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

Novon, St. Louis, v.23, n.3, p.291-301, 2014
http://www.producao.usp.br/handle/BDPI/46613

Downloaded from: Biblioteca Digital da Produção Intelectual - BDPI, Universidade de São Paulo
Four of Queens: Shuffling New *Barbacenia* from Brazil (Velloziaceae)

Author(s): Renato Mello-Silva
Published By: Missouri Botanical Garden
DOI: http://dx.doi.org/10.3417/2011016
URL: http://www.bioone.org/doi/full/10.3417/2011016

BioOne ([www.bioone.org](http://www.bioone.org)) is a nonprofit, online aggregation of core research in the biological, ecological, and environmental sciences. BioOne provides a sustainable online platform for over 170 journals and books published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Web site, and all posted and associated content indicates your acceptance of BioOne’s Terms of Use, available at [www.bioone.org/page/terms_of_use](http://www.bioone.org/page/terms_of_use).

Usage of BioOne content is strictly limited to personal, educational, and non-commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.
Four of Queens: Shuffling New *Barbacenia* from Brazil (Velloziaceae)

Renato Mello-Silva

University of São Paulo, Department of Botany, Rua do Matão, 277, edifício Sobre-as-Ondas, São Paulo-SP, 05508-090 Brazil.

mellosil@usp.br

**Abstract.** Four new species of *Barbacenia* Vand. (Velloziaceae) from Bahia and Minas Gerais, Brazil, are described. *Barbacenia piranga* Mello-Silva, *B. serracabralea* 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 serracabralea* 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. tuba*, the basifixed anthers and lateral stigma lobes would suggest placement in *Pleurostima*. Nevertheless, its capsule is not delicient 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.

**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* 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 (Mendoza 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. serracabralea* Mello-Silva, is endemic to one massif in the state of Minas Gerais.

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

Foliorum costa abaxiliter sicut margine serratis et pedicello hypantotheque longis Barbaceniae graminifoliae L. B. Sm. proxime affinis, sed ab ea foliis tristichis, emergentibus hypanthii saepe glandulosos rare eglandulosos et antheris ad partem tertiam basalem loborum coronae adnatis differt; etiam habituatione prope rivulos vel locos petrosos humidosque hae species duabus similes.

Caespitose; stems 9–80 cm. Leaves tristichous; leaf sheaths light brown, ± exposed; leaf lamina plane, older ones marcescent, reflexed, 12–32 cm × 4–9 mm, linear-triangular, long attenuate, sparsely ciliate to creeks. The new species flowers from late December to early March, but no fruits have been found.

Distribution and habitat. Barbacenia piranga occurs in the restricted and most elevated portion of the Espinhaço Range of Bahia State, in Rio de Contas, Piata, and Abaira. 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 hypantha. The two taxa share a preference for proximity to water streams or humid, rocky places. Barcabenia 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, the hypanthial emergences are rarely eglandular, and the anthers are attached to the proximal third of the corona lobes.


2. Barbacenia serraehabraeae Mello-Silva, sp. nov.

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

Facie ad Barbacenia delicatulam L. B. Sm. & Ayensu et B. minimam L. B. Sm. & Ayensu accedit, autem ab eis floribus semper violacris, 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,
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 cabralia*, 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 a region that has scarcely been botanically explored. *Barbacenia callistachna* var. *callistachna* (Vellozziaceae) is so far known. It inhabits hypanthio viridi flavidoviridi flavove, tepalis flavidoridibusa rocky outcrop near the main road that crosses the subroseisve et hypanthii emergentiis glandularibus distintu; etiam habitatione prope rivulos vel locos petrosos humidoque hae species tribus similis.

**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 vein on abaxial surface; corona lobes trapezoidal, ca. 5–7 mm, slightly bidentate at apex; anthers 9–12 mm, yellow, basifixated, auriculate at base, inserted at middle of corona lobes, connective vinaceous, appendicular at apex; style 3–4.5 cm, white to
greenish white, stigma capitata to clavate, 3 lobes confluent at apex, green to yellow. Capsule loculicidal, ca. 2 × 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 girders 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, Andarai, and Piata 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 hypanthium 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.


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

Aspectu et floribus violaceis Barbacenia fulvae Goethart & Henard maximi affinis, sed ab ea habitu plerunque minore, foliis arcuatis et emergentibus hypanthii glandulosis diagnoscitur; 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 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. Laessoe, P. T. Sano & W. Ganev H52148 (SPF).
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 appendiculate at apex, inserted at base of corona lobes; style 8–20 mm, clavate, violaceous, stigma lobes confluent at apex, whitish, stigmatic 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 Ganev 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 hisphotulose 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 & Hennard, 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 *Veloozia*, 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 dehiscient by many intercostal openings, but by apical pores, like some other species of *Barbacenia* s. str. and many others of *Veloozia*. 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.


**Acknowledgments.** Thanks are due to the curators of the herbaria cited herein. Visits to herbaria have been supported by Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP), Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Margaret Mee Amazon Trust, and the Andrew W. Mellon Kew Latin American Research Fellowships (KLARF) Programme. Thanks are given to Gisele Costa, Juliana Lovo, Tâssia Santos, and Viviane Joni for their assistance with anatomic slides and micrograph pictures. The line art illustrations are exquisitely done by Rogério Lapo. Renato de Mello-Silva is a CNPq research fellow.

**Literature Cited**


