HONDURAS. **Copán:** La Meseta, Lado Sur de la montaña alrededor de la meseta, 12 km al Noroeste de Florida, Parque Nacional Cerro Azul, 1600 m, 15°06'N, 88°55'W, 9 February 1992, *Mejía & Hawkins 32* (EAP, MO). MEXICO. **Chiapas:** Finca Irlanda, June 1914 (fl.?), *Purpus 7302* (GH [2 sheets, as "7203"], US) Municipio Berriozábal, La Pera, 1200 m, 16°52'01.5"N, 93°19'39.7"W, no date (fl., fr.), *Ortiz Rodríguez 051* (MEXU); Loc. 25 km al E de las Lagunas de Monte Bello, 1 March 1982 (fr.), *Cabrera et al. 1826* (MEXU [2 sheets]); Loc. 9.6 km al E de Lago Tziscaco y 25 km al E de lagunas de Montebello, 1140 m, 19 February 1983, *Torres et al. 2324* (GH, MEXU, MO); Municipio Ocosingo, alrededor del ex-poblado del Charrial, 800 m, 3 December 1976 (fl., fr.), *Valdivia 2404* (MEXU); Municipio Ocosingo, Naha, Selva Lacandona, 900 m, 16°56'N, 91°33'W, 30 December 1994 (fl.), *Durán 260* (MEXU); Municipio Ocosingo, zona de

trabajaderos del viejo poblado Charical, aprox. 10 km desde el puente de Nueva Palestina, Com. Lacandona, 800–500 m, 16°20'N, 91°15'W, 8 April 2000 (fr.), *Paladino & Sánchez 425* (MEXU [2 sheets]); Municipio Ocosingo, Reserva de la Biosfera Montes Azules, callejón de mejoramiento de la zona de trabajaderos del viejo poblado de San Pablo, Nueva Palestina, Comunidad Lacandona, 700 m, 16°50'N, 91°15'W, 2 October 2000 (fr.), *Paladino & Sánchez 463* (MEXU); Municipio La Trinitaria, 15 km east northeast of Dos Lagos above Santa Elena, 1000 m, [ca. 16°05'70" N, 90°28'07" W], 29 December 1981 (fr.), *Breedlove 56556* (MEXU [2 sheets], MO). **Tabasco:** San José Puyacatengo, a orillas del arroyo Ogoiba a 3 km a la der. del CRUSE-UACH, 60 m, 17°33'N, 92°57'W, June 1996 (fl.), *Guadarrama s.n.* (MEXU no. 1325866). **Veracruz:** Municipio Hidalgotit, Río Soloxóxhil entre Hnos. Cedillo y La Escuadra, 150 m, 17°17'N, 94°38'W, 3 April 1974 (fl., fr.), *Vásquez et al. V-338* (MEXU); Municipio Minatitlán, lomas al S del Poblado 11, ± 27 km al E de La Laguna, 200 m, 17°14'N, 94°17'30"W, 3 June 1981 (fl.), *Wendt et al. 3399* (MEXU).

Bauhinia beguinotii Cufodontis (1933: 192).

Type:—COSTA RICA. [Limón]: In regione Atlantica, “Waldeck”, 28 milia a Puerto Limon, ad silvarum margines versus Río Barbilla, [10°06'N, 83°23'W], 40 m, 12 May 1930 (fl.), *Cufodontis 664* (holotype: W! [photos F!, MEXU!, MO!]).

Distribution and habitat:—*Bauhinia beguinotii* occurs on the Caribbean slope of Costa Rica and Panama, at elevations of 50–700 m (Fig. 3). See additional comments below. Available specimens describe the habitat as primary and secondary tropical wet forest, frequently in the understory.

Comments:—In herbaria, *Bauhinia proboscidea* has often been confused with *B. beguinotii* because of its arborescent habit, shortly petiolate, entire to apically bifid leaves of similar shape and occurrence in both Costa Rica and Panama. However, *B. proboscidea* can be distinguished from *B. beguinotii* by its more elongate leaf blades (length-to-width ratio 2.5–3.3 vs. 1.5–2.3), the inner pair of leaf blade nerves more or less equidistant between those of the outer pair and the midrib (vs. much closer to the midrib), linear (vs. oblanceolate) petals, 3 (vs. 10) fertile stamens and longer fruits (20–35 vs. 12–18 cm). Zamora (2010) mentioned the number of leaf blade nerves as a distinguishing character between *B. beguinotii* and *B. proboscidea* (as “*Bauhinia* sp. B”; 7 vs. 5, respectively), but an exhaustive examination of herbarium specimens shows that this is not a reliable difference. Also, while *B. proboscidea* occurs on the Pacific slope of central Costa Rica and extreme western Panama at 200–1300 m, *B. beguinotii* is naturally distributed on the Caribbean slope of Costa Rica to central Panama at 50–700 m (Fig. 3). Thus, although occurring in the same two countries, both species are allopatric. Because of misidentified specimens of *B. proboscidea* and *B. gorgonae*, some studies based on determinations mined from herbarium databases have erroneously reported the occurrence of *B. beguinotii* on the Pacific slope of Costa Rica and/or Panama, and also in Colombia and/or Venezuela (e.g., Contu 2012, Cornejo *et al.* 2012, Ulloa Ulloa *et al.* 2017; see further comments in the following paragraphs and under *B. gorgonae* below).

A sterile specimen from 800–1300 m in Darien Province in Panama, identified as *Bauhinia beguinotii* (Gentry & Mori 13607, MO), has exceedingly long petioles (3.5–7 vs. 1.5–3.5 cm, the range otherwise known from the species even in the juvenile condition) and long-acuminate to caudate apices of the leaf lobes (up to 4 cm long, a condition never seen in *B. beguinotii*; see below). It is apparent that this specimen is misidentified. Another specimen misidentified as *B. beguinotii* from Cerro Obu in the Panamanian province of San Blas (*de Nevers et al.* 8099, MO), described as having white petals but lacking any flowers on the sheet, has large, deeply divided leaf blades with a ferruginous abaxial surface (a condition never present in that species, see below).

Bauhinia beguinotii has been erroneously reported from Colombia (Ruiz *et al.* 2016, Ulloa Ulloa *et al.* 2017) based both on misidentified specimens of *Schnella* (*Forero 1499*, *Romero 10081* and *Romero 10087*, all at COL, and *Gentry & Cuadros 63779*, MO, which are lianescent and have visible tendrils), and on *B. gorgonae*; see comments under that species below).

The collection *Kriebel 1613* indicates that the white flowers of *Bauhinia beguinotii* stay open at night.

Conservation status:—Contu (2012) provided a Red List conservation assessment of *Bauhinia beguinotii* according to the methods and criteria of the IUCN Species Survival Commission (2012), resulting in the placement of this species in the Least Concern (LC) category. However, Contu cited, as sites of occurrence of *B. beguinotii*, several protected areas on the Pacific slope of Costa Rica where *B. proboscidea* is known to occur (Reserva Forestal Golfo Dulce, Parque Nacional Corcovado–Estación Sirena and Parque Nacional Barbilla; see specimens cited for that species), and others in Colombia (Isla Gorgona and Paramillo National Park on the mainland; localities for *B. gorgonae* and for *Gentry & Cuadros 63779* [*Schnella* sp., cited above], respectively). Contu (2012) also listed the upper elevation limit of *B. beguinotii* as 1300 m, which agrees with the corresponding value for *B. proboscidea* but not for that of *B. beguinotii* (700 m). This, together with *B. beguinotii* (as circumscribed here) being confined to the

Caribbean slope of Costa Rica and Panama, shows that Contu (2012) included specimens of *B. gorgonae* and also misidentified specimens of both *B. proboscidea* and of the genus *Schnella* in her calculation of the EOO and AOO for *B. beguinotii*, possibly underestimating the extinction risk of the latter.

With an EOO of 45,152.88 km², an AOO of 56 km², and known from nine localities (seven in Costa Rica, two in Panama), our global-level assessment for *Bauhinia beguinotii* shows that this species fits the category of Endangered (EN). However, because of its presence in at least four protected areas (three in Costa Rica, one in Panama), it can be safely placed in the LC category. Thus, even when the EOO calculated by us with curated data is much smaller than that calculated by Contu (2012, 270,000 km²), this species maintains the same Red List category.

Our national-level assessment for Costa Rica also places *Bauhinia beguinotii* in the LC category (EOO= 7,217.66 km², AOO= 32 km²). For Panama, our national-level assessment places this species in the Vulnerable category (VU B1ab(ii,ii,iv)+2ab(ii,iii,iv), EOO= 3,263.06 km², AOO= 24 km²).

Additional specimens examined:—COSTA RICA. **Alajuela:** San Ramón, distrito Peñas Blancas, Reserva Biológica Soltis Center, sendero a la catarata, 500 m, 10°23'14" N, 83°37'19" W, 29 August 2016 (fl., fr.), *Cedeño-Fonseca et al. 935* (USJ [2 sheets]); Upala, Volcán Tenorio, Pilón, [ca. 10°40'N 85°01'W], 19 November 1987 (sterile), *Sánchez & Poveda 1285* (CR, MO); Upala, área no protegida, cuenca del Zapote, entrada la Carmela a salir a la estación, 600–700 m, 10°43'15" N, 84°59'45" W, 19 May 2004 (fl.), *Kriebel 4629* (CR, CR-INB, K, MO); Upala, Bijagua, El Pilón, Cabeceras del Río Celeste, 700 m, 10°49' N, 84°27' W, 14 November 1987 (fl., fr.), *Herrera 1275* (CR, F, MO [2 sheets]). **Cartago:** Turrialba, R.B. Barbilla, cuenca del Matina, sendero que lleva al Río Danta, 500 m, 9°58'24" N, 83°27'02" W, 16 July 1998 (fr.), *Rodríguez & Vargas 3822* (CR, CR-INB); Turrialba, P.N. Barbilla, cuenca del Matina, márgen Sur del Río Danta, 400 m, 9°58'19" N, 83°27'39" W, 16 May 2001 (fl.), *Acosta et al. 3078* (CR, CR-INB, K, MO, USJ). **Heredia:** Sarapiquí, Rara Avis, ca. 15 km al suroeste de Horquetas, sendero Atajo, 700 m, 10°17' N, 84°02' W, 24 June 1989 (fl., fr.), *Vargas 1* (CR, CR-INB, MO [2 sheets], USJ); Sarapiquí, Rara Avis, ca. 15 km al suroeste de Horquetas, siguiendo los caminos Real y Atajo, hasta la Catarata Grande, en su base, 400 m, 10°17' N, 84°02' W, 10 October 1989 (fr.), *Vargas 213* (CR, CR-INB, MEXU, USJ); Sarapiquí, Rara Avis, ca. 15 km al suroeste de Horquetas, 400–600 m, 10°17' N, 84°02' W, 23 November 1989 (fr.), *Vargas 321* (CR, CR-INB, MEXU, MO); Sarapiquí, Horquetas, El Plástico, sendero El Tigre y Atajo, 700 m, 10°17'03" N, 84°02'47" W, 11 January 1994 (fl., fr.), *Vargas et al. 1668* (CR, K, MO, USJ). **Limón:** Drenaje de Río Valle Estrella, Montana de Andromeda, [ca. 9°40'N 83°02'W], 150 m, 26–28 October 1951 (sterile?), *Shank & Molina 4466* (EAP, US); Pococí, área no protegida, cuenca Tortuguero-Sierpe, Estación Biológica La Suerte, Primavera, 100 m, 10°26'30" N, 83°47'20" W, 2 November 2002 (fl.), *Kriebel 1613* (CR, CR-INB, MO); Pococí, Llanura de Santa Clara, Finca La Suerte, 50 m, 10°26'30" N, 83°47'20" W, 8 July 1995 (fr.), *Aguilar et al. 4163* (CR, CR-INB, MEXU, MO). PANAMÁ. **Bocas del Toro:** Al N.O. del campamento Changuinola 1 de Corriente Grande, Cerro Bracha, [ca. 9°17'58" N, 82°32'04" W], 18 January 1980 (fl.), *Correa et al. 3227* (PMA, USF); Al SE y NE del campamento Changuinola 1 del IRHE, 19 January 1980 (fl., fr.), *Correa et al. 3316* (PMA, USF). **Panama:** Ca. 10 km N of Pan American Highway on El Llano-Carti Road, 500 m, 12 December 1973 (st.), *Gentry et al. 8881* (MO); Cartí Rd., 7 ml from turnoff at El Llano, 320 m, 9°15' N, 78°58' W, 16–17 April 1985 (fl.), *Hammel 13547* (MO, USF); El Llano-Carti Road, 10–12 km from junction with Inter-American Hwy, 410 m, 30 October 1974 (fl.), *Mori & Kallunki 2847* (MO); El-Llano-Carti-Tupile road, 16 km N of Pan-Am Highway at El Llano, 400–500 m, 16 January 1974 (fl.), *Nee & Dressler 9362* (MO [2 sheets]); Panama/San Blas, El Llano-Cartí road, 300–400 m, 9°20' N, 79°00' W, 28 August 1982 (fr.), *Hamilton & Stockwell 1089* (MO, USF); Road from El Llano to Carti, 14.8 km N of the Panamerican Highway, 300–500 m, 3 September 1977 (fl.), *Folsom & Maas 5202* (MO). **San Blas** [now Guna Yala]: El Llano to Carti road, near Nusgandi, along Sendero Nusgandi, west of buildings, 250–300 m, 9°15' N, 79°00' W, 16 June 1987 (fl.), *McPherson 11033* (MEXU, MO [2 sheets], USF); El Llano-Carti road, near Nusagandi, along sendero Nusagandi, ca. 11 road-miles from Pan-American Highway, 300 m, 9°15' N, 79°00' W, 12 July 1988 (fl., fr.), *McPherson 12734A* (MO); El Llano-Carti Road, km 19.1, 350 m, 9°19' N, 78°55' W, 11 March 1986 (fr.), *de Nevers et al. 7326* (MO); El Llano-Carti Road, 19.1 km from Interamerican Hwy, 350 m, 9°19' N, 78°55' W, 5 March 1985 (fl., fr.), *de Nevers et al. 4957* (MEXU, MO, PMA, USF); El-Llano-Carti Rd. Km 19.1, 350 m, 9°19' N, 78°55' W, 1 July 1985 (fl., fr.), *de Nevers 5946* (MEXU, MO, PMA, USF); Nusagandi, along continental divide on El Llano-Carti Road, headwaters of Atlantic draining creeks, 320 m, 9°19' N, 78°15' W, 12 August 1984 (fl.), *de Nevers & Pérez 3701* (MO, PMA, USF); Nusagandi, along the continental divide on the El Llano-Carti Road, 350 m, 9°19' N, 78°15' W, 30 July 1984 (fl.), *de Nevers & Pérez 3582* (MO, USF); Nusgandi ridge running NW from Punta Mamá, 300–350 m, 9°19' N, 78°15' W, 13 August 1984 (fl., fr.), *de Nevers et al. 3728* (MEXU, MO [2 sheets], USF [2 sheets]); Pemasky, sendero Nusagandi, Km 18 de la carretera Llano-Carti, 350 m, 9°20' N, 78°58' W, 4 July 1994 (fl., fr.), *Galdames et al. 1306* (CR-INB, PMA, SCZ); Trail along continental divide, 400 m, 9°20' N, 78°56' W, 23 July 1986 (fl.), *McDonagh et al. 287* (MO).

Bauhinia gorgonae Killip ex R.S. Cowan (1961: 281–282, f. 2c–d). *Bauhinia beguinotii* var. *gorgonae* (Killip ex R.S. Cowan) Wunderlin (1973: 570).

Type:—COLOMBIA. Nariño [actually Valle del Cauca]: dense forest along stream, east side of Isla Gorgona, 50–100 m, 11 February 1939 (fl.), Killip & Garcia-Barriga 33170 (holotype: US!; isotypes: BC!, BM!, COL!, US!).

Distribution and habitat:—*Bauhinia gorgonae* is endemic to Gorgona Island (Isla Gorgona) of the Department of Nariño, Colombia, located 35 km off the Colombian Pacific coast (Fig. 3). The few available herbarium specimens indicate elevations of 50–305 m (the highest point in the island reaches 338 m). The island is covered by tropical wet forest without a dry season, with an average annual precipitation of 6891 mm. See additional comments below.

Comments:—*Bauhinia gorgonae* has been considered as a variety of *B. beguinotii* (*B. beguinotii* var. *gorgonae* Wunderlin 1973; see also Wunderlin 1976, 1983, 1986, Quiñones 2005, Castellanos & Lewis 2012). However, the leaves of *B. gorgonae* are consistently divided for more than one third of their length, sometimes even completely divided in two separate leaflets, while leaves in *B. beguinotii* are entire or only slightly bifid apically (sinus less than one sixth the length of the leaf blade). The flowers of both species are very similar; however, five of the ten stamens of *B. beguinotii* (the shorter ones) are connate for ca. three fourths of their length, forming a prominent “staminate ligule” (Wunderlin 1983, Fig. 1E in Torres Colín 1999), but in *B. gorgonae* the shorter stamens appear to be connate for less than a fourth of their length (Fig. 2d in Cowan 1961). The fruits of *B. gorgonae* have not been documented.

Wunderlin (1976, 1983, 1986) stated that *B. gorgonae* and *B. beguinotii* are distinguished only in the degree of leaf lobing, and that further work would likely demonstrate the intraspecific variability of this character. We agree that the degree of leaf lobing is variable in many species of *Bauhinia s.l.* (especially in lianescent *Schnella*, even in the same plant); however, the available herbarium specimens and our own observations in the field and from cultivated plants indicate that the leaf shape of *B. beguinotii* in Costa Rica and Panama described above is fairly constant, and that markedly divided leaves are never produced in any developmental stage in this species.

Given the consistent difference in leaf shape, the apparent difference in the degree of connation of the shorter stamens, and their allopatric distribution (with resulting reproductive isolation), we consider *B. gorgonae* and *B. beguinotii* as different species.

Two sterile specimens from Gorgona Island, misidentified as *B. gorgonae* (Fernández Alonso 7393 and Lozano 5189, both at COL), are lianescent and represent species of *Schnella*.

Bauhinia beguinotii var. *gorgonae* was reported for Venezuela by Stergios *et al.* (2008), unvouchered and as with “unknown geographical distribution”. This erroneous report is likely based on the original description of *B. gorgonae* in a Venezuelan journal (Cowan 1961), even when the protologue only cited specimens from Isla Gorgona in Colombia. This also led to the erroneous report of *B. beguinotii* from Venezuela by Ulloa Ulloa *et al.* (2017).

According to the classification of tribe Cercideae of Wunderlin *et al.* (1987), both *Bauhinia beguinotii* and *B. gorgonae* belong in series *Decandrae* Wunderlin, Larsen & Larsen (1987: 14, characterized by 10 fertile stamens), of subgenus *Bauhinia* section *Amaria*.

Conservation status:—Because of its restricted AOO (estimated at 4 km²), *Bauhinia gorgonae* fits in the category of Endangered [EN B2ab (ii, iv)]. For this placement we have taken into account that the only known locality where this species occurs is currently a protected area, the Gorgona Island Natural National Park of Colombia. We used the same inferred geographical coordinates for all four available collections (indicated for *St. George Exped. 360*, below).

Additional specimens examined:—COLOMBIA. **Valle del Cauca:** Gorgona Island, 800 ft, [2°58'06" N, 78°11'04" W], 7 July 1924 (fl.), *St. George Exped. 360* (Kelsall s.n.) (US); Gorgona Island, 1000 ft, 10 July 1924 (fl.), *St. George Exped. 380* (Cheeseman s.n.) (US); Gorgona Island, sea level, 20 October 1924 (fl.), *St. George Exped. 628* (Collenette s.n.) (K, US).

Notes on the Neotropical triandrous species of *Bauhinia*:—Including the species described here, only four Neotropical species of *Bauhinia* with three fertile stamens are known. *Bauhinia proboscidea* and *B. pansamalana* are quite similar and differ mostly in their leaf proportions and the dimensions of their reproductive characters (Table 1). The other triandrous neotropical *Bauhinia* species are: *B. coulteri* Macbride (1919: 59), a species of open oak-pine, juniper, or deciduous forest of central Mexico with shortly bilobate leaves, pink (rarely white), sessile, narrowly elliptic petals, and 2–10-flowered racemose inflorescences, and *B. pinheiroi* Wunderlin (1987: 62), a rare species found exclusively in eastern Atlantic Brazilian coastal forest (Vaz *et al.* 2010) with divaricate bilobed leaves, yellowish-white, shortly clawed petals, and 24–30-flowered racemose or paniculate inflorescences. These species are related to *B. pansamalana* (and *B. proboscidea*) because of their three fertile stamens and their pollen morphology (Torres Colín 1999). According to Wunderlin *et al.*'s (1987) classification, modified by Wunderlin (2006), *B. pansamalana*, *B.*

pinheiroi and *B. proboscidea* belong in *Bauhinia* series *Remotae*, but *B. coulteri* belongs in its own monotypic section *Coulterae* Wunderlin, Larsen & Larsen (1987: 12), also of section *Bauhinia*. A key to the triandrous Neotropical *Bauhinia* species is provided below.

TABLE 1. Comparison between *Bauhinia pansamalana* and *B. proboscidea*.

Character	<i>B. pansamalana</i>	<i>B. proboscidea</i>
Petioles	3–6 cm long	1–2 cm long
Inflorescence	20–40 flowered	1–2(–8) flowered
Petals	Narrowly elliptic, 20–25 mm long	Linear, 28–63 mm long
Stamen filaments	20–25 mm long	50–55 mm long
Anthers	4–5 mm long	7 mm long
Gynoecium	20–25 mm long	50–55 mm long
Fruit	10.7–29 cm long	20–35 cm long
Distribution	Caribbean slope of southern Mexico, Guatemala and western Honduras	Pacific slope of central and southern Costa Rica and extreme western Panama

Key to the Neotropical species of *Bauhinia* with three fertile stamens

1. Leaves blades entire, sometimes apically bifid (sinus < ¼ of the blade length)2
- Leaves blades bilobed (sinus > ¼ of the blade length).....3
2. Inflorescences 1–8-flowered; petals narrowly linear; inhabiting evergreen forest of the Pacific slope of Costa Rica and extreme western Panama*B. proboscidea*
- Inflorescences 20–40-flowered; petals narrowly elliptic; inhabiting evergreen or deciduous forests of the Caribbean slope of southern Mexico, Guatemala and western Honduras*B. pansamalana*
3. Leaf blades divided for one half to two thirds of their length; from Brazil*B. pinheiroi*
- Leaf blades divided for less than one third of their length; from Mexico, Guatemala and/or Honduras4
4. Leaf lobes apically rounded; petals sessile, white to pink; inhabiting open oak-pine, juniper, or deciduous forest of central Mexico*B. coulteri*
- Leaf lobes acuminate; petals shortly clawed, white; inhabiting moist deciduous or tropical rainforest of southern Mexico, Guatemala and western Honduras*B. pansamalana*

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Please note that the phrase on page 25 (Abstract) and on page 33 (Conservation status):

Not Threatened (NT)

Should read:

Near Threatened (NT)

Please note that the phrase on page 25 (Resumen):

No Amenazada (NT)

Should read:

Casi Amenazada (NT)