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# Four of Queens: Shuffling New Barbacenia from Brazil (Velloziaceae)

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## **Four of Queens: Shuffling New *Barbacenia* from Brazil (Velloziaceae)**

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## Four of Queens: Shuffling New *Barbacenia* from Brazil (Velloziaceae)

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**ABSTRACT.** Four new species of *Barbacenia* Vand. (Velloziaceae) from Bahia and Minas Gerais, Brazil, are described. *Barbacenia piranga* Mello-Silva, *B. serracabrlea* Mello-Silva, *B. tuba* Mello-Silva & N. L. Menezes, and *B. vellozioides* Mello-Silva combine characteristics ascribed to *Aylthonia* N. L. Menezes and *Pleurostima* Raf., which have been split from *Barbacenia* s.l. *Barbacenia serracabrlea* shares leaf trichomes similar to those of *Aylthonia*, the anther insertion and stigmas of *Pleurostima*, and fruits similar to those of *Barbacenia*. *Barbacenia piranga* and *B. tuba* show tristichous phyllotaxis, serrulate leaf margins and basifixed anthers that would fit *Pleurostima*, but the long hypanthial tube, short apical, confluent stigmas lobes, and the loculicidal capsules of *B. tuba* correspond to those seen in *Aylthonia*. In *B. vellozioides*, the basifixed anthers and lateral stigma lobes would suggest placement in *Pleurostima*. Nevertheless, its capsule is not dehiscent by many intercostal openings, as in *Pleurostima*, but rather by apical pores. For these reasons, beyond obscuring the alleged distinctions among these three genera, these four are new entities. They are special also for their beauty and rarity.

**RESUMO.** São descritas quatro espécies novas de *Barbacenia* Vand. (Velloziaceae), da Bahia e de Minas Gerais, Brasil. *Barbacenia piranga* Mello-Silva, *B. serracabrlea* Mello-Silva, *B. tuba* Mello-Silva & N. L. Menezes, and *B. vellozioides* Mello-Silva combinam características atribuídas aos gêneros *Aylthonia* N. L. Menezes e *Pleurostima* Raf., desmembrados de *Barbacenia* s.l. *Barbacenia serracabrlea* agrega tricomas foliares de *Aylthonia*, inserção das anteras e estigmas de *Pleurostima* e frutos de *Barbacenia*. *Barbacenia piranga* e *B. tuba* combinam filotaxia trística, folhas serruladas e anteras basifixas, que seriam típicas de *Pleurostima*, com tubo do hipanto longo, estigmas curtos e confluentes no ápice, e cápsulas loculicidas de *B. tuba*, que seriam típicas de *Aylthonia*. As anteras basifixas e os estigmas laterais de *B. vellozioides* sugeririam sua classificação em *Pleurostima*. No entanto, suas cápsulas são deiscentes por poros apicais e não por aberturas intercostais típicas de

*Pleurostima*. Por isto, além de obscurecer as alegadas distinções entre esses três gêneros, elas constituem novas espécies. São distintas também por sua beleza e raridade.

**Key words:** *Barbacenia*, Brazil, IUCN Red List, Velloziaceae.

*Barbacenia* Vand. (Velloziaceae) comprises fewer than 100 species (Mello-Silva, 2010), which are endemic to the Neotropics (Mello-Silva et al., 2011) and have reached maximum diversity in relatively dry, rocky, or sandy habitats in the Espinhaço Range in Brazil (Mello-Silva, 2004). The genus has been treated as a large taxon (e.g., Seubert, 1847; Smith & Ayensu, 1976), or split into *Aylthonia* N. L. Menezes, *Barbacenia*, *Burlemarxia* N. L. Menezes & Semir, and *Pleurostima* Raf. (Rafinesque, 1837; Menezes, 1971, 1980a; Menezes & Semir, 1991; Kubitzki, 1998). The four new species here described are remarkable, not only for their beauty and rarity, but also for several characteristics once ascribed to *Aylthonia* or to *Pleurostima*. Like *Barbacenia lymansmithii* Mello-Silva & N. L. Menezes (Mello-Silva & Menezes, 1999), these new species challenge the delimitation of the segregate genera and reinforce cladistic analyses that support the recognition of *Barbacenia* in its broader sense (Mello-Silva, 2005; Mello-Silva et al., 2011). The new species also attest to the richness of phytochoria in the campo rupestre archipelago (Prance, 1994) and the Espinhaço range region (Giulietti et al., 1997), which encompass the greater part of the diversity assigned to the cerrado hotspot (Mendonça et al., 1997; Myers et al., 2000). Three of the new species, *B. piranga* Mello-Silva, *B. tuba* Mello-Silva & N. L. Menezes, and *B. vellozioides* Mello-Silva are from the state of Bahia; *B. tuba* is relatively widespread, and the other two are more restricted. The fourth new species, *B. serracabrlea* Mello-Silva, is endemic to one massif in the state of Minas Gerais.

**I. *Barbacenia piranga* Mello-Silva, sp. nov.** TYPE: Brazil. Bahia: Abaíra, Ouro Fino, 13°15'S, 41°54'W, 1700 m, 24 Mar. 1992 (fl.), *T. Laessle*,

*W. Ganey & T. R. S. Silva H53332* (holotype, SPF; isotypes, CEPEC not seen, HUEFS not seen, K, MO, RB, US). Figures 1, 5A.

Foliorum costa abaxilater sicut margine serratis et pedicello hypanthioque longis *Barbaceniae graminifoliae* L. B. Sm. proxime affinis, sed ab ea foliis tristichis, emergentiis hypanthii saepe glandulosis raro eglandulosis et antheris ad partem tertiam basalem loborum coronae adnatis differt; etiam habitatione prope rivulos vel locos petrosos humidisque hae species duabus similes.

Caespitose; stems 9–80 cm. Leaves tristichous; leaf sheaths light brown,  $\pm$  exposed; leaf lamina plane, older ones marcescent, reflexed, 12–32 cm  $\times$  4–9 mm, linear-triangular, long attenuate, sparsely ciliate to serrate on margins and on abaxial midrib, sometimes almost smooth, trichomes longer toward lamina base. Flowers solitary; peduncle 10–26 cm, circular in transverse section, smooth to sparsely covered with glandular emergences toward apex. Flower with hypanthium 2.5–4.5 cm; sparsely covered with glandular emergences, mostly on costae, sometimes with small eglandular emergences, almost smooth; portion fused to ovary terete-fusiform to obovoid, 9–20  $\times$  3–6 mm, red-vinaceous, hypanthial tube 1.5–3 cm, 3–6 mm wide at base, 6–8 mm wide at apex, red-vinaceous to red; perianth oblong to lanceolate, 25–40  $\times$  3–6 mm, red-vinaceous to red on abaxial side, bright red on adaxial side; sepals sparsely covered with small to sessile glandular, or sometimes eglandular, emergences on abaxial side, adaxially glabrous; petals glabrous except for sparsely sessile glandular, or sometimes eglandular, emergences on central vein abaxially; corona lobes trapezoidal to trapezoidal-oblong, 5–15  $\times$  ca. 2 mm, vinaceous to pinkish red, bidentate at apex, lobules triangular, 0.5–1 mm; anthers 1–3 cm, yellow, basifixed, auriculate at base, inserted on proximal third of corona lobes, connective pinkish white or green, slightly appendiculate at apex; style 3.5–5 cm, red-vinaceous to red, stigma capitate, 3 lobes confluent at apex, yellow to whitish yellow. Capsule not seen.

*Leaf anatomy* (from the type *Laessøe et al. H5333*). Blade inconspicuously dorsiventral; cuticle thickened on both surfaces; stomata present on abaxial surface only, between fibro-vascular bundles; epidermis uniseriate; spongy parenchyma near fibro-vascular bundles and aquiferous parenchyma occupying almost all space between bundles; fibro-vascular bundles surrounded by a distinct bundle sheath, 1 (or 2) large vessels present in each fibro-vascular bundle; phloem strands 2, separated by parenchymatous or sclerified cells; fibers extending as girders to epidermis on both sides, adaxial girder

narrowly obtapeziform in outline, larger than abaxial girder.

*Etymology.* The solitary, showy, quite distinctive, and beautiful flowers are reddish, hence the epithet, *piranga*, from the Tupi language (Ferreira, 1978; Bueno, 2008).

*Distribution and habitat.* *Barbacenia piranga* occurs in the restricted and most elevated portion of the Espinhaço Range of Bahia State, in Rio de Contas, Piatã, and Abaíra. It has been collected at elevations from 850 to 1500 m. Like other species of the family, *B. piranga* was consistently found in the proximity of creeks. The new species flowers from late December to late March, but no fruits have been found.

*IUCN Red List category.* *Barbacenia piranga* is distributed over a relatively extended region, with populations over non-utilizable grounds. Thus its conservation status would probably be Least Concern (LC), according to IUCN (2001) criteria.

*Discussion.* *Barbacenia piranga* resembles *B. graminifolia* L. B. Sm. They share a serrulate leaf margin and midrib, and both have long pedicellate flowers reddish in color with long hypanthia. The two taxa share a preference for proximity to water streams or humid, rocky places. *Barbacenia graminifolia* presents spirotristichous phyllotaxis and a hypanthium with eglandular emergences, and anthers are attached to the apex of corona lobes. In comparison, *B. piranga* presents tristichous phyllotaxis, and the hypanthial emergences are rarely eglandular, and the anthers are attached to the proximal third of the corona lobes.

*Paratypes.* BRAZIL. **Bahia:** Mun. Rio de Contas, Palmeiras, próximo à Cachoeira da Michilana, 13°24'S, 41°47'W, 27 Dec. 1993 (fl.), *W. Ganey 2704* (HUEFS, SPF); Mun. Abaíra, Barra, 13°18'S, 41°46'W, 9 Jan. 1992 (fl.), *A. M. Giulietti, R. M. Harley & A. F. Fierro H51240* (CEPEC not seen, HUEFS not seen, K not seen, SPF); Mutuca, 13°22'S, 41°50'W, 21 Mar. 1992 (fl.), *B. L. Stannard, T. R. S. Silva & W. Ganey H52735* (CEPEC not seen, HUEFS not seen, K not seen, SPF); Mun. Piatã, Salão, divisa Piatã/Abaíra, 13°16'S, 41°43'W, 23 Dec. 1992 (fl.), *W. Ganey 1734* (HUEFS, K not seen, SPF).

## 2. *Barbacenia serracabralea* Mello-Silva, sp. nov.

TYPE: Brazil. Minas Gerais: Mun. Joaquim Felício, Serra do Cabral, estrada Joaquim Felício-Várzea da Palma, 15.5 km além da ponte sobre o Córrego da Onça, alto da serra, 17°44'53" S, 44°15'41" W, 1150 m, 26 Jan. 2004 (fl., fr.), *R. Mello-Silva, J. R. Pirani, M. F. A. Calió, K. B. Lepis, R. Riina & J. Lovo 2505*

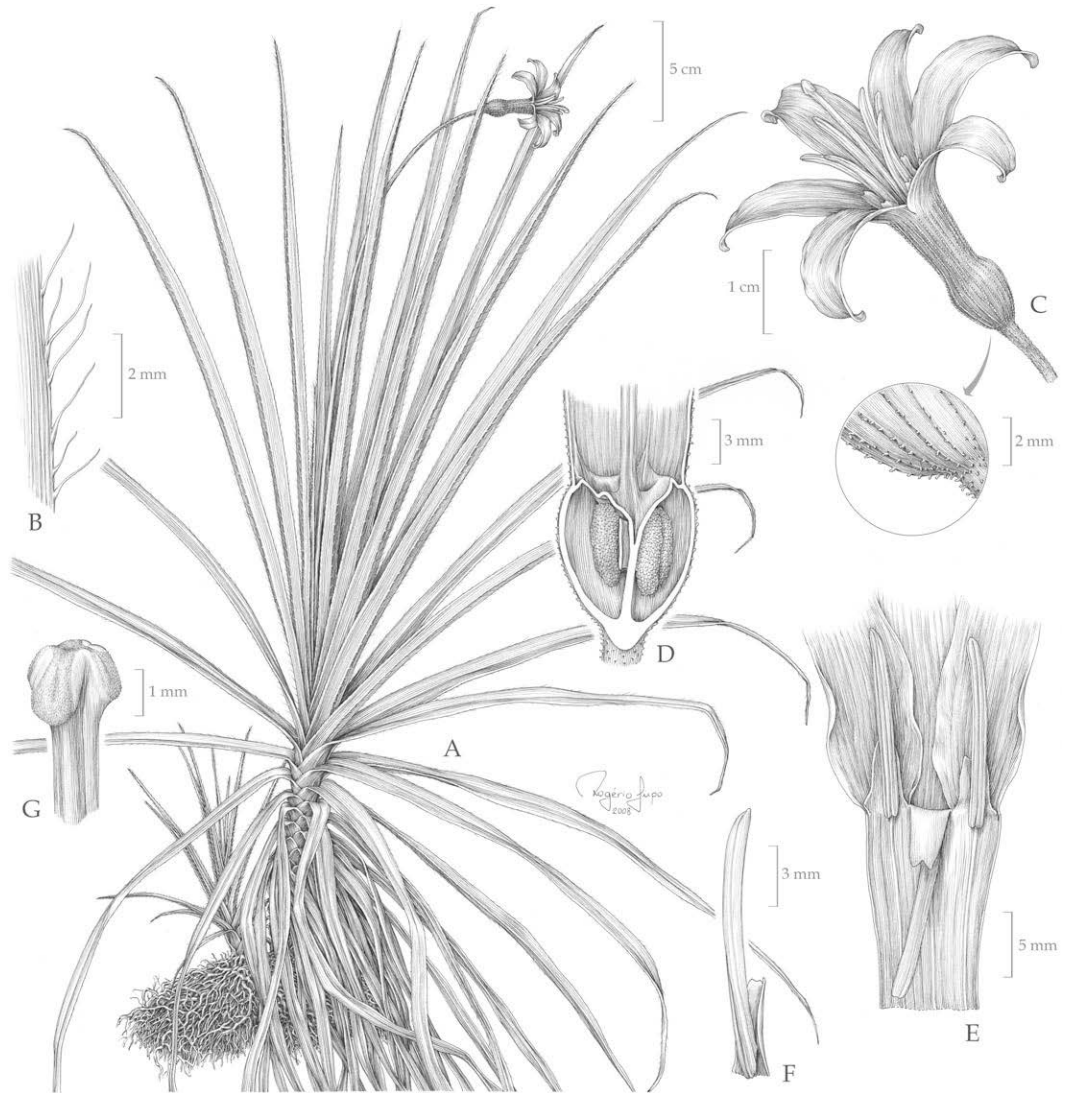


Figure 1. *Barbacenia piranga* Mello-Silva. —A. Habit. —B. Leaf margin. —C. Flower showing detail of hypanthium emergences. —D. Longitudinal section of proximal region of hypanthium and ovary. —E. Longitudinal section of distal region of hypanthium, showing insertion of corona lobes and perianth. —F. Corona lobe with anther. —G. Apex of style with stigma lobes confluent at apex. A, B drawn from the paratype A. M. Giuliatti, R. M. Harley & A. F. Fierro H51240 (SPF); C–G drawn from the holotype T. Laessøe, W. Ganev & T. R. S. Silva H53332 (SPF).

(holotype, SPF; isotypes, B, BHCB, K, L, M, MBM, MO, NY, RB, SP, US). Figures 2, 5B.

Facie ad *Barbaceniam delicatulam* L. B. Sm. & Ayensu et *B. minimam* L. B. Sm. & Ayensu accedit, autem ab eis floribus semper violaceis, hypanthio emergentiis subulatis eglandulosis sparse instructo et capsulis primo poricidalibus differt.

Caespitose; stems 5–100 cm, 0.5–1 cm wide at apex. Leaves tristichous; leaf sheaths whitish at base, hidden; leaf lamina arcuate, odoriferous, older ones

marcescent, reflexed, 6–14 cm × 2–5 mm, linear-triangular, long attenuate, long to short ciliate on margins and on abaxial midrib, trichomes longer toward lamina base. Flowers 1 to 3; pedicels 1.5–2.5 cm, circular in transverse section, brownish, sparsely covered with subulate eglandular emergences toward apex. Flower with the hypanthium 3–9 mm, campanulate, sparsely covered with thinly subulate eglandular emergences; greenish white to violaceous-white; perianth oblong to lanceolate, 4–10 × 2–3 mm, violet, lighter toward base and on midrib; sepals apiculate,

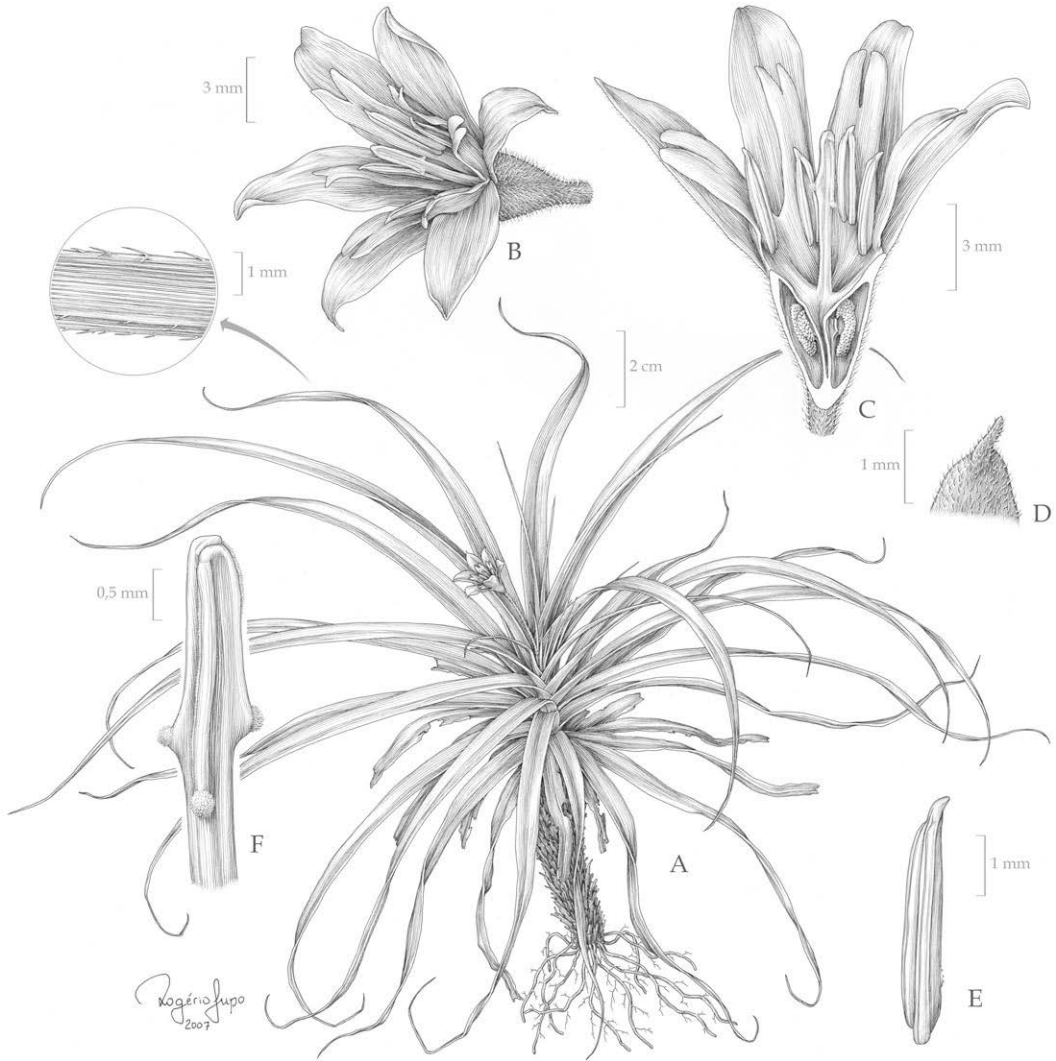


Figure 2. *Barbacenia serracabralea* Mello-Silva. —A. Habit, showing detail of abaxial side of leaf. —B. Flower. —C. Longitudinal section of flower. —D. Apex of sepal, abaxial view. —E. Anther, frontal view. —F. Apex of style with stigma lobes confluent at apex and three lateral stigmatiferous regions. Drawn from the holotype R. Mello-Silva, J. R. Pirani, M. F. A. Calió, K. B. Lepis, R. Riina & J. Lovo 2505 (SPF).

slightly narrower, sparsely covered with thin subulate eglandular emergences on abaxial side, glabrous adaxially; petals glabrous except for similar emergences on the central vein abaxially; corona lobes oblong, 4–7 × 1–1.5 mm, violet to rarely cream, deeply bidentate at apex, lobules narrowly triangular, ca. 1 mm; anthers 3–5 mm, light violaceous, basifixed, slightly auriculate at base, appendicular at apex, inserted on corona lobes base; pollen yellow; style 4–6 mm, clavate, whitish violaceous above stigmatic region, whitish below, stigma lobes confluent at apex, whitish, stigmatic regions 3 in upper 3/5 of style, circular. Capsule 7–10 × 7–9 mm, globose to

subglobose, dehiscent initially by three apical pores, then through lateral walls; seeds reniform, ca. 1 mm, alveolate, dark castaneous.

*Leaf anatomy* (from the type Mello-Silva et al. 2505). Blades dorsiventral; abaxial furrows about 1/2 thickness of blade; multiseriate trichomes present on margins, abaxial mid-vein and furrows; cuticle slightly thickened on both surfaces; stomata present inside furrows only; epidermis uniseriate; adaxial hypodermis biseriate, with bundles of sclerified cells; palisade mesophyll 3 or 4 cell layers thick, grading into spongy parenchyma; fibro-vascular bundles

surrounded by a distinct bundle sheath, 1 (or 2) large vessels present in each fibro-vascular bundle; phloem strands 2, separated by parenchymatous or sclerified cells; fibers extending as girders, adaxially to hypodermis and abaxially as inverted Y-shaped girders extending along abaxial surface on both sides and curving upward along part of the furrows.

*Etymology.* The epithet for the new species is to be regarded as a Latinized noun in apposition, and is taken from the poetic Portuguese *serra cabrália*, meaning Serra do Cabral.

*Distribution and habitat.* *Barbacenia serracabralea* is endemic to Serra do Cabral, a disjunct massif nearby and west of the central part of the Espinhaço Range in the state of Minas Gerais. The new species grows on rocky grooves on sandstone inselbergs, from which the elongate stems, sometimes to 1 m long, hang. Only the one collection is known, with flowers and fruits collected in late January.

*IUCN Red List category.* Only one population of *Barbacenia serracabralea* is so far known. It inhabits a rocky outcrop near the main road that crosses the Serra do Cabral. Those outcrops abound in the Serra, a region that has scarcely been botanically explored. Thus many more individuals are expected to exist in the area, as the Velloziaceae species are almost always represented by large populations. Nevertheless, adequate data are not available and it should be considered Data Deficient (DD), according to IUCN (2001) criteria.

*Discussion.* *Barbacenia serracabralea* shares a similar general appearance with *B. delicatula* L. B. Sm. & Ayensu, which is endemic to Serra do Cipó, in the southern part of the Espinhaço Range in Minas Gerais, and to *B. minima* L. B. Sm. & Ayensu, of a poorly known distribution (Smith & Ayensu, 1979), but which also occurs in Serra do Cabral. Morphologically, *B. serracabralea* shares with *B. minima* the presence of furrows on the abaxial surface of the leaf blade, which is rare among species of *Barbacenia* (Mello-Silva, 2000, 2005). The three species differ mainly in flower color and indumentum, generally white and totally glabrous in *B. delicatula*; yellow and stipitate glandular in *B. minima*; and, in marked contrast, violet to whitish violet flowers and eglandular emergences in the new species. And in *B. delicatula*, the fruits are capsules that dehisce by many intercostal openings. The three species would correspond perfectly with the segregate *Pleurostima* sensu Menezes (1980a, 1980b) were it not for the leaf indument and the poricidal capsule of *B. serracab-*

*ralea*. The multicellular trichomes, present on lamina and furrows, would be characteristic of many *Aylthonia* species, and the poricidal capsule is an attribute of other *Barbacenia* as well as several *Vellozia* Vand. species (e.g., *B. ignea* Mart. ex Schult. & Schult. f. and *V. variabilis* Mart. ex Schult. & Schult. f.). This intermixing of characters renders questionable the recognition of genera previously segregated from *Barbacenia* by Menezes (1980a, 1980b).

**3. *Barbacenia tuba*** Mello-Silva & N. L. Menezes, sp. nov. TYPE: Brazil. Bahia: Mucugê, estrada Andaraí-Mucugê, estrada nova, a 13 km de Mucugê, próximo a grande pedreira, na margem esquerda, 21 July 1981 (fl.), J. R. Pirani, I. Cordeiro, A. Furlan, J. Semir, N. L. Menezes, A. M. Giuliatti & L. Rossi CFCR1666 (holotype, SPF; isotypes, HUEFS, K, M, MO, RB, US). Figures 3, 5C.

Foliorum costa abaxialiter sicut margine serratis, pedicello hypanthioque longis *Barbaceniae graminifoliae* L. B. Sm. et *B. plantagineae* L. B. Sm. appropinquat, sed ab eis hypanthio viridi flavidoviridi flavove, tepalis flavidoridibus subroseisve et hypanthii emergentiis glandularibus distinguuntur; etiam habitatione prope rivulos vel locos petrosos humidisque hae species tribus similes.

Caespitose; stems 6–150 cm. Leaves tristichous; leaf sheaths light brown, purple-tinged at apex, ± exposed; leaf lamina arcuate, older ones twisted from apex, marcescent, reflexed, 6–22 cm × 6–16 mm, narrowly oblong, abruptly acuminate, ciliate trichomes present on margins, longer toward lamina base, on central vein abaxially and sometimes adaxially. Flowers 1 (to 3); pedicels 11–24 cm, circular in transverse section, sparsely covered with glandular emergences toward apex. Flower with hypanthium 2.5–4 cm; hypanthial section fused to ovary terete-fusiform, 6–12 × 4–7 mm, green, densely covered with glandular emergences; hypanthial tube 1.5–4 cm, 4–7 mm wide at base, 6–13 mm wide at apex, green to yellowish green; perianth lobes yellowish green and purple-tinged to pinkish green; sepals lanceolate to ovate-lanceolate, 15–23 × 5–7 mm, mucronate, abaxial surface sparsely covered with small to sessile glandular emergences, adaxially glabrous; petals ovate-lanceolate to ovate, 13–23 × 7–10 mm, apex obtuse, glabrous except sometimes for sparsely sessile glandular emergences on central vein on abaxial surface; corona lobes trapezoidal, ca. 3 × 1 mm, slightly bidentate at apex; anthers 9–12 mm, yellow, basifixed, auriculate at base, inserted at middle of corona lobes, connective vinaceous, appendicular at apex; style 3–4.5 cm, white to

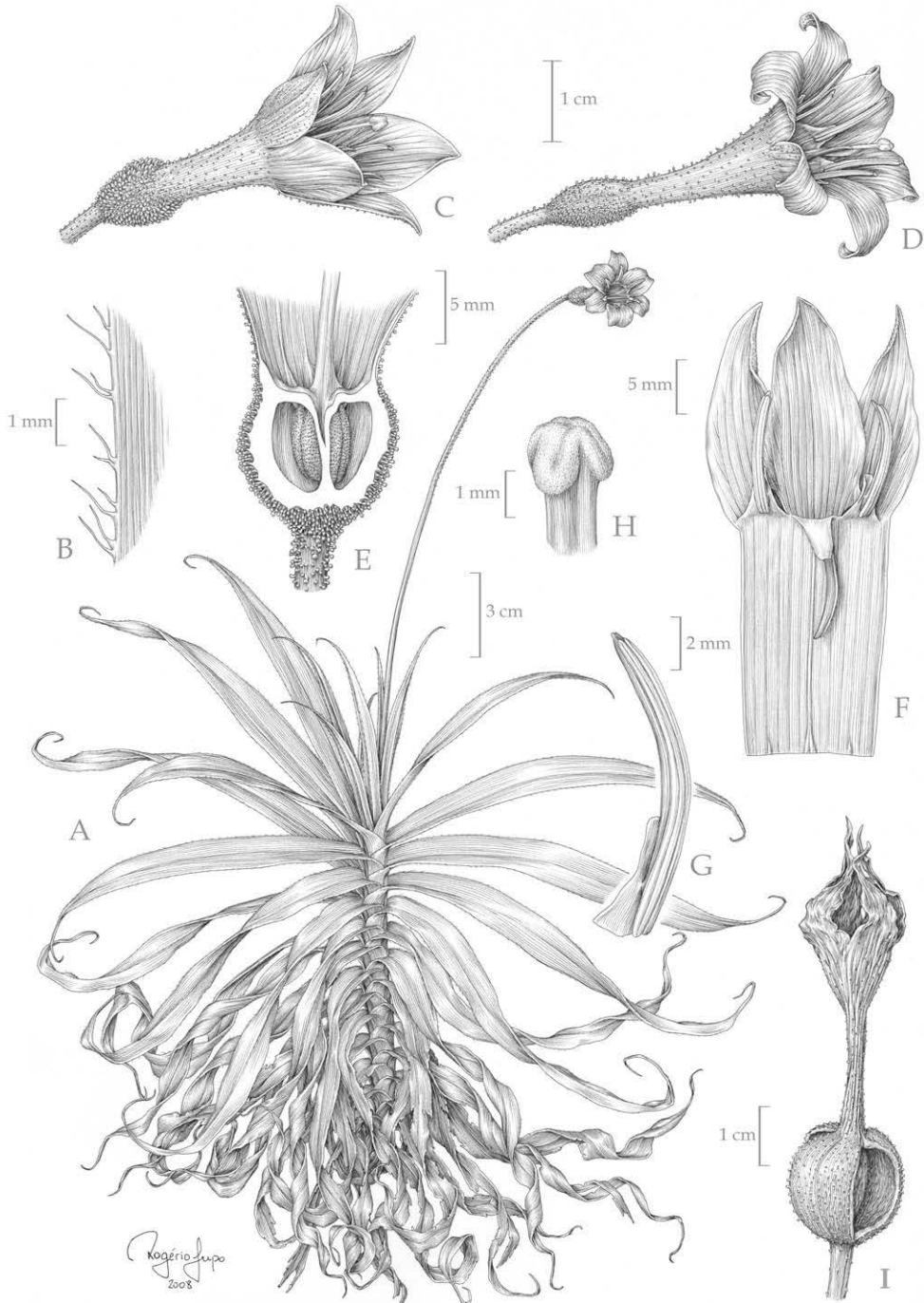


Figure 3. *Barbacenia tuba* Mello-Silva & N. L. Menezes. —A. Habit. —B. Leaf margin. —C. Flower before anthesis. —D. Flower at anthesis. —E. Longitudinal section of proximal region of hypanthium and ovary. —F. Longitudinal section of distal region of hypanthium, showing insertion of corona lobes and perianth. —G. Corona lobe with anther, lateral view. —H. Apex of style with stigmas lobes confluent at apex. —I. Fruit with remnants of hypanthium and perianth. Drawn from the holotype *J. R. Pirani, I. Cordeiro, A. Furlan, J. Semir, N. L. Menezes, A. M. Gulietti & L. Rossi CFCR1666* (SPF).



greenish white, stigma capitate to clavate, 3 lobes confluent at apex, green to yellow. Capsule loculicidal, ca.  $2 \times 1.7$  cm; seeds pyramidal, ca. 1.5 mm long, dark castaneous.

*Leaf anatomy* (from the type *Pirani et al. CFCR1666*). Blades inconspicuously dorsiventral; cuticle thickened on both surfaces; stomata present on abaxial surface only between fibro-vascular bundles; epidermis uniseriate; spongy parenchyma near fibro-vascular bundles and aquiferous parenchyma occupying almost all of the space between bundles; fibro-vascular bundles surrounded by a distinct bundle sheath, 1 (or 2) large vessels present in each fibro-vascular bundle; phloem strands 2, separated by parenchymatous or sclerified cells; fibers extending as girders to epidermis on both sides, adaxial girder much larger than abaxial, widely obtrapeziform to obtriangular in outline.

*Etymology*. The epithet for the new species is to be regarded as a Latinized noun in apposition, with the hypanthial tube the basis for the epithet.

*Distribution and habitat*. *Barbacenia tuba* occurs in the Espinhaço Range of the Brazilian state of Bahia, from Mucugê, Andaraí, and Piatã in the south to Morro do Chapéu in the north. It presents a relatively wide distribution among species of the Velloziaceae. Collection sites for the new species range from recorded elevations of 700–1260 m. The new species is distinguished by the long, widely opened and tubular, mostly green-yellow flowers. *Barbacenia tuba* prefers proximity to small rivers and waterfalls, with the stems sometimes hanging down from crevices. Flowering and fruiting take place from September to April (i.e., the rainy season).

*IUCN Red List category*. *Barbacenia tuba* is well spread in the Chapada Diamantina, from Barra da Estiva in the south to Morro do Chapéu in the north, with populations over non-utilizable grounds. Thus its conservation status would probably be Least Concern (LC), according to IUCN (2001) criteria.

*Discussion*. *Barbacenia tuba* also resembles, in habit and habitat, *B. graminifolia* and *B. plantaginea*, both from the central part of the Espinhaço Range in Minas Gerais. These taxa share serrulate leaf margins and blade midribs, flowers with long hypanthia on elongate peduncles, and an ecological preference for proximity to water streams or humid, rocky places. The latter two species present reddish flowers, with a smooth hypanthium in *B. plantaginea* and eglandular emergences in *B. graminifolia*. In

contrast, *B. tuba* has a green, yellowish green to yellow hypanthium, yellowish green to pinkish tepals, and glandular flower emergences. Additionally, *B. tuba* presents a combination of characters that distinguishes the taxon from all other *Barbacenia*. Its tristichous phyllotaxis, serrulate leaf margins and midrib, and the basifixed, articulate anthers would fit *Pleurostima* sensu Menezes (1980a, 1980b), but the long hypanthium, short apical and confluent stigma lobes, and loculicidal capsules with perianth remnants would correspond to those seen in *Aylthonia* (Menezes, 1971, 1980a, 1980b). Thus, as with the other new species here described, the combination of characters that distinguishes *B. tuba* confirms the observations of Mello-Silva (2005) and Mello-Silva et al. (2011) that *Aylthonia* and *Pleurostima* can no longer be considered.

*Paratypes*. BRAZIL. **Bahia**: Mun. Barra da Estiva, Serra do Sincorá, Camulengo, 12 Jan. 1987 (fl.), *E. L. M. Catharino 1051* (SP); Mun. Lençóis, Chapadinha, Mata do Grotão, rio Água Doce, próx. a cachoeira,  $12^{\circ}27'01''S$ ,  $41^{\circ}25'03''W$ , 26 Apr. 1995 (fl., fr.), *A. Pereira, J. Costa & M. C. Ferreira PDC1840* (ALCB not seen, HUEFS, not seen, K not seen, SPF [2]); Cachoeira do Brejão, 19 Feb. 2006 (fl., fr.), *A. A. Conceição 1730* (HUEFS, SPF); Parque Nac. Chapada Diamantina, trilha para a Cachoeira do Sossego,  $12^{\circ}34'S$ ,  $41^{\circ}23'W$ , 31 Jan. 2010 (fl.), *A. A. Conceição 3291* (HUEFS, SPF); Mun. Morro do Chapéu, 1914 (fl.), *P. Luetzelburg 455* (M); Mun. Mucugê, by Rio Cumbuca, ca. 3 km N of Mucugê on rd. to Andaraí,  $12^{\circ}59'S$ ,  $41^{\circ}21'W$ , 15 Feb. 1977 (fl., fr.), *R. M. Harley, S. J. Mayo, R. M. Storr, T. S. Santos & R. S. Pinheiro 18700* (CEPEC not seen, HUEFS, K, SPF, US); estrada nova Andaraí-Mucugê, entre 11–13 km de Mucugê, 8 Sep. 1981 (fl., fr.), *A. Furlan, J. R. Pirani, M. L. Kawasaki, J. D. Oliveira, M. C. E. Amaral & N. M. Castro CFCR2137* (K not seen, SPF); rodovia para Andaraí, 17 Sep. 1984 (fl.), *G. G. Hatschbach 48326* (MBM not seen, SPF); Serra do Gobira, encosta, 24 Jan. 2000 (fl.), *L. P. Queiroz, L. F. P. Gusmão & B. M. Silva 5639* (HUEFS); Serra do Gobira, cume, 15 Feb. 2002 (fl.), *R. M. Harley & A. M. Giulietti 54491* (HUEFS); descida do Gobira, 4 Aug. 2004 (fl.), *E. L. Borba, A. C. S. Pereira, P. L. Ribeiro & O. A. Oliveira 1860* (HUEFS); Mun. Palmeiras, Cachoeira da Fumaça, na beira da cachoeira, 1 Feb. 1997 (fl.), *A. A. Conceição & A. Grillo 345* (SPF), 24 Mar. 1997 (fl.), *A. A. Conceição & A. Grillo 467* (SPF); em baixo da Cachoeira da Fumaça, 6 Apr. 1997 (fl.), *A. A. Conceição, A. Grillo & J. Batista 511* (SPF); Cachoeira da Fumaça, 26 Dec. 1999 (fl.), *A. A. Conceição 671* (SPF); Mun. Piatã (Bom Jesus do Rio de Contas), 1914 (fl.), *P. Luetzelburg 467* (M).

**4. *Barbacenia vellozioides* Mello-Silva, sp. nov.**

TYPE: Brazil. Bahia: Mun. Abaíra, Ouro Fino (baixo),  $13^{\circ}15'S$ ,  $41^{\circ}54'W$ , 1600–1700 m, 23 Feb. 1992 (fl., fr.), *B. L. Stannard, T. Laessøe, P. T. Sano & W. Ganew H52148* (holotype, SPF; isotypes, CEPEC not seen, HUEFS not seen, K). Figures 4, 5D.

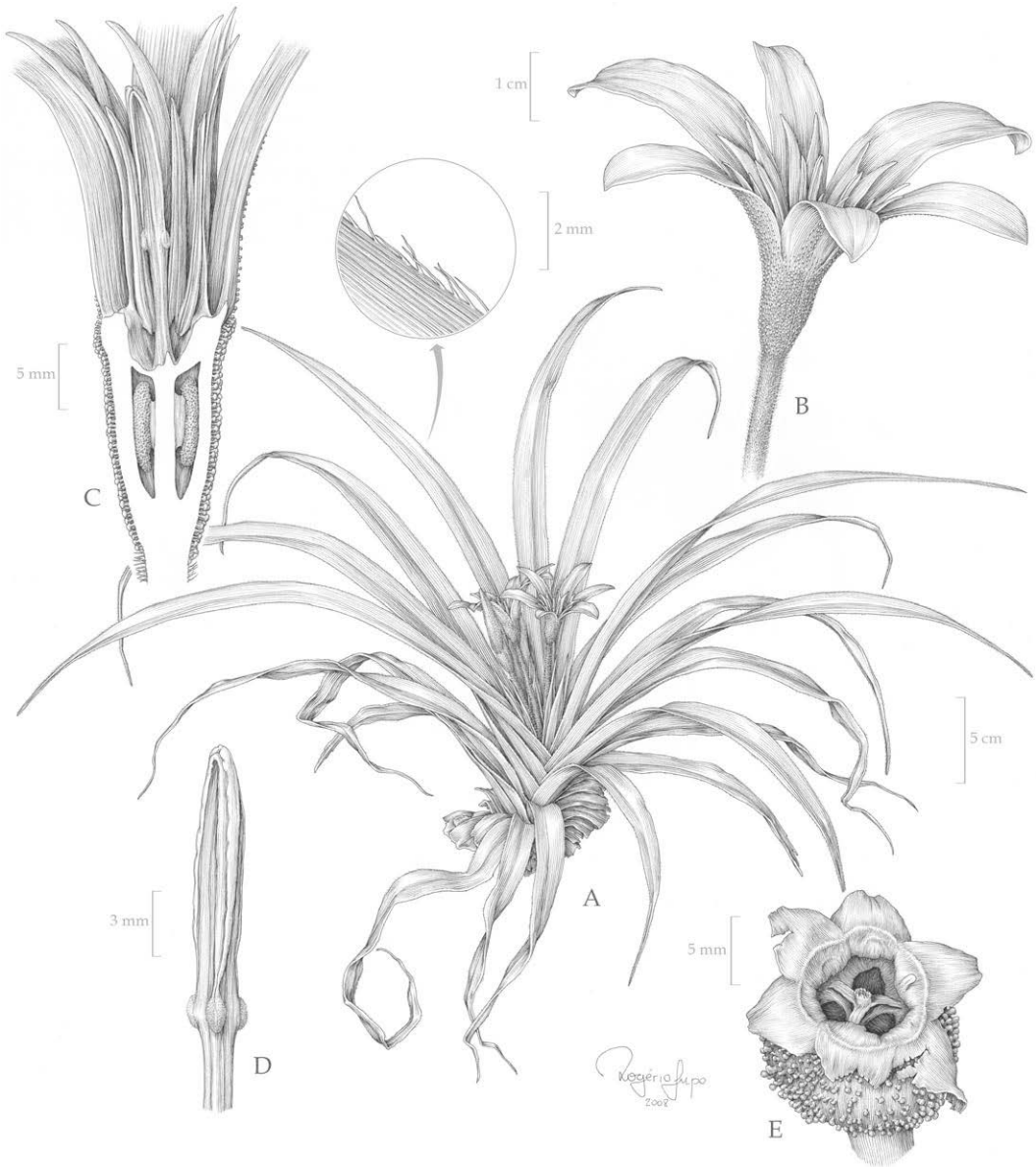


Figure 4. *Barbacenia vellozioides* Mello-Silva. —A. Habit, showing detail of leaf margin. —B. Flower. —C. Longitudinal section of flower. —D. Apex of style with stigma lobes confluent at apex and three lateral stigmatiferous regions —E. Fruit with remnants of perianth. Drawn from the holotype *B. L. Stannard, T. Laessøe, P. T. Sano & W. Ganey H52148* (SPF).

Aspectu et floribus violaceis *Barbaceniae fulvae* Goethart & Henrard maxime affinis, sed ab ea habitu plerunque minore, foliis arcuatis et emergentiis hypanthii glandulosis diagnoscutur; etiam distributione geographica disjuncta differunt.

Caespitose or not; stems 2–30 cm, 1.5–10 cm wide at apex. Leaves tristichous; leaf sheaths dark purple, whitish at base, hidden; leaf lamina arcuate, older ones marcescent, reflexed, 5–35 cm × 5–18 mm, linear-triangular, long attenuate, long to short ciliate

on margins and on midrib on abaxial side, sometimes sparsely hirsutulous on abaxial surface, rarely also on the adaxial surface, trichomes longer toward lamina base. Flowers 1 to 3; pedicels 0.5–8 cm, circular in transverse section, violaceous, smooth to densely covered with subulate eglandular whitish emergences toward apex; hypanthium 5–15 mm, terete-obovoid to campanulate, sparsely to densely covered with glandular emergences; whitish, yellowish to greenish, section fused to ovary, 3–10 × 2–7 mm, hypanthial

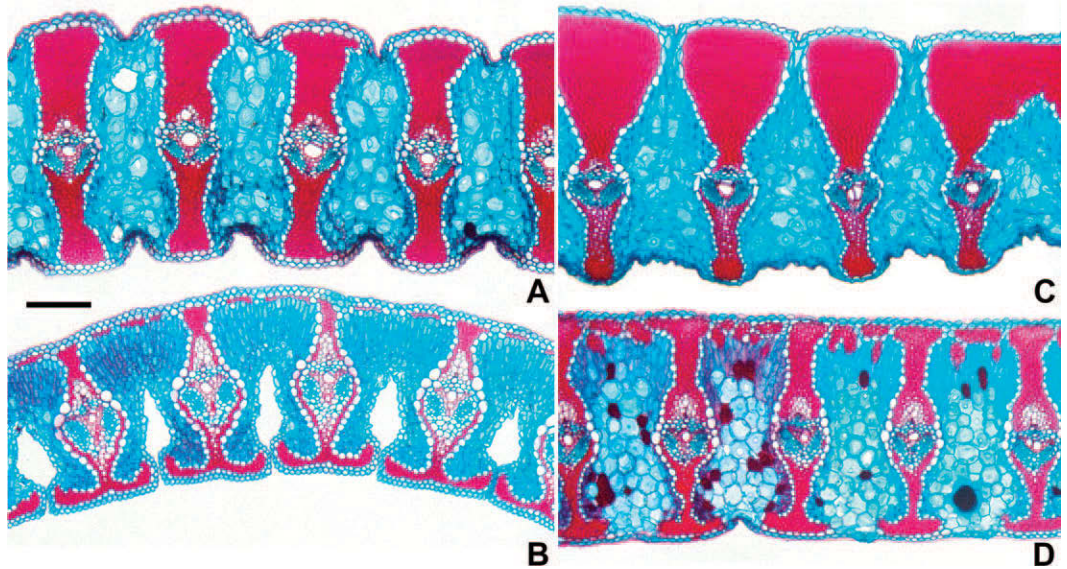


Figure 5. Cross section of median region of lamina. —A. *Barbacenia piranga*, from the type T. Laessøe, W. Ganey & T. R. S. Silva H53332. —B. *Barbacenia serracabræa*, from the type R. Mello-Silva, J. R. Pirani, M. F. A. Caliò, K. B. Lepis, R. Rüina & J. Lovo 2505 (SPF). —C. *Barbacenia tuba*, from the type J. R. Pirani, I. Cordeiro, A. Furlan, J. Semir, N. L. Menezes, A. M. Giulietti & L. Rossi CFCR1666 (SPF). —D. *Barbacenia vellozioides*, from the type B. L. Stannard, T. Laessøe, P. T. Sano & W. Ganey H52148 (SPF). Scale bar = 0.1 mm.

tube 2–5 × 3–8 mm; perianth oblong to lanceolate, 15–40 × 3–6 mm, violet; sepals slightly narrower, sparsely covered with small to sessile glandular emergences on abaxial side, adaxially glabrous; petals smooth except for sparsely sessile glandular emergences on central vein on abaxial side; corona lobes oblong, 15–27 × 1.5–3 mm, violet, deeply bidentate at apex, lobules narrowly triangular, 5–12 mm; anthers 6–15 mm, yellow, basifixed, auriculate at base, slightly appendicular at apex, inserted at base of corona lobes; style 8–20 mm, clavate, violaceous, stigma lobes confluent at apex, whitish, stigmatiferous regions 3 in middle of style, ellipsoid. Capsule 7–15 × 7–15 mm, globose, dehiscent by 3 apical pores; seeds reniform, ca. 1.2 mm, alveolate, blackish in color.

*Leaf anatomy* (from the type Stannard et al. H52148). Blades inconspicuously dorsiventral; cuticle thickened on both surfaces; stomata present on abaxial surface only, between fibro-vascular bundles; epidermis uniseriate; adaxial hypodermis 1- to 3-seriate, with bundles of sclerified cells; palisade mesophyll 1 cell-layer thick, grading into spongy parenchyma near fibro-vascular bundles and into aquiferous parenchyma in region between bundles; fibro-vascular bundles surrounded by a distinct bundle sheath, 1 or 2(3) large vessels present in each fibro-vascular bundle; phloem strands 2,

separated by parenchymatous or sclerified cells; fibers extending as girders, adaxially to hypodermis, sometimes with lateral extensions merged with bundles of sclerified cells, and abaxially as inverted Y-shaped girders extending along abaxial surface on both sides.

*Distribution and habitat.* *Barbacenia vellozioides* is endemic to the mountains of Abaíra, around Pico do Barbado, the highest point of the Espinhaço Range in Bahia (Jesus et al., 1985). Collections of the new species were recorded from elevations of 930–1700 m.

*IUCN Red List category.* Although restricted to the Abaíra region, in Pico do Barbado slopes, *Barbacenia vellozioides* is represented by numerous populations, which grow over non-utilizable terrains that are difficult to access. Thus its conservation status would probably be Least Concern (LC), according to IUCN (2001) criteria.

*Discussion.* Most distinctive of this species, which inhabits sandy soil among rocks, is its violet perianth. Populations of *Barbacenia vellozioides* were observed to be variable, most conspicuously in leaf lamina and emergences of the hypanthium. The collections Ganey 609 and Stannard H52148 (type) present leaf lamina ciliate on margins and midrib, with evident pedicellate flowers that have densely capitate-glandular emergences on the hypanthium.

Other collections such as *Ganev* 2729, 2738, 2739, and *Stannard et al.* 51689 are much smaller plants, with a hirsutulous leaf lamina, very short peduncles hidden by the leaf sheaths, and a hypanthium with sparsely subulate to only slightly capitate-glandular emergences. Collections such as *Ganev* 590 and 3258 have intermediate morphologies, with leaf lamina on 590 and with flowers on 3258. *Barbacenia vellozioides* has been collected with flowers from December to July and just once with fruits, in February.

*Barbacenia vellozioides* is quite similar in its habit, androecium, and gynoecium to *B. fulva* Goethart & Henrard, also a distinctive species. They share a similar violet perianth, an uncommon color among species of *Barbacenia*. The flowers resemble those seen in species of *Vellozia*, not only in color but also in texture and form. The epithet of the new species acknowledges this similarity in flowers. Otherwise, the basifixed anthers, attached to the hypanthium, and lateral stigma lobes would suggest placement in *Pleurostima*. Nevertheless, contrary to what has been stated for *Pleurostima* (Menezes, 1980a, 1980b; Menezes & Semir, 1991), the capsule of *B. vellozioides* is not dehiscent by many intercostal openings, but by apical pores, like some other species of *Barbacenia* s. str. and many others of *Vellozia*. This characteristic, as in the case of *B. tuba*, renders the taxonomic recognition of *Pleurostima* problematic (Mello-Silva, 2005). *Barbacenia vellozioides* and *B. fulva* differ mainly in leaf posture and hypanthium emergences, which are, respectively, plane and eglandular subulate in *B. fulva*, and arcuate and glandular-capitate, rarely subglandular in *B. vellozioides*. Moreover, these species present a wide distributional disjunction, more than 900 km, with *B. fulva* being endemic to the Serra da Canastra region, in the southwestern Brazilian state of Minas Gerais.

**Paratypes.** BRAZIL. **Bahia:** Mun. Abaíra, caminho Guarda-Mor e Água Limpa, voltando o Morro do Cuscuz, 25 June 1992 (fl.), *W. Ganev* 590 (HUEFS, K not seen, SPF); Garimpo do Bicota, 13°19'S, 41°48'W, 2 Mar. 1992 (fl.), *B. L. Stannard, W. Ganev & R. F. Queiroz* 51689 (HUEFS not seen, K not seen, SPF); caminho Betão-Tanque do Boi, 13°16'S, 41°54'W, 4 July 1992 (fl.), *W. Ganev* 609 (HUEFS, K not seen, SPF); Cabaceira, Riacho Fundo, atrás da Serra do Bicota, 13°23'S, 41°51'W, 25 Oct. 1993 (fl.), *W. Ganev* 2322 (HUEFS); Virassaia, 13°21'S, 41°50'W, 30 Dec. 1993 (fl.), *W. Ganev* 2729, 2738, 2739 (HUEFS, K not seen, SPF); estrada abandonada Catolés-Arapiranga, entre Riacho Fundo e Riacho Piçarrão, próx. à casa de Osmar Campos, 13°22'S 41°49'W, 13 Apr. 1994 (fl.), *W. Ganev* 3258 (HUEFS, K not seen, SPF); caminho Boa Vista-Bicota, 9 Sep. 1995 (fl.), *F. França, E. Melo, L. P. Queiroz & W. Ganev* 1294 (HUEFS); alto do Morro da Serrinha, 13°19'S, 41°51'W, 31 May 2003 (fl.), *M. J. G. Andrade, A. A. Conceição & M. Vanilda* 347 (HUEFS).

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