

Additions to the Bryophyte Flora of Bulgaria

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Abstract – New and noteworthy records of bryophytes from Bulgaria are reported. *Bartramia stricta*, *Bryum funckii*, *Calypogeia integristipula*, *Dicranella humilis*, *Dicranoweisia compacta*, *Ditrichum gracile*, *Grimmia anomala*, *G. lisae*, *G. meridionalis*, *Hedwigia ciliata* var. *leucophaea*, *Hypnum bambergeri*, *Hypnum recurvatum*, *Schistidium crassipilum*, *S. elegantulum*, *S. robustum*, *S. singarense* and *Tortella bambergeri* are new to Bulgaria, and some additional species are new to different regions of Bulgaria.

Mosses / liverworts / new records / distribution / Bulgaria

The collections for this article were made during excursions with the Nordic Bryological Society from 10 to 15 July 2005 throughout Bulgaria, invited and led by Anna Ganeva and Rayna Natcheva, and during two subsequent weeks travelling with Florian Hans through the country. Specimens are deposited in SOM and in the private herbarium of the author, or as otherwise indicated.

Nomenclature and distribution data are based on the two check-lists of Bulgaria (Ganeva & Natcheva, 2003; Natcheva & Ganeva, 2005), which contain 2 species of hornworts, 173 liverworts and 531 mosses. In a country like Bulgaria, with high diversity of climate, geology and morphology, about 800-1000 species of bryophytes could be expected. So there is a high probability of further discoveries. The novelties are indicated by an asterisk (*).

Liverworts

**Calypogeia integristipula* Steph.

Bulgaria: Rila Mt.: Path to Malyovitsa chalet, 41°38'N 24°24'E, 1800 m a.s.l., on bank with acid soil along the path, 11 July 2005, *M. Lüth* 4859.

Widespread in the Northern Hemisphere.

Lophozia bicrenata (Hoffm.) Dumort.

Bulgaria: Pirin Mt.: Sandanski, path from Sandanski Chalet to Kamenitsa Chalet, 41°42'N 23°09'E, 1550 m a.s.l., shady bank beside path, 22 July 2005, *M. Lüth* 4975.

This species is not listed in the check-list of Bulgaria (Ganeva & Natcheva, 2003); however, Damsholt (2002) includes Bulgaria in its distribution range.

Marsupella brevissima (Dum.) Grolle

Bulgaria: Rila Mt.: Blagoevgrad, path from Makedonija lodge to German (peak), 41°42'N 23°09'E, 2200 m a.s.l., on soil in snow-bed together with *Anthelia juratzkana* and *Kiaeria blyttii*, 18 July 2005, *M. Lüth* 4925.

Hitherto only known from Pirin Mt., new to Rila Mt.

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Mosses

**Bartramia stricta* Brid.

Bulgaria: Strouma valley: Kresna, Moravska, NE-exp. dry slope, 42°12'N 23°24'E, 250 m a.s.l., between rocks on steep part of the slope, 21 July 2005, *M. Lüth 4954*.

The dry slopes near Kresna are known for Mediterranean plants, for example *Homalothecium aureum* (Spruce) Robins. The region of Strouma Valley is adjacent to Greece and warm and dry climatic conditions reach Bulgaria through the gap formed by the valley in the high mountains around. *Bartramia stricta* is a mainly Mediterranean species and is new to Bulgaria.

**Bryum funckii* Schwägr.

Bulgaria: Strouma valley: Kresna, Moravska, NE-exp. dry slope, 42°12'N 23°24'E, 250 m a.s.l., on dry soil over rock, 21 July 2005, *M. Lüth 4953*.

This species grows rare to scattered through Europe on dry basic soil.

**Dicranella humilis* R. Ruthe

Bulgaria: Rila Mt.: Path to Malyovitsa chalet, 41°38'N 24°24'E, 1800 m a.s.l., on bank with acid soil beside the path, 11 July 2005, *M. Lüth 4858*.

Pioneer plant of unstable substrates, rare to scattered through Middle- and North Europe.

**Dicranoweisia compacta* (Schwägr.) Schimp.

Bulgaria: Pirin Mt.: Bansko, Glavnishka porta, 41°38'N 24°24'E, 2560 m a.s.l., on rock in alpine grassland, 20 July 2005, *M. Lüth 4949*.

Distinguished by the cucullate leaf apex, the short seta of just a few millimetres and the completely papillose peristome. This Nordic and alpine species grows only above timber line, in the Alps above 2000 m.

Dicranum spadiceum J. E. Zetterst.

Bulgaria: Pirin Mt.: Bansko, path from Vihren chalet to Glavnishka porta, 41°48'N 24°36'E, 2300 m a.s.l., on soil in rocky grass with *Pinus mugo*, 20 July 2005, *M. Lüth 4941*.

In Bulgaria this alpine species was hitherto known only from Rila Mt. New to Pirin Mt.

**Ditrichum gracile* (Mitt.) Kuntze

Bulgaria: Rhodopes Mt.: Chudnite mostove (Miracle Bridges), 43°13'N 23°28'E, ca 900 m a.s.l., basic rock at the bottom of the gorge, 15 July 2005, *M. Lüth 4881*.

This taxon has been separated from *D. flexicaule* at species level by Frisvoll (1985). With the characters given in this paper, clear separation is not always possible. However, leaf sections are distinct in both taxa. Whereas *D. flexicaule* has a perfect round and smooth section with the nerve not differentiated from the lamina, the section of *D. gracile* is somewhat keeled, papillose and with the nerve well differentiated (pictures in Lüth, 2006).

**Grimmia anomala* Hampe ex Schimp.

Bulgaria: Rila Mt.: Blagoevgrad, plateau at German, 43°13'N 23°28'E, 2340 m a.s.l., shady side of a rock in alpine grass, 18 July 2005, *M. Lüth 4939*.

This species looks similar to *Grimmia hartmanii*, and like it has gemmae at the leaf apex, but it has a papillose lamina and a different nerve structure in section. It replaces *G. hartmanii*, which is mainly a forest plant, in higher altitudes above the timber line.

Grimmia decipiens (Schultz) Lindb.

Bulgaria: Rila Mt.: Borovets, road to Maritsa, Chernata Skala (Black Rock), 43°13'N 23°28'E, 1350 m a.s.l., sunny rock, 17 July 2005, *M. Lüth 4922*. Strouma valley: Kresna, Moravska, NE-exp. dry slope, 42°16'N 23°39'E, 250 m a.s.l., on exposed rock, 21 July 2005, *M. Lüth 4952*.

Hitherto known only from Pirin Mt. and Strandzha Mt. New to Rila Mt. and Strouma Valley.

Grimmia elatior Bruch ex Bals.-Criv. & De Not.

Bulgaria: Rila Mt.: Borovets, road to Maritsa, south of Chernata Skala, 42°16'N 23°39'E, 1450 m a.s.l., E-exp. large rocky slope, 17 July 2005, *M. Lüth* 4913 (Priv. Herb. Lüth). Pirin Mt.: Sandanski, road to Sandanski Chalet, 42°16'N 23°39'E, 1350 m a.s.l., half shady granite rock in old beech forest, 22 July 2005, *M. Lüth* 4966 (Priv. Herb. Lüth).

Hitherto only known from West Stara Planina (Balkan range) and West Rhodopes Mt., new to Rila Mt. and Pirin Mt..

****Grimmia lisae*** De Not.

Bulgaria: Strouma valley: Kresna, Moravska, NE-exp. dry slope, 42°13'N 23°38'E, 250 m a.s.l., on little rock, 21 July 2005, *M. Lüth* 4957.

A species with mainly Mediterranean distribution. One of the expected species at this locality with a warm climate (see above at *Bartramia stricta*).

****Grimmia meridionalis*** (Müll. Hal.) E. Maier

Bulgaria: Strouma valley: Kresna, Moravska, NE-exp. dry slope, 42°13'N 23°38'E, 250 m a.s.l., on soil over rock, 21 July 2005, *M. Lüth* 4958. West Frontier Mt.: Gorna Breznitsa above Kresna, dry slope in NW of village, 42°13'N 23°38'E, 450 m a.s.l., on sunny rock, 21 July 2005, *M. Lüth* 4961, det. E. Maier.

A Mediterranean species like *G. lisae* (see above), newly circumscribed by Maier (2002).

Grimmia muehlenbeckii Schimp.

Bulgaria: Rila Mt.: Borovets, road to Maritsa, south of Chernata Skala, 42°16'N 23°38'E, 1450 m a.s.l., E-exp. large rocky slope, 17 July 2005, *M. Lüth* 4909.

Hitherto known only from Rhodope Mt. New to Rila Mt.

****Hedwigia ciliata* var. *leucophaea*** Bruch & Schimp.

Bulgaria: West Frontier Mt.: Gorna Breznitsa above Kresna, dry slope NW of the village, 42°03'N 23°27'E, 450 m a.s.l., on sunny rock, 21 July 2005, *M. Lüth* 4962 (Priv. Herb. Lüth). Pirin Mt.: Sandanski, path from Sandanski Chalet to Kamenitsa Chalet, 42°03'N 23°27'E, 1400 m a.s.l., sunny rock face within mountain forest, 22 July 2005, *M. Lüth* 4969 (Priv. Herb. Lüth). Pirin, S-exp. slope at road junction south of Pirin, 42°03'N 23°27'E, 950 m a.s.l., sunny rock, 23 July 2005, *M. Lüth* 4983 (Priv. Herb. Lüth).

This taxon is distinguished by a long hyaline leaf apex (22-55% of the leaf length, Hedenäs, 1994), that is pure white and contrasts strongly with the rest of the leaf and is papillose up to the apex. The var. *leucophaea* is mostly found in hot and sunny places, whereas the var. *ciliata* grows in more sheltered and even shaded sites (but also there exists mixed stands).

Hedwigia stellata Hedenäs

Bulgaria: Pirin Mt.: Sandanski, path from Sandanski Chalet to Kamenitsa Chalet, 41°45'N 23°25'E, 1400 m a.s.l., sunny rock face within mountain forest, 22 July 2005, *M. Lüth* 4967.

Hitherto only known from Rila Mt., new to Pirin Mt.

Hypnum bambergeri Schimp.

Bulgaria: Rhodopes Mt.: Road to Trigrad Gorge, 41°42'N 23°09'E, ca 600 m a.s.l., half shady basic rock at roadside, 14 July 2005, *M. Lüth* 4874.

Arctic-alpine species, probably a relict in this lowland and southern area.

****Hypnum recurvatum*** (Lindb. & Arnell) Kindb.

Bulgaria: Rila Mt.: Borovets, road to Maritsa, south of Chernata Skala, 41°42'N 23°09'E, 1380 m a.s.l., exposed rock along road, 17 July 2005, *M. Lüth* 4900.

Hitherto known from the Alps, the Pyrenees, the Balkan Mt. (not written which country) and the Tatra Mt. (Frey *et al.*, 2006).

Racomitrium affine (F. Weber & D. Mohr) Lindb.

Bulgaria: Rila Mt.: Borovets, road to Maritsa, south of Chernata Skala, 41°42'N 23°09'E, 1450 m a.s.l., E-exp. large boulder slope, 17 July 2005, *M. Lüth 4908*.

Hitherto only known from Pirin Mt., new to Rila Mt.

Schistidium confertum (Funck) Bruch & Schimp.

Bulgaria: Pirin Mt.: Sandanski, road to Sandanski Chalet, 41°45'N 23°07'E, 1100 m a.s.l., exposed rock at roadside, 22 July 2005, *M. Lüth 4978*.

In Bulgaria only known from West Stara Planina and Rhodope Mt., new to Pirin Mt.

****Schistidium crassipilum*** H. H. Blom

Bulgaria: Rhodopes Mt.: Road to Trigrad Gorge, 41°45'N 23°07'E, ca 600 m a.s.l., shady basic rock at roadside, 14 July 2005, *M. Lüth 4875*. West Stara planina Mt. (Balkan): Vrachanska planina, plateau at Ledenika, 41°40'N 23°23'E, 1200 m a.s.l., shady rock at roadside, 16 July 2005, *M. Lüth 4891*. (Priv. Herb. Lüth). Rila Mt.: Borovets, road to Maritsa, south of Chernata Skala, 41°40'N 23°23'E, 1400 m a.s.l., concrete wall at roadside, 17 July 2005, *M. Lüth 4902* (Priv. Herb. Lüth).

On basic rocks and concrete the most frequent species of the genus. Described as new by Blom (1996), therefore its known distribution is still incomplete.

****Schistidium elegantulum*** H. H. Blom

Bulgaria: Rila Mt.: Borovets, road to Maritsa, south of Chernata Skala, 41°40'N 23°23'E, 1400 m a.s.l., concrete wall at roadside, 17 July 2005, *M. Lüth 4903*.

Common on basic rocks, but not as frequent as *S. crassipilum*. Another new species described by Blom (1996).

Schistidium papillosum Culm.

Bulgaria: Pirin Mt.: Sandanski, road to Sandanski Chalet, 41°41'N 23°24'E, 1350 m a.s.l., half shady granite rock in humid beech forest, 22 July 2005, *M. Lüth 4965*.

Not a rare species on damp acid rocks, newly circumscribed by Blom (1996).

****Schistidium robustum*** (Nees & Hornsch.) H. H. Blom

Bulgaria: Rhodopes Mt.: Road to Trigrad Gorge, 41°41'N 23°26'E, ca 600 m a.s.l., half shady basic rock at roadside, 14 July 2005, *M. Lüth 4873*.

One of the typical and common species of the genus on basic rocks, newly circumscribed by Blom (1996).

****Schistidium singarense*** (Schiffn.) Laz.

Bulgaria: West Stara planina Mt. (Balkan): Vrachanska planina, plateau at Ledenika, 41°41'N 23°26'E, 1200 m a.s.l., sunny rocks in pasture, 16 July 2005, *M. Lüth 4884*.

A black lustrous plant on sunny, hot and basic rocks.

****Tortella bambergeri*** (Schimp.) Broth.

Bulgaria: West Stara planina Mt. (Balkan): Vrachanska planina, plateau at Ledenika, 41°39'N 23°22'E, 1200 m a.s.l., sunny rocks in pasture, 16 July 2005, *M. Lüth 4886*.

Close to *T. tortuosa*, but with easily broken leaf apex and with short cells covering the nerve dorsally near apex.

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