

FOUR NEW SPECIES OF MORACEAE FROM BAHIA, BRAZIL¹

R.M. CASTRO² & A. RAPINI^{2,3}

²Departamento de Ciências Biológicas, Universidade Estadual de Feira de Santana, BR 116, Km 3, 44031-460, Feira de Santana, Bahia, Brazil

ABSTRACT

Four new species of Moraceae, *Dorstenia caatingae* R.M.Castro, *Ficus bonijesulapensis* R.M.Castro, *F. caatingae* R.M.Castro and *Sorocea ganevii* R.M.Castro are described and illustrated. They are endemic to the semi-arid region of Bahia and occur in dry forest vegetation, differing from most species of Moraceae, a family usually associated with tropical rainforest habitats.

The Moraceae comprise 37 genera and ca. 1,050 species (ca. 750 in *Ficus*), one quarter of them occurring in the Neotropics (Berg 2004). They are usually woody plants (herbaceous in *Dorstenia*) with alternate leaves, conspicuous, often caducous stipules, and presence of milky latex. The flowers are unisexual, with or without sepals, 1-4 stamens and one pendent ovule in a unilocular ovary. They are arranged in many kinds of inflorescences, such as racemes in *Sorocea* and syconia in *Ficus*, and the monoecy, andro- and gynodioecy seems to have evolved multiple times in the history of the family from an ancestral dioecy (Datwyler & Weiblen 2004).

The unisexual, reduced flowers associated with confuse taxonomic limits and wide morphological variation among populations make the systematics of many groups of Moraceae complex (e.g. Roumaniuc-Neto 1998, Carauta et al. 2002). This may have contributed to making the family poorly known in Brazil as a whole, but almost unknown in many States such as Bahia, for where only three species and two genera of Moraceae were recorded in the checklist by Harley & Mayo (1980). This number increased to 29 species and five genera after a survey of the Brazilian Moraceae (Carauta et al. 1996).

During the preparation of the treatment of Moraceae from the State of Bahia (Castro 2006), 47 species and nine genera were recognised. Four new species, being one in *Dorstenia*, two in *Ficus* and one in *Sorocea*, are herein described and illustrated. Differing from most Moraceae, a family predominant in tropical rainforests, these species are all endemic to the semi-arid region of the State of Bahia.

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³Author for correspondence: rapinibot@yahoo.com.br

Dorstenia caatingae R.M.Castro, **sp. nov.**

Type: BRAZIL. Bahia: Itaberaba, Serra do Orobó, 12°28'S, 40°31'W, 28 May 2005, *L.P.Queiroz, D.Cardoso & C.Correa 10701* (Holotype: HUEFS). Figs. 1, 2.

Dorsteniae cayapiae ssp. *cayapiae* affinis, sed folio monochromatico et margine coenanthii producta differt.

Herb to 6 cm high; branches glabrescent, internodes inconspicuous. **Stipules** triangular, c. 1 mm long, covered with red trichomes. **Leaf** blade hirsute, chartaceous, obovate, 3-9 × 1-5 cm, apex acute, base lobate, margin crenulate, repand, midvein plane on the adaxial surface, prominent on the abaxial surface, secondary veins 6-9 pairs, actinodromous; petiole pubescent, 2-10 cm long. **Inflorescence** 1 per axil, erect, hirsute, 3-5.5 cm long, including a peduncle of 2.5-5 cm long; receptacle orbicular, cupuliform, with short, acute projections at the margin (star-like), c. 1.5 cm diam.; bracts various, triangular, ciliate at the receptacle margin. **Staminate flowers** 2-merous; sepals broadly triangular, c. 0.6 × 0.7 mm, green, membranous, connate; stamens 2, recurved in bud, filament c. 0.25 mm long, glabrous, anther basifixed, c. 0.28 × 0.25 mm, connective oblong, c. 0.2 × 0.1 mm. **Pistillate flowers** 2-3-merous; sepals c. 0.45 × 0.72 mm, glabrous, membranous, connate; ovary not seen, style 1, c. 0.1 mm long, glabrous, stigma bifid. **Fruits** not seen.

COMMENTS: *Dorstenia caatingae* is endemic to the State of Bahia, occurring only along riverside forest relicts and semideciduous forest in the semi-arid vegetation known as "caatinga". It is similar to *Dorstenia cayapia* Vell., but can be distinguished by the cupuliform inflorescence receptacle and the monochromatic, usually smaller leaves.

VERNACULAR NAME: batatinha-de-tiú, batatinha-de-teiú (personal observation).

PARATYPES: BRAZIL. Bahia: Lençóis,

Pântano do Rio Santo Antônio, 12°39'S, 41°19'W, 29 Jan 1997, *M.L.Guedes et al. in PCD 4624* (ALCB, CEPEC, HUEFS); Senhor do Bonfim, Serra de Santana, 28 Jul 2005, 10°21'55"S, 40°11'55" W, *T.S.Nunes et al. 1223* (HUEFS).

Ficus bonijesulapensis R.M.Castro., **sp. nov.**

Type: Bom Jesus da Lapa, Morro do Bom Jesus, 13°15'32"S, 43[°40"]25'11"W, 15 May 2001, *F.França, E.Melo & B.Marques da Silva 3521* (Holotype: HUEFS). Fig. 3 A-D.

Ab Fico calyptrocerate indumento glabrescente et ficis pedicellatis capitatis cum orobracteis cupulaeformibus differt.

Tree to 30 m high; branches terete, glabrescent, internodes 3-18 mm long, epidermis exfoliating. **Stipules** triangular, glabrescent, 1.8-3 cm long. **Leaf** blade green, glabrescent, chartaceous to subcoriaceous, ovate, sometimes elliptic, oblong or obovate, 2.7-14.5 × 1.7-10 cm, apex acuminate, sometimes acute, obtuse or rounded, base obtuse, truncate, cordate or lobate, margin slightly revolute, crenulate, undulate, midvein slightly prominent on the adaxial surface, prominent on the abaxial surface, secondary veins 8-13 pairs, yellowish, brochidodromous; petiole puberulous, 1-4.5 cm long. **Inflorescences** 2 per axil, erect, pubescent, 1.1-2.4 cm long, including a peduncle of 0.4-1.2 cm long; syconia globose, 0.9-1.2 cm diam.; epibracts 2, elliptic, plane, tomentose, greenish to brownish; ostiole plane with orobracts inconspicuously raised, cupuliform. **Staminate flowers** not seen. **Pistillate flowers** 3-merous; pedicel to 2.3 mm long; sepals triangular, cucullate, c. 1 × 0.8 mm, glabrous, membranous, connate; ovary elliptic, c. 1.2 × 1 mm, glabrous, style 1, 0.6-2 mm long, glabrous, stigma bifid, linguiform, verrucose. **Fruits** not seen.

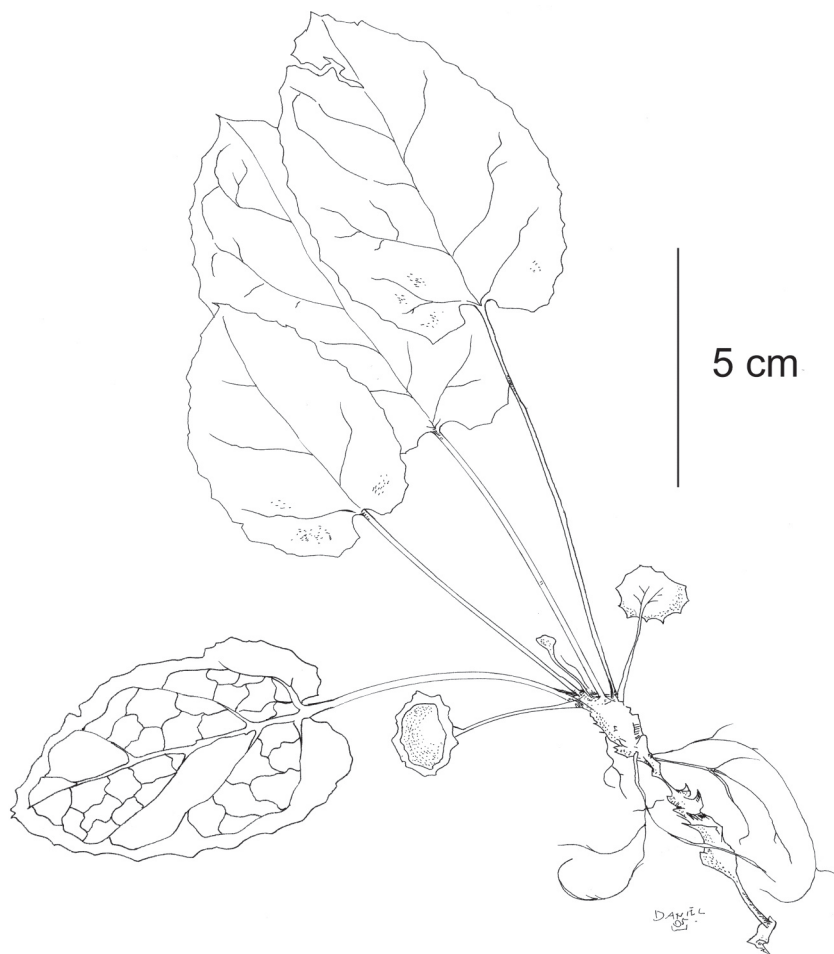


Fig. 1. *Dorstenia caatingae* R.M.Castro. Plant with inflorescences (*Queiroz et al. 10701*, holotype). Drawn by Daniel Silva.

VERNACULAR NAME: gameleira (Ferreira et al. 1255).

COMMENTS: *Ficus bonijesulapensis* are huge trees with greyish, bright trunk. The species is closely related to *Ficus calyptroceras* (Miq.) Miq., but can be easily distinguished by the glabrescent, rather than dense indumentum. It is named for the regional importance of Bom Jesus

da Lapa. The city is visited by many catholic pilgrims who believe that the Bom Jesus da Lapa cave has miraculous properties. A population of *F. bonijesulapensis* grows over the mountain where this cave is located. The species is endemic to the State of Bahia, occurring only on calcareous mountains in the Rio São Francisco valley.

PARATYPES: BRAZIL. Bahia: Bom

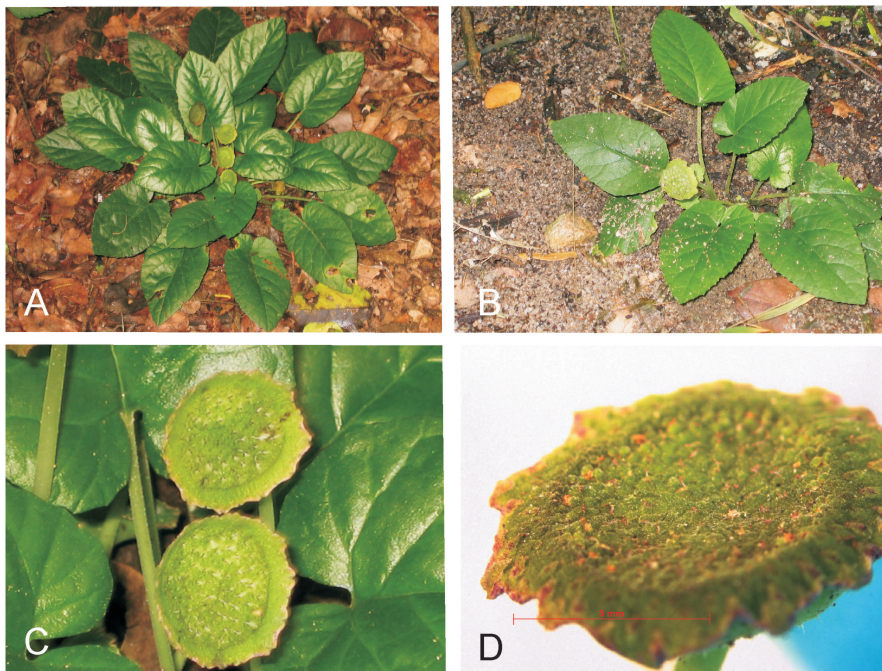


Fig 2. *Dorstenia caatingae* R.M.Castro. A-B. Habit. C-D. Inflorescences (A-D. *Queiroz et al.* 10701, holotype). Photos by Luciano P. Queiroz.

Jesus da Lapa, mountain above the church, in the centre of the city, 13°15'32"S, 43°25'11"W, 10 Feb 2000, *L.P.Queiroz et al.* 5812 (HUEFS); id., Serra Azul, 13°04'27"S, 43°17'18"W, 4 May 2002, *M.C.Ferreira et al.* 1255 (HUEFS); id., Morro da Lapa, 13°15'S, 43°25'W, 14 Apr 2005, *R.M.Castro et al.* 1196 (HUEFS); id., 15 km to Ibotirama, 13°09'49"S, 43°18'29"W, 30 Apr 2003, *L.A.Jesus-Junior et al.* 17 (ALCB, SPF); Coribe, Alagoinha, 14°56'00"S, 44°43'56"W, 10 Apr 2005, *R.M.Castro et al.* 1185 (HUEFS); Guanambi, 14°13'50"S, 42°52'54"W, 15 Apr 2002, *F.França et al.* 3778 (HUEFS); Tanhaçu, Morro do Antonino, 14°08'35"S, 41°21'57"W, 22 Feb 2004, *F.França et al.* 4911 (HUEFS).

Ficus caatingae R.M.Castro, **sp. nov.**
 Type: BRAZIL. Bahia: Mucugê, Passagem Funda, 13°06'11"S, 41°26'01"W, 17 Jul 1996, *N.Hind, R.M.Harley, H.P.Bautista & S.Smith* in PCD 3711 (Holotype: HUEFS; isotypes: ALCB, CEPEC). Fig. 3 E-F.

Fico mexiae affinis, sed indumento foliorum vesiculoso puberuloque differt.

Tree to 12 m high; branches terete, costate, puberulous to glabrescent, internodes 0.2-4 cm long. **Stipules** triangular, puberulous to glabrescent, 0.6-1.5 cm long. **Leaf** blade puberulous, vesiculose (with globose, sessile, pale trichomes), chartaceous, obovate to elliptic, 3-12 × 1.5-6.5 cm, apex rounded to retuse, base acute to lobed, margin slightly

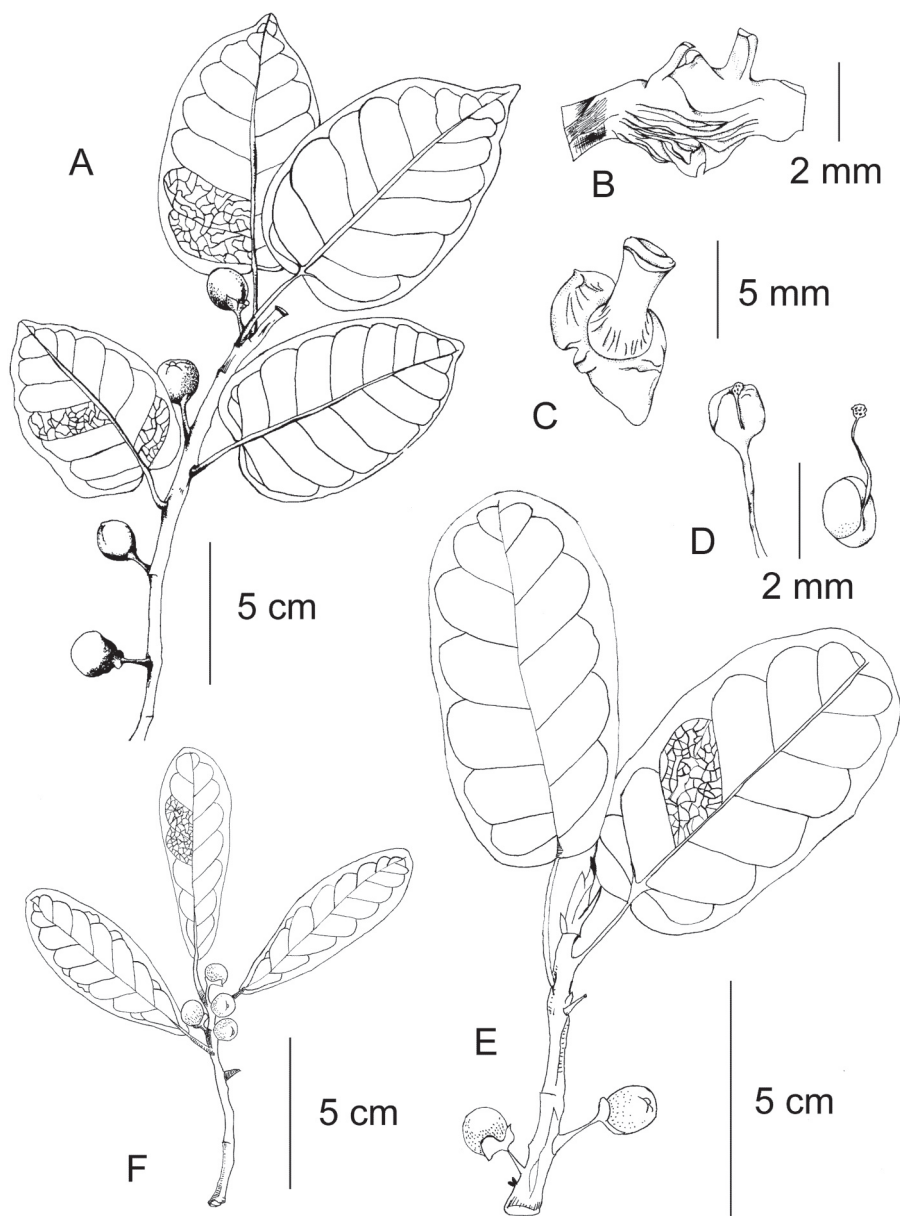


Fig 3. A-D. *Ficus bonijesulapensis* R.M.Castro. A. Branch with syconia. B. Ostiole, transversal section. C. Epibracts, abaxial view. D. Pistillate flowers (short style, left; long style, right). E-F. *F. caatingae* R.M.Castro. E-F. Branches with syconia, showing leaf variation. (A-D. França et al. 4911; E. Carvalho 1680; F. Oliveira Filho & Lima 139). Drawn by Daniel Silva.

revolute, undulate, crenulate, midvein slightly prominent on the adaxial surface, prominent on the abaxial surface, secondary veins 7-11 pairs, yellowish, brochidodromous; petiole pubescent to glabrescent, 0.5-3 cm long. **Inflorescences** 2 per axil, erect, puberulous and vesiculose, 0.9-2.7 mm long, including a peduncle of 0.2-1.2 cm long, syconia globose, 7-15 mm diam.; epibracts 2, elliptic, pubescent and vesiculose, wine to brownish; ostiole plane, crateriform. **Staminate flowers** not seen. **Pistillate flowers** 3-merous; pedicel to 1.6 mm long; sepals triangular cucullate, c. 1×0.6 mm, glabrous, membranous, connate; ovary elliptic, c. 1×1.2 mm, glabrous, style 1, 0.8-1.6 mm long, glabrous, stigma bifid, linguiform, verrucose. **Fruits** not seen.

COMMENTS: *Ficus caatingae* is closely related to *F. mexiae* Standl., but differs because of the puberulous, vesiculose leaves, which are usually smaller. *Ficus mexiae* was included in the synonymy of *F. enormis* Mart. by Berg & Villavicencio (2004). These authors, however, stated that plants from Brazilian drylands had a particular form, with smaller leaves (less than 10 cm long) and pedunculate syconia (peduncles 3-10 mm long). Accepting a narrow concept of *F. enormis*, this variation is here considered at the species level. *Ficus caatingae* is restricted to the deciduous forests known as "caatinga", in the semi-arid region of Bahia State.

PARATYPES: BRAZIL. Bahia: Vitória da Conquista, Fazenda Chapada Velha, 14°55'S, 41°04'W, 30 Mar 1984, L.C.Oliveira-Filho & J.C.A.Lima 139 (ALCB, CEPEC, HRB, HUEFS); Brumado, 14 Apr 1983, A.M.Carvalho 1680 (CEPEC); Brejões, 14 Sep 1984, G.Hatschbach 48188 (CEPEC, MBM); Caém, 11°07'01"S, 40°08'26"W, 5 Aug 2001, D.M.Loureiro et al. 258 (ALCB); Caldeirão, 13°10'S, 41°13'W, 18 Apr 1980,

R.M.Harley 21515 (CEPEC, GUA, K n.v.); Cocos, road to Itaguari, 14°15'66"S, 44°43'56"W, 9 Apr 2005, R.M.Castro et al. 1145 (HUEFS); Itiúba, EPABA, Fazenda Experimental, 10°43'S, 39°50'W, 27 May 1983, G.C.P.Pinto & H.B.Bautista 112/83 (ALCB, CEPEC, HRB, HUEFS); Manoel Vitorino, 20 Nov 1978, S.A.Mori et al. 11250 (CEPEC, RB); Maracás, 20 Jan 1981, L.P.Queiroz & M.L.Guedes 175/140 (ALCB); Pindobaçu 10°44'S, 40°21'W, 20 Dec 1999, M.L.Guedes et al. 7049 (ALCB).

Sorocea ganevii R.M.Castro, **sp. nov.**
Type: BRAZIL. Bahia: Rio de Contas, road to Jussiape, 10 km from Igreja Matriz, 13°36'10"S, 41°45'53"W, 17 Jan 2004, G.Pereira-Silva et al. 8405 (Holotype: HUEFS; isotype: CEN n.v.). Fig. 4.

Haec species Soroceae hilarii affinis, sed floribus femineis cum paribus calycum capitatis non differentibus (in S. hilarii calyce supero conico et infero cylindrico) differt.

Tree to 8 m high; branches terete, pubescent, vesiculose (with sessile, capitate, pale trichomes), internodes 0.3-4 cm long, with sparse, inconspicuous lenticels. **Stipules** ovate, c. 4 mm long, sericeous to puberulous. **Leaf** blade green, puberulous to glabrescent, coriaceous, elliptic or obovate, 5.5-14 \times 2.5-5.3 cm, apex acuminate or mucronate, base acute, asymmetric, margin serrate, spinescent, midvein impressed on the adaxial surface, prominent on the abaxial surface, secondary veins 8-12 pairs, cream, brochidodromous; petiole pubescent, vesiculose, 0.4-1.3 mm long. **Inflorescence** 1-2 per axil, pendulous, puberulous; staminate inflorescence 6.5-15 cm long, including a yellow-greenish peduncle of 3.5-7 cm long; pistillate inflorescence 5-6.5 cm long, including a wine peduncle of 5-15 mm long; floral bract 1 per flower, axillary,

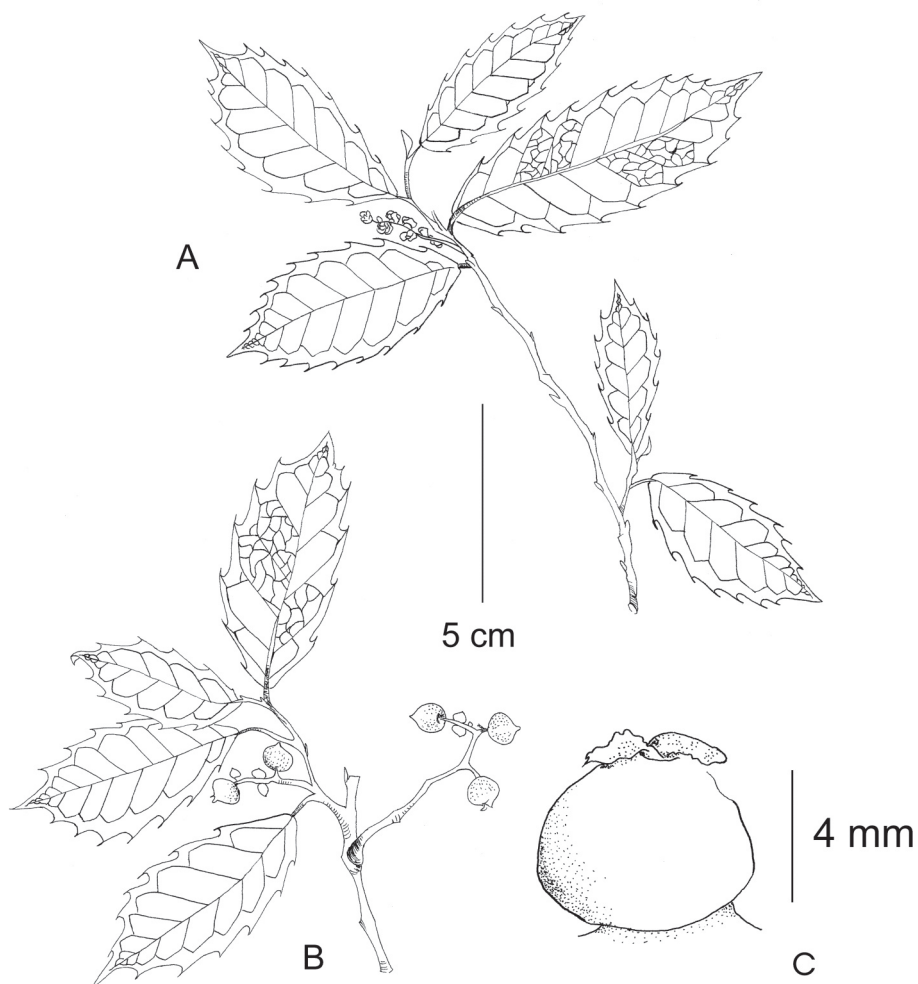


Fig 4. *Sorocea ganevii* R.M.Castro. A. Branch with staminate inflorescences. B. Branch with fruits. C. Pistillate flower. (A. Jardim *et al.* 4321; B. Ganev 3019; C. Pereira-Silva *et al.* 8405, holotype). Drawn by Daniel Silva.

ciliate. **Staminate flowers** 4-merous; sepals cucullate, 1.23-2.66 × 0.81-2.2 mm, yellow to greenish, ciliate, membranous, connate; stamens 4, opposite to the sepals, curved in bud, filaments c. 1.31 mm long, glabrous, anthers elliptic, basifixed, bilocular, c. 1 × 1.07 mm, connective inconspicuous.

Pistillate flowers 4-merous; sepals connate, calyx capitate, c. 0.35 × 0.35 mm, greenish to wine, puberulous, fleshy; ovary ovate, c. 0.32 × 0.24 mm, glabrous, green, style 1, c. 0.03 mm long, glabrous, cream, stigma bifid, linguiform, plane, verrucose.

Fruit drupe, capitate, c. 5.4 × 5.3 mm, perianth fleshy, the surface smooth, puberulous to pubescent.

VERNACULAR NAME: amora (*Jardim et al. 4321*)

COMMENTS: *Sorocea ganevii* is similar to *S. hilarii* Gaudich. because of the staminate inflorescence morphology. However, *S. ganevii* can be distinguished by the leaves that are usually smaller and by the shorter inflorescences. Furthermore, the pistillate flowers of *S. ganevii* have a capitate calyx, rather than a calyx differentiated into a conical apex and a cylindrical base as in *S. hilarii*. The species is endemic to the Chapada Diamantina, in the Espinhaço mountain Range in the State of Bahia. Its name honours Wilson Ganev, a miner who has contributed to the Flora of Bahia with numerous and precious collections of flowering plants in Chapada Diamantina.

PARATYPES: BRAZIL. Bahia: Abaíra, Mata do Criminoso, 13°20'S, 41°48'W, 3 Nov 1993, *W.Ganev 2397* (HUEFS); ib., Jambreiro, 13°17'S, 41°52'W, 3 Mar 1994,

W.Ganev 3019 (HUEFS); Mucugê, Cascavel, Fazenda Ponte, 13°14'16"S, 41°22'25"W, 16 Dec 2004, *J.G.Jardim et al. 4321* (HUEFS); Rio de Contas, Palmeira, near to Cachoeira da Michilana, 13°24'S, 41°47'W, 27 Dec 1993, *W.Ganev 2720* (HUEFS).

LITERATURE CITED

- Berg, C.C. 2004. Moraceae (Mulberry Family). Pages 253-256. In: Smith, N.; Mori, S.A.; Henderson, A.; Stevenson, D.Wm.; Heald, S.V. *Flowering Plants of the Neotropics*. Princeton University Press, Princeton.
- Berg, C.C. & Villavicencio, X. 2004. Taxonomic studies on *Ficus* (Moraceae) in the West Indies, extra-Amazonian Brazil, and Bolivia. *Ilicifolia* 5:1-177.
- Carauta, J.P.P.; Neto, S.R.; Sastre, C. 1996. Índice das espécies de moráceas do Brasil. *Albertoa* 4(7):78-93.
- Carauta, J.P.P.; Albuquerque, J.M.; Castro, R.M. 2002. *Dorstenia* (Moraceae): notas complementares V. *Albertoa série Urticineae (Urticales)* 8:53-56.
- Castro, R.M. 2006. *Flora da Bahia – Moraceae*. M.Sc. Thesis, Universidade Estadual de Feira de Santana, Feira de Santana.
- Datwyler, S.L. & Weiblein, G.D. 2004. On the origin of the fig: phylogenetic relationships of the Moraceae from *ndhF* sequences. *American Journal of Botany* 91(5):767-777.
- Harley, R.M. & Mayo, S.J. 1980. *Towards a checklist of the Flora of Bahia*. Royal Botanic Gardens, Kew.
- Romaniuc-Neto, S. 1998. Biodiversité et spéciation dans le Sud-Est du Brésil et le bassin du fleuve Paraná: exemple de quelques espèces appartenant à un complexe du genre *Sorocea* A. St.-Hil. (Moraceae). C. R. *Académie des Sciences Paris, Sciences de la terre et des planètes* 327:669-675.