Novelties in Begonia (Begoniaceae) from the coastal forests of Brazil

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Jacques, E. L. (Universidade Federal de Mato Grosso do Sul, Câmpus Universitário Três Lagoas, Caixa Postal 210, 79603-011, Três Lagoas, MS, Brazil; email: ejacques@terra.com.br) & M. C. H. Mamede (Instituto de Botânica, Caixa Postal 4005, 01061-970, São Paulo, SP, Brazil; email: mcmamede@uol.com.br). Novelties in *Begonia* (Begoniaceae) from the coastal forests of Brazil. Brittonia 56:75–81. 2004.—Two new narrow endemic species of *Begonia* from the Atlantic coastal forests of Brazil, **B. espiritosantensis** and **B. ibitiocensis**, are described and illustrated. **Begonia schenkii** var. **calvescens**, an endemic taxon from the states of Santa Catarina and Rio Grande do Sul, is transferred to species rank, and described and illustrated. A distribution map is provided for all three taxa.

Key words: Begoniaceae, *Begonia*, Atlantic forest, Brazil.

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According to Smith et al. (1986), *Begonia* is represented in Brazil by 240 taxa, the majority of which are widespread in Atlantic forests, especially in the states of Espírito Santo, Rio de Janeiro, and São Paulo. During a revision of the Brazilian species of *Begonia* with bilamellate placentae (Jacques, 2002), we discovered two undescribed species and a change in status that needs to be made.

Begonia calvescens (Brade ex L. B. Sm. & R. C. Sm.) E. L. Jacques & Mamede, stat. nov. (Fig. 1)

Begonia schenckii Irmsch. var. *calvescens* Brade ex L. B. Sm. & R. C. Sm., Fl. Ilustr. Catarin. BEGO: 74. 1971. TYPE: BRAZIL. Santa Catarina: Mun. Bom Retiro, 15 Dec 1948, *R. Reitz 2200a* (HOLOTYPE: HBR; ISOTYPE: HB).

Herbs, 0.5–0.7 m tall, scabrous; cystoliths present; indumentum of scales and short glandular trichomes, the scales ca. 0.05 mm long, palmate to 2–3-branched, with digitate-glandular apices. *Stems* striate, the internodes 1.5–7.5 cm long, scaly to scabrous. *Stipules* becoming papyraceous, persistent, 1.5–3.5 cm long, symmetric, elliptic to broadly ovate; apex acute; base truncate; margins entire; lower surface carinate, with glandular trichomes on midrib. *Petioles* 7–15 cm long, cylindric in cross section, densely scaly. *Leaf blades* basifixed, 12–25 × 6–14.5 cm, chartaceous to coriaceous, asymmetric, transversely elliptic to transversely ovate; apex cuspidate; base

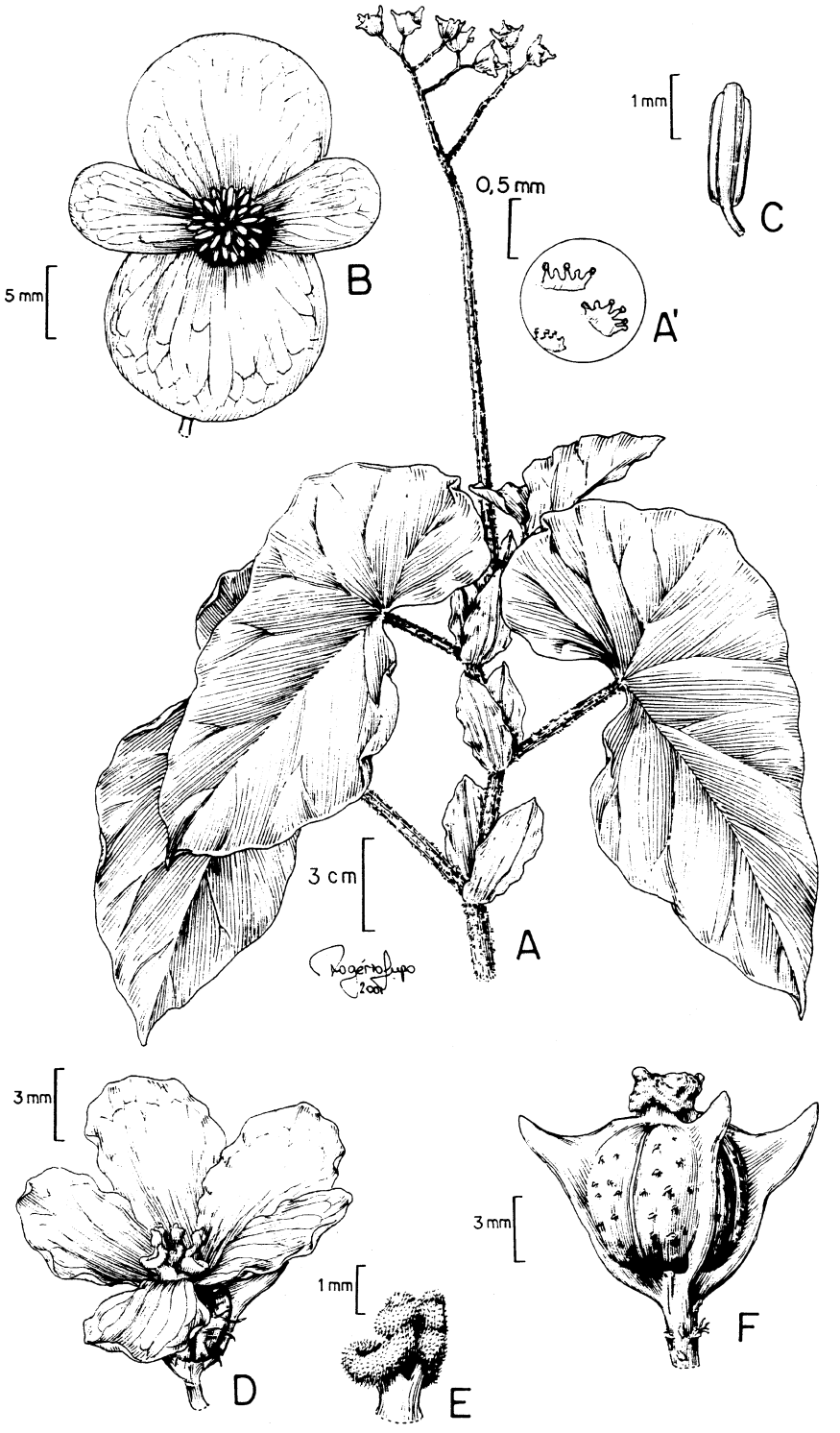

FIG. 1. *Begonia calvescens*. **A.** Habit. **A′.** Scales. **B.** Staminate flower. **C.** Stamen. **D.** Pistillate flower. **E.** Stigma. **F.** Capsule. (A from *Falkenberg 10003*, FLOR; B–C from *Falkenberg 9332*, FLOR; D–E from *Falkenberg 7738*, FLOR; F from *Falkenberg 7740*, FLOR).

auriculate; margins ciliate, sometimes inflexed; proximal lobes rounded, overlapping the petiole; upper surface glabrous; lower surface densely covered with scales and glandular trichomes; venation actinodromous; veins 6–11. *Cymes* 15–30(–41) cm long, 20–40 flowered, 4–6 dichotomously branched, proximal hypopodia 12–23(–29) cm long, scabrous, loosely pilose to glabrous, light pink. *Bracts* deciduous, elliptic, ca. 2 cm long; apex rounded to retuse; base truncate; margins ciliate, loosely pilose on midrib of lower surface. *Staminate flowers*: 1–2 cm long; prophylls absent; epipodia 0.5–1.2 cm long, glabrous, light pink; tepals 4, white; outer pair of tepals 10–22 × 10–16 mm, broadly ovate, orbicular to obovate, the apex rounded, the base rounded, the margins entire, the upper surface loosely scaly with short, red, glandular trichomes; inner pair of tepals 10–20 × 6–9 mm, obovate, the apex rounded, the base acute to attenuate, the margins entire, glabrous; stamens 38–52, 2.5–4 mm long, the filaments 0.4–1.5 mm long, free, the anthers oblong, 2–3 mm long, laterally fissured, the connective prominently projecting, the apex obtuse. *Pistillate flowers*: 1.8–2 cm long; prophylls 2, deciduous, 3–7 mm long, elliptic, ovate to obovate, the margins fimbriate; epipodia 3–6 mm long, glabrous; tepals 5, white, unequal, 10–12 × 5–10 mm, elliptic to obovate, the apex rounded, the base acute, the margins entire to irregularly crenate, glabrous; ovary elliptic, 2–3 mm long, the styles 3, cylindric, spirally twisted, the stigma ca. 3 mm long, 2-branched with stigmatic papillae entirely covering the branches, the placentae bilamellate with ovules on both sides of the lamellae. *Capsules* hyaline, 7–9 × 10–17 mm, dehiscent on basal portion; sparsely scaly; styles persistent; pericarp chartaceous; wings hornlike, 3–6 mm long. *Seeds* oblong.

Distribution and ecology.—Southern Brazil, in states of Santa Catarina and Rio Grande do Sul. Cloud forests along the Atlantic slope (Fig. 2). Flowering and fruiting from December to April.

Etymology.—The epithet refers to the upper surface of the leaf blades being completely glabrous.

Additional specimens examined: BRAZIL. **Santa Catarina**: Mun. Araranguá, Retiro, 15 Apr 1944, *Reitz C470* (RB); Mun. Bom Retiro, 23 Dec 1948, *Reitz 2726* (RB); Mun. Grão Pará, Serra do Corvo Branco, 27 Mar 1996, *Falkenberg 7738 & 7740* (FLOR); Mun. Jacinto Machado, Canon da Fortaleza dos Aparados, 21 Feb 1982, *Ribeiro 268* (GUA); Mun. Praia Grande, Serra do Faxinal, 28 Apr 1997, *Falkenberg 10003* (FLOR); Mun. Sombrio, 15 Apr 1944, *Reitz 726* (PACA); Mun. Urubici, 21 Jan 1997, *Falkenberg 9332* (FLOR). **Rio Grande do Sul**: Mun. Canela, 31 Mar 1982, *Mattos et al. 23323* (HAS); Mun. São Francisco de Paula, 16 Feb 1955, *Rambo s.n.* (PACA 56797); Mun. Terra de Areia, Serra do Pinto, 23 Mar 1997, *Falkenberg 9774* (FLOR); Mun. Três Cachoeiras, 29 Jan 1993, *Falkenberg et al. 6064* (FLOR).

The hornlike wings of the capsules of *Begonia calvescens* suggest a relationship to *B. scharffii* Hook. (an older name for *B. schenckii* Irmsch.), *B. hilariana* A. DC., and *B. squamipes* Irmsch. Like *B. calvescens*, these species also occur in the state of Santa Catarina. The characters distinguishing these species are: 1) the morphology of the petiole scale, which is filiform in *B. scharffii* and *B. hilariana* (De Candolle, 1859), laminar with a fimbriate apex in *B. squamipes* (Irmscher, 1953), and palmate to 2–3-branched with digitate-glandular apices in *B. calvescens*; 2) the indumentum of the capsule, which is densely pilose only in *B. hilariana*; and 3) the style branches, which are strongly twisted in *B. calvescens*, *B. scharffii*, and *B. hilariana*, and lyrate in *B. squamipes*. The following key summarizes the principal differences among these taxa:

1. Indumentum smooth; scales 4–6 mm long, laminar at base, the apex and margins fimbriate. ..... *B. squamipes*
1. Indumentum hispid or scabrous; scales less than 3.5 mm long, apex filiform or palmate, margins entire.
   2. Leaf blades pilose on both surfaces. ..... *B. scharffii*
   2. Leaf blades pilose only on lower surface.
      3. Plants scabrous; petiole and lower surface of leaves with scales palmate to 2–3-branched, ca. 0.05 mm long, the apex glandular. ..... *B. calvescens*
      3. Plants hispid; petiole with scales filiform, 1–3 mm long, the apex long acuminate, not glandular, sometimes bifid; lower surface of leaves with stellate trichomes. ..... *B. hilariana*

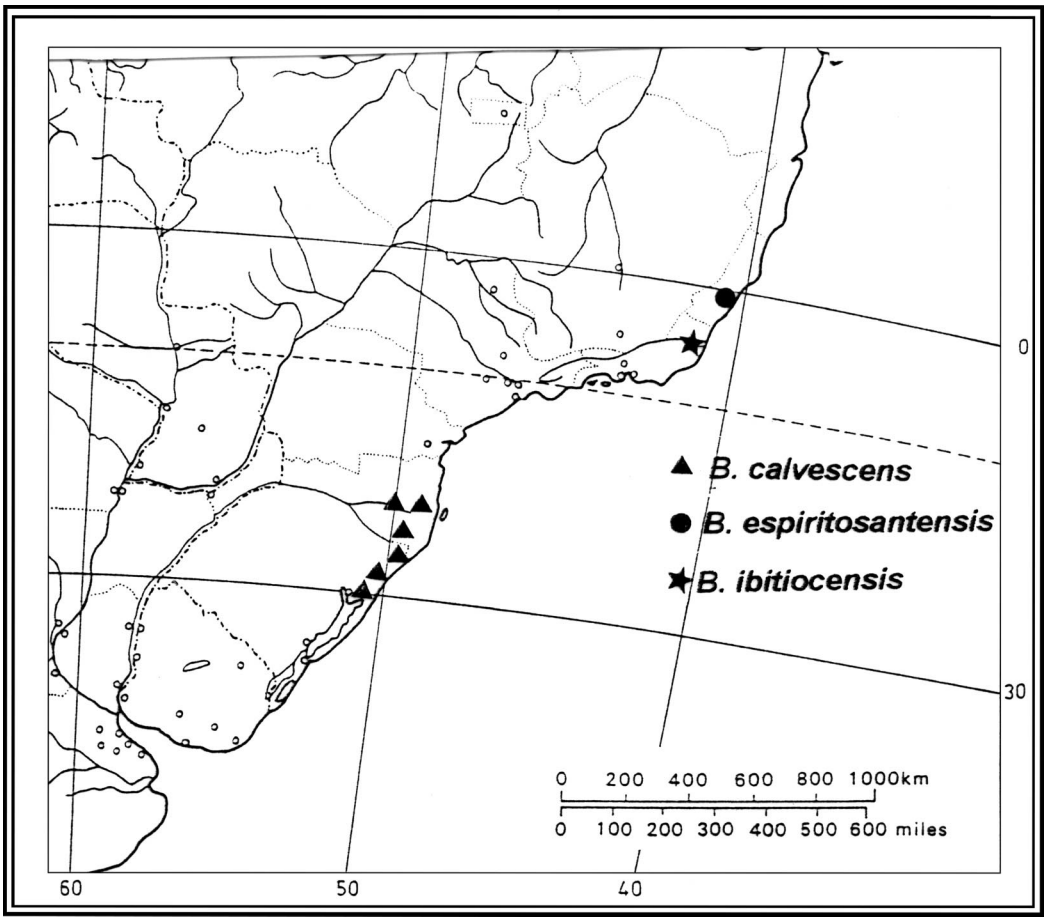

FIG. 2. Geographical distribution of *Begonia calvescens*, *B. espiritosantensis*, and *B. ibitiocensis*.

Begonia espiritosantensis E. L. Jacques & Mamede, sp. nov. (Fig. 3A–F)

TYPE: BRAZIL. Espírito Santo: Mun. Serra, nr. Vitória, Estação Biológica Mestre Álvaro, 21 Nov 1982, *J. R. Pirani 175* (HOLOTYPE: SPF; ISOTYPE: SP).

Herba rhizomatosa, pilis stellaribus, cystolithis destituta. Caulis brevis. Folia rarius peltata; petioli basifixi, 16–26.5 cm longi; lamina cordiformis vel orbicularis. Thyrsus 20-florus, 5–6-ramealis. Tepala floris masculi rosea vel coccinea; antherae obovatae, rimosae, extrorsae. Tepala floris feminei rosea vel coccinea; placentae bilamellatae; stigmata multifida. Capsulae alis minoribus, marginibus inferioribus descendentibus.

Herbs rhizomatous, ca. 0.5 m tall, cystoliths absent, indumentum of stellate trichomes. *Stems* absent or inconspicuous. *Stipules* membranaceous, persistent, (1.6–) 2–2.5 cm long, symmetric, deltate; apex acuminate; base truncate; margins entire; lower surface carinate, rust-colored. *Petioles* 16–26.5 cm long, cylindric in cross section, rust-colored. *Leaf blades* basifixed, rarely peltate, 7–17 × 11.5–20 cm, papyraceous, slightly asymmetric, cordate to orbiculate; apex rounded; base auriculate to cordate; margins short-lobed, the proximal lobes 2.5–4 cm long, imbricate (rarely joined); both surfaces velutinous; venation actinodromous; veins 7–9. *Thyrses* 40–75 cm long, ca. 20-flowered, 5–6-branched, the peduncles ca. 41 cm long, rust-colored; proximal bracts deciduous, not seen. *Staminate flowers*: 1–1.5 cm long; prophylls absent; epipodia 0.5–1.3 cm long, with glandular trichomes; tepals 4, pink to car-

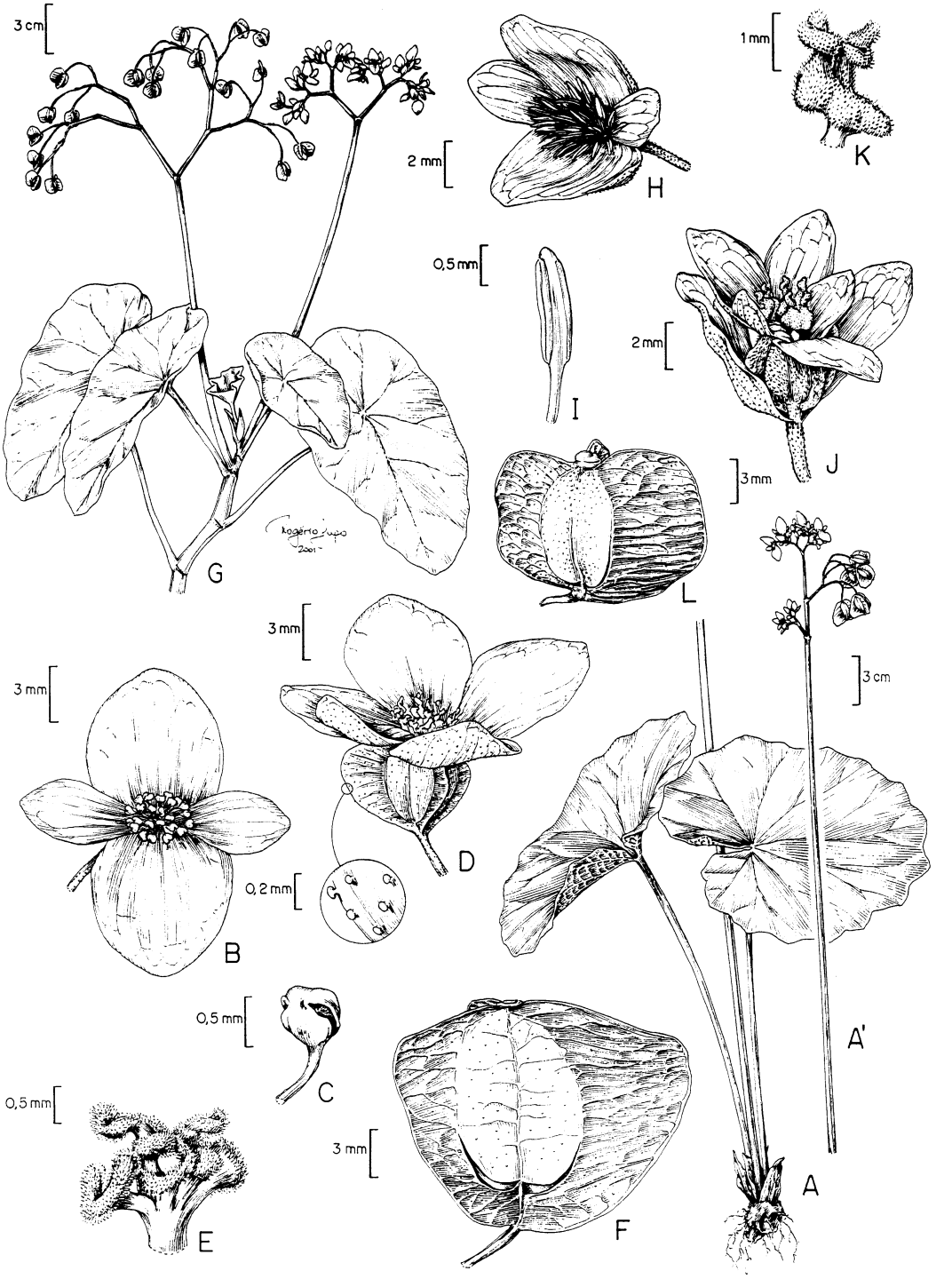

FIG. 3. **A–F.** *Begonia espiritosantensis*. **A, A′.** Habit. **B.** Staminate flower. **C.** Stamen. **D.** Pistillate flower, glandular trichomes in detail. **E.** Stigma. **F.** Capsule. **G–L.** *Begonia ibitiocensis*. **G.** Flowering branch. **H.** Staminate flower. **I.** Stamen. **J.** Pistillate flower. **K.** Stigma. **L.** Capsule. (A and F from *Pirani 175*, SPF; B–E from *Nascimento s.n.*, RB 97104; G–L from *Braga 666*, RUSU).

mine; outer pair of tepals 6–10 × 4–8 mm, elliptic to ovate, the apex obtuse, the base auriculate, the margins entire with glandular trichomes; inner pair of tepals 5–7 × 3–4 mm, elliptic to obovate, the apex obtuse, the base acute, the margins slightly crenate toward the apex, glabrous; stamens 35–47, 1.5–2.5 mm long, the filaments 1–1.8 mm long, free, the anthers obovate, ca. 0.5 mm long, recurved, extrorse, the connective scarcely projecting. *Pistillate flowers*: ca. 2.3 cm long; prophylls absent; epipodia ca. 1.3 cm long, with glandular trichomes; tepals 5, pink to carmine, unequal, 5–8 × 4–6 mm, elliptic to ovate, the apex acute, the margins entire, the lower surface with short glandular trichomes; ovary elliptic, ca. 7 mm wide, the styles 3, cylindric, spirally twisted, the stigma ca. 3 mm long, multibranched with stigmatic papillae only on the apex of the branches; placentae bilamellate with the ovules on both sides of the lamellae. *Capsules* pink to carmine, 15–17 × 19–21 mm, dehiscent on basal portion; styles deciduous; pericarp papyraceous; wings unequal, the upper margins slightly descendent, the lower margins oblique-ascendent, the largest wing 7–10 mm long, the smallest wing ca. 5 mm long. *Seeds* oblong.

Distribution and ecology.—Begonia espiritosantensis is known from only three collections from Espírito Santo State; just one of them bears a precise locality, a very restricted and preserved area of Atlantic forest near the municipality of Vitória (Fig. 2). This species grows in leaf litter and humus among rocks along with bryophytes and ferns. Flowering and fruiting in November.

Etymology.—The epithet refers to the state where the type was collected.

Additional specimens examined: BRAZIL. **Espírito Santo**: locality unknown, 1816–1821, *Saint-Hilaire 347* (P); locality unknown, s.d., *Nascimento s.n.* (RB 97104).

Begonia espiritosantensis resembles *B. acida* Vell. and *B. subacida* Irmsch.; all three have basifixed, asymmetric and transversely cordate to orbiculate leaf blades. *Begonia espiritosantensis* is easily distinguished by the indumentum of stellate hairs, the pink to carmine tepals, the obovate anthers, and the bilamellate placentae.

Begonia acida and *B. subacida* have petioles covered with scales up to 6 mm long and entire placentae. *Begonia acida* occurs in the state of Rio de Janeiro and shares with *B. espiritosantensis* the spirally twisted style branches. *Begonia acida* differs in having shorter inflorescenses (up to 30 cm long), white tepals, and linear anthers. *Begonia subacida* differs from *B. espiritosantensis* in having shorter cymes (34 cm long), oblong anthers, and cystoliths in the ovary walls; in addition, unlike *B. espiritosantensis*, *B. subacida* occurs in the moist forests of Bahia.

Begonia ibitiocensis E. L. Jacques & Mamede, sp. nov. (Fig. 3G–L)

TYPE: BRAZIL. Rio de Janeiro: Mun. Campos dos Goitacazes, Distr. Ibitioca, Fazenda Pedra Negra, 9 Oct 1993, *J. M. A. Braga 666* (HOLOTYPE: RUSU; ISOTYPE: SP).

Herba pilosa, pilis stellaribus, cystolithis destituta. Caulis internodiis 3–5.5 cm longis. Folia peltata; petioli 6.5–14.5 cm longi; lamina papyracea, transverse ovalis vel elliptica, symmetrica, 7–10-nervia. Cymae 20–150 florae, 6-ramealis. Tepala floris masculi alba; antherae oblongae, rimosae, latrorsae, connectivo obtuso, prominenti. Tepala floris feminei alba; placentae bilamellatae; stigmata bifida. Capsulae alis inaequalibus, majoribus 5–7 mm longis, marginibus superioribus et inferioribus rotundatis, laeviter ascendentibus.

Herbs, ca. 1.5 m tall; cystoliths absent; indumentum of stellate trichomes. *Stems* erect; internodes 3–5.5 cm long, velutinous, becoming glabrous. *Stipules* membranaceous, deciduous, 1.5–2.5 mm long, asymmetric, elliptic or narrowly elliptic to narrowly ovate; apex apiculate to convolute; base truncate; margins entire; lower surface velutinous. *Petioles* 6.5–14.5 cm long, cylindric in cross section, sericeous. *Leaf blades* peltate, 12–17 × 8.5–11 cm, papyraceous, symmetric, transversely ovate to broadly elliptic; apex obtuse to acute; base rounded; margins entire to slightly involute; upper surface sparsely pilose becoming glabrous, green, the stomata aquiferous; lower surface velutinous, white; venation actinodromous; veins 7–10. Dichasial *cymes* 20–30 cm, 20–150-flowered, 6-dichotomously branched; proximal hypopodia 14–37 cm

long, velutinous; bracts deciduous, not seen. *Staminate flowers*: 1–1.5 cm long; prophylls absent; epipodia 0.5–1.4 cm long, with densely stellate hairs; tepals 4, white; outer pair of tepals 7–11 × 4–7 mm, elliptic, the apex obtuse, the base obtuse, the margins entire to slightly sinuate at the apex, the upper surface glabrous, the lower surface with stellate trichomes; inner pair of tepals 6–7 × 2–3 mm, elliptic to obovate, the apex obtuse to acute, the base acute, the margins entire to irregularly crenate toward the apex, glabrous; stamens 48–53, 3–3.5 mm long, the filaments 2–2.5 mm long, free, the anthers oblong, ca. 1 mm long, laterally fissured, the connective prominently projecting, the apex obtuse. *Pistillate flowers* (immature): ca. 13 mm long; prophylls 2, born on the epipodia, covering the hypanthium and tepals, 7–8 mm long, elliptic, with stellate trichomes; epipodia ca. 6 mm up to 19–24 mm long in fruit, with stellate trichomes; tepals 5, white, unequal, 2–10 × 1.5–4 mm, elliptic, the apex obtuse, the margins irregularly sinuate toward the apex, the lower surface with stellate trichomes; ovary elliptic, 3–4 mm long, the styles 3, cylindric, spirally twisted, the stigma ca. 1 mm long, 2-branched with stigmatic papillae entirely covering the branches; placentae bilamellate with the ovules on both sides of the lamellae. *Capsules* hyaline, loosely velutinous, 9–10 × 14–18 mm, dehiscent on basal portion; styles persistent; prophylls deciduous; pericarp papyraceous; wings unequal, the largest wing 5–7 mm long, the upper and lower margins rounded, slightly ascendent, the smallest wing 3–4 mm long, crescent-shaped. *Seeds* oblong.

Distribution and ecology.—This species is endemic to the state of Rio de Janeiro (Fig. 2) where it grows on rocky slopes and outcrops within the Atlantic forest. Known only from the type collection. Flowering and fruiting in October.

Etymology.—The specific epithet refers to the type locality.

Begonia ibitiocensis is closely related to *B. santoslimae* Brade and *B. kuhlmannii* Brade, which share the same habitat (rocky slopes and outcrops) in different areas in Atlantic forest (Brade, 1943, 1945). *Begonia santoslimae* also has an indumentum composed of stellate trichomes and peltate leaf blades, but is easily distinguished by its thyrsoid inflorescence (vs. dichasial cymes) and larger capsules, 15–20 × 17–47 mm (vs. 9–10 × 14–18 mm). *Begonia kuhlmannii* differs from *B. ibitiocensis* in having basifixed leaf blades and capsule wings that are triangular and covered with stellate trichomes.

Acknowledgments

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