

The moss *Schistidium atrofusum* Schimp. in the Slovakian and Roumanian Carpathians

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In Hedwig's (1801) classical study on page 76 the species *Grimmia apocarpa* (*Schistidium*) is described so universally that this description might be applied to nearly all of today's known species for the genus *Schistidium*. Bridel (1826-1827) perceived greater variability and described 7 subgeneric taxa. Nees *et al.* (1827) recorded 13 subgeneric taxa and described three new species - *Grimmia robusta* Nees, *Grimmia fusca* Nees and *Grimmia glacialis* Nees. Only a few of these taxa have held up to present views. The rest have been forgotten as worthless from a taxonomical point of view. There are more insignificant bryological works, but I wish to concentrate only on papers whose contributions are more important. Müller (1848-1849) introduced up to that time all known moss species, but his comprehension of the *Schistidium* genus is quite different from that of today. Some of today's *Schistidium* species Müller (1848-1849) ordered to the genus *Grimmia* which many bryologists later followed. Within the species *Grimmia apocarpa* only three varieties were recorded - var. *rivularis*, var. *gracilis* and var. *conferta*. The others were ignored except for *Grimmia maritima*.

Bruch *et al.* (1836-1855) having more bryological material elaborated on the genus *Grimmia* more precisely, but the species *Schistidium atrofusum* was left out. This was described in the second edition of the work Synopsis (Schimper 1876) from Swiss mountain Rigi. The differences from *Grimmia conferta* were explained in the footnote. Apparent are the bistratose folioid margin, the bistratose lamina towards apex and the shape of the peristome. This taxa by Husnot (1884) was considered a variety while by Schimper (1876) a completely differentiated species. Bouly (1884) didn't make a note of this species at all. Limpricht (1890) considered it as a clean-cut species, but ordered it in the genus *Schistidium*. The species is described thoroughly and some locations from Salzburg, Tirolia and Styria are recorded. Not very long before that Chalubinski (1882) published his excellent monography of the Family *Grimmiaceae* from the Tatra Mountains. Despite the fact that the species *Schistidium apocarpum* was known to him, he didn't notice it.

Amann (1912) ordered this species to the Genus *Grimmia*, and considered it as a good but rare species occurring in the canton Vallis. Later (Amann 1933) reported it from more cantons but always as rare.

Loeske (1930) regarded *Schistidium atrofusum* as a subspecies of *Grimmia apocarpa* that occurred rarely, and he refers to Limpricht's (1890) sentence "sehr selten" and turns attention towards a distinct description of bistratose lamina given by different authors. He pointed to Limpricht's note on page 714 (related to the diagnosis printed in brevier) saying that Chalubinski's *Grimmia sphaerica* (Schimp.) Chalub. f. *decipiens* Limpricht (1890) regarded as *Schistidium atrofusum* f. *decipiens*. He reminded the Limpricht's discovery, that part of normal peristome is left in operculum, that is shown in enclosed Table I. He confesses he has never seen this species and records only a single location from Giewont. In course of time the number of locations increased but everywhere rare: Spain, Norway, England, North America.

Podpéra (1954) considered it as a subspecies as well. Also, Duell (1994) considered it a subspecies and added: "Nach Meinunger (1992) auch in Tirol vereinzelt stark an dieses Taxon erinnernde Formen. Wegen Seltenheit möglicherweise gefährdet."

Present distribution according to Duell (1984) is as follows: The Alps, Great Britain, Bulgaria, Crete, Slovakia, France, Germany, Greece, Spain, previous Yugoslavia, Norway, Poland, Roumania, Sicily, Sweden, Turkey, Anterior Asia, North America. With respect to the fact that Duell (1984) considers this species as subarctic - alpine, some of this information must have been confused, the revision hasn't even been done.

It was strange for me that this species doesn't grow in the Carpathians. At least Chalubinski (1882) didn't give any record of it. It provoked a supposition that something was mistaken. In the Slovak Carpathians I have collected a large number of specimens that I have determined as *Schistidium atrofusum*. Šmarda (1948, 1954, 1955, 1958) reported this species from more locations. The note in the Limpricht's work on page 714 supported my idea. I have compared Chalubinski's description of *Grimmia sphaerica* with the description of *Grimmia atrofusca* Schimp. and with my plants, and I have recognized Chalubinski's plant as *Schistidium atrofusum* Schimp. It does not belong to *Grimmia sphaerica* Schimp. [*Grimmia sphaerica* Schimp., *Schistidium pulvinatum* (Hedw.) Brid., *Grimmia flaccida* Lindb.]. So from anatomical point of view the lamina differs slightly from the description, but I have recognized that the bistratose part of lamina varies in length. The lamina is always several stratose towards the margin. In the end, its occurrence in mountainous areas on limestone bedrock suggest *Schistidium atrofusum*.

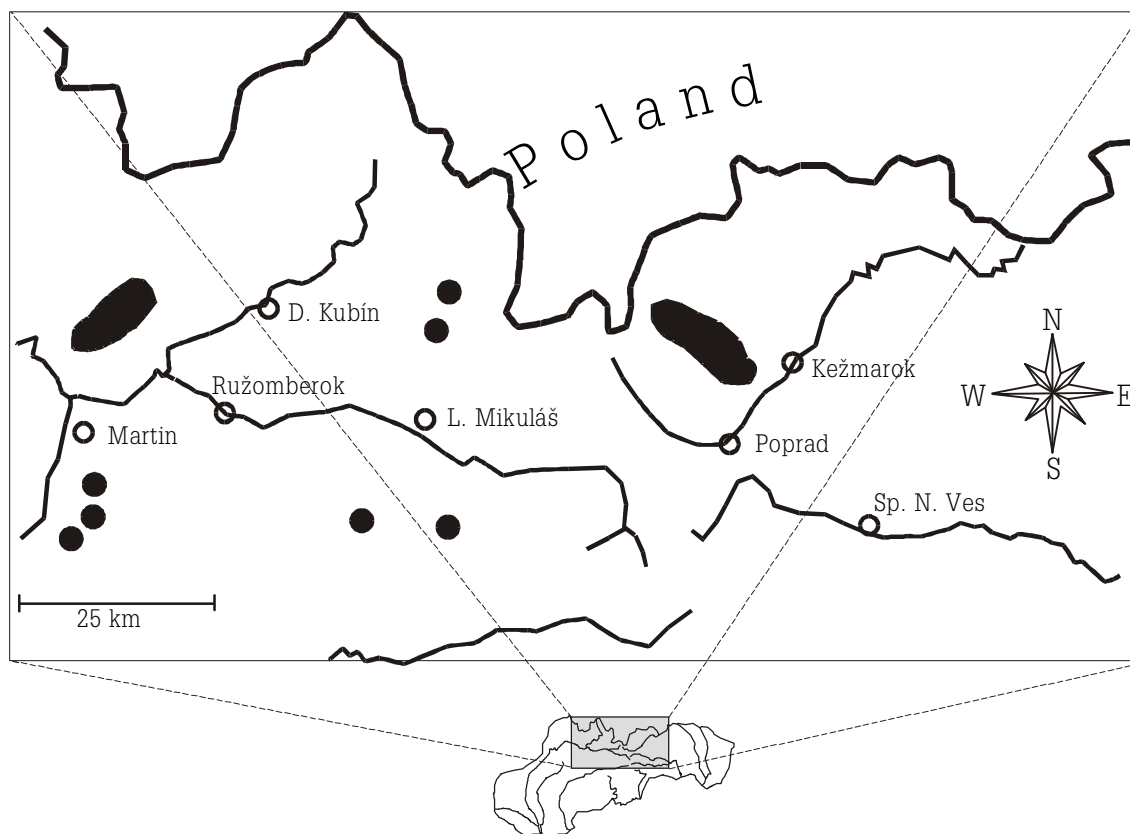


Fig. 1. The distribution of *Schistidium atrofuscum* in Slovakia

The most important conclusion is that *Grimmia pulvinata* doesn't grow in the Carpathians at all. I know it from Czech Republic near Přebram, Trhové Dušníky, leg. Pilous, but after reforestation the location is extinct. The second is Velenovský's (1897) record - rocks near Libšice. In Slovakia, this species was collected twice, leg. Pilous - Štúrovo and Kamenica nad Hronom. The Šmarda's finds turned out to have been confused. The location coincidence is apparent. Both of the species are absent in the Vilhelm's (1922) monographies from Tatra Mountains.

A taxonomical revision of the whole Genus *Schistidium* has been made by Bremer (1980). The study doesn't deal with subgeneric taxa. The number of the taxa declared as species is 12 and consequently the list of synonyms referring to *Schistidium apocarpum* became too large.

List of synonyms

- Schistidium atrofuscum* (Schimp.) Limpr.
- Grimmia apocarpa* var. *atrofusca* Husnot (Husnot 1870-1887, p. 123)
- Schistidium apocarpum* subsp. *atrofuscum* (Schimp.) Limpr. (Limpricht 1890, p. 713)
- Grimmia sphaerica* Chalub. non Schimp. (Chalubinski 1882, p. 15)
- Schistidium apocarpum* subsp. *atrofuscum* (Schimp.) Loeske (Loeske 1930, p. 53)

A thorough description of the Tatra plants can be found in the Chalubinski's (1882) Monography or in the Limpricht's Flora (1890), so it is not necessary to quote it once more.

Present distribution

(The year of collection is given in parenthesis. If not noticed otherwise, the finds were made by the author and are unpublished until now):

Slovakia (Fig. 1)

- Malá Fatra Mts.: Chleb Mt. (1978, 10 specimens; Šmarda, 1953); Rozsutec Mt. (Pilous, 1950: Musci čechosl. exicc., no. 1267, unpublished; 1972; Šmarda, 1952); Suchý Mt. (1934; Šmarda, 1952); Veľký Kriváň Mt. (1978); Fatranský Kriváň Mt. (1980, 3 specimens); Západné Tatry Mts.: Sivý vrch Mt. (Pilous, 1954: Musci čechosl. exicc., no. 566, unpublished); Osobitá Mt. (1947); Veľká Fatra Mts.: Tlstá (1976); Kráľova studňa Mt. (1975); Malá Pustolovičová Mt. (1992); Nízke Tatry Mts.: Sinná Mt. (1958, 4 specimens); Ohnište Mt. (1970); Belianske Tatry Mts.: Bujačí vrch Mt. (1981); Predné Jatky Mt. (1964); Skalné vráta Saddle (1981, 3 specimens); Hľúpy Mt. (1954); valley under Mt. Hľúpy (1947); Havran Mt. (1947; 1983; 1955: Musci čechosl. exicc., no. 282, unpublished); Nový Mt. (1952; 1961, 6 specimens); Muráň Mt. (1950); Ždiarska Vidla Mt. (1956; 1961, 4 specimens); Tristarská dolina valley (1955; 1961);

Roumania

- Piatra Craiului (Boros, Vajda, 1967, 1,500 - 1,600 m a.s.l.); Comitat Brasov: Cristianul mare (Boros, Vajda, 1967, 1,700 - 1,800 m a.s.l.); Bratocea Mts.: Cabana Muntele Rosu (Boros, Vajda, 1967); Bucegi Mts.: Malaesti Valley (Loitlesberger 1900; Degen 1914; Podpěra 1931; Boros, Vajda 1967);

Cziker Alpen (Degen 1930); Nagyhanymás (Degen 1930).

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References

- Amann, J. 1912: Flore des Mousses de la Suisse. Geografia de la Suisse. Réunies Lausanne.
- Amann, J. 1933: Flore des Mousses de la Suisse. Revision et additions III. Beitr. Kryptog. Schweiz Zürich.
- Boros, A., Vajda, L., 1967: Bryologische Beiträge zur Kenntnis der Flora Transsilvaniensis. *Rev. Bryol. et Lichenol.*, **35**:1 - 4.
- Boulay, N. 1884: Muscinées de la France I. Mousses. F. Savy Paris.
- Bremer, B. 1980: A taxonomic revision of *Schistidium* (Grimmiaceae). Bryophyta 1. *Lindbergia*, **6**: 1 - 16.
- Bridel, S.E. 1826-1827: Bryologia universa seu systematica ad novam methodum dispositio, historia et descriptio omnium muscorum frondosorum hucusque cognitorum cum synonymia ex auctoribus probatissimis. I., II. J. A. Barth Lipsiae.
- Bruch, P., Schimp, W. and Gümbel, T. 1864-1866: Bryologia europaea, seu genera muscorum europaeorum monographice illustrata. 6 Vols. Schweizerbart Stuttgart.
- Degen, A. 1914: Ein Beitrag zur Kenntnis der Berge Bucsecs in Siebenbürgen. *Mag. Bot. Lapok*, **13**: 209 - 217.
- Degen, A. 1930: Contribution a la connaissance de la Flore bryologique des Montagnes de Csik (Transsilvanie). *Folia Cryptog.*, **1**: 965 - 976.
- Duell, R. 1984: Bryologische Beiträge. Distribution of the European Mosses 4. Duell - Hermann Rheurdt
- Duell, R. 1994: Deutschlands Moose. 2. *Grimmiales - Orthotrichales*. Bad Münstereifel.
- Hedwig, J. 1801: Species muscorum frondosorum. J. A. Bart Lipsiae.
- Husnot, T. 1870-1887: Musci Galliae. Cahan.
- Chalubinski, T. 1882: Grimmiae Tatrense Ex autopsia descripsit et adumbravit. *Pamiętn. Fyziograf.*, **2**: 1 - 118.
- Limpricht, K.G. 1890: Die Laubmoose Deutschlands, Österreich und der Schweiz. Kummer Leipzig.
- Loitlesberger, K. 1900: Verzeichnis der gelegentlich einer Reise in Jahre 1897 in den rumänischen Karpathen gesammelten Kryptogamen, II. *Musci. Annal. des naturhist. Hofmuseums*, **15**: 11 - 114.
- Loeske, L. 1930: Monographie der europäischen Grimmiceae. IX. - 239. Bibliotheca botanica 101. Schweizerbart Berlin
- Müller, C. 1848-1849: Synopsis muscorum frondosum omnium hucusque cognitorum I. Foerstner Berlin
- Nees, C.G., Hornschuch, F. and Sturm, J. 1827: Bryologia Germanica oder Beschreibung der in Deutschland und in der Schweiz wachsenden Laubmoose. Fleischer Akademische Verlagsgesellschaft Leipzig.
- Podpěra, J. 1931: Ad bryophyta Romaniae congoscenda communicatio. *Bul. Grad. Bor.*, **11**: 53 - 64.
- Podpěra, J. 1954: Conspectus Muscorum europaeorum. ČSAV Praha
- Schimper, W.P. 1876: Synopsis muscorum europaeorum. Ed.2. Schweizerbart Stuttgart.
- Šmarda, J. 1948: Mechy Slovenska. *Čas. Zem. Mus. Brno*, **32**: 1-75.
- Šmarda, J. 1954: Druhý doplněk k Mechům Slovenska. *Biológia*, **9**: 12-34.
- Šmarda, J. 1958: Doplněk k Mechům Slovenska IV. *Biol. práce Slov. Akad. Vied*, **4**: 1-35.
- Šmarda, J., Vaněk, R. 1955: Třetí doplněk k Mechům Slovenska. *Práce II. sekcie Slov. Ak. Vied*, **1**: 1-42.
- Velenovský, J. 1897: Mechy české. Rozpravy Čes. akad. věd, VI. Čes. akad. Praha
- Vilhelm J., 1922: Variabilité du genre *Schistidium* en Thécloslovaquie. *Acta bot. Bohem.* **1**: 43 - 55.

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