

## LECANORA SEMIPALLIDA (LICHENIZED ASCOMYCOTA) IN POLAND

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**Abstract.** This paper discusses the status of *Lecanora semipallida* H. Magn. in Poland, with special emphasis to its known distribution. The species was first reported from the area of Poland in the 19<sup>th</sup> century under the name '*L. flotoviana* Spr.' and was neglected for over a century. Based on current study it is found to be a common, widespread species occurring on calcareous rocks and concrete in all kinds of environment; *L. flotoviana* Spreng. was not confirmed as occurring in Poland.

**Key words:** lichens, *Lecanora dispersa* group, *Lecanora flotoviana*, new records, geographical distribution

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### INTRODUCTION

*Lecanora semipallida* H. Magn. is a rather common lichen of the *L. dispersa* group. Some members of the group, including *L. dispersa* (Pers.) Sommerf. itself, are well known to lichenologists and distributed worldwide. Despite this, the taxonomy and nomenclature of the whole group has not been established till recently (see Śliwa 2007a). There have been difficulties in delimiting particular species (Poelt *et al.* 1995; Fröberg 1997; Laundon 2003). *Lecanora semipallida* is the best example of a species with an especially long and complicated history, which I have described in detail previously (Śliwa 2007b). That taxonomic paper did not focus on the species distribution in Europe and especially in Poland. Here I discuss the status of *L. semipallida* in the country, with special emphasis on its known geographical range.

### MATERIAL AND METHODS

I studied the species in Poland from 1998 through 2009. Field investigation in many parts of the country produced a significant collection, available currently in KRAM. Additionally, specimens of *Lecanora dispersa* and related species were revised from the following herbaria: GPN, KRA, KRAM, KRAP, KTC, LBL, LOD, OLTC, POZ, TRN, UGDA and WRSL.

For anatomical study, free-hand sections were cut with a razor blade and mounted in water. Measurements of tissue were made in water, and ascospores in 25% KOH (K). Granulation of tissues was observed in polarized light. The solubility of granules and/or crystals was tested with *ca* 25% KOH (K) and 65% nitric acid (N).

Chemical examinations included color reaction, response to ultraviolet light (UV) and thin-layer chromatography (TLC); methods followed Orange *et al.* (2001).

### RESULTS AND DISCUSSION

#### *Lecanora semipallida* H. Magn.

Lichens from Central Asia: 89. 1940. – *L. xanthostoma* Wedd. ex Cl. Roux, Bull. Mus. Hist. Nat. Marseille **36**: 24. 1976. – *L. xanthostoma* Cl. Roux ex Fröberg, Symb. Bot. Ups. **32**(1): 33. 1997, *nom. illegit.* – *L. flotoviana* auct. *non* Spreng. (Śliwa 2007b).

The species has apothecia with a distinct white thalline margin, and a yellow, pale greenish yellow, or yellow-orange to pale brown, rarely dark brown disc (Fig. 1). It has an endolithic, rarely superficial thallus which occasionally produces inconspicuous conidimata with elongate, filiform, characteristically curved conidia. Anatomically the species

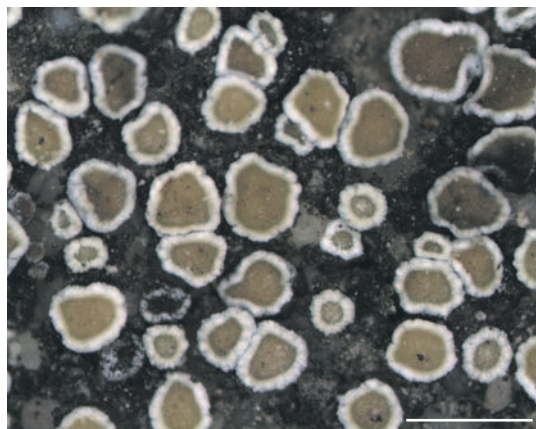


Fig. 1. Habit of *Lecanora semipallida* H. Magn. (Śliwa 4119, KRAM). Scale bar = 1 mm.

is characterized by the presence of epithelial granules that are soluble in K. The presence of vinetorin, often making the apothecia yellowish and resulting in positive spot test reactions with C, K and UV of the apothecial disc, is also diagnostic. Anatomy and chemistry well distinguish *L. semipallida* from closely related *L. dispersa* (Pers.) Sommerf. (epithelial granules insoluble in K, vinetorin absent, spot test reactions with C, K and UV negative) despite the morphological similarity of the two species which often coexist in the same habitats. For detailed characteristics of the species and taxonomic discussion see Śliwa (2007a, b).

The first note on the species in Poland is in Körber (1855) and refers to *Lecanora flotowiana*. That author recorded the species from two collecting sites in the Góry Kaczawskie Mts in the Western Sudetes: 'Kapellenberg bei Schönau' (Połom Mt. near Wojcieszów) and 'Kitzelberg bei Kauffungen' (Kapela hill near Świerzawa), and one from the SE part of the Strzelin area in Lower Silesia: 'Marmorbruch bei Prieborn' (marble quarry near Przeworno). The author applied the name '*Lecanora flotowiana* Spr.', but my recent reappraisal of the taxon (Śliwa 2007b) indicates that the name could rather refer to *L. flotowiana* auct. non Spreng., which is synonymous with *L. semipallida*. To confirm the correctness of use of the latter name for Körber's collections,

I tried to trace the herbarium material but failed. However, based on Körber's exsiccate collection (*Lich. Select. German.*, No. 338) and another specimen of his available at WRSB that I had an opportunity to examine (locality illegible), I found that his understanding of *L. flotowiana* is uniform and agrees with the present species concept of *L. semipallida*.

The next Polish records of the species are from Rehman (1879), who reported '*Lecanora flotowiana* (Spr.) Koerb. ... Na wapieniach w Ojcowie, Mnikowie i Pieninach (Rehm.); na górze Feigsblösse w Tatrach (Loyk. ZB. 7).' [*Lecanora flotowiana* (Spr.) Koerb. ... On limestone in Ojców, Mników and the Pieniny Mts (Rehm.); on Feigsblösse mountain in the Tatras']. Since the collection of Rehman from Ojców is available at KRAM I can confirm that these data also refer to *L. flotowiana* auct. non Spreng., which again means they represent the discussed *L. semipallida*.

After these historical reports originating from the 19<sup>th</sup> century the species was very much neglected for many decades in Poland and the rest of Europe as well. In 1998 during a lichen survey on the Pogórze Wiśnickie foothills I started to search for the species, inspired by the treatments of Poelt *et al.* (1995) and Fröberg (1997) which indicated much more significant variation within the *L. dispersa* group than previously thought. In this work it became obvious very quickly that the species is as common as *L. dispersa* s.str. There were some differences in the species concepts between those two treatments, and as the use of certain names remained ambiguous it took me a while to find the proper name for it. While determining or revising collections during the course of this work I applied different names (*L. flotowiana* or *L. xanthostoma*) for the same species before I determined that *L. semipallida* is the proper one (Śliwa 2007b). Meanwhile, the name *L. flotowiana* instead of *L. semipallida* showed up again and again in contemporary Polish literature based on such identifications (e.g., Bielczyk 2003; Łubek 2004; Szczepańska 2008). The data from Körber (1855) were also resurrected under this misapplied name in the checklist of Polish lichen biota

(Fałtynowicz 2003) and in a treatment of lichens growing on calcareous rocks in the Polish part of the Sudety Mts (Kossowska 2008).

This complicated species history has caused much confusion. Here, as a summary of my long-term study, *L. semipallida* is fully reported from the country, with many new regional records, all richly documented by herbarium collections. *Lecanora flotoviana* Spreng. has not been confirmed to occur in Poland. The only collection of the taxon I found are duplicate specimens of historical material collected by Rehm in 1855 in Deisenhofer (Germany), which were available at WRS� as *Lecanora muralis* var. *galactina* (cf. Śliwa 2007b).

**HABITATS AND DISTRIBUTION IN POLAND.** *Lecanora semipallida* occurs on natural, calcareous rocks (limestone, lime-rich sandstone), as well as on mortar and all kinds of concrete structures in agricultural and urban environments. It tends to inhabit other lichens, most often of the genera *Aspicilia* or *Verrucaria*. Occasionally it can also be found on metal and asbestos. The species is frequently accompanied with other members of the group [*L. albescens* (Hoffm.) Branth & Rostr., *L. dispersa* (Pers.) Sommerf. and *L. hagenii* (Ach.) Ach.] and with such lichens as *Caloplaca* spp., *Candelariella aurella* (Hoffm.) Zahlbr., *Phaeophyscia nigricans* (Flörke) Moberg, *Verrucaria nigrescens* Pers. and *Xanthoria elegans* (Link.) Th. Fr. Although in general *L. semipallida* is also known growing on tree bark, so far it has not been found on such substrate in Poland.

It is a common calciphilous species that is widespread in the country (Fig. 2). Its distribution closely coincides with the location of limestone outcrops in southern Poland, as indicated by numerous collections from the Pieniny Mts, Tatras and the Wyżyna Krakowsko-Częstochowska upland. On the other hand, thanks to the ubiquity of all kinds of calciferous man-made substrates, in addition to natural habitats it occurs more or less uniformly throughout the country.

The disjunctions of its range are due rather to the lack of field investigations in some areas than to the absence of the species. *Lecanora semipal-*

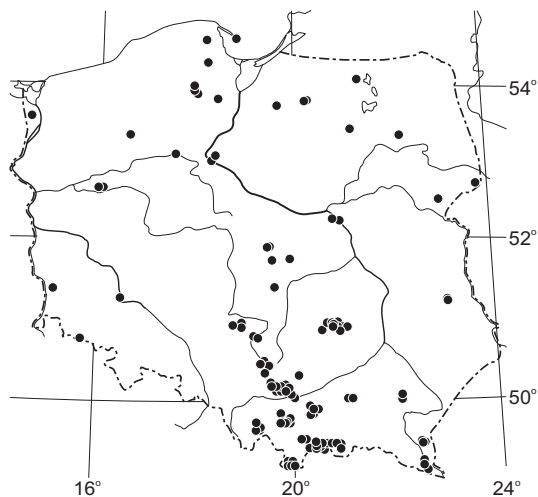


Fig. 2. Known distribution of *Lecanora semipallida* H. Magn. in Poland.

*lida* is obviously highly undercollected in areas less attractive to lichenologists. For the purpose of this study its presence in such poorly investigated regions was confirmed most recently by numerous collections in many Polish cities and their surroundings. As with other common lichens, however, the distribution map of the species still only partly reflects its real range and frequency.

**WORLD DISTRIBUTION.** The species is widely distributed in Europe, including Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Croatia, Estonia, Germany, Hungary, Italy, Norway, Romania, Russia, Slovakia, Sweden, Switzerland, Ukraine and the United Kingdom (Śliwa 2007a, 2009 and literature cited therein). Elsewhere it is known from Asia (Golubkova 1981; Śliwa 2007a, b), Australia, New Zealand and North America (Śliwa 2007a).

**EXSICCATES SEEN.** Körber, *Lich. Select. German.* 338 (as *L. flotoviana*, lignicolous) (WRS�); *Flora Hung. Exsicc.* 812 (as *L. dispersa*) (KRAM); *Lich. Danici Exsicc.* 276 (as *L. cf. xanthostoma*) (KRAM); Verseghe, *Lich. Exsicc.* 61 (as *L. dispersa*) (KRAM).

**SELECTED SPECIMENS SEEN. POLAND.** POMORZE ZACHODNIE. Kłębowiec near Wałcz, 11 Aug. 1985, *W. Fałtynowicz* (UGDA); Lubczyzna near Szczecin, 28 Jan. 2009, *A. Wieczorek* (KRAM). POMORZE ŚRODKOWE.

- Mierzeja Helska spit, E of Hel, 12 Feb. 2005, *M. Kukwa 3760* (UGDA). POJEZIERZE KASZUBSKIE LAKE-  
LAND. Kartusy district, near Miechucin, 24 July 1935, *F. Kra-  
wiec* (POZ); Trójmiejski Landscape Park, Dolina Ewy  
valley, 4 Apr. 2004, *M. Kukwa 2995* (UGDA). POJE-  
ZIERZE IŁAWSKIE LAKE-LAND. N part of Nowa Wieś,  
2 Nov. 2004, *M. Kukwa 3617* (UGDA). POJEZIERZE  
OLSZTYŃSKIE LAKE-LAND. Kętrzyn region, Podgorzyn  
near Garbno, 17 May 1974, *L. Olesiński* (KRAM);  
Olsztyn: Bartożek-Kolonia, May 1997, *D. Kubiak*  
(OLTC), Popiełuszki Street, 10 Jan. 2009, *D. Kubiak*  
(KRAM); Szymanki, 30 Apr. 1989, *J. Nowak* (KRAM).  
POJEZIERZE MIĘDZYCHODZKO-SIERAKOWSKIE LAKE-  
LAND. Jezioro near Bucharzewo, 7 Sept. 1995, *J. Nowak*  
(KRAM); Puszcza Notecka wood, Borowy Młyn,  
11 Sept. 1995, *J. Nowak* (KRAM). WYSOCZYNA DRO-  
HICZYŃSKA UPLAND. Skiwy Duże, 7 May 1993, *S. Cie-  
śliński* (KTC). BORY TUCHOLSKIE WOOD. Wdzydzki  
Landscape Park: Borsk, 13 Sept. 2006, *L. Śliwa 3588*  
& *E. Adamska & W. Gruszka* (UGDA), *L. Śliwa 3637*  
& *E. Adamska & W. Gruszka* (KRAM), N part of  
Wdzydze Tucholskie, 13 Sept. 2006, *L. Śliwa 3662* & *E.*  
*Adamska & W. Gruszka* (UGDA); Przymuszewo district,  
Widno, 4 Apr. 1975, *W. Fałtynowicz* (UGDA); Sucho-  
brzeźnica village, 15 July 2003, *M. Kukwa 2037*  
(KRAM, UGDA). KOTLINA TORUŃSKA BASIN. Toruń,  
Bydgoska Street, 2008, *E. Adamska* (KRAM, TRN);  
quarry between Piechcin and Bielawy, 11 Sept. 2005,  
*M. Kukwa 3522* (KRAM, UGDA). KOTLINA BIE-  
BRZAŃSKA BASIN. Biebrzański National Park, NW of  
Trzcianne, Budy, 16 Sept. 2005, *E. Bylińska, M. Kukwa*  
& *M. Seaward* (UGDA). RÓWNIINA BIELSKA PLATAU.  
Puszcza Białowieża primeval forest, Białowieża, near  
Research Station, 4 Oct. 2003, *L. Śliwa 2127* (KRAM).  
KOTLINA WARSZAWSKA BASIN. Warszawa, Ursynów,  
1 Apr. 2001, *L. Śliwa 1414*, (KRAM); NW of Warszawa,  
Łąki Czernowskie near Góra, 3 Aug. 2008, *K. Wilk*  
*11277* (KRAM). WIELKOPOLSKA. Nakło-Palichno,  
27 Sept. 1932, *F. Krawiec* (POZ). WZNIESIENIA ŁÓDZKIE  
HEIGHTS. Wzniesienia Łódzkie Landscape Park: By-  
szewy, Jarosław Iwaszkiewicz residence, 28 Aug. 2004,  
*M. Hachulka* (LOD 12293); Bukowiec, 10 May 2005,  
*M. Hachulka* (LOD 12298); Tadzín, 21 Apr. 2004,  
*M. Hachulka* (LOD 12299); Plichtów, 5 May 2005,  
*M. Hachulka* (LOD 12249). RÓWNIINA PIOTRKOWSKA  
PLAIN. Piotrków Trybunalski-Wierzeje, 19 Jan. 2008,  
*P. Zaniewski* (LOD 15150). WYŻYNA KIELECKA  
UPLAND. Kielce, 25 Feb. 2009, *A. Łubek* (KRAM); Góry  
Świętokrzyskie Mts: Bieliny Kapitulne, 17 July 2001,  
*A. Donica* (KTC), Górnio region, Krajno-Zagórze,  
26 June 2001, *A. Donica* (KTC), Nowa Słupia region,  
Chełmowa Góra forest inspectorate, Zapusty near  
Cząstkowa Nowego, 25 Sept. 2000, *A. Donica* (KTC),  
Nowa Słupia, 1 July 2002, *A. Łubek* (KTC), Uroczysko  
Zapusty, 22 July 1997, *S. Cieśliński & A. Donica* (KTC),  
Masłów region, Ciekoty, 2 July 2001, *A. Donica* (KTC),  
Dolina Wilkowska, N of Ciekoty, 28 June 2001, *A. Do-  
nica* (KTC, LOD); Łysogóry Mts: Święta Katarzyna,  
July 1957, *B. Halicz & S. Kuziel* (KTC), Święty Krzyż,  
23 Apr. 2002, *A. Łubek* (KTC). WYŻYNA LUBELSKA  
UPLAND. Lublin: Osiedle Felin residential neighborhood,  
15 Nov. 2008, *H. Wójciak* (KRAM, LBL), Droga Mę-  
czenników Majdanka road, 3 Jan. 2009, *H. Wójciak*  
(KRAM, LBL). WYŻYNA WIELUŃSKA UPLAND. Jaskrów  
near Mostów, 20 June 1964, *J. Nowak* (KRAM); Kamyk  
near Kłobuck, Oct. 1962, *J. Nowak* (KRAM); Łobodno,  
2 June 1964, *J. Nowak* (KRAM); near Złochowice,  
17 June 1964, *J. Nowak* (KRAM); Zawada near Cze-  
stochowa, 20 June 1964, *J. Nowak* (KRAM). WYŻYNA  
KRAKOWSKO-CZĘSTOCHOWSKA UPLAND. Biały Kościół,  
near old quarry, 4 Jan. 2009, *L. Śliwa 4085* (KRAM);  
Dolina Będkowska valley, 12 Nov. 1955, *J. Nowak*  
(KRAM); Dolina Kluczwoły valley, near Gacki, 6 Apr.  
1955, *J. Nowak* (KRAM); Dolina Kobylańska valley,  
17 Apr. 1956, *J. Nowak* (KRAM); near Kobylany,  
10 Oct. 1962, *J. Nowak* (KRAM); Dolina Szklarki  
valley, 27 Apr. 1956, *J. Nowak* (KRAM); Januszowice,  
16 Aug. 1956, *J. Nowak* (KRAM); Lutowice near Nie-  
gowa, 16 May 1958, *J. Nowak* (KRAM); Myszków  
region, between Zawada and 'Strężnik', 10 June 1974,  
*J. Nowak* (KRAM); Ojców, 18??, *A. Rehman* (KRAM);  
Rabsztyn near Olkusz, 7 Apr. 1956, *J. Nowak* (KRAM);  
Rybna, 26 Apr. 1956, *J. Nowak* (KRAM); Śrubarnia  
near Ryczów, 11 Sept. 1957, *J. Nowak* (KRAM); Skały  
Twardowskiego cliffs near Kraków, 22 March 1956,  
*J. Nowak* (KRAM); Kraków, junction of Gardowskiego  
and Rakuś Street, 5 May 2009, *L. Śliwa 4119* (KRAM);  
Chrzanów region, Kamyk near Nielepice, 9 Aug. 1956,  
*J. Nowak* (KRAM). WYŻYNA MIECHOWSKA UPLAND.  
Szczepanowice near Miechów, 13 Nov. 1963, *J. Nowak*  
(KRAM). KOTLINA SANDOMIERSKA BASIN. Głogów  
Małopolski, Wygoda, 11 May 2001, *L. Śliwa 1423*  
(KRAM). POGÓRZE WIELICKIE FOOTHILLS. Lanckorona,  
3 May 2001, *L. Śliwa 1421* (KRAM). POGÓRZE WI-  
ŚNICKIE FOOTHILLS. Królówka-Skotnica, 2 June 1998,  
*L. Śliwa 701* (KRAM); Muchówka, 7 May 2000,  
*L. Śliwa 1090* (KRAM); S of Sobolów, 5 June 2000,  
*L. Śliwa 1164* (KRAM); Stary Wiśnicz, 24 March 2000,  
*L. Śliwa 1084* (KRAM); Kobyle, 24 March 2000, *P. Sto-  
larczyk* (KRA). POGÓRZE CIĘŻKOWICKIE FOOTHILLS.  
Tarnów: Skrzyszów, 18 Aug. 1965, *R. Kozik 233*  
(KRAP), Zbylitowska Góra, 1 Aug. 1965, *R. Kozik 192*  
(KRAP). POGÓRZE RZESZOWSKIE FOOTHILLS. Rzeszów,  
Przybyszówka, Magórska Street, 8 Feb. 2009, *L. Śliwa*

4095 (KRAM). BORY DOLNOŚLĄSKIE WOODS. Between Lutynka and Witoszyn, 14 Sept. 2000, *L. Śliwa 1351* (KRAM). NIZINA ŚLĄSKA LOWLAND. Lubiąż, monastery, 11 Oct. 2002, *M. Popiel* (WRSL), 10 Nov. 2002, *M. Popiel* (WRSL). SUDETY MTS. Śnieżka Mt., Droga Jubileuszowa trail: 2007, *K. Pietrzykowska* (WRSL), 18 Sept. 2008, *Śliwa 4080* (KRAM). KOTLINA ŻYWIECKA BASIN. Radziechowy, quarry, 11 Sept. 2005, *K. Wilk 3884* (KRAM); Przybędza, old quarry, 11 Sept. 2005, *K. Wilk 3898* (KRAM). BESKID MAKOWSKI MTS. Harbutowice, valley of Gościbia stream, 16 July 1996, *J. Nowak* (KRAM); Krzczów, Krzczonówka River, Spyрки, 19 Sept. 2008, *B. Gawlak 43* (GPN); Pcim: Kolki, 24 Aug. 1996, *J. Nowak* (KRAM), Pitale, Kaczanka stream, 27 Oct. 2008, *B. Gawlak 189* (GPN); Stróża, Klubino, 3 Sept. 1996, *J. Nowak* (KRAM); Pasma Pewelskie range: Janikowa Grapa Mt., 17 Sept. 1965, *J. Nowak* (KRAM), Janikowa Grapa Mt., at Koszarawa River, 28 Sept. 2005, *K. Wilk 4036* (KRAM); Tokarnia, valley of Proszkowców stream, Barnasiówka, 13 Oct. 1996, *J. Nowak* (KRAM). BESKID MAŁY MTS. 'Zamczysko' near Łysina, 10 Aug. 1960, *J. Nowak* (KRAM). GORCE MTS. Ochotnica Dolna, Barbarówka, 5 Oct. 2000, *P. Czarnota 2356* (GPN), Ochotnica Dolna, 8 July 2004, *A. Wojnarowicz 407* (GPN); Ochotnica Górna, Potok Jaszcze, near Research Station, 14 Aug. 2001, *L. Śliwa 1503* (KRAM). BESKID SADECKI MTS. Pasma Radziejowej range: Bereśnik hill, 6 June 1991, *L. Śliwa* (KRA), valley of Brzyna stream, 29 Aug. 1990, *L. Śliwa* (KRA), Czercz, 27 Aug. 1990, *L. Śliwa* (KRA), Kłodne nad Dunajcem Nature Reserve, 28 Aug. 1990, *L. Śliwa* (KRA), Szlachtowa, 29 June 1965, *M. Olech* (KRA); Pasma Jaworzyny range: valley of Czaczowiec stream, 20 June 1990, *L. Śliwa* (KRA), Potasznia valley, 6 Sept. 1989, *L. Śliwa* (KRA), valley of Wierchomlanka stream, 6 July 1989, *L. Śliwa* (KRA), Wierchomla, 18 July 1966, *M. Olech* (KRA). HIGH TATRA MTS. Ciemnosmreczyńska Przełęczka pass, 16 Aug. 2003, *A. Flakus 1737,1, 1772,2* (KRAM); Wyżnia Żabia Przełęcz pass, 1 Sept. 2005, *A. Flakus 5644* (KRAM). WEST TATRA MTS. Saddle on S slope of Kominy Tylkowe [now Kominiański Wierch Mt.], 5 Sept. 1959, *Z. Tobolewski* (POZ); Dolina Chochołowska valley: Polana Huciska glade, 19 June 2004, *L. Śliwa 2636* (KRAM), Polana Chochołowska glade, 16 July 2004, *L. Śliwa 3119* (KRAM), Polana Dudowa glade, 16 July 2004, *L. Śliwa 3131* (KRAM), Polana Jamy glade, 16 July 2004, *L. Śliwa 3192* (KRAM); Dolina Kościeliska valley: Wyżnia Miętusia Polana glade, 17 June 2004, *L. Śliwa 2336, 2355, 2408* (KRAM), Polana Pisana glade, 14 July 2004, *L. Śliwa 2951, 2964* (KRAM). RÓW PODTATRZAŃSKI TROUGH. Dolina Ko-

ścieliska valley, Polana Nędzówka glade, 8 July 2004, *L. Śliwa 2771* (KRAM). PIENINY MTS. Trzy Korony Mt., 19 Aug. 1955, *Z. Tobolewski* (POZ); Rocks by Dunajec River near Zawiasy, June 1956, *Z. Tobolewski* (POZ); Stromowce Niżne, 18 Feb. 2009, *L. Śliwa 4117* (KRAM); *s. loc., s.d., W. Boberski* (KRAM). PIENINY SPISKIE MTS. Braniska-Hombark range, Zielone Skałki rocks, 12 Nov. 2005, *L. Śliwa 3577* (KRAM). PASMO ŻUKOWA RANGE. Olszanica, 12 Aug. 1990, *R. Kościelniak 771, 772* (KRAP); Stefkowa Góra, 12 Aug. 1990, *R. Kościelniak 777* (KRAP); Uherce, 6 Aug. 1990, *R. Kościelniak 770* (KRAP). BIESZCZADY. Smerek, 26 Apr. 2000, *B. Krzewicka* (KRAM); Ustrzyki Górne, bridge on Wołosaty stream, 24 Aug. 1957, *Z. Tobolewski* (POZ); Widełki, bridge on Wołosaty stream, 8 July 2003, *J. Kiszka* (KRAP). A full account of the specimens examined is being published separately.

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