

A CATALOGUE OF SEMATOPHYLLACEAE TYPES DEPOSITED AT BRYOLOGICAL  
HERBARIUM OF THE KOMAROV BOTANICAL INSTITUTE IN ST. PETERSBURG,  
RUSSIA

КАТАЛОГ ТИПОВЫХ ОБРАЗЦОВ СЕМ. СЕМАТОПХИЛЛАЦЕАЕ  
В БРИОЛОГИЧЕСКОМ ГЕРБАРИИ БОТАНИЧЕСКОГО ИНСТИТУТА  
ИМ. В.Л. КОМАРОВА В САНКТ-ПЕТЕРБУРГЕ, РОССИЯ

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Abstract

Types are a fundamental part of good taxonomy practices. We were able to locate 38 types from the family Sematophyllaceae deposited at the Bryological Herbarium of Komarov Botanical Institute in St. Petersburg; from these, 25 are isotypes, 18 syntypes and 2 isolecotypes.

Резюме

В бриологическом гербарии Ботанического института им. В.Л. Комарова хранится одна из богатейших коллекций мхов, включающая около 300 000 образцов; коллекция типов включает примерно 450 таксонов. В настоящей статье представлены результаты проведенного исследования, связанного с поиском типового материала, имеющего отношение к сем. Sematophyllaceae. Было обнаружено 38 типовых образцов, включающих 25 изотипа, 18 синтипа и 2 изолектотипа.

KEYWORDS: bryophytes, mosses, types, Sematophyllaceae, Herbarium of Komarov Botanical Institute

INTRODUCTION

Good taxonomic practice relies largely on the correct application of plant binomial names, which depends largely on the correct identification and study of type materials. Unfortunately it is not always an easy task to find them, as they are mostly comprised of old collections, sometimes badly preserved (or even lost), and frequently found scattered across many herbaria (Câmara *et al.*, 2014a). Another problem is the lack of a comprehensive worldwide catalog of types of plant taxa. Many of the type specimens are not identified as such, and to correctly locate them often will need big effort and an exhaustive search across the herbarium collections and literature (Câmara *et al.*, 2014a, b).

Sematophyllaceae is mostly a pantropical moss family, from which so far only one species has been cited for Russia (Ignatova *et al.*, 2009). The family is one of the largest among the pleurocarps and is considered as one of the most difficult one (Buck & Tan, 1989) and avoided by most taxonomists.

Following the molecular data published by Tsubota (2001a, b), the family has been shown to comprise two

main clades. Goffinet & Buck (2004) described the new family Pylaisiadelphaceae to accommodate one of the clades. For practical reasons in this paper we consider Sematophyllaceae *sensu lato* (Sematophyllaceae + Pylaisiadelphaceae).

The Bryophyte Herbarium at the Komarov Botanical Institute (LE) in St.-Petersburg is one of the largest in Russia. Its total holdings are more than 300 000 specimens. The foundation and the history of the herbarium are connected with the Russian Academy of Sciences since 1725. The first and early collections were made by J.Ch. Buxbaum (vicinity of St.-Petersburg and Astrakhan), I.G. Gmelin, G.W. Steller and J.P. Falck (Siberia), P.S. Pallas (the Crimea), J.G. Georgi and St.P. Kraszeninnikow (vicinity of St.-Petersburg), J.A. Gleditsch (the Caucasus) and others. In the bryological herbarium of Komarov Botanical Institute are also kept collections identified by famous foreign bryologists – *e.g.*, V.F. Brotherus, S.O. Lindberg, H.W. Arnell, E.A.F. Russow, K.J.A. Müller, and also numerous collections gathered by participants of the expeditions organized by the Russian Academy of Sciences for the thorough scientific exploration of Rus-

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sia. These specimens were collected mainly by famous Russian botanists, such as, G.G. Borszczow, I.N. Gorozhankin, S.G. Navashin, A.A. Elenkin, A.A. Sapegin, R.R. Pole, V.L. Komarov and others. Recent collections of bryophytes from different regions of Russia have been also made by L.I. Savicz-Lubitzkaja, K.I. Ladyzhenskaja, Z.N. Smirnova, A.L. Abramova, I.I. Abramov, A.L. Zhukova. Due to its historical significance of this collection, many important bryologists from 1800th and 1900th (*i.e.*, V.F. Brotherus, Müller Hallensis) usually sent duplicates there. Some specimens (like Müller Hallensis's collections) were eventually destroyed during World War II (Merrill, 1943; Hiepko, 1990) and they are likely to exist only there.

At present the Herbarium of bryophytes is a part of the Laboratory of Lichenology and Bryology of Komarov Botanical Institute. In past decades the Herbarium has enriched its holding by receiving numerous collections of mosses and liverworts recently gathered in different regions of Russia: Arctic and Siberia (O.M. Afonina, I.V. Czernyadjeva, A.D. Potemkin), Russian Far East (O.M. Afonina, I.V. Czernyadjeva, E.Yu. Kuzmina), Caucasus (G.Ya. Ukrainskaya), European Russia (L.A. Volkova, G.V. Vjunova, E.O. Kuzmina, A.D. Potemkin, L.E. Kurbatova,). From the Soviet period to the present time there is an active exchange of mosses and liverworts collections with leading foreign and domestic herbaria.

Collection of bryophyte type specimens comprises about 450 taxa at LE Herbarium. Identification and selection of type samples was started in the 60s of the last century. Usually this kind of work was carried out in conjunction with the revision of some taxonomic groups of bryophytes. In this paper we list the type materials of Sematophyllaceae found during a short visit to LE. We acknowledge the possibility of the existence of more Sematophyllaceae type materials kept at Komarov Botanical Institute beyond the ones listed here, so more visits may be necessary.

#### MATERIAL AND METHODS

A recent visit to the LE herbarium has allowed me to investigate about 1 000 specimens of the family Sematophyllaceae. The TROPICOS database ([www.tropicos.org](http://www.tropicos.org)) and the Biodiversity Heritage Library ([www.biodiversitylibrary.com](http://www.biodiversitylibrary.com)) were consulted for checking the literature for types. Also the papers by Sayre (1977) and Thiers (1992) were consulted. This is not a monographic or taxonomic revision, so we do not provide any new lectotypifications, combinations or synonymizations (however, when synonymizations were already done, we provide the references). Also, when needed, some taxonomic notes are provided. Results are presented first in alphabetical order of the basionym, and the deriving combinations are presented in chronological order. We also present data on the locations of other type duplicates (when known). The sign “!” means that the voucher at LE was studied. However, when it was not possible to study the type, but

its location is certain (much information is available on line these days) we mention the acronym of the hosting herbarium without the “!”. Collector's names are presented in italics. Vouchers were also studied under light microscope to verify its correct identity and photographed, then, all studied material was put back into its original specimen envelopes. When useful information was not present in the protologue but elsewhere in the publication, it is presented in brackets ([ ]). Information from the protologue and from labels is provided separately. Both are copied as they were found in the original sources (*sic erat scriptum*). Some of the old literature is often vague and usually lacks important information for assigning the specimens as types, a challenging situation quite common in plant taxonomy.

#### RESULTS

A total of 25 isotypes, 17 syntypes, and 2 isolectotypes were found at LE for 38 names of Sematophyllaceae. Also five are Müller Hallensis's names. This is of a high importance because the original herbarium of Carl Müller of Halle in Berlin was destroyed during WWII (Merrill, 1943). The type materials at Komarov Botanical Institute may provide good specimens for the taxon lectotypification. Finally, several original materials of invalid names were also found and are presented at the end.

#### LIST OF TYPES OF SEMATOPHYLLACEAE IN LE.

1. *Acanthodium rigidum* Mitt., J. Linn. Soc., Bot. 10: 182. 1868. — *Sematophyllum rigidum* (Mitt.) Mitt., Fl. Vit. 398. 1873. — *Acanthocladium rigidum* (Mitt.) Broth., Monunia 1: 51. 1899. — *Trismegistia rigida* (Mitt.) Broth., Nat. Pflanzenfam. I (3): 1078. 1908. — *Trismegistia calderensis* var. *rigida* (Mitt.) H. Akiy., Humans and Nature 21: 11. 2010, *nom. invalid.* [illegitimate basionym]

Protologue: [Samoa]. Tutuila, on trees and rocks in gullies on the sides of the mountains (1200-1500 ft.) No 55. [Powell].

Label: Samoa, 170° Long. W. 14° Lat. S. *Rev. T. Powell no 55* (holotype: NY, isotype: LE!). Comments: According to Thiers (1992), the holotype is in NY, but we were not able to see it during our visit there.

2. *Leskea homomalla* Hampe, Icon. Musc. 6. 1844. — *Hypnum homomallum* (Hampe) Müll. Hal., Syn. Musc. Frond. 2: 336. 1851. — *Pylaisia homomalla* (Hampe) A. Jaeger, Gen. Sp. Musc. 2: 373. 1878. — *Rhaphidorrhynchum homomallum* (Hampe) Mitt., Trans. Roy. Soc. Victoria 19: 84. 1883, *comb. invalid.* [The genus was never described] — *Rhaphidostegium homomallum* (Hampe) Broth., Nat. Pflanzenfam. I (3): 1114. 789. 1908. — *Sematophyllum homomallum* (Hampe) Broth., Nat. Pflanzenfam. Ed. 2 11: 433. 738. 1925.

Protologue: ad corticem Banksia Menziessi Novae Hollandiae, prope Oppidulum Perth. Legit Dr. L. Preiss. 19. Aug. 1839.

Label: Nova Hollandia, leg Preiss 2465 (holotype: BM;

isotypes: LE!, MO, NY!). Comments: The holotype is in BM (available online), but we were not able to see it during our visit there. The original protologue does not mention the collection number (2465), but as far as we could investigate there is no other specimen that matches the protologue. The specimens at BM, MO and NY all contain such collection number and are all labeled as types.

3. *Hypnum afroacuminulatum* Müll. Hal., Bot. Jahr. Syst. 5: 88. 1884. — *Taxithelium afroacuminulatum* (Müll. Hal.) Paris, Index Bryol. 1260. 1898.

Protologue: [Dier auf der Expedition S.M.S. Gazelle von Naumann] Mungo.

Label: Mungo. Gazelle Expedition. *Naumann*, 1874. *n. sp.* (isotypes: BM!, E!, FH!, LE!). [= *Taxithelium planum* Mitt. (Câmara 2011)]. Comments: Mungo is located in nowadays Cameroon. Even lacking collecting number, all other label data and protologue data match; also the year of collection, 1874, precedes the publication year (1884), a worth noting information. TROPICOS cited the year of publication as 1883 but the correct one is 1884. The label annotation “*n.sp.*” indicates that the author consider it as a new species.

4. *Hypnum austropulchellum* Müll. Hal., Bot. Jahrb. Syst. 5: 82. 1883. — *Plagiothecium austropulchellum* (Müll. Hal.) Kindb., Enum. Bryin. Exot., suppl. 2, 102. 1891. — *Isopterygium austropulchellum* (Müll. Hal.) Broth., Nat. Pflanzenfam. I (3): 1081. 1908.

Protologue: [Dier auf der Expedition S.M.S. Gazelle von Naumann] Kerguelen.

Label: Kerguelen, Gazelle Expedition. *Naumann* 1874. *n.sp.* (isotype: LE!). Comments: Even lacking collecting number, all other data label and protologue data match, also the collecting year, 1874, which precedes the publication year (1884) is worth noting. TROPICOS cited the year of publication as 1883, but the correct one is 1884.

5. *Hypnum bruchii* Dozy & Molk., Ann. Sci. Nat. Bot. sér. 3. 2: 306. 1844. — *Sematophyllum bruchii* (Dozy & Molk.) A. Jaeger, Gen. Sp. Musc. 2: 446. 1878. — *Trichosteleum bruchii* (Dozy & Molk.) Broth., Nat. Pflanzenfam. I (3): 1119. 1908. — *Rhaphidostichum bruchii* (Dozy & Molk.) M. Fleisch., Musci Buitenzorg 4: 1312. 1923. — *Papillidiopsis bruchii* (Dozy & Molk.) W.R. Buck & B.C. Tan, Acta Bryol. Asiat. 1: 12. 1989.

Protologue: [In the introduction of this paper (Musci Frondosi ex Archipelago Indico et Japonia) it is said that the collections from Sumatra were made by either *Blume*, *Kuhl* et *Van Hasselt*, *Zippelio*, *Korthals* or *Forten*]. Sumatra.

Label: Sumatra, *Korthals* (isotypes: LE!, NY!). Comments: As Dozy and Molkenboer's herbaria are located in the Netherlands, types for this name was expected to be found at L or U, but according to Câmara *et al.* (2014) there are none in either. Also as is often the case with very old references there is always some relevant data missing, but this specimen at LE is, to the best of our

knowledge, a duplicate of the type.

6. *Hypnum chlorosum* Hampe, Flora 64: 414. 1881. — *Isopterygium chlorosum* (Hampe) Paris, Index Bryol. 706. 1897.

Protologue: [Brazil]. Prope Rio de Janeiro, *Glaziou* (11733).

Label: Brasilia, A. *Glaziou* 11733 (types: BM!, LE!, PC!; in LE is isotype; leptotypification is discussed by Costa *et al.* 2016, submitted to *Taxon*, in press)<sup>1</sup>.

7. *Hypnum nepalense* Schwägr., Sp. Musc. Frond., suppl. 3, 1 (2): 226. 1828. — *Stereodon nepalensis* (Schwägr.) Mitt., J. Proc. Linn. Soc., Bot., Suppl. 2: 100. 1859. — *Trichosteleum nepalense* (Schwägr.) A. Jaeger, Gen. Sp. Musc. 2. 1878. — *Taxithelium nepalense* (Schwägr.) Broth., Monsunia 1: 51. 1899.

Protologue: In regno Nepal, ad terra lectum dedit *Pr. Hooker*.

Label: Nepal, *Hooker* (holotype: G!, isotypes: BM!, G!, LE!). Comments: As is often the case with old literature, both the protologue and label are quite vague, but they do match. We consider this very likely to be an isotype.

8. *Hypnum pulvinale* Hampe, Vidensk. Meddel. Dansk Naturhist. Foren. Kjöbenhavn. Ser 3, 10: 271. 1878. — *Rhaphidostegium pulvinale* (Hampe) A. Jaeger, Gen. Sp. Musc. 2: 775. 1880. — *Sematophyllum pulvinale* (Hampe) W.R. Buck, Nova Hedwigia 66: 242. 1998.

Protologue: [Brazil, vicinias urbis Rio de Janeiro, lecti *Dr. A. Glaziou*] in terra sub 7450.

Label: Brasilia, A. *Glaziou n.* 7450 (types: BM!, LE!, PC!; in LE is isotype; leptotypification is discussed by Costa *et al.* 2016, submitted to *Taxon*, in press)<sup>1</sup>.

9. *Hypnum pseudotanytrichum* Dozy & Molk., Bryol. Jav. 2: 150. 248. 1866. — *Sematophyllum pseudotanytrichum* (Dozy & Molk.) Paris, Index Bryol. Suppl. 307. 1900. — *Acanthocladium pseudotanytrichum* (Dozy & Molk.) Broth., Index Bryol., ed. 2, 1: 2. 1903.

Protologue: [Indonesia] Habitat insulam Javae; in m. Gedé. *Van Gesker*; in sylvis supreme m. Mandalawangi m. Apr. c. fructu, *Junghuhn*. — Label: Java, *Junghuhn* (syntype: LE!). Comments: According to Câmara *et al.* (2014), no type material for this name was found at the Netherlands Herbaria (L or U), the house of Dozy & Molkenboer's collections. The syntype, *Van Gesker s.n.*, was also not found at LE.

10. *Hypnum restitutum* Hampe, Vidensk. Meddel. Dansk Naturhist. Foren. Kjöbenhavn. ser. 4, 1: 141. 1879. — *Isopterygium restitutum* (Hampe) Kindb., Enum. Bryin. Exot., suppl. 2, 100. 1891. — *Sematophyllum restitutum* (Hampe) Paris, Index Bryol. 1169. 1898.

Protologue: [Brazil]. In vicinia Rio de Janeiro sub Nr. 7163 et 7455 intermixtum parce legit *Glaziou*.

Label: Brasilia, A. *Glaziou* 7455 (syntypes: BM!, PC,

1 – Preliminary reference: Costa, D.P., Peralta, D.F., Carvalho-Silva, M. & Câmara, P.E.A.S. [2016]. Types of moss names introduced by Ernst Hampe based on Glaziou's collections from Brazil. – *Taxon*.

LE!). Comments: The syntype, *Glaziou 7163*, was not found at LE.

11. *Hypnum sphaerotheca* Müll. Hal., Syn. Musc. Frond. 2: 333. 1851. — *Rhaphidostegium sphaerotheca* (Müll. Hal.) A. Jaeger, Gen. Sp. Musc. 2: 458. 1878. — *Rhynchostegium sphaerotheca* (Müll. Hal.) Dixon & A. Gepp, Bull. Misc. Inform. Kew. 1923: 216. 1923. — *Sematophyllum caespitosum* fo. *sphaerotheca* (Müll. Hal.) P. de la Varde, Mém. Soc. Sci. Nat. Math. Cherbourg. 1: 210. 1936. — *Sematophyllum sphaerotheca* (Müll. Hal.) P. de la Varde, Arch. Bot. (Forlè) 1(3): 121. 1938. Invalid.

Protologue: [South Africa] Prom. B. spei: Pappe, *Zeyher*; ad cataractam m. tabularis et inter saxa ad cataractam m. diabolic orientalis, 12 Sept. 1824: *Ecklon*; ad Hangklipp primi leg. *Mundt et Maire* 1821.

Label: Prom. Bonae Spei leg. *Ecklon s.n.* (syntype: LE!).

12. *Hypnum tanytrichum* Mont., Ann. Sci. Nat., Bot., sér. 3, 4: 88. 1845. — *Stereodon tanytrichus* (Mont.) Mitt., J. Proc. Linn. Soc., Bot., Suppl. 2, 112: 157. 1859. — *Hylocomium tanytrichum* (Mont.) A. Jaeger, Gen. Sp. Musc. 2: 616. 1880. — *Sematophyllum tanytrichum* (Mont.) Paris, Index Bryol., Suppl. 308. 1900. — *Acanthocladium tanytrichum* (Mont.) Broth., Index Bryol., ed. 2, 1: 3. 1903. — *Wijkia tanytricha* (Mont.) H.A. Crum, Bryologist 74: 174. 1971.

Protologue: [Indonesia]. Hab. Java insula cum *Leskea straminea*. Herb. Webb. *Zollinger*. Coll. N° 1737.

Label: Patria Javanica a cl. *Zollinger* lecta. No 1737 (holotype: PC, isotype: LE!). Comments: The holotype is in PC (available online), but we were not able to see it during our visit there.

13. *Hypnum tequendamense* Hampe, Linnaea 31: 529. 1862. — *Sematophyllum tequendamense* (Hampe) Mitt., J. Linn. Soc., Bot. 12: 491. 1869. — *Rhaphidostegium tequendamense* (Hampe) A. Jaeger, Gen. Sp. Musc. 2: 749. 1878.

Protologue: [the title of the original paper is *Species novas muscorum ad Dr. Alexandre Lindigio in Nova-Granada mensibus Julio et Augusto a 1861 collectus*] Nova-Granada, Tequendama ad arbores, alt. 2500 metr. Aug. 1861, sub no 2153.

Label: Nova Granada, n. 2153. *Lindig.* (holotype: BM!, isotypes: LE!, NY!).

14. *Hypnum trachyamphorum* Müll. Hal., Bot. Jahrb. Syst. 5: 85. 1883. — *Trichosteleum trachyamphorum* (Müll. Hal.) Kindb., Enum. Bryin. Exot., suppl. 2, 104. 1891.

Protologue: [original paper is entitled *Die auf der Expedition S.M.S. Gazelle von Dr. Naumann gesammelte Laubmoose*]. Nova Hannovera et insula Anachoretas.

Label: Nova Hannovera, Gazelle Expedition, *D. Naumann.* (isotype: LE!).

15. *Isopterygium andamanicum* Gangulee, Mosses E. India 8: 1953. f. 1002. 1980.

Protologue: Typus lectus a E.H. Man in Andamania (Port Blair), anni 1893, et positus in Bryotheca E. Levier in BM sub numero 2477.

Label: Bryotheca E. Levier, in insula Andaman merid. Port Blair, 1893, legit *E.H. Man* determ. C. Mueller sub no 2477 (holotype: BM, isotype: LE!). Comments: the holotype is at BM, unfortunately we were not able to study it during our visit to BM (possible was on loan), but the curators later provided a picture of the specimen (and its label) confirming it is housed there. Concerning the number 2477, it is believed that it is not the collecting number, but a Bryotheca Levier's number. This can be inferred both by the protologue as well as from the labels. The number 2477 was never associated with the collector's name, but with the collection's name. In the label, there is a space for the collector's number after a coma, but it is empty (there is no number after Man's name). So we are considering the voucher as *Man s.n.* (and 2477 as an herbarium number). There are also some specimens housed in Paris (PC) that match the name, collector and collecting year, but differ from the Bryotheca Levier's number, so we are not considering them as types. Also the presence of "*nov. sp.*" on the label indicates that the author intended it to be a new species.

16. *Isopterygium affusum* Mitt. J. Linn. Soc., Bot. 12: 499. 1869.

Protologue: Hab. Fl. Negro, ad rupes cataractae riv. Tarumá irroratas, inter *Selaginellas*, *Spruce*, n. 1059; Brasilia, Sierra de Araripe, prov. Ceara, *Gardner*, n. 106 c.

Label: *SPRUCE*. Musci Amazonici et Andini. No. 1059. (isotype: LE!).

17. *Macrohymenium laeve* Thwaites & Mitt., J. Linn. Soc., Bot. 13: 317. 1873. — *Regmatodon laevis* (Thwaites & Mitt.) Paris, Index Bryol. 1109. 1898.

Protologue: Hab. Ins. Ceylon, *Dr. Thwaites*.

Label: C.M. Central Province, Ceylon *Thwaites* (holotype: NY!; isotype: LE!). Comments: The original protologue does not cite any number, however, Thiers (1992) considered the type as *Thwaites 236*. The label at L also presents the same number (236) but not clearly associated with the collector.

18. *Meiothecium negrense* Spruce ex Mitt., J. Linn. Soc., Bot. 12: 471. 1869. — *Pterogoniella negrensis* (Spruce ex Mitt.) A. Jaeger ex Paris, Index Bryol. 1047. 1898. — *Sematophyllum negrense* (Spruce ex Mitt.) W.R. Buck, Contr. Univ. Michigan Herb. 15: 139. 1982.

Protologue: Hab. Fl. Negro, S. Carlos in *Artocarpus incisa* radicibus, *Spruce* n. 969; Uanauaca, ad arborum radices, *Spruce* n. 970. Andes Peruviaae, Tarapoto, *Spruce*. Andres Quitenses, *Jameson*.

Label: *SPRUCE*, Musci Amazonici et Andini. No 970 (lectotype, designated by Florschuetz-de-Waard (1992) NY!, isolectotypes: LE!, NY!). [= *Potamium deceptivum* Mitt. (Florschuetz-de-Waard, 1992)].

19. *Meiothecium bogoriense* M. Fleisch., Musci Buitenzorg 4: 1228. 201 f. 1–3. 1923.

Protologue: Exs. M Fleischer, M. Archipel. Ind. No 240 (1902).

Label: Musci Frond. Archipelagi Indici. 240. 1902.

West Java: In Buitenzorg and Alleebaumen im botanischen Garten und Umgebund 270m (isotype: LE!). Comments: The label states it as *n. sp.* (New Species). Comments: The protologue and label match but is not clear who is the collector as only the exsicatae information is mentioned.

20. *Meiothecium scabriusculum* var. *patens* Besch., Ann. Sci. Nat., Bot., sér. 6, 3: 226. 1876. — *Pterogoniella patens* (Besch.) Schimp. ex Paris, Index Bryol. 1048. 1898.

Protologue: Martinique, sur les arbres, camp Balata, 450m altit. (*HUSNOT*, exsicc., n° 172).

Label: *Husnot*. pl. des Antilles- 1868, 172. Les Camps Balata. Alt. 450m (holotype: BM, isotype: LE!). Comments: The holotype is in BM (available online), but we were not able to see it during our visit there.

21. *Plagiothecium flaviusculum* Müll. Hal., Hedwigia 40: 59. 1901. — *Isopterygium flaviusculum* (Müll. Hal.) Broth., Nat. Pflanzenfam. I (3): 1082. 1908.

Protologue: Brasilia, Rio de Janeiro, Restinga de Mauá, in sylvia palustri, Aug. 1897: *E. Ule*, Coll. No 1941.

Label: *E. Ule*. Bryotheca Brasiliensis 234. Rio de Janeiro, Mauá, in silva solo paludoso, Aug. 1897. Leg. *E. Ule*. (isotypes: BM, JE, LE!, MO!, NY, PC). Comments: Ernst Ule's collections frequently have two numbers associated, one is his collecting number and another one is his Bryotheca Brasiliensis number, in this case, only his Bryotheca number is present. The expression "n. sp." is also printed on the label indicates the original intention of it being a new species. The specimens at BM, JE, MO, NY and PC are all available online, have all been annotated as types and contains exactly the same label and numbers as the one in LE.

22. *Plagiothecium villae-ricae* Besch., Mém. Soc. Sci. Nat. Math. Cherbourg 21: 271. 1877.

Protologue: [Note sur les Mousses du Paraguay. Recoletés par M. Balansa]. Villa-Rica 1210.

Label: Paraguay, Guairá, Villa Rica, *Balansa* 1210. [= *Isopterygium tenerifolium* Mitt. (Buck & Ireland, 1989)]. Comments: According to Buck & Ireland (1989) the holotype is at BM and isotype in NY, but we were not able to see it during our visit to those herbaria.

23. *Pterogoniella diversifolia* Renault & Cardot, Bull. Soc. Roy. Bot. Belgique 29 (1): 179. 1890. — *Meiothecium diversifolium* (Renault & Cardot) Broth., Nat. Pflanzenfam. I (3): 1103. 1908.

Protologue: Hab. Madagascar: Tamatave (comm. *Rodriguez*), Ste-Marie (*Arbogast*), ad cortices arborum.

Label: Musci Mascareno-Madagascarienses. Sta. Marie de Madagascar. Leg. *Rev. Arbogast* (syntype: LE!). Comments: the syntype from Tatamave was not found. It is written on the label "*n. sp.*" indicating that the author intended it to be a new species.

24. *Potamium deceptivum* Mitt., J. Linn. Soc., Bot. 12: 473. 1869. — *Pterogoniella deceptiva* (Mitt.) A. Jaeger ex Paris, Index Bryol. 1046. 1898. — *Colobodon-*

*tium deceptivum* (Mitt.) J. Florsch., Fl. Guianas, Ser. C, Bryoph. 2 (Musci IV): 353. 2011.

Protologue: Hab. Fl. Casiquiari, *Spruce*, n. 821, 825; fl. Negro; fl. Uaupés, in rupibus inundatis; ad Panuré, *Spruce*, n. 822; fl. Uaupés, secus ostia frequens in truncis inundates, *Spruce*, N. 823; San Carlos, in truncis inundates, *Spruce*, n. 824.

Label: *SPRUCE*. Musci Amazonici et Andini. No 824 (syntypes: BM!, LE!, NY!).

25. *Potamium pacimoniense* Spruce ex Mitt., J. Linn. Soc., Bot. 12: 474. 1869. — *Pterogoniella pacimoniensis* (Spruce ex Mitt.) A. Jaeger, Index Bryol. 1048. 1898. — *Sematophyllum pacimoniense* (Mitt.) J. Florsch., Trop. Bryol. 3: 96. 1990 [1Dec].

Protologue: Hab. Fl. Negro, in truncis inundates ad S. Carlos, *Spruce*, n. 828; ad fl. Pacimoni necnon ad ejus tributarium Uaiuaca, in ramis inundates vulgare, *Spruce*, n. 829; S. Gabriel, in truncis inundates, *Spruce*, n. 830.

Label: *SPRUCE*. Musci Amazonici et Andini. No 829 (lectotype: NY! designated by Florschütz-de Waard (1992), isolectotypes: BM!, LE!, W!).

26. *Rhaphidostegium perrevolutum* Broth., Bot. Jahrb. Syst. 20: 206. 1894. — *Sematophyllum perrevolutum* (Broth.) Broth., Nat. Pflanzenfam., 11: 431. 1925.

Protologue: [Uganda]. Bukoka, auf Bäumen (*Stuhlmann* n. 1604).

Label: Bukoka, *Stuhlmann* 1604 (isotype: LE!).

27. *Sematophyllum inundatum* Mitt., J. Linn. Soc., Bot. 12: A494. 1869. — *Hypnum inundatum* (Mitt.) Müll. Hal., Linnaea 39: 466. 1875, *nom. illeg.* [later homonym]. *Trichosteleum inundatum* (Mitt.) A. Jaeger, Gen. Sp. Musc. 2: 485. 1878.

Protologue: Hab. Fl. Negro, ad fl. Casiquiari, *Spruce*, n. 921; Marabitanas, n. 922, secus ostia fl. Uaupés, in truncis inundates, n. 925, Uaiuáca ad radices praecipue *Citri aurantiae*, n. 926, in ripis inundates ad saxa, n. 927, ibidem terrestre, n. 928, S. Gabriel ad rupis inundates, n. 929, 930, in terra arenosa fl. Uaupés inundata, n. 931, S. Carlos in lignis, n. 905, S. Gabriel in lignis, n. 906.

Label: Rio Negro, leg. *Spruce* 925, 931 (syntypes: BM!, LE!, NY!-slide). Comments: The voucher at LE contains the two syntypes glued side by side on the same sheet.

28. *Sematophyllum monostictum* Thwaites & Mitt., J. Linn. Soc., Bot. 13: 318. 1873. — *Rhaphidostegium monostictum* (Thwaites & Mitt.) A. Jaeger, Gen. Sp. Musc. 2: 474. 1878. — *Trichosteleum monostictum* (Thwaites & Mitt.) Broth., Rec. Bot. Surv. India 1 (12): 326. 1899.

Protologue: Insl. Ceylon, *Dr. Thwaites*.

Label: C.M. Central Province, Ceylon. *Thwaites* (holotype: NY!, isotype: LE!). Comments: The original protologue does not cite any number, however, Thiers (1992) considered the type as *Thwaites* 223. The label at L also presents the same number (223) but not clearly associated with the collector.

29. *Sematophyllum oblique-rostratum* Mitt., J. Linn. Soc., Bot. 12: 490. 1869. — *Rhaphidostegium oblique-rostratum* (Mitt.) A. Jaeger, Gen. Sp. Musc. 2: 472. 1878. — *Rhaphidorrhynchium oblique-rostratum* (Mitt.) Broth., Nat. Pflanzenfam., ed. 2, 11: 428. 1925.

Protologue: Hab. Andes Quitenses, Chimborazo, Jameson; fl. Pastaza, secus ostia rivuli Verde dicti (4000 ped.), *Spruce* n. 1001; in monte Tunguragua, in lignis (7000 ped), *Spruce*, n. 1002; in sylva Canelos (4000 ped.), *Spruce*, n. 1003.

Label: *SPRUCE*. Musci Amazonici et Andini No. 1002 (syntype: NY!, LE!). Andes Quito, *Spruce* 1003 (syntype: NY!, LE!). Comments: There are two duplicates of *Spruce* 1003 at LE.

30. *Sematophyllum ramulinum* Thwaites & Mitt., J. Linn. Soc., Bot. 13: 319. 1873. — *Rhaphidostegium ramulinum* (Thwaites & Mitt.) A. Jaeger, Gen. Sp. Musc. 2: 473. 1878. — *Trichosteleum ramulinum* (Thwaites & Mitt.) Broth., Nat. Pflanzenfam. I (3): 1119. 1908. — *Rhaphidostichum ramulinum* (Thwaites & Mitt.) Broth., Natur. Pflanzenfam. 11: 435. 1925. — *Papillidiopsis ramulina* (Thwaites & Mitt.) W.R. Buck & B.C. Tan, Acta Bryolichenol. Asiat. 1: 13. 1989.

Protologue: Hab. Ins. Ceylon, *Dr. Thwaites*.

Label: C.M. Central Province, Ceylon, *Thwaites* (holotype: NY!, isotype: LE!) Comments: The original protologue does not cite any number, however, Thiers (1992) considered the type as *Thwaites* 244. The label at L also presents the same number (244) but not clearly associated with the collector.

31. *Sematophyllum ruficaule* Thwaites & Mitt., J. Linn. Soc., Bot. 13: 319. 1873. — *Rhaphidostegium ruficaule* (Thwaites & Mitt.) A. Jaeger, Gen. Sp. Musc. 2: 474. 1878. — *Clastobryophilum ruficaule* (Thwaites & Mitt.) M. Fleisch., Nova Guinea 12(3): 121. 1914, *nom. invalid.* [The genus was properly described only in 1923]. — *Clastobryella ruficaulis* (Thwaites & Mitt.) M. Fleisch., Musci Buitenzorg 4: 1199. 1923. — *Acroporium ruficaule* (Thwaites & Mitt.) Dixon, Bull. Torrey Bot. Club. 51: 250. 1924. — *Clastobryum ruficaule* (Thwaites & Mitt.) Tixier, Rev. Bryol. Lichénol. 43: 451. 1977. — *Trichosteleum ruficaule* (Thwaites & Mitt.) B.C. Tan, J. Hattori Bot. Lab. 70: 101. 1991.

Protologue: Hab. Insl. Ceylon, *Dr. Thwaites*.

Label: C.M. Central Province, Ceylon, *Thwaites* (holotype: NY!, isotype: LE!). Comments: The original protologue does not cite any number, however, Thiers (1992) considered the type as *Thwaites* 226. The label at L also presents the same number (226) but not clearly associated with the collector.

32. *Stereodon penicillatus* Mitt., J. Proc. Linn. Soc., Bot., Suppl. 2: 112. 1859. — *Eurhynchium penicillatum* (Mitt.) A. Jaeger, Gen. Sp. Musc. 2: 412. 1878. — *Hylacomium penicillatum* (Mitt.) A. Jaeger, Gen. Sp. Musc. 2: 616. 1880. — *Acanthocladium penicillatum* (Mitt.) Broth., Nat. Pflanzenfam I (3): 1076. 1908. — *Wijkia*

*penicillata* (Mitt.) H.A. Crum, Bryologist 74: 173. 1971.

Protologue: Hab. In Himalayae orient. Reg. temp., Sikkim, *J.D. Hooker* (No 778, 1035, 1040, 1074).

Label: Sikkim Himal. N. 1040 *J.D.H.* (syntype: NY!, LE!); Sikkim regions, coll. *J.D.H.* 1035 (syntype: NY!, LE!); Sikkim, Regio temp. Coll. *J.D.H.* 1074 (syntype: NY!, LE!). Comments: The abbreviation J.D.H stands for Joseph Dalton Hooker. There are two duplicates of *J.H.D.* 1040 in LE.

33. *Stereodon russulus* Mitt., J. Proc. Linn. Soc., Bot., Suppl. 1: 94. 1859. — *Platygyrium russulum* (Mitt.) A. Jaeger, Gen. Sp. Musc. 2: 342. 1878. — *Clastobryum russulum* (Mitt.) Broth., Hedwigia 50: 137. 1910. — *Gammiella russula* (Mitt.) M. Fleisch., Nova Guinea 12 (2): 121. 1914.

Protologue: Hab. In Himalayae orient., ad Sikkim, et Nepal orient. Reg. temp., *J.D. Hooker* ! (No 763, 767).

Label: Sikkim Regio Temp. Coll. *J.D.H.* 763 (syntype: LE!, NY). Comments: The abbreviation J.D.H stands for Joseph Dalton Hooker. The syntype, *Hooker* 767, was not found.

34. *Stereodon tristiculus* Mitt., J. Proc. Linn. Soc., Bot., Suppl. 2: 102. 1859. — *Rhaphidostegium tristiculum* (Mitt.) A. Jaeger, Gen. Sp. Musc. 2: 458. 1878. — *Sematophyllum tristiculum* (Mitt.) M. Fleisch., Musci Buitenzorg. 4: 1262. 1923. — *Sematophyllum subpinna-tum* fo. *tristiculum* (Mitt.) B.C. Tan & Y. Jia, J. Hattori Bot. Lab. 86: 51. 1999.

Protologue: Hab. In Mont. Khasian. Reg. temp. *J.D. Hooker et T. Thomson* (No 1087). In Assam superior, *Griffith* ! In Ceylon, *Gardner* (No 1034).

Label: Herb. Ind. Or. *Hook. fil. T. Thomson*. Hab. Ceylon, Regio. Coll. *Gardner* 1034 (syntype: LE!, NY!). Comments: The syntype, *Hooker & Thomson* 1087, was not found.

35. *Syringothecium sprucei* Mitt., J. Linn. Soc., Bot. 12: 497. 1869. — *Isopterygium sprucei* (Mitt.) W.R. Buck, Bryologist 92: 529. 1989.

Protologue: Hab. Andes Quitenses, in sylva Canelos (3000 ped.), *Spruce* n. 1517.

Label: Andes Quito, n. 1517, *Spruce*, in Sylva Canelos 3000 ped. (holotype: NY, isotypes: LE!, NY!).

36. *Taxithelium novae-guineae* Dixon, Farlowia 1: 39. 1943.

Protologue: New Guinea Britannica, Kanosia, on stilt roots of *Rhizophora* in swamp, 22 Feb. 1935; coll. *C.E. Carr* 11470.

Label: Nova Guinea Britannica, Kanosia, in paludosis, coriticicola, skiophila, ca. 0m. leg. *C.E. Carr* (11470) II. 1935 (holotype: BM!, isotypes: BR!, CANB!, DUKE!, FH!, H!, JE!, L!, LE!, M!, MICH!, NICH!, PC!, S!, SING!, US!, W!). [= *Taxithelium leptosigmatum* (Müll. Hal ex Geh.) Paris (Câmara 2011)].

37. *Trichosteleum kaernbachii* Broth., Bot. Jahrb. Syst. 17: 480. 1893. — *Taxithelium kaernbachii* (Broth.) Broth., Nat. Pflanzenfam. I (3): 1091. 1908.

Protologue: Nova Guinea, Gogolexpedition (*L. Kaernbach*).

Label: D. N. Guinea, *L. Kaernbach*. Gogolexpedition (isotypes: BM!, FH!, LE!). Comments: The annotation “n. sp.” present in the label suggests that the author considered it as a new species.

## DOUBTFUL MATERIALS

1. *Hypnum propinquum* Harv., Icon. Pl. 1: pl. 24: f. 9. 1837. — *Stereodon propinquus* (Harv.) Mitt., J. Proc. Linn. Soc., Bot., Suppl. 1: 96. 1859. — *Brotherella propinqua* (Harv.) M. Fleisch., Musci Buitenzorg 4: 1245. 1923. — *Pylaisiadelpha propinqua* (Harv.) W.R. Buck, Yushania 1(2): 13. 1984.

Protologue: [Nepal, from Harvey].

Label: [Nepal] *Hooker* (1836) (holotype: BM, isotypes: E, LE!). Comments: The holotype should be at BM (not found), there is a possible isotype at E (available online). This is a particularly difficult situation, as the protologue contains virtually no description and only a very simple illustration (it needs to be double checked with data from Companion to the Botanical Magazine that seems to have never been published). The specimen at LE contains a year that would match, but instead of Harvey it says Hooker, however, the original paper illustration was based on collections that belonged to Harvey but not necessarily made by him; on the other hand, Hooker is known to have been collecting in Nepal. So there is a possibility that this would be an isotype.

2. *Rhaphidostegium pseudobrachythecium* Broth., Bot. Jahrb. Syst. 24: 276. 1897. — *Hypnum pseudobrachythecium* (Broth.) Paris, Index Bryol. 671. 1897. — *Rhaphidorrhynchium pseudobrachythecium* (Broth.) Broth., Nat. Pflanzenfam. (ed. 2) 11:426. 1925.

Protologue: Kamerun: auf faulendem Holz bei Ekundu N'dene (*Dusén*).

Label: Africa Occid. Caremunia, March 1892. *P. Dusén* (isotype: LE!). Comments: the year is compatible and the information on protologue matches the label, unfortunately the label does not cite more precisely the locality.

## ORIGINAL MATERIAL

1. *Isopterygium argyroleucon* Renaud & Cardot, Index Bryol. 705. 1897. Invalid name for not presenting a description.

2. *Isopterygium constrictum* Broth., Gard. Bull. Straits Settlement. 4: 33. 1926. Invalid name for not presenting a description.

3. *Hypnum orthocarpon* Hornsch. ex Müll. Hal., Syn. Musc. Frond. 2: 253. 1851. Invalid name for being a later homonym.

4. *Trichosteleum wrayi* Broth., Gard. Bull. Straits Settlement. 4: 38. 1926. Invalid name for being cited as synonym with no description.

## ACKNOWLEDGEMENTS

The Brazilian author thanks CNPQ and FAP-DF for providing funds and support for this study as part of the REFLORA program. We thank also Dr. M. S. Ignatov for his support, useful suggestions and help in the execution of this work.

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