

***Osculatia* – an earlier name for a segregate of *Bryum* (Bryaceae, Bryophyta)**

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Abstract: *Gemmabryum* J.R.Spence & H.P.Ramsay is considered to be congeneric with two monotypic South American moss genera, *Neobryum* R.S.Williams and *Osculatia* De Not., of which the latter has priority. It is the earliest available generic name for one of the largest segregates of the broadly conceived genus *Bryum* Hedw. which consists of some 44 species disposed in three sections that have a worldwide distribution. Traditionally, they were all placed in *Bryum* or *Brachymenium* Schwägr. and the relevant transfers to *Osculatia* are effected in the present account.

Key words: bryophytes, *Gemmabryum*, moss taxonomy, Musci, new combinations, nomenclature, South America

Introduction

Along with *Mnium* Hedw., *Phascum* Hedw., *Splachnum* Hedw., *Sphagnum* L. and *Hypnum* Hedw., *Bryum* Hedw. is a generic name known from antiquity. It comes from a Greek designation for moss which was used by Dioscorides for some cryptogams and subsequently applied by Dillenius (1741) to this genus and its relatives. It was the largest moss genus recognised by this author who placed in it some 83 species which were given polynomial names. The name *Bryum* was widely used in all botanical works in the eighteenth century and it was accepted by Linnaeus (1753) in his *Species plantarum*, an opus which for nearly 160 years served as a starting point for the nomenclature of mosses. It was changed at the Third International Botanical Congress, held in 1910 in Brussels, when Hedwig's (1801) *Species muscorum frondosorum* was accepted as a new starting point for Musci (except Sphagnaceae) (Briquet 1912).

Hedwig (1801) validated the generic name *Bryum* and published 11 binomials for various species which are considered to be only distantly related in modern classifications of mosses. In the subsequent four decades *Bryum* served as an all-encompassing genus in which various acrocarpous species had been placed, often not having much in common with this genus in its present circumscription. Conversely, for some species which have later been considered to be incontestable members of *Bryum*, separate genera had been established, including *Ptychostomum* Hornsch. (Hornschuch 1822) and *Cladodium* Brid. and *Hemisynapsium* Brid. (Bridel 1826) but they have not gained acceptance and have fallen into obsolescence.

The first attempt to refine the concept of the genus *Bryum* was undertaken by Bruch *et al.* (1839) in *Bryologia europaea*, but in its species composition it corresponded rather to the family Bryaceae in its widely accepted circumscription. The modern concept of *Bryum* was outlined by Schimper (1856) in *Corollarium Bryologiae europaeae* and developed in his *Synopsis muscorum europaeorum* (Schimper 1860). It was generally accepted by bryologists, with some minor modifications in subsequent decades when some species placed in this genus were split off into separate small genera, including *Anomobryum* Schimp. (Schimper 1860), *Epipterygium* Lindb. and *Plagiobryum* Lindb. (Lindberg 1863), *Argyro-bryum* Hampe (Hampe 1876), *Argyrobryum* (Müll.Hal.) Kindb. (Kindberg 1882, 1883) and *Rhodobryum* (Schimp.) Limpr. (Limpricht 1892). Most of these segregates have gained wide acceptance and have been universally used in Floras, checklists and catalogues of mosses.

In its traditional circumscription *Bryum* is one of the largest and morphologically diverse of moss genera. Brotherus (1924) included in it about 800 species distributed worldwide but this number has been significantly reduced as a result of revisionary taxonomic studies. Nonetheless, there exists a remarkable discrepancy among various researchers regarding the current number of *Bryum* species. Ochi (1992) stated that approximately 150 species are still residual in this genus, whilst according to Spence's (2014) calculations this number is about twice as large.

As is the case with many large and heterogeneous moss genera, *Bryum* has been divided into numerous infrageneric taxa which often pose various nomenclatural problems (Ochi 1992; Isoviita 1992). In the last two decades, the tendency to divide large and heterogeneous moss genera is clearly marked, the traditionally understood genus *Bryum* being split into a number of segregates on the basis of morphological (Spence 1996, 2005, 2007, 2009a, b; Pedersen 2000; Spence & Ramsay 2005, 2006) and molecular data (Pedersen 2000; Pedersen & Hedenäs 2002, 2003, 2005; Pedersen *et al.* 2003, 2007; Holyoak & Pedersen 2007). Accordingly, the forgotten genus *Ptychostomum* was resurrected from obsolescence (Spence 2005a) and some new segregates have been recognised, namely *Leptostomopsis* J.R.Spence & H.P.Ramsay and *Plagiobryoides* J.R.Spence (Spence 2005a), *Gemmabryum* J.R.Spence & H.P.Ramsay and *Ochiobryum* J.R.Spence & H.P.Ramsay (Spence 2005b), and *Imbriobryum* N.Pedersen (Pedersen & Hedenäs 2005; Pedersen 2005).

There are no fewer than four neglected names which were used for exotic monotypic genera of the Bryoideae, including *Peromnion* Schwägr., *Streblopilum* Ångstr., *Osculatia* De Not. and *Neobryum* R.S.Williams. We have evaluated their availability as potential candidates for older correct names of the aforementioned segregates of *Bryum*.

Taxonomic history of *Peromnion* and *Streblopilum*

The oldest of these forgotten generic names is *Peromnion* Schwägr. which was used for a genus erected by Schwägrichen (1828) for the Brazilian species *P. radiculosum* Schwägr. This genus was subsequently accepted by Hornschuch (1840) but Mitten (1869) reduced it to a section of the then all-encompassing genus *Bryum* in which he placed four South American species. A year later Hampe (1870) transferred *Peromnion radiculosum* to the genus *Brachymenium* Schwägr. as *B. radiculosum* (Schwägr.) Hampe and he repeated this taxonomic concept in his subsequent paper on Brazilian mosses (Hampe 1879). Additionally, he reduced *Peromnion* to an unranked subdivision of the genus *Brachymenium* Schwägr. This taxonomic concept of *Peromnion* was accepted by Brotherus (1903, 1924) who recognised *Peromnion* as one of four sections of *Brachymenium*, *B. sect. Peromnion* (Schwägr.) Broth. which is obviously typified by *Brachymenium radiculosum* (*Peromnion radiculosum*), the type of the monotypic genus *Peromnion* (Art. 7.3 of the current Code) (Turland *et al.* 2018).

Ochi (1980) introduced serious confusion in the infrageneric classification of *Brachymenium* because he placed *B. radiculosum* in the type section of the genus, while for sect. *Peromnion* he designated *B. jamesonii* Taylor [= *B. speciosum* (Hook.f. & Wilson) Steere] as a lectotype. From the nomenclatural point of view this operation cannot be accepted because the transfer of the type species of sect. *Peromnion* automatically makes this section name a heterotypic synonym of the type section. For the emended sect. *Peromnion* in which Ochi (1980) placed five neotropical species, a new name should be devised. This group is certainly not homogeneous and, as Spence (2014) rightly noted, it is similar to some species of *Gemmabryum*. Indeed, three species placed in sect. *Peromnion* sensu Ochi (1980) are actually members of the latter genus. However, sect. *Peromnion* in the strict sense, typified by *Brachymenium radiculosum*, has nothing in common with this genus but its type is a typical representative of *Brachymenium*.

It is characterised by its rosulate, not comose and gemmiform stem with subfloral innovations, spatulate leaves twisted and appressed to the stem on drying, long-excurrent costa as a smooth arista, and clavate, obloid-clavate to cylindrical capsules with a short, slender neck, over 3 mm long, and a short conical and bluntly apiculate to hemispherical operculum.

The genus *Streblopilum* Ångstr. was established by Ångström (1876) to accommodate a single Brazilian species, *Brachymenium regnellii* Hampe. The author considered it to be closely related to and intermediate between *Brachymenium* and *Peromnion*, but no definite diagnostic characters were provided. This monotypic genus can be well diagnosed by the traits of the type species, which is characterised by its erect, cylindrical, elongate capsule, about 5 mm long, with a long-beaked and blunt operculum and a costa which vanishes well below the leaf apex in the lower leaves and is percurrent to short-excurrent in the upper leaves. The overall appearance of the plants and leaves fits the genus *Brachymenium* well, so *Streblopilum* does not deserve recognition as a genus in its own right. Bescherelle (1891) described *Brachymenium spirale* Besch. from Paraguay and indicated its close similarity to *B. regnellii*. In fact he placed this species in an unranked infrageneric taxon *Streblopilum*. Although no description of this taxon is given, *B. regnellii*, the generitype of *Streblopilum*, is mentioned in the discussion and according to Art. 41.3 of the ICN (Turland *et al.* 2018) it may be considered as an implicit reference to the genus *Streblopilum* and Bescherelle's (1891) parenthetic citation of *Streblopilum* within *Brachymenium* may be accepted as a new combination. Thus, *Streblopilum* cannot be considered a candidate for a name of any aforementioned segregate of *Bryum*, but it is worth noting that this name could be used for sect. *Peromnion* sensu Ochi (1980) if it truly deserves taxonomic recognition.

Taxonomic history of *Osculatia* and *Neobryum*

Osculatia is the third neglected and obscure genus of the exotic bryalean mosses. It was described by De Notaris (1859) from the specimen collected by Gaetano Osculati (1808–1894), an Italian naturalist and traveller, in the drainage basin of the Napo River in northern South America. The paper in which De Notaris (1859) described and illustrated a number of new species from the collection of Osculati was carefully analysed by Steere (1988) who found it puzzling in some points. It proved that most probably it had appeared as a preprint in 1858, as such a copy is available in the Mertz Library in the New York Botanical Garden. Additionally, due to the lack of detailed locality data, it is impossible to indicate the exact loci classici of the newly described taxa which apparently originated either from Ecuador or Peru.

De Notaris (1859) placed the newly erected genus *Osculatia* in the Meesiaceae on account of the overall similarity of the capsules and leaves of its only species *O. columbica* De Not. to those of *Catoscopium* Brid. This refers especially to the nearly horizontal spherical capsules with a hemispherical and nearly conical operculum and rigid lanceolate leaves with a salient costa excurrent as a short arista. *Osculatia columbica* and other species described by De Notaris (1859) were ignored by Mitten (1869) and the species was only listed by Jaeger (1875) and Jaeger and Sauerbeck (1879) in *Adumbratio florum muscorum* and later by Paris (1896) in *Index bryologicus*.

Salmon (1902) was the first to re-examine the type of *Osculatia columbica* and he found this species to be conspecific with *Bryum globosum* Mitt., a species described by Mitten (1869) from the Andes of Ecuador. He paid special attention to the peristome of this species and pointed out that it perfectly matches the peristome of *Brachymenium* which he considered as a section of the broadly conceived *Bryum*. This concept was subsequently accepted by Brotherus (1903, 1924) who placed *Osculatia* in synonymy with *Brachymenium* and classified *B. columbicum* (De Not.) Broth. in the sect. *Dicranobryum* (Müll.Hal.) Broth.

Ochi (1980) was not aware of Salmon's (1902) study but he examined the type of *Bryum globosum* Mitt., which is an illegitimate later homonym of *B. globosum* Lindb. and in

Brachymenium it bears the name *Brachymenium globosum* A.Jaeger. He established a separate section, *Brachymenium* sect. *Globosa* Ochi, for this species and he placed, with a question mark, *Osculatia columbica* in synonymy with *Brachymenium globosum*, mainly because he had not studied any original material of that taxon. According to Ochi (1980) this species may be a link between *Pohlia* Hedw. and *Brachymenium* and a characteristic feature of it is the presence of bulbous, yellow axillary gemmae. This is a medium-sized plant with well-spaced, long-decurrent, imbricate-flexuose leaves which are very variable in shape, ranging from ovate or ovate-lanceolate to elongate-triangular. The leaf margins are entire to obscurely crenulate and are usually weakly bordered by 1-2 rows of narrow, elongate cells. The costa is strong, reddish and excurrent as a stout cusp. The capsules are globose and the peristome has highly modified segments and cilia. The true segments are actually absent, as in most other species of *Brachymenium*, but the cilia are fully united and on either side fused with portions of segments and this entire structure is positioned opposite the exostome teeth (Shaw 1984). This is a remarkable expression of peristome morphology, yet it is a fundamentally bryoid one and in terms of other characters *Brachymenium columbicum* is quite firmly rooted in that genus in its classical circumscription.

Brachymenium columbicum is a widespread neotropical species and its geographical range extends from southern Mexico (Campeche and Tabasco) (Ochi 1994) and the Caribbean (Cuba, Dominican Republic and Puerto Rico) (Delgadillo *et al.* 1995), through Central America (Guatemala, Costa Rica and Panama) (Allen 2002) to South America (Colombia, Venezuela, Ecuador, Peru, Bolivia, Brazil) including the Galapagos Islands (Delgadillo *et al.* 1995). In this wide range it was described several times as a separate species (see Robinson 1967; Ochi 1992, 1994; Allen 2002 for synonyms). One of its synonymous names is *Neobryum costatum* R.S.Williams, a species described from Colombia (Williams 1925). It was erected on the basis of its peristome which is typical of *B. columbicum* as described above, otherwise *Neobryum* is a genus close to *Bryum*. Therefore Robinson (1967) considered *Neobryum* and *Osculatia* congeneric.

Because gametophytically, especially in its vegetative propagation by axillary gemmae, *Brachymenium columbicum* matches well the concept of the genus *Gemmabryum*, in our opinion *Osculatia* is the oldest generic name for this segregate of the broadly conceived *Bryum*. Accordingly, *Gemmabryum* is considered congeneric with *Osculatia*.

Nomenclatural implications

The congenericity of *Osculatia* and *Gemmabryum* necessitates the following synonymy and new combinations.

Osculatia De Not., Mem. Reale Accad. Sci. Torino, Ser. 2, 18: 445. 1859. Type: *Osculatia columbica* De Not.

= *Neobryum* R.S.Williams, Bryologist 28: 59. 1925. Type: *Neobryum costatum* R.S.Williams. First synonymised by Robinson (1967: p. 26).

= *Gemmabryum* J.R.Spence & H.P.Ramsay, Phytologia 82(2): 63. 2005 (14 Sep), syn. nov. Type: *Gemmabryum pachythea* (Müll.Hal.) J.R.Spence & H.P.Ramsay [*pachytheum*] (*Bryum pachythea* Müll.Hal.).

Osculatia De Not. sect. ***Caespitibryum*** (Podp.) Ochyra, Plášek & Bedn.-Ochyra, comb. nov. Basionym: *Bryum* Hedw. subsect. *Caespitibryum* Podp., Rozpr. České Akad. Věd, Tř. 2, Vědy Mat. Přír. 10(2): 52. 1901.

Osculatia De Not. sect. ***Tuberibryum*** (J.R.Spence) Ochyra, Plášek & Bedn.-Ochyra, comb. nov.

Basionym: *Gemmabryum* J.R.Spence & H.P.Ramsay sect. *Tuberibryum* J.R.Spence, Phytologia 91(3): 496. 2009.

Osculatia acuminata (Harv.) Ochyra, Plášek & Bedn.-Ochyra, comb. nov.

Basionym: *Brachymenium acuminatum* Harv. in Hook., Icon. Pl. 1: pl. 19, f. 3. 1836.

- Osculatia apiculata*** (Schwägr.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum apiculatum* Schwägr., Sp. Musc. Frond. Suppl. 1(2): 102, *pl.* 72 [*vertice*]. 1816.
- Osculatia australis*** (Hampe) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum australe* Hampe, Icon. Musc. (Hampe) 3: *t.* 26. 1844.
- Osculatia austrosabulosa*** (J.R.Spence & H.P.Ramsay) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Gemmabryum austrosabulosum* J.R.Spence & H.P.Ramsay in J.R.Spence, Phytologia 87: 65. 2005.
- Osculatia badia*** (Brid.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum caespiticium* Hedw. var. *badium* Brid., Bryol. Univ. 1(2): 850. 1827.
- Osculatia barnesii*** (J.B.Wood ex Schimp.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum barnesii* J.B.Wood ex Schimp., Syn. Musc. Eur. Ed. 2, 2: 471. 1876.
- Osculatia bicolor*** (Dicks.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum bicolor* Dicks., Fasc. Pl. Crypt. Brit. 4: 16. 1801.
- Osculatia bornholmensis*** (Wink. & R.Ruthe) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum bornholmense* Wink. & R.Ruthe, Hedwigia 38 Beibl. 3: 120. 1899.
- Osculatia brassicoides*** (J.R.Spence & Kellman) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Gemmabryum brassicoides* J.R.Spence & Kellman, Madroño 62(2): 124, *f.* 1. 2015.
- Osculatia caespiticia*** (Hedw.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum caespiticium* Hedw., Sp. Musc. Frond.: 180. 1801.
- Osculatia californica*** (Sull.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum californicum* Sull., Expl. Railroad Mississippi Pacific Descr. Moss. Liverw.: 188, *pl.* 6. 1856[1857].
- Osculatia cheelii*** (Broth.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum cheelii* Broth., Proc. Linn. Soc. New South Wales 4: 591. 1916.
- Osculatia chrysoneura*** (Müll.Hal.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum chrysoneuron* Müll.Hal., Bot. Zeit. (Berlin) 9: 549. 1851.
- Osculatia clavata*** (Schimp.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Pohlia clavata* Schimp., Ann. Sci. Nat. Bot., Sér. 2, 6: 148, *f.* 11. 1836.
- Osculatia coarctata*** (Müll.Hal.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Gemmabryum coarctatum* J.R.Spence & H.P.Ramsay, Phytologia 87: 66. 2005.
- Osculatia coronata*** (Schwägr.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum coronatum* Schwägr., Sp. Musc. Frond. Suppl. 1(2): 103, *pl.* 7a [*vertice*]. 1816.
- Osculatia crassa*** (Hook.f. & Wilson) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum crassum* Hook.f. & Wilson in Hook.f., Fl. Nov.-Zel. 2: 86, *t.* 86 *f.* 1. 1854.
- Osculatia demaretiana*** (Arts) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum demaretianum* Arts, J. Bryol. 17(2): 263, *f.* 1–3. 1992.
- Osculatia dichotoma*** (Hedw.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum dichotomum* Hedw., Sp. Musc. Frond.: 186, *pl.* 42, *f.* 8–12. 1801.
- Osculatia eremaea*** (J.R.Spence & H.P.Ramsay) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum eremaeum* Catches. ex J.R.Spence & H.P.Ramsay, J. Adelaide Bot. Gard. 17: 112, *f.* 3. 1996.
- Osculatia erythropila*** (M.Fleisch.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum erythropilum* M.Fleisch., Musci Buitenzorg 2: 553. 1904.
- Osculatia exilis*** (Dozy & Molk.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum exile* Dozy & Molk., Ann. Sci. Nat. Bot., Sér. 3, 2(5): 300. 1844.
- Osculatia gemmifera*** (R.Wilczek & Demaret) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum gemmiferum* R.Wilczek & Demaret, Bull. Jard. Bot. Natl. Belgique 46: 529, *f.* 5. 1976.
- Osculatia gemmilucens*** (R.Wilczek & Demaret) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum gemmilucens* R.Wilczek & Demaret, Bull. Jard. Bot. Natl. Belgique 46: 537, *f.* 9. 1976.

- Osculatia inaequalis*** (Taylor) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum inaequale* Taylor, London J. Bot. 5: 53. 1846.
- Osculatia indica*** (Dozy & Molk.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum indicum* Dozy & Molk., Musci Frond. Ined. Arch. Ind. 1: 22. 1845.
- Osculatia klinggraeffii*** (Schimp.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum klinggraeffii* Schimp. in Klinggr., Höh. Crypt. Preuss.: 81. 1855.
- Osculatia kunzei*** (Hornsch.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum kunzei* Hornsch., Flora 2: 90. 1819.
- Osculatia laevigata*** (Hook.f. & Wilson) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum laevigatum* Hook.f. & Wilson, London J. Bot. 3: 546. 1844.
- Osculatia macrocarpa*** (Cardot) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Brachymenium macrocarpum* Cardot, Rev. Bryol. 38(1): 6. 1911.
- Osculatia mexicana*** (Mont.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Brachymenium mexicanum* Mont., Ann. Sci. Nat. Bot., Sér. 2, 9(1): 54. 1838.
- Osculatia nanoapiculata*** (Ochi & Kürschner) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum nanoapiculatum* Ochi & Kürschner, Nova Hedwigia 47: 359, f. 1. 1988.
- Osculatia pachytheca*** (Müll.Hal.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum pachytheca* Müll.Hal., Syn. Musc. Frond. 1: 307. 1848.
- Osculatia preissiana*** (Hampe) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum preissianum* Hampe, Icon. Musc. (Hampe) 3: t. 25. 1844.
- Osculatia radiculosa*** (Brid.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum radiculosum* Brid., Muscol. Recent. Suppl. 3: 18. 1817.
- Osculatia rubens*** (Mitt.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum rubens* Mitt., Hooker's J. Bot. Kew Gard. Misc. 8: 232. 1856.
- Osculatia ruderalis*** (Crundwell & Nyholm) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum ruderale* Crundwell & Nyholm, Bot. Not. 116(1): 95. 1963.
- Osculatia sauteri*** (Bruch & Schimp.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum sauteri* Bruch & Schimp. In Bruch, Schimp. & T.Gümbel, Bryol. Eur. 4: 162, pl. 377 [Fasc. 32 Mon. Suppl. 1: 10, pl. 10]. 1846.
- Osculatia subapiculata*** (Hampe) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum subapiculatum* Hampe, Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 4(1–5): 51. 1872.
- Osculatia sullivanii*** (Müll.Hal. ex Broth.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum sullivanii* Müll.Hal. ex Broth., Öfvers. Finska Vetensk.-Soc. Förh. 35: 48. 1893.
- Osculatia tenuiseta*** (Limpr.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum tenuisetum* Limpr., Jahresber. Schles. Ges. Vaterl. Cult. 74(2b): 4. 1896[1897].
- Osculatia tuberosa*** (Mohamed & Damanhuri) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum tuberosum* Mohamed & Damanhuri, Bryologist 93: 288, f. 1–10. 1990.
- Osculatia valparaisense*** (Thér.) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum valparaisense* Thér., Revista Chilena Hist. Nat. 21: 14, pl. 4, f. 1. 1917.
- Osculatia vinosa*** (J.R.Spence & Kellman) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Gemmabryum vinosum* J.R.Spence & Kellman, Madroño 62(2): 127, f. 2. 2015.
- Osculatia violacea*** (Crundwell & Nyholm) Ochyra, Plášek & Bedn.-Ochyra, *comb. nov.*
Basionym: *Bryum violaceum* Crundwell & Nyholm, Bot. Not. 116(1): 94. 1963.

Acknowledgements: We are very grateful to Mr Arthur Copping, Roydon, Diss, England, for improving the English text. Ryszard Ochyra and Halina Bednarek-Ochyra gained financial support through the statutory fund of the W. Szafer Institute of Botany of the Polish Academy of Sciences and the contribution by V. Plášek is part of a research project of EU structural funding Operational Programme Research and Development for Innovation, project No. CZ.1.05/2.1.00/19.0388 and by the Ministry of Education, Youth and Sports of the Czech Republic in the “National Feasibility Program I”, project LO1208 “TEWEP”.

References

- Allen B. (2002): Moss flora of Central America. Part 2. Encalyptaceae–Orthotrichaceae. Monographs in Systematic Botany from the Missouri Botanical Garden 90: [1-3] + 1-699.
- Ångström J. (1876): Primae lineae muscorum cognoscendorum, qui ad Caldas Brasiliae sunt collecti. Öfversigt af Förhandlingar: Kongliga Svanska Vetenskaps-Akademiens 33(4): 3-50.
- Bescherelle E. (1891): Selectio novorum muscorum. – Journal de Botanique (Morot) 5: 252-255.
- Bridel S.E. (1826[-1827]): Bryologia universa seu systematica ad novam methodum dispositio, historia et descriptio omnium muscorum et descriptio omnium muscorum frondosorum hucusque cognitorum cum synonymia ex auctoribus probatissimis. Volumen primum. Sumtibus Joan. Ambros. Barth, Lipsiae, xlvii + 856 pp.
- Briquet J. (1912): Règles Internationales de la Nomenclature Botanique adoptées par le Congrès International de Botanique de Vienne 1905 deuxième édition mise au point d’après les décisions du Congrès International de Botanique de Bruxelles 1905. Gustav Fischer, Jena, viii + 110 pp.
- Brotherus V.F. (1903): *Brachymerium* Schwaegr., 555-560 pp. In Engler A. & Prantl K. (eds), Die Natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigeren Arten insbesondere den Nutzpflanzen. I. Teil. 3. I. Hälfte: Musci (Laubmoose). III. Unterklasse Bryales. I. Gruppe: Acrocarpi. Wilhelm Engelmann, Leipzig.
- (1924): Musci (Laubmoose). Unterklasse Bryales. II. Spezieller Teil, 143-478. In Engler A. (ed.), Die Natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigeren Arten insbesondere den Nutzpflanzen. Band 10. Wilhelm Engelmann, Leipzig.
- Bruch P., Schimper W.P. & Gumbel W.T. (1839): *Bryum*, 71-152 pp. + pls. 331-332, 334, 339-348, 351-356, 358-360, 363-376, 378-380, 382, 384 [Fasc. 6-9: 82 pp. + 41 pls.]. In: Schimper W.P. (ed.), Bryologia europaea seu genera muscorum europaeorum monographicae illustrata. Vol. II. Sumptibus Librariae E. Schweizerbart, Stuttgartiae.
- Delgadillo C.M., Bello B. & Cárdenas A.S. (1995): LATMOSS. A catalogue of neotropical mosses. Monograph in Systematic Botany from the Missouri Botanical Garden 96: [1-5] + 1-191.
- De Notaris J. (1859): Musci napoani sive muscorum ad flumen Napo in Columbia a clar.^{mo} Osculati lectorum recensio. Memorie della Reale Accademia delle Scienze di Torino, Classe di Scienze Fisiche e Matematiche, Serie seconda 18: 437-455 + pls. i-vii.
- Dillenius J.J. (1741): Historia muscorum in qua circiter sexcentae species veteres novae ad sua genera relatae describuntur et iconibus genuinis illustrantur cum appendice et indice synonymorum. E Theatro Sheldoniano, Oxonii, xvi + 576 pp., lxxxv pls.
- Hampe E. (1870): Musci frondosi. In Warming E., Symbolae ad floram Brasiliae centralis cognoscendam. Particula VIII. Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i Kjøbenhavn 1870(18-20): 267-296.
- (1876): Musci novi Musei Melbourni. Continuatio. – Linnaea 40: 301-326.
- (1879): Enumeratio muscorum hactenus in provinciis brasiliensibus Rio de Janeiro et Sao Paulo detectorum. Apud Andr. Fred. Høst & filium, Universitatis bibliopolas. Typis Bianco Luno, iv + 92 pp.
- Hedwig J. (1801): Species muscorum frondosorum descriptae et tabulis aeneis LXXVII coloratis illustratae. Sumtu Joannis Ambrosii Barthii, Lipsiae and apud Amand Koenig, Parisiis, vi + 353 pp., lxxii pls.
- Holyoak D.T. & Pedersen N. (2007): Conflicting molecular and morphological evidence of evolution within the Bryaceae (Bryopsida) and its implications for generic taxonomy. – Journal of Bryology 29: 111-124.
- Hornschuch F. (1822): *Ptychostomum* novum muscorum frondosorum genus. – Flora 5: 62-64.
- (1840): Musci, 1-99 pp., tab. 1-4. In Martius C.F.P. de (ed.), Flora brasiliensis. Enumeratio plantarum in Brasilia hactenus detectarum quas suis aliorumque botanicorum studiis descriptas et methodo naturali digestas partim icone illustratas. Vol. I. Pars II. Apud Frid. Fleischer in Comm., Lipsiae.
- Isoviita P. (1992): Notes on the sectional nomenclature of the Bryoideae. In Ochi H., *A revised infrageneric classification of the genus Bryum and related genera (Bryaceae, Musci). Appendix*. In Koponen T. & Hyvönen J. (eds), Proceedings of the Congress of East Asiatic Bryology, Helsinki, August 12-19, 1990. Bryobrothera 1: 231-244.

- Jaeger A. (1875): Genera et species muscorum systematicae disposita seu Adumbratio florum muscorum totius orbis terrarum. Pars V. Bericht über die Thätigkeit der St. Gallischen Naturwissenschaftlichen Gesellschaft, 1873-1874: 53-278.
- Jaeger A. & Sauerbeck F. (1879): Genera et species muscorum systematicae disposita seu Adumbratio florum muscorum totius orbis terrarum. Pars IX. Bericht über die Thätigkeit der St. Gallischen Naturwissenschaftlichen Gesellschaft, 1877-1878: 257-514.
- Kindberg N.C. (1882): Die Familien und Gattungen der Laubmoose (Bryineae) Schwedens und Norwegens hauptsächlich nach dem Lindbergschen Systeme. – Bihang til Kongliga Svenska Vetenskaps-Akademiens Handlingar 6(19): 1-25.
- (1883): Die Arten der Laubmoose (Bryineae) Schwedens und Norwegens. – Bihang til Kongliga Svenska Vetenskaps-Akademiens Handlingar 7(9): 1-167.
- Limpricht K.G. (1890): 102. Gattung: *Bryum* Dill., 280-444 pp. In Dr L. Rabenhorst's Kryptogamen-Flora von Deutschland, Oesterreich und der Schweiz. 2. Auflage. Vierter Band: Die Laubmoose Deutschlands, Oesterreichs und der Schweiz. II. Abtheilung: Bryineae (Stegocarpae [Acrocarpae, Pleurocarpae excl. Hypnaceae]). Eduard Kummer, Leipzig.
- Lindberg S.O. (1863): Om ett nytt släkte, *Epipterygium*, bland bladmossorna. – Öfversigt af Förhandlingar: Kongliga Svenska Vetenskaps-Akademiens 19: 599-609.
- Linnaeus C. (1753): Species plantarum, exhibentes plantas rite cognitatas, ad genera relatas, cum differentiis specificis, nominibus trivialibus, synonymis selectis, locis natalibus, secundum systema sexuale digestas. Tom. 2. Impensis Laurentii Salvii, Holmiae, 561-1200 + [1-30 unnumbered, index] pp.
- Mitten G. (1869): Musci austro-americi, sive Enumeratio muscorum omnium austro-americanorum mihi hucusque cognitorum, eorum praecipue in terris amazonicis andinisque Ricardo Spruceo lectorum. – The Journal of the Linnean Society Botany 12: 1-659.
- Ochi H. (1980): A revision of the neotropical Bryoideae, Musci (First part). The Journal of the Faculty of Education, Tottori University, Natural Science 29(2): 49-154.
- (1992): A revised infrageneric classification of the genus *Bryum* and related genera (Bryaceae, Musci). In: Koponen T. & Hyvönen J. (eds), Proceedings of the Congress of East Asiatic Bryology, Helsinki, August 12-19, 1990. – Bryobrothera 1: 231-241(-244).
- (1994): *Brachymenium* Schwaegr. In Sharp A.J., Crum H. & Eckel P.M. (eds), The moss flora of Mexico. Part one Sphagnales to Bryales. – Memoirs of the New York Botanical Garden 69: 490-501.
- Paris E.G. (1896): Index bryologicus sive enumeratio muscorum hucusque cognitorum adjunctis synonyma distributioneque geographica locupletissimis. Pars III. Apud Paul Klinsieck, Parisiis, 654-964 pp.
- Pedersen N. (2000): A cladistic overview of the Bryaceae (Musci) based on morphological and anatomical data and with emphasis on the genus *Bryum*. – Journal of Bryology 22: 193-206.
- (2005): Validation of *Imbriobryum* (Bryaceae). – The Bryologist 108: 449.
- Pedersen N. & Hedenäs L. (2002): Phylogenetic relationships between *Bryum* and supposedly closely related genera. – Journal of Bryology 24: 277-289.
- (2003): Phylogenetic investigations of a well supported clade within the Bryaceae: evidence from seven chloroplast sequences and morphology. – Plant Systematic and Evolution 240: 115-132.
- (2005): Taxonomic and nomenclatural implications of phylogenetic studies of the Bryaceae based on molecular data and morphology. – The Bryologist 108: 123-128.
- Pedersen N., Cox C.J. & Hedenäs L. (2003): Phylogeny of the moss family Bryaceae inferred from chloroplast DNA sequences and morphology. – Systematic Botany 28: 471-482.
- Pedersen N., Holyoak D.T. & Newton A.E. (2007): Systematics and morphological evolution within the moss family Bryaceae: a comparison between parsimony and Bayesian methods for reconstruction of ancestral character states. – Molecular Phylogenetics and Evolution 43: 891-907.
- Robinson H. (1967): Preliminary studies on the bryophytes of Colombia. – The Bryologist 70: 1-61.
- Salmon E.S. (1902): Bryological notes. (28). The genus *Osculatia* & *Bryum* (*Dicranobryum*) *globosum*. – The Journal of Botany, British and Foreign 40: 369-372 + pl. 443.
- Schimper W.P. (1856): Corollarium bryologiae europaeae, conspectum diagnosticum familiarum, generum et specierum, adnotationes novas atque emendationes complectens. Sumptibus librariae E. Schweizerbart, Stuttgartiae, 140 [+1, suppl.] pp.
- (1860): Synopsis muscorum europaeorum praemissa introductione de elementis bryologicis tractante. Sumptibus Librariae E. Schweizerbart, Stuttgart, clix + charts 1-5 + 1 map + 733 [=734-735, err] pp., + Tab. i-viii.
- Schwaegrichen F. (1828): Ioannis Hedwig Species muscorum frondosorum descriptae et tabulis aeneis coloratis illustratae opus posthumum. Supplementum tertium. Volumen primum, sectio secunda. Sumtu Ioannis Ambrosii Barth, Lipsiae, tabulae ccxxvi–ccl.
- Shaw J. (1984): A reinterpretation of peristome structure in *Pseudoditrichum mirabile* Steere & Iwats. (Pseudoditrichaceae). – The Bryologist 87(4): 314-318.

- Spence J.R. (1996): *Rosulabryum* genus novum (Bryaceae). – The Bryologist 99: 221-225.
- (2005a): New genera and combinations in Bryaceae (Bryales, Musci) for North America. – Phytologia 87(1): 15-28.
 - (2007): Nomenclatural changes in the Bryaceae (Bryopsida) for North America II. – Phytologia 89(1): 110-114.
 - (2009a): Nomenclatural changes in the Bryaceae (Bryopsida) for North America III. – Phytologia 91(3): 494-500.
 - (2009b): New combinations in North American *Rosulabryum* (Bryopsida, Bryaceae). – Novon 19: 397-400.
 - (2013): A new combination in *Ptychostomum* (Bryaceae, Bryophyta) for *Bryum subneodamense* Kindb. – Phytoneuron 2013-3: 1.
 - (2014): Bryaceae, 117-185 pp. In: Flora of North America Editorial Committee (ed.), Flora of North America north of Mexico. Volume 28 Bryophyta, part 2., Oxford University Press, New York – Oxford.
- Spence J.R. & Ramsay H.P. (2005): New genera and combinations in the Bryaceae (Bryales, Musci) for Australia. – Phytologia 87(2): 61-72.
- (2006): Bryaceae, 274-348 pp. In: McCarthy P.M. (ed.), Flora of Australia. Volume 51 (Mosses 1). Australian Biological Resources Study and Melbourne, CSIRO Publishing, Canberra.
- Steere W.C. (1988): Remarks on an ambiguous publication: Josepho De Notaris, Musci Napoani sive Muscorum ad Flumen Napo in Colombia a Clar.mo Osculati Lectorum. – Beiheft zur Nova Hedwigia 90: 283-287.
- Turland N.J., Wiersema J.H., Barrie F.R., Greuter W., Hawksworth D.L., Herendeen P.S., Knapp S., Wolf-Henning K., Li D.-Z., Marhold K., May T.W., McNeill J., Monro A.M., Prado J., Price M.J. & Smith G.F. (eds) (2018): International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code), adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. Regnum Vegetabile 159. Koeltz Scientific Books, Königstein, xxxviii + 254 pp.
- Williams R.S. (1925): Some undescribed mosses from Colombia. – The Bryologist 28: 59-64.

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