Some new records of *Verrucaria* from Beskid Niski Mts.

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Based on the historical collections of J. Motyka and J. Nowak deposited in LBL and KRAM herbaria 26 species of *Verrucaria* s.l. are reported from Beskid Niski Mts. *Verrucaria elaeina* is reported from Poland for the first time, whereas as much as 23 species are new to the region.

**Key words:** new records, freshwater species, *Verrucaria elaeina*, *Hydropunctaria*, *Parabagliettoa*, *Placopyrenium*, S Poland

**INTRODUCTION**

The Beskid Niski Mts. are situated in the eastern part of the Western Carpathians, in the greatest depression of the Carpathian arc, and they bridge the Western Carpathians with the Eastern Carpathians. The first data about lichens in this area were reported from Kornuty nature reserve by Sulma (1936). He listed ca 30 species, mainly macrolichens. Whereas, the first note on *Verrucaria* in this mountain range was published by Olech (1974). In the western part of Beskid Niski Mts. she recorded 226 species of lichens, including one species of *Verrucaria*, *V. nigrescens*. At that time an intensive field study in this area were carried out also by J. Kiszka, R. Kozik (KRAP) and J. Nowak (KRAM), and continued by M. Olech (KRA). Among these herbarium collections only the material gathered by M. Olech was partly published so far (Olech 1974). **However, the largest collection especially of pyrenocarpous lichens from Beskid Niski Mts., including Verrucaria is available at the KRAM herbarium.**

Additionally, during the author’s studies on *Verrucaria* genus in Poland an interesting historical material from Kąclowa in Beskid Niski Mts. was found in LBL herbarium. It was collected in the first part of 20\textsuperscript{th} century by J. Motyka. Both the oldest
(LBL) and the largest (KRAM) collection of *Verrucaria* from Beskid Niski Mts. was examined during the course of this study.

**MATERIAL AND METHODS**

The study is based on the lichen material collected by Janusz Nowak in eastern part of the Beskid Niski Mts. in the years 1974–1975 and 1979 (KRAM, Kraków) and on material collected by Józef Motyka in Kąclowa near Grybów in 1924, 1926, 1954 and 1965 (LBL, Lublin).

The localities are coded using ATPOL grid square system (changed by Cieśliński & Fältynowicz, eds 1993 and are presented on a map (Fig. 1). The names of localities follows the tourist map “Beskid Niski i Pogórze” scale 1:125 00. Observation and measurements of spores and ascomata structures were made on sections mounted in water. Nomenclature of species is based on taxonomic studies by Orange (2000, 2004), Thüs (2002), Navarro-Rosinés et al. (2007), Gueiden et al. (2009), and Krzewicka (2009).

**RESULTS AND DISCUSSION**

Based on the lichen collections 26 species of *Verrucaria* s.l. were determined. Two species belong to newly described genera: *Hydropunctaria, H. rheitrophila,* and *Para bagliettoa, P. cyanea* (Gueiden et al. 2009). Another one is currently a member of *Placopyrenium, P. fuscellum* (Navarro-Rosinés et al. 2007). Twenty three represent the genus *Verrucaria, V. aethiobola, V. andesiatrica, V. aquatilis, V. dolosa, V. elaeina, V. elaeomelaena, V. funckii, V. hydrela, V. latebrosa, V. margacea, V. minuta, V. muralis, V. murina, V. nigrescens, V. ochrostoma, V. obfuscans, V. polysticta, V. praetermissa, V. rup estris, V. sublobulata, submersella, V. umbrinula, V. viridula* (see also Appendix).

The species *Verrucaria elaeina* is for the first time reported from Poland, whereas all the other records except of *V. nigrescens, V. polysticta* and *P. fuscellum* (Olech 1974; Krzewicka 2009) are new to the Beskid Niski Mts.

The species of *Verrucaria* were collected in the study area in dry and sunny places on rocks or pebbles in meadows and grazing lands, and on pebbles in watercourse-beds, from splash to submerged zones. These epilithic lichens grow on calcareous or non-calcareous substrata, e.g., on concrete, sandstone with or without calcium carbonate or on bricks. They are often associated with *Aspicilia, Caloplaca, Candelariella, Lecanora* and *Thelidium* spp. According to Nascimbene et al. (2007) lichens belong to three main ecological guilds on the basis of their water requirements, 1) species of perennially inundated habitats; 2) semi-aquatic species of periodically inundated habitats, and 3) terrestrial species. All guilds are represented among *Verrucaria* s.l. species occurring in the study area.
Fig. 1. Sites of *Verrucaria* species in Beskid Niski Mts. Published data: ○ – locality of *Verrucaria nigrescens* from Hańczowa reported by Olech (1974); Δ – locality of *Placopyrenium fuscellum* and *Verrucaria poeppigii* from Sieniewa reported by Krzewicka (2009). Unpublished data: ★ – locality from Kąclowa in collection of J. Motyka (LBL); ● – localities in collection of J. Nowak (KRAM-L); ← border of the Beskid Niski Mts.
In total, eleven freshwater *Verrucaria* occurring in or by watercourse were distinguished in the area: *Verrucaria aethiobola, V. andesiatica, V. aquatilis, V. funckii, V. hydrela, V. latebrosa, V. margacea, V. praetermissa, V. sublobulata, V. submersella* and *Hydropunctaria rheitrophila*, along with some other associated lichen species, for example *Bacidia inundata, Thellidium aquatigum, Th. minutulum, Th. zwackhii, Verrucaria aquatilis, V. funckii, V. hydrela, and H. rheitrophila* which are characteristic to the submerged zone and *V. elaeomelaena, and V. latebrosa* characteristic to the splash zone represent species of perennially inundated habitats. The most frequent species of this guild is *V. aquatilis* which was collected nearly in all examined streams of Beskid Niski Mts. To the semi-aquatic species of periodically inundated habitats belong *V. aethiobola, V. andesiatica, V. margacea, V. praetermissa, V. sublobulata,* and *V. submersella.* The most frequent species of this guild is *V. praetermissa* which was found in all examined streams in the area. It is worth mentioning this particular species occurs also on permanently inundated substrata. Most of the freshwater species are in fact amphibious organisms, and most of them being submerged during only a part of the year mainly in spring or autumn when the water level is higher.

Terrestrial lichens were represented by 15 species of *Verrucaria* s.l., such as *Para-bagliettoa cyanea, V. dolosa, V. elaeina, V. minuta, V. muralis, V. murina, V. nigrescens, V. ochrostoma, V. obtusans, V. procopii, V. rupestris, V. umbrinula, V. viridula,* and including two parasitic species *V. polysticta* and *Placopyrenium fuscellum* that have been previously reported from Beskid Niski Mts. (Krzewicka 2009). These predominantly epilithic lichens occurred in the study area mainly on *pebbles in meadows and grazing lands,* whereas on anthropogenic substrata such as on bridges, walls and rock fences they were less frequent.

**THE NEW RECORD FROM POLAND**

*Verrucaria elaeina* Borrer, in: W. J. Hooker, English Botany Supplement 1: text to plate 2623, fig. 2 (1830).

This species is characterized by the typically pale, epilithic, usually cracked, non-gelatinous *thallus,* the more or less conical *involucreum,* and the medium-size of *ascospores,* 16.5−19.4−22.5 × 7.0−8.0−9.0 μm. It resembles *V. praetermissa* in the epilithic, non-gelatinous, generally weakly pigmented thallus, somewhat conical involucreum, tolerance of shade, and in the size and shape of the ascospores. *V. elaeina* differs however, due to the more prominent perithecia, lack of a black basal layer (which is usually well-developed in *V. praetermissa*), slightly smaller ascospores, and lack of a perispore.

This species has been misunderstood in Europe for last 150 years (Orange 2000), including Poland where it was mistakenly determined as *V. guestphalica* auct.

According to Orange (2000) the species grows on a variety of substrata, including limestone, calcareous mudstone, sandstone, mortar, concrete and bricks; in natural and semi-natural habitats including cliffs, woodland, and occasionally beside streams, also on paths, walls and debris in gardens, by disused railways and on ruined buildings; often on stone embedded in the ground, and usually in shade. It typically
occurs in species-poor communities; it often grows in abundance, but with only a few associated lichen.

In Beskid Niski Mts. the species seems to be frequent and occupies sandstone pebbles and banks of streams, mainly in the upper part of watercourse banks on sheltered and humid rocks (see Appendix). In Europe it is known from Great Britain, Ireland, Norway, Germany, Switzerland, and Austria (Orange 2000; Santesson et al. 2004).

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REFERENCES


APPENDIX – LIST OF SPECIES

Hydropunctaria rheitrophila (Zschacke) Keller, Gueidan & Thüs [=Verrucaria rheitrophila] – ATPOL grid square Gf 20 – Rozstajne, stream between Cyrła Mt. and 601 peak, 480 m, 21 Sept. 1979, J. Nowak (KRAM-L 32617); Krempna, Las Słodki forest, stream on N slope of Cyrła, 500 m, 8 Oct. 1979, J. Nowak (KRAM-L 32620) together with V. praeternissa. Gf 23 – stream between Dzial Mt. near Szkłary and Oblaz Mt. near Daliowa, 520 m, 11 Sept. 1974, J. Nowak (KRAM-L 33419b). Gf 44 – Wisłok Wielki Górny, stream Jamiska on W slope of Pasika Mt., 675 m, 22 June 1974, J. Nowak (KRAM-L 33233) together with V. sublobulata (KRAM-L 33232), and V. margacea; Wisłok Górny, Wisłok river, near Ka-
nasiówka Mt., 625 m, 22 June 1974, J. Nowak (KRAM-L 33405) together with *V. aquatilis*.


**Verrucaria andesiatica** Servít – *Ge 17* – Kąclowa, 26 July 1926, J. Motyka (LBL).


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*Verrucaria funckii* (Spreng.) Zahlbr. – **Gf 44** – Wisłok Górny, Wisłok river, near Kanasiówka Mt., 625 m, 22 June 1974, J. Nowak (KRAM-L 33323) together with *V. aquatilis*.

*Verrucaria hydrela* Ach. – **Gf 20** – Nieznajowa by the ruins of church, 460 m, 9 Oct. 1979, J. Nowak (KRAM-L 32253) together with *V. aquatilis*. **Gf 21** – Ołchowiec near Polany in stream, 450 m, 5 Oct. 1979, J. Nowak (KRAM-L 33020) together with *V. aquatilis*. **Gf 44** – Wisłok Górny, Wisłok river, near Kanasiówka Mt., 625 m, 22 June 1974, J. Nowak (KRAM-L 33405) together with *V. aquatilis*; Wisłok Wielki Górny, Jamiska stream W-slope of Pasika Mt., 675 m, 22 June 1974, J. Nowak (KRAM-L 33232) together with *V. margacea*; Dołżyca near Komańcza, stream between Średni Garb Mt. and Danawa Mt., 650 m, 20 June 1974, J. Nowak (KRAM-L 33327) together with *V. pretermissa*.


together with *V. praetermissa*. **Gf 44** – Wisłok Wielki Górny, Jamiska stream, W slope of Pasika Mt., 675 m, 22 June 1974, J. Nowak (KRAM-L 33319, 33232).


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**Verrucaria submersella** Servít – **Ge 17** — Kąclowa, 21 July 1926, J. Motyka (LBL).

**Verrucaria umbrinula** Nyl. – **Ge 17** — Kąclowa, 21 July 1926, J. Motyka (LBL).

**Verrucaria viridula** (Schrad.) Ach. – **Ge 17** — Kąclowa, 21 July 1926, J. Motyka (LBL).

Porosty rodzaju *Verrucaria* z obszaru Beskidu Niskiego

Streszczenie

W zbiorach zielnikowych KRAM i LBL z Beskidu Niskiego stwierdzono 26 gatunków *Verrucaria* s.l. (por. Appendix). *V. aethiobola*, *V. andesiatica*, *V. aquatilis*, *V. dolosa*, *V. elaeina*, *V. elaemelaena*, *V. funckii*, *V. hydrela*, *V. latebrosa*, *V. margacea*, *V. minuta*, *V. muralis*, *V. murina*, *V. nigrescens*, *V. ochrostoma*, *V. obfuscans*, *V. polysticta*, *V. praetermissa*, *V. rupestris*, *V. sublobulata*, *V. submersella*, *V. umbrinula*, *V. viridula* oraz *Hydropunctaria rheitrophila* i *Parabagliettoa cyanea* (Gueiden et al. 2009) i *Placopyrenium fuscellum* (Navarro-Rosinés et al. 2007) wyróżniono w kolekcji zielnikowej J. Nowaka (KRAM) ze wschodniej części Beskidu Niskiego i kolekcji J. Motyki (LBL) z terenu Kąclowej koło Grybowa. Po raz pierwszy dla Polski podano gatunek *Verrucaria elaeina*. Pozostałe gatunki, z wyjątkiem *V. nigrescens*, *V. polysticta* i *P. fuscellum* (Olech 1974; Krzewicka 2009) zostały podane jako nowe dla tego terenu.