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CHECKLIST

Checklist of Myxomycetes (Amoebozoa) of the Polish Tatra Mts

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Abstract

The Tatra Mts are the highest mountain range in the Carpathians and are an important biodiversity region for many organisms. Plants, animals, and fungi are better studied in this region, while myxomycetes still remain understudied. This study presents the most up-to-date checklist of myxomycetes in the Polish Tatra Mts. The list is based on the published literature data and new records from the years 2000–2019. Overall, 85 species are reported, four are new to Poland (*Arcyria* cf. *helvetica*, *Cribraria macrospora*, *Fuligo* cf. *licentii* and *Nannengaella* cf. *mellea*), and 30 taxa (species or varieties) are reported for the first time from the study area.

Keywords

distribution; new records; slime molds; Tatra National Park

1. Introduction

Myxomycetes (or plasmodial slime molds) are a small group of eukaryotic microorganisms. For a long time, they were classified within the kingdom of Fungi because of their fungus-like appearance (Lado & Eliasson, 2022) and their occurrence in the same habitats. As such, myxomycetes have been traditionally studied by mycologists. However, based on the latest phylogenetic studies, myxomycetes have been classified within the supergroup Amoebozoa, and they belong to the assemblage of soil protists (Adl et al., 2012, 2019). Myxomycetes display a complex life cycle with two distinct stages: the mobile, trophic stage (amoeboflagellates and plasmodium) and the static, reproductive stage (fruiting bodies) (Stephenson & Stempen, 1994; Walker & Stephenson, 2016). Most biodiversity inventories have been based on the occurrence of fruiting bodies, as this stage of life can be directly observed in the environment (Stephenson & Stempen, 1994).

Myxomycetes are regarded as worldwide distributed and occur in a diversity of microhabitats, although they are particularly abundant in forests where soil and decaying plant material are the substrate most commonly inhabited by them (Stephenson & Stempen, 1994). Feeding on bacteria and also yeasts, fungal spores, and algae (Keller et al., 2017), they are involved in the cycling of nutrients and occupy one of the key positions in microbial foodwebs in soil ecosystems (Geisen et al., 2018). Despite being an important part of many global ecosystems, their diversity and biogeography are still largely unexplored.

Situated at the border between Poland and Slovakia, the Tatra Mts are the highest mountain range in the Carpathians and the northernmost center of endemism in Europe (Mirek, 1996). They form an important and unique biodiversity area for many groups of organisms. In terms of myxomycetes, however, the Tatra Mts have never been regularly studied, and the knowledge about this group is scarce and fragmentary. The research of myxomycetes in the Tatra Mts dates back to the second part of the 19th century, when Marian Raciborski, the pioneer in myxomycete research, reported 32 species (Raciborski, 1885, 1887, 1889). Later on, the list of species was successively expanded with new records and finally, according to our study, reached the number of 51 (the number of 72 taxa given by Komorowska and Drozdowicz (1996) may include

unpublished records). For comparison, in Poland, 275 species are recognized altogether (Ronikier, 2022), and currently, this group is regarded to comprise more than 1,000 species worldwide (Lado, 2005–2023). Over the years, despite the sustained, albeit still quite limited interest in myxomycetes, they remain one of the least studied groups of organisms in the Tatra Mts (Komorowska & Drozdowicz, 1996). Moreover, most myxomycete records are scattered in local journals and have never been systematically summarized.

The aim of this study was to compile and synthesize the already published data on the myxomycete species reported from the Tatra Mts and to supplement the list with the new records from the field studies carried out in the years 2000–2019, mainly by Anna Ronikier, Paulina Janik, Honorata Wacławek and Jerzy Skrobek.

2. Material and methods

The presented checklist includes the already published data on myxomycetes from the Polish Tatra Mts and new, unpublished records of late-season (non-nivicolous) species. The first step of the present work was assembled by Weronika Szczytowska in her bachelor's degree dissertation (Szczytowska, 2021). The information from the published sources was compiled based on analyses of available literature data from the years 1885–2022. In the list of species provided below, nomenclature, locations, and habitats from the literature were quoted as in the original. Only primary source literature records were taken into account; those cited repeatedly in later works were not included.

Included are data from the Polish Tatra Mts only (practically within the borders of the Polish Tatra National Park, without its NE extension that comprises fragments of Sub-Tatra Depression and Fore-Tatra Foothills), however, especially in older literature, the locations have often been given imprecisely, e.g. "Zakopane" (a small town located in northern foothills of the Tatra Mts) could mean both the very town, its center being 2.5 km outside Tatra Mts, and its vicinity, which would include the mountains. In such cases, the localities were also cited, but with the sign "[?]" meaning that the real occurrence could be within the proper Tatra Mts area or outside.

The list of species includes also specimens gathered by different collectors between March and November in the years 2000–2019 during occasional, non-regular field works carried out in the Polish Tatra Mts. The collection sites were located in the lower montane zone and were characterized by *Dentario glandulosae-Fagetum* plant community and spruce forests (Radwańska-Paryska & Paryski, 2004; Skrzydłowski, 2013). For each locality (with few exceptions), the site description, habitat/plant community, substrate from which the specimen was collected, precise coordinates (obtained using Garmin GPSMAP 76 or GPSMAP 60CSx receivers), site elevation a.s.l., date of collection, the collector(s) of the specimen, collection number, herbarium number and barcode number (in parentheses) are provided, as on the label.

The identification of specimens was done mainly using the keys by Poulain et al. (2011). Macromorphological characters of fruiting bodies were examined under a stereoscopic microscope NIKON SMZ1500. Micromorphological characters were observed and measured from permanent slides mounted in Hoyer's medium (Martin & Alexopoulos, 1969) under a NIKON Eclipse E600 compound microscope. Specimens that could not be determined with certainty (because of the lack of some features) were marked with "cf." (except *Trichia* cf. *subfusca*, which is cited so after Poulain et al., 2011). Voucher specimens are deposited in the Myxomycetes collection of the W. Szafer Institute of Botany, Polish Academy of Sciences, herbarium (KRAM). Nomenclature follows Lado (2005–2023), with a few exceptions: the name *Enteridium* is used instead of *Licaethalium* because of priority, *Meriderma spinulosporum* (undescribed morhoptype), *Trichia decipiens* var. *olivacea* (considered separate from *T. crateriformis* G. W. Martin), *Trichia* cf. *subfusca* (sensu Poulain et al., 2011). Not acknowledged was a record of *Lamproderma atrosporum* Meyl. (Drozdowicz, 1995) due to the unclear status of the taxon that has recently been recognized as representing several species included now in the genus *Meriderma*. Records of *Ceratiomyxa fruticulosa*, which is more closely related to protostelids than to myxomycetes, are included since this species is traditionally listed in inventories of myxomycetes (see Lado & Eliasson, 2022). The species *Lycogala epidendrum* and *Tubifera ferruginosa* are treated in a wide sense. Literature citations are in chronological order, those based on collections – after the KRAM number. For the sake of conciseness, repetitive parts of label data in consecutive specimens' notes were replaced with '*same data*' (if all data apart from the collection number, accession number, and barcode were identical) or '*same data except:*' (for labels partially repetitive, with only one or two differing sections, as substrate, date, etc.). Otherwise, labels were cited in full.

3. Results – List of species

Signs and abbreviations:

[?] – locality imprecise, up to 5 km outside the proper Polish Tatra Mts/Tatra National Park area

(?) – before the taxon name – unclear all source citations, therefore an unsure presence of the taxon in the Tatra Mts

* – a new taxon for the Polish Tatra Mts

! – a new taxon for Poland

[cf.] – after note number in 'Specimens examined' paragraph – means that the determination of the specimen was uncertain

NP – National Park

1. *Amaurochaete tubulina* (Alb. & Schwein.) T. Macbr.

Literature records: **1**. Raciborski (1887, as *Iundzillia tubulina* (Alb. & Schwein.) Racib.): Tatra.

*** 2. *Arcyria* cf. *affinis* Rostaf.**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, Droga pod Reglami hiking trail, between Dolina Spadowiec and Dolina ku Dziurze valleys, beech (*Fagus sylvatica*) forest, on wood, 49°16′44″N, 19°56′45″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2070 (KRAM00034163-M).

*** 3. *Arcyria cinerea* (Bull.) Pers.**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the upper part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, branch of *Fagus sylvatica*, 49°16′23″N,

19°56′17″E, 1080 m, 2002-07-12, *leg. A. Ronikier, Ron 55*, KRAM M-1074 (KRAM00034161-M); **2**. Western Tatra Mts, Sarnia Skała massif, the ridge between Dolina Spadowiec and Dolina ku Dziurze valleys, *Dentario glandulosae-Fagetum*, on deciduous tree wood, 49°16′42″N, 19°56′03″E, 970 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2076 (KRAM00034162-M); **3**. *same data*, KRAM M-2077 (KRAM00034164-M); **4**. Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, left slope of the valley, at the hiking trail, beech (*Fagus sylvatica*) forest, on deciduous tree wood, 49°16′35″N, 19°56′30″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2096 (KRAM00034045-M).

4. *Arcyria denudata* (L.) Wettst.

Literature records: **1**. Raciborski (1885, as *Arcyria punicea* Pers.): Pańszczyca; [?]**2**. Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy. Note: Inclusion into the figure by Komorowska and Drozdowicz (1996, Fig. 4) suggests the species occurrence in the Tatra NP, but this fact is not mentioned either in the caption or text.

5. *Arcyria ferruginea* Saut.

Literature records: **1**. Raciborski (1885, as *Arcyrella inermis* Raciborski): Wołoszyn [misspelled as "Wotoszyn"].

! 6. *Arcyria* cf. *helvetica* (Meyl.) H. Neubert, Nowotny & K. Baumann

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, the upper part of Dolina ku Dziurze valley, beech (*Fagus sylvatica*) forest, 49°16′23″N, 19°56′31″E, 962 m, 2019-09-25, *leg. A. Ronikier, P. Janik & M. Schnittler, Ron 844*, KRAM M-2024 (KRAM00034046-M).

7. *Arcyria incarnata* (Pers. ex J.F. Gmel.) Pers.

Literature records: **1**. Raciborski (1885, as *Arcyrella incarnata* (Pers.) Rbski.): bei Tomanowa.

8. *Arcyria obvelata* (Oeder) Onsberg

Literature records: **1**. Raciborski (1885, as *Arcyrella nutans* (Bull.) Rbski. [var.] b. *spinosissima* nov. var. [Racib.]): Pańszczyca; [?]**2**. Gutwiński (1901, as *Arcyrella nutans* (Bull.)): [Zakopane,] las pod Kozińcem, na zmurszałych pniach, 7. VIII, 1899, Note: probably several hundred m N from the present Tatra NP border; [?]**3**. Gutwiński (1901, as *Arcyrella nutans* (Bull.)): Zakopane – las za Muzeum Chałubińskiego na lewo od gościńca na Bystre, 6. VIII [1899], Note: probably a few hundred m N from the present Tatra NP border; **4**. Komorowska and Drozdowicz (1996, as *Arcyria nutans* (Bull.) Grev.): Tatrzański Park Narodowy.

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the upper part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, on wood, 49°16′23″N, 19°56′17″E, 1080 m, 2000-08-21, *leg. A. Ronikier, Ron 21*, KRAM M-1076 (KRAM00034047-M); **2**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, on wood of ?*Fagus sylvatica*, 49°16′39″N, 19°56′30″E, 966 m, 2001-07-06, *leg. A. Ronikier, Ron 38*, KRAM M-1081 (KRAM00034048-M); **3**. *same data except:* 960 m, 2002-08-20, *Ron 60*, KRAM M-1083 (KRAM00034049-M); **4**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of Dolina Białego valley, at Droga pod Reglami hiking trail, *Dentario glandulosae-Fagetum*, on wood, 49°16′42″N, 19°56′27″E, 940 m, 2000-06-20, *leg. A. Ronikier, Ron 12*, KRAM M-1095 (KRAM00034050-M); **5**. the Western Tatra Mts, the Sarnia Skała massif, the ridge between the Dolina Białego valley and the Dolina Spadowiec valley, *Dentario glandulosae-Fagetum*, on the standing trunk of *Fagus sylvatica*, under bark, 49°16′39″N, 19°56′22″E, 990 m, 2003-08-16, *leg. M. Ronikier, Ron 74*, KRAM M-1096 (KRAM00034051-M); **6**. the Western Tatra Mts, the Sarnia Skała massif, the upper part of the Dolina Spadowiec valley, right side of the valley, *Dentario glandulosae-Fagetum*, on wood (coniferous?), 49°16′25″N, 19°57′05″E, 1050 m, 2000-06-20, *leg. A. Ronikier, Ron 16*, KRAM M-1116 (KRAM00034052-M).

*** 9. *Arcyria oerstedii* Rostaf.**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Dolina Białego valley, *Dentario glandulosae-Fagetum*, on wood, 49°16′36″N, 19°57′32″E, 920 m, 2001-08-21, *leg. A. Ronikier, Ron 40*, KRAM M-1117 (KRAM00034053-M).

*** 10. *Arcyria pomiformis* (Leers) Rostaf.**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the upper part of the Spaleniec ridge (a ridge between the Dolina Spadowiec valley and the Dolina ku Dziurze valley), *Dentario glandulosae-Fagetum*, on the wood of *Fagus sylvatica*, 49°16′23″N, 19°56′52″E, 1,150 m, 2003-09-10, *leg. A. Ronikier, Ron 82*, KRAM M-1091 (KRAM00034054-M).

11. *Badhamia albescens* (Ellis ex T. Macbr.) J.M. García-Martín, J.C. Zamora & Lado

Literature records (all as *Physarum albescens* Ellis): **1**. Drozdowicz (1988): Tatrzański Park Narodowy, na żywych roślinach i ich martwych szczątkach, na powierzchni kamieni; **2**. Drozdowicz (1995): Tatra NP; **3.** Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy.

12. *Calomyxa metallica* (Berk.) Nieuwl.

Literature records: **1**. Raciborski (1889, as *Perichaena krupii* [sp. nov., Racib.]): Im Kalatówkithale in dem Tatragebirge, auf der Rinde faulender Stämme; [?]**2**. Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy. Note: Inclusion into the figure depicting species known from the Tatra NP by Komorowska and Drozdowicz (1996, Fig. 2) suggests the species occurrence in the Tatra NP, but this is not mentioned in the text.

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, mouth of Dolina ku Dziurze valley, beech (*Fagus sylvatica*) forest, spruce (*Picea abies*) log hanging above a stream, 49°16′42″N, 19°56′36″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 851*, KRAM M-2034 (KRAM00034057-M).

13. *Ceratiomyxa fruticulosa* (O.F. Müll.) T. Macbr.

Literature records: [?]**1**. Raciborski (1885, as *Ceratium porioides* Alb. et Schw.): Zakopane, auf alten Stämmen.

*** 13.1. *Ceratiomyxa fruticulosa* (O.F. Müll.) T. Macbr. var. *flexuosa* (Lister) G. Lister**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, on wood, 49°16′13″N, 19°56′31″E, 960 m, 2000-06-20, *leg. A. Ronikier, Ron 37*, KRAM M-1031

(KRAM00034055-M); **2**. the Western Tatra Mts, the Sarnia Skała massif, the ridge between the Dolina Spadowiec valley and the Dolina Białego valley, *Dentario glandulosae-Fagetum*, on wood, 49°16′36″N, 19°57′17″E, 1,000 m, 2001-06-16, *leg. A. Ronikier, Ron 35*, KRAM M-1068 (KRAM00034056-M).

*** 14. *Clastoderma debaryanum* A. Blytt**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, mouth of Dolina ku Dziurze valley, beech (*Fagus sylvatica*) forest, spruce (*Picea abies*) log hanging above a stream, 49°16′42″N, 19°56′36″E, 915 m, 2019-09-25, *leg. A. Ronikier, P. Janik & M. Schnittler, Ron 834*, KRAM M-2013 (KRAM00034058-M); **2**. *same data except:* 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 845*, KRAM M-2025 (KRAM00034059-M); **3**. *same data, Ron 846a*, KRAM M-2026 (KRAM00034060-M); **4**. *same data, Ron 849a*, KRAM M-2031 (KRAM00034062-M); **5**. *same data, Ron 850*, KRAM M-2033 (KRAM00034064-M); **6**. Western Tatra Mts, Sarnia Skała massif, the lower part of Dolina ku Dziurze valley, along a stream, beech (*Fagus sylvatica*) forest, coniferous log, 49°16′42″N, 19°56′37″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 860b*, KRAM M-2045 (KRAM00034065-M); **7**. *same data, Ron 861c*, KRAM M-2049 (KRAM00034148-M); **8**. *same data, Ron 862b*, KRAM M-2051 (KRAM00034067-M).

15. *Comatricha laxa* Rostaf.

Literature records: **1**. Jarocki (1927): Krokiew-Mount (1,378 m) near Zakopane in the Tatra Mountains, Poland, on rotten wood/decorticated trunk of *Picea excelsa*, ca. 1,300 m, July 1926.

16. *Comatricha nigra* (Pers. ex J.F. Gmel.) J. Schröt.

Literature records: **1**. Raciborski (1885, as *Comatricha frieseana* (de Bary) [var.] a. *obovata* Rfski.): bei Tomanowa im Kościeliska Thal, auf faulen Baumstämmen; **2**. Jarocki (1927): Krokiew-Mount (1,378 m) near Zakopane in the Tatra Mts, Poland, on rotten wood/decorticated trunk of *Picea excelsa*, ca. 1,300 m, July 1926.

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, mouth of Dolina ku Dziurze valley, beech (*Fagus sylvatica*) forest, spruce (*Picea abies*) log hanging above a stream, 49°16′42″N, 19°56′36″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 846b*, KRAM M-2027 (KRAM00034061-M); **2**. *same data except:* rotten log on the ground, *Ron 857a*, KRAM M-2037 (KRAM00034068-M); **3**. Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, left slope of the valley, at the hiking trail, beech (*Fagus sylvatica*) forest, on wood, 49°16′31″N, 19°56′28″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2058 (KRAM00034070-M); **4**. *same data*, KRAM M-2061 (KRAM00034071-M); **5**. Western Tatra Mts, Sarnia Skała massif, Droga pod Reglami hiking trail, between Dolina Spadowiec and Dolina ku Dziurze valleys, beech (*Fagus sylvatica*) forest, on coniferous wood, 49°16′44″N, 19°56′45″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2073 (KRAM00034139-M).

17. *Craterium leucocephalum* (Pers. ex J.F. Gmel.) Ditmar

Literature records: **1**. Raciborski (1885, as *Craterium leucocephalum* Pers.): Wäldern bei Wołoszyn [misspelled as "Wotoszyn"], opadłe bukowe liście; **2**. Krzemieniewska (1960): Tatry; [?]**3**. Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy. Note: Inclusion into the figure depicting species known from the Tatra NP by Komorowska and Drozdowicz (1996) suggests the species occurrence in the Tatra NP, but this is not mentioned in the text.

18. *Craterium roseum* (Berk. & Broome) J.M. García-Martín, J.C. Zamora & Lado

Literature records: [?]**1**. Krzemieniewska (1960 after Jarocki in litt., as *Physarum roseum* Berk. & Br.): w lesie koło Zakopanego.

*** 19. *Cribraria argillacea* (Pers. ex J.F. Gmel.) Pers.**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, lower part of the Dolina Białego valley, left side of the valley, *Dentario glandulosae-Fagetum*, wood of coniferous tree, 49°16′39″N, 19°57′22″E, 980 m, 2000-07-04, *leg. A. Ronikier, Ron 19*, KRAM M-1080 (KRAM00034072-M); **2**. the Western Tatra Mts, the Sarnia Skała massif, upper part of the Dolina ku Dziurze valley, right side of the valley, *Dentario glandulosae-Fagetum*/*Polysticho-Piceetum*, on trunk of coniferous tree, 49°16′11″N, 19°56′47″E, 1,150 m, 2001-07-07, *leg. A. Ronikier, Ron 39*, KRAM M-1118 (KRAM00034 073-M); **3**. the Western Tatra Mts, the Sarnia Skała massif, middle part of the Dolina Spadowiec valley, right side of the valley, *Dentario glandulosae-Fagetum*, on fallen trunk, 49°16′27″N, 19°57′07″E, 1,050 m, 2000-06-20, *leg. A. Ronikier, Ron 17*, KRAM M-1119 (KRAM00034074-M).

20. *Cribraria aurantiaca* Schrad.

Literature records: **1**. Raciborski (1885): Pańszczyca.

Specimens examined: **1**. [cf.] (as *Cribraria* cf. *persoonii* Nann.-Bremek.) the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, on wood of ?*Fagus sylvatica*, 49°16′39″N, 19°56′30″E, 966 m, 2002-07-12, *leg. A. Ronikier, Ron 59*, KRAM M-1075 (KRAM00034077-M).

21. *Cribraria cancellata* (Batsch) Nann.-Bremek.

Literature records (all as *Dictydium cernuum* (Pers.) Nees): **1**. Raciborski (1885): bei Tomanowa; **2**. Raciborski (1885): Pańszczyca; **3**. Raciborski (1885): Wołoszyn [misspelled as "Wotoszyn"]; [?]**4**. Raciborski (1885): [bei] Jaszczurówka.

22. *Cribraria macrocarpa* Schrad.

Literature records: **1**. Raciborski (1885): bei Tomanowa; **2**. Raciborski (1885): Pańszczyca; **3**. Raciborski (1885, as *Cribraria (Schraderella) tatrica* nov. sp. [Racib.]): Pańszczyca, auf faulen Brettern.

Specimens examined: **1**. [cf.] Western Tatra Mts, Sarnia Skała massif, mouth of Dolina ku Dziurze valley, beech (*Fagus sylvatica*) forest, rotten log on the ground, 49°16′42″N, 19°56′36″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 854*, KRAM M-2035 (KRAM00034075-M).

! 23. *Cribraria macrospora* Nowotny & H. Neubert

Specimens examined: **1**. Western Tatra Mts, Krokiew massif, NW slopes of the Mt. Jastrzębia Turnia, lower montane forest, on rotten logs (*Picea abies*?) and on mosses, 1,030 m, 2004-09-30, *leg. B. Cykowska & A. Flakus*, KRAM M-1991 (KRAM00034076-M).

*** 24. *Cribraria purpurea* Schrad.**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, the mouth of Dolina ku Dziurze valley, beech (*Fagus*

sylvatica) forest, rotten log on the ground, 49°16′42″N, 19°56′36″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 855*, KRAM M-2036 (KRAM00034078-M).

25. *Cribraria rufa* (Roth) Rostaf.

Literature records: **1**. Krzemieniewska (1960): Tatry.

Specimens examined: **1**. Western Tatra Mts, Hruby Regiel massif, Staników Żleb gorge, 100 m from Droga pod Reglami hiking trail, beech (*Fagus sylvatica*) forest, on log of spruce (*Picea abies*), 49°16′10″N, 19°52′54″E, 1,114 m, 2019-09-20, *leg. W. Szczytowska & J. Skrobek*, KRAM M-2084 (KRAM000 34079-M); **2**. Western Tatra Mts, Hruby Regiel massif, Droga pod Reglami hiking trail, at the trail, beech (*Fagus sylvatica*) forest, on the log of spruce (*Picea abies*), 49°16′30″N, 19°53′56″E, 1125 m, 2019-09-21, *leg. W. Szczytowska, J. Skrobek & Sz. Górnisiewicz*, KRAM M-2089 (KRAM00034080-M); **3**. Western Tatra Mts, Hruby Regiel massif, Droga pod Reglami hiking trail, at the trail, beech (*Fagus sylvatica*) forest, on wood, 49°16′30″N, 19°54′03″E, 962 m, 2019-09-21, *leg. W. Szczytowska, J. Skrobek & Sz. Górnisiewicz*, KRAM M-2097 (KRAM00034081-M).

26. *Cribraria splendens* (Schrad.) Pers.

Literature records: **1**. Raciborski (1889, as *Cribraria splendens* (Schrad.) var. *oligocostata* [var. nov., Racib.]): Wäldern des Kalatówkithales im Tatragebirge.

*** 27. *Cribraria vulgaris* Schrad.**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, the lower part of Dolina ku Dziurze valley, W slopes of Spaleniec ridge, beech (*Fagus sylvatica*) forest, 49°16′36″N, 19°56′37″E, 950 m, 2000-06-20, *leg. A. Ronikier, Ron 15*, KRAM M-1995 (KRAM00034082-M).

(?) 28. *Diachea leucopodia* (Bull.) Rostaf.

Literature records: [?]**1**. Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy. Note: Inclusion into the figure by Komorowska and Drozdowicz (1996, Fig. 5) suggests the species occurrence in the Tatra NP, but this fact is not mentioned either in the caption or text.

29. *Dictydiaethalium plumbeum* (Schumach.) Rostaf.

Literature records: **1**. Raciborski (1885, as *Clathroptychium rugulosum* (Wallr.) Rfski.): Pańszczyca, auf faulen Brettern; [?]**2**. Krupa (1886, as *Clathroptychium rugulosum* (Wallr.) [Rostaf.]): Zakopane pod Tatrami, na korze olszyn (*Alnus glutinosa*), September–October; **3**. Krzemieniewska (1960): Tatry; [?]**4**. Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy. Note: Inclusion into the figure depicting species known from the Tatra NP by Komorowska and Drozdowicz (1996, Fig. 2) suggests the species occurrence in the Tatra NP, but this is not mentioned in the text.

30. *Diderma alpinum* (Meyl.) Meyl.

Literature records: **1**. Drozdowicz (1988): Tatrzański Park Narodowy, na żywych roślinach i ich martwych szczątkach, na powierzchni kamieni; **2**. Drozdowicz (1995): Tatra NP; **3.** Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy.

31. *Diderma testaceum* (Schrad.) Pers.

Literature records: **1**. Raciborski (1885, as *Chondrioderma (Diderma) testaceum* (Schrad.)): Kościeliska Thal; **2**. Krzemieniewska (1960): Tatry; [?]**3**. Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy. Note: Inclusion into the figure depicting species known from the Tatra NP by Komorowska and Drozdowicz (1996, Fig. 2) suggests the species occurrence in the Tatra NP, but this is not mentioned in the text.

32. *Diderma tigrinum* (Schrad.) Prikhodko, Shchepin, Novozh., López-Vill., G. Moreno & Schnittler

Literature records: **1**. Ronikier et al. (2022, as *Lepidoderma tigrinum* (Schrad.) Rostaf.): The Carpathians, the Tatra Mts, Dolina ku Dziurze valley, the mouth of the valley, 49.27806°N, 19.94305°E, 915 m, a spruce log hanging above a stream, 02 Oct 2019, *leg. A. Ronikier & P. Janik, Ron 848* (KRAM M-1990).

Specimens examined (all as *Lepidoderma tigrinum* (Schrad.) Rostaf.): **1**. Western Tatra Mts, Sarnia Skała massif, the mouth of Dolina ku Dziurze valley, beech (*Fagus sylvatica*) forest, spruce (*Picea abies*) log hanging above a stream, 49°16′42″N, 19°56′36″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 848*, KRAM M-1990 (KRAM00034108-M); **2**. *same data, Ron 847*, KRAM M-2029 (KRAM00034109-M); **3**. *same data, Ron 849*c, KRAM M-2030 (KRAM00034110-M); **4**. *same data, Ron 849b*, KRAM M-2032 (KRAM00034063-M); **5**. Western Tatra Mts, Sarnia Skała massif, the lower part of Dolina ku Dziurze valley, along a stream, beech (*Fagus sylvatica*) forest, coniferous log, 49°16′42″N, 19°56′37″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 858*, KRAM M-2039 (KRAM00034111-M).

33. *Didymium difforme* (Pers.) Gray.

Literature records: **1**. Krzemieniewska (1929): z nad Morskiego Oka [from ex-situ moist chamber culture]; **2**. Krzemieniewska (1929): dolina Strążyska [from ex-situ moist chamber culture].

*** 34. *Didymium minus* (Lister) Morgan**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, lower part of the Dolina ku Dziurze valley, left side of the valley, *Dentario glandulosae-Fagetum*, on fallen leaves of *Fagus sylvatica*, 49°16′36″N, 19°56′29″E, 980 m, 2000-06-20, *leg. A. Ronikier, Ron 13*, KRAM M-1089 (KRAM00034084-M).

*** 35. *Didymium nigripes* (Link) Fr.**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, Grześkówki ridge, beech (*Fagus sylvatica*) forest, on fallen beech (*Fagus sylvatica*) leaves, 49°16′39″N, 19°56′30″E, 970 m, 2003-08-16, *leg. A. Ronikier & M. Ronikier, Ron 76a*, KRAM M-1771 (KRAM00034085-M); **2**. Western Tatra Mts, Sarnia Skała massif, the lower part of Dolina Strążyska valley, Grześkówki ridge, *Dentario glandulosae-Fagetum*, 49°16′39″N, 19°56′30″E, 960 m, 2003-09-09, *leg. A. Ronikier, Ron 80*, KRAM M-2008 (KRAM00034086-M).

36. *Didymium spongiosum* (Leyss.) J.M. García-Martín, J.C. Zamora & Lado

Literature records: [?]**1**. Raciborski (1885, as *Spumaria alba* (Bull.) D.C.): bei Jaszczurówka; **2**. Krzemieniewska (1960, as *Spumaria spongiosa* (Leyss.) Jahn): Tatry.

37. *Didymium squamulosum* (Alb. & Schwein.) Fr.

Literature records: [?]**1**. Krupa (1889, as *Didymium effusum* Link): w Zakopanem, na łodygach żywych *Veronica anagallis*

nad potokiem; **2**. Krzemieniewska (1929): dolina Strążyska [from ex-situ moist chamber culture]; **3**. Krzemieniewska (1929): z nad Czarnego Stawu pod Kościelcem [from ex-situ moist chamber culture]; **4**. Krzemieniewska (1960): Tatry.

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, Grześkówki ridge, beech (*Fagus sylvatica*) forest, on fallen beech (*Fagus sylvatica*) leaves, 49°16′39″N, 19°56′30″E, 970 m, 2003-08-16, *leg. A. Ronikier & M. Ronikier, Ron 76b*, KRAM M-2007 (KRAM00034087-M).

38. *Enerthenema papillatum* (Pers.) Rostaf.

Literature records: **1**. Jarocki (1927): Krokiew-Mount (1378 m) near Zakopane in the Tatra Mts, Poland, on rotten wood / decorticated trunk of *Picea excelsa*, ca. 1,300 m, July 1926. [?]**2**. Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy. Note: Inclusion into the figure depicting species known from the Tatra NP by Komorowska and Drozdowicz (1996) suggests the species occurrence in the Tatra NP, but this is not mentioned in the text.

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, the mouth of Dolina ku Dziurze valley, beech (*Fagus sylvatica*) forest, a spruce (*Picea abies*) log hanging above a stream, 49°16′42″N, 19°56′36″E, 915 m, 2019-09-25, *leg. A. Ronikier, P. Janik & M. Schnittler, Ron 833*, KRAM M-2012 (KRAM00034088-M).

39. *Enteridium olivaceum* Ehrenb.

Literature records: **1**. Raciborski (1885): bei Tomanowa, auf faulen Stämmen; **2**. Krzemieniewska (1960): Tatry.

*** 40. *Fuligo leviderma* H. Neubert, Nowotny & K. Baumann**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, *leg. A. Ronikier, Ron 89*, KRAM M-1110 (KRAM00034089-M); **2**. Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, the left slope of the valley, at the hiking trail, beech (*Fagus sylvatica*) forest, on wood, 49°16′32″N, 19°56′28″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2068 (KRAM00034090-M).

! 41. *Fuligo* cf. *licentii* Buchet

Specimens examined: **1**. the Western Tatra mts, the Sarnia Skała massif, Dolina Spadowiec valley, *Dentario glandulosae-Fagetum*, deciduous log, 49°16′38″N, 19°57′04″E, 970 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2078 (KRAM00034091-M).

42. *Fuligo muscorum* Alb. & Schw.

Literature records: **1**. Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy.

43. *Fuligo septica* (L.) F.H. Wigg.

Literature records: **1**. Raciborski (1885, as *Fuligo varians* Sommerfeldt): bei "Smreczynski staw" im Kościeliska Thal; [?]**2**. Raciborski (1885, as *Fuligo tatrica* nov. sp. [Racib.]): bei Jaszczurówka, auf faulen Stämmen; **3**. Komorowska and Drozdowicz (1996, as *Fuligo septica* Gmel.): Tatrzański Park Narodowy.

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, *leg. A. Ronikier, Ron 88*, KRAM M-1992 (KRAM00034092-M); **2**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, on wood of *Fagus sylvatica*, 49°16′39″N, 19°56′30″E, 966 m, 2000-08-22, *leg. A. Ronikier, Ron 23*, KRAM M-1996 (KRAM00034093-M); **3**. Western Tatra Mts, Sarnia Skała massif, Grześkówki ridge, beech (*Fagus sylvatica*) forest, on *Abies alba*, 49°16′28″N, 19°56′15″E, 1,030 m, 2009-09-26, *leg. A. Ronikier, Ron 694*, KRAM M-2002 (KRAM00034094-M).

*** 43.1. *Fuligo septica* (L.) F.H. Wigg. var. *flava* (Pers.) Lázaro Ibiza**

Specimens examined: **1**. the Western Tatra mts, the Sarnia Skała massif, the upper part of the Spaleniec ridge (a ridge between the Dolina Spadowiec valley and the Dolina ku Dziurze valley), *Dentario glandulosae-Fagetum*, on a stump, 49°16′17″N, 19°56′52″E, 1,150 m, 2002-07-12, *leg. A. Ronikier, Ron 56*, KRAM M-1067 (KRAM00034095-M); **2**. the Western Tatra Mts, the Sarnia Skała massif, a ridge between the Dolina Białego valley and the Dolina Spadowiec valley, *Dentario glandulosae-Fagetum*, on wood, 49°16′39″N, 19°56′22″E, 990 m, 2000-07-04, *leg. A. Ronikier, Ron 18*, KRAM M-1101 (KRAM00034096-M); **3**. the Western Tatra Mts, the Sarnia Skała massif, upper part of the Dolina Spadowiec valley, right side of the valley, *Dentario glandulosae-Fagetum*, on litter (fallen leaves and twig of *Fagus sylvatica*), 49°16′25″N, 19°57′05″E, 1,050 m, 2002-07-12, *leg. A. Ronikier, Ron 58*, KRAM M-1102 (KRAM00034097-M); **4**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of Dolina Strążyska valley, Grześkówki ridge, *Dentario glandulosae-Fagetum*, on dead, standing trunk of *Abies alba*, 49°16′39″N, 19°56′30″E, 960 m, 2003-09-09, *leg. A. Ronikier, Ron 78*, KRAM M-1103 (KRAM00034098-M); **5**. [cf.] the Western Tatra Mts, the Sarnia Skała massif, the lower part of Dolina Strążyska valley, Grześkówki ridge, *Dentario glandulosae-Fagetum*, on wood, 49°16′39″N, 19°56′30″E, 960 m, 2001-09-05, *leg. A. Ronikier, Ron 42*, KRAM M-1104 (KRAM00034099-M); **6**. the Western Tatra Mts, the Sarnia Skała massif, upper part of the Dolina ku Dziurze valley, right side of the valley, *Dentario glandulosae-Fagetum*, on spruce stump, 49°16′36″N, 19°56′52″E, 1,000 m, 2002-07-03, *leg. A. Ronikier, Ron 53*, KRAM M-1105 (KRAM 00034100-M); **7**. the Western Tatra Mts, the Sarnia Skała massif, the upper part of the Dolina Spadowiec valley, right side of the valley, *Dentario glandulosae-Fagetum*/*Polysticho-Piceetum*, a log of *Picea abies*, 49°16′17″N, 19°57′07″E, 1,150 m, *leg. A. Ronikier, Ron 87*, KRAM M-1106 (KRAM000 34101-M); **8**. the Western Tatra Mts, the Sarnia Skała massif, the ridge between the Dolina Białego valley and the Dolina Spadowiec valley, *Dentario glandulosae-Fagetum*, on wood, 49°16′40″N, 19°57′22″E, 950 m, 2000-07-04, *leg. A. Ronikier, Ron 20*, KRAM M-1107 (KRAM00034102-M); **9**. the Western Tatra Mts, the Sarnia Skała massif, lower part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, on wood of *Fagus sylvatica*, 49°16′39″N, 19°56′30″E, 966 m, 2000-08-21, *leg. A. Ronikier, Ron 22*, KRAM M-1108 (KRAM00034103-M); **10**. Western Tatra Mts, Sarnia Skała massif, Droga pod Reglami hiking trail, between Dolina Spadowiec and Dolina ku Dziurze valleys, beech (*Fagus sylvatica*) forest, on coniferous log, 49°16′44″N, 19°56′53″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2074 (KRAM00034104-M).

*** 43.2. *Fuligo septica* (L.) F.H. Wigg. var. *rufa* (Pers.) Lázaro Ibiza**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the upper part of the Dolina Białego valley, below the Czerwona Przełęcz pass, by Ścieżka nad Reglami hiking trail, windfall, on wood, 49°15′45″N, 19°56′47″E, 1,250 m, 2000-06-09, *leg. A. Ronikier, Ron 11*, KRAM M-1069 (KRAM00034105-M).

44. *Hemitrichia clavata* (Pers.) Rostaf.

Literature records: **1**. Raciborski (1885, as *Hemiarcyria clavata* (Pers.) Rfski.): bei Tomanowa; **2**. Krzemieniewska (1960): Tatry.

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, a log of ?*Fagus sylvatica*, 49°16′36″N, 19°56′27″E, 990 m, 2003-03-30, *leg. A. Ronikier & M. Ronikier, Ron 63*, KRAM M-1072 (KRAM00034106-M); **2**. *same data except:* on the beech (*Fagus sylvatica*) log, 980 m, *Ron 62*, KRAM M-1085 (KRAM00034107-M).

45. *Hemitrichia decipiens* (Pers.) García-Cunch., J.C. Zamora & Lado

Literature records: [?]**1**. Raciborski (1885, as *Trichia fallax* Pers. [f./var.] β *genuina*): bei Jaszczurówka; [?]**2**. Krupa (1886, as *Trichia fallax* Pers.): Zakopane w Tatrach; [?]**3**. Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy. Note: Inclusion (as *Trichia decipiens* (Pers.) Macbr.) into the figure depicting species known from the Tatra NP by Komorowska and Drozdowicz (1996) suggests the species occurrence in the Tatra NP, but this is not mentioned in the text.

Specimens examined: **1**. (as *Trichia decipiens* (Pers.) T. Macbr.) Western Tatra Mts, Sarnia Skała massif, the lower part of Dolina ku Dziurze valley, along a stream, a beech (*Fagus sylvatica*) forest, a coniferous log, 49°16′42″N, 19°56′37″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 859-2a*, KRAM M-2043 (KRAM00035294-M).

*** 45.1. *Hemitrichia decipiens* (Pers.) García-Cunch., J.C. Zamora & Lado var. *decipiens***

Specimens examined (all as *Trichia decipiens* (Pers.) T. Macbr. var. *decipiens*): **1**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, on beech log, 49°16′36″N, 19°56′27″E, 980 m, 2003-03-30, *leg. A. Ronikier & M. Ronikier, Ron 64*, KRAM M-1088 (KRAM00035286-M); **2**. *same data except:* on log of *Fagus sylvatica*, 990 m, *Ron 144*, KRAM M-1109 (KRAM00035287-M); **3**. the Western Tatra Mts, the Sarnia Skała massif, the upper part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, on coniferous log, 49°16′24″N, 19°56′17″E, 1,080 m, 2003-10-14, *leg. A. Ronikier & M. Ronikier, Ron 84*, KRAM M-1121 (KRAM00035288-M); **4**. Western Tatra Mts, Sarnia Skała massif, Grześkówki ridge, beech (*Fagus sylvatica*) forest, on the coniferous log, 49°16′28″N, 19°56′15″E, 1,030 m, 2009-09-26, *leg. A. Ronikier, Ron 691*, KRAM M-1999 (KRAM00035289-M); **5**. *same data except:no substrate, Ron 692*, KRAM M-2000 (KRAM000 35290-M); **6**. Western Tatra Mts, Sarnia Skała massif, lower part of Dolina ku Dziurze valley, along a stream, a beech (*Fagus sylvatica*) forest, a coniferous log, 49°16′42″N, 19°56′37″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 859-1a*, KRAM M-2040 (KRAM00035291-M); **7**. Western Tatra Mts, Sarnia Skała massif, Droga pod Reglami hiking trail, between Dolina Strążyska and Dolina ku Dziurze valley, a beech (*Fagus sylvatica*) forest, 49°16′44″N, 19°57′19″E, 940 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 863*, KRAM M-2052 (KRAM00035295-M); **8**. Western Tatra Mts, Hruby Regiel massif, Staników Żleb gorge, a beech (*Fagus sylvatica*) forest, on wood, 49°16′19″N, 19°52′50″E, 1010 m, 2019-09-07, *leg. H. Wacławek & J. Skrobek*, KRAM M-2082 (KRAM00035296-M); **9**. *same data*, KRAM M-2083 (KRAM00035297-M); **10**. Western Tatra Mts, Hruby Regiel massif, Staników Żleb gorge, 100 m from the hiking trail, a beech (*Fagus sylvatica*) forest, on the log of fir (*Abies alba*), 49°16′10″N, 19°52′53″E, 1,114 m, 2019-09-20, *leg. W. Szczytowska & J. Skrobek*, KRAM M-2087 (KRAM00035298-M); **11**. *same data*, KRAM M-2088 (KRAM00035299-M); **12**. Western Tatra Mts, Hruby Regiel massif, Droga pod Reglami hiking trail, at the trail, a beech (*Fagus sylvatica*) forest, on the coniferous logs, 49°16′30″N, 19°53′56″E, 1125 m, 2019-09-21, *leg. W. Szczytowska, J. Skrobek & Sz. Górnisiewicz*, KRAM M-2091 (KRAM00035300-M); **13**. Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, the left slope of the valley, at the hiking trail, a beech (*Fagus sylvatica*) forest, on wood, 49°16′31″N, 19°56′28″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2098 (KRAM00035301-M).

46. *Lamproderma arcyrioides* (Sommerf.) Rostaf.

Literature records: **1**. Raciborski (1889, as *Lamproderma tatricum* [sp. nov., Racib.]): Im Kalatówkithale in dem Tatragebirge.

47. *Lamproderma argenteobrunneum* A. Ronikier, Lado & Mar. Mey.

Literature records: **1**. Ronikier et al. (2010): The Carpathians: Tatry Mountains, a gully in Mała Koszysta mountain toward Waksmundzka Polana meadow, on the living shoots of *Salix silesiaca*, 49°15′03″N, 20°03′28″E, 1630 m, 2008-06-01 (*leg. A. Ronikier & M. Ronikier*, KRAM M-1482).

48. *Lamproderma columbinum* (Pers.) Rostaf.

Literature records: **1**. Raciborski (1885): Pańszczyca, auf faulen Baumstämmen; **2**. Raciborski (1889, as *Lamproderma staszycii* [sp. nov., Racib.]): Im Kalatówkithale in dem Tatragebirge; **3**. Krzemieniewska (1960, also as *L. "staszicii"* Racib.): Tatry; **4.** Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy.

49. *Lamproderma sauteri* Rostaf.

Literature records: **1**. Drozdowicz (1988): Tatrzański Park Narodowy, na żywych roślinach i ich martwych szczątkach, na powierzchni kamieni.

50. *Leocarpus fragilis* (Dicks.) Rostaf.

Literature records: **1**. Rouppert (1912): dol. Roztoki, na mchu, VIII [19]09; **2**. Krzemieniewska (1960): Tatry; [?]**3**. Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy. Note: Inclusion into the figure depicting species known from the Tatra NP by Komorowska and Drozdowicz (1996) suggests the species occurrence in the Tatra NP, but this is not mentioned in the text.

51. *Licea kleistobolus* G.W. Martin

Literature records: **1**. Jarocki (1927, as *Kleistobolus pusillus* Lippert): Krokiew-Mount (1,378 m) near Zakopane in the Tatra Mts, Poland, on rotten wood/decorticated trunk of *Picea excelsa*, ca. 1,300 m, July 1926.

*** 52. *Licea minima* Fr.**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, the lower part of Dolina ku Dziurze valley, a beech (*Fagus sylvatica*) forest, on the spruce (*Picea abies*) log, 49°16′40″N, 19°56′33″E, 903 m, 2019-09-25, *leg. A. Ronikier, P. Janik & M. Schnittler, Ron 835b*, KRAM M-2015 (KRAM00034129-M); **2**. Western Tatra Mts, Sarnia Skała massif, the lower part of Dolina ku Dziurze valley, along a stream, a beech (*Fagus sylvatica*) forest, coniferous log, 49°16′42″N, 19°56′37″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 860a*, KRAM M-2044 (KRAM00034112-M).

*** 53. *Licea pusilla* Schrad.**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, the mouth of Dolina ku Dziurze valley, a beech (*Fagus sylvatica*) forest, a rotten log on the ground, 49°16′42″N, 19°56′36″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 857b*, KRAM M-2038 (KRAM00034069-M).

54. *Lycogala epidendrum* (L.) Fr. sensu lato

Literature records: [?]**1**. Raciborski (1885): Zakopane; [?]**2**. Raciborski (1885): Kościeliska; **3**. Raciborski (1885): Tomanowa; **4**. Raciborski (1885): Pańszczyca; **5**. Raciborski (1885): Wołoszyn [misspelled as "Wotoszyn"]; **6**. Rouppert (1912, as *Lycogala epidendron* Bux.): opodal ujścia dol[iny] Lejowej, na pniu w szkółce leśnej, 1909-09-14; **7**. Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy.

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the upper part of the Dolina Białego valley, the right side of the valley, *Dentario glandulosae-Fagetum*, on the standing trunk of *Picea abies*, 49°15′51″N, 19°57′22″E, 1,080 m, 2001-11-05, *leg. A. Ronikier, Ron 46*, KRAM M-1123 (KRAM00034113-M); **2**. Western Tatra Mts, Sarnia Skała massif, Grześkówki ridge, a beech (*Fagus sylvatica*) forest, on the coniferous log, 49°16′28″N, 19°56′15″E, 1,030 m, 2009-09-26, *leg. A. Ronikier, Ron 690*, KRAM M-1998 (KRAM000 34114-M); **3**. Western Tatra Mts, Sarnia Skała massif, the lower part of Dolina Strążyska valley, Grześkówki ridge, *Dentario glandulosae-Fagetum*, 49°16′39″N, 19°56′30″E, 960 m, 2003-06-07, *leg. A. Ronikier, Ron 73*, KRAM M-2006 (KRAM00034115-M); **4**. Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, a beech (*Fagus sylvatica*) forest, on the bark of fir (*Abies alba*) log, 49°16′34″N, 19°56′30″E, 940 m, 2019-09-25, *leg. A. Ronikier, P. Janik & M. Schnittler, Ron 839*, KRAM M-2019 (KRAM00034116-M); **5**. Western Tatra Mts, Sarnia Skała massif, the upper part of Dolina ku Dziurze valley, a beech (*Fagus sylvatica*) forest, 49°16′23″N, 19°56′30″E, 962 m, 2019-09-25, *leg. A. Ronikier, P. Janik & M. Schnittler, Ron 843*, KRAM M-2023 (KRAM00034117-M); **6**. Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, the left slope of the valley, at the hiking trail, a beech (*Fagus sylvatica*) forest, on, probably on the beech (*Fagus sylvatica*) log, 49°16′35″N, 19°56′30″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2054 (KRAM00034118-M); **7**. Western Tatra Mts, Hruby Regiel massif, Staników Żleb gorge, a beech (*Fagus sylvatica*) forest, on mosses, 49°16′19″N, 19°52′50″E, 1,010 m, 2019-09-07, *leg. H. Wacławek & J. Skrobek*, KRAM M-2081 (KRAM00034119-M); **8**. Western Tatra Mts, Hruby Regiel massif, Droga pod Reglami hiking trail, at the trail, a beech (*Fagus sylvatica*) forest, on wood, 49°16′30″N, 19°53′59″E, 962 m, 2019-09-21, *leg. W. Szczytowska, J. Skrobek & Sz. Górnisiewicz*, KRAM M-2094 (KRAM00034120-M).

55. *Meriderma carestiae* (Ces. & De Not.) Mar. Mey. & Poulain

Literature records: **1**. Komorowska and Drozdowicz (1996, as *Lamproderma carestiae* (Ces. et de Not) Meylan): Tatrzański Park Narodowy; **2**. Janik and Ronikier (2016, as *Meriderma carestiae* (Ces. & De Not.) Mar. Mey. & Poulain var. *carestiae*): The Tatra Mts, High Tatra Mts; gully descending from Koszysta Mt to the Waksmundzka Polana, scrub of *Salix silesiaca*, on small twigs, 49°14′56″N, 20°03′28″E, 1,780 m, 2008-06-01 (*leg. A. Ronikier & M. Ronikier, Ron 635*, KRAM M-1641).

56. *Meriderma echinulatum* (Meyl.) Mar. Mey. & Poulain var. *echinulatum*

Literature records: **1**. Janik and Ronikier (2016): The Tatra Mts, High Tatra Mts; the mouth of a gully descending from Koszysta Mt to the Waksmundzka Polana, spruce forest, on *Vaccinium myrtillus* stems, 49°15′17″N, 20°03′31″E, 1430 m, 2008-06-01 (*leg. A. Ronikier & M. Ronikier, Ron 621*, KRAM M-1656).

57. *Meriderma spinulosporum* ad int. f. *spinulosporum* sensu Poulain et al. (2011)

Literature records: **1**. Janik and Ronikier (2016): The Tatra Mts, High Tatra Mts; the upper part of a gully descending from Koszysta Mt to the Waksmundzka Polana, grass near the fence, on the *Vaccinium myrtillus* stems, 49°15′03″N, 20°03′28″E, 1,630 m, 2008-06-01 (*leg. A. Ronikier & M. Ronikier, Ron 642*, KRAM M-1669).

*** 58. *Metatrichia floriformis* (Schwein.) Nann.-Bremek.**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, Grześkówki ridge, a beech (*Fagus sylvatica*) forest, on the beech (*Fagus sylvatica*) log, 49°16′39″N, 19°56′27″E, 970 m, 2009-09-26, *leg. A. Ronikier, Ron 688*, KRAM M-1770 (KRAM00034121-M).

59. *Metatrichia vesparia* (Batsch) Nann.-Bremek. ex G.W. Martin & Alexop.

Literature records: [?]**1**. Raciborski (1885, as *Hemiarcyria rubiformis* (Pers.) Rfski.): Zakopane.

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, on the beech log, 49°16′36″N, 19°56′27″E, 960 m, 2001-05-24, *leg. A. Ronikier, Ron 34*, KRAM M-1028 (KRAM00034122-M); **2**. the Western Tatra Mts, the Sarnia Skała massif, the middle part of the Dolina ku Dziurze valley, the left side of the valley, *Dentario glandulosae-Fagetum*, on wood, 49°16′30″N, 19°56′27″E, 1,000 m, 2003-03-30, *leg. A. Ronikier & M. Ronikier, Ron 66*, KRAM M-1029 (KRAM00034123-M); **3**. the Western Tatra Mts, the Sarnia Skała massif, the middle part of the Dolina ku Dziurze valley, the left side of the valley, *Dentario glandulosae-Fagetum*, on the beech log, 49°16′30″N, 19°56′27″E, 970 m, 2000-11-24,

leg. A. Ronikier, Ron 26, KRAM M-1070 (KRAM00034124-M); **4**. *same data except*: 49°16′30″N, 19°56′27″E*, Ron 27b*, KRAM M-2100 (KRAM00035312-M).

! 60. *Nannengaella* cf. *mellea* (Berk. & Broome) J.M. García-Martín, J.C. Zamora & Lado

Specimens examined: **1**. [cf.] (as *Physarum* cf. *melleum* (Berk. & Broome) Massee) Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, the left slope of the valley, at the hiking trail, a beech (*Fagus sylvatica*) forest, on wood, 49°16′35″N, 19°56′30″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2055 (KRAM00 034141-M).

*** 61. *Oligonema affine* (de Bary) García-Cunch., J.C. Zamora & Lado**

Specimens examined: **1**. (as *Trichia affinis* de Bary) the Western Tatra Mts, the Sarnia Skała massif, the upper part of the Dolina Spadowiec valley, right side of the valley, by path, *Dentario glandulosae-Fagetum*, on the wood of *Fagus sylvatica*, 49°16′23″N, 19°57′07″E, 1080 m, 2002-07-12, *leg. A. Ronikier, Ron 57*, KRAM M-1082 (KRAM00034159-M).

62. *Oligonema favogineum* (Batsch) García-Cunch., J.C. Zamora & Lado

Literature records: **1**. Raciborski (1885, as *Trichia chrysosperma* (Bull.) D.C.): Pańszczyca.

Specimens examined (all as *Trichia favoginea* (Batsch) Pers.): **1**. the Western Tatra Mts, the Sarnia Skała massif, the mouth of the Dolina ku Dziurze valley, *Dentario glandulosae-Fagetum*, on stump of coniferous tree, 49°16′43″N, 19°56′42″E, 910 m, 2001-09-09, *leg. A. Ronikier, Ron 43*, KRAM M-1092 (KRAM 00035306-M); **2**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, on wood, 49°16′39″N, 19°56′30″E, 966 m, 2002-06-15, *leg. A. Ronikier & M. Ronikier, Ron 52*, KRAM M-1093 (KRAM00035307-M); **3**. *same data except:* 2003-06-07, *leg. A. Ronikier, Ron 71*, KRAM M-1094 (KRAM 00035308-M); **4**. Western Tatra Mts, Sarnia Skała massif, Grześkówki ridge, a beech (*Fagus sylvatica*) forest, on the beech (*Fagus sylvatica*) log, 49°16′39″N, 19°56′27″E, 970 m, 2009-09-26, *leg. A. Ronikier, Ron 689*, KRAM M-1997 (KRAM 00035309-M); **5**. Western Tatra Mts, Sarnia Skała massif, Droga pod Reglami hiking trail, at the trail, a beech (*Fagus sylvatica*) forest, on the log of fir (*Abies alba*), 49°16′30″N, 19°53′56″E, 1,125 m, 2019-09-21, *leg. W. Szczytowska, J. Skrobek & Sz. Górnisiewicz*, KRAM M-2092 (KRAM000 35310-M).

*** 63. *Perichaena corticalis* (Batsch) Rostaf.**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Dolina Strążyska valley, *Dentario glandulosae-Fagetum*, on fallen leaves of *Fagus sylvatica*, 49°16′30″N, 19°56′07″E, 920 m, 2003-09-09, *leg. A. Ronikier, Ron 79*, KRAM M-1090 (KRAM00034125-M).

*** 64. *Physarum album* (Bull.) Chevall.**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, Grześkówki ridge, a beech (*Fagus sylvatica*) forest, 49°16′28″N, 19°56′15″E, 1,030 m, 2009-09-26, *leg. A. Ronikier, Ron 693*, KRAM M-2001 (KRAM00034126-M); **2**. Western Tatra Mts, Sarnia Skała massif, the mouth of Dolina ku Dziurze valley, a beech (*Fagus sylvatica*) forest, a spruce (*Picea abies*) log hanging above a stream, 49°16′42″N, 19°56′36″E, 915 m, 2019-09-25, *leg. A. Ronikier, P. Janik & M. Schnittler, Ron 832*, KRAM M-2011 (KRAM00034127-M); **3**. Western Tatra Mts, Sarnia Skała massif, the lower part of Dolina ku Dziurze valley, a beech (*Fagus sylvatica*) forest, on spruce (*Picea abies*) log, 49°16′40″N, 19°56′33″E, 903 m, 2019-09-25, *leg. A. Ronikier, P. Janik & M. Schnittler, Ron 835a*, KRAM M-2014 (KRAM00034128-M); **4**. *same data, Ron 836*, KRAM M-2016 (KRAM00034130-M); **5**. Western Tatra Mts, Sarnia Skała massif, the upper part of Dolina ku Dziurze valley, a beech (*Fagus sylvatica*) forest, 49°16′23″N, 19°56′31″E, 962 m, 2019-09-25, *leg. A. Ronikier, P. Janik & M. Schnittler, Ron 842*, KRAM M-2022 (KRAM00034131-M); **6**. Western Tatra Mts, Sarnia Skała massif, the lower part of Dolina ku Dziurze valley, along a stream, a beech (*Fagus sylvatica*) forest, a coniferous log, 49°16′42″N, 19°56′37″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 861b*, KRAM M-2048 (KRAM00034147-M); **7**. Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, the left slope of the valley, at the hiking trail, a beech (*Fagus sylvatica*) forest, on coniferous wood, 49°16′35″N, 19°56′30″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2053 (KRAM00034132-M); **8**.[cf.] *same data except:* on wood, 49°16′31″N, 19°56′28″E, KRAM M-2057 (KRAM00034133-M); **9**. [cf.] *same data*, KRAM M-2060 (KRAM00034134-M); **10**. *same data*, KRAM M-2064 (KRAM00034135-M); **11**. *same data*, KRAM M-2065 (KRAM00034136-M); **12**. *same data except:* Western Tatra Mts, Sarnia Skała massif, Droga pod Reglami hiking trail, between Dolina Spadowiec and Dolina ku Dziurze valleys, 49°16′44″N, 19°56′45″E, KRAM M-2071 (KRAM00034137-M); **13**. *same data except:* on coniferous wood, KRAM M-2072 (KRAM00034138-M); **14**. *same data except:* on wood, 49°16′44″N, 19°56′53″E, KRAM M-2075 (KRAM000 34140-M).

65. *Physarum leucophaeum* Fr. & Palmquist

Literature records: [?]**1**. Raciborski (1885): bei Jaszczurówka; **2**. Krzemieniewska (1960): Tatry.

66. *Physarum licheniforme* (Schwein.) Lado

Literature records: **1**. Krzemieniewska (1960, as *Physarum lividum* Rost.): Tatry.

67. *Physarum viride* (Bull.) Pers.

Literature records: [?]**1**. Raciborski (1885, as *Tilmadoche mutabilis* Rfski. [f./var.] β *aurantiaca* (Bull.)): Kościeliska.

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, the lower part of Dolina ku Dziurze valley, along a stream, a beech (*Fagus sylvatica*) forest, coniferous log, 49°16′42″N, 19°56′37″E, 915 m, 2019-10-02, *leg. A. Ronikier & P. Janik, Ron 860c*, KRAM M-2046 (KRAM00034066-M); **2**. *same data, Ron 861a*, KRAM M-2047 (KRAM00034146-M); **3**. *same data, Ron 862a*, KRAM M-2050 (KRAM00034142-M); **4**. Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, the left slope of the valley, at the hiking trail, a beech (*Fagus sylvatica*) forest, on (probably coniferous) wood, 49°16′31″N, 19°56′28″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2059 (KRAM00034143-M); **5**. *same locality, no other data*, KRAM M-2080 (KRAM00034144-M); **6**. [cf.] *same data*, KRAM M-2085 (KRAM00034145-M).

68. *Polyschismium carestianum* (Rabenh.) A. Ronikier, J.M. García-Martín, A. Kuhnt, J.C. Zamora, M. de Haan, Janik & Lado

Literature records (all as *Lepidoderma carestianum* (Rab[enh].) Rost[af].): **1**. Drozdowicz (1988): Tatrzański Park Narodowy, na żywych roślinach i ich martwych szczątkach, na powierzchni kamieni; **2**. Drozdowicz (1995): Tatra NP; **3.** Komorowska and Drozdowicz (1996): Tatrzański Park Narodowy.

69. *Polyschismium fallax* (Rostaf.) A. Ronikier, J.M. García-Martín, A. Kuhnt, J.C. Zamora, M. de Haan, Janik & Lado

Literature records (all as *Diderma lyallii* (Masse[e]) Macbr.): **1**. Drozdowicz (1988): Tatrzański Park Narodowy, na żywych roślinach i ich martwych szczątkach, na powierzchni kamieni; **2**. Drozdowicz (1995): Tatra NP.

70. *Polyschismium neoperforatum* (A. Kuhnt) A. Ronikier, A. Kuhnt, M. de Haan & Janik

Literature records: **1**. Ronikier et al. (2022): The Carpathians, the Tatra Mts, Dolina Gąsienicowa valley, vicinity of the Murowaniec refuge, near blue-marked hiking trail from Kuźnice to the Murowaniec refuge, on twigs of *Rubus idaeus*, ca. 1,500 m, 1987 (*leg. A. Drozdowicz*, KRAM M-1989 (KRAM 00032763-M)).

71. *Reticularia lycoperdon* Bull.

Literature records: [?]**1**. Raciborski (1885): Zakopane.

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the upper part of the Dolina ku Dziurze valley, above the Dziura Wyżnia cave, *Dentario glandulosae-Fagetum*, on the trunk of *Fagus sylvatica*, 49°16′23″N, 19°56′47″E, 1,100 m, 2001-05-15, *leg. A. Ronikier, Ron 33*, KRAM M-1098 (KRAM00034150-M); **2**. the Western Tatra mts, the Sarnia Skała massif, a ridge between the Dolina Białego valley and the Dolina Spadowiec valley, *Dentario glandulosae-Fagetum*, on standing trunk of *Fagus sylvatica*, under bark, 49°16′39″N, 19°56′22″E, 990 m, 2003-08-16, *leg. M. Ronikier, Ron 75*, KRAM M-1100 (KRAM 00034151-M).

72. *Stemonitis axifera* (Bull.) T. Macbr.

Literature records: **1**. Raciborski (1885, as *Stemonitis ferruginea* Ehrb.): Pańszczyca.

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, on wood, 49°16′36″N, 19°56′27″E, 990 m, 2001-09-05, *leg. A. Ronikier, Ron 41*, KRAM M-1077 (KRAM00034152-M); **2**. *same data except:* on the trunk of *Fagus sylvatica*, 2000-09-19, *Ron 25*, KRAM M-1097 (KRAM00034153-M).

*** 73. *Stemonitis fusca* Roth**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, Droga pod Reglami hiking trail, at the trail, a beech (*Fagus sylvatica*) forest, on wood, 49°16′30″N, 19°53′59″E, 962 m, 2019-09-21, *leg. W. Szczytowska, J. Skrobek & Sz. Górnisiewicz*, KRAM M-2095 (KRAM00034155-M); **2**. [cf.] Western Tatra Mts, Nosal massif, on wood covered with mosses, 2019-??-??, *leg. P. Kauzal*, KRAM M-1994 (KRAM000 34154-M).

*** 74. *Stemonitis splendens* Rostaf.**

Specimens examined: **1**. Western Tatra Mts, Dolina Miętusia valley, trail from Przysłop Miętusi to Kobylarzowy Żleb, forest, on the log of *Picea abies*, 1,140 m, 2002-06-09, *leg. A. Ronikier, Ron 51*, KRAM M-1099 (KRAM00034156-M).

*** 75. *Stemonitopsis hyperopta* (Meyl.) Nann.-Bremek.**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, a ridge between the Dolina Białego valley and the Dolina Spadowiec valley, *Dentario glandulosae-Fagetum*, on wood, 49°16′38″N, 19°57′17″E, 1,000 m, 2003-06-04, *leg. A. Ronikier, Ron 70*, KRAM M-1087 (KRAM00034157-M).

76. *Stemonitopsis typhina* (F.H. Wigg.) Nann.-Bremek.

Literature records: **1**. Raciborski (1885, as *Comatricha typhina* Roth [var.] a. *genuina* Rfski.): Pańszczyca, auf alten Stämmen.

*** 77. *Symphytocarpus amaurochaetoides* Nann.-Bremek.**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, a beech (*Fagus sylvatica*) forest, on the bark of fir (*Abies alba*) log, 49°16′34″N, 19°56′30″E, 940 m, 2019-09-25, *leg. A. Ronikier, P. Janik & M. Schnittler, Ron 841*, KRAM M-2021 (KRAM00034158-M).

78. *Trichia alpina* (R.E. Fr.) Meyl.

Literature records: **1**. Drozdowicz (1988): Tatrzański Park Narodowy, na żywych roślinach i ich martwych szczątkach, na powierzchni kamieni; **2**. Drozdowicz (1995): Tatra NP.

79. *Trichia contorta* (Ditmar) Rostaf.

*** 79.1. *Trichia contorta* (Ditmar) Rostaf. var. *attenuata* (Meyl.) Meyl.**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, Grześkówki ridge, a beech (*Fagus sylvatica*) forest, 49°16′28″N, 19°56′15″E, 1,030 m, 2009-09-26, *leg. A. Ronikier, Ron 696*, KRAM M-2004 (KRAM00034160-M).

*** 79.2. *Trichia contorta* (Ditmar) Rostaf. var. *iowensis* (T. Macbr.) Torrend**

Specimens examined: **1**. Western Tatra Mts, Sarnia Skała massif, Grześkówki ridge, a beech (*Fagus sylvatica*) forest, on the fir (*Abies alba*) log, 49°16′19″N, 19°56′13″E, 1,093 m, 2009-09-26, *leg. A. Ronikier, Ron 697*, KRAM M-2005 (KRAM00035285-M).

*** 80.1. *Trichia decipiens* (Pers.) T. Macbr. var. *olivacea* (Meyl.) Meyl.**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the upper part of the Dolina Spadowiec valley, the right side of the valley, *Dentario glandulosae-Fagetum*, on a log, 49°16′23″N, 19°57′07″E, 1,070 m, 2000-06-20, *leg. A. Ronikier, Ron 14*, KRAM M-1113 (KRAM00035302-M); **2**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, on wood, 49°16′39″N, 19°56′30″E, 966 m, 2003-06-07, *leg. A. Ronikier, Ron 72*, KRAM M-1120 (KRAM00035303-M); **3**. Western Tatra Mts, Sarnia Skała massif, Droga pod Reglami hiking trail, between Dolina Spadowiec and Dolina ku Dziurze valleys, a beech (*Fagus sylvatica*) forest, on deciduous tree wood, 49°16′44″N, 19°56′45″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2069 (KRAM00035304-M); **4**. Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, the left slope of the

valley, at the hiking trail, a beech (*Fagus sylvatica*) forest, on wood, 49°16′35″N, 19°56′30″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2090 (KRAM00035305-M).

*** 81. *Trichia scabra* Rostaf.**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the middle part of the Dolina ku Dziurze valley, the left side of the valley, *Dentario glandulosae-Fagetum*, on the beech log, 49°16′30″N, 19°56′28″E, 970 m, 2000-11-24, *leg. A. Ronikier, Ron 27a*, KRAM M-1086 (KRAM000 35311-M).

82. *Trichia sordida* Johannesen

Literature records: **1**. Ronikier and Janik (2020): Tatrzański Park Narodowy, masyw Ciemniaka (Czerwone Wierchy), około 20 m na północny zachód od Polany Upłaz, 49°15′05,0″N, 19°52′46,4″E, 1,299 m, w lesie świerkowym, przy topniejącym śniegu, na mchach i drobnych gałązkach świerkowych leżących na ziemi, 9 maja 2020 r., *leg. P. Janik & A. Ronikier, Ron 1031*, KRAM M-1935; *Ron 1045*, KRAM M-1936

*** 83. *Trichia* cf. *subfusca* Rex sensu Poulain et al. (2011)**

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Grześkówki ridge, *Dentario glandulosae-Fagetum*, log of *Fagus sylvatica*, 49°16′36″N, 19°56′27″E, 990 m, 2003-03-30, *leg. A. Ronikier & M. Ronikier, Ron 137*, KRAM M-1073 (KRAM00035313-M); **2**. *same data except:* log of ?*Fagus sylvatica, Ron 138*, KRAM M-1078 (KRAM00035314-M); **3**. *same data, Ron 139*, KRAM M-1079 (KRAM00035315-M); **4**. Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, the left slope of the valley, at the hiking trail, a beech (*Fagus sylvatica*) forest, on wood, 49°16′31″N, 19°56′28″E, 930 m, 2019-09-06, *leg. A. Ronikier, P. Janik, H. Wacławek & J. Skrobek*, KRAM M-2056 (KRAM00035316-M); **5**. *same data except:* on coniferous wood, KRAM M-2062 (KRAM00035317-M); **6**. *same data*, KRAM M-2099 (KRAM00035318-M).

84. *Trichia varia* (Pers. ex J.F. Gmel.) Pers.

Literature records: **1**. Raciborski (1885, as *Trichia varia* Pers. [f./var.] α *nigripes* Pers.): bei Wołoszyn [misspelled as "Wotoszyn"]; [?]**2**. Krupa (1886, as *Trichia varia* Pers. [f./var.] γ *genuina* Rostaf.): w Zakopanem, pod korą pniaków świerkowych, September.

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the lower part of the Dolina Strążyska valley, at hiking trail, young forest with spruce, on wood, 49°16′36″N, 19°56′17″E, 900 m, 2000-09-05, *leg. A. Ronikier, Ron 24*, KRAM M-1084 (KRAM00035319-M); **2**. the Western TatraM., the Sarnia Skała massif, the lower part of Dolina Strążyska valley, on wood, 49°16′30″N, 19°56′17″E, ca. 900 m, 2003-09-09, *leg. A. Ronikier, Ron 81*, KRAM M-1585 (KRAM00035320-M); **3**. Western Tatra Mts, Nosal massif, on wood, 2019, *leg. P. Kauzal*, KRAM M-1993 (KRAM00035321-M); **4**. Western Tatra Mts, Sarnia Skała massif, Grześkówki ridge, a beech (*Fagus sylvatica*) forest, on coniferous log, 49°16′28″N, 19°56′15″E, 1,030 m, 2009-09-26, *leg. A. Ronikier, Ron 695*, KRAM M-2003 (KRAM00035322-M); **5**. Western Tatra Mts, Sarnia Skała massif, between Dolina Białego valley and Dolina Spadowiec valley, *Dentario glandulosae-Fagetum*, bark of fir (*Abies alba*), 49°16′43″N, 19°57′17″E, 950 m, 2003-09-10, *leg. A. Ronikier, Ron 83*, KRAM M-2009 (KRAM00035323-M); **6**. Western Tatra Mts, Sarnia Skała massif, Droga pod Reglami hiking trail, between Dolina Strążyska and Dolina ku Dziurze valley, a beech (*Fagus sylvatica*) forest, on the bark of a fallen spruce (*Picea abies*) trunk, 49°16′44″N, 19°56′28″E, 895 m, 2019-09-25, *leg. A. Ronikier, P. Janik & M. Schnittler, Ron 830*, KRAM M-2010 (KRAM00035324-M); **7**. Western Tatra Mts, Sarnia Skała massif, Dolina ku Dziurze valley, a beech (*Fagus sylvatica*) forest, on fir (*Abies alba*) log, 49°16′34″N, 19°56′30″E, 940 m, 2019-09-25, *leg. A. Ronikier, P. Janik & M. Schnittler, Ron 837*, KRAM M-2017 (KRAM00035325-M); **8**. *same data, Ron 838*, KRAM M-2018 (KRAM00035326-M); **9**. *same data except:* on the bark of fir (*Abies alba*) log, *Ron 840*, KRAM M-2020 (KRAM00035327-M).

85. *Tubifera ferruginosa* (Batsch) J.F. Gmel. sensu lato

Literature records: **1**. Raciborski (1885, as *Tubulina cylindrica* (Bull.) D.C.): bei Tomanowa, auf alten Stämmen.

Specimens examined: **1**. the Western Tatra Mts, the Sarnia Skała massif, the upper part of Dolina Spadowiec valley, near Łomik ridge, the left side of the valley, *Polysticho-Piceetum*, on wood (probably coniferous), 49°16′40″N, 19°56′57″E, 1,170 m, 2001-06-16, *leg. A. Ronikier, Ron 36*, KRAM M-1030 (KRAM00035329-M).

Summary of results

Regarding all the data published until now, as well as the species reported within this study, the list of species reported from the Polish Tatra Mts counts 85. Among them, four species: *Arcyria* cf. *helvetica*, *Cribraria macrospora*, *Fuligo* cf. *licentii*, and *Nannengaella* cf. *mellea* are new records for Poland, and 30 taxa (24 species and six varieties) are reported for the first time from the Polish Tatra Mts. The most commonly reported species, with the highest number of records, were: *Lycogala epidendrum* (15 records), *Hemitrichia decipiens* (14), *Physarum album* (14), *Fuligo septica* var. *flava* (10), *Trichia varia* (10), *Arcyria obvelata* (10) and *Clastoderma debaryanum* (8).

4. Discussion

Most myxomycete species recorded so far from the Polish Tatra Mts are common in Poland. Three species (*Arcyria* cf. *helvetica*, *Cribraria macrospora,* and *Fuligo* cf. *licentii*) out of four new to Poland are, however, rare in Europe. This indicates that further, more systematic studies in this area can bring about more records of rare species. The Polish Tatra Mts, which are entirely protected as a national park, are one of few regions in Poland with a well-developed alpine zone. Additionally, the presence of various types of bedrock (granite, limestone, mylonite) makes the area exceptionally rich in habitat types, from montane forest to open alpine vegetation (Mirek, 1996). Taking into account the diversity of habitats, compared to other national parks located in the Polish Carpathians, the Tatra NP seems to be one of the least studied to date since 92 species are known from much smaller area of the Babiogórski NP (Magiera & Drozdowicz, 2004), 79 species are reported from the Gorczański NP (Drozdowicz, 2006) and 77 species – from the Pieniński NP (Drozdowicz, 2000) (the latter two parks, apart from smaller area, lack the spectrum of habitats present in the Tatras). From two other Carpathian

national parks of similar size but much lower habitat diversity when compared to the Tatra NP, i.e. Bieszczadzki NP and Magurski NP, 73 and 54 species are known to date, respectively (Drozdowicz & Bochynek, 2016).

Most species known so far from the Polish Carpathian national parks are late-season myxomycetes, and localities of only ca. 30 nivicolous ones have been published so far. From the Tatra Mts only 11 nivicolous species are known, while this group encompasses more than 100 species worldwide (Dagamac et al., 2021). Since nivicolous myxomycetes are mountain organisms (Ronikier & Ronikier, 2009), they form an important part of mountainous ecosystems. This group is currently under systematic studies (Drozdowicz, Ronikier & Janik, unpublished data); thus more species new to Poland and the Tatra Mts are expected to be reported in the near future.

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