

Taxonomic notes on Iochrominae (Solanaceae: Physalideae) from Brazil

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Abstract: The subtribe Iochrominae (Solanaceae) is represented in Brazil by two species, both with broad morphological variation. No study focusing on this subtribe has been published for the country to date. Therefore, the aim of this study is to provide a taxonomic treatment for the Iochrominae occurring in Brazil. *Iochroma arborescens* is widely distributed across eastern Brazil, with a few collections reported from the Central-West region of the country; whereas *Vassobia breviflora* occurs in the subtropical zone of the country, mainly in the South region, but also with a few records from the Southeast region. Complete descriptions, illustrations, and distribution maps for the two species are presented here. Five lectotypes are also designated.

Keywords: *Acnistus*, biodiversity, flora, *Iochroma*, Solanoideae, *Vassobia*.

Resumo: A subtribo Iochrominae (Solanaceae) é representada no Brasil por duas espécies, ambas com ampla variação morfológica. Nenhum estudo focado nessa subtribo foi desenvolvido para esse país até a presente data. Portanto, o objetivo desse estudo foi desenvolver um tratamento taxonômico para os táxons de Iochrominae ocorrentes no Brasil. *Iochroma arborescens* é amplamente distribuída na porção leste do país, e poucos registros para a região Centro-Oeste; enquanto que, *Vassobia breviflora* ocorre na zona subtropical do Brasil; região Sul, poucas coletas registram essa espécie para a região Sudeste. Descrições completas, ilustrações e mapa de distribuição são apresentados. Adicionalmente, cinco novos lectótipos são aqui designados.

The subtribe Iochrominae Reveal (Solanaceae: Physalideae) includes ca. 34 species, traditionally distributed among six genera: *Acnistus* Schott, *Dunalia* Kunth, *Eriolarynx* (Hunz.) Hunz., *Iochroma* Benth., *Saracha* Ruiz & Pav., and *Vassobia* Rusby (Olmstead et al., 1999). Phylogenetic analyses revealed that the genera of Iochrominae needed to be recircumscribed (Smith & Baum, 2006; Olmstead et al., 2008;

Deanna et al., 2019). Shaw (2016) proposed to conserve the genus name *Iochroma* against *Acnistus*, which was approved (Wiersema et al., 2018), and therefore published the new combination *Iochroma arborescens* (L.) J.M.H.Shaw (Shaw, 2018a,b). D’Arcy (1989) proposed that the genus name *Trozelia* Raf. should be rejected against *Iochroma*, which was approved (Greuter et al., 1994). Only three genera should be recognized in this subtribe (Deanna et al., 2019), i.e., *Iochroma*, *Saracha*, and *Trozelia* (which is going

to be reestablished with a circumscription not including the type of *Ioichroma*), but all the new combinations are still not published (Deanna et al., in prep. 1919).

Most representatives of *Ioichrominae* occur in the Neotropics, mainly in South America, with greatest diversity in the Andes (Smith & Baum, 2006). The Flora do Brasil (2020) records two species of this subtribe in Brazil: *Ioichroma arborescens* and *Vassobia breviflora* (Sendtn.) Hunz. *Ioichroma arborescens* has been reported for Mexico, Guatemala, Nicaragua, Costa Rica, the Antilles [Cuba, Jamaica, Leeward Islands, Puerto Rico, Trinidad & Tobago, Virgin Islands, Windward Islands], Colombia, Venezuela, Ecuador, Peru, and Brazil; 27 synonyms are cited under this name (Hunziker, 1982), and four heterotypic synonyms are reported for Brazil: *Acnistus cauliflorus* (Jacq.) Schott [= *Cestrum cauliflorum* Jacq.], *Acnistus miersi* Dunal, *Acnistus plumieri* Miers (Stehmann et al., 2020), and *Solanum congestum* Vell. (Knapp et al., 2015). *Vassobia breviflora* is reported for Argentina, Bolivia, Brazil, Paraguay, and Uruguay (Hunziker, 1984, 2000); Hunziker (1984) cites 30 synonyms under this name, while Zuloaga et al. (2008) cite 28 synonyms. For both species, in this paper, we are treating only the taxonomic synonyms published as occurring in Brazil.

Sendtner (1846) described *Acnistus breviflorus* Sendtn., along with two varieties: *A. breviflorus* var. *glabratus* Sendtn. and *A. breviflorus* var. *spinescens* Sendtn., all three taxa occurring in Brazil. Dammer (1919) published three other names based on specimens from Brazil: *Acnistus bornmuelleri* Dammer, *A. ulei* Dammer, and *A. sellowii* Dammer; at the same time, he elevated *A. breviflorus* var. *glabratus* to species rank: *A. glabratus* (Sendtn.) Dammer. All these six taxa in *Acnistus* are considered synonyms of *Vassobia breviflora* (Hunziker, 1984; Zuloaga et al., 2008). However, Mentz & Soares (2020) did not list *A. breviflorus* var. *glabratus* as a synonym of *V. breviflora*.

Both Brazilian species of *Ioichrominae* display broad variation in the indumentum of the leaf surfaces and the color and size of the flowers. Despite Hunziker's (1982, 1984) contributions to our knowledge of *Acnistus* (now *Ioichroma*) and *Vassobia* [to be combined into *Saracha* (Deanna et al., in prep.)], some gaps remain, such as some typification issues. Due to the presence of

nine heterotypic names published as occurring in Brazil, the morphological variation among specimens, and the absence of taxonomic studies focusing on this subtribe in Brazil, we questioned whether there are more species/subspecies of *Ioichrominae* in this country than the number currently accepted. Therefore, the aim of this work is to study the genera *Ioichroma* and *Vassobia* in Brazil. All the names and type collections reported for the country were analyzed. Comprehensive descriptions and illustrations and a distribution map are presented, and five lecto-types are designated.

Methods

Our work is based on field expeditions, analysis of relevant historic and contemporary literature for *Ioichrominae* (i.e., Sendtner, 1846; Dammer, 1919; Hunziker, 1977, 1982, 1984, 2000; Smith & Baum, 2006; Soares et al., 2011; Shaw, 1998, 2016, 2018a,b; Moura et al., 2019; Deanna et al., 2019; Flora do Brazil, 2020), and examination of herbarium specimens. Morphological descriptions use the terminology of Hickey and King (2000). We visited the BOTU, F, MBM, MO, and NY herbaria. The websites The Global Plants Initiative (jstor.org) and REFLOA (reflora.jbrj.gov.br) were also consulted. According to Stafleu and Cowan (1976–1988), the type collections of Carl Lebrecht Udo Dammer are located at B [possibly destroyed], and those of Otto Sendtner might be in M, and also in other herbaria, e.g., B (herb. Koch), BM, BR, CGE, FI, G, GOET, K, L, LZ (dest.), ROST, S, W, and WRSL; the specimens available online and the curators of all the herbaria cited above were consulted in search of any extant original material. Stafleu and Cowan (1985) listed a number of herbaria that may hold further material of Sellow's collections; we contacted the curators of all those we did not visit (i.e., A, BM, BR, CGE, E, FI, G, HAL, K, KIEL, L, LD, LE, LISU, LZ, M, MW, PH, R, S, SGO, U, UPS, US, VT, W, and WU), even when online catalogues/databases were available. Finally, to obtain a more complete view of the distribution of *Ioichrominae* in Brazil, we also examined specimens in the speciesLink network (<http://www.splink.org.br/index?lang=pt>). Herbarium acronyms follow Thiers (2019, continuously updated).

Results

After carefully analyzing collections in the field and herbaria, literature for the genera, and the type collections, considering the names cited for Brazil, we agree with the synonymies presented by Hunziker (1982, 1984) and Zuloaga et al. (2008).

Therefore, in accordance with Flora do Brasil (2020), Iochromineae in Brazil is represented by two morphologically variable species, *Iochroma arborescens* and *Vassobia breviflora*. Regarding the latter, pending stabilization of the generic limits of subtribe Iochrominae, the name applied by Hunziker (1984) is used here.

Key to the species of iochrominae in Brazil

1. Thorny shrub or tree; leaf blades $2.5\text{--}9.5\text{--}(12.5) \times 1.7\text{--}4\text{--}(5)$ cm; inflorescences axillary, with (2–) 4–8 (–12) flowers per brachyblast; corolla lilac, pale lilac, rarely white *Vassobia breviflora*
1. Unarmed shrub or tree; leaf blades $6\text{--}27 \times 3\text{--}10$ cm; inflorescences ramiflorous, with ca. 15–35 flowers per brachyblast; corolla pale yellow, greenish, or white *Iochroma arborescens*

***Iochroma arborescens* (L.) J.M.H.Shaw.** *Plantsman*, n.s. 17(3): 200 (2018). *Atropa arborescens* L. Cent. Pl. II: 10 (1756). *Lycium arborescens* (L.) Spreng. Syst. Veg. [Sprengel] 1: 701 (1824 [1825]). *Acnistus arborescens* (L.) Schltld. Linnaea 7: 67. 1832. *Pederlea arborescens* (L.) Raf. Sylva Tellur.: 54 (1838). *Dunalia arborescens* (L.) Sleumer Lilloa 23: 124 (1950).—Type: “Belladonna frutescens, flore albo, nicotianae foliis,” [Icon in] Plumier, Pl. Amer. 2: pl. 46, fig. 1. (1756 [8 Feb. 1756]) (lectotype, designated by Moura et al. [2019: 235]).

Solanum congestum Vell., Fl. Flumin.: 82 (1825 [1829]).—Type: Brazil, [Rio de Janeiro]: “Campis apricis habitat”; [illustration] Original parchment plate of Flora Fluminensis in the Manuscript Section of the Biblioteca Nacional, Rio de Janeiro [cat. no.: mss1198651_093] and later published in Vellozo, Fl. Flumin. Icon. 2: t. 90. (1827[1831]) (lectotype, designated by Knapp et al. [2015: 828]).

Acnistus miersii Dunal Prodr. 13(1): 497 (1852). —Type: Brazil, 1832, *J. Lhotsky s.n.* (lectotype, designated by Hunziker [1982: 87]; G-DC [housed at G]; **lectotype, second step, here designated:** G barcode G00200565 [image!]; isolectotype: G barcode G00200566 [image!]).—Remaining syntypes: Brazil, Rio de Janeiro, *M. Gaudichaud 510* (P barcode P00410297 [image!]; P barcode P00410304 [image!], MPU barcode MPU023026 [image!]).

Shrubs 2–3 m tall [Lima et al. 2 (NY); Eiten & Eiten 7207, 7890 (NY)] or trees 3–7 m tall [Bianchini et al. 1373 (NY); Mexia 4450, 5027 (NY)]; stems pubescent with simple erect trichomes when young, glabrescent with age. Petiole 1–3 cm long, pubescent; leaf blade elliptic, $6\text{--}27 \times 3\text{--}10$ cm, attenuate or shortly attenuate at base, acute or acuminate at apex, glabrescent to tomentose on both surfaces (especially in young

leaves), when tomentose, more densely so abaxially. Inflorescence ramiflorous, fasciculate, with ca. 15–35 flowers per brachyblast; pedicels 1–2 cm long, glabrescent to tomentose. Flowers ca. 1–2 cm long, aromatic [Bianchini et al. 1373 (NY)]; calyx pale green [Nascimento & da Silva 317 (NY)], 3–4 mm long, glabrous or tomentose, teeth 1–1.4 mm long; corolla campanulate, 8–10 mm long, pale yellowish green, almost white [Lindeman & de Hass 2631 (NY)], cream [Paixão et al. 78 (NY); Bianchini et al. 1373 (NY)], yellow-cream [Sobral & dos Santos 5463 (NY)], or white [Silva et al. 09 (NY); Nascimento & da Silva 317 (NY)]; corolla lobes 5, connate about 60–70% of their length, pubescent at apex; stamens 5, filaments free, ca. 7 mm long, white [Nascimento & da Silva 317 (NY)], glabrous, adnate to corolla, anthers ca. 2 mm long, longitudinally dehiscent, basifixed, yellow [Nascimento & da Silva 317 (NY)], glabrous; gynoecium ca. 10 mm long, ovary glabrous, ca. 2×1 mm, style ca. 8 mm long, glabrous, stigma peltate, dark [Nascimento & da Silva 317 (NY)], carpels 2, ovules numerous. Fruit a berry, globose, ca. 5×5 mm, green when immature [Nascimento & da Silva 317 (NY)], light orange when ripe, the calyx persistent; seeds numerous, flattened-discoid, about 1×1.5 mm. (Figs. 1 & 2A.)

Distribution.—This species is widely distributed across the Neotropics. In Brazil it is frequent in the East region, with fewer reports in the Central-West region of the country (Fig. 3). It occurs in various environments: dense ombrophilous montane forest [Borges 354 (NY)]; deciduous-semideciduous forest transition [Cervi et al. 7403 (NY)], disturbed areas [Thomas et al. 13,014 (NY)]; edge of forest [Sobral & dos Santos



FIG. 1. *Iochroma arborescens*. A. Branch with leaves and flowers. B. Indumentum on abaxial surface of leaf. C. Indumentum on adaxial surface of leaf. D. Flower. E. Flower with calyx removed and corolla opened out. F. Fruits. [A–C from Hage & Brito 1424 (MO); D and E from Hatschbach & Zelma 49,846 (MO); F from Agra et al. 5018 (MO). Illustration by Barbara Alongi.]

(NY)]; moist forest [Paixão et al. 78 (NY)]; secondary forest [Amorim et al. 3798 (NY); Rosa & Pires 3797 (NY)]; mature secondary forest [Cervi 6289 (NY)]; rupicolous areas in open forest [Araújo 1205 (NY)]; roadside [Eiten & Eiten 7890 (NY); Rossi & de Barros 709 (NY)].

Phenology.—Flowers and fruits reported throughout the year.

Additional specimens examined.—**BRAZIL.** Alagoas: Mun.

Murici: Serra do Ouro, 25 Mar 1999 [fr], K. M. Ferreira et al. 6 (NY). Mun. Quebrangulo: Reserva Biológica de Pedra Talhada, 7 Mar 1994 (fl.), A. Cervi et al. 7403 (MO, NY). **Bahia:** Mun. Barra do Choça: estrada que liga Barra do Choça à Faz. Roda d'água (Rio Catolé), 3–6 km a E de Barra do Choça, 22 Nov 1978 [fr], S. A. Mori et al. 11,310 (NY). Mun. Camacan: RPPN Serra Bonita, 9.7 km de Camacan na estrada para Jacareci, 6 km SW na estrada para RPPN e torre da Embratel, 9 Dec 2006, R. A. X. Borges et al. 345 (NY); Serra Bonita (Serra da Torre), 10 km N of mun. Camacan on road to Jacareci, then 6.2 km. W on road to transmission towers, 2 Aug 2002 [fr], W. W. Thomas et al. 13,014 (MO, NY). Mun. Ilhéus: Reserva do CEPEC, Mar 1987 [fl], M. Sobral & E. B. dos Santos 5463 (NY); área do CEPEC, km 22 da Rodovia Ilhéus/Itabuna (BR 415), 18



FIG. 2. Species of Iochrominae (Physalideae, Solanaceae) occurring in Brazil. **A.** *Iochroma arborescens*. **B–G.** *Vassobia breviflora*. **B.** Immature fruits. **C.** Flowers. **D–G.** Variation in color of corolla. [Vouchers: Orejuela & Castillo 2697, E, USM (A); Deanna & Wheeler 441, CORD (B); Moura 1226, BOTU (C, G); Campos & Moura 68, BOTU (D–E). Photos by Andres Orejuela (A), Rocío Deanna (B, F), Renan P. Campos (C, G), and T. M. Moura (D, E).]



FIG. 3. Distribution of Iochrominae (Solanaceae: Physalideae) in Brazil. Map plotted using QGIS. Lighter shaded areas 761–2274 m elevation; darker areas 752–761 m elevation.

Nov 1988 [fl], *J. L. Paixão et al.* 78 (NY); *ibid.*, 16 Oct 1980 [fr], *J. L. Hage* 323 (NY); *ibid.*, 4 Mar 1981 [fr], *J. L. Hage et al.* 506 (MO, NY); *ibid.*, 15 Jul 1986 [fl], *J. L. Hage & E. B. dos Santos* 2089 (NY); *ibid.*, 7 Oct 1981 [fl], *J. L. Hage & H. S. Brito* 1424 (MO). Mun. Jussari: Rod. Jussari/Palmira, entrada ca. 7.5 km da sede do município, Fazenda Teimoso, 1.5 km E da entrada, RPPN, 23 Apr 1999 [fl], *J. G. Jardim et al.* 2100 (NY); Experimental Station, near Itabuna, 11 Jul 1964 [fl], *N. T. Silva* 58,362 (NY); RPPN Serra do Teimoso, Rodovia Jussari-Palmeira, entra ca. 7.5 km de Jussari, Fazenda Teimoso, 17 Jul 2003 [fr], *A. M. Amorim et al.* 3798 (NY). Mun. Una: ramal para a repetidora da embratel, entrada no km 53 do trecho Buerarema/Camacã (BR 101), lado direito, 28 Sep 1979 [fr], *J. L. Hage & L. A. M. Silva* 315 (NY). **Ceará:** Mun. Meruoca: Sítio Stº Antônio, 25 Feb 1981 [fr], *A. Fernandes & P. Martins s.n.* (NY). **Distrito Federal:** Brasília, 26 Jul 1990, *L. B. Blanchetii* 889 (BOTU). **Minas Gerais:** Distrito Ilheu, Fazenda das Tabunha, 31 Aug 1930 [fl], *Y. Mexia* 5027 (MO, NY). Mun. Rio Preto: perto do Rio do

Funil, em frente a gruta do funil, 2 Nov 1967 [fr], *J. P. P. Carauta* 474 (MO). Mun. Viçosa: road to Silvestre, about halfway, 10 Mar 1930 [fl], *Y. Mexia* 4450 (MO, NY); Fazenda da Creciuma, 23 Oct 1930 [fr], *Y. Mexia* 5209 (MO, NY). **Paraíba:** Mun. Maturéia, Pico do Jabre, 800-1010m, 12 Jul 1997 [fr], *M. F. Agra et al.* 4026 (MO); *ibid.*, 20–23 Dec 1997 [fl], *M. F. Agra et al.* 4413 (MO); *ibid.*, 18–21 Jan 1998 [fr], *M. F. Agra et al.* 4675 (MO); *ibid.*, 18–21 Jan 1998 [fl], *M. F. Agra et al.* 4763 (MO); *ibid.*, 7–10 Feb 1998 [fr], *M. F. Agra et al.* 5018 (MO). **Paraná:** Mun. Antonina: ca. 5 km W of Antonina, without date [fl], *J. C. Lindeman & J. H. de Haas* 2631 (NY); Porto das Moças, 25 Sep 1985 [fl], *G. Hatschbach* 49,846 & *F. J. Zelma* (MO). Mun. Guaraqueçaba: Reserva Ecológica O'boticário, Salto Morato, 26 Oct 1997 [fr], *A. C. Cervi* 6289 (NY). Mun. Morretes: 11 Sep 1909 [fl], *P. Dusén* 8817 (NY). **Pernambuco:** Brejo da Madre de Deus, 19 Jan 2000 [fl], *L. M. Nascimento & A. G. da Silva* 317 (NY). **Rio de Janeiro:** Mun. Barra do Piraí: estrada entre Barra do Piraí e Vassouras, margem esquerda do

Rio Paraíba, 9 Apr 1980 [fl], *E. de S. F. da Rocha* 30 (MO); Ilha dos Amores do Itapá a Country Clube, no Rio Paraíba do Sul, 7 Nov 1984 [fr], *J. Carauta et al.* 4976 (MO); estrada que liga Barra do Pirai a Vassouras, Margem direita do Rio Paraíba do Sul, 9 Apr 1980 [buds], *D. S. Souza* 26 (MO). Mun. Guanabara: Jacarépaguá, represa do Comarim, 1 Oct 1958 [fl], *E. D. Pereira et al.* 4352 (NY); Pedra Branca, 1020m, 20 Nov 1964 [fl], *J. P. P. Carauta* 232 (MO). Mun. Magé: praia de Piedade, 16 Sep 1976 (fl, fr), *D. Araujo* 1205 (NY); on mountainside along highway south of Teresópolis, where road crosses the canyon, “Grota do Inferno” in its upper level, 24 Apr 1966 [fl], *G. Eiten & L. T. Eiten* 7205 (NY). Mun. Nova Friburgo: Nova Friburgo, Sep 1946 [fl], *J. Eugenio Leite* 4167 (NY); Barracão dos Mendes, km 40 da Rodovia Teresópolis-Nova Friburgo, 8 Nov 1979 [fr], *C. M. S. Lira* 109 (MO). Mun. Rio Claro: 5.4 k along road south of village of Lidice, 22 Nov 1966 [fr], *G. Eiten & L. T. Eiten* 7890 (MO, NY). Mun. Rio de Janeiro: Engenheiro Passos (vila), margem da Barragem de Saracuruna, 24 Jul 2000 [fl], *W. G. Lima et al.* 2 (NY). Mun. Valença: à margem do Rio Paraíba, 5 Sep 1979 [fl], *J. P. P. Carauta s.n.* (MO). Mun. Volta Redonda: Santa Cecília, Reserva Florestal da Companhia Siderúrgica Nacional, 6 Nov 1984 [fr], *J. Carauta et al.* 4937 (MO). **Rio Grande do Sul:** Mun. Porto Alegre: Ponta Grossa, 29 Nov 2004 [fl, fr], *E. L. C. Soares* 40 (ICN: image). Mun. Tapes: rod. BR-16, 39 Sep 1990 [fl], *J. A. Jarenkow* 1715 (MBM). **Santa Catarina:** Mun. Gaspar: ao lado da estrada, 14 Oct 1954 [fl, fr], *Reitz & Klein* 2172 (NY). **São Paulo:** Mun. Campos do Jordão: Parque Estadual do Instituto Florestal, Região do “paiol”, 9 Nov 1984 [fl, fr], *J. P. M. Carvalho & M. J. Robin s.n.* (NY). Mun. Caraguatatuba: Parque Estadual da Serra do Mar, Núcleo Caraguatatuba, caminho para a trilha da Mococa, 11 Aug 2000 [fl], *R. S. Bianchini et al.* 1373 (NY). Mun. Jacareí: Mata de Escola Técnica Agrícola “Cônego José Bento”, 28 Nov 1985 [fl], *D. S. Silva et al.* 09 (NY). Mun. Miracatu: Beira da estrada BR-116, 14 Sep 1990 [fl], *L. Rossi & F. de Barros* 709 (NY). Mun. São Paulo: Jardim Botânico e Parque do Estado, 13 Oct 1970 [fl], *F. de Oliveira* 10 (NY); Reserva do Instituto de Botânica de São Paulo, 17 Nov 1980 [fl], *N. A. Rosa & J. M. Pires* 3797 (NY).

PERU. Cajamarca: San Ignacio, Distrito de San Ignacio, Las Huaquillas, 3 Feb 2017 [fr], *A. Orejuela & J. Castillo* 2697, (E, USM).

Hunziker (1982) commented that he studied the syntypes of *A. miersii* and designated the specimen collected by Lhotsky and hosted in G as the lectotype for the name. Nevertheless, a second-step lectotypification is necessary, due to the presence in G of two, apparently duplicate specimens of the same gathering. Both specimens are informative, but G00200565, which has several mature leaves, and a number of inflorescences, buds, and flowers, was preferred due to its better state of preservation.

Although Stehmann et al. (2020) cited *Cestrum cauliflorum* Jacq. [*Acnistus cauliflorus* (Jacq.) Schott] as a heterotypic synonym of *Iochroma arborescens* in Brazil, we did not locate any reference citing these names for Brazil. Therefore, we are not considering them in this work.

Iochroma arborescens is easily distinguished from the other Brazilian Iochromineae representative by the cauliflorous inflorescences and white (–ish) flowers [versus inflorescences axillary and purple, pale purple, rarely white (–ish) corolla in *Vassobia breviflora*]. Moreover, *V. breviflora* is thorny, while *I. arborescens* is not; and the former occurs only in subtropical Brazil, while *I. arborescens* has a broader distribution.

***Vassobia breviflora* (Sendtn.) Hunz. Kurtziana 10: 23. 1977. *Acnistus breviflorus* Sendtn. Flora Bras. (Martius) 10: 152 (1846). *Dunalia breviflora* (Sendtn.) Sleumer, Lilloa 23: 126 (1950).—Type: Brazil [“in Brasilia australiore cum varietatibus: Sellow B”], Sellow 170 (lectotype, here designated: U barcode U0006787 [image!]).—Remaining syntypes: Brazil, Sellow 34 (G barcode G00446758 [image!]); Brazil, Sellow 34 (B [destroyed, F photo neg. 2483!], W barcode 1889–0167560 [image!], UPS accession V-104032 [image!]).**

Acnistus breviflorus var. *glabratus* Sendtn., Fl. Bras. (Martius) 10: 152 (1846). *Acnistus glabratus* (Sendtn.) Dammer., Repert. Spec. Nov. Regni Veg. 15: 388 (1919). *Dunalia breviflora* var. *glabrata* (Sendtn.) Sleumer, Lilloa 23: 131 (1950).—Type: Brazil [“in Brasilia australiore cum varietatibus: Sellow B”], Sellow s.n. (lectotype, here designated: G barcode G00343535 [image!]).—Remaining syntypes: Sellow 263 (B [destroyed, F photo neg. 2488!], F cat. no. 619289 [image!], fragment mounted with photo neg. 2488!).

Acnistus breviflorus var. *spinescens* Sendtn., Fl. Bras. (Martius) 10: 152 (1846).—Type: Brazil [“in Brasilia australiore cum varietatibus: Sellow B”], Sellow 63 (lectotype, designated by Hunziker [1984: 97]: L barcode L0003576 [image!]).—Remaining syntypes: Brazil, Sellow 3741 (B [destroyed, F photo neg. 2496!, 2497!]); Brazil, Sellow s.n. (K barcode K000585928 [image!]).

Acnistus bornmulleri Dammer, Repert. Spec. Nov. Regni Veg. 15: 391 (1919).—Type: Brazil, Rio Grande do Sul, Oct. 1904, A. Bornmüller 323 (lectotype, first step designated by Hunziker [1984: 98]; lectotype, second step here designated: GH barcode GH00076910 [image!]; isoclectotypes: A [image!], K [n.v.], G [n.v.]).

Acnistus sellowii (1919) (as ‘sellowi’).—Type: Brazil [“Brasilia meridionalis”], Sellow 3741 (B [destroyed]). Nom. superfl. illeg.

Acnistus ulei Dammer, Repert. Spec. Nov. Regni Veg. 15: 392 (1919).—Type: Brazil, Santa Catarina: am Flussufer bei Tubarão, Jan 1889, E. Ule 1010 (holotype: B [destroyed, F photo neg. 2498!]); lectotype, here designated: CORD barcode CORD00003901 [image!]; isoclectotypes: F cat. no. 619277 [image!], fragment mounted with photo neg.

2498], HBG barcode HBG-511313 [image!], HBG barcode HBG-511314 [image!], US barcode 00385975 [image!].

Thorny shrubs [*Hatschbach* 45,517 (MO)] or trees, ca. 1.5–3 m tall [*Hatschbach* 22,767 (MO); *Smith & Klein* 7903 (MO)]; thorns 0.8–1.2(–1.5) cm × ca. 2 mm at base [reported to be up to 4 cm long; *Handro* 2331 (MO)]; stems when young slightly sulcate, pubescent, with simple erect trichomes (sparse or dense), becoming denser towards apex, usually glabrescent. Petiole 1–2 cm long, glabrous or pubescent with erect trichomes; leaf blade elliptic to obovate, 2.5–9.5(–12.5) × 1.7–4(–5) cm, attenuate to acute at base, rounded, acute, acuminate or cuspidate at apex, glabrous or both surfaces with erect trichomes, denser abaxially (especially in young leaves). Inflorescence axillary, fasciculate, with (2)–4–8(–12) flowers per brachyblast; pedicel 1.5–3 cm long in flower, (1.5–)2.5–3(–4) cm long in fruit, with sparse erect trichomes, sometimes glabrescent. Flowers 0.6–1.1(–1.5) cm long; calyx green, 2–5 mm long, with erect trichomes, sometimes glabrescent, teeth 5, ca. 1 mm long; corolla campanulate, 8–9(–12) mm long, lilac [*Hatschbach* 22,767, 45,517, 47,100 (MO); pers. obs.], dark vinaceous [*Handro* 2331 (MO)], pale lilac, or rarely white [*Krapovickas & Cristóbal* 44,706 (NY)] or whitish [pers. obs.]; corolla lobes 5(–6), fused about 1/2 to 2/3 of the corolla length, pubescent at apex; stamens 5(–6), filaments free, 1.5–3 mm long, glabrous, adnate to corolla, anthers 2–3 mm long, longitudinally dehiscent, basifixed, glabrous; gynoecium 8–10 mm long, ovary globose, glabrous, 1.5–3 × ca. 2 mm, style 5–6 mm long, white, glabrous, stigma green, carpels 2, ovules numerous. Fruit a berry, globose, 5–7(–10) × 5–7(–8) mm, green when immature, yellowish turning reddish to purplish when mature, the calyx persistent; seeds numerous, flattened-discoid, ca. 1 × 1 mm. (Figs. 2 B–G & 4).

Distribution.—*Vassobia breviflora* occurs in Bolivia, Paraguay, Brazil, Uruguay, and Argentina (Hunziker 1984). In Brazil, the species occurs in São Paulo, Paraná, Santa Catarina, and Rio Grande do Sul states (Fig. 3). It is reported from open and disturbed areas: forest glade [*Hatschbach* 17,349 (F); *Hatschbach* 47,100 (MO)], forest grove [*Kummrow* 147 (MO)], roadsides [*Wasum* 1157 (MO)], and open field [*Smith & Klein* 7903 (MO)].

Phenology.—Flowers have been recorded from August to March, and fruits from October to March.

Additional specimens examined.—**ARGENTINA.**

Misiones: General Manuel Belgrano, en las afueras de Bernardo de Yrigoyen, 804 m, 24 Oct 2019 [fl, fr], *R. Deanna & L. Wheeler* 441 (DORD).

BRAZIL. Paraná: Mun. Balsa Nova: Balsa Nova, 21 Nov 1915 [fl], *P. Dusén* 17,158 (MO, NY). Mun. Bocaina do Sul: Rio Putunã, 31 Oct 1969 [fl], *G. Hatschbach* 22,767 (MBM, MO, NY). Mun. Campina do Simão: Reserva ecológica municipal, 22 Mar 2019 [veg], *T. M. Moura* 1233 (BOTU). Mun. Campina Grande Sul Paraná: Sítio do Belizário, 6 Oct 1967 [fl], *G. Hatschbach* 17,349 (F, MBM). Mun. Curitiba: Bom Retiro, 22 Aug 1997 [fl], *G. Hatschbach* 40,221 (MBM, NY); Curitiba, Parque Barigui, 19 Nov 1973 [fl], *R. Kummrow* 147 (MBM, MO); ibid. 3 Oct 1995 [fl], *D. J. S. Carrião & V. A. O. Dittrich* 26,098 (NY); Curitiba, Parque Iguacu, 23 Sep 1982 [fl], *R. Kummrow* 2039 (NY); Curitiba, Parque Náutico, 9 Feb 1983 [fl], *G. Hatschbach* 47,100 (MBM, MO). Mun. Guarapuava: Guarapuava, Unicentro – campus CEDETEG, 20 Mar 2019 [fr], *T. M. Moura* 1226 (BOTU); Rio Cavernoso, 1000 m, 15 Dec 1965 [fr], *Reitz & Klein* 17,749 (NY). Mun. Itaperuçu: 17 Nov 1908 [fl], *P. Dusén* 7168 (MO, NY). Mun. Pitanga: PCH Itaguaçu, rio Pitanga, 9 Nov 2016 [fl], *J. M. Silva et al.* 9394 (MBM). Mun. Ponta Grossa: Ponta Grossa, 2 Nov 1928 [fl], *F. C. Hoehne s.n.* (F). Mun. São Mateus do Sul: Mina de Xisto, Lago Sul, 8 Nov 2005 [fr], *R. Wasum et al.* 3219 (MBM). Mun. Turvo: Estação Ecológica Rio Bonito, 17 Mar 2019 [fl, fr], *R. P. Campos & T. M. Moura* 68 (BOTU); Turvo, 17 Sep 2012 [fl], *E. D. Lozano et al.* 1038 (MBM). **Rio Grande do Sul:** Mun. Agudo: Agudo, 80m, 27 Dec 1994 [fl], *R. Wasum et al.* 10,372 (NY). Mun. Capela de Santana: Pareci Velho, 7 Oct 1949 [fl], *B. Rambo* 43,835 (MO). Mun. Encruzilhada do Sul: estrada para Amaral Ferrador, 22 Jan 1994 [fl], *J. R. Stehmann et al.* 1357 (NY). Mun. Esteio: Esteio para São Leopoldo, 25 Oct 1950 [fl], *B. Rambo* 49,029 (MO). Mun. Farroupilha: São Roque, 12 Oct 1988 [fl], *M. Rossato et al.* 4636 (MBM, MO, NY). Mun. Porto Alegre: Morro Santana-Campus Alegre, 24 Oct 1995 [fl], *M. Ritter* 871 (F). Mun. São Francisco de Paula: à 11 km, caminho a Taquara, 29 Jan 1994 [fl], *A. Krapovickas & C. L. Cristóbal* 44,706 (NY); São Francisco de Paula, estrada para Taquara, 13 Oct 2001 [fl], *R. Wasum* 1175 (MBM, MO); São Francisco de Paula, 29 Oct 1994 [fl], *R. Wasum et al.* 10,241 (MBM, MO, NY) [specimen with glabrescent leaves]. Mun. São Leopoldo: Jacaré, 7 Dec 1948 [fr], *B. Rambo* 38,592 (F). Mun. Pelotas: Pelotas, Horto Botânico, 29 Oct 1954 [fl] *J. C. Sacco* 210 (F, NY) [specimen with glabrescent leaves]. **Santa Catarina:** Mun. Águas de Chapecó: forest, near Águas de Chapecó, 15 Oct 1964 [fl], *L. B. Smith & Pe. R. Reitz* 12,561 (MO). Mun. Bom Retiro: Pinheiral, Campina, Riozinho, 24 Nov 1956 [fl], *L. B. Smith & R. Klein* 7903 (MO); Barracão, 27 Oct 1957 [fl], *P. R. Reitz & R. Klein* 5524 (NY); Riosinho, 23 Dec 1948 [fr], *P. R. Reitz* 2754 (NY). Mun. Ipumirim: 19 km south of Rio Irani, 450–550m, 9 Dec 1964 [fl, fr], *L. B. Smith & R. M. Klein* 13,926 (NY) [specimen with glabrescent leaves]. Mun. Papanduva: Serra do Espigão, 1000m, 24 Oct 1962 [fl], *Reitz & Klein* 13,411 (NY) [specimen with glabrescent leaves]. Mun. São Joaquim: Passo da Cadeia, 1000 m, 4 Feb 1963 [fl, fr], *P. R. Reitz* 6704 (NY). **São Paulo:** Mun. São Paulo: São Paulo, Água Funda, nativa no Jardim Botânico, 15 Oct 1985 [fl, fr], *O. Handro* 2331 (MBM, MO, NY); São Paulo, nativa no Jardim

Botânico e Parque do Estado, 24 Sep 1974 [fl], *J. S. Silva* 345 (F, NY); São Paulo, Reserva Biológica do Parque Estadual das Fontes do Ipiranga, 25 Nov 1981 [fr], *M. R. F. Melo* 215 (NY); São Paulo, Reserva Estadual das Fontes do Ipiranga, 26 Aug 1982 [fl, fr], *J. S. Silva* 706 (NY).

Sendtner (1846) stated “*in Brasilia australiore cum varietatibus: Sellow B*”, referring to *Acnistus breviflorus* and its two varieties: *A. breviflorus* var. *glabrata* and *A. breviflorus* var. *spinescens*.

Thus, the types of all three taxa are Sellow collections from southern Brazil. Six specimens collected by Sellow with thorny stems and pubescent leaves, apparently representing three or more gatherings, were located on the Global Plants Initiative (JSTOR) website or in correspondence with curators: *Sellow* 34 (G), *Sellow* 63 (L), *Sellow* 170 (U). and *Sellow* s.n. (K, UPS, W).

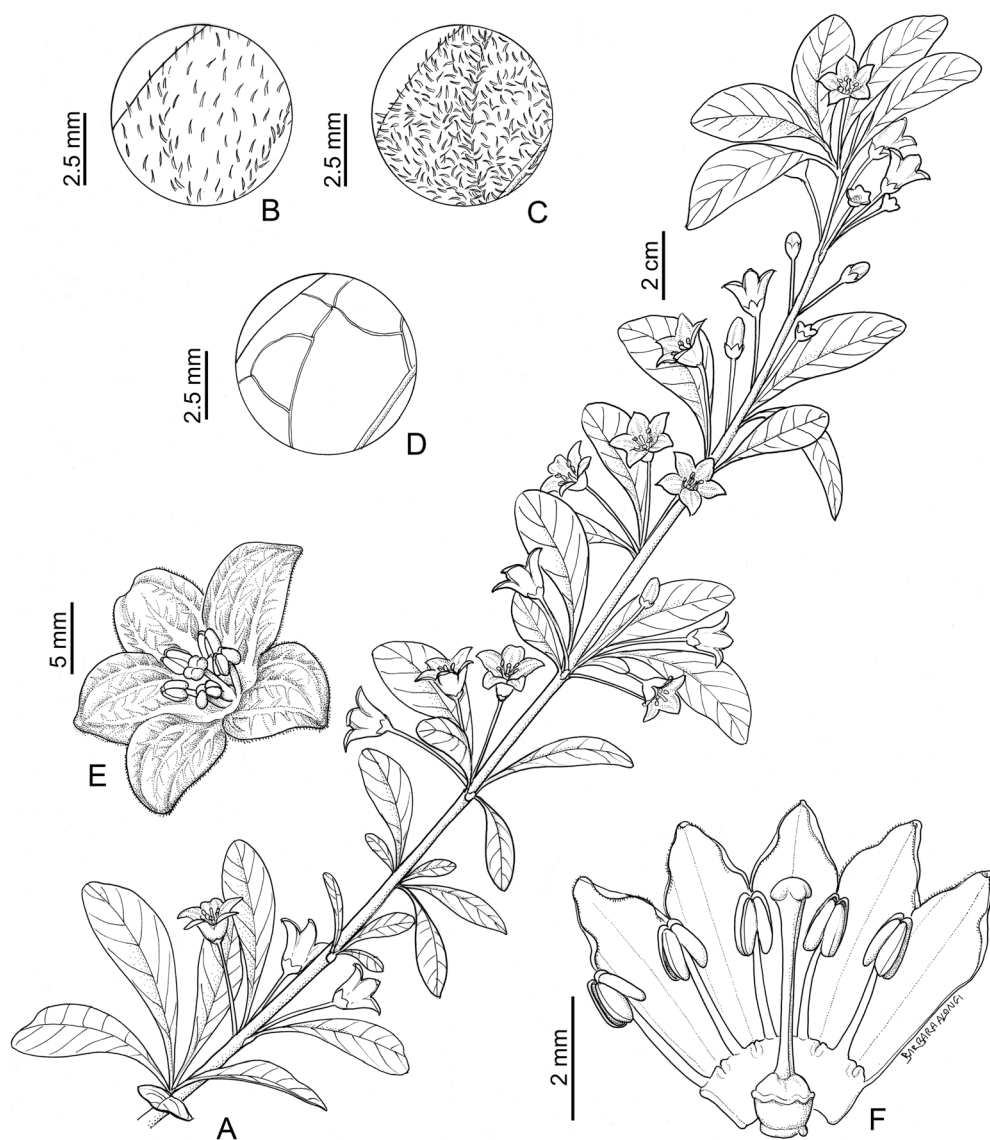


FIG. 4. *Vassobia breviflora*. A. Branch with leaves and flowers. B. Indumentum on adaxial surface of a pilose leaf. C. Indumentum on abaxial surface of a pilose leaf. D. Abaxial surface of a glabrous leaf. E. Flower. F. Flower with calyx removed and corolla opened out, detailing androecium and gynoecium. [Vouchers: *Hatschbach* 22,767, MO and 47,100, MO (A–C, E, F); *Wasum et al.* 10,241, MO (D). Illustration by Barbara Alongi.]

Two other *Sellow* specimens with glabrescent leaves were located: *Sellow* 263 (F) and *Sellow* s.n. (G). Handwriting appears on most of these specimens but fails to match that of Otto Sendtner (Rogensburg 1976: 419). The writing is nevertheless the same as that in the images (F photo negatives 2483, 2488, 2496, and 2497) of the destroyed specimens formerly housed at B, which were presumably examined by Sendtner. We therefore assume that all these specimens are duplicates of gatherings examined by Sendtner and distributed from B, and that consequently they are original material for the three names.

Among the specimens with thorny stems and pubescent leaves in G, UPS, W, and U [see comments below about specimens at K and L], we consider the one deposited at U as the most informative (due to presence of several leaves, flowers, and thorns on the stems); therefore, we selected it as the lectotype of *Acnistus breviflorus*.

The specimens housed at K and at L are annotated by hand as “*Acnistus breviflorus* Sendtn. γ *spinescens*”, and Hunziker (1984) designated the L duplicate as neotype for *A. breviflorus* var. *spinescens*. Following Art. 9.10 of the Code, we are correcting the term “neotype” to “lectotype” because we consider both specimens to be original material.

Although the glabrescent-leaved specimens at F and G have neither the annotation “ γ *glabratus*” nor O. Sendtner’s handwriting, they are the only two *Sellow* specimens located that are morphologically compatible with the description of *A. breviflorus* var. *glabratus*. As the specimen at F consists of only fragments (a branch with leaves ca. 4 cm long), we are selecting the specimen at G as the lectotype for the variety.

In the protologue of *Acnistus bornmulleri*, Dammer (1919) cited two syntypes: “Brazil, Rio Grande do Sul, Alfred Bornmüller 323”, and “Paraguay, K. Fiebrig”. Hunziker (1984) selected the Brazilian gathering as lectotype but failed to designate a single specimen from among cited duplicates at K, G, and GH, thus necessitating a second-step lectotypification. We have seen only two duplicates of this collection, at A and GH. As the one from GH was among those cited by Hunziker (1984) and is a more complete and morphologically informative specimen, we selected it as lectotype.

In the protologue of *Acnistus sellowii*, Dammer (1919) cited the gathering “*Brasilia meridionali*,

Sellow no. 3741”. Although the photographic negative at F [no. 2496, barcode F0BN002496], was annotated by Dammer as *Acnistus sellowii*, the specimen depicted is from the destroyed Berlin type gathering of *Acnistus breviflorus* var. *spinescens*, which makes *A. sellowii* a superfluous and illegitimate name [Arts. 52.1 and 52.2, Turland et al. (2018)].

In the protologue of *Acnistus ulei*, Dammer (1919) cited the gathering “*Brasilia: Sta. Catharina am Flussufer bei Tubarao m. Jan. 1889 leg. E. Ule no 1010*”; and since Dammer’s work, as its title implies, was based on specimens in the Berlin Herbarium, the destroyed duplicate formerly housed at B was the holotype for the name. We located existing duplicates of *Ule 1010* at CORD, F, HBG (two sheets), and US. Apart from the specimen at F, which is an uninformative fragment, the other four specimens conform to the protologue. We therefore selected the specimen at CORD as the lectotype, because it is the most informative, due to the presence of thorns, which although they were not mentioned in the protologue are characteristic of the species (although not seen in Fig. 4). Due to the uneven distribution of the thorns on the branches, they are frequently not found on individual specimens.

Mentz & Soares (2020), following Hunziker (1984) and Zuloaga et al. (2008), cited *Acnistus lycioides* Dammer, *A. mollis* Dammer, and *A. parviflorus* Griseb. as synonyms of *Vassobia breviflora*. However, the first two names were based on material from Paraguay, and the third from material from Argentina. We have not located any reference applying these names to Brazilian material.

The density of trichomes on the leaf blade surfaces, the main characteristic upon which Sendtner based his two varieties, is remarkably variable among specimens of *Vassobia breviflora*, ranging from glabrous/glabrescent to densely pilose, and is similarly variable in some other representatives of the subtribe, including *Lochroma arborescens*. Moreover, we noticed that even the glabrous/glabrescent specimens have pubescent young leaves and buds; therefore, we assume that the trichomes are caducous in some specimens. As such, we find no basis to reestablish the varieties of *V. breviflora*. However, as suggested to us by Dr. Michael Nee, outstanding authority on Neotropical Solanaceae, a

thorough analysis of morphological variation across the entire range of *Vassobia breviflora* is needed to better assess its circumscription.

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