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Four new species of *Eriocaulon* (Eriocaulaceae) from Bahia, Brazil

Earl Celestino de Oliveira Chagas[1], James Lucas da Costa-Lima[1] & Ana Maria Giulietti[1]

Summary. Four new species of *Eriocaulon* from Bahia, Brazil, are described and illustrated. *Eriocaulon botocudo* and *E. yba* occur in the western part of the state, while *E. kulumi* and *E. pyatan* inhabit the Chapada Diamantina. Comparisons with morphologically similar taxa, their preferred habitats, and the known distributions of the new species are provided.

Key Words. Aquatic plants, *cerrado*, *campo rupestre*, Eriocauloideae, north-eastern Brazil, taxonomy.

Introduction

Eriocaulon L. comprises 400 – 800 species (Giulietti *et al.* 2012) and is the only genus of Eriocaulaceae with pantropical and subtropical distribution (Giulietti & Hensold 1990). Many of the species in the genus occur in the tropics, especially in Tropical Asia (Zhang 1999; Ansari & Balakrishnan 2009) and open vegetation types in the Neotropics, such as *cerrado* (savanna) and *campo rupestre* (grassland and highland rocky fields) of the Espinhaço Range, eastern Brazil (Giulietti & Hensold 1990; Costa *et al.* 2008). The *Eriocaulon* species are characterised by the diplostemonous flowers (staminate flowers with 4 or 6 stamens) with glands on free petals (Ruhland 1903; Giulietti 2012). In Brazil the genus is represented by 53 – 57 species (Giulietti *et al.* 2010; Oliveira & Bove 2015).

During a taxonomic revision of *Eriocaulon* in Brazil, we came across four undescribed species in the state of Bahia, which inhabit *cerrado* and *campo rupestre* vegetation. This work describes these species.

Materials and Methods

As part of a revision of *Eriocaulon* in Brazil, 30 expeditions to various regions of the country, especially the state of Bahia, were conducted. This study is based on the material collected during those expeditions and specimens examined at the following herbaria: ALCB, CEPEC, HUEFS, K, MAC, MBM, MG, NY and R. Herbarium acronyms follow Thiers (continuously updated).

Morphological analyses of the flowers and measurements were made using a stereomicroscope. Seeds were coated with gold and observed and photographed with a scanning electron microscope (Zeiss Sigma VP) at the Instituto Tecnológico Vale and Universidade Federal do Pará.

The conservation status of each species was evaluated using the categories and criteria of the International Union for the Conservation of Nature (IUCN 2012). The assessments were based on area of occupancy (AOO) and extent of occurrence (EOO), which were calculated with GeoCAT (Bachman *et al.* 2011; http://geocat.kew.org), with AOO based on grids of 2 km^2. Data on conservation units of the state of Bahia were obtained from the virtual databases of the Instituto do Meio Ambiente e Recursos Hídricos (INEMA) which are available at http://www.inema.ba.gov.br/gestao-2/unidades-de-conservacao.

Taxonomic Treatment

Eriocaulon botocudo *E.C.O.Chagas & Giul.*, **sp. nov.** Type: Brazil, Bahia, Mun. Correntina, Rio das Éguas, Ranchão, 17 July 2014, *E. C. O. Chagas* 13177 (holotype HUEFS!; isotypes K!, MAC!).

http://www.ipni.org/urn:lsid:ipni.org:names:77192548-1

Perennial herbs, 13.8 – 28.9 cm tall. *Rhizomes* 0.5 – 2 × 0.5 – 0.75 cm, elongate- or short-vertical. *Leaf blades* 1.2 – 2.6 × 0.3 – 0.5 cm, narrowly lanceolate-triangular, membranous, glabrous, 8 – 10-nerved, apex acuminate, arranged in a depressed-globose rosette of 15 – 35 leaves. *Inflorescences* 1 – 5 per rosette. *Spathes* 3.3 – 4 × 0.1 – 0.15 cm, glabrous, surpassing the leaves, the upper part slightly narrowed, apex acute. *Scapes* 13 – 28.4 cm long, 6-costate, glabrous. *Capitula* 5.5 – 6 mm diam., hemispherical to globose; receptacles 0.5 – 0.75 mm long, ovoid, pilose. *Involucral bracts* in 2 – 3 series, suberect to patent; external series 0.75 – 1 ×

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[1] Programa de Pós-Graduação em Botânica, Universidade Estadual de Feira de Santana, Av. Transnordestina, s/n, Novo Horizonte, Feira de Santana, Bahia, 44036-900, Brazil. e-mail: earlchagas@gmail.com

0.75 – 0.9 mm, oblong, chartaceous, stramineous, apex rounded, glabrous on both surfaces; internal series 1 – 1.25 × 0.8 – 1.1 mm, oblong-obovate, chartaceous, stramineous, apex obtuse, glabrous on both surfaces. *Floral bracts* 1.5 – 1.75 × 0.75 – 1 mm, obtrullate-spathulate, chartaceous, stramineous from the base to the middle, slightly griseous at the tip, apex acute, adaxial surface glabrous, abaxial surface with white filamentous trichomes at the tip. *Flowers* trimerous. *Staminate flowers* 2 – 2.5 mm long; pedicels 0.2 – 3 mm long; sepals connate above the middle into a spathe, stramineous from the base to the middle, blackish at the tip and midrib, adaxial surface glabrous, abaxial surface with white filamentous trichomes on the midrib and tip, 3-lobed, lobes obtuse; anthophore campanulate, 1 – 1.5 mm long; petals creamy, glabrous at the base and middle, adaxial surface with white filamentous trichomes; ventral petals 1 – 1.25 × 0.4 – 0.5 mm, oblong, apex rounded to obtuse; the dorsal petal 1.25 – 1.5 × 0.5 – 0.6 mm, oblong-elliptic, apex obtuse; gland 0.1 – 0.2 mm long, oblong, creamy; stamens 6, filaments 0.75 – 1 mm long, anthers 0.2 – 3 mm long, creamy; pistillodes 3, creamy. *Pistillate flowers* 1.9 – 2.25 mm long; pedicels c. 0.1 mm long; sepals free, stramineous from the base to the middle, slightly blackish at the tip, adaxial surface glabrous, abaxial surface with white filamentous trichomes; ventro-lateral sepals 1.5 – 1.75 mm long, gibbous, apex obtuse; dorsal sepal 1.5 – 1.75 mm long, gibbous, concave, apex truncate to obtuse; anthophores c. 0.5 mm long, obconic; petals hyaline, glabrous at the base and middle, tip with white filamentous trichomes on adaxial surface; ventral petals 1.25 – 1.5 × 0.3 – 0.4 mm, falcate, oblong-spathulate, apex rounded to obtuse; dorsal petal 1.5 – 1.75 × 0.3 – 0.4 mm, oblong-spathulate, apex rounded to obtuse; glands oblong, creamy; ovary 3-locular; styles column c. 0.2 mm long, cylindrical; stigmatic branches 0.75 – 1.25 mm long, simple. *Seeds* 480.8 – 502.3 × 334.6 – 345.9 µm, prolate to oblate, rounded at the funicular and distal ends; testa stratified-squamous, flat; polyhedral cells variable, vertically elongated in ratio of 1:1, 2:1 or 3:1; contact areas of the periclinal and transverse walls forming smooth cristae, flat; absent appendages. Figs 1, 2A – B, 3A – C.

RECOGNITION. *Eriocaulon botocudo* is morphologically similar to *E. gibbosum* Körn., especially in the habit, stem architecture and narrowly lanceolate-triangular leaves arranged in a rosette. However, *E. botocudo* has hemispherical to globose (vs hemispherical in *E. gibbosum*) capitula (Fig. 3A), obtrullate-spathulate (vs elliptic-spathulate) floral bracts (Fig. 3C – D), stramineous (vs blackish) floral bracts and sepals (Fig. 3C – D), and pistillate flowers at anthesis with obconic (vs. cylindrical) anthophores. *Eriocaulon botocudo* can occur sympatrically with *E. coniferum* Herzog, which also has gibbous sepals, but can be distinguished by the narrowly lanceolate-triangular (vs linear-lanceolate in *E. coniferum*) leaf blades, hemispherical to globose (vs hemispherical to ovoid) capitula, and pistillate flowers at anthesis with obconic (vs cylindrical) anthophores.

DISTRIBUTION. Brazil: western Bahia, in the municipality of Correntina.

SPECIMENS EXAMINED. BRAZIL. Bahia: Mun. Correntina, margem do Rio Corrente, 9 Aug. 1996, *Jardim et al.* 885 (CEPEC, HUEFS, NY); *loc. cit.*, Rio das Éguas ou Corrente, 16 July 2014, *Chagas* 13176 (HUEFS, MAC); *loc. cit.*, Rio das Éguas, Ranchão, 17 July 2014, *Chagas* 13177 (holotype HUEFS; isotypes K, MAC).

HABITAT. *Eriocaulon botocudo* forms small clusters between the roots of woody plants on the banks of the rivers or small "islands" in clay or sandy substrate; alt. 400 – 500 m.

CONSERVATION STATUS. Critically Endangered CR A3c+B1ab(i,ii,iii)+B2ab(i,ii,iii). Two subpopulations of *Eriocaulon botocudo* occur on the Das Éguas River (or Corrente River) within an area of approximately 3 km (EOO = 0.025 km^2). Although it is likely there are more subpopulations along this river, the area is considered a single locality based on IUCN (2012) criteria (AOO = 8 km^2) because upstream changes could influence the subpopulations at the same time. The main threats to the species come from agriculture and extensive cattle farming, which promote deforestation and fire, impoundment from damming and siltation of rivers, as well as tourism development and real estate expansion on the banks of the rivers and islands.

ETYMOLOGY. The epithet alludes to the Botocudo people, who were the first inhabitants of the region where the species occurs.

Eriocaulon kulumi *E.C.O.Chagas & Giul.*, **sp. nov.** Type: Brazil, Bahia, Mun. Abaíra, Rio Água Suja, 15 Feb. 2015, *E. C. O. Chagas & M. C. S. Mota* 13240 (holotype HUEFS!; isotypes K!, MAC!).

http://www.ipni.org/urn:lsid:ipni.org:names:77194099-1

Perennial herbs, 14.5 – 20 cm tall. *Rhizomes* 2.2 – 5.5 cm, elongate- or short-vertical. *Leaf blades* 0.8 – 3.5 × 0.15 – 0.5 cm, narrowly lanceolate-triangular, membranous, 6 – 10-nerved, apex acuminate, arranged in a depressed-globose rosette of 20 – 60 leaves. *Inflorescences* 1 – 4 per rosette. *Spathes* 2.5 – 4.2 × 0.15 – 0.5 cm, glabrous, surpassing the leaves, the upper part slightly narrowed, apex acuminate. *Scapes* 6 – 19 cm long, 6-costate, glabrous. *Capitula* 5 – 8 mm diam., hemispherical; receptacles 1 – 1.25 mm long, ovoid, pilose. *Involucral bracts* in 2 – 3 series, patent to suberect; external series 1.5 – 2 × 0.75 – 1 mm, oblong, chartaceous, stramineous from the base to the middle,

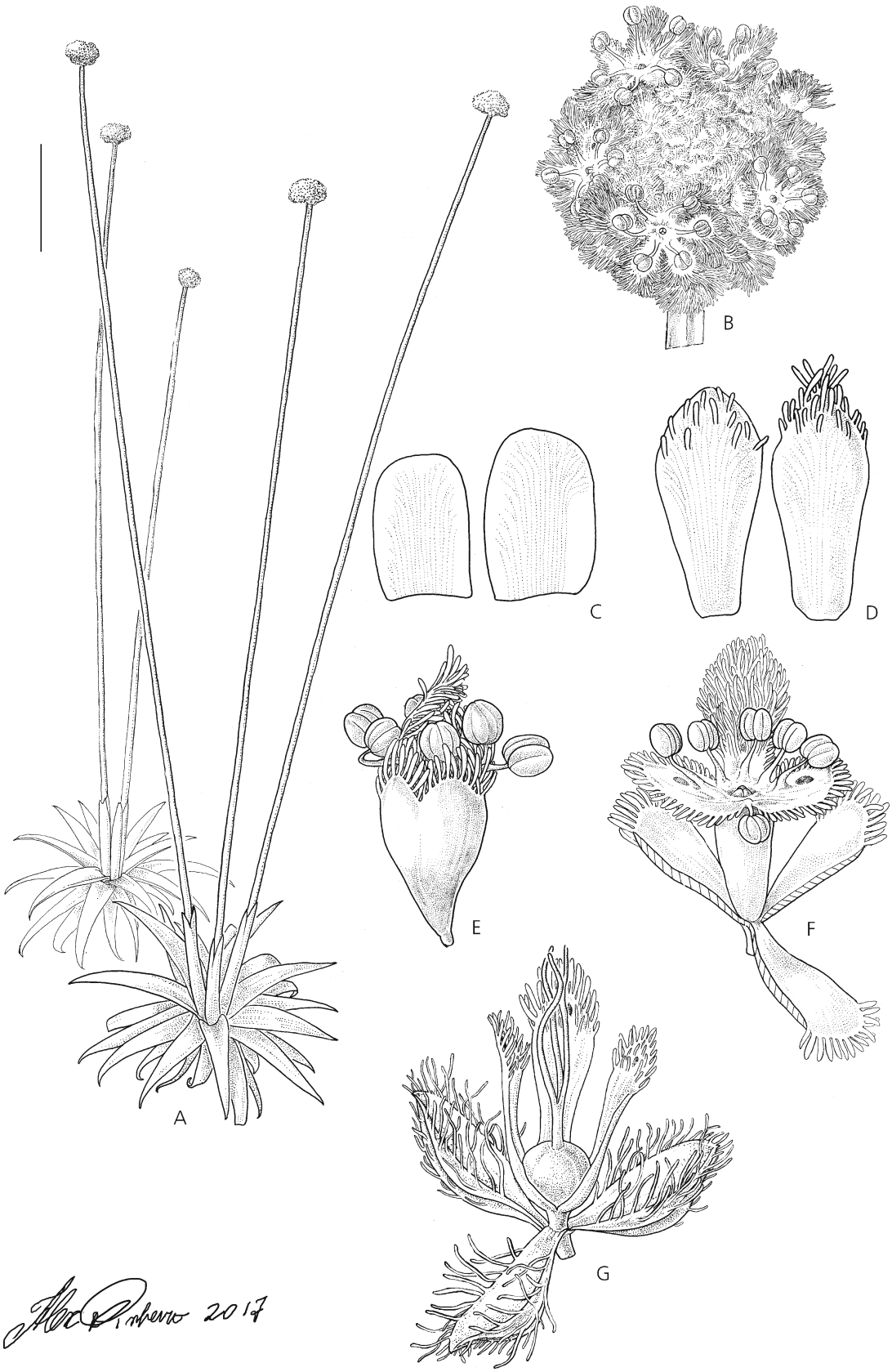

Fig. 1. *Eriocaulon botocudo*. **A** habit; **B** capitulum; **C** involucral bracts from outer to inner series; **D** floral bracts; **E** – **F** staminate flower; **G** pistillate flower. Scale bar: **A** 2.5 mm; **B** 2 mm; **C** – **G** 0.7 mm. All from *E. C. O. Chagas* 13177. DRAWN BY ALEX ARAUJO.

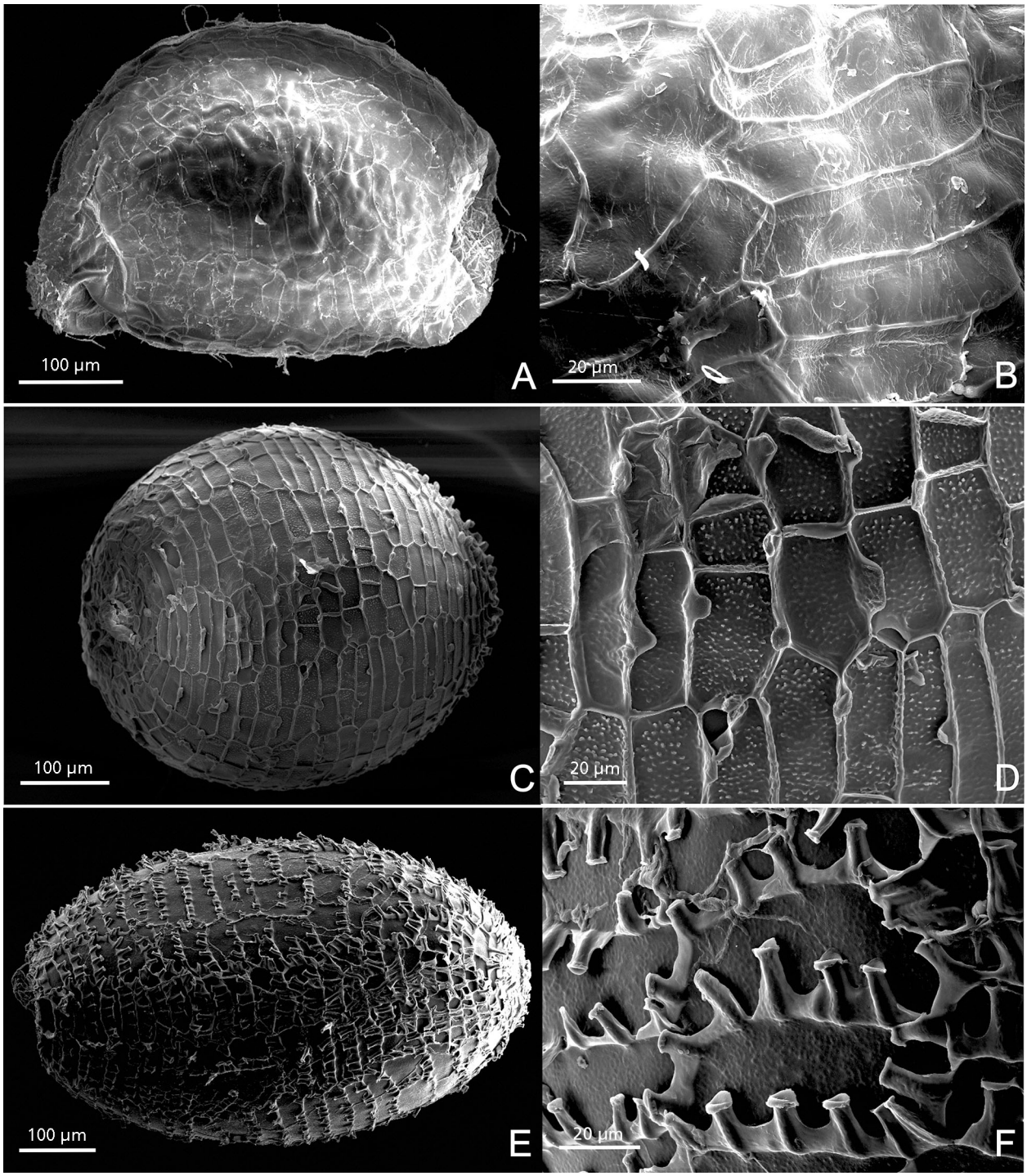

Fig. 2. SEM images of the entire seeds and details showing testa morphology. A – B *Eriocaulon botocudo*; C – D *E. kulumi*; E – F *E. pyatan*.

blackish at the tip, apex rounded, glabrous; internal series 1.5 – 2 × 0.5 – 0.75 mm, oblong, chartaceous, stramineous from the base to the middle, blackish at the tip, apex obtuse, glabrous. *Floral bracts* 2 – 2.5 × 0.5 – 0.7 mm, elliptic-spathulate, chartaceous, stramineous to griseous from the base to the middle, blackish at the tip and midrib, apex obtuse, adaxial surface glabrous, abaxial surface with white filamentous trichomes at the tip and midrib. *Flowers* trimerous. *Staminate flowers* 2.5 – 3 mm long; pedicels 0.25 – 0.35 mm long; sepals connate above the middle into a spathe, stramineous from the base to the middle, blackish at the tip and midrib, adaxial surface glabrous, abaxial surface with white filamentous tri-

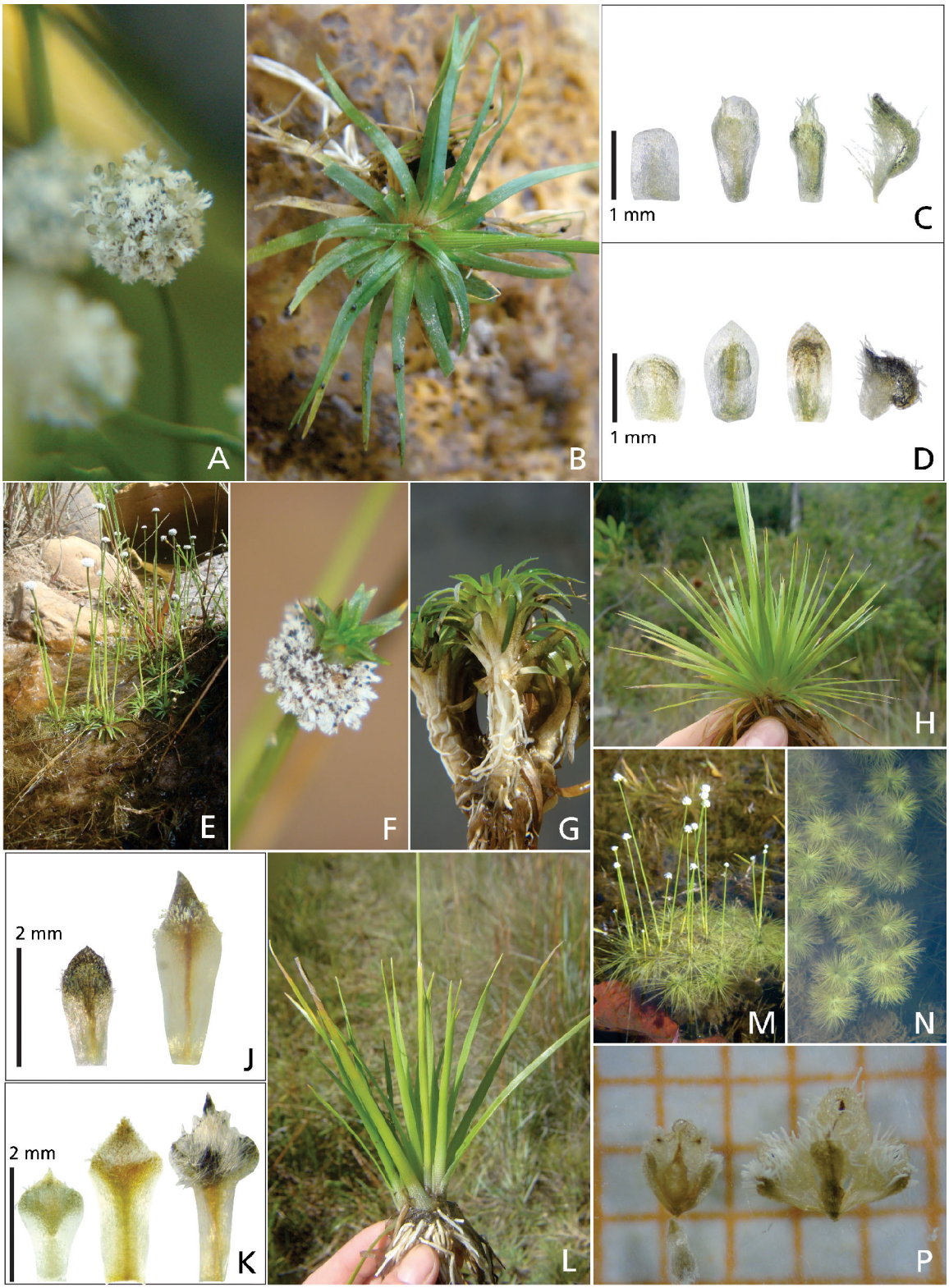

Fig. 3. New species of *Eriocaulon* from Bahia, Brazil, and morphologically related species. **A** – **C** *E. botocudo.* **A** capitulum; **B** rosette; **C** involucral bract, external floral bract, internal floral bract, and sepal, respectively. **D** *E. gibbosum,* involucral bract, external floral bract, internal floral bract, and sepal, respectively. **E** – **G** *E. kulumi.* **E** habit; **F** pseudoviviparous capitulum; **G** rosettes. **H** *E. modestum,* rosette. **J** – **K** comparison of floral bracts: **J** *E. kulumi* vs *E. modestum*, respectively; **K** *E. cabralense* vs *E. linearifolium* vs *E. pyatan*, respectively. **L** *E. pyatan,* rosette. **M** – **N** *Eriocaulon yba.* **M** habit; **N** rosettes. **P** comparison of pistillate flowers, *Eriocaulon araguaiense* vs *E. yba*, respectively, grid 1 mm. PHOTOS: E. C. O. CHAGAS.

chomes on the midrib and tip, 3-lobed, lobes obtuse; anthophore campanulate, 0.7 – 1 mm long; petals creamy, adaxial surface with white filamentous trichomes and glabrous at the base and middle, abaxial surface glabrous; ventral petals 1.25 – 1.5 × 0.4 – 0.5 mm, oblong, apex rounded to obtuse; the dorsal petal 1.5 – 1.75 × 0.6 – 0.7 mm, oblong-elliptic, apex obtuse; gland 0.1 – 0.2 mm long, oblong, blackish; stamens 6, filaments 1 – 1.25 mm long, anthers c. 0.25 mm long, blackish; pistillodes 3, blackish. *Pistillate flowers* 2.5 – 3.0 mm long; pedicels 0.1 – 0.2 mm long; sepals free, stramineous from the base to the middle, blackish at the tip and midrib, adaxial surface glabrous, abaxial surface pilose at the tip, with white filamentous trichomes; ventro-lateral sepals 1.75 – 2 mm long, navicular, apex rounded; the dorsal sepal 1.25 – 1.5 × 0.4 – 0.5 mm, oblong-spathulate, concave, apex rounded; anthophore 0.2 – 0.3 mm long, cylindrical; petals creamy, adaxial surface with white filamentous trichomes at the tip, abaxial surface glabrous; ventral petals 1.6 – 1.8 × 0.4 – 0.5 mm, falcate, oblong-spathulate, apex rounded to obtuse; the dorsal petal 1.75 – 2 × 0.6 – 0.8 mm, rhombic-spathulate, apex obtuse; glands prolate to deltoid, blackish; ovary 3-locular; styles column 0.75 – 1 mm long, cylindrical; stigmatic branches 0.75 – 1 mm long, simple. *Seeds* 467.7 – 483.9 × 419.4 – 422.6 µm, prolate to oblate, rounded to obtuse at the funicular end and rounded at the distal end; testa stratified squamous, verrucous; polyhedral cells variable, vertically elongated in ratio of 1:1, 2:1 or 3:1; contact areas of the periclinal and transverse walls forming slightly prominent cristae, verrucous; appendages 8 – 12 × 7 – 20 µm, columnar cylindrical-depressed, occurring on the periclinal and transverse walls, 0 – 4 per cell, truncate at apex, flat. Figs 2C – D, 3E – G, J, 4.

RECOGNITION. *Eriocaulon kulumi* is similar to *E. modestum* Kunth in the stem architecture and floral morphology, but differs by the smaller size (14.5 – 20 cm long vs 8.5 – 61 cm long in *E. modestum*), narrowly triangular (vs narrowly lanceolate) leaf blades arranged in depressed-globose (vs globose) rosettes (Fig. 3G – H) and oblanceolate-spathulate (vs obtrullate-spathulate) floral bracts with an obtuse (vs cuspidate) apex (Fig. 3J).

DISTRIBUTION. Brazil: Bahia, southern region of Chapada Diamantina, in the municipalities of Abaíra, Piatã, and Rio de Contas.

SPECIMENS EXAMINED. BRAZIL. Bahia: Mun. Abaíra, Rio Água Suja, 15 Feb. 2015, *Chagas & Mota* 13240 (holotype HUEFS; isotypes K, MAC); Mun. Rio de Contas, 27 April 1997, *Harley & Giulietti* 28677 (HUEFS); *loc. cit.*, Barra do Brumado, 7 March 1992, *Hatschbach et al.* 56818 (MBM); *loc. cit.*, Povoado Mato Grosso, 17 June 1998, *Giulietti & Nascimento* 1380 (HUEFS, K); *loc. cit.*, 3 Aug. 1998, *Giulietti* 1395 (HUEFS); *loc. cit.*, 22 June 2000, *Harley & Giulietti* 54027 (HUEFS, MG); *loc. cit.*, 12 June 2004, *Serrão Neto* 54 (HUEFS); *loc. cit.*, 27 Sept. 2010, *Harley & Pastore* 56162 (HUEFS); *loc. cit.*, Rio Brumado, 22 June 2013, *Chagas et al.* 13045 (HUEFS, MAC). Mun. Piatã, Rio Patricinho, 11 Nov. 2014, *Chagas et al.* 13222 (HUEFS, MAC).

HABITAT. *Eriocaulon kulumi* is found exclusively in the headwaters of the Água Suja, Brumado, and Patricinho rivers, growing on the banks or at the bottom of streams in sandy or clay substrates; alt. 970 – 1300 m.

CONSERVATION STATUS. Endangered EN B2ab(i,ii,iii). This species has a relatively small extent of occurrence (EOO = 238.143 km^2) and is only known from a few collections in five localities (AOO = 16 km^2). The main threats to *Eriocaulon kulumi* are deforestation, fire and damming of watercourses, including in state protected areas in the municipalities of Abaíra, Piatã, and Rio de Contas.

ETYMOLOGY. The epithet comes from the Tupi language trunk and means "boy" (Navarro 2013), which is here used as an analogy to the small size of *Eriocaulon kulumi* compared to the morphologically similar *E. modestum*.

Eriocaulon pyatan *E.C.O.Chagas & Giul.*, **sp. nov.** Type: Brazil, Bahia, Mun. Mucugê, estrada para Guiné, 12°53'6"S, 41°31'43"W, 1000 m, 30 July 2013, *E. C. O. Chagas* 13114 (holotype HUEFS!).

http://www.ipni.org/urn:lsid:ipni.org:names:77194101-1

Perennial herbs, 80 – 82.2 cm tall. *Rhizomes* 1 – 1.5 cm, short-vertical or -horizontal. *Leaf blades* 21.5 – 35.2 × 0.3 – 0.4 cm, linear-lanceolate, slightly thick, erect, glabrous, 10 – 12-nerved, apex subacute, arranged in an infundibular rosette of 5 – 10 leaves. *Inflorescences* 1 – 2 per rosette. *Spathes* 18 – 21.5 × 0.2 – 0.3 cm, glabrous, equal or smaller than the leaves, apex acuminate. *Scapes* 79 – 81.2 cm long, 8 – 9-costate, glabrous. *Capitula* 5 – 6 mm diam., hemispherical to ovoid; receptacles 2 – 3 mm long, conical, pilose. *Involucral bracts* in 2 – 3 series, concave, patent to suberect; external series 1.7 – 1.9 × 1.5 – 1.6 mm, ovate to oblong, coriaceous, castaneous, apex rounded, glabrous on both surfaces; internal series 2 – 2.25 × 1.5 – 1.6 mm, elliptical, chartaceous, castaneous from the base to the middle, blackish at the tip, apex rounded to obtuse, glabrous on both surfaces. *Floral bracts* 2 – 2.25 × 1.3 – 1.5 mm, obtrullate, chartaceous, stramineous from the base to the middle, blackish at the tip and midrib, apex obtuse to acute, adaxial surface glabrous, abaxial surface with white filamentous trichomes on the tip and midrib. *Flowers* trimerous. *Staminate flowers* 2 – 2.25 mm long; pedicels c.

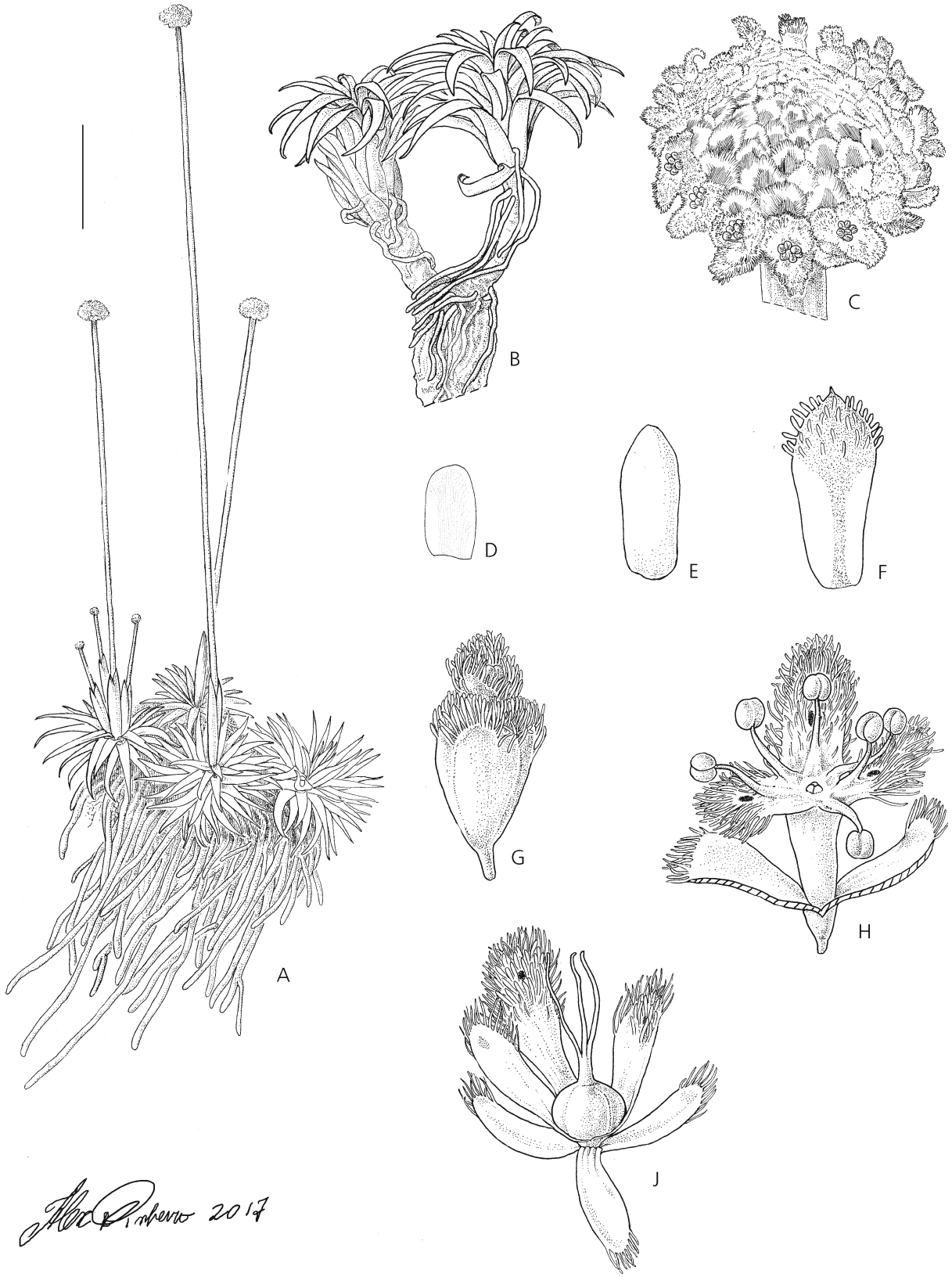

Fig. 4. *Eriocaulon kulumi*. **A** habit; **B** detail of stems and leafly rosettes; **C** capitulum; **D** involucral bract; **E – F** floral bracts; **G – H** staminate flower; **J** pistillate flower Scale bar: **A – B** 2.5 mm; **C** 3 mm; **D – H** 1 mm; **G – J** 1.3 mm. All from *E. C. O. Chagas & M. C. S. Mota* 13240. DRAWN BY ALEX ARAUJO.

Fig. 5. *Eriocaulon pyatan*. **A** habit; **B** capitulum; **C** involucral bract; **D** floral bract; **E** pistillate flower; **F – G** staminate flower. Scale bar: **A** 6 mm; **B** 2 mm; **C – D** 1.5 mm; **E** 1.8 mm; **F – G** 2.3 mm. All from *E. C. O. Chagas* 13301. DRAWN BY ALEX ARAUJO.

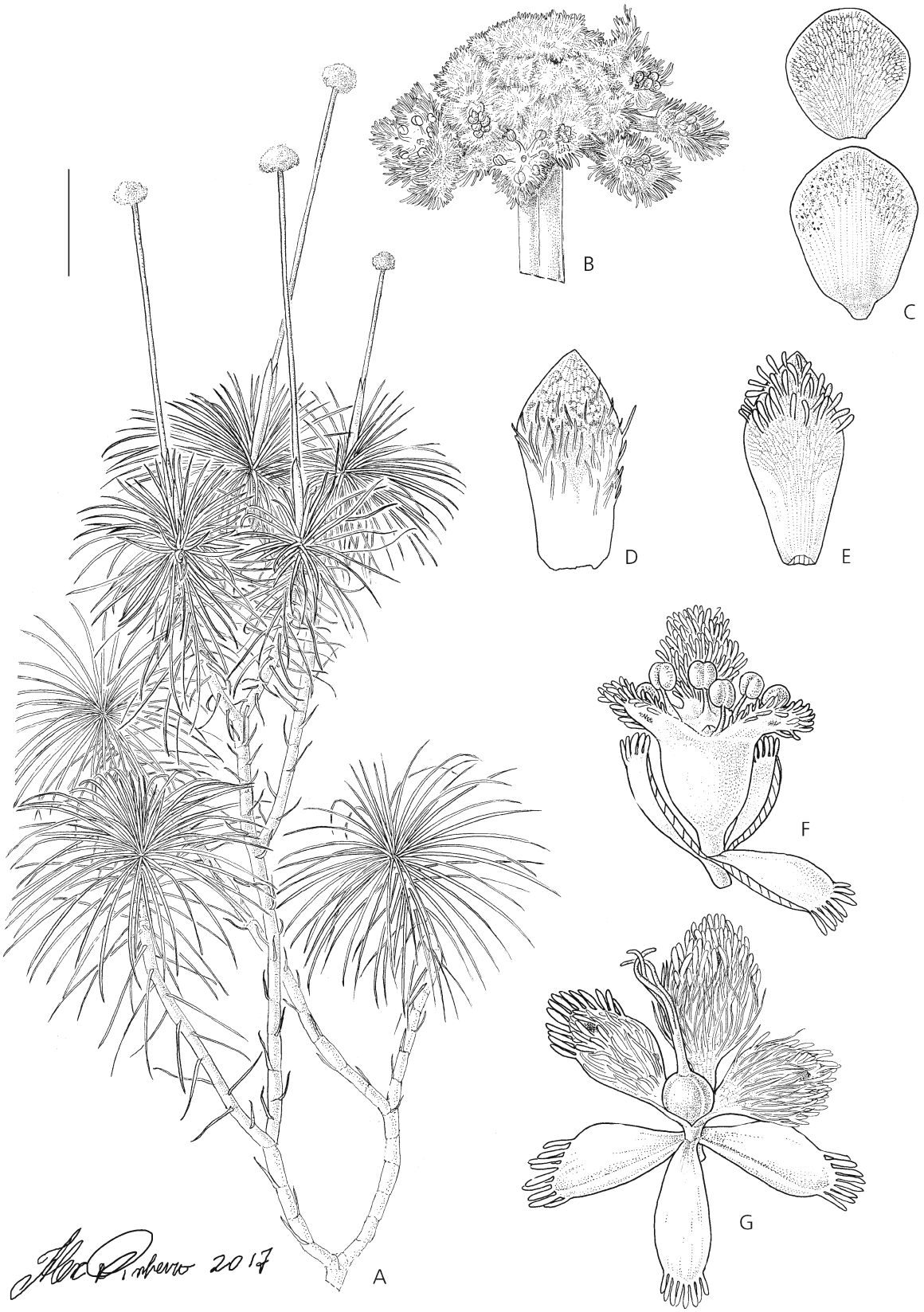

Fig. 6. *Eriocaulon yba*. **A** habit; **B** capitulum; **C** involucral bracts from outer to inner series; **D** – **E** floral bracts; **F** staminate flower; **G** pistillate flower. Scale bar: **A** 2.5 mm; **B** 2 mm; **C** 1 mm; **D** – **E** 0.8 mm; **F** 1.4 mm; **G** 1 mm. All from *E. C. O. Chagas* 13153. DRAWN BY ALEX ARAUJO.

0.25 mm long; sepals connate above the middle into a spathe, stramineous from the base to the middle, blackish at the tip and on the midrib, adaxial surface glabrous, abaxial surface with white filamentous trichomes on the midrib and tip, 3-lobed, lobes obtuse; anthophore 1.2 – 1.5 mm long, campanulate, pilose; petals with adaxial surface with white filamentous trichomes on the middle and tip, glabrous at the base, abaxial surface glabrous; ventral petals 0.5 – 0.6 × 0.4 – 0.5 mm, oblong, apex rounded; dorsal petal 0.5 – 0.6 × 0.5 – 0.6 mm, elliptical-ovate, apex rounded; glands blackish; stamens 6, filaments 0.6 – 0.7 mm long, anthers c. 0.3 mm long, olive; pistillodes 3, blackish. *Pistillate flowers* 2.5 – 2.7 mm long; pedicels c. 0.25 mm long; sepals free, stramineous from the base to the middle, blackish at the tip and on the midrib, adaxial surface glabrous, abaxial surface with white filamentous trichomes on the tip and hyaline filamentous trichomes on the midrib; ventro-lateral sepals 1.2 – 1.5 mm long, navicular, apex rounded to obtuse; dorsal sepal 1.5 – 1.7 × 0.3 – 0.5 mm, oblanceolate-spathulate, concave, apex rounded to obtuse; anthophore c. 0.3 mm long, cylindrical; petals creamy, adaxial surface with white filamentous trichomes, abaxial surface glabrous; ventral petals 1.6 – 1.8 × 0.5 – 0.7 mm, falcate, obovate, apex rounded to obtuse; the dorsal petal 2 – 2.2 × 0.7 – 0.9 mm, elliptic-spathulate, apex rounded to obtuse; glands blackish; ovary 3-locular; style column c. 0.5 mm long; stigmatic branches 0.6 – 0.75 mm long, simple. *Seeds* 600 – 633.5 × 372 – 388.2 µm, prolate, obtuse at the funicular end and rounded at the distal end; testa stratified squamous, flat; cells rectangular to hexagonal, vertically elongated in ratio of 2:1 or 3:1; contact areas of the periclinal and transverse walls forming prominent cristae, flat; appendages 16 – 23 × 6 – 7 µm, columnar cylindrical, occurring on the periclinal and transverse walls, 15 – 25 per cell, truncate at apex, flat. Figs 2E – F, 3K – L, 5.

RECOGNITION. *Eriocaulon pyatan* is morphologically similar to a small group of South American species that have caespitose growth and rosettes with linear-lanceolate (ensiform) and thick leaf blades (Fig. 3L). Among these species, *E. linearifolium* Körn., *E. humboldtii* Kunth and *E. paraguayense* Körn. have flowers with stramineous sepals, while in *E. cabralense* Silveira and *E. pyatan,* they are blackish at the tip and/or midrib. *Eriocaulon pyatan* differs from *E. cabralense* by the castaneous (vs blackish in *E. cabralense*) involucral bracts, floral bracts obtuse to acute (vs caudate) at the apex (Fig. 3K) and pistillate flowers with obtuse (vs cuspidate) ventro-lateral sepals at the apex.

DISTRIBUTION. Brazil: on the outskirts of the central portion of Chapada Diamantina, in the municipality of Mucugê.

SPECIMENS EXAMINED. BRAZIL. Bahia: Mun. Mucugê, estrada para Guiné, 12°53'6"S, 41°31'43"W, 1071 m, 29 Oct. 2005, *Carvalho Sobrinho & Neto* 686 (HUEFS); *loc. cit.*, estrada para Guiné, 12°53'6"S, 41°31'43"W, 1000 m, 30 July 2013, *Chagas* 13114 (holotype HUEFS).

HABITAT. *Eriocaulon pyatan* inhabits marshy areas or the banks of rivers and streams in *campo rupestre* vegetation (in Mucugê), in muddy or clay substrates; alt. 1000 – 1550 m.

CONSERVATION STATUS. Data Deficient (DD). This species is known only from the type locality, which is threatened by deforestation and fire.

ETYMOLOGY. The epithet comes from the Tupi language and means "vigorous" or "fortress."

Eriocaulon yba *E.C.O.Chagas & Giul.*, **sp. nov.** Type: Brazil. Bahia: Mun. São Desidério, Rio Grande, 12 July 2014, *E. C. O. Chagas* 13153 (holotype HUEFS!; isotypes K!, MAC!).

http://www.ipni.org/urn:lsid:ipni.org:names:60477978-2

Perennial herbs, 9 – 180 cm long, forming dense clusters with much-branched individuals, branches spreading and dividing, up to a few dozen terminal branches in large, mature individuals. *Stems* 8 – 170 cm long. *Leaf blades* 0.7 – 2.5 × 0.05 – 0.1 cm, lanceolate-filiform, membranous, middle leaves patent to reflexed, slightly concave, glabrous, 3-nerved, apex narrowly acuminate to caudate, distributed along the stem, but concentrated at the apex. *Inflorescences* 1 – 2 per rosette. *Spathes* 1 – 2.2 × 0.07 – 0.1 cm, chartaceous, glabrous, surpassing the leaves, apex acuminate. *Scapes* 8.1 – 22.2 cm long, 7-costate, glabrous. *Capitula* 5 – 6 mm diam., hemispherical to globose; receptacles 1 – 2 mm long, globose, pilose. *Involucral bracts* in 2 – 3 series, patent; external series 1 – 1.25 × 1 – 1.25 mm, obovate-orbicular, chartaceous, stramineous at the base, blackish from the middle to the tip, apex rounded, glabrous on both surfaces; internal series 1.5 – 1.75 × 1.25 – 1.5 mm, obovate-orbicular, chartaceous, stramineous from the base to the middle, blackish at the tip, apex rounded to obtuse, glabrous on both surfaces. *Floral bracts* 1.5 – 1.8 × 0.6 – 0.8 mm, obtrullate-spathulate, chartaceous, stramineous from the base to the middle, blackish at the tip, apex acute, adaxial surface glabrous, abaxial surface with white filamentous trichomes on the tip. *Flowers* trimerous. *Staminate flowers* 2.75 – 3 mm long;

pedicels c. 0.25 mm long; sepals connate above the middle into a spathe, stramineous from the base to the middle, blackish at the tip and midrib, adaxial surface glabrous, abaxial surface with white filamentous trichomes on the midrib and tip, 3-lobed, lobes obtuse; anthophore cup-shaped, 1 – 1.25 mm long; petals creamy, adaxial surface with white and hyaline filamentous trichomes on the middle and tip, abaxial surface glabrous; ventral petals 0.8 – 1 × 0.4 – 0.5 mm, oblong, apex obtuse; dorsal petal 0.75 – 1 × 0.6 – 0.7 mm, oblong-elliptic, apex obtuse; gland oblong, blackish; stamens 6, filaments 1 – 1.25 mm long, anthers c. 0.3 mm long, blackish; pistillodes 3, blackish. *Pistillate flowers* 2.25 – 2.5 mm long; pedicels c. 0.1 mm long; sepals free, stramineous from the base to the middle, blackish at the tip, adaxial surface glabrous, abaxial surface with white filamentous trichomes on the tip; ventro-lateral sepals 1.25 – 1.5 mm long, navicular, apex asymmetric; dorsal sepal 1 – 1.25 × 0.3 – 0.5 mm, obovate-spathulate, concave, apex rounded; anthophore c. 0.25 mm long, obconic; petals creamy, adaxial surface with white and hyaline filamentous trichomes on the middle and tip, adaxial surface glabrous; ventral petals 1.25 – 1.5 × 0.75 – 1 mm, elliptic-spathulate, apex rounded; dorsal petal 1.5 – 1.75 × 0.8 – 1.25 mm, ovate-spathulate, apex rounded; glands prolate, blackish; ovary 3-locular; styles column c. 0.2 mm long, conical; stigmatic branches 0.75 – 1 mm long, simple. *Seeds* not seen. Fig. 3M – P, 6.

RECOGNITION. *Eriocaulon yba* is similar to *E. araguaiense* A.L.R.Oliveira & C.P.Bove by having a caulescent habit (Fig. 3M – N) and petals with two types of trichomes. However, individuals of *E. yba* are more robust than those of *E. araguaiense* and have a submerged stem that is 9 – 180 cm long with successive dichotomous ramifications, while those of *E. araguaiense* have stems that are 1 – 14 cm long, which may have dichotomous ramifications to one level. The successive dichotomous ramifications of *E. yba* stems are unique among *Eriocaulon* species. *Eriocaulon yba* also differs from *E. araguaiense* by the lanceolate-filiform (vs narrowly lanceolate-triangular in *E. araguaiense*) leaf blades, which have a narrowly acuminate to caudate (vs long acuminate) apex and are 3-nerved (vs 5-nerved or more) at the base, 1 – 2 (vs 3 or more) inflorescences per rosette, capitula 5 – 6 mm in diam. (vs 3 – 4 mm in diam.), longer pistillate flowers (2 – 2.5 mm vs 1.25 – 1.75 mm long) (Fig. 3P), and ovate-spathulate (vs elliptic-spathulate) ventral petals.

DISTRIBUTION. Brazil: western Bahia, in the municipalities of Barreiras, Correntina, Formosa do Rio Preto, and São Desidério.

SPECIMENS EXAMINED. BRAZIL. Bahia: Mun. Barreiras, Rio das Pedras, 14 July 1983, *Faria* s.n. (ALCB, HUEFS); *loc. cit.*, caminho para a EPABA, 14 July 1983, *Guedes* 775 (ALCB); Mun. Correntina, Rio Santo Antônio, 15 July 2014, *Chagas* 13162 (HUEFS, MAC); Mun. Formosa do Rio Preto, Rio Preto, 485 m, 4 June 2011, *Bove et al.* 2265 (R); *loc. cit.*, 23 Aug. 2014, *Chagas & Mota* 13195 (HUEFS, MAC); Mun. São Desidério, Rio Grande, 12 July 2014, *Chagas* 13153 (holotype HUEFS; isotypes K, MAC).

HABITAT. *Eriocaulon yba* inhabits areas in the headwaters of the Grande, das Pedras, Preto, and Santo Antônio rivers. It is common in the marginal portion of the bottom of streams and small rivers in *cerrado* vegetation, in clay or sandy substrates; alt. 300 – 500 m.

CONSERVATION STATUS. Endangered EN B2ab(i,ii,iii), based on the area of occupancy. Despite the wide extent of occurrence (EOO = 7,077.448 km^2), the region that *Erioculon yba* occurs in has many environmental conflicts because of farming, livestock and tourism activities, which has resulted in deforestation, fires, damming of tributary streams, and silting of rivers that threaten the species, including in the protected areas of the Rio Preto Ecological Station (Mun. Formosa do Rio Preto), Rio de Janeiro Basin Environmental Protection Area (Mun. Barreiras), and São Desidério Environmental Protection Area (Mun. São Desidério). This species is only known from a few populations (AOO = 24 km^2) in western Bahia, which is a heavily deforested agricultural frontier where much of the grain from Brazil is cultivated.

ETYMOLOGY. The word "yba" refers to "tree" in the Tupi language (Navarro 2013). The use of this epithet alludes to the growth form of the stems of this species.

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Publisher's Note

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