

Review of the bryophyte research in Romania

Gheorghe Dihoru

Institute of Biology, Romanian Academy, Splaiul Independentei 296, 060031, Bucharest VI, Romania, e-mail: oltue@yahoo.com

Received: May 5, 2004 ▷ Accepted: May 27, 2004

Abstract. The research on bryophytes in Romania during the past decade is reviewed. According to the conclusions, some of the recently found and reported species were indeed previously unknown, while others were erroneously considered new for the Romanian bryoflora, either because only part of the literature has been consulted, or because the micromorphological analysis has been superficial or even absent.

Key words: bryophytes, Romania

Introduction

The small number of bryologists in Romania, as well as in other countries accounts for the slow advancement, or even stalling of the research on bryophytes. Several young Romanian bryologists have asserted themselves in the past decade, writing *PhD theses* on this subject. Foreign bryologists also published new data for the Romanian bryoflora, although not always properly supported with arguments.

Botanical literature of the past decade and even earlier was used to reveal the new bryoflora contributions from Romania and to make the necessary corrections after reviewing of some materials have been reviewed according to the newly available data in bryology.

Regrettably, some of the greatest Romanian bryologists have passed away: S. Radian (†1958), who discovered *Bucegia romanica* (Radian 1903), C. Papp (†1972), who developed the first identification books in Romania (Papp 1943) and T. Ștefureac (†1986), the founder of bryophyte ecocoenology in Romania (Ștefureac 1941). They were my contemporaries and I am glad to say that the young scientists they had trained quite successfully attempt to continue their work.

Review of some new aspects in Romanian bryology

1. *Bryology Flora of Romania. Musci (Sphagnales – Seligeriales)* was published by Plămadă & Dumitru (1998a). The authors describe a new species *Seligeria transylvanica* Plămadă & Dumitru based on the presence of rhizoidal gemmae. Some specialists wonder if this was not a mistake, since no gemmae are known in the genus *Seligeria*.

2. Since 2002 in the Bucharest Institute of Biology have been investigated some groups of *Hepaticae* (Orders *Anthocerotales*, *Calobryales* & *Metzgeriales*). S. Ștefănuț wrote his *PhD thesis* on the Romanian *Hepaticae*. In this process he discovered three interesting species in the Carpathians: *Haplomitrium hookeri* (Sm.) Nees, *Pallavicinia lyellii* (Hook.) Carruth. (Ștefănuț 2000, 2003) and *Lophozia opacifolia* Culm. ex Mehl. (Ștefănuț 2004).

3. Recently, Goia (2001) presented at Cluj-Napoca her *PhD thesis* on bryophytes growing on wood substrate with an inventory of the saprologicolous and corticolous species and their associations. Another *PhD thesis* was presented at Iași (Barabaș 1997; Costică 1998) on mountain bryophytes.

4. Self-taught bryologist Wallfisch (2001) discovered *Pterygoneurum kozlovii* Laz. near Bucharest in Cernica Forest.

5. Several regional taxonomical and chorological conspects have been compiled during the past decade: Dobroudzha (Ștefureac & al. 1970), Moldova (Ștefureac & al. 1973), and Bucovina (Ștefureac & Pascal 1981). There are also lists of the species of *Hepaticae* (Mihai 1983), Schumacker & Vána 2000) and *Musci* (Dihoru 1994) from all over the country, or of both groups, without chorology (Düll 1983, 1984, 1985; Mihai & al. 1998, by region) or with chorology (Mohan 1998) and valid names and synonyms for *Sphagnaceae* (Dihoru 2000) and *Hepaticae* (partial, A-J) (Dihoru 2001). A pronounced trend towards synthesis-making has been observed, instead of true research at the working table. For example, the ninth or tenth list of *Hepaticae* in Romania was published recently (Ștefănuț 2002).

6. There is a series of synthetic papers mapping *Musci Acrocarpi* from Transylvania (Orbán 1974, 1975, 1976, 1977).

7. During the past decade a number of foreign bryologists and some Romanian ones have mentioned several rare *Musci* species, new to Romania or new to science:

– *Dicranum transsylvanicum* Lüth (Lüth 2002), a species new to science, described from Apuseni Mts. It seems to be very close to *D. scoparium* Hedw., and especially to *D. crassifolium* Sérgio, Ochyra & Séneca;

– *Ditrichum gracile* (Mitt.) Kunze, in the Southern Carpathians (Novotný 2002). Some comments need on this species: Koperski & al. (2000) mentioned two varieties of *Ditrichum flexicaule*: var. *flexicaule* and var. *sterile* (De Not.) Limpr. The former variety has var. *densum* (Bruch & Schim.) Braithw. as synonym cited occasionally by the Romanian bryologists. The latter variety has frequently been cited in all the papers on mountain bryophytes in Romania as synonymous to *D. gracile*. Therefore we do not consider *Ditrichum gracile* as a new species to Romania;

– *Hygrohypnum cochlearifolium* (Venturi) Broth., in the Southern Carpathians (Bucegi) (Ochyra & Novotný 2002);

– *Rhabdoweisia crenulata* (Mitt.) H. Jameson, in the Southern Carpathians (Făgăraș Mountains, at Sâmbăta de Sus) (Novotný 2002).

8. Five new species for the Romanian bryoflora were published in Hunedoara County (Smets 2003):

– *Cephaloziella baumgartneri* Schiffn., at Grohot – Bulzeștii de Sus, 360 m and Garda de Sus, 800 m;

– *Bryoerythrophyllum ferruginascens* (Stirt.) Giacom., at Peștera lui Ionel – Garda de Sus, 800 m;

– *Bryum gemmiferum* R. Wilczek & Demaret, at Țebea – Baia de Criș, 235 m;

– *Fissidens exiguus* Sull., at Tomnatec – Bulzeștii de Sus, 650 m;

– *Tortula princeps* De Not., between Bulzeștii de Sus and Stânculești, 550 m and Păulești – Bulzeștii de Sus 850 m.

9. The following ultraxerophilous species growing on loess were identified as new to the Romanian bryoflora (Pócs & al. 2002):

– *Hilpertia velenovskyi* (Schiffn.) R. H. Zander (= *Tortula velenovskyi* Schiffn.) in Moldova near Roman, 180–200 m (Neamț County), at Cosmești, 140–180 m, Galați, 50–60 m (Galați County), Cornățel, 300 m, Căiuți, 290 m, Urechești, 260 m (Bacău County), Adjud, 200–230 m (Vrancea County); – Dobroudzha at 10–20 m (Tulcea County); – Oltenia at Cetate, 50–80 m (Dolj County);

– *Pterygoneurum compactum* Cano, Guerra & Ros, in Moldova near Roman, 180–200 m (Neamț County), Cosmești, 140–180 m, Galați, 50–60 m (Galați County); – Oltenia at Cetate, 50–80 m (Dolj County);

– *P. squamosum* Segarra & Kurschner, in Moldova at Galați, 50–60 m (Galați County);

– *Crossidium laxefilamentosum* Frey & Kurschner, in Oltenia at Cetate, 50–80 m (Dolj County).

10. Other foreign bryologists have found putatively new bryophyte species for Romania, but some of them have been published earlier, so there was apparently lack of information (Jakab 1999, 2000a, b):

– *Sphagnum pylaesii* Brid. It is supposedly mentioned for the first time not only for Romania but also for all the Carpathian mountain chain by Jakab (1999). Had the author read the paper of his fellow countryman Debreczy (1972), he would have seen that the latter cited this species (although erroneously, as we will see) 30 years ago. The information of Debreczy made B. Lange visit on purpose the habitat where the species was collected (Bucura Lake in Făgăraș Mts), examine the material of Debreczy, and publish a paper (Lange 1977) with corrections, stating that the material collected by Debreczy belonged to *Sphagnum platyphyllum* (Braithw.) Warnst. var. *subsimplax* (Lindb.) Warnst. We wrote earlier on this matter (Dihoru 1999). Other material collected from the same lake Bucura was also identified as *S. compactum* Lam. & DC. fo. *submersum* (Limpr.) Warnst. (Plămadă & Dumitru 1998a). For the moment, we are also doubtful of the information of Jakab (1999) on this boreal species from the Romanian bryoflora. Although it is stated in the *Abstract* (Jakab 1999: 49), erroneously, that only *Sphagnum pylaesii* occurs in the Carpathians, in the same paper the author reported that “*Porella cordaeana*,

Hygrohypnum eugyrium and *Calypogeia fissa* are new to the SE Carpathians” (Jakab 1999: 53). This statement is also incorrect (Mihai 1983; Dihoru 1994, 2001).

11. The same author (Jakab 2000a, b) mentioned *Warnstorfia pseudostraminea* (Müll. Hal.) Tuom. & T. J. Kop. as a new species to the Romanian bryoflora (as *Drepanocladus pseudostramineus* (Müll. Hal.) G. Roth.). This species was already reported earlier (Dihoru 1994). The same situation applies for *Schistidium trichodon* (Brid.) Poelt. *S. gracile* (Schleich. ex Rohl.) Limpr. is mentioned among the synonyms of the species and is quite frequently cited in the Romanian literature as *S. apocarpum* (Hedw.) Bruch & al. var. *gracile* (Schleich. ex Rohl.) Bruch & Schimp. Therefore we consider that *S. trichodon* was already well known and established for the Romanian bryoflora. We give credit to the information concern-

ing *Cephaloziella massalongi* (Spruce) Müll. Frib., which Jakab (2000a) cited too.

12. *Dicranum crassifolium* Sérgio, Ochyra & Séneca, has recently been found on the peak Zăvideanu, 1400–1600 m, in Cernei de Olteț basin (Vâlcea County, coll. D. Răduțoiu & A. Răduțoiu, 31.08. 2003). The species is very close to *D. scoparium* Hedw., from which it differs by the presence of bistratose zones in the leaf and the (2)5–6(7) ridges, abaxial on the upper part of the costa (Dihoru & Răduțoiu 2004).

13. Bellow are listed several species mentioned misleadingly in the literature, or misidentified by some bryologists. These species have to be excluded for the time being from the list of bryofites of Romania (Mihai 1986; Plămadă & Dumitru 1998b), because they are not yet confirmed or because there is no herbarium material to confirm their presence:

Aongstroemia longipes (Sommerf.) Bruch & Schimp.
Brachythecium latifolium Kindb.
B. ryanii Kaurin
Bryum arcticum (R. Br.) Bruch & Schimp.
Desmatodon cernuus (Huebener) Bruch & Schimp.
Discelium nudum (Dicks.) Brid.
Eurhynchium meridionale (Schimp.) De Not.
Habrodon perpusillus (De Not.) Lindb.
Homalothecium aureum (Spruce) H. Rob.
Marchantia paleacea Bertol.
Mielichhoferia mielichhoferiana (Funck) Loeske
Plagiomnium drummondii (Bruch & Schimp.) T. J. Kop.
Plagiothecium latebricola Schimp.
P. neckeroideum Schimp.
P. piliferum (Sw. ex Hartm.) Bruch & al.
Pleuridium palustre (Bruch & Schimp.) Bruch & Schimp.
Pohlia flexuosa Harv. (= *P. muyldermansii* R. Wilczek & Demaret)
Polytrichum leonii Papp

Scapania compacta (Roth) Dumort.
S. crassiretis Bryhn
Scleropodium touretii (Brid.) L. F. Koch
Sematophyllum demissum (Wilson) Mitt.
S. substrumulosum (Hampe ex Müll. Hal.) Britt.
Sphagnum annulatum Warnst.
S. molle Sull.
S. pulchrum (Braithw.) Warnst.
S. pylaesii Brid.
Splachnum luteum Hedw.
S. vasculosum Hedw.
Tetraplodon urceolatus (Hedw.) Bruch & Schimp.
Timmia megapolitana Hedw.
Tortella flavovirens (Bruch) Broth.
T. nitida (Lindb.) Broth.
Tortula latifolia Bruch ex Hartm.
Trochobryum carniolicum Breidl. & Beck.

Possibly some of these species will be found in the future.

14. In conclusion we would like to mention that we have completed *Illustrated Dictionary of Bryology*, in Romanian (Dihoru & Dihoru in press) and that we have also almost finished a *Bibliography on the Bryophytes from Romania* (Dihoru pers. comm.).

15. The nomenclature and abbreviation of authors of taxa are in accordance with some recent papers (Brummitt & Powell 1992; Koperski & al. 2000; Kučera & Váňa 2003).

References

- Barabaș, V.** 1997. The researches on bryophytes in Nemira Mountain (Bacău County). *PhD Thesis*. Univ. “Al. I. Cuza”, Iași (in Romanian, unpublished).
- Brummitt, R. K. & Powell, C.E.** 1992. (eds), Authors of plant names. Royal Bot. Gardens, Kew.
- Costică, M.** 1998. The flora and vegetation of masive Măgura – Pietricica. *PhD Thesis*. Univ. “Al. I. Cuza”, Iași (in Romanian, unpublished).
- Debreczy, Z.** 1972. The atlantic-boreal *Sphagnum pylaesii* Brid. in the Carpathian Flora. – *Bot. Közlem.*, **59**: 159-172 (in Hungarian).

- Dihoru, G.** 1994. *Bryophyta – Musci* in the Romanian flora. – Rev. Roumaine Biol., Sér. Biol. Vég., **39**(2): 91- 107.
- Dihoru, G.** 1999. Legitimate and synonyms names of taxa from Bryoflora of Romania. (I). – Acta Horti Bot. Bucurest., **28**: 143-150 (in Romanian).
- Dihoru, G.** 2001. Legitimate and synonyms names of taxa from Bryoflora of Romania. (II). *Hepaticae* (A- J). – Acta Horti Bot. Bucurest., **29**: 109-128 (in Romanian).
- Dihoru, A. & Dihoru, G.** In press. Illustrated Dictionary of Bryology. Publishing House “Alo București”, Bucharest (in Romanian).
- Dihoru, G. & Răduțoiu, D.** 2004. The Bryophytes in the Cerna of Olteț Basin (2) – Analele Univ. Craiova, **7**: 75-81 (in Romanian).
- Düll, R.** 1983. Distribution of the European and Macaronesian liverworts (*Hepaticophytina*). – Bryol. Beitr., **2**: 1-114.
- Düll, R.** 1984. Distribution of the European and Macaronesian Mosses (*Bryophytina*). Part I. – Bryol. Beitr., **4**: 1-112.
- Düll, R.** 1985. Distribution of the European and Macaronesian Mosses (*Bryophytina*). Part II. – Bryol. Beitr., **5**: 110-123.
- Goia, I.** 2001. Xylophilous Bryoflora from upper basin of Arieș river. Bryotaxonomic, chorologic, ecologic and coenologic studies. *PhD Thesis*. Cluj-Napoca (in Romanian, unpublished).
- Jakab, G.** 1999. Contributions to the knowledge of the bryophyte flora of the SE Carpathians (Romania). – Stud. Bot. Hung., **29**: 49-57.
- Jakab, G.** 2000a. Three bryophytes new to Romania. – Stud. Bot. Hung., **30-31**: 87-94.
- Jakab, G.** 2000b. Some data to the bryophyte flora of the Padiș area (Bihar Mountains). – Crisicum, **3**: 65-72 (in Hungarian).
- Koperski, M., Sauer, M., Braun, W. & Garstein, S. R.** 2000. Referenzliste der Moose Deutschlands. Bundesamt für Naturschutz, Bonn – Bad Godesberg.
- Kučera, J. & Váňa, J.** 2003. Check- and Red List of bryophytes of the Czech Republic (2003). – Preslia, **75**(3): 193-222.
- Lange, B.** 1977. Additional notes on the distribution of *Sphagnum pylaesii*. – Bryologist, **80**(3): 527-529.
- Lüth, M.** 2002. *Dicranum transylvanicum* (*Musci, Dicranaceae*), a new species from Romania. – Cryptog., Bryol., **23**(1): 17-21.
- Mihai, G.** 1983. The Liverworts list from Romanian Socialist Republic. – Analele Ști. Univ. Al. I. Cuza Iași, Ser. Nouă, **2a**, **29**: 31-34 (in Romanian).
- Mihai, G.** 1986. Precisions on some Bryophytes from flora of RS Romania. – Analele Ști. Univ. Al. I. Cuza Iași, Ser. Nouă, **2a**, **32**: 38-41 (in Romanian).
- Mihai, G., Pascal, P. & Costică, M.** 1998. The Liverworts and Mosses of Romania; an annotated list of species, with their distribution in the smaller territorial units (provinces). Publishing House Corson, Iași (in Romanian).
- Mohan, G.** 1998. The catalogue of Bryophytes from Romania. – Acta Horti Bot. Bucurest., 1-432.
- Novotný, I.** 2002. In: **Blockeel, T. L.**, New national and regional bryophyte records, 6. – J. Bryol., **24**: 329-332.
- Ochyra, R. & Novotný, I.** 2002. In: **Blockeel, T. L.**, New national and regional bryophyte records, 6. – J. Bryol., **24**: 329-332.
- Orbán, S.** 1974. Moos-arealgeographische Studien aus dem Gebiet der Karpaten und Karpatenbecken. II. – Stud. Bot. Hung., **9**: 43-70.
- Orbán, S.** 1975. Moos-arealgeographische Studien aus dem Gebiet der Karpaten und Karpatenbecken. III. – Stud. Bot. Hung., **11**: 63-109.
- Orbán, S.** 1976. Moos-arealgeographische Studien aus dem Gebiet der Karpaten und Karpatenbecken. IV. – Stud. Bot. Hung., **11**: 49-81.
- Orbán, S.** 1977. Moos-arealgeographische Studien aus dem Gebiet der Karpaten und Karpatenbecken. V. – Stud. Bot. Hung., **12**: 41-54.
- Papp, C.** 1943. Flora for determination of known Bryophytes in Moldavia between Carpathians and Prut. – Mem. Sect. Ști. Acad. Română, Ser. III, **18**(17): 643-762.
- Plămadă, E. & Dumitru, C.** 1998a. Bryology Flora of Romania. Musci (*Sphagnales – Seligeriales*). Univ. Press, Cluj-Napoca (in Romanian).
- Plămadă, E. & Dumitru, C.** 1998b. Espèces et sous-unités rayées de la bryoflore de Roumanie. – Contr. Bot. Cluj-Napoca, **2**, 63-71.
- Pócs, T., Goia, I., Kis, G., Orbán, S., Sass-Gyrmati, A. & van Zanten, B. O.** 2002. *Hilpertia velenovskyi* (Schiffn.) Zander and other pottioid mosses (*Bryophyta*) new to Romania. Studies on the cryptogamic vegetation of loess cliffs, IX. – Contr. Bot. Univ. “Babes-Bolyai” Cluj-Napoca, **37**: 13-24.
- Radian, S.** 1903. Sur le *Bucegia*, nouveau genre d'Hépatiques a thalle. – Bull. Herb. Inst. Bot. Bucarest, **3-4**: 3-7.
- Schumacker, R. & Vána, J.** 2000. Identification keys to the liverworts and hornworts of Europe and Macaronesia. (Distribution & Status). Ed. **1**. Documents de la Station scientifique Hautes-Fagnes no. 31.
- Smets, L.** 2003. Additions to the bryophyte flora of Romania. – Belg. Journ. Bot., **136**(1): 59-62.
- Ștefănuț, S.** 2000. *Haplomitrium hookeri*, new species to the Romanian flora. – Acta Horti Bot. Bucurest., **28**: 139-141.
- Ștefănuț, S.** 2002. The Hornworts and Liverworts list of Romania. – Rev. Roumaine Biol., Sér. Biol. Vég., **47**(1-2): 27-39.
- Ștefănuț, S.** 2003. *Pallavicinia lyellii*, a new species from Romania. – Acta Horti Bot. Bucurest., **30**: 71-78.
- Ștefănuț, S.** 2004. In: **Blockeel, T. L.**, New national and regional bryophyte records, 9. – J. Bryol., **26**: 63-66.
- Ștefureac, T.** 1941. Synecological and sociological researches on Bryophytes from Codrul Secular Slătioara (Bucovina). – Analele Acad. Române, Mem. Sect. Ști., Ser. III, **16**(27): 1133-1329.
- Ștefureac, T., Mihai, G. & Pascal, P.** 1970. Conspectus of Bryophytes from Dobroudzha. – In: Comunic. Bot. Pp. 119-139. Soc. Ști. Biol. Rom. Sixth Natl. Conf. Geobot.
- Ștefureac, T., Mihai, G., Pascal, P. & Barabaș, V.** 1973. Conspects of Bryophytes from Moldova. – Stud. Comun. Muz. Ști. Nat., **6**: 129-258 (in Romanian).
- Ștefureac, T. & Pascal, P.** 1981. Conspectus of Bryophytes from Bucovina. – Stud. Comun. Ocrot. Nat., **5**: 471-544 (in Romanian).
- Wallfisch, R.** 2001. *Pterygoneurum kozlovii* – new for Romania. – Acta Horti Bot. Bucurest., **29**: 129-132.