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A new species of *Gymnanthes* (*Euphorbiaceae*) from northeastern Brazil

Abstract

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Gymnanthes boticario, a new species of *Gymnanthes* sensu lato (formerly *Sebastiania* sect. *Adenogyne*), is described from the caatinga forests of northeastern Brazil. A key to the pubescent-fruited species of *Gymnanthes* sensu lato and related taxa is provided.

Resumo

Gymnanthes boticario, uma nova espécie de *Gymnanthes* sensu lato (anteriormente *Sebastiania* sect. *Adenogyne*), é descrita para áreas de caatinga do Nordeste do Brasil. Uma chave para determinação de espécies de *Gymnanthes* com frutos pubescentes e generos relacionados é fornecida.

Additional key words: *Hippomaneae*, *Gymnanthes boticario*, *Sebastiania*, Neotropics, caatinga, dry forests

During floristic and taxonomic studies in the dry forests of northeastern Brazil, the authors discovered a new species of *Euphorbiaceae* of the tribe *Hippomaneae* A. Juss ex Bartl.

The last complete monograph of the *Hippomaneae* was published by Pax & Hoffmann (1912), who accepted *Gymnanthes* Sw. with 11 Neotropical species, defined primarily by characters of the staminate flowers (reduced sepals and enlarged number of stamens). In the classification of Pax & Hoffmann, the new species described here falls within *Sebastiania* Spreng. sect. *Adenogyne* (Klotzsch) Benth. However, Esser (2001) restricted *Sebastiania* to the typical section of the genus (sect. *Sebastiania*) and suggested that sect. *Adenogyne* was better placed in *Gymnanthes*.

Gymnanthes boticario Esser, M. F. A. Lucena & M. Alves, **sp. nov.**

Holotype: Brazil, Piauí, Mun. Coronel José Dias, Parque Nacional Serra da Capivara, 8°45'51.2"S, 42°2'20.9"W, c. 546 m, 24.4.2007, fl., fr., M. F. A. Lucena & E. Silva 1696 (UFP; isotypes: K, M, MO, SP). – Fig. 1.

Ab speciebus aliis *Gymnanthis* ramulis non spinescens, petiolis et pedicellis brevissimis, foliis saepe distincte dentatis, foliis et fructibus distincte pilosis distinguenda.

Shrub to c. 4 m tall, without obvious latex, much branched; *twigs* pubescent, slowly glabrescent, not spiny; *cataphylls* usually 2 with each bud, stiff; sometimes

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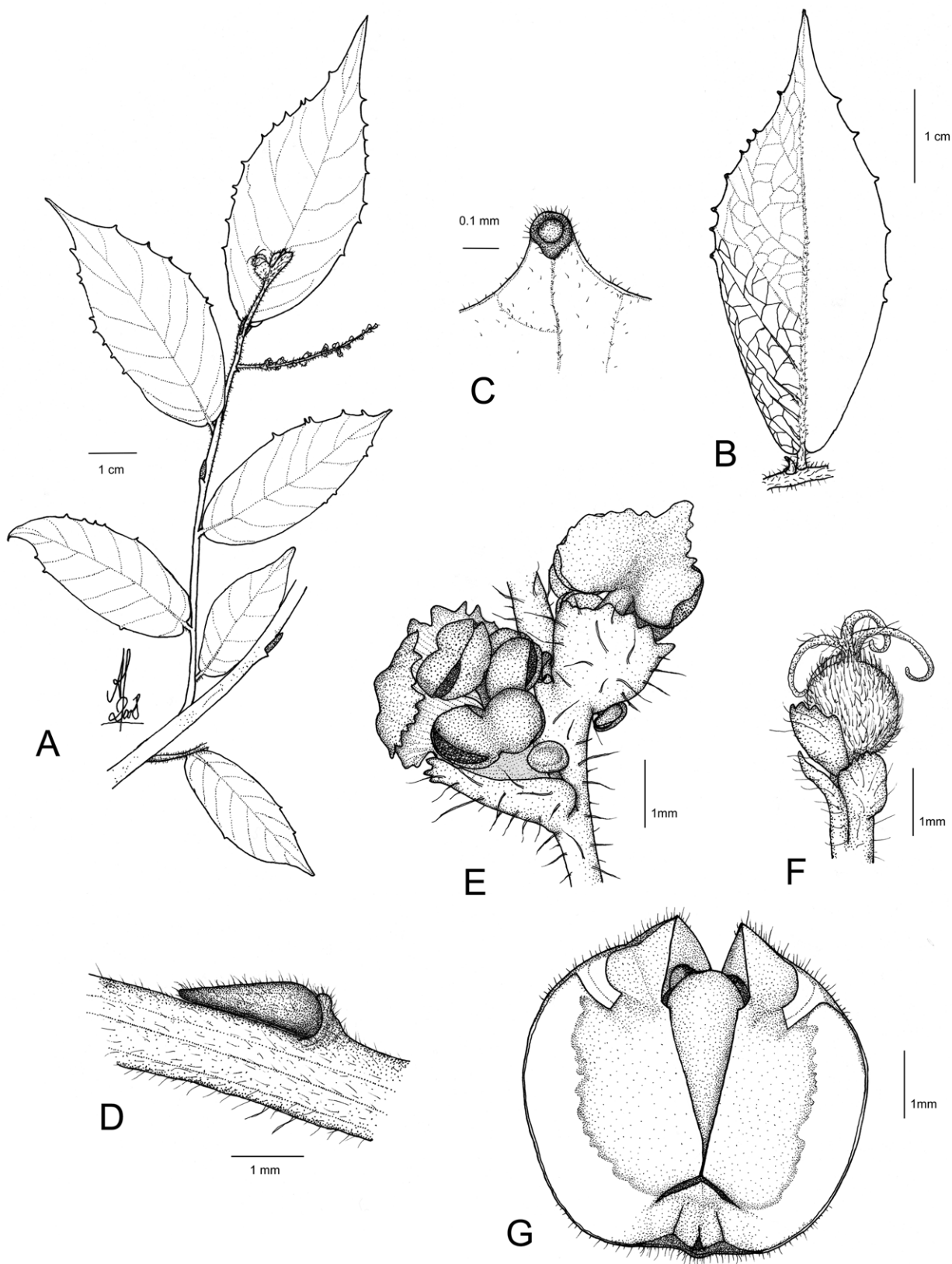


Fig. 1. *Gymnanthes boticario* – A: flowering branch with leaves; B: leaf with details of venation; C: detail of leaf margin, abaxial view, with marginal gland; D: leaf bud with cataphyll; E: detail of staminate part of inflorescence; F: pistillate flower; G: fruit, ventral view of a mericarp. – A–C = based on *Lemos 289* (K); D, G = based on isotype (M); E, F = based on *Lucena 1679* (M).

flowering when leafless. *Indumentum* of simple, erect, multicellular, pale brown hairs c. 0.1–0.2 mm long. *Stipules* c. 1.5×0.2 mm, linear, pubescent, glandular, caducous. *Leaves* alternate (rarely subopposite); *petiole* very short, 1–1.5 mm long, pubescent; *blade* elliptic (rarely slightly ovate or obovate), 4–6×2–4 cm, membranaceous to chartaceous, the base rounded to obtuse with the very base slightly cordate, the margin entire to distinctly dentate in the median or distal part, the apex acute to acuminate to rarely obtuse, the adaxial and abaxial base eglandular, without laminar glands but with distinct marginal glands c. 0.3–0.4 mm diam. on the marginal teeth, the abaxial surface brighter but not glaucous, the adaxial and abaxial midvein pubescent, often also the side veins, sometimes both surfaces wholly pubescent, lateral veins 8–10 pairs, eucamptodromous, tertiary veins loosely percurrent, smaller veinlets reticulate, distinctly visible abaxially. *Inflorescences* unbranched sessile thyrses, on short lateral and often leafy shoots, with staminate and pistillate flowers on the same plant, but sometimes separated (monoecious and probably dichogamous). *Staminate inflorescences* 1.5–2.5 cm long, 2–3 mm diam., the axes pubescent; *bracts* c. 0.4 mm long, pubescent, the margins slightly sinuous, with a basal pair of very small stipitate glands c. 0.1 mm diam. each; *bracteoles* not seen; *flowers* 1 or 3 per bract, glabrous; *pedicel* c. 0.4 mm long; *calyx* 0.4–0.6 mm diam., mostly fused, somewhat erose; *stamens* 3, free, the filaments c. 0.1 mm long, the anthers basifixed, c. 0.25 mm long. *Pistillate flowers* often solitary or 2; *pedicel* c. 0.5 mm long, pubescent; *sepals* 3, c. 0.7×0.3 mm, broadly ovate-oblong, somewhat erose, glabrous or with very few hairs outside; *ovary* c. 1 mm long, smooth, densely tomentose, with 3 carpels; *style* absent, stigmas three, c. 2 mm long, thin, stigmatic surface smooth. *Fruits* with pedicel c. 2.5 mm long, subglabrous; *capsule* 5–5.5×5 mm, globose and not sulcate, smooth and without appendages, with scattered hairs, with regular septicial dehiscence; pericarp dry, woody, c. 0.5 mm thick; septa persistent, with a single apical vascular strand; remaining columella 3-ate, persistent. *Seeds* 3 per fruit, ovoid, c. 3.5×2.5 mm, smooth, dry, grey-brown/dark brown mottled, ecarunculate.

Ecology. — The species was found in dense caatinga forests, on sandy soils and latosols at 400–900 m elevation. Caatinga is a vegetation of semi-arid forests in northeastern Brazil; it is highly endangered due to urbanisation and conversion to agriculture and has a high priority for conservation. This new species was collected in slightly more mesophytic forest patches within the caatinga. The plants show few xeromorphic adaptations, such as leaf loss, the presence of stiff cataphylls, a dense indumentum and notably short pedicels rendering the flowers less exposed than in other members of this genus.

Etymology. — The species is named for the Fundação O Boticário de Proteção à Natureza, which is active in supporting several environmental projects in Brazil and which also funded this research on the *Euphorbiaceae* from this semi-arid region in Brazil.

Additional specimens examined. — BRAZIL: BAHIA: Abaíra, Mendonça de Daniel Abreu, 13°16'S, 41°50'W, 12.1.1994, fr., *Ganev 2811* (SP); Delfino, Estrada Delfino–Mimoso de Minas, 20 km de Delfino, 10°29'31"S, 41°20'35"W, 8.3.1997, fl., *Giulietti & al. PCD 6127* (SP); *ibid.*, 8.3.1997, fr., *Harley & al. PCD 6123* (SP); Caetité, São Francisco caminho para Lagoa Real, 13°59'35"S, 42°12'27"W, 8.2.1997, fr., *Saar & al. PCD 5245* (SP, HUEFS); Oeste, Formosa do Rio Preto, Fazenda Santa Luzia, 25.2.2005, fl., *Xavier & Guedes 330* (ALCB). — CEARÁ: Reserva Biológica Serra de Aiuaaba, 25.1.2005, fl., *Lemos & Matias 289* (K, UVA); Crateús, Serra das Almas, 6.4.2001, fr., *Sobrinho 8* (UFRN). — PERNAMBUCO: Mirandiba, área do Projeto Chico Torres, Fazenda Areias, 8°08'30"S, 38°43'10"W, 31.5.2006, fr., *Lucena & al. 1461* (CEPEC, M, UFP); Mirandiba, Serrotonho, 8°07'39.6"S, 38°42'29.1"W, 9.2.2007, fl., *Lucena & al. 1679* (K, M, NY, UFP). — PIAUÍ: Coronel José Dias, PARNA Serra da Capivara, 9°13'13.9"S, 43°29'6.7"W, 24.4. 2007, fl., *Lucena & Silva 1693* (K, M, NY, UFP). — RIO GRANDE DO NORTE: Mata Redonda, Coronel João Pessoa, 6°16'00"S, 38°23'00"W, 19.7.1991, fr., *Figueiredo & al. 396* (MOSS); *ibid.*, 26.3.1981, immat. fr., *Oliveira & al. 1881* (MOSS); Cerro Corá, próximo à Fazenda Pitumba, 6°08'15"S, 36°21'30"W, 24.3.1981, fr., *Oliveira & al. 1785* (MOSS).

Notes on *Gymnanthes sensu lato*

Pax & Hoffmann (1912) treated the genus *Adenogyne* Klotzsch as a section within *Sebastiania*, primarily on the basis of the staminate flowers with a well developed calyx and the number of stamens (3). Three stamens, however, are found in several other genera of the *Hippomaneae* as described by Pax & Hoffmann (1912), including *Conosapium* Müll. Arg., *Excoecaria* L. and *Grimmeodendron* Urb. *Gymnanthes sensu stricto*, however, is characterised by staminate flowers with reduced sepals and an enlarged stamen number. Character states of the staminate flowers may be apomorphic for these species of *Gymnanthes* and in our opinion the stamen number is insufficient for the circumscription of *Sebastiania*. Except for the staminate flowers, *Adenogyne* and *Gymnanthes* are hardly distinguishable. In addition, species of *Adenogyne* have pedicellate flowers with fused sepals (vs. sessile flowers with free sepals in *Sebastiania*) and fruits with a thicker pericarp (vs. thin in *Sebastiania*). Fruits with a thinner pericarp are often distorted on herbarium specimens, which is never seen in *Gymnanthes*. On the basis of these observations, summarised here in Table 1, Esser (1999, 2001) restricted *Sebastiania* to the type section, but has not yet transferred any species of section *Adenogyne* to *Gymnanthes*.

Table 1. Comparison of characters of *Adenogyne*, *Gymnanthes* s.str. and *Sebastiania*.

	<i>Gymnanthes</i> s.l.		
	<i>Adenogyne</i>	<i>Gymnanthes</i> s.str.	<i>Sebastiania</i>
Indumentum	absent or present	absent or present	absent
Staminate flowers	subsessile to pedicellate	pedicellate	(sub)sessile
Sepals of staminate flowers	well developed, fused	much reduced to absent	well developed, free to nearly free
Stamen number	3	3–12	3
Thickness of fruit wall	¹ / ₁₀ of fruit length	¹ / ₁₀ of fruit length	< ¹ / ₁₀ of fruit length
Vascular strands on mericarp septa	1	1	3 or more

Gymnanthes in this wider sense is pantropical, comprising approximately 45 species, with the centre of diversity being in Brazil. Species can be glabrous or pubescent, with the hairs, when present, simple, multicellular and pale brown to cream-coloured. The genus is characterised by 1- or 3-flowered staminate cymules, each staminate flower pedicellate (although the pedicel might be short and not always distinct), usually three (sometimes more) stamens and a calyx of three, fused to much-reduced sepals. The fruits are always dry, septically dehiscent with a comparatively thick wall and only one vascular strand per septum. The fruits may be glabrous or pubescent but they are never as densely tomentose as in *Mabea*.

The genus is still in need of revision. It includes unusual species such as *Gymnanthes hypoleuca* Benth. and the molecular phylogeny of Wurdack & al. (2005) indicated that the genus might not be monophyletic. Some problems of the circumscription of the genus were also discussed by Esser (1999).

The key to the genera of *Hippomaneae* by Esser (2001: 356–360) was incomplete because it did not allow for pubescent ovaries and fruits in *Gymnanthes* (steps 27–28).

Revised key to *Gymnanthes* s.l. and related genera

- 1. Pistillate flowers with (3–)6(–9) sepals; ovaries and fruits densely tomentose *Mabea* Aubl.
- Pistillate flowers with 3 sepals; ovaries and fruits glabrous to pubescent 2
- 2. Staminate flowers (3–)5–7 per bract; ovaries and fruits glabrous, with 2 or 3 locules; fruits, if 3-locular, with a very thick pericarp more than ¹/₁₀ of fruit length *Shirakiopsis* Esser
- Staminate flowers 1–3(–5) per bract; ovaries and fruits glabrous or pubescent, with 3 locules; fruits with a moderately thick pericarp c. ¹/₁₀ of fruit length *Gymnanthes* s.l.

Key to the pubescent-fruited species of *Gymnanthes* s.l.

- 1. Leaves obovate-elliptic, narrowly obovate to narrowly elliptic; Mesoamerica 2
- Leaves oblong, elliptic or spatulate; Brazil to Paraguay 3
- 2. Inflorescences hardly branched; fruiting pedicel elongating to more than 2 cm; Guatemala *Sebastiania pubiflora* Lundell

- Inflorescences much-branched; fruiting pedicel less than 2 cm long; Mexico to Costa Rica *Gymnanthes riparia* (Schltdl.) Klotzsch
- 3. Leaves spatulate, to 1.5 cm wide; Brazil (Minas Gerais state) . . . *Sebastiania pubescens* Pax & K. Hoffm.
- Leaves oblong to elliptic (1.2–)1.5–4 cm wide; Brazil to Paraguay 4
- 4. Leaves glabrous or with few hairs only, the margins shallowly serrate 5
- Leaves distinctly pubescent, the margins entire to distinctly dentate 6
- 5. Leaves subcoriaceous; staminate flowers 1 per bract; Brazil (São Paulo state) to Paraguay *Sebastiania edwalliana* Pax & K. Hoffm.
- Leaves thinner; staminate flowers 3 per bract; Brazil (São Paulo state) *Sebastiania ramulosa* Pax & K. Hoffm.
- 6. Leaves subentire; petiole 2–4 mm long; pedicel of staminate flowers distinct at least in central flower of cymule (at least 1 mm long); Brazil (Minas Gerais state) *Sebastiania vestita* Müll. Arg.
- Leaves entire to distinctly dentate; petiole 1–1.5 mm long; pedicel of staminate flowers very short and indistinct (to 0.4 mm long); Brazil (several NE states) *Gymnanthes boticario*

In the course of research on the pubescent-fruited taxa of *Gymnanthes* s.l., type specimens of *Sebastiania pubiflora* Lundell and *Sebastiania leptopoda* Lundell were examined and found to agree in all relevant characters, including the narrowly obovate leaves, the pubescence of all floral parts (including bract glands) and the exceptionally long fruiting pedicels. On this basis, the following synonym is proposed:

Sebastiania pubiflora Lundell in Wrightia 5: 80. 1975.
– Holotype: Guatemala, Baja Verapaz, Union Barrios, on Salama–Coban Road, south of km 146/147, 4.2.1975, fl., C. L. Lundell & E. Contreras 18908 (LL; isotype: S!).
= *Sebastiania leptopoda* Lundell in Wrightia 5: 164. 1975, **syn. nov.** – Holotype: Guatemala, Baja Verapaz, Union Barrios, northwest of km 159 of road, 12.6.1975, fr., C. L. Lundell & E. Contreras 19439 (LL; isotype: S!).

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References

- Esser H.-J. 1999: A partial revision of the *Hippomaneae* (*Euphorbiaceae*) in Malesia. – *Blumea* **44**: 149–215.
- Esser H.-J. 2001: Tribe *Hippomaneae*. – Pp. 352–393 in: Radcliffe-Smith A., *Genera Euphorbiacearum*. – Kew: Royal Botanic Gardens.
- Pax F. & Hoffmann K. 1912: *Euphorbiaceae-Hippomaneae*. – In: Engler A. (ed.), *Das Pflanzenreich* **52**. – Leipzig: Engelmann.
- Wurdack K. J., Hoffmann P. & Chase M. W. 2005: Molecular phylogenetic analysis of uniovulate *Euphorbiaceae* (*Euphorbiaceae* sensu stricto) using plastid *rbcL* and *trnL-F* DNA sequences. – *Amer. J. Bot.* **92**: 1397–1420. [[CrossRef](#)]