

# Pottiaceae Schimp.

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This treatment is composed of the following taxa: Pottiaceae, *Acaulon*, *Aloina*, *Andina*, *Anoetangium*, *Barbula*, *Chenia*, *Didymodon*, *Dolotortula*, *Erythrophyllopsis*, *Eucladium*, *Ganguleea*, *Gymnostomiella*, *Gymnostomum*, *Hymenostyliella*, *Hymenostylium*, *Hyophila*, *Hyophiladelphus*, *Leptodontium*, *Luisierella*, *Microbryum*, *Molendoa*, *Plaubelia*, *Pleurochaete*, *Pseudocrossidium*, *Pseudosymblepharis*, *Streptocalypta*, *Streptopogon*, *Syntrichia*, *Timmiella*, *Tortella*, *Tortula*, *Trachycarpidium*, *Trichostomum*, *Weisiopsis*, *Weissia*.

## HOW TO CITE

Costa, D.P. 2020. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96764>.

## DESCRIPTION

**Pottiaceae** Schimper Plants small, erect, in dense or gregarious turfs or cushion, reddish brown. Leaves incurved or imbricate when dry, erect-patent when moist, lingulate, ovate or ligulate, concave, apex rounded, cucullate, mucronate or piliferous; margins entire, dentate or crenulate, unistratose; bordered or not by short-rectangular to linear hyaline cells; costa subpercurrent, sometimes excurrent; in cross-section guide cells in 2-4 layers, band of stereids differentiated, hydroids absent, photosynthetic filaments uniseriate covering part of the dorsal surface of the lamina. Upper and middle laminal cells rectangular, quadrate or rounded, thick-walled, smooth; basal laminal cells quadrate or rectangular; basal marginal cells sometimes differentiated, quadrate or rectangular, thin-walled, hyaline. Dioicous or monoicous. Perichaetia terminal. Seta erect, twisted to right, reddish brown. Capsule erect, sometimes inclined, stegocarpous, exserted; theca ovoid-cylindrical to cylindrical, reddish brown. Peristome of 32 filamentous, papillose, spirally twisted, incurved or straight, reddish brown to yellowish brown, basal membrane usually developed. Operculum conical or rostrate, reddish brown. Calyptra cucullate, smooth, naked, yellowish brown. Spores spherical, usually granulate, yellowish to light brown.

With 7 subfamilies, 6 tribes, 77 genera, and 1457 species globally (Zander 1993); being represented in tropical America by 55 genera and 361 species (Gradstein et al. 2001), and in Brazil by 4 subfamilies, 36 genera, and 69 species (Costa 2016).

## COMMENTS

Pottiaceae is a family of acrocarpous mosses comprising 7 subfamilies, 6 tribes, 77 genera, and 1457 species globally (Zander 1993). In the Neotropics, it is represented by 55 genera and 361 species (Gradstein et al. 2001). Costa (2016) published a synopsis for the family to Brazil, recognizing 4 subfamilies, 36 genera, and 69 species. The habitats of the species in Brazil are diverse, but they usually occur in environments subject to desiccation or disturbances that are associated with human anthropogenic activities (urban areas).

Subfamilies and tribes of Pottiaceae present in Brazil

Subfamily Timmielloideae (1 genus, 1 species): *Timmiella*.

Subfamily Trichostomoideae (8 genera, 18 species): *Eucladium*, *Pleurochaetae*, *Pseudosymblepharis*, *Streptocalypta*, *Tortella*, *Trachycarpidium*, *Trichostomum*, *Weissia*.

Subfamily Barbuloideae (3 tribes, 18 genera, 35 species).

Tribe Barbuleae (9 genera, 14 species): *Andina*, *Anoetangium*, *Barbula*, *Didymodon*, *Erythrophyllopsis*, *Gymnostomum*, *Hymenostyliella*, *Hyophiladelphus*, *Molendoa*.

Tribe Bryoerythrophyllae (1 genus, 2 species): *Pseudocrossidium*.

Tribe Hyophilleae (6 genera, 8 species): *Ganguleea*, *Gymnostomiella*, *Hyophila*, *Luisierella*, *Plaubelia*, *Weisiopsis*.

Tribe Leptodontieae (2 genera, 11 species): *Hymenostylium*, *Leptodontium*.

Subfamily Pottioideae (2 tribes, 9 genera, 15 species).

Tribe Pottieae (1 genus, 1 species): *Tortula*.

Tribe Syntrichieae (8 genera, 14 species): *Acaulon*, *Aloina*, *Chenia*, *Dolotortula*, *Henediella*, *Microbryum*, *Streptopogon*, *Syntrichia*.

**Life Form**

Cushion, foliose, Tuft, Weft

**Substrate**

Corticicolous, Epixilous, Rupicolous, Saxicolous, Terrestrial

**DISTRIBUTION**

Native, Not endemic to Brazil

**Phytogeographic Domains**

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa, Pantanal

**Vegetation Types**

Anthropic area, Caatinga (stricto sensu), Amazonian Campinarana, High Altitude Grassland, Grassland, Highland Rocky Field, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Inundated Forest (Igapó), Terra Firme Forest, Inundated Forest (Várzea), Seasonally Deciduous Forest, Seasonally Semideciduous Forest, Ombrophylloous Forest (Tropical Rain Forest), Mixed Ombrophylloous Forest, Coastal Forest (Restinga), Rock outcrop vegetation

**Ocean Islands**Confirmed occurrences

Fernando de Noronha

**Geographic Distribution**Confirmed occurrences

North (Acre, Amazonas, Pará, Rondônia, Roraima, Tocantins)

Northeast (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe)

Central-west (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

**IDENTIFICATION KEY**

1. Costal outgrowths present (filaments or lamellae) ..... 2
- 1'. Costal outgrowths absent ..... 4
2. Costa with 2 rows of lamellae on the upper ventral surface or adaxial surface (lamellae with 10–12 cells high) ..... *Hymenostyliella alata*
- 2'. Costa with many photosynthetic filaments on the adaxial surface ..... 3
3. Leaves short-lingulate to lingulate, costa subpercurrent to percurrent, covered from midleaf to near apex with photosynthetic filaments with 3–9 cells high. Basal membrane of peristome with with 3–4 rows of cells projecting above mouth..... *Aloina rigida*
- 3'. Leaves ovate-lanceolate to lanceolate, costa percurrent, ventral outgrowths forming a group of cells inflate and papillose. Basal membrane of peristome scarcely differentiated..... *Andina pruinosa*
4. Lamina bistratose or partially unistratose and fully bistratose at midleaf ..... 5
- 4'. Lamina unistratose ..... 6
5. Lamina plane to slightly incurved, bistratose except at margin; cells smooth, the upper laminal cells medially bistratose, in cross section without a layer of cells directly above the other ..... *Timmiella barbuloidea*
- 5'. Lamina keeled or channeled, partially unistratose and fully bistratose at midleaf; cells papillose, the upper laminal cells bistratose, in cross section with one layer of cells directly above the other ..... *Erythrophyllopsis andina*
6. Costa without stereid bands ..... *Gymnostomiella vernicosa*
- 6'. Costa with stereid bands ..... 7
7. Costa with one stereid band ..... 8
- Costa with two stereid bands ..... 24
- Costa with two rows of guide cells ..... *Streptocalypta lorentziana*
- 8'. Costa with one row of guide cells..... 9
9. Costal epidermis presents in both abaxial and adaxial surfaces ..... 10
- 9'. Costal epidermis present in only one surface, abaxial or adaxial ..... 17
10. Leaves obtuse, acute, acuminate, rounded or abruptly cucullate..... 12

- 10'. Leaves apiculate or mucronate.....11
11. Leaves broadly ovate. Dioicous. Capsule globose. Operculum absent ..... Acaulon uleanum
- 11'. Leaves oblong-elliptical to spatulate. Monoicous. Capsule ovate, with 8 plicae. Operculum long-conical, smooth to rough..... *Ganguleea angulosa*
12. Leaf margins plane..... 13
- 12'. Leaf margins recurved..... 16
13. Leaves lingulate to spatulate; laminal cells in cross section bulging on both surfaces (abaxial and adaxial)..... 14
- 13'. Leaves oblong-elliptic or ligulate to spatulate; laminal cells in cross section bulging-mammillose on the ventral surface and plane or weakly convex on the abaxial surface..... 15
14. Marginal cells forming a border, (2-)3-5(-7) rows of linear to long-rectangular cells at midleaf. Capsule yellow-brown, cylindrical; annulus of 2-4 rows of cells. Operculum conical to rostrate. Calyptra cucullate .. *Henediella denticulata*
- 14'. Marginal cells not forming a border. Capsule brown, spherical; annulus of 2-3 rows of cells. Operculum short- to long-conical. Calyptra mitriform..... *Chenia leptophylla*
15. Plants rosulate. Leaves oblong-elliptical; costa subpercurrent to percurrent. Dioicous. Capsule ellipsoidal or oblong; annulus persistent on the capsule mouth. Operculum rostrate....*Plaubelia sprengelli*
- 15'. Plants evenly foliate. Leaves ligulate to spatulate; costa subpercurrent. Monoicous. Capsule cylindrical; annulus not persistent. Operculum long-conical to rostrate ..... *Weisiopsis bahiensis*
16. Leaf bordered by rows of long and narrow cells, apex with propagula. Dioicous or monoicous. Capsule elliptical, with a short rugose neck; annulus of 4 rows of slightly vesiculose cells. Operculum conical. Calyptra conic-mitrate, lobed below, strongly papillose..... *Streptopogon*
- 16'. Leaf not bordered, apex without propagula. Dioicous. Capsule elliptical to cylindrical, with a neck; annulus of 1-3 rows of vesiculose cells. Operculum short- to long-conical. Calyptra cucullate, smooth..... *Didymodon* p.p.
17. Ventral costal epidermis absent..... *Anoetangium aestivum*  
Obs: the leaves are keeled and narrowly oblong.
- 17'. Ventral costal epidermis present ..... 18
18. Leaves with a strong multistratose border ..... *Dolotortula mniifolia*
- 18'. Leaves without a multistratose border ..... 19
19. Leaves lingulate ..... *Luisierella barbula*
- 19'. Leaves oblong, lanceolate, ovate, obovate to spatulate ..... 20
20. Leaf margins plane..... *Syntrichia* p.p.
- 20'. Leaf margins recurved..... 21
21. Leaves not mucronate (acute) ..... *Syntrichia amphidiacea*
- 21'. Leaves mucronate ..... 22
22. Leaf margins usually bordered by one or two rows of cells with thicker walls and a lesser development of papillae. Costa short- to long-excurrent as a hair point hyaline or rarely yellowish ..... *Tortula muralis*
- 22'. Leaf margins not bordered. Costa excurrent or short-excurrent as an apiculus, mucro or short awn, occasionally only percurrent ..... 23
23. Leaf margin incurved distally, often recurved near the apex, entire at apex (rarely serrulate). Costa excurrent as an apiculus, mucro or short awn, occasionally percurrent. Monoicous. Capsule ovate to short-elliptical; annulus of 1-2 rows of vesiculose cells, persistent. Operculum short-conical. Calyptra mitrate, smooth ..... *Microbryum davallianum*
- 23'. Leaf margin incurved distally, plane below, or strongly revolute, entire. Costa subpercurrent or short-excurrent (mucronate). Dioicous. Capsule elliptical to cylindrical, occasionally curved; annulus of 2-4 rows of vesiculose cells, persistent. Operculum short- to long-conical or conical-rostrate. Calyptra cucullate, smooth..... *Pseudocrossidium*
24. Costal epidermis absent on both surfaces ..... *Leptodontium*
- 24'. Costal epidermis present ..... 25
25. Costal epidermis present on both surfaces, abaxial and adaxial ..... 26
- 25'. Costal epidermis present in one surface, abaxial or adaxial ..... 34
26. Leaf margins usually denticulate only near leaf base or upper sheathing portion of leaf..... *Eucladium verticillatum*
- 26'. Leaf margins entire, denticulate, serrulate or serrate near apex or throughout..... 27
27. Leaves not mucronate, apex acute-rounded to subulate ..... 28
- 27'. Leaves mucronate, apex acute to rounded-obtuse ..... 29
28. Leaf apex acute-rounded, margins plane (occasionally recurved), costa subpercurrent to percurrent. Capsule short-cylindrical, erect. Operculum rostrate..... *Molendoa sendtneriana*
- 28'. Leaf apex acute to subulate, occasionally fragile, margins recurved, costa percurrent to long-excurrent as a subula. Capsule long-elliptical to cylindrical, sometimes curved. Operculum long-conical to conical-rostrate..... *Didymodon rigidulus* [Obs: ventral stereid band usually weak]
29. Leaf margins recurved..... *Barbula* p.p.

- 29'. Leaf margins not recurved (plane or incurved)..... 30
30. Leaves oblong-obovate, elliptical to spatulate .....31
- 30'. Leaves ovate to elliptical, ligulate, oblong, oblong-lanceolate, linear-lanceolate ..... 32
31. Leaf acute, margins plane, recurved near base; costa excurrent to percurrent, with hydroid (in cross section). Peristome well-developed..... Hyophiladelphusagrarius
- 31'. Leaf rounded-obtuse, margins plane throughout; costa subpercurrent to percurrent, without hydroid (in cross section). Peristome absent ..... Hyophila
32. Leaf margins plane or incurved or undulate above. Leaves ligulate, oblong to oblong-lanceolate, linear-lanceolate; costa strong, shortly-excurrent, tip robust..... Trichostomum
- 32'. Leaf margins plane or weakly recurved at midleaf. Leaves ovate to elliptical, lanceolate to triangular-lanceolate; costa not strong, subpercurrent to shortly-excurrent as a mucro..... 33
33. Costa shortly-excurrent as a mucro..... Barbula indica
- 33'. Costa subpercurrent..... Barbula afrofontana
34. Abaxial costal epidermis present ..... Hymenostylium recurvirostrum
- 34'. Adaxial costal epidermis present ..... 35
35. Leaf margins incurved..... Weissia
- 35'. Leaf margins plane..... 36
36. Costa with two rows guide cells ..... Streptocalypta lorentziana
- 36'. Costa with one row guide cells ..... 37
37. Leaves bordered, marginal cells forming a border 2/3–3/4 lamina length ..... Pleurochaete luteola
- 37'. Leaves not bordered ..... 38
38. Leaves with basal laminal cells differentiated extending upward along margin like a V (inverted or not) ..... 39
- 38'. Leaves with basal laminal cells not differentiated along margin or weakly differentiated as weak V..... 40
39. Basal laminal cells extending upward along margin like a V inverted, rectangular, lax, thin-walled. Costa excurrent as a mucro or awn. Monoicous. Seta very short. Capsule ovate, with protuberances, annulus absent. Calyptra campanulate..... Trachycarpidium lonchophyllum
- 39'. Basal laminal cells forming a V-shape extension toward and along marginal shoulder, rectangular, thin to occasionally thick-walled. Costa percurrent to short-excurrent. Dioicous. Seta long. Capsule cylindrical without protuberances. Calyptra cucullate ..... Tortella
40. Leaves plane or weakly concave, costa subpercurrent (ending below apex). Peristome absent .....Gymnostomum aeruginosum
- 40'. Leaves erect, often clasping at base, incurved, costa short-excurrent or excurrent in a mucro. Peristome 16 teeth, short, erect or twisted, spiculate ..... Pseudosymblepharis

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Zander, R.H. (2006) The Pottiaceae s. str. as an evolutionary Lazarus taxon. *The Journal Hattori Botanical Laboratory* 100: 581–602. Zander, R.H. & During, H.J. (1999) *Neophoenix* (Pottiaceae), a new African moss genus found through soil diaspore bank analysis. *Taxon* 48: 657–662.

# *Acaulon* Müll. Hal.

This treatment is composed of the following taxa: *Acaulon*, *Acaulon uleanum*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96765>.

## DESCRIPTION

### **Acaulon Müll. Hal.**

**Plants** small, gregarious turfts, yellowish, brown or reddish. **Stems** unbranched, short, to 0.5 mm. **Leaves** appressed, broad-ovate, strongly concave, apex reflexed, acute; margins plane, entire to dentate; costa short-excurrent, apiculate or mucronate, cells above and below elongate, smooth, in cross-section round, ventral stereid band generally absent, dorsal present but weak, guide cells 2–4 in 1 layer; upper laminal cells quadrate-rounded to rhomboidal, thickened, smooth to papillose, papillae over cell lumen; basal cells rectangular, thin-walled. **Dioicous**. **Perichaetia** terminal. **Seta** short, to 0.2 mm. **Capsule** cleistocarpous, immersed, spherical. **Operculum** and **peristome** absent. **Calyptra** mitrate, lobed at base. **Spores** finely papillose.

## COMMENTS

**Comments:** One species occurs in Brazil, on semi-dry vegetation at low to medium elevations.

### **Life Form**

foliose, Tuft

### **Substrate**

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### **Phytogeographic Domains**

Atlantic Rainforest, Pampa

### **Vegetation Types**

Grassland, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

### **Geographic Distribution**

#### Confirmed occurrences

South (Paraná, Rio Grande do Sul, Santa Catarina)

# *Acaulon uleanum* Müll. Hal.

## DESCRIPTION

**Acaulon uleanum** Müll. Hal., Flora 71: 3. 1888. Type: Brazil, Santa Catarina, insula Sta. Catharina, in terra nuda, August 1886, *E. Ule* 2 (Holotype: BM; Isotypes: BM, HBG, RB).

**Plants** very small. **Leaves** strongly concave, broadly ovate; costa short-excurrent. **Dioicous**. **Capsule** globose, immersed, apiculate, cleistocarpic. **Operculum** absent.

## COMMENTS

**Distribution and ecology:** Brazil and Chile (Zander 1993). In Brazil occurs in Steppe and Atlantic Rainforest, 0-700 m, on moist soil or rocks. In Brazil it is restricted to the southern region, occurring on semi-dry vegetation at low altitude. In the world is restricted to Southern Hemisphere (subtropical areas).

**Comments:** The presence of an apiculus in cleistocarpic capsules is a well-recognized and highly conserved trait (Zander 1993).

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest, Pampa

## Vegetation Types

Grassland, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

South (Paraná, Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

E.H.G. Ule, 64, RB, Santa Catarina, **Typus**

D. M. Vital, 11403, SP, Paraná

E. Ule, s.n., RB, Santa Catarina

D. M. Vital, 9011, SP, Rio Grande do Sul

D. M. Vital, 9175, SP, Rio Grande do Sul

## FIELD IMAGES / ILLUSTRATIONS



FIGURE *Acaulon uleanum* Müll. Hal. A. Habit; B-C. Leaves; D. Leaf apex; E. Sporophyte. F. Leaf section.

*danise pinheiro da costa*

Figure 1: *Acaulon uleanum* Müll. Hal.

## REFERENCE

Costa, D. P. 2016. A synopsis of the family Pottiaceae in Brazil. *Phytotaxa*, Monograph, 251: 1-69.

# *Aloina* Kindb.

This treatment is composed of the following taxa: *Aloina*, *Aloina rigida*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB581923>.

## DESCRIPTION

### **Aloina** Kindb.

**Plants** very small, in isolated or dense turfs, reddish brown. **Stem** erect, 2-6 mm, single or with few branches. **Leaves** ovate-lingulate or short-lingulate, concave, 0.5-2.5 mm; lamina partly bistratose; hyaline hair differentiated formed from the lamina (4-8 cells high, the apical cell thickened); apex rounded, cucullate, mucronate or piliferous; base auriculate; margins strongly incurved, entire, dentate or crenulate; costa ending at or some cells below the apex; in cross section plane-convex, guide cells in 2-4 layers, ventral stereids band not differentiated, dorsal stereid band differentiated; upper and median laminal cells oblate, sometimes rectangular, quadrate or rounded, thickened, smooth; basal laminal cells rectangular, thin-walled. **Dioicous** or **monoicous**. **Perichaetia** terminal. **Seta** spirally twisted. **Capsule** erect, cylindrical or ovoid-cylindrical. **Operculum** long-conical or rostrate. **Peristome** single, teeth filamentous, papillose, spirally twisted, erect to incurved. **Calyptra** cucullate, smooth, naked. **Spores** spherical, slightly to strongly papillose.

## COMMENTS

**Comments:** A widely distributed genus, with only one species in Brazil.

### **Life Form**

foliose, Tuft

### **Substrate**

Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### **Vegetation Types**

Anthropic area

### **Geographic Distribution**

Confirmed occurrences

Southeast (São Paulo)

# *Aloina rigida* (Hedw.) Limpr.

## DESCRIPTION

***Aloina rigida*** (Hedw.) Limpr., Die Laubm. Deutschl. 1: 637, 1888. Basionym: *Barbula rigida* Hedw., Sp. Musc. Frond. 115. 1801. Type: Europe. In muris limosis, tumulis coemeteriorum, collibus apricis Saxoniae, Germaniae, Angliae, Scotiae, Hungariae (lectotype G 208412 by Gallego et al. 1999).

**Plants** very small (to 2.5 mm). **Leaves** short-ligulate to ligulate, margins entire or dentate; apex cucullate; costa large, subpercurrent to percurrent, ventrally covered with photosynthetic filaments (4–8 cells high); lamina bistratose. **Dioicous**. **Peristome** long, 4.0–15 mm. **Capsule** ovoid-cylindric. **Operculum** conical, long-rostrate. **Peristome** long.

## COMMENTS

**Distribution and ecology:** widespread throughout the world (Zander 1993). In Brazil, only one collection is known from an urban area of São Paulo city, growing on soil, ca. 800 m.

**Illustration:** Cano et al. (2008)

## Life Form

foliose, Tuft

## Substrate

Terrestrial

## DISTRIBUTION

Native, Is endemic from Brazil

## Vegetation Types

Anthropic area

## Geographic Distribution

### Confirmed occurrences

Southeast (São Paulo)

## HERBARIUM MATERIAL

A. Schäfer-Verwimp, 15308, SV, MEXU, São Paulo

## FIELD IMAGES / ILLUSTRATIONS

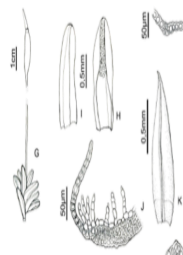


FIGURE *Aloina rigida* (Hedw.) Limpr. G. Habitat; H. Leaf with photosynthetic filaments; I. Leaf; J. Leaf section;

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Figure 1: *Aloina rigida* (Hedw.) Limpr.

## REFERENCE

Costa, D. P. 2016. A synopsis of the family Pottiaceae in Brazil. *Phytotaxa, Monograph*, 251: 1-69.



# Andina J.A. Jiménez & M.J. Cano

This treatment is composed of the following taxa: *Andina*, *Andina pruinosa*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB581926>.

## DESCRIPTION

**Andina** J.A. Jiménez & M.J. Cano **Plants** small to median, in dense turfs, green to brown above, brown to blackish below. **Stem** erect, 0.2-2.2 cm, simple or branched; axillary hairs filiform, 3-6 cells long, basal cell brown. **Leaves** erect-patent to patent, lanceolate, ovate to triangular; apex obtuse to rounded; margins recurved to revolute; costa subpercurrent to percurrent; ventral surface with photosynthetic lamellae; dorsal surface bulging and papillose, upper and median laminal cells round to quadrate, smooth to papillose, papillae single or bifid; basal laminal cells long-rectangular, quadrate to short-rectangular, thin-walled, smooth; costa in cross section elliptical to rounded, guide-cells in 1-3 layers, ventral stereid band differentiated or not, dorsal stereid band semicircular. **Dioicous**. **Perichaetial** terminal. **Seta** erect, smooth. **Capsule** erect, cylindrical. **Operculum** rostrate to long-conic. **Peristômio** with tooth filiform and papillose. **Calyptra** cucullate, smooth, naked. **Spores** spherical, slightly papillose.

## COMMENTS

**Comments:** A South America genus, with one rare species occurring in Brazil (Jiménez & Cano 2012).

### Life Form

foliose, Tuft

### Substrate

Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest

### Vegetation Types

Ombrophyllous Forest (Tropical Rain Forest)

### Geographic Distribution

#### Confirmed occurrences

South (Paraná)

# *Andina pruinosa* (Mitt.) .A. Jiménez & M.J. Cano

## DESCRIPTION

**Andina pruinosa** (Mitt.) J.A. Jiménez & M.J. Cano, Syst. Bot. 37: 296. 2012. Basionym: *Tortula pruinosa* Mitt., J. Linn. Soc., Bot. 12: 152, 1869. Type: ECUADOR. Cargairazo: 10,000–11,000 ft, Spruce 208 (NY!, lectotype by Steere 1948; BM!, S, isolectotypes)

**Plants** with axillary hairs with one basal brownish cell. **Leaves** ovate-lanceolate to lanceolate when twisted; apex cucullate; margins revolute; costa percurrent, with two stereid bands in cross section, with the cells of the adaxial surface as groups of bulging; cells papillose.

**Illustration:** Jiménez & Cano (2008).

## COMMENTS

**Distribution and ecology:** South America (Argentina, Bolivia, Brazil, Colombia, Ecuador, Peru, and Venezuela - Jiménez et al. 2012). In Brazil encountered in the Atlantic Rainforest (PR), ca. 900 m, occurring on soil.

**Comments:** Jiménez & Cano (2008) cited one collection from Paraná state, Bocaiuva do Sul, sampled by Cordeiro & Poliquesi 1040 (FLAS). According to its actual distribution, this species should occur in southern Brazil.

**Illustration:** Jiménez & Cano (2008)

## Life Form

foliose, Tuft

## Substrate

Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

Confirmed occurrences

South (Paraná)

## HERBARIUM MATERIAL

Cordeiro & Poliquesi, 1040, FLAS, Paraná

R. Spruce, 208, NY, BM, **Typus**

## REFERENCE

Jiménez, J. A., M. J. Cano & J. F. Jiménez. 2012. Taxonomy and phylogeny of *Andina* (Pottiaceae, Bryophyta): a new moss genus from the tropical Andes. Syst. Bot. 37(2): 293–306.

# Anoectangium Schwägr.

This treatment is composed of the following taxa: *Anoectangium*, *Anoectangium aestivum*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96767>.

## Has as synonym

*Anictangium* Hedw.

## DESCRIPTION

### **Anoectangium Schwägr.**

**Plants** small, in tufts, green to yellowish-green, brown below. **Stems** erect, simple to few branched, tomentose or not. **Leaves** distant to crowded, appressed to erect-spreading, incurved, oblong to ligulate or lanceolate, keeled, grooved along costa, apex acute to obtuse, mucronate; margins plane or weakly reflexed at midleaf, entire or crenulate; costa subpercurrent to percurrent, ventral superficial cells elongate, dorsal superficial cells elongate, in cross section reniform to oval, stereids only below guide cells (2–4 cells in one layer); upper laminal cells oval to subquadrate or hexagonal, thick-walled, papillose, papillae simple or multiple; basal cells close to costa, short rectangular, thick-walled. **Dioicous**. **Perichaetia** terminal on short lateral branches. **Seta** long and twisted. **Capsule** erect, ovoid to elliptical, neck short. **Operculum** long-rostrate, oblique. **Peristome** absent. **Calyptra** cucullate, smooth. **Spores** spherical, slightly to densely papillose.

## COMMENTS

**Comments:** One species in Brazil, occurring on soil or rocks (frequently calcareous) in lowland to upper montane sites.

### **Life Form**

Cushion, foliose, Tuft

### **Substrate**

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### **Phytogeographic Domains**

Central Brazilian Savanna, Atlantic Rainforest

### **Vegetation Types**

Riverine Forest and/or Gallery Forest, Terra Firme Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

### **Geographic Distribution**

#### Confirmed occurrences

Northeast (Maranhão)

Central-west (Goiás)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Santa Catarina)

# *Anoectangium aestivum* (Hedw.) Mitt.

## Has as synonym

basionym *Gymnostomum aestivum* Hedw.

## DESCRIPTION

*Anoectangium aestivum* (Hedw.) Mitt., J. Linn. Soc., Bot. 12: 175. 1869. Basionym: *Gymnostomum aestivum* Hedw., Spec. Musc. Frond. 32. 1801. Type: Locia palustribus Angliae, Helvetiae, Lipsiae in argillaefodina inventum habet Schreber, mihi tamen necdum obvium (G lectotype selected by Geissler 1985).

**Plants** medium-sized, in tufts or cushions, yellowish-green to brownish. Stems erect. **Leaves** incurved when dry, spreading to patent when wet, ovate-lanceolate or lanceolate, acute or acuminate smooth, with a short apiculus, keeled, carinate (deeply grooved); margins plane, papillose-crenulate except at base; costa strong, subpercurrent or percurrent, papillose above; laminal cells rounded-quadrate, thickened walls, pluripapillose, with bifid papillae; basal laminal cells hyaline, subquadrate to short rectangular. **Sporophyte** terminal, on short lateral branch. Seta erect **Peristome** absent. **Operculum** oblique.

## COMMENTS

**Distribution and ecology:** widespread globally, in Brazil encountered in the Amazon Forest, Savanna, and Atlantic Rainforest, 0-1900 m, growing on moist soil and rocks.

**Comments:** In Brazil can be confused with *Molendoa sendtneriana* (Bruch & Schimp.) Limpr., which differs by being smaller, leaves with part of the lamina bistratose, costa ending below the apex with two stereid bands.

## Life Form

Cushion, foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Riverine Forest and/or Gallery Forest, Terra Firme Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

Northeast (Maranhão)

Central-west (Goiás)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Santa Catarina)

## HERBARIUM MATERIAL

Pietrobon-Silva, M.R., 1787, SP, São Paulo

Rolfs, P.H., s.n., NY, Minas Gerais

Vital, D.M. & Buck, W.R., 12427, NY, Santa Catarina

A. Schäfer Verwimp, 8668, SP, MO, Goiás

M.F.F. Silva, 1095, NY, Maranhão

## FIELD IMAGES / ILLUSTRATIONS

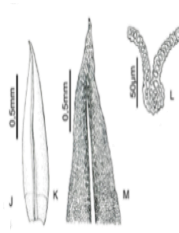


FIGURE *Anoetangium aestivum* (Hedw.) Mitt. K. Leaf. L. Leaf section.  
M. Leaf apex.

DENISE PINHEIRO DA COSTA

Figure 1: *Anoetangium aestivum* (Hedw.) Mitt.

# Barbula Hedw.

This treatment is composed of the following taxa: *Barbula*, *Barbula afrofontana*, *Barbula arcuata*, *Barbula indica*, *Barbula riograndensis*, *Barbula unguiculata*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96769>.

## Has as synonym

heterotypic *Hydrogonium* (Müll. Hal.) A. Jaeger

## DESCRIPTION

### **Barbula** Hedw.

**Plants** small to median, in loose turfs, yellowish-brown or blackish-brown. **Stems** erect, solitary or few branched; central strand well-developed. **Leaves** spatulate to ovate- or triangular-lanceolate, 1–3 mm, broadly concave or narrowly channeled, apex rounded to acute; margins plane to recurved, entire; costa subpercurrent to short excurrent as a mucro, ventral and dorsal cells elongate, occasionally quadrate, papillose or smooth, 2–3(–5) ventral cells at midleaf, in cross-section semicircular to oval, with 2 stereid bands (the dorsal well developed and the ventral weakly differentiated), 2–4 guide cells in 1 layer; lamina unistratose; upper laminal cells quadrate to short rectangular, thin-walled to thick-walled, flat to slightly convex or bulging on adaxial surface, papillose or not, papillae over cell lumen; basal cells differentiated across leaf or higher medially, rectangular, smooth to weakly papillose. **Gemmae** on the rhizoids or in the leaf axils, clavate to ovoid. **Dioicous**. **Perichaetia** terminal. **Seta** elongate, twisted. **Capsule** erect, ovoid or short to long-cylindrical; annulus in 1–2 rows, persistent or deciduous. **Operculum** short to long-conical. **Peristome** weakly to strongly twisted, teeth divided into 32 filaments; basal membrane low. **Calyptra** cucullate, naked, smooth. **Spores** finely papillose.

## COMMENTS

**Comments:** Five species recorded for Brazil, occurring on exposed sites, frequently associated with disturbed areas.

Excluded species

*Barbula unguiculatula* Mu#ll. Hal.—Yano (1984) cited this taxon to Minas Gerais State based on Mu#ller (1901). However, checking this publication, I found that the citations for this taxon do not cover Brazil, being for Argentina in South America. According to Zander (1993), the taxon is distributed in Am4 (Andes) and Am6 (West Indies), not occurring in Brazil.

## Life Form

foliose, Tuft, Weft

## Substrate

Rupicolous, Saxicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pantanal

## Vegetation Types

Anthropic area, Grassland, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Inundated Forest (Igapó), Terra Firme Forest, Inundated Forest (Várzea), Seasonally Deciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest, Coastal Forest (Restinga), Rock outcrop vegetation

## Geographic Distribution

Confirmed occurrences

North (Acre, Amazonas, Pará)

Northeast (Bahia, Pernambuco, Rio Grande do Norte, Sergipe)

Central-west (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul)

## IDENTIFICATION KEY

1. Costa subpercurrent (2–5 cells below apex) or percurrent..... 2
1. Costa percurrent, short- to long-excurrent (mucronate)..... 3
2. Leaf narrowly lanceolate-subulate, margin revolute, upper laminal cells rectangular, usually smooth ..... ***B. arcuata***
2. Leaf broadly lanceolate to triangular-lanceolate, margin plane, upper laminal cells hexagonal, quadrate or short-rectangular, cells smooth..... ***B. afrofontana***
3. Costa long-excurrent, mucro long with ca. 6 rectangular cells, yellowish, strongly toothed; abaxial costal cells quadrate, strongly papillose ..... ***B. riograndensis***
3. Costa short-excurrent, mucro short with 1–3 conical cells, not colored, smooth; abaxial costal surface with cells long-rectangular, cells smooth or weakly papillose..... 4
4. Leaf oval to elliptical, apex acute (green), margins plane or weakly recurved at midleaf; gemmae small, green, obovoid, in upper leaf axils ..... ***B. indica***
4. Leaf long-lingulate or ovate-lanceolate (blackish), apex obtuse to broadly acute (black), margins recurved (1/2–2/3 length) rarely to near apex; gemma absent ..... ***B. unguiculata***

## REFERENCE

Costa, D.P. 2016. A synopsis of the family Pottiaceae. Phytotaxa, Monograph 25: 1-69.



# *Barbula afrofontana* (Müll.Hal.) Broth.

## Has as synonym

basionym *Trichostomum afrofontanum* Müll. Hal.

## DESCRIPTION

*Barbula afrofontana* (Müll. Hal.) Broth., Die Natürl. Pflanz., Zweite Auflage 10: 280. 1924. Basionym: *Trichostomum afrofontanum* Müll. Hal., Hedwigia 38: 99. 1899. Type: South Africa, Natal, Van Reenen, 1875, A. Rehmann 82 (holotype PRE, isotype NY).

A semi-aquatic plant nature, with a flaccid habit, costa subpercurrent, leaf cells smooth, with weak leaf borders (enlarged and thickened cells).

## COMMENTS

**Distribution and ecology:** Brazil (MG, SP) and eastern and southern Africa. In Brazil is encountered in Savanna and Atlantic Rainforest, 500-800 m, occurring in rocky crevices, near misty waterfalls or on rocks along streams.

### **Life Form**

foliose, Tuft

### **Substrate**

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

### **Phytogeographic Domains**

Central Brazilian Savanna, Atlantic Rainforest

### **Vegetation Types**

Ombrophyllous Forest (Tropical Rain Forest)

### **Geographic Distribution**

#### Confirmed occurrences

Southeast (Minas Gerais, São Paulo)

## HERBARIUM MATERIAL

D. M. Vital, 10841, SP, Minas Gerais

## FIELD IMAGES / ILLUSTRATIONS



*Barbula afrofontana* (Müll.Hal.) Broth. N. Habit. O. Leaf.  
P. Leaf apex. Q. Laminal cells. R. Leaf section.

Figure 1: *Barbula afrofontana* (Müll.Hal.) Broth.

# *Barbula arcuata* Griff.

## Has as synonym

homotype *Hydrogonium arcuata* (Griff.) Wijk & MArgent

## DESCRIPTION

***Barbula arcuata*** Griff., Calcutta J. Nat. Hist. Misc. Arts Sci. India 2: 491, 1842. Type: India, legimus specimina 2–3 fructifera in arenosis “Bogapaneer”, J.W. Griffith 27 (holotype BM).

**Stem** with a sclerodermis and central strand. **Leaves** linear-lanceolate, apex obtuse, denticulate; margins entire; costa broad (up to 1/3 the width of the base), cells smooth, in cross section, with guide cells, epidermal cells only on the ventral surface, and stereids on the dorsal surface.

## COMMENTS

**Distribution and ecology:** widespread throughout the world. In Brazil is encountered in the Amazon Forest, Savanna, and Atlantic Rainforest, 0–900 m, on humid soils along river banks, sometimes submerged, or on moist rocks (AM, GO, MG, RJ, SP).

**Comments:** This taxon is apparently rare in Brazil being known only for Goiás States, and recently cited by Costa (2016) for northern and southeastern regions (Amazonas and Rio de Janeiro states).

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Amazon Rainforest, Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Cerrado (lato sensu), Terra Firme Forest, Inundated Forest (Várzea), Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

North (Amazonas)

Central-west (Goiás)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

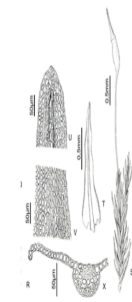
## HERBARIUM MATERIAL

J.G. Kuhlmann, 1585, RB, Amazonas

Yano, O. et al., 21712, SP, Minas Gerais

Schäfer-Verwimp, A., 9867, SV, RB, Goiás

## FIELD IMAGES / ILLUSTRATIONS



*Barbula arcuata* Griff. S. Habit. T. Leaf. U. Leaf apex. V. Leaf section. X. Marginal cells.

Denise Pinheiro da Costa

Figure 1: *Barbula arcuata* Griff.

# *Barbula indica* (Hook.) Spreng.

## Has as synonym

basionym *Tortula indica* Hook.

heterotypic *Barbula cancellata* Müll. Hal.

heterotypic *Barbula cruegeri* Sonder ex Müll. Hal.

## DESCRIPTION

***Barbula indica*** (Hook.) Spreng., Nomencl. Bot. 2: 72, 1824. Basionym: *Tortula indica* Hook., Musci Exot. 2: 135, 1819. Type: India Orientali, Madras, Tranquebar, Roettler s.n. (holotype LINN, isotype NY).

**Plants** median, erect. **Leaves** narrowly oval to elliptical; margins plane or weakly recurved at mid-leaf; apex acute to rounded, aciculate; costa percurrent or subpercurrent, laminal cells quadrate, papillose. **Propagula** small, green, obovoid in the leaf axils.

## COMMENTS

**Distribution and ecology:** tropical and warm temperate areas world-wide (Zander 1993, 1994). In Brazil is widespread and encountered in the Amazon Forest, Atlantic Rainforest, Savanna, Pantanal, and Restinga, 0–1600 m, growing on sandy soils, shaded rocks, road banks, and steep slopes.

**Comments:** It is quite common in Brazil.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pantanal

## Vegetation Types

Anthropic area, Grassland, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Inundated Forest (Igapó), Terra Firme Forest, Seasonally Deciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Coastal Forest (Restinga), Rock outcrop vegetation

## Geographic Distribution

### Confirmed occurrences

North (Acre, Amazonas, Pará)

Northeast (Bahia, Pernambuco, Rio Grande do Norte, Sergipe)

Central-west (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul)

## HERBARIUM MATERIAL


D.P. Costa et al., 3897, RB, Acre

D.M. Vital, 12753, SP, Minas Gerais

D. M. Vital, s.n., SP, Espírito Santo

Carvalho, M.A.S., 147, SP, Goiás

Costa, D.P. & Molinaro, L.C., 241, RB, Rio de Janeiro

Schäfer-Verwimp, s.n., RB, 531932,  (RB00680429), São Paulo  
Costa, D.P., 5033, RB, São Paulo  
Pôrto, K.C., s.n., UFP, 9080, Pernambuco  
Vital, D.M., 8427, SP, Mato Grosso do Sul  
Windisch, P.G., 7753, SJRP, Mato Grosso  
Oliveira, S.M., 127, UFP, Pernambuco  
Bordin, J., 154, SP, Rio Grande do Sul  
J. Cordeiro, 1040, CEPEC, Paraná

## FIELD IMAGES / ILLUSTRATIONS



*Barbula indica* (Hook.) Spreng. A. Habit. B-C. Leaves. D.  
Leaf apex. E. Leaf section. F. Basal cells.

Denise Pinheiro da Costa

Figure 1: *Barbula indica* (Hook.) Spreng.

# *Barbula riograndensis* E.B.Bartram

## DESCRIPTION

***Barbula riograndensis*** Bartr., J. Washington Acad. Sci. 42: 179, 1952. Type: Brazil, Rio Grande do Sul, Sa#o Leopoldo, Quilombo, super rupem ad marginem viae, 50 m, Sep 1941, A. Sehnem 195 (holotype FH; isotype PACA).

**Plants** small. **Leaves** oblongo-lanceolate, apex long-mucronate, yellowish, strongly toothed, costa long-excurrent, cells smooth, in cross section recurved, epidermal cells quadrate, strongly papillose, two epidermal cells, one row of guide-cells, and two stereid bands.

## COMMENTS

**Distribution and ecology:** Endemic to southern Brazil (PR, RS), encountered in the Atlantic Rainforest, 0-950 m, occurring on soil along roads or river rocks.

**Comments:** According to Bartram (1952), it resembles a small *Tortula* but the costa in cross section shows dorsal and ventral stereid bands. The mucro short, yellowish, and strongly toothed, distinguishes from the other *Barbula* species in Brazil.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Is endemic from Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

South (Paraná, Rio Grande do Sul)

## HERBARIUM MATERIAL

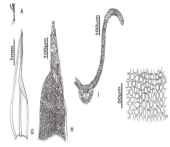
A. Sehnem, 195, FH, PACA, Rio Grande do Sul, **Typus**

A. Sehnem, 3980, R, RB, SP, Rio Grande do Sul

G. Hatschbach, 53150, NY, Paraná

## FIELD IMAGES / ILLUSTRATIONS





*Barbula riograndensis* Bart.: G. Leaf; H. Leaf apex; I. Leaf section; J. Laminal cells.

Denise Pinheiro da Costa

Figure 1: *Barbula riograndensis* E.B.Bartram

# *Barbula unguiculata* Hedw.

## DESCRIPTION

***Barbula unguiculata*** Hedw., Sp. Musc. Frond. 118, 1801. Type: In muris limosis, arvis siccioribus, locis graminineis, *Hedwig s.n.* (holotype G).

**Leaves** often blackish, long-lingulate or ovate-lanceolate, apex obtuse to broadly acute, margins recurved, costa with papillae at the tip of cells, laminal cells pluripapillose.

## COMMENTS

**Distribution and ecology:** widespread in northern and southern temperate zones (Zander 1994). In Brazil is encountered in the Atlantic Rainforest, 700–800 m, occurring on rocks.

## Life Form

Tuft

## Substrate

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Southeast (São Paulo)

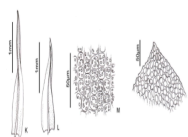
South (Rio Grande do Sul)

## HERBARIUM MATERIAL

J. Bordin & L. Bordin, 381, SP, Rio Grande do Sul

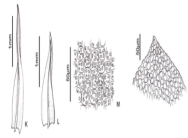
D.M. Vital & W.R. Buck, 20541, NY, São Paulo

## FIELD IMAGES / ILLUSTRATIONS



*Barbula unguiculata* Hedw. K-L. Leaves. M. Laminal cells with papillae. N. Leaf apex.

Denise Pinheiro da Costa

Figure 1: *Barbula unguiculata* Hedw.

*Barbula unguiculata* Hedw. K-L. Leaves. M. Laminal cells with papillae. N. Leaf apex.

Denise Pinheiro da Costa

Figure 2: *Barbula unguiculata* Hedw.

# *Chenia* R.H.Zander

This treatment is composed of the following taxa: *Chenia*, *Chenia leptophylla*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96774>.

## DESCRIPTION

### **Chenia R.H. Zander**

**Plants** small, in turfs, green above, brownish below. **Stems** erect, rarely branched. **Leaves** appressed, contorted, ligulate to spatulate, apex broadly acute to rounded, apiculate; margins plane or weakly recurved at base, strongly crenulate or dentate, outer walls thickened and papillose; costa subpercurrent, in cross-section 2 guide cells in 1 layer, stereids bands few below or absent; upper and median cells isodiametric, bulging, smooth, thin-walled; basal cells short rectangular. **Dioicous**. **Perichaetia** terminal. **Seta** short to elongate, twisted. **Capsule** cleistocarpous, spherical, or stegocarpous, ovoid to cylindrical. **Operculum** short to long conical. **Peristome** when present single, 32 filaments, straight or twisted, spiculose. **Calyptra** cucullate or mitrate and lobed at base. **Spores** spherical, smooth to finely papillose.

## COMMENTS

**Comments:** One species frequently occurs in Brazil in disturbed areas.

### **Life Form**

foliose, Tuft

### **Substrate**

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### **Phytogeographic Domains**

Atlantic Rainforest

### **Vegetation Types**

Anthropic area, Riverine Forest and/or Gallery Forest, Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest)

### **Geographic Distribution**

#### Confirmed occurrences

Northeast (Maranhão)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná)

# *Chenia leptophylla* (Müll.Hal.) R.H.Zander

## Has as synonym

basionym *Phascum leptophyllum* Müll. Hal.

heterotypic *Physcomitrium rhizophyllum* Sakurai

heterotypic *Tortula rhizophylla* (Sak.) Z. Iwats & Saito

## DESCRIPTION

*Chenia leptophylla* (Müll. Hal.) R.H. Zander, Bull. Buffalo Soc. Nat. Sci. 32: 258. 1993. Basionym: *Phascum leptophyllum* Müll. Hal., Flora 71: 6. 1888. Type: Africa. Somerset East, Monte Boschberg, 1882, Mac Owan s.n. (holotype: destroyed in B; isotype H).

Plants small, greenish. Leaves lingulate to elliptic, apex acute to apiculate, brownish, costa subpercurrent to percurrent, margins finely and evenly denticulate, laminal cells hexagonal, smooth. **Gemmae** rhizoidal. **Seta** short. **Capsule** subspherical. **Operculum** long-rostrate.

## COMMENTS

**Distribution and ecology:** worldwide distribution. In Brazil encountered in Savanna and Atlantic Rainforest, 0–1600 m, in urban and disturbed areas, on stone walls, humus, the base of roadside walls, and bare soil. Brazil (ES, MA, MG, PR, RJ, RS, SP).

**Comments:** The first record of this species for Brazil was published by Schäfer-Verwimp (1991) from a specimen

sampled in one mountain region of Espírito Santo State. This is a common species in urban areas in southeastern Brazil, rarely collected and probably overlooked.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Anthropic area, Riverine Forest and/or Gallery Forest, Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Northeast (Maranhão)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná)

## HERBARIUM MATERIAL

Oliveira-e-Silva, M.I.M.N., 2818, HRJ, Rio de Janeiro

Schäfer-Verwimp, A., 14361, RB, São Paulo

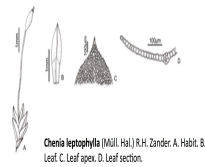
Schäfer-Verwimp, A., 19241, RB, Espírito Santo

D.P.Costa, 145, RB, 350341,  (RB00696706), Rio de Janeiro

E.S. Arnou, 87, RB,  (RB01408573), Rio de Janeiro

Bordin, J. & Bordin, L., 375, SP, Rio Grande do Sul  
Correia, M.M.F., s.n., SP, Maranhão  
Ristow, R., 1471, IRAI, Paraná

### FIELD IMAGES / ILLUSTRATIONS



*Chenia leptophylla*

Figure 1: *Chenia leptophylla* (Müll.Hal.) R.H.Zander

# Didymodon Hedw.

This treatment is composed of the following taxa: *Didymodon*, *Didymodon australasiae*, *Didymodon rigidulus*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96776>.

## DESCRIPTION

*Didymodon* Hedw.

**Plants** median to robust, in cushions or turf, light to dark green. **Stems** erect, few-branched. **Leaves** ovate or triangular, short to long lanceolate, apex acute, base sheathing, channeled distally; margins plane, recurved to reflexed below, entire to dentate or crenulate at apex; costa subpercurrent to long-excurrent, in cross section ovate, semicircular or reniform, stereids above and below the guide cells, ventral epidermis present, dorsal epidermis weak, 2–6(–8) guide cells in 1 layer; lamina unistratose; upper laminal cells subquadrate to hexagonal-rounded, thin to thick-walled, bulging or with papillae, simple or bifid; basal cells quadrate or rectangular, smooth or weakly papillose. **Dioicous**. **Perichaetia** terminal. **Seta** long, twisted. **Capsule** erect, ovate to long-cylindric. **Operculum** conic or conic-rostrate. **Peristome** single, 32 filaments twisted, or reduced and short, papillose or spiculose. **Calyptra** cucullate, naked, smooth. **Spores** spherical, smooth to papillose.

## COMMENTS

**Comments:** Two species occur in Brazil. This genus requires a critical revision in tropical America.

### Life Form

foliose, Tuft

### Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest

### Vegetation Types

Anthropic area, Ombrophylous Forest (Tropical Rain Forest)

### Geographic Distribution

#### Confirmed occurrences

Southeast (Minas Gerais, São Paulo)

South (Paraná, Rio Grande do Sul)

## IDENTIFICATION KEY

key is based on Sharp et al. (1994)

1. Plants blackish-green. Leaves oblong-lanceolate to lanceolate, apex rounded to acute, costa subpercurrent to percurrent, in cross section without hydroids and ventral stereids, basal cells differentiated hyaline, thin-walled ..... *D. australasiae*

1. Plants olive-yellow to dark-green. Leaves ovate to lanceolate, apex obtuse, costa excurrent to percurrent, in cross section without hydroids but ventral stereids often present, basal cells not or weakly differentiated, walls thin or evenly thickened ..... *D. rigidulus*



# *Didymodon australasiae* (Hook. & Grev.) R.H.Zander

## Has as synonym

basionym *Tortula australasiae* Hook. & Grev.

## DESCRIPTION

**Didymodon australasiae** (Hook. et Grev.) R.H. Zander, Phytologia 41: 21, 1978. Basionym: *Tortula australasiae* Hook. et Grev., Edinburgh J. Sci. 1: 301. 1824. Type: AUSTRALIA. New Holland: King George's Sound, A. Menzies s.n., 1791 (BM, lectotype by Guerra & Ros 1987).

**Plants** blackish-green. **Leaves** oblong-lanceolate to lanceolate, apex rounded to acute, costa subpercurrent to procreant, in cross section without ventral stereids, basal cells

## COMMENTS

**Distribution and ecology:** widespread throughout the world. In Brazil encountered in Savanna and Atlantic Rainforest (GO, PR, RS, SP), 780–900 m, in city centers, ruderal on the base of walls and sidewalks.

**Comments:** Schafer-Verwimp (1996) commented that this taxon may have been introduced through human activities. According to Zander (1994), the hydroids in the costa, and the absence of ventral stereid bands are characteristic of this species.

## Life Form

foliose, Tuft

## Substrate

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Anthropic area

## Geographic Distribution

### Confirmed occurrences

Southeast (São Paulo)

South (Paraná, Rio Grande do Sul)

## HERBARIUM MATERIAL

Bordin, J. & Bordin, L., 472, SP, Rio Grande do Sul

Schäfer-Verwimp, A., 15297, RB, São Paulo

## FIELD IMAGES / ILLUSTRATIONS



*Didymodon australasiae* (Hook. & Grev.) R.H. Zander. E. Leaf. F. Leaf apex. G. Leaf section. H. Basal cells.

Denise Pinheiro da Costa

Figure 1: *Didymodon australasiae* (Hook. & Grev.) R.H.Zander

# *Didymodon rigidulus* Hedw.

## DESCRIPTION

**Didymodon rigidulus** Hedw., Sp. Musc. Frond. 104, 1801. Type: Europe. in interstitiis murorum antiquorum, praeprimis cotaceorum (Holotype: G).

**Plants** green or blackish. **Stem leaves** spreading or not when moist, oblong-lanceolate, elliptic-lanceolate or long-lanceolate, channeled, base ovate; costa percurrent to long-excurrent as a subula; margins recurved (1/4 to 3/4), entire; apex acute to subulate, fragile or not; laminal cells smooth to papillose, quadrate, distal lamina uni or often bistratose at the leaf apex or along the margins, basal cells rectangular, walls thickened. Gemmae present in the leaf axils, ovate to elliptic. **Seta** long. Capsule long-elliptical to cylindrical. Opercule long-conical to long-rostrate.

## COMMENTS

**Distribution and ecology:** widespread throughout the world (Zander 1994). In Brazil encountered in the Atlantic Rainforest (MG, RS), 200–1500 m, occurring on human habitats, open soil near a hotel, sunny stone walls of a pool, or shaded stone walls of a garden.

**Comments:** According to Schäfer-Verwimp (1992), this taxon was probably introduced from Europe.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Naturalized, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Anthropic area, Ombrophylous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Southeast (Minas Gerais, São Paulo)

South (Rio Grande do Sul)

## HERBARIUM MATERIAL

Wasum, R. & Pasini, E., 3555, SP, Rio Grande do Sul

Bordin, J. & Sartori, M., 427, SP, Rio Grande do Sul

Schäfer-Verwimp, A., 10039, RB, SV, Minas Gerais

## FIELD IMAGES / ILLUSTRATIONS



Denise Pinheiro da Costa

Figure 1: *Didymodon rigidulus* Hedw.

## REFERENCE

Costa, D.P. 2016. A Synopsis of the family Pottiaceae in Brazil. Phytotaxa, Monograph 251: 1-69.

# *Dolotortula* R.H.Zander

This treatment is composed of the following taxa: *Dolotortula*, *Dolotortula mnifolia*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96779>.

## DESCRIPTION

### *Dolotortula* R.H. Zander

**Plants** median, in loose and soft turfs, dark-green to brownish-green. **Stems** erect. **Leaves** erect to wide spreading, commonly spatulate, flat; apex obtuse-rounded, bluntly apiculate; margins plane or slightly recurved below, entire, limbate; costa subpercurrent to percurrent, in cross-section rounded, few stereids below the guide cells, epidermis present in ventral and dorsal surface, 2 guide cells in 1 layer; lamina unistratose; upper and median laminal cells large, oblong-hexagonal to short rectangular, rounded, thin-walled, smooth; basal cells rectangular, lax; marginal cells long linear, forming a border, multistratose. **Dioicous**. **Perichaetia** terminal. **Seta** elongate, twisted. **Capsule** erect, urn cylindrical, annulus persistent. **Operculum** long-conical. **Peristome** teeth divided into 32 filaments, spiculose. **Calyptra** cucullate, naked, smooth. **Spores** slightly papillose.

## COMMENTS

**Comments:** Genus monotypic and according to Gradstein *et al.* (2001), is rare. It can be distinguished by its obtuse-rounded, spatulate leaves with a strong, multistratose borders and large upper laminal cells.

### Life Form

foliose, Tuft

### Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest

### Vegetation Types

Anthropic area, Ombrophylous Forest (Tropical Rain Forest)

### Geographic Distribution

#### Confirmed occurrences

Northeast (Bahia, Ceará)

Southeast (Espírito Santo, Rio de Janeiro, São Paulo)

# *Dolotortula mniifolia* (Sull.) R.H.Zander

## Has as synonym

basionym *Barbula mniifolia* Sull.

## DESCRIPTION

*Dolotortula mniifolia* (Sull.) R.H. Zander, Phytologia 65: 426. 1989. Basionym: *Barbula mniifolia* Sull., Proc. American Acad. Arts Sci. 5: 277. 1861. Type: Cuba, dry shaded banks, *Wright 33* (Holotype: BM).

**Plants** small. **Leaves** obtuse-rounded, spatulate, apiculate, with a multistratose border of stereid cells, cells smooth and large, upper laminal cells large and hexagonal, basal laminal cells short-rectangular; costa in cross section with stereid band weak, ventral and dorsal epidermis, 2 guide cells in 1 layer.

## COMMENTS

**Distribution and ecology:** Tropical America (Vital & Pursell (1992)). In Brazil, encountered in the Atlantic Rainforest (BA, CE, ES, RJ, SP), 0–540 m, occurring in urban areas, on the ground, or along stream margins on calcareous soils, or on shaded river banks.

**Comments:** According to Gradstein et al. (2001), this genus is rare and distinguished by its obtuse-rounded, spatulate leaves with a strong, multistratose borders and large upper laminal cells.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Anthropic area, Ombrophylous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Northeast (Bahia, Ceará)

Southeast (Espírito Santo, Rio de Janeiro, São Paulo)

## HERBARIUM MATERIAL

Vital, D.M., 11087, SP, São Paulo

S. dos Prazeres, s.n., SP, Ceará

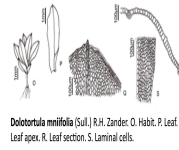
D. M. Vital, s.n., SP, Rio de Janeiro

D. M. Vital, 11087, SP, São Paulo

Bastos, C.J.P., 805, ALCB, Bahia

Vital, D.M., s.n., SP, Espírito Santo

## FIELD IMAGES / ILLUSTRATIONS



Denise Pinheiro da Costa

Figure 1: *Dolotortula mnifolia* (Sull.) R.H.Zander

# *Erythrophyllopsis* Broth.

This treatment is composed of the following taxa: *Erythrophyllopsis*, *Erythrophyllopsis andinum*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96781>.

## DESCRIPTION

### **Erythrophyllopsis** Broth.

**Plants** median, in loose or dense turfs, dark green, black or brown. **Stems** erect, reddish-brown, few branched. **Leaves** appressed, incurved when dry, wide spreading, lanceolate, keeled, broadly sheathing below, apex acute; margins plane, entire; costa percurrent; in cross section semicircular, stereids above and below the guide cells, 4–6 guide cells in one layer; lamina unistratose to bistratose; laminal cells subquadrate or oval; cells of sheathing forming an enlarged area of rectangular cells; marginal cells forming a border of long rectangular cells. **Dioicous**. **Perichaetia** terminal. **Seta** long. **Capsule** erect, elliptical. **Operculum** long-conical to conical-rostrate, oblique. **Peristome** teeth short and irregularly divided, perforate, papillose. **Calyptra** cucullate, smooth. **Spores** finely papillose (description of the sporophyte from Zander 1993).

## COMMENTS

**Comments:** A monotypic genus previously known to the Andes (Colombia to Bolivia), and recently reported for southern Brazil, where it occurs on humid rocks at low elevations.

### **Life Form**

foliose, Tuft

### **Substrate**

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

### **Phytogeographic Domains**

Atlantic Rainforest

### **Vegetation Types**

Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest)

### **Geographic Distribution**

#### Confirmed occurrences

South (Paraná, Rio Grande do Sul)

## REFERENCE

Costa, D.P. 2016. A synopsis of the family Pottiaceae in Brasil. Phytotaxa, Monograph 251: 1-69.



# *Erythrophyllopsis andinum* (Sull.)

## R.H.Zander

### Has as synonym

basionym *Trichostomum andinum* Sull.

### DESCRIPTION

*Erythrophyllopsis andina* (Sull.) R.H. Zander, Bryologist 80: 159. 1977. Basionym: *Trichostomum andinum* Sull., U. S. Expl. Exped., Musci 5. 1859. Type: Andes Peruvianae, U.S. Expl. Exp. Wilkes, 1838–1842, 15.000 ped, 1838–1842, *Sullivant s.n.* (Holotype: FH).

**Plants** median, dark green or reddish brown to brownish, hyalodermis usually undifferentiated. **Leaves** ovate-lanceolate to long-lanceolate, keeled; lamina unistratose to regularly bistratose; apex acute; margins plane, entire to papillose, slightly differentiated; costa percurrent, ventral and dorsal cells quadrate to short-rectangular, smooth or papillose; in cross-section guide cells in one layer, band of ventral and dorsal stereids differentiated, cells rectangular to quadrate; upper and middle laminal cells quadrate to short-rectangular, papillose; basal cells long-rectangular, hyaline, thin-walled, smooth.

According to Cano et al. (2010), the lamina regularly bistratose in distal part and the adaxial surface cells of the costa absent below the apex, are characteristic of this species.

### COMMENTS

**Distribution and ecology:** widely distributed in the South America Andes Cano et al. (2010). In Brazil is encountered in the Atlantic Rainforest (PR, RS), 220–1500 m, occurring on moist rocks.

**Comments:** Before the construction of the Itaipu hydroelectric dam in 1982 that inundated the entire area of the Sete Quedas National Park, Yano & Colletes (2000) collected bryophytes in this region and found one sample of *E. andina* mixed with *Trichostomum brachydontium*, and this being was the first record outside the Andes.

**Conservation:** Critically Endangered (CR—B1ab (iii)) in Brazil because of its restricted geographic range, extent of occurrence (less than 100 km), only known from one sample collected 30 years ago from only one locality, and habitat quality (Sete Quedas National Park was flooded).

### Life Form

foliose, Tuft

### Substrate

Rupicolous

### DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest

### Vegetation Types

Seasonally Semideciduous Forest, Ombrophylous Forest (Tropical Rain Forest)

### Geographic Distribution

#### Confirmed occurrences

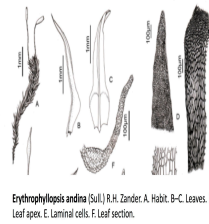
South (Paraná, Rio Grande do Sul)

### HERBARIUM MATERIAL

Bordin, J. & E. Pasini, E., 452, SP, Rio Grande do Sul

Yano, O., 3983 p.p., SP, Paraná

## FIELD IMAGES / ILLUSTRATIONS



*Erythrophylopsis andinum* (Sull.) R.H.Zander. A. Habit. B-C. Leaves. D. Leaf apex. E. Laminar cells. F. Leaf section.

Denise Pinheiro da Costa

Figure 1: *Erythrophylopsis andinum* (Sull.) R.H.Zander

# *Eucladium* Bruch & Schimp.

This treatment is composed of the following taxa: *Eucladium*, *Eucladium verticillatum*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96783>.

## DESCRIPTION

**Eucladium** Bruch & Schimp.

**Plants** small, in turfs, bright to dark green above. **Stems** erect, irregularly branched. **Leaves** recurved-spreading to spreading, linear to narrowly oblong-lanceolate, apex narrowly to broadly acute; margins plane, entire above and denticulate below; costa short excurrent, strongly mucronate, in cross section semicircular to elliptical, stereids above and below the 4–7 guide cells, epidermis present on ventral and dorsal surfaces, smooth; lamina unistratose; upper cells subquadrate, thick-walled and often weakly bulging, pluripapillose, papillae low, simple, occasionally multifid; basal cells oblong-rectangular, thin-walled. **Dioicous**. **Perichaetia** terminal. **Seta** long, twisted or not. **Capsule** erect, urn ovoid to short cylindrical. **Operculum** conic-long rostrate. **Pristome** teeth cleft or entire, usually rudimentary, papillose. **Calyptra** cucullate. **Spores** spherical, smooth.

## COMMENTS

**Comments:** A monotypic genus found in southeastern Brazil, occurring on the calcareous rocks of a cave.

### Life Form

foliose, Tuft

### Substrate

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

### Vegetation Types

Cerrado (lato sensu), Ombrophylous Forest (Tropical Rain Forest)

### Geographic Distribution

#### Confirmed occurrences

North (Rondônia)

Southeast (Minas Gerais)

# *Eucladium verticillatum* (Hedw.) Bruch & Schimp.

## Has as synonym

heterotypic *Weissia verticillata* Hedw.

## DESCRIPTION

*Eucladium verticillatum* (With.) Bruch. & Schimp., Bryol. Europ. 1: 93. 1846. Basionym: *Bryum verticillatum* With., Syst. Arr. Brit. Pl. Ed. 4, 3: 804. 1801. *Weissia verticillata* (With.) Brid., Muscol. Recent. Suppl. 1: 121. 1806. Type: *Dicks. h. s.* —Dill. 47.35 [Lectotype by Ochyra & Zijlstra (2005), BM 000855574, No 19. *Bryum verticillatum*. Rocks, Cumberland. Dickson's Hor. [tus] Sicc.[us] Brit.[annicus]).

**Leaves** with margins plane and irregular serration along the leaf base, upper median laminal cells larger than those at the margins.

## COMMENTS

**Distribution and ecology:** widespread throughout the world (Zander 1994). In Brazil encountered in the Atlantic Rainforest and Savanna (MG, RO), 200–900 m, on shaded calcareous rocks at the entrance of a cave.

**Comments:** Scha#fer-Verwimp (1996) recorded this taxon for the first time for South America, commenting that its natural habitat and its association with *Neohyophila sprengelii* (Schwa#gr.) H.A. Crum is indicated that it was not introduced in Brazil.

## Life Form

foliose, Tuft

## Substrate

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

North (Rondônia)

Southeast (Minas Gerais)

## HERBARIUM MATERIAL

Lisboa, P.L.B., 3795, MG, Rondônia

D. M. Vital, 9071/Z, SP, Minas Gerais

## FIELD IMAGES / ILLUSTRATIONS



*Eucladium verticillatum* (Hedw.) Bruch & Schimp. G. Habit. H. Leaf. I. Leaf apex. J. Marginal basal cells. K. Leaf section.

Denise Pinheiro da Costa

Figure 1: *Eucladium verticillatum* (Hedw.) Bruch & Schimp.

# Ganguleea R.H.Zander

This treatment is composed of the following taxa: *Ganguleea*, *Ganguleea angulosa*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96785>.

## Has as synonym

*Merceyopsis* Broth. & Dixon

## DESCRIPTION

### **Ganguleea R.H. Zander**

Plants small, in loose turfs, green above and brown or blackish below. Stems rosulate, branched. Leaves spreading, oblong-elliptical to spatulate; apex rounded apiculate to broadly acute; margins incurved, entire; costa subpercurrent to short excurrent as a mucro, strong, in cross-section circular, stereids bands below the 2 guide cells, epidermis present on both surfaces (ventral and dorsal), smaller, smooth; lamina unistratose; cells thick-walled, quadrate-rounded, bulging on upper surface, lower surface flat; juxtacostal cells near base enlarged, oblong-rectangular. Autoicous (paricous). Perichaetia on short lateral branches. Seta long, twisted. Capsule erect or suberect, urn ovoid, plicate. Operculum long-conical, rostrate. Peristome absent. Calyptra long-conical, smooth to roughened. Spores spherical, smooth.

## COMMENTS

**Comments:** A monotypic genus in Brazil, occurring on rocks, on river banks, or river sides.

### **Life Form**

foliose, Tuft

### **Substrate**

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### **Phytogeographic Domains**

Atlantic Rainforest

### **Vegetation Types**

Ombrophyllous Forest (Tropical Rain Forest)

### **Geographic Distribution**

#### Confirmed occurrences

Southeast (Rio de Janeiro, São Paulo)

# *Ganguleea angulosa* (Broth. & Dixon)

## R.H.Zander

### Has as synonym

basionym *Merceyopsis angulosa* Broth. & Dixon

### DESCRIPTION

*Ganguleea angulosa* (Broth. & Dix.) R.H. Zander, Phytologia 65: 427. 1989. Basionym: *Merceyopsis angulosa* Broth. & Dixon, Journ. Bot. 48: 302. 1910. Type: India, Sikkim-Himalaya: prope Kurseong Punkabari, 2000 p., 16 Dec 1899, Decoly & Schaul s.n. (Holotype H, Isotype BM).

**Plants** rosulate, green, brown to blackish. Leaves spatulate to oblong-elliptical, channeled, margins incurved, entire, apex rounded to acuminate, narrowing toward the base, costa subpercurrent to short-excurrent, in cross section epidermal cells present, 2 guide cells in 1 layer, upper laminal cells rounded, bulging, basal laminal cells rectangular. **Monoicous**. **Sporophyte** lateral. **Capsule** plicate without peristome.

### COMMENTS

**Distribution and ecology:** Southeastern Brazil, Himalayas of India and Nepal (Zander 1989). In Brazil is encountered in the Atlantic Rainforest (RJ, SP), 160–700 m, on shaded rocks along riverbanks and on the vertical faces of granitic riverside rocks.

**Comments:** The Brazilian collections of Schäfer-Verwimp (1992) and Schäfer-Verwimp & Giacconti (1993) were the first records for the Southern Hemisphere, being considered rare in Brazil.

### Life Form

foliose, Tuft

### Substrate

Rupicolous, Terrestrial

### DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest

### Vegetation Types

Ombrophylous Forest (Tropical Rain Forest)

### Geographic Distribution

#### Confirmed occurrences

Southeast (Rio de Janeiro, São Paulo)

### HERBARIUM MATERIAL

Costa, D.P., 1250, RB, Rio de Janeiro

Schäfer-verwimp, A., 14844, NY, SP, São Paulo

# *Gymnostomiella* M.Fleisch.

This treatment is composed of the following taxa: *Gymnostomiella*, *Gymnostomiella vernicosa*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96787>.

## DESCRIPTION

**Gymnostomiella** Fleisch.

**Plants** diminute, in low turfs, green to brown. **Stems** erect, simple or branched. **Leaves** spreading to wide-spreading, oblong-obovate, apex obtuse to broadly rounded; margins plane, crenulate-papillose (distal half); costa ca. 3/4 lamina length, weak, in cross-section elliptical, cells undifferentiated or guide cells positioned centrally, 2 guide cells in 1 layer; lamina unistratose; laminal cells lax, upper cells hexagonal, papillose, 1–3 papillae over lumen, basal cells rectangular and smooth. **Dioicous**. **Perichaetia** terminal. **Seta** long, erect. **Capsule** erect, ovoid to short ellipsoid. **Operculum** large, oblique-rostrate, conical base. **Peristome** absent. **Calyptra** cucullate, smooth. **Spores** spherical, finely papillose.

## COMMENTS

**Comments:** One species in Brazil, occurring on rocks.

### Life Form

foliose, Tuft

### Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Amazon Rainforest, Central Brazilian Savanna

### Vegetation Types

Anthropic area, Cerrado (lato sensu)

### Geographic Distribution

#### Confirmed occurrences

North (Pará)

Southeast (Minas Gerais)



# *Gymnostomiella vernicosa* (Harv.) M. Fleisch.

## Has as synonym

basionym *Gymnostomum vernicosum* Harv.

heterotypic *Gymnostomiella orcuttii* E.B. Bartram

## DESCRIPTION

*Gymnostomiella vernicosa* (Harv.) Fleisch., Musci Fl. Buitenzorg 1: 310. 1904. Basionym: *Gymnostomum vernicosum* Harv. in Hooker's Ic. Pl. 1: t. 17, f. 4. 1836. Type: Burma, Prome, 1826, *N. Wallich s.n.* (Holotype: BM, Isotypes: BM, E).

Plants very small up to 20 mm long. Stem simple, at based with smooth brown rhizoids. Leaves patent, spatulate, apex broadly acute, margin plane, entire below, dentate to papillose-crenulate above, costa subpercurrent (ending 5 or more cells below apex), upper laminal cells thin-walled, hexagonal, uni- to pluripapillose, basal laminal cells thin-walled, rectangular, smooth. Idiocytes. Perigonia and perichaetial terminal. **Seta** 3-6 mm long. **Capsules** erect, ovoid, brown. **Peristome** absent. **Operculum** rostrate. **Calyptra** cucullate smooth.

## COMMENTS

**Distribution and ecology:** Southeastern U.S.A., Mexico, Central America, West Indies, Western South America, Indo-China, and Australasia (Allen 2002). In Brazil is encountered in Savanna (MG, PA) and in urban areas, 0–500 m, occurring on the walls at the entrance of a small cave, on humid cliffs, or on soils.

**Comments:** The current distribution may not reflect the real distribution of this species in Brazil.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Amazon Rainforest, Central Brazilian Savanna

## Vegetation Types

Anthropic area, Cerrado (lato sensu)

## Geographic Distribution

### Confirmed occurrences

North (Pará)

Southeast (Minas Gerais)

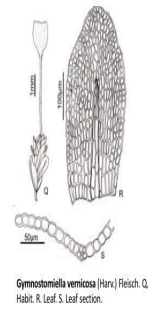
## HERBARIUM MATERIAL

Lisboa, R.C.L., 422, MG, Pará

D. M. Vital, 5022, SP, Minas Gerais

Gomes, H.C.S. et al., 217, CESJ, Minas Gerais

## FIELD IMAGES / ILLUSTRATIONS



Denise Pinheiro da Costa

Figure 1: *Gymnostomiella vernicosa* (Harv.) M. Fleisch.

# *Gymnostomum* Nees & Hornsch.

This treatment is composed of the following taxa: *Gymnostomum*, *Gymnostomum aeruginosum*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96789>.

## DESCRIPTION

**Gymnostomum** Nees & Hornsch.

**Plants** erect, in turfs or cushions, light to dark green or olive green. **Stems** erect, few to several branched. **Leaves** spreading, oblong to oblong-ligulate, apex broadly acute to acute-rounded, apiculate or not; margins plane, entire or crenulate; costa subpercurrent, in cross section ovate to semicircular, stereid bands weakly on ventral and dorsal surface, ventral epidermis present, 2–4 guide cells in 1 layer; upper laminal cells subquadrate, pluripapillose, papillae simple or bifid; basal cells subquadrate. **Dioicous**. **Perigonia** terminal on short branches. **Perichaetia** terminal. **Seta** long, erect. **Capsule** erect, urn ovoid to short cylindrical. **Operculum** rostrate. **Peristome** absent. **Calyptra** cucullate, smooth. **Spores** spherical, smooth to papillose.

## COMMENTS

**Comments:** Only one species in Brazil, occurring on calcareous rocks or soil.

Doubtful name: *Hymenostomum goyazensis* (Broth.) Broth., Nat. Pflanzenfam. 1: 386, 1902 (Brotherus 1902).

Basionym: *Hyophila goyazensis* Broth., Hedwigia 34: 124, 1895. Type: Brasil, Goiás, *E. Ule 1537*. Cited by Yano (2010) for Bahia, Espírito Santo, Goiás, Mato Grosso, and Paraíba states, but according Costa (2016) no material collected by E. Ule in Goiás State was encountered in any of the herbaria consulted in her synopsis.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Anthropic area, Cerrado (lato sensu), Ombrophylous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

North (Tocantins)

Central-west (Goiás)

Southeast (Minas Gerais, São Paulo)

# *Gymnostomum aeruginosum* Sm.

## DESCRIPTION

**Gymnostomum aeruginosum** Sm., Fl. Brit. 3: 1163. 1804. Type: Wales. North Wales, in palustribus alpinis, J.W. Griffith s.n. Esq. (Holotype BM?).

Plants small, yellow-green to pale-green. **Stem** irregularly branched. Leaves distant, wide-spreading, ligulate, apex acute to obtuse, margins plane, entire to crenulate, costa narrow, subpercurrent, laminal cells pluripapillose, and basal cells rectangular with thin to occasionally thick-walled. **Dioicous**. **Seta** yellow, smooth. **Capsule** erect, cylindrical. **Operculum** rostrate. **Peristome** absent. **Calyptra** cucullate.

## COMMENTS

**Distribution and ecology:** widespread throughout the world (Zander 1977b, 1994). In Brazil encountered in Savanna (GO, MG), 400–800 m, in urban areas, on calcareous rocks or soils.

**Comments:** According to Costa (2016), reported for the first time this taxon to middle-western and southeastern regions. It can be confused with *Molendoa sendtneriana* but separated by the small plants, with ligulate leaves, subpercurrent costa, laminal cells pluripapillose, and basal cells rectangular with thin to occasionally thick-walled.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Anthropic area, Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

North (Tocantins)

Central-west (Goiás)

Southeast (Minas Gerais, São Paulo)

## HERBARIUM MATERIAL

J.R. Pirani, 1958, SP, Tocantins

Rodrigues, L., 28, SP, Minas Gerais

D. M. Vital, 12769, SP, Goiás

Vital, D.M., s.n., SP, São Paulo

Schäfer-Verwimp, Ma31, RB, 530624,  (RB00678772)

## FIELD IMAGES / ILLUSTRATIONS



*Gymnostomum aeruginosum* Sm. A. Leaf apex. B. Basal cells. C. Laminal cells with papillae. D. Leaf section.

Denise Pinheiro da Costa

Figure 1: *Gymnostomum aeruginosum* Sm.

## REFERENCE

Citado por Brotherus (1924) para o Brasil sem localidade.

# *Hymenostyliella* E.B.Bartram

This treatment is composed of the following taxa: *Hymenostyliella*, *Hymenostyliella alata*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96791>.

## DESCRIPTION

### **Hymenostyliella** Bartr.

**Plants** median, in dense turfs, dark green. **Stems** rosulate, few branched. **Leaves** crowded, spreading to widespreading, narrowly oblong-lanceolate to ligulate; base slightly ovate, channeled-concave; apex acute to obtuse, cucullate, occasionally mucronate, base only slightly broader; margins involute above, plane below, entire or often dentate above; costa short-excurrent as a mucro, in cross-section semicircular, 2 stereid bands, 3-4 guide cells in 1 layer; upper laminal cells hexagonal or elongate, mammillose, basal cells weakly differentiated, rectangular, thick-walled. **Dioicous**. **Perigonia** lateral. **Perichaetia** on short lateral branches. **Seta** long, erect. **Capsule** obovoid to elliptical. **Operculum** long-rostrate. **Peristome** absent. **Calyptra** cucullate, smooth. **Spores** spherical, smooth.

## COMMENTS

**Comments:** A small genus with three species and only one species occurring in Brazil.

### **Life Form**

foliose, Tuft

### **Substrate**

Terrestrial

## DISTRIBUTION

Native, Is endemic from Brazil

### **Phytogeographic Domains**

Atlantic Rainforest

### **Vegetation Types**

Ombrophyllous Forest (Tropical Rain Forest)

### **Geographic Distribution**

#### Confirmed occurrences

Southeast (São Paulo)

# *Hymenostyliella alata* (Herzog) H. Rob.

## Has as synonym

basionym *Timmiella alata* Herzog

## DESCRIPTION

*Hymenostyliella alata* (Herzog) H. Rob., *Phytologia* 21: 3. 1971. Basionym: *Timmiella alata* Herzog, *Arch. Bot. Est. Sa#o Paulo* 1(2): 61. 1925. Type: Brazil. Lu#tzelburg s.n. (SP, holotype not found).

**Plants** small, green, not branched. **Leaves** crispate, erect-patent, elliptic to linear-lingulate, apex acute to obtuse, channeled-concave, cucullate, mucronate; margins involute; costa percurrent to short-excurrent, superficial cells with two flexuose lamellae; laminal cells unistratose, mammilose above and laxa-rectangular at base.

This species was described by Herzog (1925) based on a collection by Lu#tzelburger on soil, in southeastern Brazil. According to Robinson (1971), although the type material was not studied, the combination of leaf characters and the adaxial surface of the costa are characteristic of this taxon, but additional material should be examined to confirm the position of the perichaetia. Costa (2016) comment that she was not been able to study the type or any other collection from Brazil.

**Illustrations:** Herzog (1925)

## COMMENTS

**Comments:** Robinson (1971) transferred *Timmiella alata* to the genus *Hymenostyliella* as it appears to be closely related to *H. llanosii* (Mu#ll. Hal.) H. Rob., differing by the cucullate leaf apex and the presence of ventral lamellae (up to 12 cells long) in two rows over the costa, in combination with strongly mammillose cells on the upper leaf surface.

## Life Form

foliose, Tuft

## Substrate

Terrestrial

## DISTRIBUTION

Native, Is endemic from Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Southeast (São Paulo)

## HERBARIUM MATERIAL

Lützelburg, P., s.n., SP, São Paulo, **Typus**

## FIELD IMAGES / ILLUSTRATIONS



*Gymnostomum acrocladum* Sm. A. Leaf apex. B. Basal cells. C. Laminal cells with papillae. D. Leaf section. *Hymenostyliella alata* (Herzog) Hobbs. E. Habitat. F. Leaf. G. Leaf section (redrawn from Herzog 1925). *Hymenostylium recurvirostrum* (Hedw.) Dixon. H. Habitat. I. Leaf. J. Leaf apex. K. Laminal cells with papillae. L. Leaf section. *Hymenostyliella alata* (Herzog) J. & Wilson. M. Habitat. N. Leaf. O. Leaf apex. P. Leaf section. *Hymenostylium recurvirostrum* (Hedw.) J. & Jagger. Q. Habitat. R. Leaf apex. S. Leaf section. I. Basal cells. U. Laminal cells.

Denise Pinheiro da Costa

Figure 1: *Hymenostyliella alata* (Herzog) H. Rob.



# Hymenostylidium Brid.

This treatment is composed of the following taxa: *Hymenostylidium*, *Hymenostylidium aurantiacum*, *Hymenostylidium recurvirostrum*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96793>.

## DESCRIPTION

### Hymenostylidium Brid.

**Plants** small, in dense turfs, green above and brown below. **Stems** erect, branched, radiculose or tomentose. **Leaves** spreading to widespreading, narrowly oblong to ligulate-lanceolate, keeled, apex acute to rounded, base decurrent or not; margins plane or recurved, dentate to crenulate; costa subpercurrent to short excurrent, as a short mucro, in cross section semi-circular or circular, 2–4 guide cells in 1 layer, stereids bands 2–3 above guide cells or absent, below 3–6; lamina unistratose; upper laminal cells subquadrate to irregularly short rectangular, papillose, papillae 1–3 over lumen; marginal cells elongate; basal cells elongate, rectangular, ± thick-walled and porose or not; basal marginal cells rectangular and hyaline. **Dioicous**. **Perichaetia** terminal. **Seta** long, twisted. **Capsule** erect, urn ovoid. **Operculum** long-rostrate, oblique. **Peristome** absent. **Calyptra** cucullate, smooth, naked. **Spores** slightly papillose.

## COMMENTS

**Comments:** Two species occurring in Brazil.

### Life Form

foliose, Tuft

### Substrate

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

### Vegetation Types

Cerrado (lato sensu), Ombrophylous Forest (Tropical Rain Forest)

### Geographic Distribution

#### Confirmed occurrences

Central-west (Distrito Federal, Goiás)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Santa Catarina)

## IDENTIFICATION KEY

This key is based on Cano et Jime#nez (2013)

1. Leaves oblong-lanceolate to linear-lanceolate; median laminal cells often collenchymatous, cells with 1(–2) coarse papillae. Setae straight to twisted to the right. Capsule ovoid to cylindrical. Operculum conical-rostrate to rostrate, 0.6–1.2 mm long, not systylious..... *H. aurantiacum*

1. Leaves usually lanceolate; median laminal cells usually not collenchymatous, cells with 2–3 small or coarse papillae. Setae twisted to the right. Capsule cylindrical. Operculum rostrate, usually systylious..... *H. recurvirostrum*



# *Hymenostylium aurantiacum* Mitt.

## DESCRIPTION

**Hymenostylium aurantiacum** Mitt., J. Proc. Linn. Soc., Bot., Suppl. 1: 32, 1859. Type: India. Sikkim, Hooker 190. (NY 1128560, lectotype by Saito 1975)

**Plants** small to medium, yellowish green to light green. **Stems** branched, sclerodermis with 1–2 layers of smaller and thicker-walled cells, central strand absent. **Leaves** spreading to reflexed, oblong-lanceolate to ligulate, slightly keeled; lamina unistratose; apex acute; margins recurved on one side (1/2 to 1/3), papillose, unistratose; costa percurrent, occasionally short-excurrent, in cross-section with 2–4 guide cells in one layer and 1–2 ventral stereids rows, dorsal surface cells smooth; laminal cells subquadrate to polygonal, thick-walled, flat or slightly convex, with 1–2 papillae; basal cells rectangular to linear, thick-walled, smooth. **Dioicous**. Capsule ovoid to cylindrical, peristome absent. **Operculum** conic-rostrate, not systylious. Illustrations: Cano & Jime#nez (2013).

## COMMENTS

**Distribution and ecology:** Asia, South and Central America, West Indies, and Oceania (Cano et Jime#nez 2013). In Brazil encountered in Savanna and the Atlantic Rainforest (DF, GO, MG, SP), 200–1100 m, on calcareous rocks near streams and waterfalls.

**Comments:** It is characterized by having leaves oblong-lanceolate and less glossy (not lanceolate as in *H. recurvirostrum*), distal laminal cells with sinuose lumens and often with one papilla per cell.

### Life Form

foliose, Tuft

### Substrate

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

### Vegetation Types

Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest)

### Geographic Distribution

#### Confirmed occurrences

Central-west (Distrito Federal, Goiás)

Southeast (Minas Gerais, São Paulo)

## HERBARIUM MATERIAL

A. Schäfer Verwimp & Verwimp, 9910, MG, SP, Goiás

A. Schäfer Verwimp & Verwimp, 9970, SP, Minas Gerais

D.M. Vital & W.R. Buck, 12538, NY, São Paulo

H.S. Irwin, 31701, NY, Distrito Federal

# *Hymenostylium recurvirostrum* (Hedw.) Dixon

## DESCRIPTION

*Hymenostylium recurvirostrum* (Hedw.) Dixon. Basionym: *Gymnostomum recurvirostrum* Hedw., Spec. Musc. Frond. 33. 1801. Type: Poland and Germany. In rupibus gypsaceis prope Osterode et Niedersachswerfen dextexit, J.B. Ehrhart s.n. (G 00040165, lectotype designated by :Cano & Jiménez 2013).

**Plants** small to medium-sized, yellowish-green to dark-green. **Stems** with sclerodermis differentiated, 1–2 layers of smaller and thickened cells, central strand absent. **Leaves** erect-patent to spreading, oblong-lanceolate to linear-lanceolate, keeled, base decurrent; lamina unistratose; apex acute; margins recurved only in one side (1/2 to 1/3), papillose, unistratose; costa percurrent, dorsal surface cells rectangular to linear, ventral surface cells rectangular to long-rectangular or linear, in cross-section with 2(–4) guide cells in one layer, without ventral epidermis, two ventral stereids; laminal cells quadrate to rectangular or oblate, slightly thick-walled, flat or slightly convex, with 1–3 simple low papillae; basal cells rectangular to linear, thick-walled, smooth. **Dioicous**. **Seta** long, reddish. **Capsule** cylindrical without peristome. **Operculum** rostrate.

## COMMENTS

**Distribution and ecology:** widespread throughout the world (Cano & Jiménez 2013). In Brazil encountered in Savanna and the Atlantic Rainforest (RJ, SP), 200–2350 m, on rocks near streams and waterfalls.

**Comments:** It is characterized by the absence of a hyalodermis and central strand, leaves oblong-lanceolate or ligulate, one margin recurved and the other erect, laminal cells with one or more low papillae, the costa without ventral epidermis and with two stereid bands, and the capsule without peristome. In Brazil, it can be confused with *Anoetangium aestivum*, *Gymnostomum aeruginosum*, and *Molendoa sendtneriana*.

## Life Form

foliose, Tuft

## Substrate

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Central-west (Distrito Federal, Goiás)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Santa Catarina)

## HERBARIUM MATERIAL

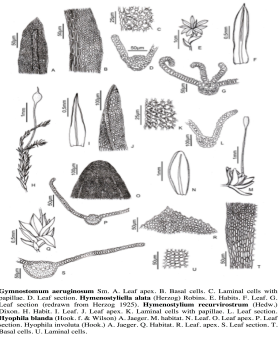
Costa, D.P., 4953, RB, Rio de Janeiro

H.S. Irwin, 31701, NY, Distrito Federal

Vital, D.M. & Buck, W.R., 12538, NY, São Paulo

Schäfer-Verwimp, A. &amp; Verwimp, I, 1910, RB, SP, Goiás

## FIELD IMAGES / ILLUSTRATIONS

Figure 1: *Hymenostylium recurvirostrum* (Hedw.) Dixon

# Hyophila Brid.

This treatment is composed of the following taxa: *Hyophila*, *Hyophila blanda*, *Hyophila involuta*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96795>.

## DESCRIPTION

*Hyophila* Brid.

**Plants** small to median, in dense to loose turfs, green, blackish or brownish-green. **Stems** erect. **Leaves** oblong-obovate to ± spatulate, narrowed to base, apex acute to obtuse, apiculate or mucronate; margins plane, entire below or throughout, irregularly serrate or dentate; costa strong, subpercurrent to percurrent, in cross section semicircular, stereids above and below guide cells, ventral and dorsal epidermis present, 4(–6) guide cells in 1 layer; lamina unistratose, bulging on ventral surface; upper laminal cells quadrate-rounded to oval, thick-walled, mammillose; basal cells short rectangular, ± thin-walled and lax. **Gemmae** in the leaf axils, clavate or stellate or terminal on cylindrical stalks. **Dioicous**. **Perichaetia** terminal. **Seta** long, 4–7 mm. **Capsule** erect, urn cylindrical. **Operculum** conical-rostrate. **Peristome** absent. **Calyptra** cucullate, smooth. **Sporangia** spherical, smooth to slightly papillose.

## COMMENTS

**Comments:** only two species can be recognize for Brazil, both occurring on rocks and soil in urban areas or ion exposed sites.

**Doubtful species:** *Hyophila subcucullata* Williams, Bryologist 24: 22, 1921. Until 1993 this species was considered endemic from Cuba (Zander 1993), but cited by Yano (2011) for Rio de Contas, Bahia State. According to Costa (2016) she could not study this material.

### Names excluded:

*Hyophila assimilis* Broth., Hedwigia 34: 125, 1895. Type: Brasil, Goya#, Mossamedes, Jan 1893, *E. Ule 1551* (?), holotype, HBG, isotype).

*Hyophila brevifolia* Hampe, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn ser. 4, 1: 80, 1879. Type: Brasil, Minas Gerais: Lagoa Santa, *Warming s.n.* (BM ?, holotype).

*Hyophila laete-virens* Broth., Bih. Kongl. Svenska Vetensk.-Akad. Handl. 3: 22, 1895. Type: Brasil, *Glaziou 9227* (BM ?, holotype).

*Hyophila lororhyncha* Mu#ll. Hal. ex. A#ngstr., O#fvers. Fo#rh. Kongl. Svenska Vetensk.-Akad. 33: 9, 1876. Type: Brasil, Rio de Janeiro: Catumby ad muros, Mose#n 198 (?), holotype).

*Hyophila mosenii* Broth., Bih. Kongl. Svenska Vetensk.-Akad. Handl. 3: 22, 1895. Type: Brasil, Minas Gerais: Caldas, ad arbores in ripa rivuli Ribeira#o de Girivas, *Mose#n 38* (?), holotype).

*Hyophila ochracea* Broth., Ergebn. Bot. Exped. Su#dbras., Musci. 285, 1924. Cited from Brazil, Rio de Janeiro by Brotherus (1924).

*Hyophila ovalifolia* (Hampe) Hampe, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn ser. 3, 6: 131, 1879. Cited from Brazil, Ceara#, Rio de Janeiro, and Sa#o Paulo (Mu#ller 1849; Hampe 1872; Brotherus 1924).

*Hyophila regnellii* Mu#ll. Hal. ex A#ngstr., O#fvers. Fo#rh. Kongl. Svenska Vetensk.-Akad. 33: 9, 1876. Type: Brasil, Rio de Janeiro, *Glaziou s.n.* (Hampe 1879).

*Hyophila rubiginosa* Hampe, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn ser. 4, 1: 80, 1879. Type: Brasil, Rio de Janeiro, *Glaziou 1994* (BM?, holotype).

*Hyophila uleana* Mu#ll. Hal., Hedwigia 34: 125, 1895. Type: Brasil, Goia#, auf Felsen im Walde bei Goyaz, *E. Ule 1550* (HBG, isotype) by Brotherus (1895a).

*Hyophila variegata* A#ngstr., O#fvers. Fo#rh. Kongl. Svenska Vetensk.-Akad. 33: 8, 1876. Type: Brasil, Minas Gerais: Rio de Janeiro, and Sa#o Paulo (Å#ngstro#m 1876; Hampe 1879).

*Hyophila warmingii* Hampe, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn ser. 3, 2: 269, 1879. Cited by Hampe (1870) for Brazil, Minas Gerais State. Type: Brasil, Minas Gerais: Lagoa Santa, *Warming s.n.* (BM 000872666 [Herb. Hampe], holotype).

**Life Form**

foliose, Tuft

**Substrate**

Rupicolous, Saxicolous, Terrestrial

**DISTRIBUTION**

Native, Not endemic to Brazil

**Phytogeographic Domains**

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa, Pantanal

**Vegetation Types**

Anthropic area, Caatinga (stricto sensu), Grassland, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Inundated Forest (Igapó), Terra Firme Forest, Inundated Forest (Várzea), Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

**Geographic Distribution**Confirmed occurrences

North (Amazonas, Pará, Rondônia, Roraima)

Northeast (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí)

Central-west (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul)

**IDENTIFICATION KEY**

1. Upper and median leaf cells smooth..... *H. blanda*
1. Upper and median leaf cells mamillöse..... *H. involuta*

# *Hyophila blanda* (Hook.f. & Wilson) A. Jaeger

## DESCRIPTION

*Hyophila blanda* (Hook. f. & Wilson) A. Jaeger, Ber. Thurg. St. Gallischen Naturwiss. Ges. 1871–72: 352, 1873.

Basionym: *Gymnostomum blandum* Hook. f. & Wilson, London J. Bot. 3: 151, 1844 (Hooker & Wilson 1844). Type: Brasil, Piauí#, on sandstone rocks, near city of Oeiras, May 1839, G. Gardner 6 (Holotype: BM 000872676; Isotypes: BM 000872671, BM 000872674, NY).

**Plants** very small. **Leaves** appressed, erect-patent, concave, obovate, keeled (channeled), involute, margin entire; upper and median laminal cells quadrate, smooth; costa subpercurrent.

## COMMENTS

**Distribution and ecology:** Endemic to Brazil (MG, PI), encountered in Savanna and Atlantic Rainforest, 0–1100 m, occurring on rocks and soil.

**Comments:** This taxon is only known from very old collections made between 1839 and 1876.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Is endemic from Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

Confirmed occurrences

Northeast (Piauí)

Southeast (Minas Gerais)

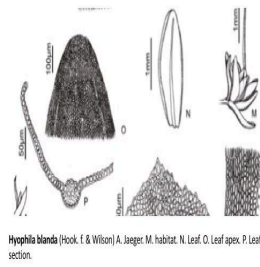
## HERBARIUM MATERIAL

G. Gardner, 1, BM, Piauí

G. Gardner, 6, NY, Piauí, **Typus**

## FIELD IMAGES / ILLUSTRATIONS





*Hyophila blanda*

Figure 1: *Hyophila blanda* (Hook.f. & Wilson) A.Jaeger

# *Hyophila involuta* (Hook.) A. Jaeger

## Has as synonym

basionym *Gymnostomum involutum* Hook.

heterotypic *Hyophila matto grossensis* Broth.

## DESCRIPTION

*Hyophila involuta* (Hook.) A. Jaeger, Ber. Thurg. St. Gallischen Naturwiss. Ges. 1871–72: 354, 1873.

Basionym: *Gymnostomum involutum* Hook., Musci Exot. 2: 154, 1819. Type: Nepal, Gardner s.n (Holotype: BM).

**Plants** small to medium, dark green to red-brown or blackish. **Stem** irregularly branched. **Leaves** erect-spreading, spatulate to obovate, concave, apex rounded to obtuse, sometimes apiculate; costa sub-percurrent to short-excurrent, smooth on the abaxial surface to occasionally roughened at the apex; margin entire to dentate above; upper and median laminal cells bulging-mammillose, basal laminal cells short-rectangular, brownish or hyaline, thin to thick-walled, bulging-mammillose on the adaxial surface, plane on the abaxial. **Dioicous**. **Seta** reddish to yellow-brown. **Capsule** erect, cylindrical, annulus well differentiated, red-brown. Peristome absent. Operculum erect, conic-rostrate. **Calyptra** cucullate.

## COMMENTS

**Distribution and ecology:** widespread throughout the world [America, West Indies, Europe, Siberia, Russia Far East, China, Japan, Asia, Macaronesia, Africa, Western Indian Ocean, Indian Subcontinent, Indo-China, Malesia, and Australia, Allen 2002]. In Brazil is also widespread (AL, AM, BA, CE, DF, ES, GO, MG, MS, MT, PA, PB, PE, PI, PR, RJ, RO, RR, RS, SP), encountered in the Amazon Forest, Atlantic Rainforest, Caatinga, and Savanna, 0–1400 m, occurring on shaded soils, old stone walls in urban areas, or rocks.

**Comments:** It is recognized when dry by its strongly rolled-up leaf margins.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Saxicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa, Pantanal

## Vegetation Types

Anthropic area, Caatinga (stricto sensu), Grassland, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Inundated Forest (Igapó), Terra Firme Forest, Inundated Forest (Várzea), Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

North (Amazonas, Pará, Rondônia, Roraima)

Northeast (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí)

Central-west (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul)

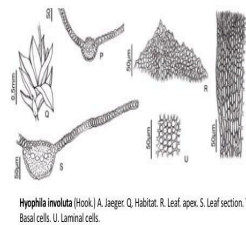
## HERBARIUM MATERIAL

Buck, W.R., 2620A, NY, Amazonas

Boom, B. & Mori, S.A., 1042, NY, Alagoas

D. M. Vital, 12761, SP, Goiás  
 D. M. Vital, 8352, NY, Paraná  
 D.M. Vital, 1082, SP, Bahia  
 Lindmann, C.A.M., 541, H, Mato Grosso  
 O. Yano & Z.R. Mello, 13896, SP, Ceará  
 Yano, O., 1346, SP, Mato Grosso do Sul  
 Reese, W.D., 16800, NY, Pará  
 Vital, D.M., 11874, NY, Minas Gerais  
 Vital, D.M., 5423, SP, Paraíba  
 Yano, O. et al., 9144, SP, Pernambuco  
 Vital, D.M. & Buck, W.R., 12590, NY, São Paulo  
 Vital, D.M., 5413, SP, Piauí  
 Costa, D.P. et al., 5022, RB, Rio de Janeiro  
 Reese, W.D., 12710, NY, Rondônia  
 Felipe Juliani, 74, RB, 📍 (RB00907931), Rio de Janeiro  
 H.S. Irwin, 31674, SP, Distrito Federal

### FIELD IMAGES / ILLUSTRATIONS



Denise Pinheiro da Costa

Figure 1: *Hyophila involuta* (Hook.) A.Jaeger

# *Hyophiladelphus* (Müll.Hal.) R.H.Zander

This treatment is composed of the following taxa: *Hyophiladelphus*, *Hyophiladelphus agrarius*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96800>.

## DESCRIPTION

**Hyophiladelphus** (Müll. Hal.) R.H. Zand.

**Plants** small, blackish green, in tufts. **Stems** short. **Leaves**, oblong-obovate, elliptical or spatulate, concave to channeled, apex broadly acute; margins entire, occasionally serrulate at apex; costa percurrent to short excurrent, in cross section stereids above and below guide cells, 2 guide cells in 1 layer; lamina unistratose to bistratose; upper laminal cells subquadrate to subrectangular, thin-walled, smooth, bulging on upper surface, plane on lower surface; basal cells from near base to 1/3 lamina length, rectangular and rather curved, thin-walled; alar cells often bulging. **Dioicous**. **Perichaetia** terminal. **Seta** long, erect. **Capsule** erect, cylindrical to ellipsoid, sulcate. **Operculum** long-conical. **Peristome** teeth divided into 32 filamentous segments, spiculate, articulations numerous, granulate to spiculate. **Calyptra** cucullate, smooth. **Spores** spherical, slightly papillose.

## COMMENTS

**Comments:** Monotypic genus occurring on calcareous soils, limestone and sandstone rocks; being frequent in urban areas on brick or concrete.

### Life Form

foliose, Tuft

### Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest

### Vegetation Types

Anthropic area, Caatinga (stricto sensu), Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Terra Firme Forest, Ombrophyllous Forest (Tropical Rain Forest), Coastal Forest (Restinga)

### Geographic Distribution

#### Confirmed occurrences

North (Acre, Amazonas, Pará, Rondônia, Tocantins)

Northeast (Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Rio Grande do Norte, Sergipe)

Central-west (Distrito Federal, Mato Grosso)

Southeast (Rio de Janeiro, São Paulo)

South (Rio Grande do Sul)

# *Hyophiladelphus agrarius* (Hedw.)

## R.H.Zander

### Has as synonym

basionym *Barbula agraria* Hedw.

### DESCRIPTION

*Hyophiladelphus agrarius* (Hedw.) R.H. Zander, Bryologist 98: 372, 1995. Basionym: *Barbula agraria* Hedw., Sp. Musc. Frond. 116, 1801. Type: Jamaica, *O. Swartz s.n.* (Lectotype: G by Zander 1979 ).

**Plants** small, green above and yellow below. **Stems** short, not branched. **Leaves** oblong-ovate to oblong-spathulate, erect to spreading, apex acute, mucronate, margins entire, serrulate near apex, lamina occasionally bistratose, marginal entire to serrulate at apex, costa short-excurrent to percurrent, ventral and dorsal cells elongate, two steroid bands, upper laminal cells quadrate, basal laminal cells short to long-rectangular, thin-walled, smooth. **Dioicous**. **Perichaetia** terminal. **Seta** red-brown, twisted, smooth. **Capsule** erect, red-brown, cylindrical. **Operculum** twisted, long-rostrate. **Calyptra** smooth, cucullate.

### COMMENTS

**Distribution and ecology:** America (U.S.A., Mexico, Central America, West Indies, South America - Allen 2002). In Brazil is widespread and encountered in the Amazon Forest, Atlantic Rainforest, Savanna, and Restinga (sandy area coastal vegetation) [AC, AL, AM, BA, DF, CE, DF, ES, FN, GO, MA, MG, MS, MT, PA, PB, PE, PI, PR, RJ, RO, RS, SE, SP], 0–650 m, occurring on soil, limestone rocks, and walls in urban areas.

**Comments:** It is characterized by leaves oblong-obovate to oblong-spathulate, costa with cells elongated and smooth on the adaxial and abaxial surfaces, steroid bands visible in cross section above and below the guide cells, with cells bulging on the adaxial surface lamina.

### Life Form

foliose, Tuft

### Substrate

Rupicolous, Terrestrial

### DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest

### Vegetation Types

Anthropic area, Caatinga (stricto sensu), Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Terra Firme Forest, Ombrophylous Forest (Tropical Rain Forest), Coastal Forest (Restinga)

### Geographic Distribution

#### Confirmed occurrences

North (Acre, Amazonas, Pará, Rondônia, Tocantins)

Northeast (Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Rio Grande do Norte, Sergipe)


Central-west (Distrito Federal, Mato Grosso)

Southeast (Rio de Janeiro, São Paulo)

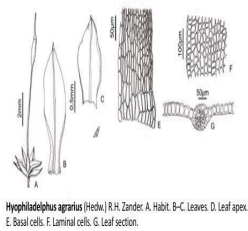
South (Rio Grande do Sul)

### HERBARIUM MATERIAL

D.M. Vital & W.R. Buck, 20061, NY, Bahia

Marcelli, M., 7611, SP, Ceará  
E.S. Brito & G.M. Barroso, 323, SP, Maranhão  
Oliveira, H.C., 351, HUEFS, Ceará  
D.P. Costa, 2188, RB, 531179,  (RB00679470), Rio de Janeiro  
A.L. Ilkiu-Borges, 379, MG, Pará  
Schäfer-verwimp, A., 8749, MO, Sergipe  
Costa, D.P. et al., 2188, RB, Rio de Janeiro  
Silva, L.L.S., s.n., RB, Pernambuco  
Rossato, M. et al., 5896, NY, Rio Grande do Sul  
Reese, W.D., 13236, MG, Acre  
Buck, W.R., 2198, MG, Amazonas

## FIELD IMAGES / ILLUSTRATIONS



Denise Pinheiro da Costa

Figure 1: *Hyophiladelphus agrarius* (Hedw.) R.H.Zander

# *Leptodontium* (Müll.Hal.) Hampe ex Lindb.

This treatment is composed of the following taxa: *Leptodontium*, *Leptodontium araucarieti*, *Leptodontium capituligerum*, *Leptodontium filicola*, *Leptodontium flexifolium*, *Leptodontium luteum*, *Leptodontium pungens*, *Leptodontium stellatifolium*, *Leptodontium viticulosoides*, *Leptodontium wallisii*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96802>.

## DESCRIPTION

**Leptodontium** (Müll. Hal.) Hampe ex Limpr.

**Plants** small to robust, in short, loose to dense turfs, light to dark green, brownish-yellow or golden. **Stems** rigid, erect, simple to branched. **Leaves** short or long-lanceolate, sheathing base oblong, apex narrowly to broadly acute to obtuse, base decurrent or not; margins plane to recurved or reflexed, entire to serrate or dentate near base; costa subpercurrent to short excurrent, in cross-section reniform, semi-circular or elliptical, stereid bands below and above guide cells, epidermal cells absent, 2–4 guide cells in one layer; lamina unistratose; upper and median cells isodiametric, pluripapillose, or papillae crown-shaped and branched; basal cells large, narrowly rectangular to oblong-rectangular, thin-walled, porose and papillose. **Dioicous** (rare autoicous). **Perichaetia** terminal. **Seta** long, erect. **Capsule** erect to inclined, cylindrical. **Operculum** conical to conic-rostrate. **Peristome** single, teeth irregularly divided or perforate, smooth to striate. **Calyptra** cucullate, smooth. **Spores** papillose.

## COMMENTS

**Comments:** Nine species occur in Brazil, on soil and on rocks, occasionally on tree trunks, common at high altitudes.

### Life Form

foliose, Tuft

### Substrate

Corticicolous, Epixilous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest, Pampa

### Vegetation Types

High Altitude Grassland, Grassland, Highland Rocky Field, Cerrado (lato sensu), Seasonally Deciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

### Geographic Distribution

#### Confirmed occurrences

Northeast (Bahia, Pernambuco)

Central-west (Goiás)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

## IDENTIFICATION KEY

1. Leaf lingulate..... 2  
 1'. Leaf lanceolate, oblong-lanceolate to ovate-lanceolate..... 3  
 2. Margin reflexed in the lower 1/2, crenulate in the upper 1/2..... ***L. stellatifolium***  
 2'. Margin recurved in the lower 1/2-2/3, dentate to denticulate in the upper 1/3..... ***L. flexifolium***  
 3. Leaf strongly dentate near the base..... ***L. luteum***  
 3'. Leaf not dentate in the base..... 4  
 4. Leaf with apex narrowly acute, margin recurved, revolute and incurved in the lower 1/3-1/2, high sheating base (>2/3).....5  
 4'. Leaf with apex acute to obtuse, margin recurved in the lower 1/3-2/3, slightly sheating base (< 1/2).....6  
 5. Margin revolute and incurved, costa percurrent or ending 1-3 cells below apex..... ***L. wallisii***  
 5'. Margin recurved, costa subpercurrent ending 4-8 cells below apex..... ***L. araucarieti***  
 6. Alar cells differentiated (grouped of cells short-rectangular, thick and porose walls)..... ***L. pungens***  
 6'. Alar cells not differentiated..... 7  
 7. Papillae coroniform, crownded (sometimes scattered), in a crown-like ring over the cell lumen, with a high columnar base (in cross section).....***L. capituligerum***  
 7'. Papillae simple to bifid, scattered or centrally grouped over each lumen (in cross section).....8  
 8. Margin serrate; papillae scattered grouped over each lumen; inner basal cells rectangular to long-rectangular, porose to not porose .....***L. viticulosoides***  
 8'. Margin denticulate; papillae centrally grouped over each lumen; inner basal cells short-rectangular, not porose..... ***L. filicola***



# *Leptodontium araucarieti* (Müll.Hal.) Paris

## Has as synonym

basionym *Trichostomum araucarieti* Müll. Hal.

## DESCRIPTION

*Leptodontium araucarieti* (Müll. Hal.) Paris, Ind. Bryol. Suppl. 224, 1900. Basionym: *Trichostomum araucarieti* Müll. Hal., Bull. Herb. Boissier 6: 93, 1898. Type: Brasil, Santa Catarina: Serra Geral, May 1890, *E. Ule* 658 (Lectotype: FH; Isolectotypes: HBG, M, NY, S-PA, US).

**Plants** medium-sized, greenish- to yellowish-brown, 6-9 cm long. **Leaves** spreading-recurved, twisted when dry, spreading-to squarrose-recurved when wet, lanceolate to ovate-lanceolate, apex acute, carinate above; upper laminal cells subquadrate to elongated, lumens rounded-hexagonal; **margins** recurved in the lower portion, dentate; **costa** subpercurrent, ending 4-8 cells below apex, papillose, in cross section with 4 guide cells, 1-2 ventral and dorsal layers of stereid; papillae simple to multifid, scattered or grouped in the center of the lumen; basal cells rectangular, papillose, walls thin to thickened. **Propagula** obovoid, on short stalks on the stem. **Diocious**. **Perigonia** lateral, **perichaetia** terminal. **Setae** yellowish-brown, twisted above. **Capsule** cylindrical, erect, yellowish- to reddish-brown. **Operculum** conic-rostrate.

## COMMENTS

**Distribution and ecology:** Peru, Bolivia, and Brazil (Zander 1972). In Brazil is encountered in Atlantic Rainforest (MG, PR, RJ, RS, SC, SP), 300–2500 m, on soil and rocks.

**Comments:** This taxon is close to *L. wallisii*, differing by the recurved margin (not revolute and incurved), and costa subpercurrent ending below the apex (not percurrent).

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

Wasum, R., 8885, NY, Rio Grande do Sul

D.P. Costa, 1007, RB, 302382,  (RB00679491), Rio de Janeiro

Schäfer-Verwimp, A. & Verwimp, I., 11188, SP, RB, Minas Gerais

Vital, D.M. & Buck, W.R., 12411A, NY, Santa Catarina

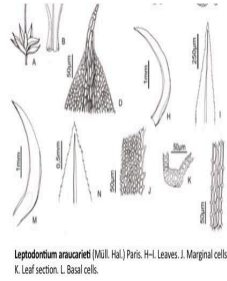
Costa, D.P., 855, RB, Rio de Janeiro

E.H.G. Ule, 658, FH, HBG, NY, Santa Catarina, **Typus**

Koehne, 669, JE, São Paulo

R. Marquete, 3112, RB, 382288,       (RB00682476), Minas Gerais

### FIELD IMAGES / ILLUSTRATIONS



*Leptodontium araucarieti* (Müll. Hal.) Paris. H-I. Leaves. J. Marginal cells.  
K. Leaf section. L. Basal cells.

Denise Pinheiro da Costa

Figure 1: *Leptodontium araucarieti* (Müll.Hal.) Paris

# *Leptodontium capituligerum* Müll. Hal.

## DESCRIPTION

*Leptodontium capituligerum* Müll. Hal., Linnaea 42: 323, 1879. Type: Argentina, Cordobensis, Siambon, Apr 1871, Lorentz s.n. (Lectotype: NY).

**Plants** medium-sized, yellow-brown, in tufts, 2.0-5.2 cm. **Stem** red and slightly radiculose. **Leaves** erect, flexuose to crispate, ovate-lanceolate to lanceolate, keeled, sheathing at base, **apex** acute to acuminate, **margins** recurved at base, serrate to dentate at apex, **costa** subpercurrent, pluripapillose, upper **laminal cells** quadrate, pluripapillose, basal laminal cells rectangular, hyaline, papillae near margins at base, crown-shaped, columnar.

## COMMENTS

**Distribution and ecology:** Mexico, Central America, Andes, southern Brazil, Uruguay, and Africa (Zander 1972, 1994). In Brazil is encountered in Steppe and the Atlantic Rainforest (RS), 500–800 m, on soil or rocks. It is considered a rare species in Brazil, restricted to the southern region.

**Comments:** In this taxon, the papillae are coroniform, with a thickened columnar base, occurring on the lumen of the upper laminal cells.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Pampa

## Vegetation Types


Grassland, Seasonally Deciduous Forest

## Geographic Distribution

Confirmed occurrences

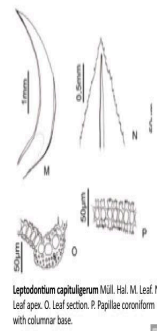
South (Rio Grande do Sul)

## HERBARIUM MATERIAL

S. Churchill, 22254, RB, 415548,  (RB00682534)

Wasum, R., 4158, NY, Rio Grande do Sul

## FIELD IMAGES / ILLUSTRATIONS



*Leptodontium capituligerum* Müll. Hal. M. Leaf. N.  
Leaf apex. O. Leaf section. P. Papillae coroniform  
with columnar base.

Denise Pinheiro da Costa

Figure 1: *Leptodontium capituligerum* Müll. Hal.

# *Leptodontium filicola* Herzog

## DESCRIPTION

**Leptodontium filicola** Herzog, Biblioth. Bot. 87: 34.1916. Type: Bolivia, An einem Baumfarn zwischen San Mateo und Sunchal, ca. 1800 m, T. Herzog 4512, April 1911 (Holotype: JE).

**Plants** small, greenish to yellowish. **Leaves** strongly incurved, oblong-lanceolate; apex acute; costa subpercurrent, in cross section with 4 guide cells, 2 layers of dorsal and ventral stereid; margin denticulate; laminal **cells** papillose, papillae centrally grouped over each lumen, simple to bifid, upper cells quadrate, inner basal cells short-rectangular, not porose. **Dioicous**. **Propagula** clustered in dense masses on the upper stem.

## COMMENTS

**Distribution and ecology:** Central America and Southern Brazil (Allen 2002, Zander 1972). In Brazil encountered in the Atlantic Rainforest, 800–2500 m, on tree trunks and rocks. Only known for Rio de Janeiro States from two old collections from Serra dos O#rga#os and Serra da Mantiqueira; probably a rare species.

**Comments:** It is distinguished by the leaves strongly incurved and by the propagula clustered in dense masses on the upper stem.

## Life Form

foliose, Tuft

## Substrate

Corticicolous, Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Seasonally Deciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

Southeast (Minas Gerais, Rio de Janeiro)

South (Rio Grande do Sul, Santa Catarina)

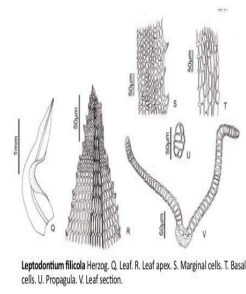
## HERBARIUM MATERIAL

Costa, D.P. et al., 4283, RB, Santa Catarina

Wasum, R., s.n., HUCC 4387:, Rio Grande do Sul

D. M. Vital, 11694, SP, Minas Gerais

## FIELD IMAGES / ILLUSTRATIONS



*Leptodontium filicola* Herzog, Q, Leaf. R, Leaf apex. S, Marginal cells. T, Basal cells. U, Propogula. V, Leaf section.

Denise Pinheiro da Costa

Figure 1: *Leptodontium filicola* Herzog

# *Leptodontium flexifolium* (Dicks.) Hampe

## Has as synonym

basionym *Bryum flexifolium* Dicks ex With.

## DESCRIPTION

*Leptodontium flexifolium* (Dicks. ex With.) Hampe in Lindb., Öfvers. Förh. Svenska Vetensk.-Akad. 21: 227. 1864.

Basionym: *Bryum flexifolium* Dicks. ex With., Syst. Arrang. Brit. Pl., ed. 4, 3: 799. 1801. Type: England, on barren sloping ground near Croydon, Dickson s.n. (Holotype: BM).

**Plants** small, green to yellowish-brown, 1-3(-5) cm long. **Leaves** erect-appressed to erect-flexuose, spreading, recurved, lingulate, apex broadly acute, mucronate, carinate above, decurrent below, margin recurved in the lower 1/2-2/3, dentate to denticulate in the upper 1/3; **costa** ending below apex, dorsally papillose, in cross section reniform to semicircular, 2-4 guide cells rows, ventral and dorsal layers of stereid, hyaline or yellow; upper **laminal cells** subquadrate, rounded-rectangular, in cross section, walls thickened, papillose, papillae bi- to trifid, 4-7 over lumen; **basal cells** short rectangular, little papillose, walls thickened, hyaline or yellowish. **Propagula** obovoid, on short branching on the stem. **Dioicous**, perigonia and perichaetia terminal. **Seta** yellowish-brown, twisted. **Capsule** cylindrical, erect, brown to yellowish-brown; annulus of 2-3 rows of cells. **Spores** yellowish-brown, slightly papillose. **Operculum** conic-rostrate.

## COMMENTS

**Distribution and ecology:** Brazil, Southern Appalachians, Mexico, Central America, Andes, Europe, Africa, Himalayas, China, Formosa, Japan, Southeast Asia, Hawaii (Zander 1972, 1994). In Brazil is encountered in the Atlantic Rainforest, ca. 2500 m, occurring on layers of humus on exposed rocks.

Comments: It is widespread globally, although it was reported for the first time for Brazil by Schäfer-Verwimp (1996), by only one collection from Itatiaia; and considered a rare species in the country.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Ombrophylous Forest (Tropical Rain Forest)

## Geographic Distribution

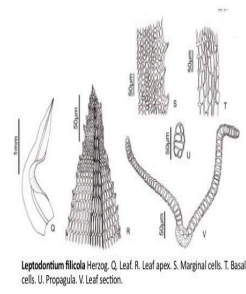
Confirmed occurrences

Southeast (Rio de Janeiro)

## HERBARIUM MATERIAL

Schäfer-Verwimp, A., 14659, SV, RB, Rio de Janeiro

## FIELD IMAGES / ILLUSTRATIONS



*Leptodontium filicola* Herzog, Q. Leaf. R. Leaf apex. S. Marginal cells. T. Basal cells. U. Propogula. V. Leaf section.

Denise Pinheiro da Costa

Figure 1: *Leptodontium flexifolium* (Dicks.) Hampe



# *Leptodontium luteum* (Taylor) Mitt.

## Has as synonym

basionym *Didymodon luteus* Tayl.

## DESCRIPTION

*Leptodontium luteum* (Taylor) Mitt., J. Linn. Soc. Bot. 12: 50. 1869. Basionym: *Didymodon luteus* Taylor, London Jour. Bot. 5: 48, 1846. Type: ECUADOR, Pichincha, near Quito, *W. Jameson s.n.* (Holotype: FH).

**Plants** medium to robust, greenish to yellowish. **Leaves** erect to spreading, lanceolate, apex obtuse, elliptical sheathing base, short-decurrent, **margins** revolute and dentate in the lower, often erose below, with 1-5 rows of short-rectangular cells; **costa** subpercurrent, ending 2-4 cells below apex, in cross section 4 guide cells, 1-2 layers of stereids; upper **laminal** cells subquadrate to short-rectangular, in cross section walls slightly to moderately thickened, **papillae** crowded, low, delicate, simple to multifid; basal laminal cells rectangular, papillose, walls thickened, porose. **Diocious**.

## COMMENTS

**Distribution and ecology:** Brazil, Central America, West Indies, Western and Northern South America, West Central and East Tropical Africa (Allen 2002). In Brazil is encountered in the Atlantic Rainforest, 1750–2130 m, occurring on soil, rotting wood, or tree branches.

**Comments:** According Zander (1972), this species is found at high elevations (1830–4000 m) in the Andes and Africa, having been collected on volcanoes and páramos. In Brazil, it also occurs at high elevations, in Serra da Mantiqueira and Serra do Mar.

## Life Form

foliose, Tuft

## Substrate

Corticicolous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Southeast (Minas Gerais, Rio de Janeiro)

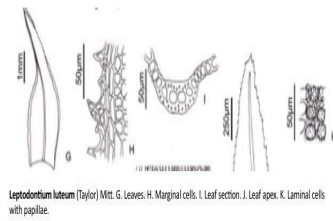
## HERBARIUM MATERIAL

Schäfer-Verwimp, A., 11188, SV, Minas Gerais

Costa, D.P. et al., 4957, RB, Rio de Janeiro

Costa, D.P. et al., 4959, RB, Rio de Janeiro

## FIELD IMAGES / ILLUSTRATIONS



Denise Pinheiro da Costa

Figure 1: *Leptodontium luteum* (Taylor) Mitt.

# *Leptodontium pungens* (Mitt.) Kindb.

## Has as synonym

basionym *Didymodon pungens* Mitt.

## DESCRIPTION

*Leptodontium pungens* (Mitt.) Kindb., Enum. Bryin, Exot. 63. 1888. Basionym: *Didymodon pungens* Mitt, J. Linn. Soc. Bot. 7: 150. 1864. Type: Cameroon, Cameroon Mountains, on rocks, 10.000 ft, December 1862, Mann s.n. (Holotype: NY).

**Plants** greenish-yellow to reddish-brown. **Leaves** erect, spreading-recurved, ovate-lanceolate to lanceolate, apex acute often papillose, sheathing base, **margins** recurved in the base, dentate in the upper; **costa** percurrent or subpercurrent (ending 1-4 cells below apex), in cross section with 4 guide cells, 2(-4) ventral and 2-3(-6) dorsal layers of stereid; upper **laminal** cells subquadrate, walls thickened, papillae crowded, multifid, 2-4 over each lumen; basal cells rectangular, scarcely papillose, walls thin or thickened, porose, alar cells forming a group of yellowish-brown, short-rectangular cells with thick and porose walls.

**Dioicous.**

## COMMENTS

**Distribution and ecology:** Mexico, Central and South America, Andes, Juan Fernandez, Southern Brazil, Africa (Zander 1972, 1994). In Brazil encountered in Steppe, Savanna (Gallery Forest), and Atlantic Rainforest, 0–1100 m, on soil or rocks.

**Comments:** The papillae in this species are thick, crowded, 2–3 branched near the base, and usually secondary branching above, forming a crest.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest, Pampa

## Vegetation Types

Grassland, Cerrado (lato sensu), Ombrophylous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Central-west (Goiás)

Southeast (Minas Gerais)

South (Rio Grande do Sul)

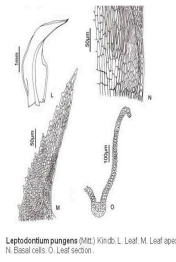
## HERBARIUM MATERIAL

A. Sehnem, 286, NY, Rio Grande do Sul

Pietrobon-Silva, M.R., 2878, SP, Goiás

Yano, O. & Morretes, B.L., 31584, SP, Minas Gerais

## FIELD IMAGES / ILLUSTRATIONS



*Leptodontium pungens* (Mitt.) Kindb. L. Leaf. M. Leaf apex.  
N. Basal cells. O. Leaf seta.

DENISE PINHEIRO DA COSTA

Figure 1: *Leptodontium pungens* (Mitt.) Kindb.

# *Leptodontium stellatifolium* (Hampe) Broth.

## Has as synonym

basionym *Anacalypta stellatifolia* Hampe

homotype *Pottia stellatifolia* (Hampe) A. Jaeger

homotype *Tortula stellatifolium* (Hampe) Müll. Hal.

## DESCRIPTION

**Leptodontium stellatifolium** (Hampe) Broth., Nat. Pflanzenfam. 1: 400, 1902. Basionym: *Anacalypta stellatifolia* Hampe, Vidensk. Meddel. Dansk. Naturhist. Foren. Kjobenhavn 34: 37, 1872. Type: Brazil, Rio de Janeiro: Glaziou 5205 (lectotype BM 872532 by Costa et al. 2015; isoelectotypes BM 872528, BM 872531, BM 872524, BM 872526, BM 872527, S-PA, NY [2], PC 0109728, PC 0709197).

Plants small, reddish to yellowish. Leaves crowded, lingulate, apex obtuse to broadly acute and mucronate, **margin** reflexed in the lower 1/2, crenulate in the distal 1/2 by papillae, costa and inner basal laminal cells orange, subpercurrent (ending 4-6 cells below the apex), in cross section with 2-4 guide cells and 1-2 dorsal and ventral stereids bands, upper laminal cells sub quadrate, thickened, papillose, papillae simple, bi- or trifid, 2-8 over the lumen. **Dioicous**.

## COMMENTS

**Distribution and ecology:** Southeastern and southern Brazil and Central America (Allen 2002). In Brazil encountered in the Atlantic Rainforest, 1000–2890 m, growing on rocks or soil.

**Comments:** The leaves lingulate, with margins minutely crenulated, and costa and inner basal laminal cells orange are characteristic.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Is endemic from Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

High Altitude Grassland, Highland Rocky Field, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Santa Catarina)

## HERBARIUM MATERIAL

Vital, D.M. & Buck, W.R., 11754E, NY, Espírito Santo

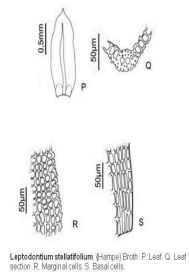
Schäfer-Verwimp, A., 11497, SV, Minas Gerais

K.T.Ribeiro, 306, RB, 354107,  (RB00696725), Rio de Janeiro

Peralta, D.F. et al., 4053, SP, São Paulo

A.F.M. Glaziou, s.n., BM, NY, Rio de Janeiro, **Typus**

FIELD IMAGES / ILLUSTRATIONS



DENISE PINHEIRO DA COSTA

Figure 1: *Leptodontium stellatifolium* (Hampe) Broth.

# *Leptodontium viticulosoides* (P. Beauv.) Wijk & Margad.

This treatment is composed of the following taxa: *Leptodontium viticulosoides*, *Leptodontium viticulosoides* var. *sulphureum*, *Leptodontium viticulosoides* var. *viticulosoides*.

## Has as synonym

heterotypic *Tortula squarrosus* (Brid.) Brid.

## DESCRIPTION

*Leptodontium viticulosoides* (P. Beauv.) Wijk & Margad., Taxon 9: 51. 1960. Basionym: *Neckera viticulosoides* P. Beauv., Prodr. 78. 1805. Type: RE#UNION, Bory-St.-Vicent s.n. (Holotype: ?).

**Plants** small to large, greenish to yellowish. **Leaves** erect to spreading, ovate to lanceolate, apex acute, sheathing base ovate, cirrhate, **margin** received below, dentate above, serrate; costa subpercurrent, in cross section dorsally papillose, 4 guide cells, 1-2 bands of stereid ventral and dorsal; laminal cells papillose, papillae hemispherical, scattered grouped over each lumen, upper cells sub quadrate, inner basal cells rectangular to long-rectangular, porose to not porose. **Monoicous** (rarely **dioicous**).

## COMMENTS

**Distribution and ecology:** Brazil, Mexico, Central America, Andes, Southern Brazil, Africa, Madagascar, Re#union, Himalayas, Formosa, Southeastern Asia (Zander 1972, 1994). In Brazil encountered in the Atlantic Rainforest, 100–2200 m, on soil, rocks, tree trunks, and rotten wood.

**Comments:** There are seven varieties described and only one cited by Zander (1972) for Brazil, *Leptodontium viticulosoides* var. *panamense* (Lor.) R.H. Zander for BA, MG, RJ, RS, SC and SP states, between 0–1850 m.

## Life Form

foliose, Tuft

## Substrate

Corticicolous, Epixilous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

High Altitude Grassland, Cerrado (lato sensu), Seasonally Deciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

Northeast (Bahia, Pernambuco)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

## IDENTIFICATION KEY

Key based in Zander (1972)

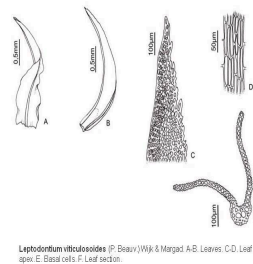
1. Autoicous. Leaves seldom cirrhate, vaginate base high and broad; spores heterogeneous, two sizes and shape (Mexico, Central America, Andes, Brazil, Madagascar, Reunion, Himalayas, Formosa, SE Asia) ..... **L. viticulosoides** var. **viticulosoides**

1. Dioicous. Leaves elongate to cirrhate, vaginate base low and narrow; spores homogeneous (S Appalachians, West Indies, Mexico, Central America, Andes, SE Brazil).. **L. viticulosoides** var. **panamensis**

### HERBARIUM MATERIAL

S.R. Visnadi & D.M. Vital, 2605a, RB, Bahia  
 K.C. Pôrto, 3165, UFP, Pernambuco  
 Wasum, R., 2546, SP, Paraná  
 D. M. Vital, 11753, SP, Espírito Santo  
 Vital, D.M. & Buck, W.R., 19873, NY, Minas Gerais  
 Buck, W.R., 26436, NY, SP, São Paulo  
 Vital, D.M. & Buck, W.R., 12408, NY, Santa Catarina  
 A. Sehnem, 5302, NY, Rio Grande do Sul  
 Costa, D.P., 1066, RB, Rio de Janeiro

### FIELD IMAGES / ILLUSTRATIONS



*Leptodontium viticulosoides* P. Beauv/Wijk & Margad. A-B. Leaves. C-D. Leaf  
 spore. E. Basal cells. F. Leaf section.

DENISE PINHEIRO DA COSTA

Figure 1: *Leptodontium viticulosoides* (P. Beauv.) Wijk & Margad.



# *Leptodontium viticulosoides* (P. Beauv.) Wijk & Margad. var. *viticulosoides*

## Has as synonym

basionym *Neckera viticulosoides* P. Beauv.

## DESCRIPTION

*Leptodontium viticulosoides* (P. Beauv.) Wijk & Margad., Taxon 9: 51. 1960. Basionym: *Neckera viticulosoides* P. Beauv., Prodr. 78. 1805. Type: RE#UNION, Bory-St.-Vicent s.n. (Holotype: ?).

**Plants** small to large, greenish to yellowish. **Leaves** erect to spreading, ovate to lanceolate, apex acute, sheathing base ovate, cirrhate, **margin** received below, dentate above, serrate; costa subpercurrent, in cross section dorsally papillose, 4 guide cells, 1-2 bands of stereid ventral and dorsal; laminal cells papillose, papillae hemispherical, scattered grouped over each lumen, upper cells sub quadrate, inner basal cells rectangular to long-rectangular, porose to not porose. **Monoicous** (rarely **dioicous**).

## COMMENTS

**Distribution and ecology:** Brazil, Mexico, Central America, Andes, Southern Brazil, Africa, Madagascar, Re#union, Himalayas, Formosa, Southeastern Asia (Zander 1972, 1994). In Brazil encountered in the Atlantic Rainforest, 100–2200 m, on soil, rocks, tree trunks, and rotten wood.

**Comments:** There are seven varieties described and only one cited by Zander (1972) for Brazil, *Leptodontium viticulosoides* var. *panamense* (Lor.) R.H. Zander for BA, MG, RJ, RS, SC and SP states, between 0–1850 m.

## Life Form

Tuft

## Substrate

Epixilous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

High Altitude Grassland, Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Northeast (Bahia)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

D. M. Vital, 19873, NY, São Paulo

A.F.M. Glaziou, 6369, NY, Rio de Janeiro

S.R. Visnadi & D.M. Vital, 2605A, RB, Bahia

L. Kollmann, 7036, SP, Espírito Santo

D.M. Vital & W.R. Buck, 19873, NY, Minas Gerais

R. Wasum, 2546, SP, São Paulo

E. Lemos-Michel, 3647, SP, Rio Grande do Sul

D.M. Vital & W.R. Buck, 12408, NY, Santa Catarina

# *Leptodontium viticulosoides* var. *sulphureum* (Müll.Hal.) R.H.Zander

## Has as synonym

homotype *Trichostomum sulphureum* Müll. Hal.

## DESCRIPTION

*Leptodontium viticulosoides* var. *panamense* (Lor.) R.H. Zander, Bryologist 75: 250. 1972. Basionym: *Leptodontium sulphureum* var. *panamense* Lorentz, Moosstudien 161. 1864. Type: Panama, Chiriqui, 1858, Wagner s.n. (Isotypes: FM, M, NY)

Plants robust. Leaves often cirrhate, ovate-lanceolate, long, decurrent, heating base short and narrow, to 12 mm, basal laminal cells papillose. **Dioicous**. **Spores** homogenous.

## COMMENTS

**Distribution and ecology:** S Appalachians, West Indies, Mexico, Central America, Andes, SE/S Brazil (Zander 1972, Costa 2016). In Brazil encountered in Savanna and Atlantic Forest, between 800-2750 m, on tree trunks or soils.

**Comments:** According to Zander (1972) the var. *panamense* and var. *viticulosoides* are very similar and difficult to distinguish when sterile.

## Life Form

foliose, Tuft

## Substrate

Corticicolous, Epixilous, Terrestrial

## DISTRIBUTION

Native, Is endemic from Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Cerrado (lato sensu), Seasonally Deciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

Northeast (Bahia)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

A. Sehnem, 5334, FH, Rio Grande do Sul

Koehne, 645, JE, São Paulo

A.R. Reitz, 16016, US, Santa Catarina

Frahm, J.-P., 1614, MO, Rio de Janeiro

R.M. Harley, 26274, MO, Bahia

# *Leptodontium wallisii* (Müll.Hal.) Kindb.

## Has as synonym

basionym *Trichostomum wallisii* Müll. Hal.

## DESCRIPTION

*Leptodontium wallisii* (Müll. Hal.) Kindb., Enum. Bryin. Exot. 63. 1888. Basionym: *Trichostomum wallisii* Müll. Hal., Linnaea 38: 603. 1874. Type: Colombia, Nova Granata: prov. Antioquia, Paramo de Ruiz, 13,000 ped. altum in locis paludosis sphagnosis, 1872, G. Wallis s.n. (Isotypes: BM, JE, NY, PC, S-PA).

**Plants** median, greenish to yellowish-brown. **Leaves** erect to spreading, lanceolate to long-lanceolate, apex acute and sometimes papillose, high-sheathing base, **margins** revolute and incurved in lower part and dentate in upper, **marginal** cells in 1-3 rows, elongated; **costa** percurrent or ending 1-3 cells below apex, in cross section with 4 guide cells, 2-3 ventral and dorsal layers of stereids; upper **laminal cells** subquadrate, walls thickened; **papillae** crowded, simple to multifid. **Dioicous**.

## COMMENTS

**Distribution and ecology:** Central America, Andes, Southern Brazil, West-Central and East Tropical Africa (Zander 1972, Allen 2002). In Brazil encountered in the Atlantic Rainforest, 0–1750 m, on soil or rocks. In Brazil, this species is known from high elevations (1750–2500 m) and recently encountered at sea level in São Paulo State, being considered a rare species in the country.

**Comments:** According to Zander (1972), this species is closely related to *L. pungens*, differing by the enlarged lower submarginal cells and in the more highly sheathing leaf base.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution


### Confirmed occurrences

Southeast (Rio de Janeiro, São Paulo)

## HERBARIUM MATERIAL

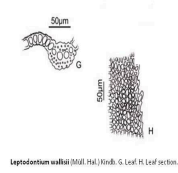
Costa, D.P. et al., 4972, RB, Rio de Janeiro

Costa, D.P. et al., 5031, RB, São Paulo

Costa, D.P. et al., 5031, RB, 488360,  (RB00577193), São Paulo

S. Churchill et al, 22786, RB, 405832,  (RB00682840)

## FIELD IMAGES / ILLUSTRATIONS



DENISE PINHEIRO DA COSTA

Figure 1: *Leptodontium wallisii* (Müll.Hal.) Kindb.

# *Luisierella* Thér. & P. de la Varde

This treatment is composed of the following taxa: *Luisierella*, *Luisierella barbula*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96814>.

## DESCRIPTION

### *Luisierella* Thér. & P. Varde

**Plants** small, gregarious, green or blackish-green. **Stems** short, erect, to 2 mm high, rarely branched; in cross section cells uniform, hyalodermis and central strand absent. **Leaves** spreading-recurved, long-ligulate, 1–2 mm, apex obtuse-rounded to broadly acute; margins plane to incurved, crenulate; costa subpercurrent, ventral superficial cells similar to laminal cells, 4–6 cells across at midleaf, dorsal superficial cells elongate, in cross section stereids below guide cells, ventral epidermis present and dorsal absent, 2–4 guide cells in 1 layer; laminal cells rounded, bulging on upper surface, flat on lower surface; basal cells forming a V-shape, inflated, oblong-rectangular, hyaline, thin-walled. **Synicous**. **Perichaetia** terminal. **Seta** long, to 5 mm, twisted. **Capsule** erect, urn cylindrical, straight or curved. **Operculum** long-conical. **Peristome** absent, rudimentar or teeth divided to near base, papillose to spiculose. **Calyptra** cucullate, smooth, naked. **Spores** spherical, smooth.

## COMMENTS

**Comments:** This genus was described by Potier de La Varde (1936) based on one collection from Bahia State, Itaparica, 1913, *P.G. Silva Tavares s.n.* (PC as *Luisierella pusilla*). In Brazil it occurs on calcareous rock, often in open sites.

### Life Form

foliose, Tuft

### Substrate

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest, Pantanal

### Vegetation Types

Cerrado (lato sensu), Riverine Forest and/or Gallery Forest

### Geographic Distribution

#### Confirmed occurrences

Central-west (Goiás, Mato Grosso do Sul)

# *Luisierella barbula* (Schwägr.) Steere

## Has as synonym

basionym *Gymnostomum barbula* Schwaegr.

## DESCRIPTION

*Luisierella barbula* (Schwa#gr.) Steere, Bryologist 48: 84, 1945. Basionym: *Gymnostomum barbula* Schwa#gr., Sp. Musc. Frond. Suppl. 2, 2: 77, 1826. Type: Cuba, ad rupes calcareas Cubenses, *D. Poeppig s.n.* (Holotype: NY, Isotype: BM, MO, JE).

**Plants** very small, scattered, dark green. **Stems** very short, 1.5-2 mm long, central strand absent. **Leaves** ligulate-lanceolate or oblong-elliptic, tubulose, margins plane to erect-incurved, entire, rounded-crenulate, apex rounded or rounded-obtuse, occasionally cucullate; **costa** subpercurrent, rounded-quadrate to short-rectangular; in cross section elliptic to circular, adaxial epidermis differentiated, guide cells 2-4(-5) in one row, adaxial stereid band absent and abaxial present; basal laminal cells inflated, smooth, forming a V-shaped, oblong-rectangular, thick-walled, thin and lax at margins. **Synicous**. Perichaetia terminal. **Seta** up to 1 cm. **Capsule** stegocarpous, cylindrical; annulus large in two rows persistent. **Operculum** narrowly high-conic. **Calyptra** cucullate.

## COMMENTS

**Distribution and ecology:** Brazil, South-Central and Southeastern U.S.A., Mexico, Central America, West Indies, Eastern Asia, and Malesia (Zander 1994, Allen 2002). In Brazil encountered in Savanna and Pantanal, 0–1100 m, on moist rocks.

**Comments:** In Brazil can be confused with *Hyophila involuta* and *Plaubelia sprengelii*, because all the three species have leaves spatulate, with apex rounded to obtuse. Yano (1981) cited two old collections from the states of Bahia (Luisier 1941, as *L. pusilla*) and Ceara# (Hooker & Wilson 1844), although Costa (2016) was not been able to confirm their occurrence in these states.

## Life Form

foliose, Tuft

## Substrate

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest, Pantanal

## Vegetation Types

Cerrado (lato sensu), Riverine Forest and/or Gallery Forest

## Geographic Distribution

### Confirmed occurrences

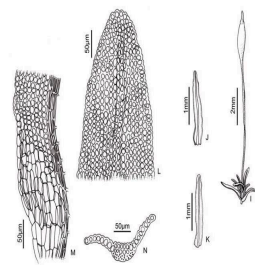
Central-west (Goiás, Mato Grosso do Sul)

## HERBARIUM MATERIAL

D. M. Vital, 12762, SP, Goiás

D. M. Vital, 2307, SP, Mato Grosso do Sul

## FIELD IMAGES / ILLUSTRATIONS



*Luisierella barbula* (Schwägr.) Steere. I. Habit. J-K. Leaves. L. Leaf apex. M. Basal cells. N. Leaf section.

DENISE PINHEIRO DA COSTA

Figure 1: *Luisierella barbula* (Schwägr.) Steere



# *Microbryum* Schimp.

This treatment is composed of the following taxa: *Microbryum*, *Microbryum davallianum*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96816>.

## DESCRIPTION

**Microbryum** Schimp.

**Plants** small, in a low turf, scattered or gregarious, reddish brown. **Stem** short. **Leaves** spreading, lanceolate, elliptical or ovate, weakly concave to channeled, short; margins recurved at midleaf and recurved to near apex, entire or rarely serrulate near apex; apex broadly acute; costa excurrent as an apiculus, mucro or short awn, occasionally percurrent, outgrowths occasionally present; in cross section rounded to semicircular, adaxial and abaxial epidermis present, adaxial stereid band absent, abaxial stereid band present, 2(-4) guide cells in 1 layer, hydroid present; proximal cells rectangular, thin-walled; distal cells quadrate to hexagonal or short-rectangular, occasionally rhomboidal, small to enlarged, unistratose; papillae simple, hollow, 1-6 per lumen, thin-walled to thick-walled, convex on both sides. **Monoicous**. **Perichaetia** terminal. **Seta** short to long, erect. **Capsule** stegocarpous or cleistocarpous, ovate to short elliptical, operculum conic. **Peristome** when present with 16 teeth, irregular, rudimentar, ligulate to triangular. **Calyptra** conical-cucullate, occasionally mitrate. **Spores** large, papillose.

## COMMENTS

**Comments:** Only one species in Brazil, *Microbryum davallianum* (Sm.) R.H. Zander, occurring on soil in montane forest.

### Life Form

foliose, Tuft

### Substrate

Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest

### Vegetation Types

Ombrophylous Forest (Tropical Rain Forest)

### Geographic Distribution

Confirmed occurrences

Southeast (Minas Gerais)

# *Microbryum davallianum* (Sm.)

## R.H.Zander

### DESCRIPTION

*Microbryum davallianum* (Sm.) R.H. Zander, Bull. Buffalo Soc. Nat. Sci. 32: 237. 1993. Basionym: *Gymnostomum davallianum* Sm., Ann. Bot. 1: 577. 1805. Type: Switzerland, *Davall s.n.* (holotype LINN).

*Pottia humillima* (Ångstr.) Par., Index Bryol. 1023. 1898. Basionym: *Anacalypta humillima* Ångstr., Öfvers. Förh. Kongl. Svenska Vetensk.-Akad. 33: 10. 1876. *Ind. loc.*: [Brazil] 'Widgren retulit'. Type: BRASILIA, Minas Gerais, Caldas, *Widgren s.n.* (lectotype S B10082, selected by Cano & Gallego 2008), *syn. fide* Cano & Gallego (2008)

Plants small. Leaves apiculate, margins recurved; laminal cells weakly convex, papillose; costa in cross section with a single band of dorsal stereid; seta elongate; capsule cylindrical, stegnocarpous.

### COMMENTS

**Distribution and ecology:** Worldwide. Cano & Gallego (2008) cited this taxon for the first time for South America (Brazil and Chile). In Brazil encountered in the Atlantic Rainforest, occurring on soil, ca. 1000 m.

**Comments:** It is similar to *Syntrichia* by having broad leaves and a single stereid band, differing by having short stems, a rounded to semicircular costal stereid band (reniform in *Syntrichia*), peristome (when present) with 16 irregular, often rudimentary, truncate teeth, and operculum conical.

### Life Form

foliose, Tuft

### Substrate

Terrestrial

### DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest

### Vegetation Types

Ombrophyllous Forest (Tropical Rain Forest)

### Geographic Distribution

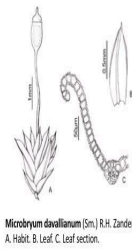
Confirmed occurrences

Southeast (Minas Gerais)

### HERBARIUM MATERIAL

Widgren, J.F., s.n., S, B10082, Minas Gerais, **Typus**

### FIELD IMAGES / ILLUSTRATIONS



Denise Pinheiro da Costa

Figure 1: *Microbryum davallianum* (Sm.) R.H.Zander

# Molendoa Lindb.

This treatment is composed of the following taxa: *Molendoa*, *Molendoa sendtneriana*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96818>.

## DESCRIPTION

**Molendoa** Lindb.

**Plants** small, in dense turfs, light to dark green. **Stems** erect, simple to branched, tomentose. **Leaves** oblong or linear-lanceolate to ligulate, flat to grooved, apex acute-rounded, occasionally cucullate; margins plane, occasionally recurved below, entire to crenulate; costa subpercurrent to percurrent, in cross section rounded to semicircular or reniform, ventral stereid bands absent or few, dorsal stereid bands well developed, 2–4 guide cells in one layer; lamina bistratose; upper cells subquadrate to oval, pluripapillose, papillae 3–4 over lumen, simple or multiple; basal cells rectangular, smooth to weakly papillose. **Dioicous**. **Perichaetia** terminal, on short lateral branches. **Seta** short to long, twisted. **Capsule** erect, urn ovoid to cylindrical. **Operculum** long-rostrate, oblique. **Peristome** absent. **Calyptra** cucullate, smooth. **Spores** smooth to papillose.

## COMMENTS

**Comments:** One species occurs in Brazil, *Molendoa sendtneriana* (Bruch & Schimp.) Limpr. , growing on rocks in lower and montane forests. The genus is similar to *Anoetangium* by the lateral perichaetia and absence of peristome, differing by the presence of a ventral stereid band, glaucous upper leaves in some species, and upper margins bistratose.

## Life Form

foliose, Tuft

## Substrate

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest, Pantanal

## Vegetation Types

Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

Central-west (Distrito Federal, Goiás, Mato Grosso do Sul)

Southeast (Minas Gerais, São Paulo)

South (Santa Catarina)

# *Molendoa sendtneriana* (Bruch & Schimp.) Limpr.

## Has as synonym

basionym *Anoetangium sendtnerianum* Bruch & Schimp.

## DESCRIPTION

*Molendoa sendtneriana* (Bruch & Schimp.) Limpr., Laubm. Deutschl. 1: 250. 1886. Basionym: *Anoetangium sendtnerianum* Bruch et Schimp., Bryol. Eur. 1: 91, 1846. Type: Austria, in alpebus Salisburgensisbus, Funck s.n. (Lectotype by Cano & Jimenez 2013, BM 670335).

**Plants** small to median, to 3 cm long. **Leaves** lingulate, apex acute-rounded, margins plane (occasionally recurved), **costa** subpercurrent to percurrent; costal epidermis present on both surfaces, abaxial and adaxial; costa in cross section with two stereid bands. Capsule short-cylindrical, erect. Operculum rostrate.

## COMMENTS

**Distribution and ecology:** Europe, Asia, Tropical Africa, North America, Central America, South America, and West Indies (Cano et Jimenez 2013). In Brazil encountered in Savanna and the Atlantic Rainforest, 260–1100 m, on shaded lime turf or on the vertical faces of shaded humid rocks (near cave entrances).

**Comments:** According to Zander (1977b), *Didymodon rigidulus* may be confused with *M. sendtneriana* by their bistratose upper leaf margins, but they are distinct by its leaves lanceolate, apex not apically broadly, obtuse or rounded, not crowded or glaucous. The upper laminal cells in *D. rigidulus* are bulging, pellucid, with simple papillae; the bistratose marginal cells are the same size as the median unistratose cells. The dorsal epidermal cells are often quadrate, and spherical propagula are often present, borne on stout, brown, stalks branching from the stem.

## Life Form

foliose, Tuft

## Substrate

Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest, Pantanal

## Vegetation Types

Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Ombrophylous Forest (Tropical Rain Forest), Mixed Ombrophylous Forest

## Geographic Distribution

### Confirmed occurrences

Central-west (Distrito Federal, Goiás, Mato Grosso do Sul)

Southeast (Minas Gerais, São Paulo)

South (Santa Catarina)

## HERBARIUM MATERIAL

Schäfer-Verwimp, A., 13509, RB, Santa Catarina

Schäfer-Verwimp, A., 9970, SP, Minas Gerais

D. M. Vital, 8524, SP, Goiás

Schäfer-Verwimp, s.n., RB, 534714,  (RB00684038), Santa Catarina

FIELD IMAGES / ILLUSTRATIONS

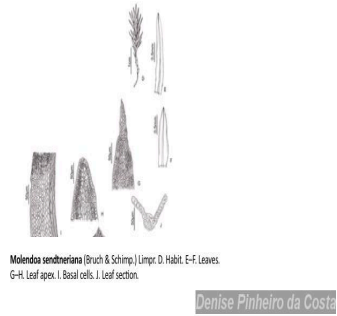


Figure 1: *Molendoa sendtneriana* (Bruch & Schimp.) Limpr.

# *Plaubelia* Brid.

This treatment is composed of the following taxa: *Plaubelia*, *Plaubelia sprengelii*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96820>.

## Is a synonym of

basionym *Neohyophila* H.A. Crum

## DESCRIPTION

### *Plaubelia* Brid.

**Plants** small, in short turfs, green. **Stems** short, few branched. **Leaves** wide-spreading, rosulate, oblong-elliptical, concave, apex obtuse-rounded to broadly acute; margins plane to erect, entire to denticulate at apex; costa strong, subpercurrent to percurrent, in cross section rounded, stereids bands above and below guide cells, or upper stereids absent or weak, 2–4 guide cells in one layer; ventral epidermis well developed, lamina unistratose; laminal cells quadrate to hexagonal-rounded, bulging to papillose on ventral surface, papillae 1–2, dorsal surface flat; basal cells short oblong-rectangular, inflated. **Dioicous**. **Perichaetia** terminal. **Seta** short to long, erect. **Capsule** erect, ellipsoidal. **Operculum** rostrate. **Peristome** single, teeth divided to near base, spiculose. **Calyptra** cucullate, smooth. **Spores** spherical, papillose.

## COMMENTS

**Comments:** A single species occurring in Brazil, *Plaubelia sprengelii* (Schwägr.) R.H. Zander, growing on rocks, in exposed sites.

### Life Form

foliose, Tuft

### Substrate

Epixilous, Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest

### Vegetation Types

Anthropic area, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Terra Firme Forest, Seasonally Deciduous Forest, Ombrophyllous Forest (Tropical Rain Forest)

### Ocean Islands

#### Confirmed occurrences

Fernando de Noronha

### Geographic Distribution

#### Confirmed occurrences

North (Acre, Amazonas, Roraima)

Northeast (Bahia, Maranhão, Pernambuco)

Central-west (Goiás, Mato Grosso)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

# *Plaubelia sprengelii* (Schwägr.)

## R.H.Zander

### Has as synonym

basionym *Barbula sprengelii* Schwaegr.

homotype *Neohyophila sprengelii* (Schwägr.) H.A. Crum var. *sprengelii*

homotype *Neohyophila sprengelii* (Schwägr.) H.A. Crum

### DESCRIPTION

***Plaubelia sprengelii*** (Schwa#gr.) R.H. Zander, Bull. Buffalo Soc. Nat. Sci. 32: 176.1993. Basionym: *Barbula sprengelii* Schwa#gr., Sp. Musc. Frond., Suppl. 2, 1: 64. 1823. Type: HISPANIOLA [In Hispaniola lectam misit cl. Sprengel—ex descr.] (Holotype: Herb. Hedwig-Schwa#grichen G).

Plants rosulate. Stem short, 1-4 mm. Leaves spatulate, oblong-elliptical, apex broadly acute to rounded-obtuse; costa subpercurrent to percurrent, margins entire, plane; cells oblong-rectangular, laminal cells mammies, smooth on both surfaces. Dioicous. Capsule erect, ellipsoidal or oblong, red-brown; annulus persistent on the capsule mouth. Operculum rostrate.

### COMMENTS

**Distribution and ecology:** Southwestern U.S.A., Mexico, Central America, West Indies, and Brazil (Allen 2002). In Brazil encountered in the Amazon Forest, Savanna, and Atlantic Rainforest, 0–900 m, on shady rocks, soil, rotten woods, or rock walls in urban areas.

**Comments:** In Brazil can be confused with *Hyophila involuta*, differing by the presence of enlarged and bulging epidermal cells on the ventral costal surface.

### Life Form

foliose, Tuft

### Substrate

Epixilous, Rupicolous

### DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest

### Vegetation Types

Anthropic area, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Terra Firme Forest, Seasonally Deciduous Forest, Ombrophyllous Forest (Tropical Rain Forest)

### Ocean Islands

Confirmed occurrences

Fernando de Noronha

### Geographic Distribution

Confirmed occurrences

North (Acre, Amazonas, Roraima)

Northeast (Bahia, Maranhão, Pernambuco)

Central-west (Goiás, Mato Grosso)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

### HERBARIUM MATERIAL



Oliveira-e-Silva, M.I.M.N., 1984, HRJ, Rio de Janeiro  
BUCK, W.R., 2619a, NY, Amazonas  
Boom, B.M. et al., 1214, NY, Bahia  
Vital, D.M., 6144, SP, Goiás  
Correa, M.M., s.n., SP, Maranhão  
Vital, D.M. & Buck, W.R., 11832, NY, Minas Gerais  
Yano, O. et al., 13609, RB, Pernambuco  
Buck, W.R. et al., 2034, NY, Roraima  
Costa, D.P. et al., 5095, RB, São Paulo  
Schwacke, s.n., RB, 534721,  (RB00684106), Amazonas  
Costa, D.P. et al., 5095, RB, 488425,  (RB00577263), São Paulo  
H.S. Irwin, 29738, NY, Distrito Federal

### FIELD IMAGES / ILLUSTRATIONS



Denise Pinheiro da Costa

Figure 1: *Plaubelia sprengelii* (Schwägr.) R.H.Zander

# *Pleurochaete* Lindb.

This treatment is composed of the following taxa: *Pleurochaete*, *Pleurochaete luteola*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96822>.

## DESCRIPTION

### **Pleurochaete** Lindb.

**Plants** robust, in dense turfs or cushions, light to dark green or yellowish-green. **Stems** erect to suberect, branched. **Leaves** wide-spreading to squarrose-recurved above a sheathing base, long and gradually lanceolate from a broadly ovate base, channeled above shoulders, apex acute, base concave, and  $\pm$  plicate; margins plane to erect, wavy below, expanded base serrulate, serrulate-crenulate; costa short excurrent, superficial cells quadrate to short rectangular, papillose, in cross section semicircular or reniform, stereids bands well developed above and below the guide cells, 4–6 guide cells in one layer; laminal cells short rectangular to quadrate, pluripapillose; basal cells oblong-rectangular, smooth; marginal cells forming a border,  $2/3$ – $3/4$  lamina length, at widest point of 8–10 rows, hyaline, smooth, rectangular or oblong. **Dioicous**. **Perichaetia** terminal. **Seta** long. **Capsule** erect, urn ovoid-cylindrical. **Operculum** long-conical. **Peristome** teeth divided into 32 filaments, weakly twisted, densely papillose. **Calyptra** cucullate, smooth. **Spores** spherical, papillose.

## COMMENTS

**Comments:** A genus with four species widely distributed globally, with only one species occurring in Brazil, on rocks, in exposed sites.

### **Life Form**

foliose, Tuft

### **Substrate**

Corticicolous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### **Phytogeographic Domains**

Central Brazilian Savanna, Atlantic Rainforest, Pampa

### **Vegetation Types**

Grassland, Cerrado (lato sensu), Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

### **Geographic Distribution**

#### Confirmed occurrences

Northeast (Rio Grande do Norte)

Central-west (Goiás)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul)

# *Pleurochaete luteola* (Besch.) Thér.

## Has as synonym

basionym *Trichostomum luteolum* Besch.

## DESCRIPTION

**Pleurochaete luteola** (Besch.) Thér., Smithsonian Misc. Collect. 78 (2): 14. 1926. Basionym: *Trichostomum luteolum* Besch., Me#m. Soc. Sci. Nat. Cherbourg 16: 178. 1872. Type: Mexico, Orizaba, Fr. Mu#ller s.n. (not located). Plants robust. Leaves bordered by enlarged, bulging, hyaline cells, denticulate above, margins plane, marginal cells forming a border 2/3–3/4 lamina length; upper laminal cells very different of the basal cells; **costa** in cross section with one row guide cells, adaxial epidermis present, two stereid bands.

## COMMENTS

**Distribution and ecology:** North-Central, South-Central, and Southeastern U.S.A.; Mexico, West Indies, Central America, and Western South America (Allen 2002). In Brazil encountered in the Atlantic Rainforest, Savanna, and Steppe, 0–2000 m, on rocks, soil, or tree trunks in exposed sites.

**Comments:** A genus with four species widely distributed globally.

## Life Form

foliose, Tuft

## Substrate

Corticicolous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest, Pampa

## Vegetation Types

Grassland, Cerrado (lato sensu), Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

Northeast (Rio Grande do Norte)


Central-west (Goiás)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul)

## HERBARIUM MATERIAL

D. M. Vital, 15095, SP, São Paulo

E.S. Arnou, 77, RB,  (RB01401416), Rio de Janeiro

Wasum, R., 2710, SP, Rio Grande do Sul

D. M. Vital, 8502, SP, Goiás

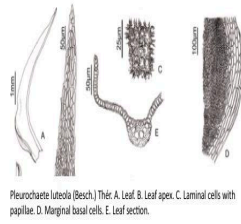
Yano, O., 8502, SP, Minas Gerais

Wasum, R., 2426, SP, Paraná

D. Sucre, 1027, RB, Rio de Janeiro

F. Marchett, 322, RB, 546256,  (RB00708404), Rio Grande do Sul

## FIELD IMAGES / ILLUSTRATIONS



*Pleurochaete luteola* (Besch.) Thér. A. Leaf. B. Leaf apex. C. Laminal cells with papillae. D. Marginal basal cells. E. Leaf section.

Denise Pinheiro da Costa

Figure 1: *Pleurochaete luteola* (Besch.) Thér.

# *Pseudocrossidium* R.S. Williams

This treatment is composed of the following taxa: *Pseudocrossidium*, *Pseudocrossidium exiguum*, *Pseudocrossidium replicatum*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96824>.

## DESCRIPTION

### *Pseudocrossidium* R.S. Williams

**Plants** small to median, in loose to dense turfs or cushion, dark green to blackish or brownish-green. **Stems** erect, few branched. **Leaves** erect-spreading, oblong-ligulate, ovate or ligulate to lanceolate, apex obtuse to acute; margins entire, recurved or strongly revolute; costa strong, subpercurrent or short excurrent and mucronate or with a short smooth awn, in cross section reniform to circular, stereid band strong below, weak or absent above the guide cells, 2–4 guide cells in one layer, epidermal cells large; laminal cells subquadrate to hexagonal, papillose, papillae crowded, bifid to multiple; basal cells rectangular, thin to rather thick-walled. **Dioicous**. **Perichaetia** terminal. **Seta** long, 10–15 mm, twisted. **Capsule** erect, urn cylindrical to elliptical. **Operculum** short to long-conical or short-rostrate. **Peristome** single, teeth divided into 32 filaments to base, twisted or erect, spiculose. **Calyptra** cucullate, smooth. **Spores** spherical, smooth to papillose.

## COMMENTS

**Comments:** Two species occur in Brazil, on soil or rocks, in dry vegetation areas or in exposed sites.

### Life Form

Cushion, foliose, Tuft

### Substrate

Corticicolous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest

### Vegetation Types

Anthropic area, Grassland, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

### Geographic Distribution

#### Confirmed occurrences

Central-west (Goiás)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul)

## IDENTIFICATION KEY

1. Leaves elliptic to obovate-lanceolate; apex broadly acute to obtuse-rounded, mucronate; marginal cells differentiated; costa with one guide cells layer; long and spirally twisted peristome teeth..... *P. replicatum*

1. Leaves lingulate to oblong-obovate; apex rounded to obtuse, occasionally apiculate or emarginate; marginal cells differentiated or not; costa with 2–3 guide cells; short and straight peristome teeth..... *P. exiguum*

# *Pseudocrossidium exiguum* M.J. Cano & J.A. Jiménez

## DESCRIPTION

***Pseudocrossidium exiguum*** M.J. Cano & J.A. Jiménez, J. Bryol. 37: 56–61. 2015. Type: Peru, Cajamarca: pr. Huayllapampa, 71°12'08"S, 78°33'44"W, 3310 m, 15 June 2009, M.J. Cano, J. Guerra & J.A. Jiménez 5044 (Holotype: MUB, Isotype: USM) Illustrations: Cano & Jiménez (2015)

**Plants** very small, yellowish green. **Stems** not branched. **Leaves** erect-patent to patent, lingulate to ovate, channeled near apex; **lamina** unistratose; apex rounded to obtuse, occasionally apiculate; **margins** revolute, papillose-crenulate; **costa** percurrent or subpercurrent, papillose, in cross section semicircular, 2–3 guide cells in one layer, 2 rows of dorsal stereids, cells quadrate to rectangular or oblate, upper and median laminal cells hexagonal to rectangular or oblate, thin-walled, with 3–4 simple **papillae** or C-shaped on both surfaces; upper and median laminal **cells** not or scarcely differentiated, slightly thick-walled; basal laminal cells rectangular to quadrate, not inflated, slightly thick-walled, smooth. Dioicous. Seta yellowish to orange, twisted. **Capsules** ellipsoidal, brown. **Operculum** conical. **Calyptrae** cucullate.

## COMMENTS

Distribution and ecology: South America (Cano & Jiménez (2015)). In Brazil is known only by one collection from Paraná state, Castro, sampled by Alfons Schäfer-Verwimp 15136 (SV) in a disturbed habitat, on a walkway, ca. 1000 m.

**Comments:** *Pseudocrossidium exiguum* differs from *P. replicatum* by having lingulate to oblong-obovate leaves, with marginal cells differentiated or not, costa with two guide cells, and basal laminal cells rectangular to quadrate.

## Life Form

foliose, Tuft

## Substrate

Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Anthropic area

## Geographic Distribution

Confirmed occurrences

South (Paraná)

## HERBARIUM MATERIAL

A. Schäfer-Verwimp & Verwimp, 15140, RB, Paraná

## REFERENCE

M.J. Cano & J.A. Jiménez, J. Bryol. 37: 56–61, 2015

# *Pseudocrossidium replicatum* (Taylor)

## R.H.Zander

### Has as synonym

basionym *Barbula replicata* Tayl.

### DESCRIPTION

***Pseudocrossidium replicatum*** (Taylor) R.H. Zander, Phytologia 44: 206. 1979. Basionym: *Barbula replicata* Taylor, London J. Bot. 5: 49. 1846. Type: Ecuador, Pichincha: near Quito, on walls, W. Jameson 103, 1843 (Holotype: E 00011847; Isotypes; BM, NY).

**Leaves** elliptic to obovate-lanceolate; **apex** acute to obtuse-rounded, mucronate; **margin** incurved distally, plane below, or strongly revolute, entire, marginal cells differentiated, strongly spiralled, thin-walled, papillose cells; upper laminal cells papillose, smoother towards the margins; costa subpercurrent or short-excurrent, in cross section with one guide cells, and one stereid band. **Dioicous**. **Capsule** elliptical to cylindrical. **Operculum** short- to long-conical or conical-rostrate. **Calyptra** cucullate, smooth..

### COMMENTS

**Distribution and ecology:** Southwestern and South-Central U.S.A., Mexico, Central America, Western, Northern, and South America (Allen 2002). In Brazil encountered in the Atlantic Rainforest, 500–1250 m, on rock walls, calcareous rocks, in open areas along road banks, and urban areas.

**Comments:** The diagnostic characteristics are the strongly spiralled leaf margins, with thin-walled, papillose cells, the upper laminal papillose cells becoming smoother towards the margins, and costa in cross section presenting only one stereid band (Zander 1979).

### Life Form

Cushion, Tuft

### Substrate

Corticolous, Rupicolous, Terrestrial

### DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest

### Vegetation Types

Grassland, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

### Geographic Distribution

#### Confirmed occurrences

Central-west (Goiás)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul)

### HERBARIUM MATERIAL

D. M. Vital, 8502, Goiás

Schäfer-Verwimp, A., 14928, SV, Minas Gerais

Wasum, R., 2710, Rio Grande do Sul

Schäfer-Verwimp, A. & Verwimp, I, 15135, RB, Paraná  
Felipe Juliani, 15, RB,  (RB00907871), Rio de Janeiro

### FIELD IMAGES / ILLUSTRATIONS

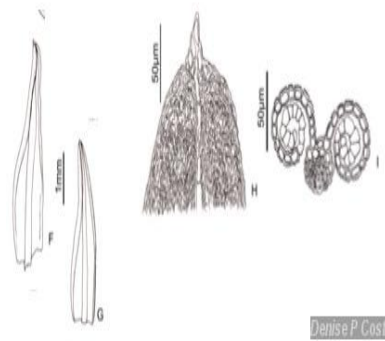


Figure 1: *Pseudocrossidium replicatum* (Taylor) R.H.Zander



# *Pseudosymblepharis* Broth.

This treatment is composed of the following taxa: *Pseudosymblepharis*, *Pseudosymblepharis schimperiana*, *Pseudosymblepharis schlimii*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96826>.

## DESCRIPTION

### PSEUDOSYMBLEPHARIS BROTH.

**Plants** median, in dense turfs. **Stems** branched or not. **Leaves** spreading to squarrose, linear to lanceolate, narrow to broad oblong sheathing base, sheathing base concave, yellowish-hyaline, apex acuminate; margins plane to inflexed, crenulate; costa strong, short excurrent as a smooth, as a sharp point, in cross section semicircular to ovate, stereids bands above and below the guide cells, ventral epidermis present, dorsal absent or present, 6–9 guide cells in one layer; upper laminal cells quadrate-rounded, thick-walled, pluripapillose, papillae bulging over cell lumen; cells at sheath elongate, thick-walled and weakly porose; cells at lamina sheath long-rectangular, smooth, thin-walled below; cells at shoulder usually extending along margin. **Dioicous**. **Perichaetia** terminal. **Seta** long, slender, twisted. **Capsule** erect, cylindrical. **Operculum** conical-rostrate, oblique. **Peristome** single, teeth erect, divided into 2–3 fused segments, papillose. **Calyptra** cucullate, smooth. **Spores** spherical, slightly papillose.

## COMMENTS

**Comments:** Only two species known to Brazil, occurring on soils, rocks, or tree trunks, in exposed sites, in lowland forests to upper montane forests.

### Life Form

foliose, Tuft

### Substrate

Corticicolous, Epixilous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest, Pantanal

### Vegetation Types

Anthropic area, Grassland, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest, Coastal Forest (Restinga)

### Geographic Distribution

#### Confirmed occurrences

North (Rondônia, Tocantins)

Northeast (Alagoas, Pernambuco)

Central-west (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

## IDENTIFICATION KEY

1. Leaf linear-lanceolate from a broadly ovate, clasping, sheathing base, apex acuminate, sharply mucronate, costa short-excurrent..... *P. schimperiana*
1. Leaf linear to linear-lanceolate, concave, at base not clasping, apex acute, costa excurrent..... *P. schlimii*

# *Pseudosymblepharis schimperiana* (Paris)

## H.A.Crum

### Has as synonym

basionym *Syrrhopodon schimperiana* Par.

basionym *Syrrhopodon schimperianus* Paris

heterotypic *Pseudosymblepharis cavernarum* (Broth.) R.H.Zander

heterotypic *Syrrhopodon circinatus* (Brid.) Mitt.

### DESCRIPTION

***Pseudosymblepharis schimperiana*** (Paris) H.A. Crum, Bryologist 55: 139. 1952. Basionym: *Syrrhopodon schimperianus* Paris, Index Bryol. 1254. 1898. *Symblepharis schimperiana* (Paris) Card., Rev. Bryol. 38: 99. 1911. *Pseudosymblepharis circinata* (Schimp. ex Besch.) Broth. in E. & P., Nat. Pflanzenf. 10: 261. 1924. Type: Mexico, Veracruz, Orizaba, Cordova, 1853, Fr. Müller s.n. (Holotype BM).

Plants robust, green, brown or red-brown. **Leaves** linear-lanceolate from a broadly ovate, clasping, sheathing base, **apex** acuminate, sharply mucronate, **margins** plane and entire, **costa** short-excurrent as a mucro, in cross section with two stereid bands, guide cells in one layer, epidermal cells quadrate to sub quadrate, upper laminal cells subquadrate, thickened, convex, with 3-5 papillae bifid fused, basal laminal cells differentiated (heating base), rectangular to rhomboidal, thin walls. Dioicous. **Perichaetial** terminal. **Seta** brown or red, twisted. **Capsules** erect, operculum rostrate.

### COMMENTS

**Distribution and ecology:** Mexico, Central America, West Indies, Western and Northern South America (Allen 2002). In Brazil is encountered in the Atlantic Rainforest, Savanna, Steppe, and Restinga, 0–2500 m, occurring on soils, rocks, tree trunks, and rotten wood, also in urban areas.

**Comments:** In Brazil, *P. schimperiana* is similar to *Trichostomum tenuirostre* (Hook. & Tayl.) Lindb. because of their narrow leaf bases, but the basal laminal cells near the costa are not porous in *Trichostomum*. *Pseudosymblepharis schimperiana* differs from *P. schlimii* (Müll. Hal.) M. Alonso et al. by the leaf apex acuminate and leaf base enlarged and clasping.

### Life Form

foliose, Tuft

### Substrate

Corticicolous, Epixilous, Terrestrial

### DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest, Pantanal

### Vegetation Types

Anthropic area, Grassland, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Seasonally Semideciduous Forest, Ombrophylous Forest (Tropical Rain Forest), Mixed Ombrophylous Forest, Coastal Forest (Restinga)

### Geographic Distribution

#### Confirmed occurrences

North (Tocantins)

Northeast (Alagoas, Pernambuco)

Central-west (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso)

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

### HERBARIUM MATERIAL

Bordin, J., 313, SP, Rio Grande do Sul  
D. M. Vital, 2885, SP, Pernambuco  
Y. Mexia, 5141a, BM, NY, Minas Gerais  
Andrade Lima, D., 81-6696, SP, Alagoas  
Costa, D.P. et al., 2116, RB, Rio de Janeiro  
Puiggari, J., 2028, H, São Paulo  
V.J. Pott, 6006, CGMS, Mato Grosso do Sul  
Carvalho-Silva, M., 512, HEPH, Distrito Federal  
Ristow, R., 1243, IRAI, Paraná  
Vital, D.M., 2885, SP, Pernambuco  
Vital, D.M., 2233, SP, Goiás  
Vaz Imbassahy, T. F., 116, RB, 441102,  (RB00684199), Rio de Janeiro  
T.B. Cavalcanti, 3458, CEN, Tocantins

### FIELD IMAGES / ILLUSTRATIONS

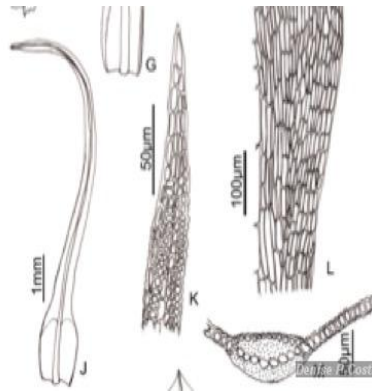


Figure 1: *Pseudosymblepharis schimperiana* (Paris) H.A.Crum

### REFERENCE

# *Pseudosymblepharis schlimii* (Müll. Hal.) M. Alonso, M.J. Cano & J.A. Jiménez

## DESCRIPTION

*Pseudosymblepharis schlimii* (Müll. Hal.) M. Alonso, M.J. Cano & J.A. Jiménez, J. Bryol. 36: 27–32. 2014.

Basionym: *Trichostomum schlimii* Müll. Hal., Bot. Zeitung Berlin 15: 579. 1857. Type: Colombia, Santa Marta, 1524 m, *Schlim 914* (Lectotype: BM by Alonso et al. 2014; Isotypes: G, PC0100173).

Plants median, green. Leaves spiralled when dry, erect to linear-lanceolate, **apex** acute, margins plane, papillose, costa excurrent in a mucro, cells of the ventral surface rectangular and papillose, dorsal one smooth, in cross section with 4-7 guide cells in one layer, two stereids bands, upper and median **laminal cells** quadrate, basal marginal cells rectangular, hyaline, thin-walled, extending up the margins cells, forming a weak V-shaped. **Dioicous**.

## COMMENTS

**Distribution and ecology:** Tropical America, from Mexico to the Southern part of Brazil and Bolivia (Alonso et al. 2014). In Brazil is encountered mainly in Savanna, and also occurring in the Atlantic Rainforest, 0–1500 m, on soil, rocks, and river banks.

**Comments:** Alonso et al. (2014) transferred *Trichostomum schlimii* to the genus *Pseudosymblepharis*, citing new records for Bolivia, Brazil, the Dominican Republic, Ecuador, Guiana, Peru, and Venezuela.

Illustrations: Alonso et al. (2014).

## Life Form

foliose, Tuft

## Substrate

Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

North (Rondônia)

Central-west (Goiás, Mato Grosso)

Southeast (Minas Gerais)

South (Paraná, Santa Catarina)

## HERBARIUM MATERIAL

S.C. Santos & J.S. Oliveira, 2, SP, Mato Grosso

D.M. Vital & W.R. Buck, 11642B, NY, Minas Gerais

J.P.-Frahm, 1187, L, Santa Catarina

H.S. Irwin, 31763, NY, Goiás

K. McFarland, 215, NY, Rondônia

## REFERENCE

Alonso, M., Cano, M.J. & Jiménez, J.A. (2014) A new combination in *Pseudosymblepharis* (Pottiaceae) from South and Central America. *Journal of Bryology* 36: 27–32.

# *Streptocalypta* Müll. Hal.

This treatment is composed of the following taxa: *Streptocalypta*, *Streptocalypta lorentziana*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96829>.

## DESCRIPTION

**Streptocalypta** Müll. Hal.

**Plants** small, in low turfs, green above and brown below. **Stems** erect, few branched. **Leaves** spreading, ligulate to lingulate, to ca. 3 mm, apex acute to rounded, apiculate; margins plane or incurved; costa subpercurrent to short excurrent, in cross section stereids bands weak or absent above and present below the guide cells, 2–4 rows of guide cells; lamina unistratose; upper laminal cells subquadrate, pluripapillose, papillae over cell lumen; basal cells extending along margin in a "V," rectangular, smooth, lax and thin-walled; marginal cells distally similar to inner laminal cells or 1–3 rows of fusiform, smooth. **Autoicous**, **synoicous** or **dioicous**. **Perichaetia** terminal. **Seta** twisted. **Capsule** erect, cylindrical to ellipsoid. **Operculum** long-conical to long-rostrate, oblique. **Peristome** absent or present, single, teeth divided into 32 filaments, straight to slightly twisted, papillose or spiculose. **Calyptra** cucullate, smooth. **Spores** spherical, papillose.

## COMMENTS

**Comments:** Only a single species occurs in Brazil, on tree trunks, along stream banks.

### Life Form

foliose, Tuft

### Substrate

Corticolous

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest, Pampa

### Vegetation Types

Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest)

### Geographic Distribution

#### Confirmed occurrences

Southeast (Minas Gerais)

South (Paraná, Rio Grande do Sul, Santa Catarina)

# *Streptocalypta lorentziana* Müll. Hal.

## Has as synonym

homotype *Streptocalypta lorentzii* Müll. Hal. ex Kindb.

## DESCRIPTION

*Streptocalypta lorentziana* Müll. Hal., *Linnaea* 42: 354. 1879. Type: Argentina, Urugunesis, entre Ri#os Prov., Concepcion del Uruguay, 1877, P.G. Lorentz s.n. (Isotype: H-BR).

Plants small, green. Leaves lingulate-lanceolate to elliptical, margins entire, plane, apex acute to apiculate, costa percurrent to short-excurrent, in cross section with several layers of guide cells, ventral stereids absent or nearly so, and 1-4 guide cells, in one layer, upper **laminal cells** quadrate, papillose, papillae small, 2-4 over the lumen, basal laminal cells differentiated, rectangular, thin-wall, smooth, extending up in V-shaped. **Dioicous**.

## COMMENTS

**Distribution and ecology:** Brazil, Bolivia, Peru, Argentina, and Uruguay (Tropicos 2015). In Brazil is encountered in Savana and Atlantic Rainforest, 0–700 m, occurring on tree trunks.

Comments: Costa (2016) considered this taxon apparently a rare, because it is known only from two collections.

## Life Form

foliose, Tuft

## Substrate

Corticicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest, Pampa

## Vegetation Types

Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Southeast (Minas Gerais)

South (Paraná, Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

A. Sehnem, 3195, HBR, Rio Grande do Sul

Ule, E., 5, MG, Santa Catarina

Yano, O. & Wanderley, M.G.L., 10748, SP, Minas Gerais

## FIELD IMAGES / ILLUSTRATIONS



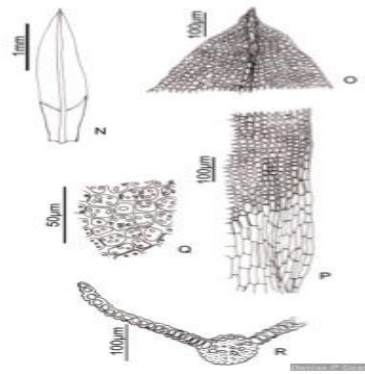


Figure 1: *Streptocalypta lorentziana* Müll. Hal.

# *Streptopogon* Wilson ex Mitt.

This treatment is composed of the following taxa: *Streptopogon*, *Streptopogon brasiliensis*, *Streptopogon calymperes*, *Streptopogon cavifolius*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96831>.

## DESCRIPTION

**Streptopogon** Wils. in Mitt.

**Plants** median, solitary or in small turfs, dark green to reddish-brown. **Stems** erect, simple or few branched. **Leaves** spreading, broadly lanceolate to oblong-ovate; apex acuminate and awned or rounded to cucullate; margins recurved or incurved above, entire to serrate and often sharply so, limbate or elimbate; costa strong, long excurrent and smooth or toothed, or percurrent, in cross section rounded, stereids bands few to many rows below the guide cells, 2 guide cells in one layer; lamina unistratose; laminal cells smooth, short or long hexagonal to rectangular; basal cells rectangular, lax to firm-walled; marginal cells, long linear, hyaline. **Dioicous** or **autoicous**. **Perichaetia** terminal. **Seta** short, erect. **Capsule** emergent, erect, long-elliptical. **Operculum** long-conical. **Peristome** teeth 16 or divided into 32 segments, papillose-spiculose. **Calyptra** mitrate, lobed, roughened or scabrous. **Spores** spherical, strongly papillose.

## COMMENTS

**Comments:** Three species occur in Brazil, growing in primary and secondary forests. According to Casado (2000), it is a small genus with 5-7 species in the tropical America and 7 species in the Paleotropics.

### Life Form

foliose, Tuft

### Substrate

Corticicolous, Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest

### Vegetation Types

Anthropic area, Seasonally Deciduous Forest, Ombrophylous Forest (Tropical Rain Forest), Mixed Ombrophylous Forest

### Geographic Distribution

#### Confirmed occurrences

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

## IDENTIFICATION KEY

1. Leaf apex acuminate, costa excurrent (extending beyond the apex), completely filling the apex (proboscis); gemmae concentrated on the leaf apex around tip of costa ..... *S. calymperes*
1. Leaf apex acute, rounded to cucullate, costa subpercurrent (almost reaching the apex); gemmae on leaf margin or spreading on the upper distal leaf surface..... 2
2. Leaf apex rounded to abruptly cucullate; gemmae distributed on the upper distal leaf surface (apex and margin).....*S. cavifolius*

2. Leaf apex acute, plane; gemmae concentrated along the margins of leaf apex and upper 1/3 of leaf .....*S. brasiliensis*

# *Streptopogon brasiliensis* Casado ex D.P.Costa

## DESCRIPTION

*Streptopogon brasiliensis* Casado ex D. P. Costa, Syst. Bot. 37: 583-586. 2010. Type: Brazil, São Paulo, Serra da Bocaina at Cunha, forest meadow at Sítio da Grama, 1,400 m, 28 Oct 1989, A. Schäfer-Verwimp 11950 (Holotype: L; Isotype: herb. Schäfer-Verwimp).

**Plants** small, olive-green. **Stems** erect, unbranched. **Leaves** spreading when wet, contorted when dry, oblong, **apex** acute, **margins** not bordered, entire, plane above, recurved at base, **costa** subpercurrent, in cross-section with one dorsal stereid band, guide cells in a single layer, upper **laminal cells** hexagonal, thick-walled, median laminal cells hexagonal, thick-walled, basal laminal cells rectangular, thin-walled, porose. **Gemmae** multicellular, in the leaf apex, clavate, smooth.

## COMMENTS

**Distribution and ecology:** Endemic to sBrazil, occurring in southeastern and southernmost, in the Atlantic Rainforest, 500–1,400 m, on tree trunks, in Minas Gerais, Rio Grande do Sul, Santa Catarina, and São Paulo states.

**Comments:** It is similar to *S. cavifolius* Mitt., differing by the plane and acute leaf apex, multicellular gemmae at the leaf margin, and by the quadrate and thick-walled median laminal cells, and the porose basal cells.

## Life Form

foliose, Tuft

## Substrate

Corticicolous, Rupicolous

## DISTRIBUTION

Native, Is endemic from Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Mixed Ombrophylous Forest

## Geographic Distribution

### Confirmed occurrences

Southeast (Minas Gerais, São Paulo)

South (Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

A. Schafer-Verwimp, 11950, L, São Paulo, **Typus**

W.R. Buck, 26937, NY, SP, Minas Gerais

A. Schafer-Verwimp & I. Verwimp, 10719, Rio Grande do Sul

A. Schafer-Verwimp & I. Verwimp, 10442, Santa Catarina

## FIELD IMAGES / ILLUSTRATIONS

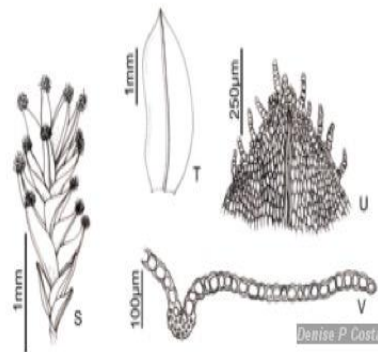


Figure 1: *Streptopogon brasiliensis* Casado ex D.P.Costa

## REFERENCE

COSTA, D. P. 2012. Validation of the New Species of *Streptopogon* (Pottiaceae, Bryophyta) and a Synopsis of the Genus for Brazil. *Systematic Botany* 37: 583-586.

# *Streptopogon calymperes* Müll. Hal.

## Has as synonym

heterotypic *Streptopogon rigidus* Mitt. ex Broth.

heterotypic *Streptopogon schenckii* Müll. Hal. ex Broth.

## DESCRIPTION

**STREPTOPOGON CALYMPERES** Müll. Hal. in Geh., Abh. Naturwiss. Vereine Bremen 7: 207. 1882. Type: Madagascar, Ambatondrazaka, 6 Dec 1877, *Rutenberg* 22 (Holotype: B, assumed destroyed).

**Plants** small, dark-green, reddish green to reddish yellow. **Stems** erect, irregularly branched. **Leaves** when dry imbricate, erect-crispate, **apex** acute, cuspidate, **margins** elimbate, entire, slightly to strongly recurved below, plane to inflexed above, **costa** percurrent into a proboscis, in cross section with one row of 2 guide cells and one layer with 4–5 rows of abaxial stereids, upper **laminal cells** subquadrate, hexagonal, rhomboidal, median cells thin-walled, smaller and subquadrate, basal cells large-rectangular, shorter at margin. **Gemmae** in tufts on leaf apex, multicellular, clavate, or cylindrical. **Dioicous**. **Perichaetia** terminal. **Setae** smooth, reddish. **Capsule** erect, cylindrical, annulus in 3 rows. **Operculum** conical, the annulus of 2–3 rows of cells. **Calyptra** mitrate, scabrous, the base lobed.

## COMMENTS

**Distribution and ecology:** Central Africa, Madagascar, Mexico, Central America, Caribbean, and South America (Costa 2012). In Brazil is encountered in Atlantic rainforest, 800–2,000 m, on tree trunks or rocks.

**Comments:** It is easily recognized by its cluster of reddish brown globose and multicellular gemmae at the leaf tips (proboscis) that consist largely of excurrent costa (Casado 2000; Sharp et al. 1994).

## Life Form

foliose, Tuft

## Substrate

Corticicolous, Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná)

## HERBARIUM MATERIAL

Vital, D.M. & Buck, W.R., 19640, NY, Minas Gerais

Schäfer-Verwimp, A., 11946, RB, São Paulo

Schenck, H., 4789, MO, Rio de Janeiro

Ristow, R., 1225, IRAI, Paraná

## FIELD IMAGES / ILLUSTRATIONS

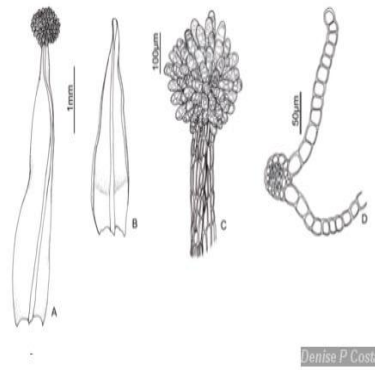


Figure 1: *Streptopogon calymperes* Müll. Hal.

# *Streptopogon cavifolius* Mitt.

## DESCRIPTION

**STREPTOPOGON CAVIFOLIUS** Mitt., J. Linn. Soc. Bot. 12:180. 1869. Type: Ecuador, Andes Quitenses, Baños ad pedem montis Tungurahua, in ramulis praecipue malvacearum suffruticosarum, etiam in monte Guayrapata, 6,000–10,000 ped., *Spruce s. n.* (lectotype: NY, by Costa, 2012).

**Plants** small, dark green to yellow or brownish. **Stems** erect, irregularly branched. **Leaves** crowded to distant, erect-patent, oblong-elliptical to lingulate, sheathing at base, **apex** obtuse, slightly cucullate, **margins** not bordered, entire, revolute at base, incurved above, **costa** percurrent to subpercurrent, in cross section with guide cells in a single layer, with 2 ventral cells and 2–3 rows of abaxial stereids, upper **laminal cells** hexagonal to rhomboidal, thin-walled, smaller toward the margin, median cells rhomboidal, thick-walled, basal cells quadrate to rectangular, thin-walled, smooth. **Gemmae** multicellular, clavate or cylindrical, around the apex, simple or branched. **Dioicous**.

## COMMENTS

Distribution **and ecology**: Mexico, Central America, Caribbean, and South America (Costa 2012i). In Brazil is encountered in Atlantic rainforest, on tree trunks, between 300–2,000 m, being common in urban areas.

**Comments**: It is recognized by the cucullate apex covered by numerous cylindrical gemmae. The Brazilian material has planar leaves with straight margins, subpercurrent costae, and leaf apices often bearing cylindrical and septate gemmae.

### Life Form

foliose, Tuft

### Substrate

Corticicolous

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest

### Vegetation Types

Anthropic area, Seasonally Deciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

### Geographic Distribution

#### Confirmed occurrences

Southeast (Minas Gerais, São Paulo)

South (Paraná, Rio Grande do Sul)

## HERBARIUM MATERIAL

Schäfer-Verwimp, A. & Verwimp, I., 10719, SV, Rio Grande do Sul

Peralta, D.F. et al., 3664, SP, São Paulo

Buck, W.R., 26937, SP, Minas Gerais

Vital, D.M., 9446, SP, Paraná

## FIELD IMAGES / ILLUSTRATIONS



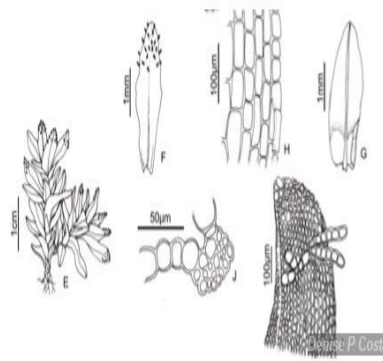


Figure 1: *Streptopogon cavifolius* Mitt.

# *Syntrichia* Brid.

This treatment is composed of the following taxa: *Syntrichia*, *Syntrichia amphidiacea*, *Syntrichia fragilis*, *Syntrichia lacerifolia*, *Syntrichia laevipila*, *Syntrichia papillosa*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96834>.

## DESCRIPTION

### SYNTRICHIA BRID.

**Plants** small to robust, in loose to dense turfs, light to dark green, yellowish-green or reddish-brown. **Stems** erect, simple to branched. **Leaves** erect, wide-spreading to squarrose, oblong-lanceolate or oblong-obovate to spatulate, apex acute to rounded; margins plane to recurved, entire or crenulate to serrate at apex; costa percurrent, apiculate to short or long excurrent, projecting on back, hyaline point, in cross section rounded, stereids bands present below, 2–4 guide cells on 1–4 layers; median and upper laminal cells isodiametric, hexagonal to subquadrate, thick-walled, pluripapillose, papillae bifid, C-shaped; basal cells long rectangular. **Dioicous** or **autoicous**. **Perichaetia** terminal. **Seta** long, twisted. **Capsule** erect to suberect, long cylindrical, straight to slightly curved. **Operculum** short to long-conical or conic-rostrate. **Peristome** teeth divided into 32 filaments either divided to base or forming a short to  $\pm$  long basal membrane, spiculose. **Calyptra** cucullate, naked, smooth. **Spores** spherical, papillose.

## COMMENTS

**Comments:** Four species occur in Brazil, on rotten logs, shaded rocks, and tree trunks, at low to high elevations.

### Life Form

foliose, Tuft

### Substrate

Corticicolous, Epixilous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa

### Vegetation Types

Anthropic area, Grassland, Cerrado (lato sensu), Seasonally Deciduous Forest, Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

### Geographic Distribution

#### Confirmed occurrences

Northeast (Paraíba)

Central-west (Mato Grosso do Sul)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

## IDENTIFICATION KEY

This Key is based on Mishler (1994)

1. Leaves strongly bordered by thicker-walled, collenchymatous cells; costa percurrent; gemmae present..... *S. amphidiacea*
1. Leaves not bordered, collenchymatous cells or not, costa excurrent, gemmae present or absent..... 2

2. Leaves fragile, often broken and appearing eroded, not bordered or occasionally weakly bordered by thicker-walled cells, oblong-lingulate to spatulate, margin entire or crenulate; cells moderately thicker-walled, not collenchymatous; costa excurrent into a mucro or apiculus; gemmae absent .....*S. fragilis*
2. Leaves not fragile, not bordered, spatulate, margin entire or occasionally serrulate near the apex; cells rather thick-walled, collenchymatous; costa excurrent into a short, smooth or serrulate awn; gemmae present..... 3
3. Leaf cells papillose-crenulate or smooth; costa excurrent as an awn or hyaline hair point; propagula on the stem apex or in the base of upper leaves.....*S. laevipila*
3. Leaf cells unipapillose; costa strongly serrate, percurrent or short-excurrent into a mucro or apiculus; propagula on the upper surface of costa.....*S. papillosa*

# *Syntrichia amphidiacea* (Müll.Hal.) R.H.Zander

## Has as synonym

basionym *Barbula amphidiacea* Müll. Hal.

## DESCRIPTION

*Syntrichia amphidiacea* (Müll. Hal.) R.H. Zander, Bull. Buffalo Soc. Nat. Sci. 32: 267. 1993. Basionym: *Barbula amphidiacea* Müll. Hal., Linnaea 38: 639. 1874. Type: Mexico, Monte Orizaba, Frederick Müller, inter alios muscos, Hb. Lorentz sub *Zygodon* (Holotype ?).

**Plants** small to robust, yellow-green. Leaves erect-spreading, broadly spatulate, apex acute to acuminate, margins entire, revolute, costa strong subpercurrent to percurrent, upper cells rounded, thick wall, basal cells narrow toward the margin. Dioicous. **Seta** red. **Capsule** curved with a neck. **Operculum** red. Gemmae multicellular, cylindrical.

## COMMENTS

**Distribution and ecology:** Brazil, Southeastern U.S.A., Mexico, Central America, Western South America, and Malesia (Allen 2002). In Brazil encountered in the Atlantic Rainforest, 650–1650 m, occurring on rotten wood, shaded rocks, and tree trunks (common in urban areas).

**Comments:** It is characterized by multicellular, cylindrical gemmae on the ventral.

## Life Form

foliose, Tuft

## Substrate

Corticicolous, Epixilous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest, Pampa

## Vegetation Types

Anthropic area, Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Santa Catarina)

## HERBARIUM MATERIAL

Schäfer-Verwimp, A., 11851, SV, São Paulo


Schäfer-Verwimp, A., 10314a, SV, Espírito Santo

Schäfer-Verwimp, A., 12683, SV, Minas Gerais

Schäfer-Verwimp, A., 15175, SV, Paraná

Schäfer-Verwimp, A., 13114, SV, Rio de Janeiro

Schäfer-Verwimp, A., 10569/B, SV, Santa Catarina

Felipe Juliani, 61, RB,  (RB00907918), Rio de Janeiro

## FIELD IMAGES / ILLUSTRATIONS

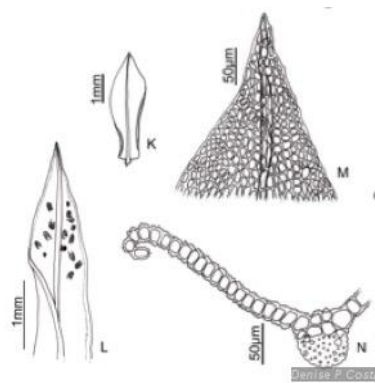


Figure 1: *Syntrichia amphidiacea* (Müll.Hal.) R.H.Zander

# *Syntrichia fragilis* (J.Taylor) Ochyra

## Has as synonym

basionym *Tortula fragilis* Taylor

## DESCRIPTION

*Syntrichia fragilis* (Taylor) Ochyra, *Fragm. Florist. Geobot.* 37: 212. 1992. Basionym: *Tortula fragilis* Taylor, *London J. Bot.* 6: 333. 1847. Type: Ecuador. Pichincha, November 1846, *W. Jameson 66* (Lectotype by Gallego (2005): FH; Isolectotypes: FH, MO, NY, PC 0054240).

**Plants** small to robust, light to dark-brown. Leaves erect-spreading, oblong-lingulate to spatulate, apex truncate to acute (fragile), margins revolute below, costa percurrent to excurrent (mucro), upper cells quadrate, thick walls, bulging, marginal cells differentiated in 2-3 rows, basal cells differentiated. Dioicous. **Seta** red. **Capsule** curved with a neck, red. **Operculum** red.

## COMMENTS

**Distribution and ecology:** Brazil, Africa, America, South Asia, Europe, Macaronesia (Gallego 2005). In Brazil is encountered in the Atlantic Rainforest and Savanna, 800–2000 m, on tree trunks, rocks, or stone walls in urban area.

**Comments:** According to Schäfer-Verwimp & Giancotti (1993), the records of *S. fragilis* by Egunyomi & Vital (1984) for Goiás State and by Guarim Neto & Yano (1985) for Mato Grosso State correspond to *Trichostomum weisioides* Muell. Hal. and my examinations of these collections confirmed it.

## Life Form

foliose, Tuft

## Substrate

Corticicolous, Rupicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest, Pampa

## Vegetation Types

Grassland, Cerrado (lato sensu), Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Central-west (Mato Grosso do Sul)

Southeast (Minas Gerais, Rio de Janeiro)

South (Paraná, Rio Grande do Sul)

## HERBARIUM MATERIAL


D.M. Vital, 6455, SP, Mato Grosso do Sul

Schäfer-Verwimp, A., 15140, SV, Rio Grande do Sul

Schäfer-Verwimp, A., 11818, SV, Minas Gerais

Schäfer-Verwimp, A. & Verwimp, I., 11819, SP, São Paulo

Schäfer-Verwimp, A. & Verwimp, I., 15140, RB, Paraná

S. Churchill, 22833, RB, 399967,  (RB00684897)

## FIELD IMAGES / ILLUSTRATIONS

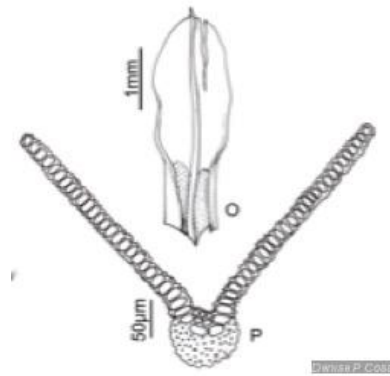


Figure 1: *Syntrichia fragilis* (J.Taylor) Ochyra

# *Syntrichia lacerifolia* (R.S. Williams) R.H. Zander

## DESCRIPTION

*Syntrichia lacerifolia* (R.S. Williams) R.H. Zander, Bull. Buffalo Soc. Nat. Sci. 32: 269. 1993. Basionym: *Tortula lacerifolia* R.S. Williams, Bull. Torrey Bot. Club 43: 326. 1916. Type: Argentina, Tucuman, Tafi# del Valle, 2000 m, Lamb 5477 (ex LIL no. 12668) (Holotype: FH-Bartram).

**Plants** small, not branched, 6-8 mm. **Leaves** fragile (broken along the margins into laciniae), erect-spreading, **apex** apiculate, **margins** unbordered, recurved and constrict at the middle, usually deeply incised in the upper portion and entire at base, costa excurrent, more or less papillose on the upper side, in cross section with two guide-cells, and stereid band on the dorsal side, laminal cells hexagonal, mamillate, papillose (papillae C-shaped), upper laminal cells papillose. Dioicous. **Sporophytes** with a height membrane.

**Illustrations:** Williams (1916)

## COMMENTS

**Distribution and ecology:** Brazil, Colombia, Ecuador, Peru, Bolivia, Argentina, and Brazil (Gallego et al. 2011). In Brazil is encountered in Savanna, ca. 860 m, on tree trunks.

**Comments:** According to Gallego et al. (2011), it is similar to *S. fragilis* because of the fragile leaves with margins recurved and laminal cells papillose, differing the former by the leaves spreading to recurved when moist and leaves apiculate (mucronate), breaking along the margins into laciniae (irregular). These authors expanded the distribution of this species significantly.

## Life Form

foliose, Tuft

## Substrate

Corticicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Caatinga

## Vegetation Types

Cerrado (lato sensu)

## Geographic Distribution

Confirmed occurrences

Southeast (Minas Gerais)

## HERBARIUM MATERIAL

D.M. Vital & R. Pursell, 8304, SP, NY, Minas Gerais

## REFERENCE

Gallego, M.T. et al. 2011. New records, synonyms and one combination in the genus *Syntrichia* (Pottiaceae) from South America. *Bryologist* 114(3): 556-562.



# *Syntrichia laevipila* Brid.

## Has as synonym

heterotypic *Syntrichia pagorum* (Milde) Amann

## DESCRIPTION

***Syntrichia laevipila*** Brid., Muscol. Recent. Suppl. 4: 98. 1818 [1819]. Type: Italia, around Rome & Naples, 1803 (lectotype by Gallego et al. 2004, B).

Plants small, green, erect, branched. Leaves spreading, lingulate to spatulate, unistratose, **apex** obtuse, margins plane or recurved at middle, **cells** unipapillose or smooth, bordered or not, **costa** strongly serrate, percurrent or short-excurrent into a mucro or apiculus, hairpoint hyaline, in cross section with 1-2 **guide cells** rows, upper and median cells quadrate or rounded, thin walled, with 4-8 papillae per cell, basal cells quadrate or rectangular, hyaline. Gemmae on the upper surface of costa (adaxial). Dioicous or autoicous. Seta erect, **capsule** cylindrical, operculum long-conical.

## COMMENTS

**Distribution and ecology:** Brazil, Africa, North, Central and South America, Asia, Australia, Europe, and New Zealand (Gallego 2005). In Brazil encountered in the Atlantic Rainforest, Steppe, 0–900 m, on tree trunks, roadside soils, or rock walls (common in urban areas).

**Comments:** Schafer-Verwimp (1996) cited several collections from human habitations, commenting that this species is expected to occur in the towns in southern Brazil.

## Life Form

foliose, Tuft

## Substrate

Corticicolous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest, Pampa

## Vegetation Types

Anthropic area, Grassland, Seasonally Deciduous Forest, Ombrophylous Forest (Tropical Rain Forest), Mixed Ombrophylous Forest

## Geographic Distribution

### Confirmed occurrences

Northeast (Paraíba)

South (Paraná, Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

Ristow, R., s.n., IRAI, 3288, Paraíba

Bordin, J. & Yano, O., 164b, SP, Rio Grande do Sul

Schäfer-Verwimp, A. & Verwimp, I., 10690, SP, Rio Grande do Sul

## FIELD IMAGES / ILLUSTRATIONS

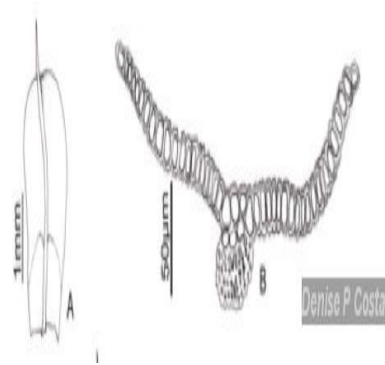


Figure 1: *Syntrichia laevipila* Brid.

# *Syntrichia papillosa* (Wils. ex Spruce) Jur.

## DESCRIPTION

**Syntrichia papillosa** (Wils. ex Spruce) Jur., Laubm.-Fl. Oesterr.-Ungarn. 141, 1882. Basionym: *Tortula papillosa* Wils. ex Spruce, London J. Bot. 4: 193. 1845. Type: England, in Howard park, July 1843, W. Wilson (Holotype: BM, Isotype: F). Plants small, dark green, erect, not branched. Leaves spreading, lingulate to spathulate, unistratose, **apex** obtuse, margins plane or incurved, hairpoint hyaline, **cells** papillose, not bordered, **costa** in cross section with 1-2 **guide cells** rows, upper and median cells quadrate to rounded, thin or thick walled, with 1-2 papillae per cell, basal cells quadrate or rectangular, hyaline. Gemmae on the upper surface of costa (adaxial). Dioicous. Seta erect, **capsule** erect, cylindrical, **operculum** long-conical.

## COMMENTS

**Distribution and ecology:** Brazil, North, Central and South Africa, America, Asia, Australia, Europe, Macaronesia, and New Zealand (Gallego 2005). In Brazil encountered in the Atlantic Rainforest, 1420 m, on tree trunks in a garden near the center of São Joaquim.

**Comments:** According to Costa (2016), the only collection known to Brazil was made by Schäfer-Verwimp (1992) in Santa Catarina State in urban area. *Syntrichia papillosa* can be confused with *S. laevipila*, differing by cells unipapillose, costa strongly serrate, and gemmae on the ventral surface cells of the costa (abaxial), cylindrical and rounded at the ends.

## Life Form

foliose, Tuft

## Substrate

Corticicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Anthropic area, Mixed Ombrophylous Forest

## Geographic Distribution

### Confirmed occurrences

South (Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

Schäfer-Verwimp, A. & Verwimp, I., 10570, RB, Santa Catarina  
Wasum, R., 4748, RON, Rio Grande do Sul

## FIELD IMAGES / ILLUSTRATIONS

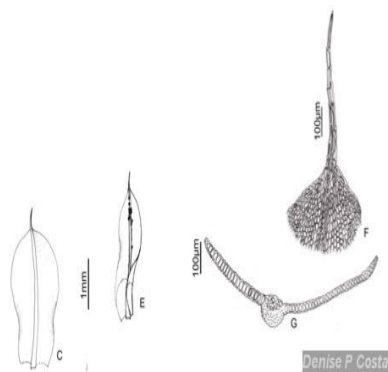


Figure 1: *Syntrichia papillosa* (Wils. ex Spruce) Jur.

# *Timmiella* (De Not.) Limpr.

This treatment is composed of the following taxa: *Timmiella*, *Timmiella barbuloides*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96838>.

## DESCRIPTION

**Timmiella** (De Not.) Limpr.

**Plants** small, in turfs or cushions. **Stems** erect, simple or branched. **Leaves** spreading, broadly lanceolate to long-elliptical, narrower above sub-sheathing base, apex acute; margins plane to incurved, serrulate to denticulate above base, apex serrate; costa strong, percurrent, in cross section stereids bands above and below guide cells; lamina bistratose except at margin; upper and lower cells slightly alternating, laminal cells above sheathing base subquadrate, bulging on upper surface, smooth on lower surface, thick-walled; basal cells rectangular to long hexagonal, thin-walled. **Dioicous**, **autoicous** or **synoicous**. **Perichaetia** terminal. **Seta** long, twisted. **Capsule** erect, long-cylindrical. **Operculum** long-rostrate, erect. **Peristome** single, teeth divided to near base, straight or twisted, papillose or spiculose. **Calyptra** cucullate, smooth. **Spores** spherical, papillose.

## COMMENTS

**Comments:** One species in Brazil, *Timmiella barbuloides* (Brid.) Moenk., disjunct between southeastern Brazil and the southern Andes.

### Life Form

Cushion, Tuft

### Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Atlantic Rainforest

### Vegetation Types

Ombrophylous Forest (Tropical Rain Forest)

### Geographic Distribution

#### Confirmed occurrences

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

# *Timmiella barbuloides* (Brid.) Mönk.

## Has as synonym

basionym *Trichostomum barbuloides* Brid.

heterotypic *Barbula cirrhata* Hornsch.

heterotypic *Tortula cirrhata* Arnell

## DESCRIPTION

**Timmiella barbuloides** (Brid.) Mönk., Laub. Europ. 273. 1927. Basionym: *Trichostomum barbuloides* Brid., Musc. Rec. Suppl. 1: 233. 1806. Type: Europe, *Bridel 406* (Holotype: B 31041001).

Plants small, erect, not branched. Leaves spreading, broad-lanceolate, **lamina** bistratose (upper laminal cells), **apex** acute, **margins** plane, serrate above, **costa** strong, in cross section steroids bands above and below the guide cells, upper and basal cells subquadrate, smooth, thin or thick-walled. **Dioicous**.

## COMMENTS

**Distribution and ecology:** Bolivia, Brazil, Canary Island, Greece, Israel, Egypt, Central Asia, Iraq, and sub-Saharan Africa (Tropicos 2015). In Brazil encountered in the Atlantic Rainforest, 0–1100 m, on soil and rocks.

**Comments:** According to Costa (2016), this species is only known from old collections of southeastern Brazil (RJ, MG) cited as *Barbula cirrhata* or *Tortula cirrhata* by Arnott (1823), Hornschuch (1840), Mueller (1844), Hampe (1870, 1872, 1874a, 1877, 1879), and Hampe & Geheeb (1881). Although considered widespread globally, Costa (2016) did not find any new collections to Brazil.

## Life Form

Cushion, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Southeast (Minas Gerais, Rio de Janeiro, São Paulo)

## FIELD IMAGES / ILLUSTRATIONS

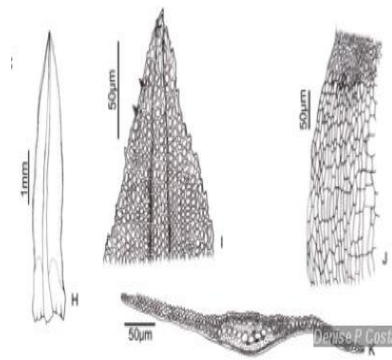


Figure 1: *Timmiella barbuloides* (Brid.) Mönk.

# *Tortella* (Lindb.) Limpr.

This treatment is composed of the following taxa: *Tortella*, *Tortella humilis*, *Tortella lilliputana*, *Tortella linearis*, *Tortella tortuosa*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96840>.

## DESCRIPTION

*Tortella* (Lindb.) Limpr.

**Plants** small to median, in loose or dense turfs. **Stems** erect, simple or branched. **Leaves** erect-spreading to spreading, linear to oblong-lanceolate or lingulate, channeled, apex obtuse to narrowly or broadly acute, often apiculate; margins plane, entire to crenulate by projecting papillae, or irregularly denticulate; costa strong, percurrent to short excurrent, in cross section semicircular or ovate, stereids bands above and below guide cells, 4–6 guide cells in one layer; laminal cells subquadrate to short rectangular or rounded-hexagonal, thick-walled, pluripapillose, papillae dense; basal cells in a "V" shape, extending toward and along margin, rectangular, thin-walled to thick-walled, smooth. **Dioicous** or **autoicous**. **Perichaetia** terminal. **Seta** long, erect. **Capsule** stegocarpic, erect, cylindrical. **Operculum** conical. **Peristome** with teeth divided into 32 linear segments twisted, spiculose-branched. **Calyptra** cucullate. **Spores** smooth to papillose.

## COMMENTS

**Comments:** A widespread genus globally, with four species occurring in Brazil.

### Life Form

Cushion, foliose, Tuft

### Substrate

Corticicolous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa, Pantanal

### Vegetation Types

Grassland, Cerrado (lato sensu), Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

### Geographic Distribution

#### Confirmed occurrences

Northeast (Bahia, Maranhão, Pernambuco)

Central-west (Distrito Federal, Goiás, Mato Grosso do Sul)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

## IDENTIFICATION KEY

1. Leaf narrowly ligulate, costa subpercurrent, cross section with two rows of guide cells..... *T. linearis*
1. Leaf ligulate, oblong-lanceolate to linear-lanceolate, costa short excurrent to excurrent, cross section with one row of guide cells .....2
2. Costa more or less excurrent as an entire or serrulate point, wide at the base; margin more or less undulate....*T. tortuosa*



2. Costa short-excurrent to excurrent as a mucro, margin entire to crenulate, plane to more or less undulate.....3
3. Leaf oblong-lanceolate (ca. 3.0 mm), concave, apex broadly acute to acuminate, mucronate, reflexed, costa excurrent as a mucro, margin crenulate, more or less undulate..... *T. humilis*
3. Leaf long-ligulate to oblong-lanceolate (1.5-2.5 mm), apex acute, apiculate, shortly mucronate (hyaline); costa short-excurrent, margin entire to weakly crenulate, plane to erect..... *T. lilliputiana*

# *Tortella humilis* (Hedw.) Jenn.

## Has as synonym

basionym *Barbula humilis* Hedw.  
 heterotypic *Barbula caespitosa* Schwägr.  
 heterotypic *Barbula morthiana* (Grev.) Müll. Hal.  
 heterotypic *Mollia caespitosa* (Schwägr.) Broth.  
 heterotypic *Tortella caespitosa* (Schwägr.) Limpr.  
 heterotypic *Tortula caespitosa* (Schwägr.) Hook. & Grev.

## DESCRIPTION

***Tortella humilis*** (Hedw.) Jenn., Man. Mosses W. Pennsylvania 96. 1913. Basionym: *Barbula humilis* Hedw., Sp. Musc. Frond. 25: 116. 1801. Type: USA, Lancaster Pennsylvaniae, Jan 1897, *J. Cardot s.n.* (Holotype: G).

**Stem** short, dark green to yellow-green. Leaves rosulate, fragile, often fragmented, widespreading to patent, oblong to spatulate, leaf base is narrow, broad to narrowly acute, **apex** obtuse to acute, mucronate, margins plane, laminal cells small and obscure, **costa** short-excurrent, papillose, diminishes in size toward the leaf tip, in cross section, cells on the ventral surface of the costa are similar in shape and size to the laminal cells. **Autoicous**. **Capsule** cylindrical, erect, operculum short-conical, annulus deciduous.

## COMMENTS

**Distribution and ecology:** Brazil, Mexico, Guatemala, Cuba, Jamaica, Haiti, Northern South America, Eastern North America, Europe, and North Africa (Zander 1994). In Brazil encountered in Savanna, Atlantic Rainforest, Pantanal, Steppe, and urban areas, 0–1400 m, on soil, rocks, tree trunks, and tomb walls.

**Comments:** It is similar to *Hyophila involuta* because the cells on the ventral surface of the costa are similar in shape and size to the laminal cells, the leaf base is narrow, and with the presence of stem central strand. *Hyophila involuta* differs by having dentate leaf apices, and by the laminal cells (in cross section) bulging on the ventral surface.

## Life Form

foliose, Tuft

## Substrate

Corticicolous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa, Pantanal

## Vegetation Types

Grassland, Cerrado (lato sensu), Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest


## Geographic Distribution

### Confirmed occurrences

Northeast (Bahia, Maranhão, Pernambuco)  
 Central-west (Distrito Federal, Goiás, Mato Grosso do Sul)  
 Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)  
 South (Paraná, Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

E.S. Arnou, 61, RB,  (RB01401419), Rio de Janeiro

Ule, E., 14, R, Santa Catarina  
Yano, O. et al., 2900, SP, Pernambuco  
Felipe Juliani, 72, RB,  (RB00907929), Rio de Janeiro  
Felipe Juliani, 72, RB,  (RB00907929), Rio de Janeiro  
Boom, B. & Mori, S.A., 1084, NY, Bahia  
Costa, D.P. et al., s.n., RB, São Paulo  
Buck, W.R., 26956, NY, Minas Gerais  
Vital, D.M., 8502, NY, Goiás  
Felipe Juliani, 72, RB,  (RB00907929), Rio de Janeiro  
Vervloet, R.R., 1108, MBML, Espírito Santo  
D.N.S. Machado, 2152, RB,  (RB01348800), Rio de Janeiro  
Oliveira-e-Silva, M.I.M.N., 1626, HRJ, Rio de Janeiro  
A. Sehnem, 6011, NY, Rio Grande do Sul  
G. Hatschbach, 45254, NY, Paraná

### FIELD IMAGES / ILLUSTRATIONS

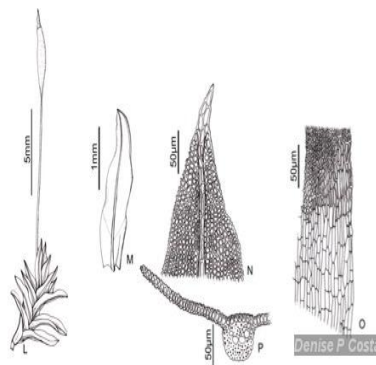


Figure 1: *Tortella humilis* (Hedw.) Jenn.

# *Tortella lilliputana* (Müll.Hal.) R.H.Zander

## Has as synonym

heterotypic *Tetrapterum lilliputanum* (Müll. Hal. ex G. Roth) Broth.

## DESCRIPTION

***Tortella lilliputana*** (Müll. Hal. ex Roth) R.H. Zander, Bull. Buffalo Soc. Nat. Sci. 32: 104, 1993. Basionym: *Phascum lilliputanum* Müll. Hal. ex Roth, Ausserer. Laubm. 212, 1911 (Roth 1911). Type: BRAZIL. Santa Catarina: Tubaraço, ad terram, August 1889, E. Ule 133 (Isotypes: FH, LE, MO, NY, PC Ex Bryotheca brasiliensis).

*Tetrapterum lilliputanum* (Müll. Hal. ex Roth) Broth., syn. fide Zander (1993).

Plants small, green above, growing in cushions or tufts, 2–3(–4) mm long. Stem red, erect. Leaves long-ligulate to oblong-lanceolate, 1.5–2.5 mm long, apex acute, shortly mucronate (hyaline), margins entire to weakly crenulated, plane to erect, costa short- excurrent, in cross section with guide cells and two started bands, upper laminal cells quadrate, pluripapillose, basal laminal cells rectangular, hyaline, smooth, outer forming a V-shaped. **Autoicous**. Seta up to 2 mm long, smooth, yellow. Capsule oblong, cleistocarpic with a rudimentary and non funcional annulus.

## COMMENTS

**Distribution and ecology:** Central America and Brazil (Allen 2002). In Brazil encountered in the Atlantic Rainforest, 0–1300 m, on moist soils or rocky cliffs covered with a thin layer of soil.

**Comments:** It was only known from two old collections from Santa Catarina (Tubaraço) made by E. Ule between 1889–1890, cited by Costa (2016) after 117 years for the states of Goiás and Rio Grande do Sul. In Brazil, it is considered by Costa (2016) probably a rare species.

## Life Form

Cushion, foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest)


## Geographic Distribution

### Confirmed occurrences

Central-west (Goiás)

South (Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

F. Gonzatti, s.n., RB,  (RB01376458), Rio Grande do Sul

Yano, O. & Sousa, M.A.R., 28660, SP, Goiás

Lindeman, C.A.M., 97, S, Rio Grande do Sul

Ule, E., 133, FH, NY, Santa Catarina, **Typus**

E.H.G. Ule, 133, FH, NY, MO (MO2249221), PC (PC0100059), Santa Catarina, **Typus**

E.H.G. Ule, 8, NY, R, Santa Catarina

## FIELD IMAGES / ILLUSTRATIONS

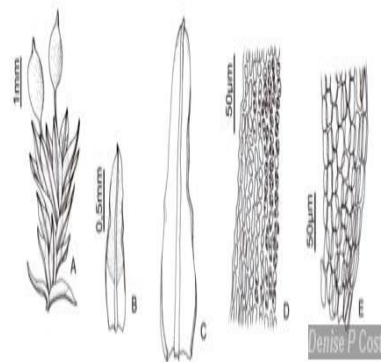


Figure 1: *Tortella lilliputana* (Müll.Hal.) R.H.Zander

## REFERENCE

Costa, D.P. 2016. A Synopsis of the family Pottiaceae in Brazil. Phytotaxa Monograph 251 (1): 1-69.

# *Tortella linearis* (Sw. ex F. Weber & D. Mohr) R.H. Zander

## Has as synonym

basionym *Barbula linearis* Sw. ex F. Weber & D. Mohr

## DESCRIPTION

***Tortella linearis*** (Sw. ex F. Weber & D. Mohr) R.H. Zander, Bull. Buffalo Soc. Nat. Sci. 32: 104, 1993. Basionym: *Barbula linearis* Sw. ex F. Weber et D. Mohr, Index Mus. Pl. Crypt. 2, 1803. Type: Jamaica. Swartz s.n. (Isotypes BM, NY).

*Tuerckheimia linearis* (Sw. ex Web. & Mohr) Britt., syn. fide Zander (1982)

**Plants** median, light green. **Leaves** oblong to narrowly ligulate, apex acuminate, **margins** plane and entire, **costa** subpercurrent, grooved, in cross section with two rows of guide cells, laminal cells papillose, papillae massive (crown-shaped).

## COMMENTS

**Distribution and ecology:** West Indies and Brazil (Zander 1993, Tropicos 2015). In Brazil occurs in the Atlantic Rainforest, in Bahia and Rio de Janeiro states, growing on tree trunks.

Comments: In Brazil it is only known from two collections, an old one from Rio de Janeiro state (Hornschuch 1840) and another one more recent from Bahia state (*D.M. Vital 6560 p.p.* - SP).

## Life Form

foliose, Tuft

## Substrate

Corticicolous

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Ombrophylous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Northeast (Bahia)

Southeast (Rio de Janeiro)

## HERBARIUM MATERIAL

Gonzatti, F, Gonzatti, F, FURB (FURB55273), Rio Grande do Sul

Swartz, O., s.n., LINN, Rio de Janeiro

## FIELD IMAGES / ILLUSTRATIONS

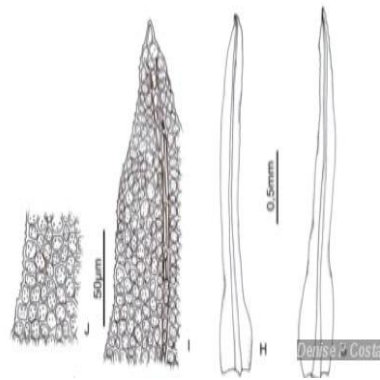


Figure 1: *Tortella linearis* (Sw. ex F.Weber & D.Mohr) R.H.Zander

# *Tortella tortuosa* (Hedw.) Limpr.

## Has as synonym

basionym *Tortula tortuosa* Hedw.

## DESCRIPTION

***Tortella tortuosa*** (Hedw.) Limpr., Die Laubm. Deutschl. 1: 604, 1888. Basionym: *Tortula tortuosa* Hedw., Sp. Musc. 124, 1801. Type: in montibus, Pedemontii, Helvetiae, Galliae, Scotiae, Sueciae, Thuringiae, Hercyniae, in silvis arenosis Palatinatus, in ripibus calcareis Franconiae, Austriae, nec non in Virginia. Junio et Julio sporangiae matura. Perennis, *O. Swartz s.n.* (Holotype: G).

Plants in dense tufts, green to yellow-brown above, 1.0-5.8 cm long. Leaves crisped when dry, flexuose to spreading when wet, long-lanceolate to linear-lanceolate, wide at the base, **apex** narrowed, long mucronate, **margins** more or less undulate, costa long excurrent, long-mucronate, smooth or denticulate, in cross section with large stereid bands. **Dioicous**. **Peristome** twisted. **Seta** often red below, up to 2.7 cm long. Operculum as long as the capsule. Calyptra cucullate.

## COMMENTS

**Distribution and ecology:** Mexico, Guatemala, Europe, Asia, Africa, Arctic, Asiatic Russia, Central Asia, Japan (Eckel 1998) and Brazil (Costa 2016). In Brazil occurs in the Upper Montane Atlantic Rainforest, on soil, rocks, and rotten wood, 2000–2600 m, RJ and RS states.

**Comments:** According to Zander (1994), the plants have broad leaf bases and large stereid bands. Depauperate forms may be confused with *Tortella fragilis* (Hook. et Wilson) Limpr., which has leaves more rigid, more or less erect, not or only slightly contorted when dry, and fragile, with propagulum at the leaf apex (Costa 2016).

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest

## Vegetation Types

Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Southeast (Rio de Janeiro)

South (Rio Grande do Sul)

## HERBARIUM MATERIAL

Landrum, L.R., 2155, RB, Rio de Janeiro

s.c., s.n., PACA, Rio Grande do Sul

## FIELD IMAGES / ILLUSTRATIONS



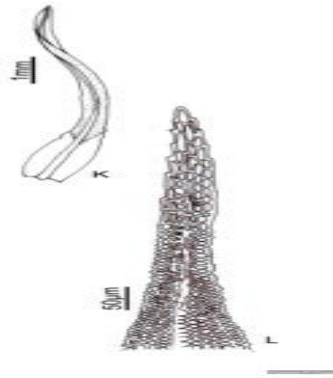


Figure 1: *Tortella tortuosa* (Hedw.) Limpr.

# Tortula Hedw.

This treatment is composed of the following taxa: *Tortula*, *Tortula muralis*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96844>.

## Has as synonym

*Phascum* Hedw.

## DESCRIPTION

### **Tortula** Hedw.

**Plants** small, in loose to dense turfs, green to yellowish brown. **Stems** short or elongate, few branched. **Leaves** erect to erect-spreading, oblong-lanceolate to oblong-obovate or spatulate, plane to concave; apex apiculate, acute or short acuminate; margins revolute, entire; costa short to long excurrent, in cross section circular to semicircular, dorsal stereid bands well developed and ventral stereid bands weak or absent, ventral epidermal cells enlarged, 1(–2) guide cells in 1(–2) layers; laminal cells quadrate-rounded to hexagonal, pluripapillose, papillae over lumen (C-shaped), basal cells rectangular, thin-walled. **Dioicous** or **autoicous**. **Perichaetia** terminal. **Seta** short or curved to elongate, twisted or not. **Capsule** cleistocarpic or stegocarpic, immersed or exserted, subglobose or ellipsoid and apiculate, or short to cylindrical. **Operculum** absent or present, long-conical. **Peristome** absent or present, teeth divided into 32 filaments, twisted or not, spiculose. **Calyptra** cucullate, smooth. **Spores** spherical to subspherical, papillose.

## COMMENTS

**Comments:** One species occurring in Brazil, *Tortula muralis* Hedw.

### **Life Form**

foliose, Tuft

### **Substrate**

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### **Phytogeographic Domains**

Atlantic Rainforest, Pampa

### **Vegetation Types**

Anthropic area, Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest)

### **Geographic Distribution**

#### Confirmed occurrences

Northeast (Pernambuco)

Southeast (Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

# *Tortula muralis* Hedw.

## Has as synonym

heterotypic *Tortula muricola* (Müll. Hal.) Mitt.

## DESCRIPTION

**Tortula muralis** Hedw., Sp. Musc. Frond. 123, 1801. Type: Europe, faxis muris, tectis, regulis [Linn. Sp. Pl. 2. p. 1581. n. 8. *Bryum tegulare humile pillosum & incanum* Dill. H.M. 355. t.45. f. 14] (Lectotype by Guerra et al. 1992, G). Plants small, growing in tufts, up to 4 mm. Leaves ovate to oblong-lanceolate (2.0-3.5 mm long), **margins** revolute and bordered by 1–2(-4) rows of thick-walled cells, **apex** acute to rounded, smooth and with a hyaline hair-point, **costa** long-excurrent, upper and middle **laminal cells** with low or high papillae. **Peristome** long and twisted (1–3 times). **Capsule** stegnocarpic, erect, cylindrical, with annulus disposed in only one row.

## COMMENTS

**Distribution and ecology:** Argentina, Brazil, Chile, Paraguay, Uruguay, Europe, temperate Asia, tropical Asia, Africa, North America, Australia, and New Zealand (Cano et Gallego 2008). In Brazil encountered in Atlantic Rainforest and Savanna, 0–1400 m, growing on soil, rocks, or cement walls (common in urban areas), in the following states: PE, PR, RJ, RS, SC, SP).

**Comments:** Cano & Gallego (2008) selected as the lectotype the specimen housed at the G herbarium.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Atlantic Rainforest, Pampa

## Vegetation Types

Anthropic area, Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Northeast (Pernambuco)


Southeast (Rio de Janeiro, São Paulo)


South (Paraná, Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

Yano, O., 561, SP, São Paulo

D. M. Vital, 8904, SP, Rio Grande do Sul

Schäfer-Verwimp, A., 10566, RB, RB, 534863,  (RB00684828), Santa Catarina

A. Schäfer-Verwimp, s.n., RB, 534863,  (RB00684828), Santa Catarina

## FIELD IMAGES / ILLUSTRATIONS

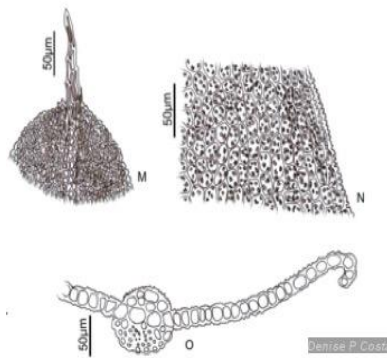


Figure 1: *Tortula muralis* Hedw.

# Trachycarpidium Broth.

This treatment is composed of the following taxa: *Trachycarpidium*, *Trachycarpidium lonchophyllum*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB131062>.

## DESCRIPTION

### Trachycarpidium Broth.

**Plants** small, to 2 mm, in loose turfs, light green. **Stems** erect, few to several branched, radiculose at base; in cross section hyalodermis absent and central strand weak. **Leaves** contorted-undulated when dry, erect-spreading to spreading when wet, linear, to ca. 1.4 mm, apex short acuminate; margins involute when dry, plane when wet, crenulate; costa strong, short excurrent as a mucro or awn, ventral and dorsal superficial cells elongate, in cross section semicircular to ovate, stereids few, above and below guide cells, ventral epidermis weakly developed, dorsal epidermis absent or weak, 2 guide cells in one layer; lamina unistratose; upper laminal cells hexagonal to subquadrate, thick-walled, pluripapillose, papillae over cell lumen, bifid; basal laminal cells extending along margin forming a “V,” rectangular, thin-walled. **Autoicous**. **Perichaetia** terminal. **Seta** short, to 0.2 mm. **Capsule** cleistocarpous, spherical, beaked. **Calyptra** mitrate, smooth, naked. **Spores** finely papillose.

## COMMENTS

**Comments:** A single species in southeastern Brazil, *Trachycarpidium lonchophyllum* (G. Roth) R.H. Zander, occurring in exposed sites.

### Life Form

foliose

### Substrate

Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Central Brazilian Savanna

### Vegetation Types

Cerrado (lato sensu)

### Geographic Distribution

Confirmed occurrences

Southeast (São Paulo)

# *Trachycarpidium lonchophyllum* (Roth.)

## R.H. Zander

### DESCRIPTION

**Trachycarpidium lonchophyllum** (G. Roth) R.H. Zander, Bull. Buffalo Soc. Nat. Sci. 32: 213, 1993. Basionym: *Astomum lonchophyllum* G. Roth, Aussereur. Laubm. 182, 1910. Type: Brasil, Santa Catarina, Tubara#o, July 1889, E. Ule 7 (Isotypes: G, GOET, JE, LE, MICH, PC, R).

**Plants** very small, gregarious, lights green. **Leaves** erect-spreading, long-lanceolate, **margins** plane, entire, **costa** excurrent, ending in a short awn, in cross section with guide cells in one layer (2-4), upper **laminal cells** hexagonal to sub quadrate, papillose (papillae bifid, 2-3 per cell), basal laminal cells rectangular, extending upward along the margin in a V-shape. **Autoicous**. Seta very short. Capsule elliptical, presenting a very large apiculus (half as wide as the capsule).

### COMMENTS

**Distribution and ecology:** Endemic of southeastern Brazil (São Paulo and Santa Catarina states), occurring in Savanna, 0–600 m, on soil in exposed sites.

**Comments:** This taxon is similar to *Trachycarpidium verrucosum* (Besch.) Broth., differing mainly by the capsule that presents a very large apiculus (half as wide as the capsule). It is considered rare, and in Brazil only known from two collections: the type from Santa Catarina State and another more recent from Sa#o Paulo State.

### Life Form

foliose

### Substrate

Terrestrial

### DISTRIBUTION

Native, Is endemic from Brazil

### Phytogeographic Domains

Central Brazilian Savanna

### Vegetation Types

Cerrado (lato sensu)

### Geographic Distribution

Confirmed occurrences

Southeast (São Paulo)

### HERBARIUM MATERIAL

Yano, O. & Morretes, B.L., 28820, SP, São Paulo

Ule, E., s.n., MICH, R, **Typus**

### FIELD IMAGES / ILLUSTRATIONS



Figure 1: *Trachycarpidium lonchophyllum* (Roth.) R.H. Zander

## REFERENCE

Costa, D.P. 2016. A Synopsis of the family Pottiaceae in Brazil. Phytotaxa Monograph 251: 1-69.

Zander, R.H. 1993. *Trachycarpidium* In: Genera of the Pottiaceae: mosses of harsh environments. Bull. Buffalo Sco. Nat. Sc. 32: Pp 212-213.

# Trichostomum Hedw.

This treatment is composed of the following taxa: *Trichostomum*, *Trichostomum arboreum*, *Trichostomum brachydontium*, *Trichostomum tenuirostre*, *Trichostomum termitarum*, *Trichostomum weisioides*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96847>.

## DESCRIPTION

**Trichostomum** Bruch.

**Plants** small to median, in dense turfs, dark green to brown. **Stems** erect, simple or few branched. **Leaves** erect-spreading to squarrose, oblong to ligulate-lanceolate or lanceolate to linear-lanceolate; apex acute or short-acuminate, mucronate, base slightly sheathing; margins plane to erect, smooth or undulate, crenulate-papillose, dentate below; costa strong, short to long-excurrent, in cross section semicircular, reniform or ovate, stereids bands above and below guide cells, upper stereid band equal or smaller than lower, 2–4 guide cells in one layer, epidermal surface papillose; laminal cells subquadrate, thick-walled, pluripapillose, papillae over lumen, bifid, crowded; basal cells extending upward along margin, long rectangular, smooth, yellowish-hyaline, along costa and above long rectangular, hyaline, thin-walled. **Dioicous**. **Perichaetia** terminal. **Seta** long, smooth. **Capsule** stegocarpic, erect, short to long cylindrical. **Operculum** short to long rostrate. **Peristome** single, teeth divided and jointed below or to base, short and fragile, papillose. **Calyptra** cucullate, smooth. **Spore** finely to strongly papillose.

## COMMENTS

**Comments:** According to Zander (1993), this is a large genus, being found on all continents except Antarctic. Five species occur in Brazil, often in open and disturbed sites.

### Life Form

Cushion, foliose, Tuft

### Substrate

Corticicolous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest, Pampa

### Vegetation Types

Caatinga (stricto sensu), Amazonian Campinarana, Grassland, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Terra Firme Forest, Ombrophyllous Forest (Tropical Rain Forest)

### Geographic Distribution

#### Confirmed occurrences

North (Amazonas, Pará, Rondônia, Roraima)

Northeast (Bahia, Ceará, Maranhão, Pernambuco, Piauí, Sergipe)

Central-west (Distrito Federal, Goiás, Mato Grosso)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul)

## IDENTIFICATION KEY

1. Leaf very fragile, margin undulate, apex obtuse, short mucronate..... *T. tenuirostre*



1. Leaf not fragile, margin plane or incurved only above, apex acute, obtuse, round or cuspidate, short to long mucronate.... 2
2. Leaves long-mucronate, basal cells 1/8-1/3 the leaf length (not like a “V” inverted)..... 3
2. Leaves short-mucronate, basal cells 1/3 the leaf length (like a “V” inverted)..... 4
3. Leaf ligulate to lanceolate, margin plane, apex rounded to acute..... ***T. brachydonium***
3. Leaf oblong, margin convolute above, apex cuspidate..... ***T. termitarum***
4. Leaf ligulate, apex rounded..... ***T. weisioides***
4. Leaf oblong to oblong-lanceolate, apex rounded to obtuse..... ***T. arboreum***

# *Trichostomum arboreum* (Mitt.)

## R.H.Zander

### Has as synonym

basionym *Weissia arborea* Mitt.

### DESCRIPTION

*Trichostomum arboreum* (Mitt.) R.H. Zander, Bull. Buffalo Soc. Nat. Sci. 32: 91, 1993. Basionym: *Weissia arborea* Mitt., J. Linn. Soc. Bot. 12: 138, 1869. Type: Brazil, Goiás, ad Mission Douro, in arbores, Oct 1893, G. Gardner 5 (Lectotype designated by Alonso et al. 2016: NY 01050384; isolectotypes: NY 00913395, 0105385).

*Hyophila arborea* (Mitt.) A. Jaeger, syn. fide Zander (1993)

**Plants** small. **Leaves** oblong to oblong-lanceolate, short-mucronate, apex rounded to obtuse, **margins** entire, upper **lamina cells** small, obscure and papillose, basal **laminal cells** oblong, like an inverted V (1/3 the leaf length). **Dioicous**. Capsule ovate-cylindrical.

### COMMENTS

**Distribution and ecology:** Endemic to Brazil (AM, GO, PA, RO, RR), encountered in the Amazon Forest and Savanna (Gallery Forest), 0–800 m, growing on tree trunks, and soil-covered rocks.

Comments: Alonso et al. (2016) found in NY a sheet with different collections of *Weisia arborea*, with three agreeing with the prologue, and selected the collection NY 01050384 as the electotype because it has sporophytes and is well preserved.

### Life Form

foliose, Tuft

### Substrate

Corticicolous, Rupicolous, Terrestrial

### DISTRIBUTION

Native, Is endemic from Brazil

### Phytogeographic Domains

Amazon Rainforest, Central Brazilian Savanna

### Vegetation Types

Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Terra Firme Forest

### Geographic Distribution

#### Confirmed occurrences

North (Amazonas, Pará, Rondônia, Roraima)

Central-west (Goiás)

### HERBARIUM MATERIAL

Buck, W.R., 2519, NY, Amazonas

Reese, W.D., 16124, NY, Pará

Buck, W.R. et al., 2050, MG, Roraima

G. Gardner, 5, NY, Goiás, **Typus**

### FIELD IMAGES / ILLUSTRATIONS

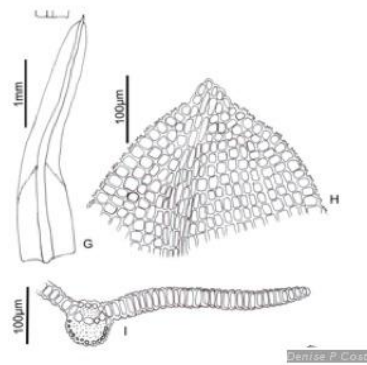


Figure 1: *Trichostomum arboreum* (Mitt.) R.H.Zander

# *Trichostomum brachydontium* Bruch

## DESCRIPTION

**Trichostomum brachydontium** Bruch, Flora 12: 393, 1829. Type: Greece and Sardinia, Wachstum häufig an einer feuchten Erdwand bei Spezzia und auf Hügelu unter Gebu#sch bei Cagliari, März und April 1827, F. Müller s.n. (Holotype: JE)

*Trichostomum duidense* E. B. Bartram, syn. fide Zander (1993)

Plants small to medium-sized, yellow-green, in tufts. Stem erect, red. Leaves broad, lingulate to lanceolate, apex acute, mucronate, margin entire, plane, weak bordered with thin-walled cells, **costa** excurrent, in cross section guide-cells and two stereid bands, pluripapillose, basal laminal cells rectangular, hyaline, smooth, outer basal laminal cells forming a weak V-shaped. **Dioicous**. **Seta** yellow, smooth. **Capsule** cylindrical. **Operculum** rostrate. **Calyptra** smooth. **Peristome** with 16 teeth.

## COMMENTS

**Distribution and ecology:** widespread throughout the world— Americas, Europe, China, Japan, Asia, Arabian Peninsula, Macaronesia, Africa, Western Indian Ocean, India Subcontinent, Indo-China, Malesia, Australia, and New Zealand (Allen 2002). In Brazil encountered in Atlantic Rainforest, Caatinga, and Amazon Forest (BA, ES, PA, PE, PR, RO), 200–1200 m, growing on cliff rocks, and soil.

**Comments:** *Trichostomum brachydontium* is similar to *T. tenuirostre* differing by the leaves shorter and abruptly contracted to a mucro.

## Life Form

Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Caatinga (stricto sensu), Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Terra Firme Forest, Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

North (Pará, Rondônia)

Northeast (Bahia, Pernambuco)

Central-west (Goiás)

Southeast (Espírito Santo)

South (Paraná)

## HERBARIUM MATERIAL

Schäfer-Verwimp, A., 12981, RB, Pernambuco

B.M. Boom, 1059, NY, Bahia

Yano, O., 3983 p.p., SP, Paraná

McFarland, K. et al., 206, NY, Rondônia

W.D. Reese, 16124, NY, Pará

A. Schäfer-Verwimp & Verwimp, I., 12981, SP, Pernambuco

## FIELD IMAGES / ILLUSTRATIONS

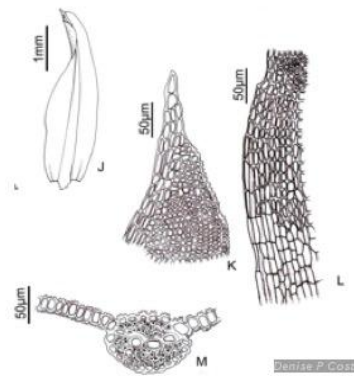


Figure 1: *Trichostomum brachydontium* Bruch

# *Trichostomum tenuirostre* (Hook. & Taylor) Lindb.

## Has as synonym

basionym *Weissia tenuirostris* Hook. & Taylor

## DESCRIPTION

***Trichostomum tenuirostre*** (Hook. et Taylor) Lindb., *Öfvers. Förs. Kongl. Svenska Vetensk.-Akad.* 21: 225, 1864.

Basionym: *Weissia tenuirostre* Hook. et Taylor, *Muscol. Brit.*, ed. 2, 83, 1827. Type: SCOTLAND and IRELAND. Moist rocks, in fructification at Campsie, near Glasgow, Scotland, about Powerscourt Waterfall, near Dublin (Isolectotype: E 0007505).

*Trichostomum subcirrhatum* Hampe, *Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn* 3, 6: 133, 1874. Type: BRAZIL. Rio de Janeiro: Mar 1873, Glaziou 6363 (BM 000872450!, holotype, BM!, PC 0109861, PC 0709204, isotypes), syn. fide Costa et al. (2015).

*Trichostomum carassense* Broth. in Paris, *Index Bryol.* 1320, 1898. Original material: BRAZIL. Minas Gerais: Serra do Caracara, ad terram in silva, Mar 1892, E. Ule 128 (BM 000872457!), nom. inval. (no description).

Plants small to medium-sized, green to yellow-green, in tufts. Stem erect, red, rhizoids below. **Leaves** often fragile, erect to flexuose, lanceolate, **apex** obtuse, short mucronate, margins entire, plane, undulate above, **costa** short-excurrent, in cross section guide-cells and two stereid bands (adaxial band equal to or slightly smaller than, the abaxial one), upper laminal cells quadrate, basal laminal cells rectangular, hyaline, smooth, outer basal laminal cells forming a weak V-shaped. Dioicous. Capsule cylindrical. Operculum long-conic to rostrate. Calyptra cucullate, smooth.

*Trichostomum carassense* Broth. in Paris, *Index Bryol.* 1320, 1898. Original material: BRAZIL. Minas Gerais: Serra do Caracara, ad terram in silva, Mar 1892, E. Ule 128 (BM 000872457!), nom. inval. (no description).

**Leaves** often fragile, lanceolate, apex obtuse, short mucronate, margins undulate above, stereids band above and below the guide cells (adaxial band equal to, or slightly smaller than, the abaxial one).

## COMMENTS

**Distribution and ecology:** widespread throughout the world—North and Central America, West Indies, South America, Europe, Siberia, Russia, Asia, China, Arabian Peninsula, Africa, Western Indian Ocean, India Subcontinent, Indo-China, Malesia, Malesia, and New Zealand (Allen 2002). In Brazil encountered in the Amazon Forest, Atlantic Rainforest, and Savanna, 0–1100 m., on soil, tree trunks, and branches.

**Comments:** *Trichostomum tenuirostre* has leaves often fragile, lanceolate, with apex obtuse, short mucronate, margins undulate above, stereids band above and below the guide cells (adaxial band equal to, or slightly smaller than, the abaxial one).

## Life Form

foliose, Tuft

## Substrate

Corticolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Amazon Rainforest, Caatinga, Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types




Amazonian Campinarana, Grassland, Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Terra Firme Forest, Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

Confirmed occurrences

North (Amazonas, Pará, Rondônia, Roraima)  
 Northeast (Bahia, Ceará, Maranhão, Piauí, Sergipe)  
 Central-west (Distrito Federal, Goiás, Mato Grosso)  
 Southeast (Minas Gerais, São Paulo)  
 South (Paraná, Rio Grande do Sul)

**HERBARIUM MATERIAL**

G.T. Prance, 15990, NY, Amazonas  
 H.S. Irwin, 33233, NY, Distrito Federal  
 P. Lisboa, N.A. Rosa & M.R. Santos, 2652, MG, Rondônia  
 Buck, W.R. et al., 2050, NY, Roraima  
 Strudwicj, J.J. et al., 3598, NY, Pará  
 Costa, D.P. et al., 4508, RB, 534723,  (RB00684112), RB, Rio de Janeiro  
 D.P. Costa, 4508, RB, 534723,  (RB00684112), Rio de Janeiro  
 Brinker, J. et al., s.n., NY, Rio Grande do Sul  
 D. M. Vital, 5928, SP, Bahia  
 D. M. Vital, 8524, NY, Goiás  
 S. Churchill, 21810, RB, 412180,  (RB00684130)  
 G. Hatschbach, 55499, MBM, Minas Gerais

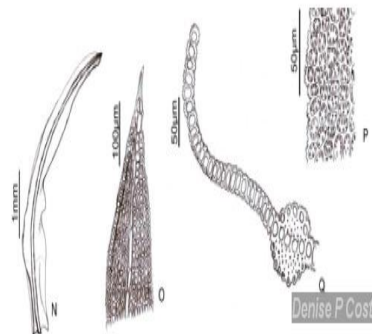
**FIELD IMAGES / ILLUSTRATIONS**

Figure 1: *Trichostomum tenuirostre* (Hook. & Taylor) Lindb.

# *Trichostomum termitarum* (Müll.Hal.)

## R.H.Zander

### DESCRIPTION

**Trichostomum termitarum** (Müll. Hal.) R.H. Zander, Bull. Buffalo Soc. Nat. Sci. 32: 92. 1993. Basionym: *Weissia termitarum* Müll. Hal., Hedwigia 39: 267. 1900. Type: Brasil, Goiás, “auf termitenhu#geln” prope Mossamedes, Jan 1893, E. Ule 1065 (Holotype: R, Isotypes: JE, NY, LE).

Plants small to median-sized, aggregated, growing in cushions or tufts. Stem not branched. Leaves erect-patent, oblong, base narrow, long, hyaline, cells reticular-rectangular (not like a V inverted), lamina entire, **margin** erect or convolute above, **apex** cuspidate, **costa** wide, mucro short-excurrent, **laminal cells** small-rounded, thick-walled, and reticulated. **Dioicous**. Capsule ovate. Operculum conical-subulate.

### COMMENTS

**Distribution and ecology:** Endemic to Brazil (BA, GO, RS, SE), encountered in Savanna, 80–650 m, occurring on soils along streams or rivers.

**Comments:** It is characterized by: **leaves** with the base narrow, long, hyaline, reticular-rectangular, lamina entire; **apex** cuspidate; **margin** erect or only convolute above; **costa** wide, mucro short-excurrent; **laminal cells** small-rounded, thick-walled, and reticulated.

### Life Form

Cushion, foliose, Tuft

### Substrate

Terrestrial

### DISTRIBUTION

Native, Is endemic from Brazil

### Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest, Pampa

### Vegetation Types

Grassland, Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest)

### Geographic Distribution

#### Confirmed occurrences

Northeast (Bahia, Sergipe)

Central-west (Goiás)

South (Rio Grande do Sul)

### HERBARIUM MATERIAL

D. M. Vital, 2862, SP, Sergipe

Ule, E., 1065, NY, R, Goiás, **Typus**

D. M. Vital, 8170, SP, Bahia

D. M. Vital, 9098, SP, Rio Grande do Sul

### FIELD IMAGES / ILLUSTRATIONS



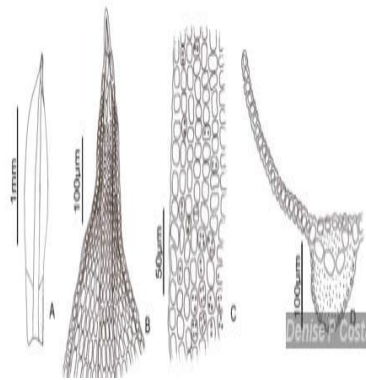


Figure 1: *Trichostomum termitarum* (Müll.Hal.) R.H.Zander

# *Trichostomum weisioides* Müll. Hal.

## DESCRIPTION

*Trichostomum weisioides* Müll. Hal., Bull. Herb. Boissier 6: 92, 1898. Type: Brasil, Serra do Itatiaia, Mont Serrat, 1500 m, in solo sylvestre, March 1814, *E. Ule 1814* (Holotype: R, Isotype: HBG).

**Plants** small-sized, green. Stem with short and few branches. Leaves spreading, ligulate, crispate, channeled, **apex** rounded, **margins** entire, erect, **costa** short-mucronate, **laminal cells** rounded, basal **laminal cells** 1/3 the leaf length (like a inverted V). Dioicous. Capsule cylindrical. **Operculum** conic-rostrate.

## COMMENTS

**Distribution and ecology:** Endemic to Brazil (DF, GO, MT, RJ), encountered in Savanna and Atlantic Rainforest, 500–1500 m, growing on soils and tree trunks.

**Comments:** The records of *Syntrichia fragilis* for Goiás and Mato Grosso by Egunyomi & Vital (1984) and Guarim Neto & Yano (1985), actually refer to *Trichostomum weisioides*.

## Life Form

foliose, Tuft

## Substrate

Corticicolous, Terrestrial

## DISTRIBUTION

Native, Is endemic from Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Cerrado (lato sensu), Riverine Forest and/or Gallery Forest, Ombrophyllous Forest (Tropical Rain Forest)

## Geographic Distribution

### Confirmed occurrences

Northeast (Bahia)

Central-west (Distrito Federal, Goiás, Mato Grosso)

Southeast (Minas Gerais, Rio de Janeiro)


## HERBARIUM MATERIAL

H.S. Irwin, 33272, NY, Bahia

E.H.G. Ule, 1814, HBG, R, Rio de Janeiro, **Typus**

D. M. Vital, 3013, SP, Goiás

Vital, D.M., 6225, SP, Minas Gerais

Heringer, F.P., 6005, RB, RB, 253313,  (RB00684166), Distrito Federal

## FIELD IMAGES / ILLUSTRATIONS

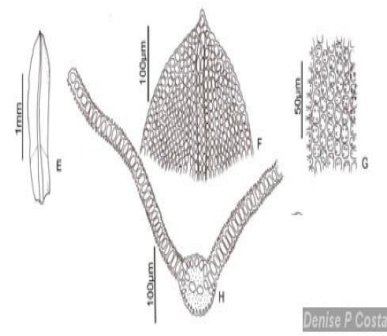


Figure 1: *Trichostomum weisioides* Müll. Hal.

# Weisiopsis Broth.

This treatment is composed of the following taxa: *Weisiopsis*, *Weisiopsis bahiensis*, *Weisiopsis nigeriana*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96858>.

## DESCRIPTION

### **Weisiopsis** Broth.

**Plants** small, in short turfs, light-green or yellowish-brown. **Stems** short, simple to branched. **Leaves** spreading, ligulate to spatulate, apex bluntly acute to obtuse-rounded, cucullate or not; margins plane to incurved, crenulate; costa subpercurrent to percurrent, in cross section rounded, stereids bands below guide cells, ventral epidermis absent, dorsal epidermis present, 2(-4) guide cells in one layer; laminal cells quadrate or hexagonal-rounded, thick-walled; basal laminal cells extending along costa, rectangular, smooth. **Autoicous**. **Perichaetia** terminal. **Seta** long, slender, smooth. **Capsule** ovoid-cylindrical to ovoid. **Operculum** long-conical or short-rostrate. **Peristome** absent or single, teeth inserted below the mouth, slender and spaced, finely spiculose. **Calyptra** cucullate, smooth. **Spores** spherical, smooth.

## COMMENTS

**Comments:** Two species occur in Brazil, both restricted to savanna.

### **Life Form**

foliose, Tuft

### **Substrate**

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### **Phytogeographic Domains**

Central Brazilian Savanna, Atlantic Rainforest

### **Vegetation Types**

Cerrado (lato sensu), Riverine Forest and/or Gallery Forest

### **Geographic Distribution**

#### Confirmed occurrences

North (Pará, Tocantins)

Northeast (Pernambuco, Piauí)

Central-west (Goiás)

## IDENTIFICATION KEY

1. Leaf tubulose, ligulate to spatulate, margins plane to slightly incurved, cells mamilliose-bulging on ventral surface, plane on the dorsal surface, capsule without bulging exothecial cells, peristome simple or absent ..... *W. bahiensis*
1. Leaf not or weakly tubulose, ligulate-rounded, margins plane, slightly crenulate, cells mamilliose-bulging on the ventral surface and dorsal surface, capsule with bulging exothecial cells, peristome absent..... *W. nigeriana*

# *Weisiopsis bahiensis* (Müll.Hal.) Broth.

## Has as synonym

basionym *Pottia bahiensis* Müll. Hal.

## DESCRIPTION

*Weisiopsis bahiensis* (Müll. Hal.) Broth., Nat. Pflanzenfam. 10: 271, 1924. Basionym: *Pottia bahiensis* Müll. Hal., Bot. Zeit. 13: 764, 1855. Type: America Austral, Brasilia (Holotype: B ?).

**Plants** small, evenly foliate. **Leaves** tubuloses (when dry), lingulate to spatulate, margins plane to slightly incurved, costa subpercurrent, in cross section, laminal cells bulging-mammillose on the ventral surface and plane on the dorsal surface, and costa with the guide cells flattened. Monoicous. **Capsule** cylindrical. **Annulus** not persistent. **Operculum** long-conical to rostrate. Peristome single or absent.

## COMMENTS

**Distribution and ecology:** Endemic to Brazil, Piauí State, encountered in Savanna, ca. 300 m, on bank soil.

**Comments:** Yano (1981) cited *W. bahiensis* from Oeiras, Goiás State, although Oeiras is actually located in Piauí State. It is characterized by small plants, with tubulose, lingulate to spatulate leaves, margins plane to slightly incurved, guide cells flattened, and peristome single or absent.

## Life Form

foliose, Tuft

## Substrate

Rupicolous

## DISTRIBUTION

Native, Is endemic from Brazil

## Phytogeographic Domains

Central Brazilian Savanna

## Vegetation Types

Cerrado (lato sensu)

## Geographic Distribution

### Confirmed occurrences

Northeast (Piauí)

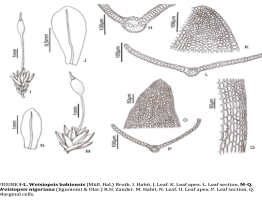
## HERBARIUM MATERIAL

D. M. Vital, 8215-A, SP, Piauí

D. M. Vital, 8217, SP, Piauí

s.c., s.n., B, **Typus**

## FIELD IMAGES / ILLUSTRATIONS



Denise pinheiro da Costa

Figure 1: *Weisiopsis bahiensis* (Müll.Hal.) Broth.

# *Weisiopsis nigeriana* (Egunyomi & Olar.) R.H.Zander

## Has as synonym

basionym *Gyroweisia nigeriana* Egunyomi & Olar.

## DESCRIPTION

**Weisiopsis nigeriana** (Egun. & Olar.) R.H. Zand., Bull. Buffalo. Soc. Nat. Sci. 32: 190. 1993. Basionym: **Gyroweisia nigeriana** Egun. & Olar., Bryologist 81: 443, 1978. Type: NIGERIA, Cross River, Obudu cattle ranch, on rock surface, September 1975, A. Egunyomi 379 (UIH holotype; Herb. M. Bizot isotype).

Plants small, light-green, erect. Leaves broad, not or weakly tubulose (when dry), ligulate-rounded, concave, obtuse, margins plane, slightly crenulate, costa subpercurrent (cells quadrate), laminal cells mammillose-bulging on the ventral surface and dorsal surface. Monoicous. **Seta** yellow. Capsule short-cylindric, with bulging exothecial cells. Peristome absent. **Caliptra** cucullate.

## COMMENTS

**Distribution and ecology:** Central America and South and East Tropical Africa (Allen 2002). In Brazil, cited to Pará, Piauí, Tocantins, Goiás, and Pernambuco states, occurring in Savanna and Atlantic Rainforest, 0–1200 m, on rocks and soil.

**Comments:** It was cited for the first time for Brazil by Castro et al. (2002) from Piauí# State. In Brazil, *W. nigeriana* may be confused with *Hyophila involuta*, *Luisierella barbula*, or *Plaubelia sprengelii*, that are similar on terms of the shape of their leaves, but differ in the laminal cells mammillose-bulging on the ventral surface, but plane and smooth on the dorsal surface.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Cerrado (lato sensu), Riverine Forest and/or Gallery Forest

## Geographic Distribution

### Confirmed occurrences

North (Pará, Tocantins)

Northeast (Pernambuco, Piauí)

Central-west (Goiás)

## HERBARIUM MATERIAL

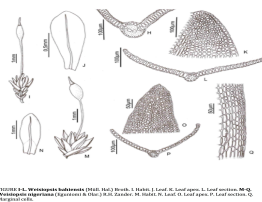
Reese, 16444, MO, Pará

Farias Castro, 16, MO, Piauí

Silva, s.n., UFP, Pernambuco

D. M. Vital, 3003, SP, Tocantins

## FIELD IMAGES / ILLUSTRATIONS



Denise Pinheiro da Costa

Figure 1: *Weisiopsis nigeriana* (Egunyomi & Olar.) R.H.Zander

## REFERENCE

- Allen, B. (2002) Moss Flora of Central America Part 2. Encalyptaceae-Orthotrichaceae. Monographs in Systematic Botany from the Missouri Botanical Garden 90: 1–699.
- Costa, D.P. 2016. A synopsis of the family Pottiaceae in Brazil. Phytotaxa Monograph 251: 1-69.
- Egunyomi, A. & Vital, D.M. (1984) Comparative studies on the bryofloras of the Nigerian savanna and the Brazilian cerrado. Revista Brasileira de Botânica 7: 129–136.



# Weissia Hedw.

This treatment is composed of the following taxa: *Weissia*, *Weissia breutelii*, *Weissia controversa*, *Weissia jamaicensis*.

## HOW TO CITE

Costa, D.P. Pottiaceae in **Flora do Brasil 2020**. Jardim Botânico do Rio de Janeiro. Available at: <http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB96853>.

## Has as synonym

heterotypic *Astomum* (Müll. Hal.) Broth.

*Hymenostomum* (Müll. Hal.) Broth.

## DESCRIPTION

### *Weissia* Hedw.

**Plants** small, in cushions or in short turfs, green or brown. **Stems** erect, few branched. **Leaves** spreading, narrow, oblong-lanceolate, apex acute to subulate, mucronate; margins involute to strongly incurved, entire; costa short excurrent, apiculate, in cross section ovate to semicircular, stereid band cells above and below guide cells, 4–6(–8) guide cells in one layer; laminal cells subquadrate to hexagonal, pluripapillose, papillae bifid; basal cells short rectangular, smooth, thin-walled to thick-walled. **Autoicous** or **dioicous**. **Perichaetia** terminal. **Seta** long, erect. **Capsule** erect, ovoid to short cylindrical. **Operculum** absent to present, long-rostrate. **Peristome** absent or single, teeth partially to fully divided, fragile or rudimentar, papillose to spiculose. **Calyptra** cucullate, smooth. **Spore** papillose.

## COMMENTS

**Comments:** According to Zander (1993), this is a large genus found on all continents except Antarctica. Three species occurring in Brazil, in open and disturbed sites.

### Life Form

Cushion, foliose, Tuft

### Substrate

Corticicolous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

### Phytogeographic Domains

Amazon Rainforest, Central Brazilian Savanna, Atlantic Rainforest, Pampa

### Vegetation Types

Grassland, Cerrado (lato sensu), Seasonally Semideciduous Forest, Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

### Geographic Distribution

#### Confirmed occurrences

North (Tocantins)

Northeast (Bahia, Maranhão, Pernambuco)

Central-west (Goiás)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

## IDENTIFICATION KEY

key is based on Allen (2002)

1. Leaf cells bulging-mammillose on the ventral surface, smooth on the dorsal surface.....***W. breutelii***

1. Leaf cells pluripapillose on both surfaces (dorsal and ventral)..... 2

2. Leaf long, linear-lanceolate (2.5-4.0 mm long), fragile and broken, costa stoutly excurrent, apex narrowly acute, apiculate ....***W.***

***jamaicensis***

2. Leaf linear-lanceolate to lanceolate (1.3-2.3 mm long), not fragile, costa long-excurrent, apex acuminate, mucronate....***W.***

***controversa***

# *Weissia breutelii* Müll. Hal.

## Has as synonym

heterotypic *Weissia glazioui* R.H.Zander

## DESCRIPTION

***Weissia breutelii*** Müll. Hal., Syn. Musc. Frond. 1: 664. 1849. Type: Insula Antillarum, St. Tomas, 1841, *J.C. Breutel s.n.* (Isotypes: MO, NY).

*Weissia canaliculata* Hampe, syn. fide Costa (2014)

*Weissia glazioui* R.H. Zander, syn. fide Costa (2014)

*Hymenostomum fasciculatum* Hampe, syn. fide (Costa et al. 2015)

**Plants** small, dark-green to yellow-green. **Stem** red, irregularly branched. **Leaves** linear-lanceolate to lanceolate, erect-flexuose to erect-spreading, acuminate to mucronate; margins entire, involute; costa excurrent, broad at base, in cross section with epidermal ventral cells quadrate and dorsal rounded to quadrate, 2 stereid bands; laminal cells quadrate above, thick-walled, mammies to pluripapillose (4-6 papillae), basal cells rectangular, hyaline, smooth, in a V-shaped. **Autoicous**. **Seta** erect, yellow, long. **Capsules** symmetric, erect or inclined. **Calyptra** cucullate.

## COMMENTS

**Distribution and ecology:** Central America, West Indies, and Brazil (Allen 2002). In Brazil encountered in the Atlantic Rainforest and Savanna (BA, ES, MA, RJ, RS, SC, SP), 0–900 m, growing on soils or rocks.

**Comments:** *Weissia breutelii* is similar to *W. controversa* Hedw. and *W. jamaicensis* (Mitt.) Grolle differing by the leaf cells bulging-mammilose on the ventral surface and smooth on the dorsal surface. The Brazilian collections from the states of Rio de Janeiro, Rio Grande do Sul, and Sa#o Paulo are all very old (done by Hampe, Luisier, Puiggari, and Loefgren). Costa (2014 ad 2015) reduced *W. canaliculata*, *W. glazioui*, and *Hymenostomum fasciculatum* to synonym of *W. breutelii*.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest, Pampa

## Vegetation Types

Grassland, Cerrado (lato sensu), Seasonally Semideciduous Forest, Ombrophylous Forest (Tropical Rain Forest), Mixed Ombrophylous Forest

## Geographic Distribution

### Confirmed occurrences

Northeast (Bahia, Maranhão)

Southeast (Espírito Santo, Rio de Janeiro, São Paulo)

South (Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

Peralta, D.F. & Lucas, M.W.S., 3254, SP, São Paulo

E.S. Brito & G.M. Conceição, 410, SP, Maranhão

Brito, E.S. & Conceição, G.M., 410, SP, Maranhão  
Schäfer-Verwimp, A., 10260, RB, SV, Espírito Santo  
Oliveira-e-Silva, M.I.M.N., 1984, SP, Rio de Janeiro  
Schäfer-Verwimp, A., 8711, SP, Bahia

### FIELD IMAGES / ILLUSTRATIONS

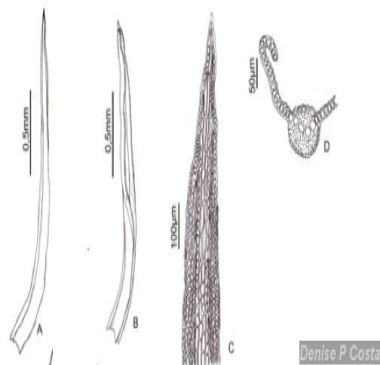


Figure 1: *Weissia breutelii* Müll. Hal.

# Weissia controversa Hedw.

## Has as synonym

heterotypic *Hymenostomum subglobosum* Nees & Hornsch.

heterotypic *Tetrapterum vernicosum* (Müll. Hal. ex G. Roth) Broth.

## DESCRIPTION

*Weissia controversa* Hedw. Sp. Musc. Frond. 67. 1801. Type: Lipsiae ad rivulum post collem Bienitz. Humo theca loca, nec non sabulosa, uda, praeprimis regionum montosarum amat, Tab. 5. B. in Hedwig 1791–1792 (B lectotype designated by Inoue & Tsubota, 2017)

Plants small, low cushions or tufts. **Stem** simple or branched, erect. Leaves short to long-lanceolate, base ovate, shoulders weak or absent, apex plane to channeled, acute, margins entire, incurved above when dry, costa single, subpercurrent to excurrent, in cross section circular to semi-circular, epidermis present, guide cells in a single row, lamina cells sub quadrate to hexagonal papillose on both surfaces, basal laminal cells oblong, smooth. **Monoicous or dioicous.** **Perichaetium** terminal. Seta twisted or erect. Capsule stegocarpic, spherical to cylindrical. Calyptra cucullate. **Spore** papillose.

## COMMENTS

**Distribution and ecology:** Widespread throughout the world. In Brazil is widespread, found in disturbed areas and forested areas, encountered in Savanna, Atlantic Rainforest and Steppe, 0–900 m, growing on soils, rocks, and tree trunks. Its occurrence in other regions and states is expected.

**Comments:** It is common in disturbed areas, preferring xeric or mesic habitats, tolerant of full shade to full sunlight, not tolerant of high moisture.

## Life Form

Cushion, foliose, Tuft

## Substrate

Corticicolous, Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Amazon Rainforest, Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Cerrado (lato sensu), Ombrophyllous Forest (Tropical Rain Forest), Mixed Ombrophyllous Forest

## Geographic Distribution

### Confirmed occurrences

North (Tocantins)

Northeast (Bahia, Pernambuco)

Central-west (Goiás)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná, Rio Grande do Sul, Santa Catarina)

## HERBARIUM MATERIAL

A.F.M. Glaziou, 5612, NY, Rio de Janeiro

Yano, O. et al., 2610, SP, Pernambuco

E. Melo et al., 2690, SP, Bahia

D. M. Vital, 6330, SP, Goiás

Ule, E., 31, R, MG, Santa Catarina  
Machado, P.S. et al., 315, CESJ, Minas Gerais  
Wasum, R., 2149, MO, Rio Grande do Sul  
Vital, D.M., 3003, SP, Tocantins  
Vital, D.M., 11157, SP, São Paulo  
Vital, D.M. et al., 11487, SP, Espírito Santo  
Ule, E., 7, NY, Paraná

### FIELD IMAGES / ILLUSTRATIONS



Figure 1: *Weissia controversa* Hedw.

# *Weissia jamaicensis* (Mitt.) Grout

## Has as synonym

basionym *Tortula jamaicensis* Mitt.

## DESCRIPTION

*Weissia jamaicensis* (Mitt.) Grout., Moss Fl. N. Amer. 1: 157. 1938. Basionym: *Tortula jamaicensis* Mitt., J. Linn. Soc. Bot. 12: 147. 1869. Type: Jamaica, Inter Marchantias, Wilds s.n. (Holotype: NY).

**Plants** median or robust, dark-green to yellow-green. **Stem** red, irregularly branched. **Leaves** linear-lanceolate, ovate to oblong, erect-flexuose to spreading, acute to apiculate; margins entire, strongly involute; costa excurrent, broad at base, in cross section with epidermal ventral cells quadrate and dorsal rounded to quadrate, guide-cells, 2 stereid bands; laminal cells quadrate above, thick-walled, mammilose to pluripapillose (4-6 papillae), basal cells rectangular, hyaline, smooth, in a V-shaped. **Autoicous**. **Seta** erect, yellow, long. **Capsules** symmetric, erect or inclined. **Calyptra** cucullate.

## COMMENTS

**Distribution and ecology:** North, Central, and South America. In Brazil is encountered in Savanna (Gallery Forest) and Atlantic Rainforest, 100–800 m, growing on roadside rocks and river banks.

**Comments:** It has similar leaves with *W. controversa*, that in the latter are smaller.

## Life Form

foliose, Tuft

## Substrate

Rupicolous, Terrestrial

## DISTRIBUTION

Native, Not endemic to Brazil

## Phytogeographic Domains

Central Brazilian Savanna, Atlantic Rainforest

## Vegetation Types

Cerrado (lato sensu), Seasonally Semideciduous Forest, Ombrophylous Forest (Tropical Rain Forest), Mixed Ombrophylous Forest

## Geographic Distribution

### Confirmed occurrences

Northeast (Bahia)

Central-west (Goiás)

Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo)

South (Paraná)

## HERBARIUM MATERIAL

Gomes, H.C.S. et al., 2127, CESJ, Minas Gerais

D. M. Vital, 11487, NY, SP, Espírito Santo

D.M. Vital, 12658, SP, Goiás

Costa, D.P. et al., 4507, RB, Rio de Janeiro

Schäfer-Verwimp, A. & Verwimp, I., 8441, RB, SP, São Paulo

Peralta, D.F., 1931, SJRP, Mato Grosso do Sul

J. Cordeiro, 1046, CEPEC, Paraná

## FIELD IMAGES / ILLUSTRATIONS

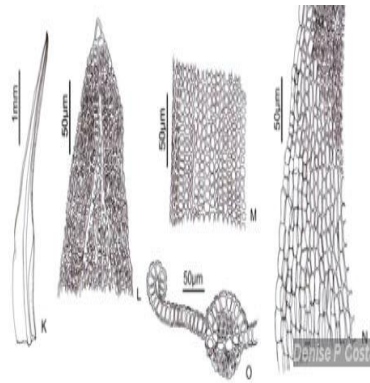


Figure 1: *Weissia jamaicensis* (Mitt.) Grout