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Taxonomic and nomenclatural notes on *Didymodon austroalpigenus* (Pottiaceae, Bryophyta) from Îles Kerguelen

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Abstract – The taxonomic status of *Didymodon austroalpigenus* (Müll.Hal.) Broth., a species described as *Trichostomum austroalpigenum* Müll.Hal. from subantarctic Îles Kerguelen, is discussed. Because the original collection of this species was destroyed, its name is neotypified with a specimen from this archipelago and the species is considered to be conspecific with *Bryoerythrophyllum rubrum* (Jur. *ex* Geh.) P.C.Chen. The distribution of this species is briefly reviewed and the present discovery firmly establishes *B. rubrum* as a bipolar species.

Bipolar mosses / *Bryoerythrophyllum* / *Didymodon* / distribution / Îles Kerguelen / neotypification / nomenclature / Subantarctica / taxonomy

INTRODUCTION

The moss genus *Didymodon* Hedw. is not well represented in the polar regions in the Southern Hemisphere. A single species, *D. gelidus* Cardot, was described from Antarctica which is the central land mass of the biome surrounding the South Pole (Cardot, 1907). The species was subsequently considered identical to the North American *D. brachyphyllus* (Sull.) R.H.Zander (Zander & Ochyra, 2001) which was described and illustrated in detail by Ochyra and Zander (2002) and Ochyra *et al.* (2008) in the *Illustrated Moss Flora of Antarctica.* This species was subsequently recorded from subantarctic South Georgia (Blockeel *et al.,* 2005) and Îles Kerguelen (Ellis *et al*., 2015).

The type and many non-type specimens of *Didymodon brachyphyllus* and *D. gelidus* were recently studied by the present author. Although initially they were considered to be distinct species (Sollman, 2015), a careful re-assessment of the available material of these species led this author to conclude that both *D. gelidus* and *D. brachyphyllus* are identical and that the latter epithet is the correct name for the species.

The Subantarctic region consists of six islands or island groups scattered in the vast Southern Ocean. Apart from the aforementioned *Didymodon brachyphyllus,* only two species of this genus have so far been recorded from the region, namely *D. australasiae* (Hook. & Grev.) R.H.Zander from South Georgia (Blockeel *et al.*, 2007) and *D. austroalpigenus* (Müll.Hal.) Broth. originally described as *Trichostomum austroalpigenum* Müll.Hal. from Îles Kerguelen (Müller, 1883, 1889). This is an obscure species whose taxonomic status is uncertain and it is assessed in the present account.

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ON THE TAXONOMIC STATUS OF *DIDYMODON AUSTROALPIGENUS*

Didymodon austroalpigenus was described by Müller (1883, 1889) from scanty material collected by F.C. Naumann on Îles Kerguelen during the German Transit-of-Venus Expedition of 1874-1875 in the ship *Gazelle.* Initially, Müller (1883) provided only a short diagnosis of this new species in which he emphasized its similarity to *Trichostomum alpigenum* (Venturi) Müll.Hal. [≡ *Bryoerythrophyllum alpigenum* (Venturi) P.C.Chen]. The new species differed from it in having serrulate to entire leaves at the extreme apex, thick and coarse, less papillose laminal cells which result in a rather glabrous leaf areolation, and subsecund and crispate leaves at stem apices. This diagnosis was repeated verbatim by Müller (1889) in the book presenting botanical results of the *Gazelle* expedition and it was an unusual situation for him because all other species were thoroughly described. The main reason for such consideration of this species was apparently the scantiness of the material since it was found to occur in small quantities among other mosses.

The original set of the specimens collected by F.C. Naumann was preserved in Müller's personal herbarium which, after his death, was acquired by the Botanical Museum Berlin-Dahlem (B). Unfortunately, in 1943 his herbarium was completely destroyed in the Berlin fire, along with the greater part of the Berlin herbarium. Duplicates of many of Müller's type collections are preserved in various herbaria where they had been distributed either through an official exchange from the Botanical Museum Berlin-Dahlem or had reached them with the collections of other eminent bryologists with whom Müller had actively exchanged specimens. It is likely that *Trichostomum austroalpigenum* Müll. Hal. was a unicate and duplicates never existed.

During many years of research on austral mosses Ochyra (1999) has located in various herbaria most of the original collections of taxa described by Müller (1883, 1889) from Îles Kerguelen. The herbaria in BM, H, HBG, LE, PC and S are particularly rich in these specimens, although sometimes they are located in quite unexpected places, for example the types of new species of *Andreaea* Hedw. were found in U which was recently incorporated in the herbarium in Leiden (L).

Unfortunately, for a small group of species no portion of the original collection could be located, so the identities of such taxa cannot be precisely established. However, Müller's (1889) paper may be helpful, because he usually provided extensive taxonomic discussion for most species and these can sometimes be quite indicative. In this way the taxonomic status of *Barbula validinervia* Müll. Hal. was established (Ochyra, 1999). Unfortunately, the group of species lacking original material includes *Trichostomum austroalpigenum*, a species which was transferred to *Didymodon* as *D. austroalpigenus* (Müll.Hal.) Broth. (Brotherus, 1902). The original material was not located in the consulted herbaria, including BM, H, JE, M, PC, S and some others.

The taxonomic status of *Didymodon austroalpigenus* has been discussed only once, by Savicz-Lyubitskaya and Smirnova (1963). They examined the specimen which was collected on Îles Kerguelen by Rallier du Baty in 1913-1914 and determined by Cardot (1916) as *D. austroalpigenus*. This species was also reported from Tristan da Cunha (Dixon, 1960) but the voucher specimen represents *Bryoerythrophyllum campylocarpum* (Müll.Hal.) H.A.Crum (Ellis *et al*., 2013).

The material collected by Rallier du Baty and cited below agrees well with the concept of the modern genus *Bryoerythrophyllum* P.C.Chen. The plants are reddish-brown tinged. The leaves are dentate only at the extreme apex and they are often gradually tapered towards a small acute apex from a rather large sheath. They

are concave and often keeled and sometimes they are curved in the apical region. The leaf margins are recurved from above the sheath to the apex. The costa is strongly developed and is sometimes excurrent as an awn. The laminal cells are pluripapillate. All these characters agree well with *B. rubrum* (Jur. *ex* Geh.) P.C.Chen and, accordingly, the two species are considered to be conspecific, the latter name having priority.

Bryoerythrophyllum rubrum (Jur. *ex* Geh.) P.C.Chen

Trichostomum austroalpigenum Müll.Hal., *Bot. Jahrb.* 5: 80. 1883 [‘austro-alpigenum’] ≡ *Didymodon austroalpigenus* (Müll.Hal) Broth. *in* Engl. & Prantl, *Nat. Pflanzenfam*. 1(3): 405. 1902. **Type citation:** all new species were collected by Dr. F.C. Naumann and described in the section “I. Bryologia Kerguelensis”; later Müller (1889: p. 24) wrote: Ins. Kerguelen, inter alios muscos sine loco natali, 1874. Original material not located and apparently destroyed. **Neotype** (*designated here*): “57 Didymodon austroalpigenus (C.M.) Broth. Kerguelen, Exped. Rallier du Baty, 1913-14 det. J. Cardot 8/1915” – PC!, ***syn. nov.***

PHYTOGEOGRAPHICAL CONSIDERATION

The conspecificity of *Didymodon austroalpigenus* with *Bryoerythrophyllum rubrum* has significant phytogeographical implications because it results in a considerable extension of the known geographical range of the latter species to the Subantarctic. Until recently, *B. rubrum* had been considered to be a Eurasian montane species, scattered in the Alps (Grimms, 1999), Scandinavia (Sollman & Frahm, 2007), Turkey (Batan & Özdemir, 2012), the Caucasus, Asian Russia (Fedosov & Ignatova, 2008) and occasional in China and Taiwan (Li *et al.,* 2001), as well as in India, Nepal, Bhutan and Mongolia (Sollman, 2015). Outside the Holarctic *B. rubrum* has only once been found, in the Kilimanjaro Mountains of Tanzania (Bizot & Pócs, 1979). From a revision of herbarium collections, the species was recently identified from the Antarctic region where it is widely distributed but scattered in the South Orkney Islands, the South Shetland Islands and on Alexander Island in the maritime Antarctic and in the Princess Elizabeth Land in East Antarctica (Sollman, 2015). Thus, in the Southern Hemisphere *B. rubrum* may be considered as an amphiatlantic subantarctic species and this type of distribution exhibits quite many austral species of moss (e.g. Ochyra & Lewis Smith, 1998; Bednarek-Ochyra & Ochyra, 2010, 2012, 2013). The present discovery firmly established *B. rubrum* as a bipolar species with a single intermediate occurrence at altimontane elevation in tropical East Africa.

Îles Kerguelen have the richest moss flora of all subantarctic islands with approximately 140 species. Many have been discovered during recent exploration of the archipelago (e.g. Bednarek-Ochyra & Ochyra, 1998; Ochyra & Poulsen, 2003; Blockeel *et al*., 2009a,b, 2010; Ochyra, 2010; Ellis *et al*., 2010, 2011, 2012a,b). Beside the Grimmiaceae and Bryaceae, the Pottiaceae is reported to be the third richest in species in this area, with 16 species. Six belong to the genus *Syntrichia* Brid. (Lightowlers, 1986; Blockeel *et al*., 2009a; Ochyra *et al*., 2014) and four to the closely related *Hennediella* Paris (Cano, 2008). As with other subantarctic (Van der Putten *et al*., 2004, 2009, 2010) and antarctic islands (Birkenmajer *et al*., 1985) most must be considered as relative newcomers which colonized the archipelago after the Last Glacial Maximum.

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REFERENCES

BATAN N. & ÖZDEMIR T., 2012 — *Bryoerythrophyllum rubrum* (Pottiaceae) – a new moss in the Turkish bryophyte flora. *Phytologia balcanica* 18(2): 117-120.

BEDNAREK-OCHYRA H. & OCHYRA R., 1998 — *Racomitrium lamprocarpum* (Müll. Hal.) Jaeg. – an addition to the moss flora of Îles Kerguelen and the Subantarctic. *Journal of bryology* 20(2): 525-528.

BEDNAREK-OCHYRA H. & OCHYRA R., 2010 — *Bucklandiella allanfifei* (Grimmiaceae), a new moss species from New Zealand, with a note on South American *B. striatipila*. *Journal of bryology* 32: 245-255.

BEDNAREK-OCHYRA H. & OCHYRA R., 2012 — A consideration of *Bucklandiella* (Bryophyta, Grimmiaceae) in South America, with a taxonomic re-assessment of *Racomitrium looseri*. *Nova Hedwigia* 95: 153-163.

BEDNAREK-OCHYRA H. & OCHYRA R., 2013 — Diversity of Grimmiaceae subfam. Racomitrioideae in sub-Saharan Africa, including an addition of *Bucklandiella striatipila* to the moss flora of the continent. *Cryptogamie, Bryologie* 34: 3-12.

BIRKENMAJER K., OCHYRA R., OLSSON I.U. & STUCHLIK L., 1985 — Mid-Holocene radiocarbon-dated peat at Admiralty Bay, King George Island (South Shetland Islands, West Antarctica). *Bulletin of the polish academy of sciences*, *earth sciences* 33: 7-13.

BIZOT M. & PÓCS T., 1979 — East African bryophytes, III. *Acta botanica academiae scientiarum hungaricae* 25(3-4): 223-261.

BLOCKEEL T.L., BEDNAREK-OCHYRA H., OCHYRA R., GARCIA C., MATCHAM H.W., SÉRGIO C., SIM-SIM M., STEBEL A., TOWNSEND C.C. & VÁŇA J., 2005 — New national and regional bryophyte records, 11. *Journal of bryology* 27(2): 163-168.

BLOCKEEL T.L., BEDNAREK-OCHYRA H., OCHYRA R., GARILLETTI R., GLIME J.M., LARA F., MAZIMPAKA V., RUSIŃSKA A., SCHAEFER-VERWIMP A., SHABBARA H.M., SÖDERSTRÖM L., STEBEL A., TOWNSEND C.C.,VÁŇA J., YAYINTAŞ Ö.T. & ŻARNOWIEC J., 2007 — New national and regional bryophyte records, 17. *Journal of bryology* 29(4): 277-283.

BLOCKEEL T.L., BEDNAREK-OCHYRA H., OCHYRA R., CYKOWSKA B., ESQUIVEL M. G., LEBOUVIER M., LUIS L., MARTINS S., MÜLLER F., NÉMETH CS., PAPP B., PLÁŠEK V., PÓCS T., SABOVLJEVIĆ M., SÉRGIO C., SIM-SIM M., STECH M., VÁŇA J. & YAYINTAŞ Ö.T., 2009a — New national and regional bryophyte records, 21. *Journal of bryology* 31(2): 132-139.

BLOCKEEL T.L., BASTOS C.J.P., BEDNAREK-OCHYRA H., OCHYRA R., DULIN M.V., FOVET L., GARCIA C., HEDENÄS L., HUGONNOT V., KIRMACI M., KOPONEN T., LEBOUVIER M., MARTINS A., MÜLLER F., SABOVLJEVIĆ M., LAKUŠIĆ D., SCHÄFER-VERWIMP A., SÉRGIO C., SURINA B. & YAYINTAŞ Ö.T., 2009b — New national and regional bryophyte records, 22. *Journal of bryology* 31(3): 201-210.

BLOCKEEL T.L., BEDNAREK-OCHYRA H., CYKOWSKA B., OCHYRA R., DÜZENLI A., EZER T., HOLYOAK D.T., HUGONNOT V., KARA R., LARRAIN J., LEBOUVIER M., PRESTON C.D., SCHÄFER-VERWIMP A., SMITH V.R., SPITALE D., ŞTEFĂNUŢ S. & VÁŇA J., 2010 — New national and regional bryophyte records, 23. *Journal of bryology* 32(2): 140-147.

BROTHERUS V.F., 1902 — *Didymodon. In:* A. Engler & K. Prantl (eds), *Die Natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigeren Arten inbesondere den Nutzpflanzen* 1(3[2]) – Musci (Laubmoose). Leipzig, Wilhelm Engelmann, pp. 404-407.

CANO M.J., 2008 — Taxonomic revision of *Hennediella* Paris (Pottiaceae, Bryophyta). *Bryophytorum bibliotheca* 64: 1-142.

CARDOT J., 1907 — Musci. *In: National Antarctic Expedition. 1901-1904. Natural History.* 3. Zoology and Botany. London, Trustees of the British Museum. 6 p. + pls. i-ii.

CARDOT J., 1916 — Note sur des Mousses de Kerguelen. *Bulletin du muséum d'histoire naturelle* 22: 336-341.

DIXON H.N., 1960 — Mosses of Tristan da Cunha. *In*: Christophersen E. (ed.), *Results of the Norwegian Scientific Expedition to Tristan da Cunha* 1937-1938. No. 48. Oslo, Kommissjon hos H. Aschehoug & Co. (W. Nygaard). 49 p.

ELLIS L.T., ASTHANA A.K., SAHU V., BEDNAREK-OCHYRA B.H., OCHYRA R., CANO M.J., COSTA D.P., CYKOWSKA B., OCHYRA R., PHILIPPOV D.A., DULIN M.V., ERZBERGER P., LEBOUVIER M., MOHAMED H., OCHYRA R., ORGAZ J.D., PHEPHU N., VAN ROOY J., STEBEL A., SUÁREZ G.M., SCHIAVONE M.M., TOWNSEND C.C., VÁŇA J., VONČINA G., YAYINTAŞ Ö.T., YONG K.T. & ZANDER R.H. 2010 — New national and regional bryophyte records, 25. *Journal of bryology* 32(4): 311-322.

ELLIS L.T., ASTHANA A.K., SAHU V., SRIVASTAVA A., BEDNAREK-OCHYRA H., OCHYRA R., CHLACHULA J., COLOTTI M.T., SCHIAVONE M.M., HRADILEK Z., JIMENEZ M.S., KLAMA H., LEBOUVIER M., NATCHEVA R., PÓCS T., PORLEY R.D., SÉRGIO C., SIM-SIM M., SMITH V.R., SÖDERSTRÖM L., ŞTEFĂNUT S., SUÁREZ G.M. & VÁŇA J., 2011 — New national and regional bryophyte records, 28. *Journal of bryology* 33(3): 237-247.

ELLIS L.T., BEDNAREK-OCHYRA H., CYKOWSKA B., OCHYRA, R., GARCIA C., SÉRGIO C., LEBOUVIER M., MANOLAKI P., GIANNOURIS E., KADIS C., MARKOVÁ I., PAPP B., SZURDOKI E., PERALTA D.F., PLÁŠEK V., RISTOW R., SABOVLJEVIĆ M., SIM-SIM M., SMITH V.R., TSAKIRI E., VÁŇA J., VIRCHENKO V.M. & BARSUKOV O.O., 2012a — New national and regional bryophyte records, 30. *Journal of bryology* 34(1): 45-51.

ELLIS L.T., ALEGRO A., BEDNAREK-OCHYRA H., OCHYRA R., BERGAMINI A., COGONI A., ERZBERGER P., GÓRSKI P., GREMMEN N., HESPANHOL H., VIEIRA C., KURBATOVA L.E., LEBOUVIER M., MARTINČIČ A., ASTHANA A.K., GUPTA R., NATH V., NATCHEVA R., GANEVA A., ÖZDEMIR T., BATAN N., PLÁŠEK V., PORLEY R.D., RANDIĆ M., SAWICKI J., SCHRODER W., SÉRGIO C., SMITH V.R., SOLLMAN P., ŞTEFĂNUŢ S., STEVENSON C.R., SUÁREZ G.M., SURINA B., UYAR G. & SURINA Z.M., 2012b — New national and regional bryophyte records, 31. *Journal of bryology* 34(2): 123-134.

ELLIS L.T., BEDNAREK-OCHYRA H., OCHYRA R., BENJUMEA M.J., SAÏS L.V., CAPARRÓS R., LARA F., MAZIMPAKA V., DULIN M.V., GARILLETTI R., GREMMEN N., GRUNDLING P.-L., HERAS P., INFANTE M., HUTTUNEN S., IGNATOV M.S., KORVENPÄÄ T., LEBOUVIER M., LEWIS SMITH R.I., LIN S.-H., YANG J.-D., LINSTRÖM A., PLÁŠEK V., ROSSELLÓ J.A., SAWICKI J., VAN ROOY J., SMITH V.R., 2013 — New national and regional bryophyte records, 35. *Journal of bryology* 35(2): 129-139.

ELLIS L.T., ASTHANA A.K., SRIVASTAVA A., BAKALIN V.A., BEDNAREK-OCHYRA H., CANO M.J., JIMÉNEZ J.A., ALONSO M., DEME J., CSIKY J., DIA M.G., CAMPISI P., ERZBERGER P., GARILLETI R., GOROBETS K.V., GREMMEN N.J.M, JIMÉNEZ M.S., SUÁREZ G.M., JUKONIENĖ I., KIEBACHER T., KIRMACI M., KOCZUR A., KÜRSCHNER H., LARA F., MAZIMPAKA V., LARRAÍN J., LEBOUVIER M., MEDINA R., NATCHEVA R., NEWSHAM K.K., NOBIS M., NOWAK A., ÖREN M., ÖZÇELIK A.D., ORGAZ J.D., PERALTA D.F., PLÁŠEK V., ČÍHAL L., RISTOW R., SAWICKI J., SCHÄFER-VERWIMP A., SMITH V.R., STEBEL A., ŞTEFĂNUŢ S., SUBKAITĖ M., SUN B.-Y., USELIENĖ A., UYAR G., VÁŇA J., YOON Y.-J. & PARK S.J., 2015 — New national and regional bryophyte records, 43. *Journal of bryology* 37(2): 128-146.

FEDOSOV V.E. & IGNATOVA E.A., 2008 — The genus *Bryoerythrophyllum* (Pottiaceae, Bryophyta) in Russia. *Arctoa* 17: 19-38.

GRIMMS F., 1999 — *Die Laubmoose Österreichs. Catalogus florae Austriae, II. Teil, Bryophyten (Moose), Heft 1, Musci (Laubmoose)*. Wien, Österreichische Akademie der Wissenschaften. vii + 418 p.

LI X.-J., HE S. & IWATSUKI Z., 2001 — Pottiaceae. *In*: Li X.-J., Crosby M.R. & He S. (eds), *Moss flora of China. English version.* Volume 2. Fissidentaceae–Ptychomitriaceae. Beijing – New York, Science Press and St. Louis, Missouri Botanical Garden, pp. 114-249.

LIGHTOWLERS P.J., 1986 — Taxonomy and distribution of the subantarctic species of *Tortula*. *Journal of bryology* 14(2): 281-295.

MÜLLER C., 1889 — Laubmoose (Musci frondosi). *In:* A. Engler (ed.), *Die Forschungsreise S.M.S."Gazelle" in den Jahren 1874 bis 1876 unter Kommando des Kapitän zur See Freiherrn von Schleinitz.* 4. Botanik. Berlin, Ernst Siegfried Mittler und Sohn. 64 p.

MÜLLER K., 1883 — Die auf der Expedition S.M.S. “Gazelle” von Dr. Naumann gesammelten Laubmoose. *Botanische jahrbücher für systematik, pflanzengeschichte und pflanzengeographie* 5: 76-88.
OCHYRA R. & LEWIS SMITH R.I., 1998 — Antarctic species in the genus *Ditrichum* (Ditrichaceae, Bryopsida), with a description of *D. gemmiferum* sp. nov. *Annales botanici fennici* 35: 33-53.
OCHYRA R., 1999 — Antipodal mosses: XIII. A neotypification and the taxonomic status of *Barbula validinervia* (Pottiaceae), with a note on muscological research on Îles Kerguelen. *Fragmenta floristica et geobotanica* 44(2): 245-253.
OCHYRA R. & ZANDER R.H., 2002 — The genera *Didymodon* and *Bryoerythrophyllum* (Pottiaceae) in Antarctica. *Journal of bryology* 24(1): 33-44.
OCHYRA R. & POULSEN R., 2003 — Four new moss records from Îles Kerguelen. *Journal of bryology* 25(2): 136-138.
OCHYRA R., LEWIS SMITH R.I. & BEDNAREK-OCHYRA H., 2008 — *The illustrated moss flora of Antarctica*. Cambridge, Cambridge University Press. xvii + 685 p. [+ 24 p. with plates].
OCHYRA R., 2010 — Antipodal mosses: XVI. The first record of the genus *Sematophyllum* (Sematophyllaceae) in the Subantarctic, with a description of *S. lebouvieri* sp. nov. *Cryptogamie, Bryologie* 31(3): 223-232.
OCHYRA R., ZANDER R.H. & LEBOUVIER M., 2014 — Antipodal mosses: XVIII. *Syntrichia christophei*, a new species from subantarctic Îles Kerguelen. *Cryptogamie, Bryologie* 35(1): 37-46.
SAVICZ-LYUBITSKAYA L.I. & SMIRNOVA Z.N., 1963 — A contribution to the biology and geography of *Bryoerythrophyllum recurvirostre* (Hedw.) Chen – a new species in the bryoflora of the Antarctic. *Botanicheskiy zhurnal* (Moscow & Leningrad) 48(3): 350-361 (in Russian with English summary).
SOLLMAN P. & FRAHM J.-P., 2007 — *Bryoerythrophyllum rubrum* – funnen i Skandinavien. *Myrinia* 17(1): 34-35.
SOLLMAN P., 2015 — The genus *Bryoerythrophyllum* (Musci, Pottiaceae) in Antarctica. *Polish botanical journal* 50(1): 19-25.
VAN DER PUTTEN N., STIEPERAERE H., VERBRUGGEN C. & OCHYRA R., 2004 — Holocene palaeoecology and climate history of South Georgia (sub-Antarctica) based on a macrofossil record of bryophytes and seeds. *The holocene* 14: 382-392.
VAN DER PUTTEN N., VERBRUGGEN C., OCHYRA R., SPASSOV S., DE BEAULIEU J.-L., DE DAPPER M., HUS J. & THOUVENY N., 2009 — Peat bank growth, Holocene palaeoecology and climate history of South Georgia (sub-Antarctica), based on a botanical macrofossil record. *Quaternary science reviews* 28: 65-79.
VAN DER PUTTEN N., VERBRUGGEN C., OCHYRA R., VERLEYEN E. & FRENOT Y., 2010 — Subantarctic flowering plants: pre-glacial survivors or post-glacial immigrants? *Journal of biogeography* 37: 582-592.
ZANDER R.H. & OCHYRA R., 2001 — *Didymodon tectorum* and *D. brachyphyllus* (Musci, Pottiaceae) in North America. *The bryologist* 104(3): 372-377.