

**Zeitschrift:** Candollea : journal international de botanique systématique = international journal of systematic botany  
**Band:** 40 (1985)  
**Heft:** 1  
  
**Artikel:** A preliminary list of the mosses of Paraguay  
**Autor:** Buck, William R.  
**DOI:** <https://doi.org/10.5169/seals-879780>

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# A preliminary list of the mosses of Paraguay

WILLIAM R. BUCK

## RÉSUMÉ

BUCK, R. (1985). Liste préliminaire des mousses du Paraguay. *Candollea* 40: 201-209. En anglais, résumés français et anglais.

Cette revue de la littérature des mousses du Paraguay nous révèle 137 taxons dans 64 genres et 35 familles. Les *nomina nuda* ne sont pas inclus. Les nouveautés de nomenclature sont *Fissidens guarani* nom. nov., *Uleastrum* nom nov., *U. paraguensis* comb. nov., *Entosthodon paraguensis* comb. nov., *Schizomitrium circinatum* comb. nov., *S. subdepressum* comb. nov., *S. torrentium* comb. nov., *Sematophyllum paraguariense* comb. nov. et *Mittenothamnium pachnocarpum* comb. nov.

## ABSTRACT

BUCK, W. R. (1985). A preliminary list of the mosses of Paraguay. *Candollea* 40: 201-209. In English, French and English abstracts.

A review of the literature on the mosses of Paraguay reveals 137 taxa in 64 genera and 35 families. *Nomina nuda* are not included. Nomenclatural novelties are *Fissidens guarani* nom. nov., *Uleastrum* nom nov., *U. paraguensis* comb. nov., *Entosthodon paraguensis* comb. nov., *Schizomitrium circinatum* comb. nov., *S. subdepressum* comb. nov., *S. torrentium* comb. nov., *Sematophyllum paraguariense* comb. nov. and *Mittenothamnium pachnocarpum* comb. nov.

## Introduction

In preparation for the treatment of the mosses for the *Flora del Paraguay*, a literature review was prepared to facilitate the identification of specimens. The moss flora of Paraguay is still very poorly known. The last major floristic treatise dealing with Paraguay was published in 1900. Only three collectors, B. Balansa, C. A. M. Lindman and T. Morong, account for all but a smattering of the published records on the Paraguayan Musci. Without doubt, many species are still to be discovered in Paraguay and many of the apparently endemic taxa will be found to be more widespread. However, as additional roads are built, the few remaining forests are rapidly being destroyed. There is, though, a well developed national park system in Paraguay and several biological reserves have been established along the reservoir formed from the dammed Río Alto Paraná by the Itaipú project. Collectors are encouraged to gather bryophytes whenever possible when traveling in Paraguay.

## Catalogue

### *Sphagnaceae*

**Sphagnum flaccidum** Besch. (BESCHERELLE, 1877).

**S. flaccidum** var. **lindmanii** (Warnst.) Warnst. (WARNSTORF, 1898; BROTHERUS, 1900, both sub *S. lindmanii* Warnst.).

**S. magellanicum** Brid. (BESCHERELLE, 1885 sub *S. paraguense* Besch., nom. nud).

*Fissidentaceae*

- Fissidens abruptus** (Broth.) Broth. ex Purs. (BROTHERUS, 1900 sub *Moenkemeyera*; PURSELL, 1979).
- F. balansaeanus** Besch. (BESCHERELLE, 1877; SALMON, 1899).
- F. brevipes** Besch. (BESCHERELLE, 1885, 1891b).
- F. glaucifrons** Besch. (BESCHERELLE, 1885, 1891b).
- F. guarani** Buck, **nom. nov.**; *F. polycarpus* (Besch.) Broth., Nat. Pfl. 1(3): 357. 1901, hom. illeg., non Hedw., Spec. Musc. 159. 1801; *Conomitrium polycarpum* Besch., J. Bot. (Morot) 5: 252. 1891 (BESCHERELLE, 1885; BESCHERELLE, 1891b sub *Conomitrium*).
- F. guarapiensis** Besch. (BESCHERELLE, 1885, 1891b; MÜLLER & STEPHANI, 1887 sub *F. stenocarpus* C. Müll., nom. nud.).
- F. hornschurchii** Mont. (BRITTON, 1892; BROTHERUS, 1900).
- F. mollis** Mitt. (BROTHERUS, 1900).
- F. paraguensis** Broth. (BROTHERUS, 1900).
- F. subcrispus** Besch. (BESCHERELLE, 1877, 1885; BRITTON, 1892).
- F. zollingeri** Mont. (BESCHERELLE, 1877 sub *F. balansaeanus* var. *limosus* Besch.; SALMON, 1899 sub *F. kegelianus* C. Müll.).

*Dicranaceae*

- Campylopus amabilis** (C. Müll.) Kindb. (BESCHERELLE, 1885; FRAHM, 1975).
- Holomitrium arboreum** Mitt. (HEGEWALD, 1978).
- H. paraguense** Besch. (BESCHERELLE, 1891a).
- Microdus crenulatus** (Broth.) Par. (BROTHERUS, 1900 sub *Dicranella*).
- M. paraguensis** Besch. (BESCHERELLE, 1885, 1891a).

*Bruchiaceae*

- Bruchia aurea** Besch. (BESCHERELLE, 1877, 1885; MÜLLER, 1888 sub *B. ligulata* C. Müll.; BROTHERUS, 1900 sub *B. acuminata* Broth. et *B. ligulata* C. Müll.; RUSHING, 1982).
- B. uruguensis** C. Müll. (BROTHERUS, 1900; RUSHING, 1982).
- Trematodon longicollis** Michx. (BROTHERUS, 1900 sub *T. squarrosus* C. Müll.).
- T. palettifolius** C. Müll. ex Besch. (BESCHERELLE, 1877, 1885).

*Calymperaceae*

- Octoblepharum albidum** Hedw. (BESCHERELLE, 1885; MÜLLER & STEPHANI, 1887; BROTHERUS, 1900).
- Syrhophodon incompletus** Schwaegr. var. **incompletus** (REESE, 1977).
- S. ligulatus** Mont. (BESCHERELLE, 1885 as *S. argentinicus* Lor. ex C. Müll.; BESCHERELLE, 1891c sub *S. paraguensis* Besch.; BROTHERUS, 1900 sub *S. anomalus* Broth.).

*Pottiaceae*

- Acaulon nanum** C. Müll. (MÜLLER, 1888).
- Astomum frucharti** (C. Müll.) Broth. (BROTHERUS, 1900).

- A. lorentzii** (C. Müll.) Par. (BESCHERELLE, 1885 sub *Sphaerangium*).
- Hymenostomum balanseanum** Besch. (BESCHERELLE, 1877, 1885; MÜLLER & STEPHANI, 1887).
- Hyophila paraguayensis** Broth. (BROTHERUS, 1900).
- Rhamphidium laetum** (C. Müll.) Broth. (BRITTON, 1892 sub *Tortula*).
- Tetrapterum recurvirostre** (C. Müll.) Broth. (MÜLLER, 1888 sub *Phascum*).
- Tortella humilis** (Hedw.) Jenn. (BESCHERELLE, 1877 sub *Barbula caespitosa* Schwaegr.; BRITTON, 1892, MÜLLER, 1897, both sub *Barbula pallido-viridis* C. Müll.; BROTHERUS, 1900 sub *Tortella caespitosa* (Schwaegr.) Limpr.).
- T. pseudo-caespitosa** (C. Müll.) Broth. (BESCHERELLE, 1885 sub *Barbula*).
- Tortula muralis** Hedw. (BRITTON, 1892 sub *Barbula muricola* C. Müll.).
- Uleastrum nom. nov.**, *Ulea* C. Müll., Hedwigia 36: 102. 1897, hom. illeg., non Schroeter, Bot. Centralbl. 50: 42. 1892.
- U. paraguayensis** (Besch.) Buck, **comb. nov.**, *Anacalypta paraguayensis* Besch., Mém. Soc. Sci. Nat. Cherbourg 21: 261. 1877 (BESCHERELLE, 1877, 1885 both sub *Anacalypta*).

#### *Gigaspermaceae*

- Lorentziella imbricata** (Mitt.) Broth. (BESCHERELLE, 1877, 1885 both sub *L. paraguayensis* Besch.; LAWTON, 1953).

#### *Ephemeraceae*

- Ephemerum conicum** C. Müll. (MÜLLER, 1879; BESCHERELLE, 1885).
- E. homomallus** C. Müll. (MÜLLER, 1888).
- E. ligulatum** C. Müll. ex Roth (MÜLLER & STEPHANI, 1887; ROTH, 1914).

#### *Funariaceae*

- Entosthodon balansae** Besch. (BESCHERELLE, 1877, 1885).
- E. paraguayensis** (Broth.) Buck, **comb. nov.**, *Funaria paraguayensis* Broth., Bih. Kongl. Svenska Vetensk.-Akad. Handl. Afd. 3, 26(7): 24. 1900 (BROTHERUS, 1900 sub *Funaria*).
- Funaria calvescens** Schwaegr. (BESCHERELLE, 1877, 1885; BROTHERUS, 1900).
- Physcomitrium cupulare** C. Müll. (BROTHERUS, 1900).
- P. luteolum** Besch. (BESCHERELLE, 1877, 1885).
- P. paraguayense** Besch. (BESCHERELLE, 1877, 1885).

#### *Bryaceae*

- Brachymerium spirale** Besch. (BESCHERELLE, 1891b).
- Bryum argenteum** Hedw. (BESCHERELLE, 1877 sub *B. argenteum* var. *corrugatum* (Hampe) Besch.; BESCHERELLE, 1885 sub *B. corrugatum* Hampe; BROTHERUS, 1900).
- B. densifolium** Brid. (BROTHERUS, 1900).
- B. paraguayense** Besch. (BESCHERELLE, 1877, 1885).
- Rhodobryum beyrichianum** (Hornsch.) C. Müll. (BROTHERUS, 1900; OCHI, 1981 both sub *Bryum*).

*Mniaceae*

**Plagiomnium rhynchophorum** (Hook.) T. Kop. (BESCHERELLE, 1877 sub *Mnium rostratum* auct., non Schrad.; KOPONEN, 1979).

*Rhizogoniaceae*

**Pyrrhobryum spiniforme** (Hedw.) Mitt. (BROTHERUS, 1900 sub *Rhizogonium*).

*Helicophyllaceae*

**Helicophyllum torquatum** (Hook.) Brid. (BROTHERUS, 1900).

*Racopilaceae*

**Racopilum tomentosum** (Hedw.) Brid. (BESCHERELLE, 1877, 1885; MÜLLER & STEPHANI, 1887; BRITTON, 1892; BROTHERUS, 1900).

*Hypopterygiaceae*

**Hypopterygium argentinicum** Lor. ex C. Müll. (BESCHERELLE, 1877, 1885).

**H. rotundo-stipulatum** C. Müll. (MÜLLER, 1897).

*Bartramiaceae*

**Philonotis ampliretis** Broth. (BROTHERUS, 1900).

**P. curvata** (Hampe) Jaeg. (BESCHERELLE, 1877, 1885 both sub *P. balansaeana* Besch.; DISMIER, 1910).

**P. glaucescens** (Hornsch.) Broth. (MÜLLER, 1897 sub *Philonotula oreadea* C. Müll.)

**P. glaucescens** var. **terrestris** (Dism.) Flow. in Grout (DISMIER, 1910 sub *P. sphaerocarpa* (Hedw.) Brid. var. *terrestris* Dism.).

**P. humilis** Brid. (DISMIER, 1910 sub *P. sphaerocarpa* var. *humilis* (Brid.) Dism.).

*Erpodiaceae*

**Aulacopilum tumidulum** Thwaites & Mitt. ex Mitt. (BESCHERELLE, 1885 sub *A. paraguense* Besch., nom. nud.; MÜLLER, 1887 sub *A. balansae* C. Müll.; BROTHERUS, 1900 sub *A. balansae* C. Müll.; CRUM, 1972).

**Erpodium beccarii** C. Müll. ex Vent. (BESCHERELLE, 1877 sub *E. paraguense* Besch.; BESCHERELLE, 1885 sub *E. lanceolatum* Besch., nom. nud.; BRITTON, 1892 sub *E. paraguense* Besch.; CRUM, 1972).

**E. biseriatum** (Aust.) Aust. (BESCHERELLE, 1885, 1891b both sub *E. exsertum* Besch.; BROTHERUS, 1900 sub *Solmsiella paraguayensis* Broth.; CRUM, 1972).

**E. coronatum** (Hook. & Wils.) Mitt. (BESCHERELLE, 1885).

**E. glaziovii** Hampe (Müller, 1887; BROTHERUS, 1900 both sub *E. balansae* C. Müll.; CRUM, 1972).

*Ptychomitriaceae*

- Ptychomitrium balansae** Besch. (BESCHERELLE, 1877).  
**P. lindmanii** (Broth.) Par. (BROTHERUS, 1900 sub *Glyphomitrium*).  
**P. subdentatum** Besch. (BESCHERELLE, 1877).  
**P. vaginatum** Besch. (BESCHERELLE, 1877, 1885).

*Orthotrichaceae*

- Macrocoma orthotrichoides** (Raddi) Wijk & Marg. (BESCHERELLE, 1877, 1885; BRITTON, 1892, all sub *Macromitrium phyllorhizans* C. Müll. ex Besch., nom. nud.; BROTHERUS, 1900 sub *Macromitrium macropyxis* Broth.; VITT, 1980).  
**Macromitrium angulicaule** C. Müll. (BROTHERUS, 1900).  
**Orthotrichum paraguense** Besch. (BESCHERELLE, 1891b).  
**Schlotheimia argentinica** Lor. ex C. Müll. (BESCHERELLE, 1885).  
**S. lindmanii** Broth. (BROTHERUS, 1900).  
**S. paraguensis** Besch. (BESCHERELLE, 1877; MÜLLER & STEPHANI, 1887; BROTHERUS, 1900).

*Hedwigiaceae*

- Braunia cirrhifolia** (Wils.) Jaeg. (BESCHERELLE, 1885 sub *B. incana* C. Müll.).

*Cryphaeaceae*

- Schoenobryum gardneri** (Mitt.) Manuel (BROTHERUS, 1900 sub *Acrocryphaea*).  
**S. julaceum** Dozy & Molk. (BESCHERELLE, 1877 sub *Acrocryphaea*).  
**S. paraguense** (Besch.) Manuel (BESCHERELLE, 1885, 1891c; FLEISCHER, 1914, all sub *Acrocryphaea*).

*Leptodontaceae*

- Forsstroemia coronata** (Mont.) Par. (BROTHERUS, 1900; FLEISCHER, 1917).  
**F. cuspidata** (C. Müll.) Broth. (MÜLLER, 1897 sub *Duseniam*; BROTHERUS, 1900; FLEISCHER, 1917).  
**F. julacea** (C. Müll.) Par. (MÜLLER, 1897 sub *Duseniam*; FLEISCHER, 1917).  
**F. occulta** (Besch.) Par. (BESCHERELLE, 1885, 1981c both sub *Lasia*).  
**F. paraguensis** (Besch.) Par. (BESCHERELLE, 1877, 1885 both sub *Lasia*).  
**F. subcoronata** (Besch.) Par. (BESCHERELLE, 1877, 1885 both sub *Lasia*).  
**F. subcoronata** var. **patens** (Besch.) Par. (BESCHERELLE, 1877 sub *Lasia subcoronata* var. *patens* Besch.).

*Meteoriaceae*

- Papillaria guarapiensis** Besch. (BESCHERELLE, 1885 sub *P. subnigrescens* Besch., nom. nud.; BESCHERELLE, 1891c).  
**P. viridata** C. Müll. ex Broth. (BROTHERUS, 1900).  
**Zelometeorium ambiguum** (Hornsch.) Manuel (MANUEL, 1977).

*Neckeraceae*

- Neckeropsis disticha** (Hedw.) Kindb. (MÜLLER, 1897 sub *Neckera balansae* C. Müll. et *N. brunnea* C. Müll.; BROTHERUS, 1900 sub *N. balansae* C. Müll.).
- N. pabstiana** (C. Müll.) Broth. (BROTHERUS, 1900 sub *Neckera*).
- N. undulata** (Hedw.) Reichdt. (BESCHERELLE, 1885, 1877; BROTHERUS, 1900 sub *Neckera*).
- N. villae-ricae** (Besch.) Broth. (BESCHERELLE, 1877 sub *Neckera*; BROTHERUS, 1900 sub *Neckera brevinervis* Broth.).
- Pinnatella geheebii** (C. Müll.) Fleisch. (BROTHERUS, 1900 sub *Porotrichum paraguayense* Broth.; KINDBERG, 1902 sub *Thamnium*).

*Hookeriaceae*

- Hookeriopsis leucomioides** (Broth.) Broth. (BROTHERUS, 1900 sub *Hookeria*).
- H. luteo-viridis** (Besch.) Broth. (BESCHERELLE, 1885, 1891c both sub *Hookeria*).
- Schizomitrium circinatum** (Broth.) Buck, **comb. nov.**, *Hookeria circinata* Broth., Bih. Kongl. Svenska Vetensk.-Akad. Handl. Afd. 3, 26(7): 35. 1900 (BROTHERUS, 1900 sub *Hookeria*).
- S. subdepressum** (Besch.) Buck, **comb. nov.**, *Hookeria subdepressa* Besch., J. Bot. (Morot) 5: 345. 1891 (BESCHERELLE, 1885, 1891c both sub *Hookeria*; MÜLLER & STEPHANI, 1887 sub *Hookeria paraguensis* C. Müll., nom. nud.; BRITTON, 1892 sub *Hookeria*; FLEISCHER, 1922 sub *Callicostella paraguensis* Fleisch., nom. nud.).
- S. torrentium** (Broth.) Buck, **comb. nov.**, *Hookeria torrentium* Broth., Bih. Kongl. Svenska Vetensk.-Akad. Handl. Afd. 3, 26(7): 34. 1900 (BROTHERUS, 1900 sub *Hookeria*).

*Thuidiaceae*

- Haplocladium microphyllum** (Hedw.) Broth. (BESCHERELLE, 1877, 1885 both sub *Pseudoleskea paraguensis* Besch.; MÜLLER & STEPHANI, 1887 sub *Hypnum subnudum* C. Müll.; BRITTON, 1892 sub *Hypnum subnudum* C. Müll.; MÜLLER, 1897 sub *Amblystegium haplocladium* C. Müll.; BROTHERUS, 1900 sub *Thuidium laterculi* (C. Müll.) Kindb.).
- Thuidium paraguense** Besch. (BESCHERELLE, 1885, 1891c; GIER, 1980).

*Brachytheciaceae*

- Rhynchostegium assumptionis** Besch. (BESCHERELLE, 1877, 1885).
- R. fissidentellum** Besch. (BESCHERELLE, 1877).
- R. lindmanii** (Broth.) Par. (BROTHERUS, 1900 sub *Hypnum*).

*Myriniaceae*

- Helicodontium capillare** (Hedw.) Jaeg. (BESCHERELLE, 1877; MÜLLER & STEPHANI, 1887 sub *Hypnum tenuirostre* C. Müll.; BRITTON, 1892 sub *Hypnum tenuirostre* var. *paraguariense* C. Müll. ex Britt., nom. nud.; BROTHERUS, 1900).
- H. pervirens** (C. Müll.) Par. (BESCHERELLE, 1885).
- H. pseudo-limnobium** (C. Müll.) Par. (BROTHERUS, 1900).

*Stereophyllaceae*

- Entodontopsis leucostega** (Brid.) Buck & Irel. (BROTHERUS, 1900 sub *Stereophyllum*).
- E. nitens** (Mitt.) Buck & Irel. (BESCHERELLE, 1885 sub *Omalia paraguensis* Besch., nom. nud.; BESCHERELLE, 1891c sub *Stereophyllum homalioides* Besch.; BUCK & IRELAND, 1985).
- Stereophyllum radiculosum** (Hook.) Mitt. (BESCHERELLE, 1877 sub *S. guarapense* Besch. et *S. paraguense* Besch.; BESCHERELLE, 1885 sub *S. guarapense* Besch.; MÜLLER & STEPHANI, 1887 sub *Hypnum turgidicaule* C. Müll.; BRITTON, 1892 sub *H. turgidicaule* C. Müll.; BROTHERUS, 1900 sub *S. lindmanii* Broth.; BUCK & IRELAND, 1985).

*Fabroniaceae*

- Dimerodontium balansae** C. Müll. ex Besch. (BESCHERELLE, 1877, 1885; MÜLLER & STEPHANI, 1887).
- Fabronia ciliaris** (Brid.) Brid. var. **polycarpa** (Hook.) Buck (BESCHERELLE, 1877 sub *F. julacea* Besch.; BESCHERELLE, 1885 sub *F. balansaeana* Besch., nom. nud. et *F. guarapiensis* Besch.; BESCHERELLE, 1891c sub *F. balansae* Besch. et *F. guarapiensis* Besch.; BUCK, 1983).

*Entodontaceae*

- Entodon argyreus** (Besch.) Broth. (BESCHERELLE, 1885, 1891c both sub *Cylindrothecium*; MÜLLER & STEPHANI, 1887; BROTHERUS, 1900).
- Erythrodontium longisetum** (Hook.) Par. (MÜLLER & STEPHANI, 1887 sub *Entodon denticulatum* C. Müll.; FLEISCHER, 1917 sub *Erythrodontium brasiliense* (Hampe) Par.).
- E. squarrosus** (Hampe) Par. (BESCHERELLE, 1877 sub *Leptohymenium squarrosus* var. *griseum* Besch.; BESCHERELLE, 1885 sub *Leptohymenium*; BROTHERUS, 1900 sub *Entodon*; FLEISCHER, 1917).

*Plagiotheciaceae*

- Plagiothecium villae-ricae** Besch. (BESCHERELLE, 1877, 1885; BRITTON, 1892).

*Sematophyllaceae*

- Sematophyllum chlorothecium** (Besch.) Broth. (BESCHERELLE, 1877, 1885 both sub *Rhaphidostegium*).
- S. circinicaule** (C. Müll.) Broth. (MÜLLER & STEPHANI, 1887 sub *Hypnum*; MÜLLER, 1897 sub *Aptychus*).
- S. fabronia** (Besch.) Buck (BESCHERELLE, 1885 sub *Pterogoniopsis*; BESCHERELLE, 1891c sub *Meiothecium*).
- S. paraguariense** (C. Müll. ex Broth.) Buck, **comb. nov.**, *Rhaphidostegium paraguariense* C. Müll. ex Broth., Bih. Kongl. Svenska Vetensk.-Akad. Handl. Afd. 3, 26(7): 44. 1900 (BROTHERUS, 1900 sub *Rhaphidostegium*).
- S. subpinnatum** (Brid.) Britt. (BESCHERELLE, 1877, 1885 both sub *Rhaphidostegium fallax* Besch. et *R. circinale* (Hampe) Besch.; BESCHERELLE, 1885 sub *R. aureolum* (Hampe) Jaeg.; BESCHERELLE, 1885, 1891c both sub *R. fusco-viride* Besch. et *R. globosum* Besch.; BRITTON, 1892 sub *R. kegelianum* (C. Müll.) Jaeg. et *Sematophyllum circinale* (Hampe) Mitt.; BROTHERUS, 1900 sub *R. kegelianum* (C. Müll.) Jaeg. et *R. circinale* (Hampe) Besch.).



*Hypnaceae*

**Isopterygium callochlorum** Broth. (BROTHERUS, 1900).

**I. exile** (C. Müll.) Par. (MÜLLER, 1897 sub *Taxicaulis*).

**I. guarapense** Besch. (BESCHERELLE, 1885, 1891c).

**I. longisetum** Broth. (BROTHERUS, 1900).

**I. subtenerum** Besch. (BESCHERELLE, 1885, 1891c).

**Mittenothamnium eurystomum** (Besch.) Card. (BESCHERELLE, 1877, 1885 both sub *Microthamnium*).

**M. humile** (Besch.) Card. (BESCHERELLE, 1877, 1885; BROTHERUS, 1900, all sub *Microthamnium*).

**M. pachnocarpum** (C. Müll. ex Broth.) Buck, **comb. nov.**, *Microthamnium pachnocarpum* C. Müll. ex Broth., Bih. Kongl. Svenska Vetensk.-Akad. Handl. Afd. 3, 26(7): 47. 1900 (BROTHERUS, 1900 sub *Microthamnium*).

**M. subcampaniforme** (Geh. & Hampe) Card. (BROTHERUS, 1900 sub *Microthamnium*).

**Vesicularia glaucinum** (Besch.) Broth. (BESCHERELLE, 1877, 1885 sub *Ectropothecium*).

**V. squamatifolia** C. Müll. (MÜLLER, 1897).

**V. vesicularis** (Schwaegr.) Broth. var. **rutilans** (Brid.) Buck (BRITTON, 1892; BROTHERUS, 1900 both sub *Ectropothecium rutilans* (Brid.) Mitt.).

*Polytrichaceae*

**Pogonatum perpussillum** (C. Müll.) Par. (MÜLLER, 1897 sub *Polytrichum*).

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