

## LICHENS AND LICHENICOLOUS FUNGI OF MAGURSKI NATIONAL PARK (POLAND, WESTERN CARPATHIANS)

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**Abstract.** The paper lists 337 species from Magurski National Park (MNP): 314 lichens, 18 lichenicolous fungi, four saprotrophic fungi and one lichenicolous myxomycete; 112 of them are new for MNP, 75 are reported for the first time for the Beskid Niski Mts, and two are new for Poland. Selected species are accompanied by taxonomic notes and remarks on their distribution in Poland and other Carpathian ranges. First records of *Intralichen lichenicola*, *Burgoa angulosa* and *Verrucaria policensis* and a second record of *Epigloea urosperma* are given for the whole Carpathian range, and *Fuscidea arboricola* was recorded for the first time in the Western Carpathians. *Haleciana viridescens* and *Mycocomrothelia confusa* are new for the Polish Carpathians. The records of *Absconditella pauxilla*, *Collema crispum*, *Licea parasitica* and *Rinodina griseosoralifera* in MNP are their second known localities for the range. 93 species, mainly rare or threatened in Poland, were reported from MNP in the 20<sup>th</sup> century but were not refund.

**Key words:** lichenized fungi, saprotrophic fungi, myxomycete, lichen diversity, new records, rare species, Beskid Niski Mts

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## INTRODUCTION

Magurski National Park (MNP) was founded in 1995 for the purpose of protecting the most important landscape and natural formations typical of the Beskid Niski Mts, which are part of the Western Carpathians (Kondracki 1989). The Beskid Niski Mts are low and intermediate-height mountains

built of Carpathian flysch (Fig. 1). Altitude ranges mainly from 650 to 700 m a.s.l., reaching maximum of 847 m at the summit of Magura Wątkowska Mt. The park covers 19,439 ha of the Wisłoka River valley, including its upper reaches and origin. MNP is located in a pass in the Carpathians where two



**Fig. 1.** Typical landscape of the Beskid Niski Mts – view of Ciechania village in Magurski National Park. Photo M. Węgrzyn.



**Fig. 2.** *Dentario glandulosae-Fagetum* – dominant forest association in Magurski National Park. Photo M. Węgrzyn.

main ecological corridors intersect: north-south and east-west. The park is a typical woodland (90% wooded area) with relatively well-preserved vegetation. The most frequent forest community is *Dentario glandulosae-Fagetum*, which creates the characteristic landscape of the park (Fig. 2). Sycamore woods, rare in the Polish Carpathians, are represented by three associations: *Sorbo-Aceretum*, which occurs only on the peak rocks on Kamień Mt., *Phyllitido-Aceretum*, occurring on Magura Wątkowska Mt., Kamień Mt. and Suchania Mt., as well as *Lunario-Aceretum* developed in several patches. In the foothills there are mainly planted and managed stands dominated by pine, as well as multi-species riparian forests, and rarely hornbeam woods. Non-forest vegetation is represented by varied meadow and grassland communities, and also peat-bogs. Biocenoses in MNP having

a natural species composition and high stability helped to justify the inclusion of area in the Natura 2000 network; 14 kinds of habitats given in the annex to the Habitat Directive were identified here. Detailed information on the importance of the park and its vegetation is found in a monograph of MNP (Górecki & Zemanek 2009).

Prior to this work, Magurski National Park was lichenologically the least-known national park in the Polish Carpathians. More than 300 lichen species have been recorded (Bielczyk 2003 and literature cited therein) in the Beskid Niski area, but the majority were reported from outside the park (e.g., Motyka 1927; Olech 1974; Kukwa & Czarnota 2006) or are only historical records (e.g., Sulma 1936; Polakowska 2002 based on T. Sulma's collection). In the 1970s, MNP was studied by lichenologists from Kraków (J. Nowak,

M. Olech, J. Kiszka, R. Kozik) but their herbarium collections were only partially examined and published in articles or taxonomic monographs (e.g., Kukwa 2005, 2011; Czarnota 2007; Flakus & Kukwa 2009; Krzewicka 2009, 2012; see also Bielczyk & Kozik 2009).

Recent lichenological fieldwork in MNP was done during the 24<sup>th</sup> Meeting of Polish Lichenologists in September 2009, the results of which are presented here in the form of an annotated checklist of lichens, lichenicolous fungi and saprotrophic fungi known from MNP (taking into account all published data). Also, the lichenological values of MNP are characterized, and an attempt was made to evaluate changes in the lichen biota.

MATERIAL AND METHODS

This study is based on material we collected during fieldwork on 10–11 September 2009 at 58 localities in Magurski National Park (Fig. 3 and list of collecting sites given below); the collecting sites are mapped in the ATPOL grid square system (Zajac 1978), subdivided into 1×1 km squares. The taxa recognized in the field were listed and samples of others were collected for identification in the laboratory by standard lichenological methods, including spot tests, UV reaction and TLC (Orange *et al.* 2010). Voucher material is housed in KRAP, with some duplicates in GPN, KRAM and UGDA.

The species list below is based on (1) original data collected during the 2009 fieldwork, (2) unpublished historical collections from UGDA (by T. Sulma) and

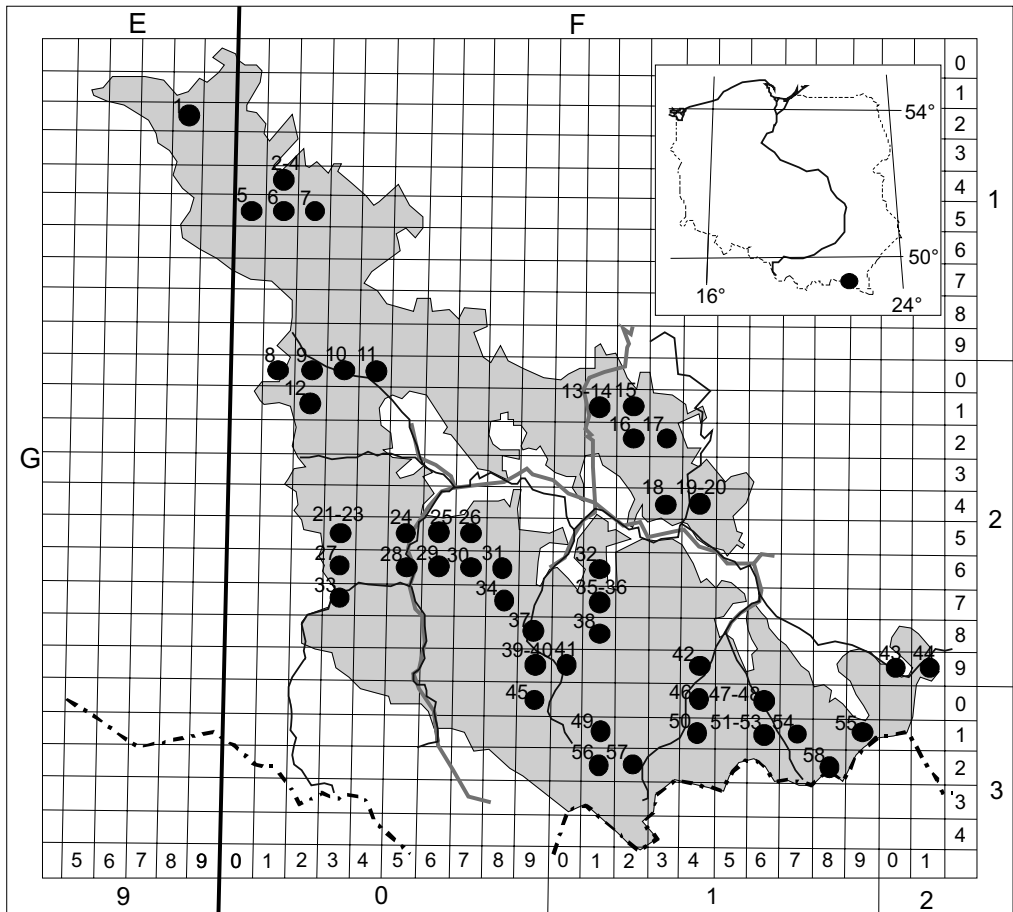


Fig. 3. Location of the collecting sites in Magurski National Park.

KRAM (by J. Nowak), and (3) all earlier publications. Nomenclature of taxa follows the MycoBank Database (2015; <http://www.mycobank.org>) except for the genus *Caloplaca*, which is treated traditionally. For species whose nomenclature was changed recently, synonyms used in Bielczyk (2003) are provided.

#### LIST OF COLLECTING SITES VISITED IN 2009

1 – EG-1928: Bednarka stream, 49°37'30"N, 21°19'52"E, alt. ca 440 m, mixed forest with alder and ash.

2 – FG-1041: Diabli Kamień, 49°36'08.1"N, 21°22'05.3"E, alt. ca 500 m, mixed forest with beech, fir, birch and pine, and moderately sunlit (peak parts) or heavily-shaded (N exposure) sandstone rock.

3 – FG-1041: Diabli Kamień, by trail along Kłopotnica stream, 49°36'31.8"N, 21°22'03.7"E, alt. ca 410 m, mixed forest with ash and alder.

4 – FG-1041: Folsz, by road to Diabli Kamień, 49°36'38.5"N, 21°22'16.0"E, alt. ca 400, sunlit roadside bank.

5 – FG-1050: Kornuty, crossing of forest road and yellow trail, 49°36'01.8"N, 21°21'44"E, alt. ca 450 m, mixed forest with beech, fir, birch and larch, and roadside bank.

6 – FG-1051: Kosma Mt., SE slope, 49°35'48.8"N, 21°22'40.5"E, alt. ca 675, mixed forest with high proportion of fir.

7 – FG-1052: Magurski waterfall, 49°35'57.9"N, 21°23'09.2"E, alt. ca 520 m, mixed forest with beech, fir, birch and pine, and steep sandstone rock above head-streams.

8 – FG-2001: Mareszka Mt., foot of NE slope, forest section no. 148/149, 49°33'09"N, 21°22'25"E, alt. ca 600 m, ca 80-year-old *Dentario glandulosae-Fagetum*.

9 – FG-2002: Mareszka Mt., NE slope, right tributary of Świerzówka stream, forest section no. 138, 49°33'28"N, 21°22'27"E, alt. ca 580 m, young, ca 40-year-old beech-wood.

10 – FG-2003: Świerzowa Ruska, Świerzówka stream valley, 49°33'0.2"N, 21°23'38"E, alt. ca 520 m, abandoned orchard, ruderal brushwood.

11 – FG-2004: Świerzówka stream valley, forest section no. 135/121, 49°32'54" N, 21°24'23" E, alt. ca 495 m, stream bed next to dirt road, marshy meadow, tall riverside brushwood.

12 – FG-2012: Mareszka Mt., E slope, forest section no. 146/147, 49°32'28"N, 21°22'53"E, alt. ca 700 m, ca 120–140-year-old *Dentario glandulosae-Fagetum*.

13 – FG-2111: Kamień Mt., W slope, 49°32'17.4"N,

21°30'32.4"E, alt. ca 670 m, *Dentario glandulosae-Fagetum*.

14 – FG-2111: Kamień Mt., summit part, 49°32'18.1"N, 21°30'37.5"E, alt. ca 700 m, individual trees and boulders.

15 – FG-2112: Kamień Mt., NE slope, 49°32'15.2"N, 21°30'43.5"E, alt. ca 680 m, *Sorbo-Aceretum*, single boulders.

16 – FG-2122: Kamień Mt., SE slope, 49°31'53.6"N, 21°31'03.7"E, alt. ca 680 m, *Dentario glandulosae-Fagetum*.

17 – FG-2123: Kamień Mt., E slope, 49°31'48"N, 21°31'47"E, alt. ca 480 m, *Ribeso nigri-Alnetum* (Fig. 4).

18 – FG-2143: Kamień Mt., S ridge spur, E slope, 49°30'53.5"N, 21°32'13.9"E, alt. ca 460 m, *Phyllitido-Aceretum*.

19 – FG-2144: Suchania Mt., W slope, 49°30'29.6"N, 21°32'40.2"E, alt. ca 430 m, *Dentario glandulosae-Fagetum*.

20 – FG-2144: Suchania Mt., W slope, valley of stream flowing into Wilsznia river, 49°30'30.2"N, 21°32'29.6"E, alt. ca 360 m, riverside alder forest, boulders in stream.

21 – FG-2053: Uhrec Mt., S slope, forest section nos 291, 292, 49°30'24"N, 21°22'33"E, alt. ca 500 m, pine forest with some deciduous trees, young *Dentario glandulosae-Fagetum*.

22 – FG-2053: Uhrec Mt., SW slope, forest section no. 289/290, 49°30'25"N, 21°22'34"E, alt. ca 600 m, 80–100-year-old *Dentario glandulosae-Fagetum*, deep ravine.

23 – FG-2053: Uhrec Mt., summit parts, forest section no. 167/291, 49°30'36"N, 21°23'33"E, alt. ca 680 m, *Dentario glandulosae-Fagetum*.

24 – FG-2055: Wisłoka river valley, E slope of Uhrec Mt., forest section no. 172a, 49°30'17.94"N, 21°25'00.59"E, alt. 400 m, *Dentario glandulosae-Fagetum*.

25 – FG-2056: Cyrla Mt., NW slope, stream valley, forest section no. 150c, 49°30'14.09"N, 21°25'58.7"E, alt. 500 m, *Dentario glandulosae-Fagetum*.

26 – FG-2057: Świątkowa Mała, slopes above village, forest section no. 142b, 49°30'17.81"N, 21°26'47.85"E, alt. 514 m, fir-beech forest.

27 – FG-2063: surroundings of Nieznajowa, S slope of hill, forest section nos 293, 294, 49°29'39"N, 21°23'32"E, alt. ca 500 m, mixed forest, pasture.

28 – FG-2065: Wisłoka river valley, SE slope of Uhrec Mt., forest section no. 173a, 49°29'52.00"N, 21°25'14.5"E, alt. 400 m, *Dentario glandulosae-Fagetum*.

29 – FG-2066: Cyrla Mt., W slope, stream valley,



**Fig. 4.** Collecting site no. 17 with *Ribeso nigri-Alnetum* plant community – the site of *Absconditella pauxilla* Vězda & Vivant. Photo R. Kościelniak.

forest section no. 152a, 49°29'41.28"N, 21°25'54.27"E, alt. 550 m, shady *Dentario glandulosae-Fagetum*.

30 – FG-2067: Cyrła Mt., summit parts, forest section no. 143a, 49°29'42.05"N, 21°26'34.56"E, alt. 690 m, fir forest.

31 – FG-2068: Krempna stream valley, Las Słodki, forest section no. 140a, 49°29'37.85"N, 21°27'34.85"E, alt. 670 m, shady *Dentario glandulosae-Fagetum* with scattered old sycamores.

32 – FG-2161: Huta Krempska, 49°39'49"N, 21°30'29"E, alt. ca 450 m, willows by stream.

33 – FG-2073: surroundings of Nieznajowa, Wisłoka river valley, forest section nos 157, 158, 49°29'22"N, 21°23'27"E, alt. ca 435 m, remains of sawmill, willow-alder marshy meadow.

34 – FG-2078: Krempna stream valley, slopes of Słodkie Mt., forest section no. 146a, 49°29'01.72"N, 21°27'44.94"E, alt. 600 m, shady *Dentario glandulosae-Fagetum* with scattered old sycamores.

35 – FG-2171: Huta Krempska, ca 1 km SSW of village, 49°28'58"N, 21°30'19"E, alt. ca 500 m, stream bank, forest, scattered trees.

36 – FG-2171: Huta Krempska, S of village, 49°29'20"N, 21°30'34"E, alt. 440 m, open area.

37 – FG-2089: Żydowskie, site of former center

of destroyed village at foot of Kiczera Żydowska Mt., 49°28'34"N, 21°28'15"E, alt. ca 450 m, abandoned orchards; remains of buildings and graveyard.

38 – FG-2181: Las Huciska, ca 2.5 km SSW of village Huta Krempska, 49°28'39"N, 21°30'26"E; alt. ca 600 m, beech woods.

39 – FG-2099: Żydowskie, S foot of Wysokie Mt., 49°27'51"N, 21°28'22"E, alt. ca 450 m, abandoned apple orchards on edge of woods.

40 – FG-2099: Wysokie Mt., slope N, 49°28'15.7"N, 21°28'10.5"E, alt. ca 500 m, *Dentario glandulosae-Fagetum*, boulders in stream.

41 – FG-2190: Żydowskie, site of former hamlet, by road to Ciechania (former state collective farm), 49°28'47"N, 21°28'27"E, alt. ca 445 m, boulders in stream, maple lane, remains of houses.

42 – FG-2194: Polany, ca 2 km SW of village, Hucianka stream valley, 49°27'41"N, 21°32'23"E, alt. ca 450 m, open area.

43 – FG-2290: Wilsznia river, 49°27'46.4"N, 21°37'58.4"E, alt. 485 m, remains of bridge.

44 – FG-2291: abandoned Wilsznia village, 49°27'42.2"N, 21°38'04.6"E, alt. 490 m, old orchard, plantings.

45 – FG-3009: slope of Wysokie Mt., 49°27'36"N,

21°28'26"E, alt. 600 m, initial grassland in gaps of plantations.

46 – FG-3104: Demcza, N of village Huta Polańska, 49°27'24"N, 21°32'24"E, alt. ca 470 m, forest, open area.

47 – FG-3106: Baranie stream valley, forest section no. 35b, 49°27'20.8"N, 21°34'02.9"E, alt. 480 m, shady 70–90-year-old *Dentario glandulosae-Fagetum*.

48 – FG-3106: Baranie stream valley, forest section no. 36b, 49°27'19"N, 21°34'08.3"E, alt. 485 m, roadside bank and edge of young fir-beech wood by forest road.

49 – FG-3111: Ciechania, N edge of destroyed village, below road to Żydowskie, 49°26'51"N, 21°30'07"E, alt. ca 590 m, single trees in fields and by roads.

50 – FG-3114: Huta Polańska village, Hucianka stream valley, 49°27'01"N, 21°32'22"E, alt. ca 470 m, open area, church, churchyard, forest E of village.

51 – FG-3116: Baranie stream valley, forest section no. 25a, 49°27'09.8"N, 21°04'26.9"E, alt. 500 m, sunlit side of forest road, small outcrops.

52 – FG-3116: Baranie stream valley, forest section no. 25a, 49°27'07.8"N, 21°34'32.7"E, alt. 550 m, shady ca 90-year-old *Dentario glandulosae-Fagetum*.

53 – FG-3116: Baranie stream valley, forest section no. 35a, 49°27'26.6"N, 21°34'05.4"E, alt. 470 m, grove of young ash in streamside marshy meadow.

54 – FG-3117: Baranie stream valley, forest section no. 27a, 49°27'02.0"N, 21°35'06.1"E, alt. 620 m, shady *Dentario glandulosae-Fagetum* by stream.

55 – FG-3119: Olchowczyk stream valley, forest section no. 21a, 49°26'30.4"N, 21°36'13.1"E, alt. 605 m, shady *Dentario glandulosae-Fagetum*, beech tree-stand.

56 – FG-3121: Ciechania, center of destroyed village, 49°26'29"N, 21°30'32"E, alt. ca 570 m, remains of basements, abandoned orchards.

57 – FG-3122: Ciechania, surroundings of research station in Magurski National Park, SE of edge of destroyed village, 49°26'36"N, 21°30'53"E, alt. 535 m, abandoned orchards, meadows, wasteland.

58 – FG-3128: Baranie Mt., summit area, 49°26'13.4"N, 21°35'51.2"E, alt. 754 m, exposed, sunlit place.

#### LIST OF SPECIES KNOWN FROM MNP

As a result of fieldwork undertaken in 2009, 227 species of lichenized fungi, 12 of lichenicolous fungi and four of saprotrophic fungi traditionally included in lichenological lists, as well as one lichenicolous myxomycete species were recorded for the study area. The list below also contains 87 lichen species and six allied fungi previously

reported from MNP, creating a complete list of 337 species currently known from this Carpathian national park.

For each species the following information is provided: habitat, number(s) of collecting site(s) and/or location of historical site(s), date and author of the collection, with reference to voucher specimen(s) and/or literature. For rare and taxonomically interesting species some comments are provided. Symbols: \* – lichenicolous fungus, + – saprotrophic fungus, # – lichenicolous myxomycete, (!) – species new for the Beskid Niski Mts. Species recorded during the current study are **bolded**.

#### \**Abrothallus bertianus* De Not.

On thallus of *Melanelixia glabrata* growing on apple tree. Collecting site: 37. (!)

#### *Absoconditella delutula* (Nyl.) Coppins & Kilius

On shaded sandstone pebble. Collecting site: 53. (!)

#### *Absoconditella lignicola* Vězda & Pišut

On decaying tree stump and wood of *Abies alba* log. Collecting sites: 8, 30, 54. (!)

#### *Absoconditella pauxilla* Vězda & Vivant

On decaying tree stump. Collecting site: 17. (!)

NOTE. An inconspicuous, ephemeral species only recently recorded in Poland, known from Gdańsk Pomerania (Kukwa & Zduńczyk 2011; Kukwa *et al.* 2013) and one locality in the Tatra Mts (Czarnota 2012). It usually grows on decaying wood of stumps and logs. Unlike other representatives of the genus, it forms narrow, needle-shaped ascospores.

#### *Acarospora fuscata* (Ach.) Th. Fr.

On sandstone and concrete. Collecting sites: 2, 41, 50.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1936, *leg. T. Sulma* (UGDA; Polakowska 2002); Rostajne (FG-2075), Kremna (FG-2151), Ciechania (FG-3121), 1979, *leg. J. Nowak* (KRAM; Bielczyk & Kozik 2009).

#### *Acarospora glaucocarpa* (Wahlenb. in Ach.) Körb.

On limestone wall; Polany (FG-2175), 1976, *leg. J. Nowak* (KRAM; Leśniński 2002).

***Acarospora moenium*** (Vain.) Räsänen  
*Aspicilia moenium* (Vain.) G. Thor & Timdal  
 On concrete. Collecting sites: 33, 41. (!)

***Acarospora umbilicata*** Bagl.  
 On wall of old stone roadside shrine; Nieznajowa (FG-2073), 1979, *leg. J. Nowak* (KRAM).

***Acrocordia gemmata*** (Ach.) A. Massal.  
 On bark of beech, apple tree and sycamore. Collecting sites: 34, 54.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1936, *leg. T. Sulma* (UGDA; Polakowska 2002); Żydowskie (FG-2180), 1979, *leg. J. Nowak* (KRAM).

***Agonimia repleta*** Czarnota & Coppins  
 On bark at base of beech trees and mossy boulder in forest. Collecting sites: 12, 52, 54. (!)

NOTE. An inconspicuous microlichen, described from specimens from the Gorce Mts (Czarnota & Coppins 2000), nowadays frequently found in the Carpathians at the base and on roots of beech (Czarnota unpubl.).

***Alyxoria varia*** (Pers.) Ertz & Tehler  
*Opegrapha varia* Pers.  
 On bark of beech, sycamore and apple tree. Collecting sites: 10, 26, 30, 34, 44.

***Anaptychia ciliaris*** (L.) Körb.  
 On bark of roadside willow; Folsz – stream valley (FG-1041), 1955, *leg. T. Sulma* (UGDA; Polakowska 2002); Nieznajowa (FG-2073), 1974, *leg. J. Nowak* (KRAM; Bielczyk & Kozik 2009).

***Anisomeridium polypori*** (M. B. Ellis & Everh.) M. E. Barr  
 On bark of deciduous trees, mainly in forests, less frequently in open areas. Collecting sites: 33, 35, 38, 53, 54. (!)

NOTE. In the Polish part of the Carpathians the species was found in the Gorce Mts (Czarnota 2010), Babia Góra Massif (Czarnota & Węgrzyn 2012), the Pogórze Wiśnickie foothills (Śliwa 2010) and the Bieszczady Mts (Kościelniak 2013); recently it has spread into many regions of Europe; it can be locally common but most

frequently it occurs in an anamorphic form with pycnidia characterized by its conical, elongated ostioles.

***Arthonia atra*** (Pers.) A. Schneid.  
*Opegrapha atra* Pers.  
 On bark of apple tree in abandoned orchard. Collecting site: 44. (!)

***Arthonia radiata*** (Pers.) Ach.  
 On bark of deciduous trees, mainly beech. Collecting sites: 5, 24, 34, 46, 54.

***Arthonia spadicea*** Leight.  
 On bark of deciduous trees in forests. Collecting sites: 1, 9, 35, 38, 52, 53.  
 HISTORICAL DATA: Nieznajowa (FG-2064), Rostajne (FG-2074), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003).

\****Arthorhaphis aeruginosa*** R. Sant. & Tønsberg  
 On *Cladonia* sp. growing on soil; Diabli Kamień Mt. (FG-1041), 1955, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Arthothelium ruanum*** (A. Masasl.) Körb.  
*Arthonia ruana* A. Massal.  
 On bark of deciduous trees in shaded places in forests. Collecting sites: 1, 15, 18, 19, 35, 40.  
 HISTORICAL DATA: Nieznajowa (FG-2064), Krempana (FG-2069), Rostajne (FG-2074), Skarpoty (FG-2079), 1979, *leg. J. Nowak* (KRAM; Nowak 1983).

***Aspicilia* cf. *laevata*** (Ach.) Arnold  
 On boulder; Diabli Kamień Mt. (FG-1041), 1955, *leg. T. Sulma* (UGDA; Polakowska 2002).

\****Athelia arachnoidea*** (Berk.) Jülich  
 On *Lecanora conizaeoides* and *Scoliciosporum chlo-rococum* growing on fir. Collecting sites: 2, 7, 34, 35, 53. (!)

***Bacidia pycnidiata*** Czarnota & Coppins  
 On decaying bark of log and wood of beech stump. Collecting sites: 46, 53. (!)

NOTE. Usually an epibryophytic species, distinctive for its sorediate thallus and numerous pale to brown, globose external pycnidia with long, ostiolar necks. Originally it was reported from the



Czech Republic (E Sudetes) and Poland (Gorce Mts and Pogórze Strzyżowskie foothills) (Czarnota & Coppins 2006); currently it is known from additional sites in both countries (Łubek 2009, 2012; Vondrák *et al.* 2010b; Czarnota & Hernik 2014). It has also been found in Estonia, Belgium, Finland, Lithuania, Ukraine, the North Caucasus and the European part of Russia (Urbanavichene & Urbanavichus 2014).

***Bacidia rubella*** (Hoffm.) A. Massal.

On bark of sycamore, ash and apple tree. Collecting sites: 8, 10, 15, 34, 38, 54.

***Bacidia subincompta*** (Nyl.) Arnold

On bark of apple tree, beech, willow, ash and sycamore. Collecting sites: 10, 12, 15, 19, 35, 38, 47, 54. (!)

***Bacidia viridescens*** (A. Massal.) Norman

On concrete wall. Collecting site: 33. (!)

***Bacidina adastr*** (Sparrius & Aptroot) M. Hauck & V. Wirth

On bark of apple tree and willow. Collecting sites: 5, 35. (!)

***Bacidina* cf. *brandii*** (Coppins & van den Boom) M. Hauck & V. Wirth

On blown-down tree. Collecting site: 19. (!)

NOTE. So far this species has been reported from only one locality in NE Poland (Kubiak & Sparrius 2004), but revision of the source material revealed that the specimen represents a specific morphotype of *Bacidina sulphurella* (Samp.) M. Hauck & V. Wirth (Czarnota unpubl.). The specimen found in Magurski National Park resembles a pale form of *B. brandii* but its thallus is composed of tiny yet distinct gonocysts and its exciple of branched hyphae. According to the original description (Coppins & van den Boom 2002), *B. brandii* is characterized by its crustose thallus built of flat, confluent areoles and a paraplectenchymatic exciple with wide cells (6–10 µm). The presence of Arnoldiana-brown pigment in the hypothecium suggests that the specimen belongs to the group *B. arnoldiana*, but this requires further research.

***Bacidina egenula*** (Nyl.) Vězda

On sandstone structure of old bridge. Collecting site: 43. (!)

NOTE. In Poland the species is considered critically endangered (Cieśliński *et al.* 2006) but its threat category seems to be due to insufficient data. Several records of this species in the Polish Western Carpathians (wet microhabitats on man-made constructions) show that at least in this part of the country it is locally more frequent (Czarnota unpubl.).

***Bacidina inundata*** (Fr.) Vězda

*Bacidia inundata* (Fr.) Körb.

On sandstone sprinkled with water. Collecting sites: 1, 7, 40.

***Bacidina* cf. *neosquamulosa*** (Aptroot & van Herk) S. Ekman

On bark of ash and willow. Collecting sites: 33, 54. (!)

NOTE. The examined specimens with fruiting bodies possessed anatomical characteristics resembling *B. neosquamulosa* but differing in the structure of the thallus, which is indeterminate to granular, unlike the coralloid one which characterizes *B. neosquamulosa* *s.str.* Similar specimens have been recorded in different regions of Poland and elsewhere (Czarnota unpubl.). The possible taxonomic differentiation of the materials requires molecular proofs.

***Bacidina phacodes*** (Körb.) Vězda

On bark of elm. Collecting site: 30.

***Bacidina saxenii*** (Erichsen) M. Hauck & V. Wirth

On sandstone in forest. Collecting site: 48.

NOTE. An inconspicuous, ephemeral species, often inhabiting small stones in ruderal localities, reported from several localities in Poland, including the buffer zone of Magurski National Park, near the village of Kotań (Czarnota & Coppins 2007).

***Bacidina sulphurella*** (Samp.) M. Hauck & V. Wirth

On bark and epiphytic bryophytes of apple tree, willow, alder and ash. Collecting sites: 1, 6, 33, 46, 50, 54. (!)

***Baeomyces rufus*** (Huds.) Rebert.

On soil, wood, roots and sandstone. Collecting sites: 2, 13, 14, 15, 17, 19, 29, 31, 34, 45, 47, 48.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954, 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Biatora chrysantha*** (Zahlbr.) Printzen

On epiphytic bryophytes on beech and bark of willow and cherry tree. Collecting sites: 1, 16, 26, 28, 29. (!)

***Biatora efflorescens*** (Hedl.) Räsänen

On bark of sycamore. Collecting site: 34.

***Biatora epixanthoides*** (Nyl.) Diederich

*Myxobilimbia epixanthoides* (Nyl.) Hafellner & Türk

On epiphytic bryophytes of elm, beech, willow and cherry tree. Collecting sites: 1, 15, 33, 51. (!)

***Biatora globulosa*** (Flörke) Fr.

*Bacidia globulosa* (Flörke) Hafellner & V. Wirth.

On bark of willow and apple tree. Collecting site: 44.

***Bilimbia sabuletorum*** (Schreb.) Arnold

*Myxobilimbia sabuletorum* (Schreb.) Hafellner

On bryophytes growing on concrete. Collecting sites: 33, 43, 50.

***Botryolepraria lesdainii*** (Hue) A. Canals, Hern.-Mar., Gómez-Bolea & Llimona

*Lepraria lesdainii* (Hue) R. C. Harris

On sandstone rock. Collecting site: 7. (!)

***Bryoria capillaris*** (Ach.) Brodo & D. Hawksw.

Habitat not given; Folsz – stream valley (FG-1041), 1936, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Buellia griseovirens*** (Turner & Borrer ex Sm.) Almb.

On bark of deciduous trees and fir, on wood in one locality. Collecting sites: 10, 11, 16, 17, 19, 27, 29, 31, 33, 42, 44, 50, 54, 58.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002); Krempna (FG-2069), 1979, *leg. J. Nowak* (KRAM; Nowak 1998).

***Buellia punctata*** (Hoffm.) A. Massal.

*Amandinea punctata* (Hoffm.) Coppins & Scheid.

On bark of deciduous trees and wood. Collecting sites: 1, 10, 11, 27, 28, 29, 31, 33, 34, 39, 41, 42, 50, 54, 58.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002); Krempna (FG-2069), Rostajne (FG-2074), 1979, *leg. J. Nowak* (KRAM; Nowak 1998; Bielczyk & Kozik 2009).

***Burgoa angulosa*** Diederich, Lawrey & Etayo

On decaying lichens and bark. Collecting site: 42. (!)

NOTE. A facultative lichenicolous or muscicolous species, on rocks and bark. It is characterized by its whitish bulbils of irregular shape and often angular surface, elongate internal hyphae, and no specialized external cells. The species has recently been described and reported from Belgium, France, Spain, Luxemburg, Great Britain and Hungary (Diederich & Lawrey 2007). Here it is recorded for the first time for Poland and the whole Carpathian range.

***Caeruleum heppii*** (Nägeli ex Körb.) K. Knudsen & L. Arkadia

*Acarospora heppii* (Nägeli) Nägeli

On stones on roadside bank. Collecting site: 33.

***Calicium viride*** Pers.

On decayed fir. Collecting site: 26.

***Caloplaca cerina*** (Ehrh. ex Hedw.) Th. Fr. *s.l.*

On old wooden roof shingles; Nieznajowa (FG-2073), 1979, *leg. J. Nowak* (KRAM).

NOTE. The species is heterogenic (Šoun *et al.* 2011).

***Caloplaca cerinella*** (Nyl.) Flagey

On bark of alder; Folsz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Caloplaca citrina*** (Hoffm.) Th. Fr.

On sandstone in old bridge structure and on concrete wall. Collecting sites: 33, 41, 43.

***Caloplaca crenulatella*** (Nyl.) H. Olivier

On concrete. Collecting site: 41. (!)

HISTORICAL DATA: Świerzowa Ruska (FG-2003), 1979, *leg. J. Nowak* (KRAM).

***Caloplaca decipiens*** (Arnold) Blomb. & Forssell

On concrete. Collecting site: 41. (!)

***Caloplaca flavocitrina*** (Nyl.) H. Olivier

On mortar and concrete. Collecting sites: 33, 46, 50. (!)

***Caloplaca holocarpa*** (Hoffm.) A. E. Wade *s.l.*

On mortar and concrete. Collecting sites: 15, 33, 46, 50, 56, 57.

***Caloplaca oasis*** (A. Massal.) Szatala

On concrete. Collecting site: 41. (!)

NOTE. This species is separated from *C. holocarpa* (Hoffm.) A. E. Wade *s.str.* by its more prominent, yellow thallus, and apothecia tending to be more deeply orange, crowded, rather uniform in size, with a thinner proper margin that becomes indistinguishable from the apothecial discs; some anatomical differences are given by Arup (2009). The species perhaps is frequent but overlooked in the Carpathians (Wilk 2012).

***Caloplaca phlogina*** (Ach.) Flagey

On bark of poplar. Collecting site: 46. (!)

NOTE. This is a corticolous representative of the *C. citrina* group. Substrate ecology seems to be the best way to separate the species from *C. citrina* itself. *C. phlogina* may be confused with *C. flavocitrina*, which may occur on the same kind of phorophyte (bark with high pH). The latter species differs from *C. phlogina*, which is entirely sorediate, in having an areolate thallus only partly dissolved into soredia (Arup 2006). In Poland it is known from the Bory Tucholskie forest (Kukwa *et al.* 2013).

***Caloplaca pusilla*** (A. Massal.) Zahlbr.

On concrete. Collecting sites: 41, 46. (!)

NOTE. It is a common representative of *Caloplaca*, often confused with *C. saxicola*. *C. pusilla* differs from the latter by having a distinctly placodioid thallus with long lobes tightly attached to the substrate, and according to Wilk (2012) it is widespread in the Polish Carpathians.

***Candelaria concolor*** (Dick.) Stein

On bark of apple tree. Collecting site: 45.

HISTORICAL DATA: on bark of willow; Folsz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002); Wyszowatka towards Rostajne (FG-2095), 1979, *leg. J. Nowak* (KRAM).

***Candelariella aurella*** (Hoffm.) Zahlbr.

On concrete and mortar. Collecting sites: 15, 33, 35, 41, 42, 46, 50.

HISTORICAL DATA: Folsz – stream valley (FG-1041), *s.d.*, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Candelariella coralliza*** (Nyl.) H. Magn.

On sandstone rocks; Nieznajowa (FG-2073), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003; Bielczyk & Kozik 2009).

***Candelariella efflorescens*** R. C. Harris & W. R. Buck

On bark of deciduous trees. Collecting sites: 1, 10, 21, 22, 33, 35, 36, 39, 41, 42, 44.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002 as *C. reflexa* auct.).

NOTE. It is a sorediate species with polysporous asci, previously misidentified in Poland as *C. reflexa* (Nyl.) Lettau (Kubiak & Westberg 2011). The species was reported by the latter authors from northern and central parts of the country, and by Śliwa and Kukwa (2012) from the Tatra Mts.

***Candelariella vitellina*** (Hoffm.) Müll. Arg.

On sandstone rock, concrete wall and granite post. Collecting sites: 33, 50, 56.

HISTORICAL DATA: Kornuty Reserve (EG-1969) (*Sulma* 1936).

***Candelariella xanthostigma*** (Pers. *ex* Ach.) Lettau

On bark of deciduous trees. Collecting sites: 10, 20, 28, 33, 37, 39, 41, 44, 46, 50, 56, 58.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

***\*Carbonea supersparsa*** (Nyl.) Hertel

On *Lecanora polytropa* growing on rock; Diabli Kamień Mt. (FG-1041), 1936, *leg. T. Sulma* (UGDA; Kukwa 2005).

*Cetraria chlorophylla* (Willd.) Vainio

On bark of trees; Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1936, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cetraria islandica* (L.) Ach.

On rock waste; Kornuty Reserve (EG-1969) (Sulma 1936).

*Chaenotheca brunneola* (Ach.) Müll. Arg.

On standing decorticated wood in forests. Collecting sites: 8, 15, 40. (!)

*Chaenotheca chrysocephala* (Ach.) Th. Fr.

On bark of fir and willow, on wood. Collecting sites: 31, 34, 44.

HISTORICAL DATA: Świerzowa Ruska (FG-2003), Skarpoty (FG-2079), Krempna (FG-2151), 1979, *leg. J. Nowak* (KRAM).

*Chaenotheca ferruginea* (Turner ex Sm.) Mig.

On bark of fir, pine, alder and pear tree, and wood in forests. Collecting sites: 1, 2, 8, 15, 17, 16, 22, 27, 34, 40.

HISTORICAL DATA: Żydowskie (FG-2180), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003; Bielczyk & Kozik 2009).

*Chaenotheca furfuracea* (L.) Tibell

On bark of elm. Collecting site: 34.

*Chaenotheca phaeocephala* (Turner) Th. Fr.

On bark of fir and sycamore, on wood. Collecting sites: 13, 15, 16, 34. (!)

*Chaenotheca stemonea* (Ach.) Müll. Arg.

On bark of old fir and alder, on wood. Collecting sites: 17, 33.

HISTORICAL DATA: Las Spelzły (FG-2062), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003).

*Chaenotheca trichialis* (Ach.) Th. Fr.

On wood, bark of beech and fir. Collecting sites: 6, 40.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Chaenotheca xyloxena* Nád.

On wood of fir. Collecting sites: 8, 7, 23, 31, 34, 40, 53, 54.

*\*Chaenothecopsis pusilla* (Ach.) A. F. W. Schmidt

On wood of beech and thallus of *Chaenotheca xyloxena*. Collecting sites: 8, 23, 40. (!)

*Chrysothrix candelaris* (L.) J. R. Laundon

On bark of beech and fir; Folsz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia arbuscula* (Wallr.) Flot. subsp. *beringiana* Ahti

*C. arbuscula* subsp. *squarrosa* (Wallr.) Ruoss

On boulder; Diabli Kamień Mt. (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia arbuscula* subsp. *mitis* (Sandst.) Ruoss

On soil; Folsz – stream valley (FG-1041), 1936, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia borealis* S. Stenroos

On soil; Diabli Kamień Mt. (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia caespiticia* (Pers.) Flörke

At base of birch stump and on clay soil. Collecting sites: 1, 13.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1955, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002); Ostryszne near Krempna (FG-2153), 1979, *leg. J. Nowak* (KRAM; Nowak 1995).

*Cladonia cariosa* (Ach.) Spreng.

On soil. Collecting site: 36. (!)

*Cladonia cenotea* (Ach.) Schaer.

On bryophytes at base of beech and on boulder. Collecting site: 19.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia chlorophaea* (Sommerf.) Speng.

On soil, bark of deciduous trees, boulder and wood. Collecting sites: 9, 10, 17, 22, 24, 25, 26, 29, 31, 33, 34, 44, 45.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–57, *leg. T. Sulma* (UGDA; Polakowska 2002); Nieznajowa (FG-2064), 1979, *leg. J. Nowak* (KRAM).

*Cladonia coccifera* (L.) Willd. *s.l.*

On rock waste; Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1954–62, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

*Cladonia coniocraea* (Flörke) Spreng.

incl. *Cladonia ochrochlora* Flörke

On bark of trees, wood, soil and boulders. Collecting sites: 1, 3, 5, 6, 8, 9, 10, 14, 15, 16, 17, 18, 19, 20, 24, 26, 29, 30, 31, 34, 35, 38, 39, 48, 44, 50, 51, 52, 56.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002); Nieznajowa (FG-2064), Krempna (FG-2069), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003).

*Cladonia cornuta* (L.) Hoffm.

On soil and boulder. Collecting sites: 15, 16.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1955–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia crispata* (Ach.) Flot.

On soil; Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1955, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia deformis* (L.) Hoffm.

On soil; Diabli Kamień Mt. (FG-1041), 1955, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia digitata* (L.) Hoffm.

On bark of trees, wood, soil, and bryophytes on rocks. Collecting sites: 2, 8, 14, 15, 16, 17.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia fimbriata* (L.) Fr.

On bark of trees, soil, wood, and bryophytes on rocks. Collecting sites: 2, 5, 9, 10, 14, 15, 16, 17, 19, 20, 24, 25, 26, 28, 31, 34, 35, 38, 42, 43, 44, 46, 48, 50, 51.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–57, *leg. T. Sulma* (UGDA; Polakowska 2002); Hałbów (FG-2100), 1979, *leg. J. Nowak* (KRAM).

*Cladonia floerkeana* (Fr.) Flörke

*C. macilenta* subsp. *floerkeana* (Fr.) V. Wirth

On bark of apple tree and boulder. Collecting site: 10.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia furcata* (Huds.) Schrad.

On soil and boulder. Collecting sites: 33, 41.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia glauca* Flörke

On bark of sycamore. Collecting site: 15.

*Cladonia gracilis* (L.) Willd.

On soil in rock crevices; Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1954–62, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

*Cladonia humilis* (With.) J. R. Laundon

On epiphytic bryophytes of beech. Collecting site: 12. (!)

*Cladonia macilenta* Hoffm.

On bark of deciduous trees, wood, soil, and bryophytes on rock. Collecting sites: 1, 2, 5, 6, 7, 10, 14, 15, 18, 22, 34, 38.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1936, 1954–57, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia macroceras* (Delise) Hav.

On boulder; Folsuz – stream valley (FG-1041), 1962, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia macrophyllodes* Nyl.

On soil; Folsuz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia merochlorophaea* Asahina

On rock, stones and epilithic mosses; Diabli Kamień Mt. (FG-1041), 1954–56, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Cladonia monomorpha* Aptroot, Sipman & van Herk

On boulder; Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1957–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Cladonia* cf. *parasitica*** (Hoffm.) Hoffm.

On soil. Collecting site: 2. (!)

***Cladonia phyllophora*** Hoffm.

On boulder; Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Cladonia pleurota*** (Flörke) Schaer.

On boulder and soil; Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Cladonia pyxidata*** (L.) Hoffm.

On wood of ash. Collecting site: 10.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954–57, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Cladonia ramulosa*** (With.) J. R. Laundon

On apple tree stump. Collecting site: 10.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1962, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Cladonia rangiferina*** (L.) F. H. Wigg.

On boulder and soil; Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Cladonia rangiformis*** Hoffm.

On boulder; Diabli Kamień Mt. (FG-1041), 1962, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Cladonia squamosa*** Hoffm.

On decaying stump, soil and boulder. Collecting sites: 1, 15.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1936, 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Cladonia subulata*** (L.) F. H. Wigg.

On soil, bark of fir, and wood. Collecting sites: 5, 14, 29, 41, 45.

***Coenogonium pineti*** (Ach.) Lücking & Lumbsch

*Dimerella pineti* (Ach.) Vězda

On bark of trees, epiphytic bryophytes and wood, on stone in one locality. Collecting sites: 1, 2, 5, 6, 7, 8, 9, 12, 15, 16, 19, 24, 28, 29, 30, 34, 35, 38, 50, 52, 53, 54.

***Collema crispum*** (Huds.) F. H. Wigg.

On soil. Collecting site: 33. (!)

NOTE. In the Polish Carpathians the species is known only from the Góry Słonne Mts (Kiszka & Piórecki 1992).

***Collema tenax*** (Sw.) Ach. *emend.* Degel.

On clay soil; Wilsznia village (FG-2291), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003; Bielczyk & Kozik 2009).

***Cryptodiscus gloeocapsa*** (Nitschke *ex* Arnold) Baloch, Gilenstam & Wedin

*Bryophagus gloeocapsa* Nitschke *ex* Arnold

On clay soil by forest road, between Magura Wątkowska Mt. and Kornuty Reserve (FG-1061), 1977, *leg. J. Nowak* (KRAM; Bielczyk 2003; Bielczyk & Kozik 2009).

***Dibaeis baeomyces*** (L.) Rambold & Hertel

On soil. Collecting sites: 4, 5, 45, 48.

***Dictyocatenulata alba*** Finley & E. F. Morris

On bark of beech. Collecting sites: 47, 55. (!)

NOTE. A lichenized species of basidiomycete, widespread worldwide. It is characterized by its white, elongated conidiophores aggregated in handle-shaped synnemata ended with  $\pm$ spherical conidial masses. In Poland known only from the Gorce Mts (where it is locally very numerous; Czarnota unpubl.); in the Carpathians recorded in Slovakia and Ukraine (Diederich *et al.* 2008). It mainly inhabits bases of stumps and protruding roots of beeches in natural forests.

***Diploschistes gypsaceus*** (Ach.) Zahlbr.

On limestone; Olchowiec, by Wilsznia River (FG-2199), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2002).

***Diploschistes muscorum*** (Scop) R. Sant.

On soil; Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Diploschistes scruposus*** (Schreb.) Norman

On sandstone boulders; Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1955–62, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

**\**Epigloea urosperma*** Döbblers

On thallus of *Placynthiella* sp. growing on rock. Collecting site: 4. (!)

NOTE. In the Carpathians the species was previously recorded only in the Babia Góra Massif (Czarnota & Hernik 2013). Unlike other species in the genus, which usually are algicolous fungi, *E. urosperma* is a lichenicolous fungus associated in Poland with *Placynthiella dasaea* and *P. uliginosa* (Kukwa & Flakus 2009; Czarnota & Hernik 2013).

***Evernia divaricata*** (L.) Ach.

On bark of beech; Kornuty Reserve (EG-1969) (Sulma 1936).

***Evernia mesomorpha*** Nyl.

On bark of birch and fir, and on rock; Diabli Kamień Mt. (FG-1041), 1936, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Evernia prunastri*** (L.) Ach.

On bark of deciduous trees and shrubs, on pine and boulders. Collecting sites: 10, 27, 39, 44, 50, 58.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1936, 1954–57, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

***Flavoparmelia caperata*** (L.) Hale

On epilithic mosses, bark of pine, fir and beech; Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1936, 1954–62, *leg. T. Sulma* (UGDA; Sulma 1936; Sulma & Fałtynowicz 1988; Polakowska 2002).

***Fuscidea arboricola*** Coppins & Tønsberg

On bark of sycamore. Collecting site: 15. (!)

NOTE. This sorediate, sterile lichen was collected in the Pogórze Dynowskie foothills in the early 21<sup>st</sup> century but was not reported then (Czarnota unpubl.; GPN). Probably overlooked, but in the mountains certainly not as frequent as in the northern part of the country (e.g., Fałtynowicz 2003; Łubek & Jaroszewicz 2012 and literature cited therein). Known from the Eastern Carpathians in Slovakia and Ukraine (Kondratyuk *et al.* 2003; Coppins *et al.* 2005) and Romania (Ardelean *et al.* 2013). A species new for the Western Carpathians.

***Fuscidea pusilla*** Tønsberg

On bark of deciduous trees and fir. Collecting sites: 1, 2, 33, 38.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1955, *leg. T. Sulma* (UGDA).

***Graphis scripta*** (L.) Ach.

On bark of deciduous trees. Collecting sites: 5, 7, 8, 9, 12, 15, 16, 17, 18, 19, 22, 24, 28, 30, 34, 46, 52, 53, 54.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1954–57, *leg. T. Sulma* (UGDA; Sulma 1936; Sulma & Fałtynowicz 1988; Polakowska 2002).

***Gyalecta ulmi*** (Sw.) Zahlbr.

On bark of elm in forest; Skarpoty (FG-2079), 1979, *leg. R. Kozik & J. Nowak* (KRAM; Nowak 1995; Bielczyk & Kozik 2009).

***Halecania viridescens*** Coppins & P. James

On bark of ash. Collecting site: 1. (!)

NOTE. A sterile species resembling *Rinodina efflorescens* Malme and *R. griseosoralifera*, both of which develop similar bluish-grey to brownish external soredia. The two taxa can be easily distinguished from *Halecania viridescens* chemically: *Rinodina efflorescens* contains pannarin and zeorin as major secondary compounds and *R. griseosoralifera* contains atranorin and zeorin, whereas *Halecania viridescens* produces argopsin and ‘gracilentia unknown 1’. In Poland the species is reported from the northern part of the country (Kukwa & Jabłońska 2009; Schiefelbein *et al.* 2012). A species new for the Polish Carpathians.

***Hydropunctaria rheitrophila*** (Zschacke) Keller, Gueidan & Thüs***Verrucaria rheitrophila*** Zschacke

On stones in stream and on wet rock. Collecting sites: 7, 8, 40.

HISTORICAL DATA: Rostajne (FG-2075), Las Słodki (FG-2077), 1979; *leg. J. Nowak* (KRAM; Krzewicka 2009).

***Hypocenomyce scalaris*** (Ach.) M. Choisy

On bark of trees, on wood. Collecting sites: 1, 2, 10, 11, 14, 15, 16, 17, 19, 21, 22, 26, 27, 29, 30, 38, 39, 41, 44, 45, 49, 50, 56, 57.

***Hypogymnia physodes* (L.) Nyl.**

On bark of trees and shrubs, on wood, boulders and epilithic bryophytes. Collecting sites: 1, 2, 5, 6, 10, 11, 14, 15, 16, 17, 18, 19, 22, 26, 27, 28, 29, 30, 31, 33, 34, 35, 39, 41, 42, 44, 45, 49, 50, 53, 56, 57.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1936, 1954–62, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

***Hypogymnia tubulosa* (Schaer.) Hav.**

On bark of deciduous trees, pine, fir and larch, on wood. Collecting sites: 5, 27, 29, 39, 42.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Hypotrachyna afrorevoluta* (Krog & Swinscow) Krog & Swinscow**

On rock; Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Flakus & Kukwa 2009).

***Imshaugia aleurites* (Ach.) S. L. F. Meyer**

On bark of birch, fir and pine. Collecting site: 2.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1936, 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

**\**Intralichen lichenicola* (M. S. Christ.**

& D. Hawksw.) D. Hawksw. & M. S. Cole

On thallus and apothecia of *Candelariella aurella* growing on concrete. Collecting site: 42. (!)

NOTE. The species is distinguished by its multicellular conidia arising as elongate chains of cells. It is much less frequent than *I. christianseanii*, which is characterized by its 1-septate conidia. *I. lichenicola* was previously reported from Europe (Greenland, Luxemburg, Norway, Spain, Svalbard, Sweden), Asia (Siberia) (Hawksworth & Cole 2002) and North America (California) (Kocourková *et al.* 2012). Here it is newly reported for Poland and the Carpathian range.

***Ionaspis ceracea* (Arnold) Hafellner & Türk**

On sandstone rocks; Huta Krempska (FG-2162), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003).

***Lecania cyrtella***

On bark of ash and willow. Collecting sites: 12, 33, 56. (!)

***Lecania erysibe* (Ach.) Mudd**

On sandstone in structure of old bridge. Collecting site: 43. (!)

***Lecanora albella* (Pers.) Ach.**

On bark of beech and fir; Folsz – stream valley (FG-1041), Kornuty Reserve (EG-1969), 1957, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

***Lecanora albellula* Nyl.**

*L. piniperda* Körb.

On bark of ash and willow. Collecting sites: 10, 11, 33. (!)

***Lecanora albescens* (Hoffm.) Flörke**

On concrete. Collecting sites: 15, 33, 46, 49.

***Lecanora argentata* (Ach.) Malme**

On bark of beech, fir, sycamore and rowan. Collecting sites: 12, 15, 16, 18, 19.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1955–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lecanora carpinea* (L.) Vain.**

On bark of beech, hornbeam and alder. Collecting sites: 15, 18, 19, 23, 35, 46.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–57, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lecanora chlorotera* Nyl.**

On bark of deciduous trees and fir, on wood. Collecting sites: 2, 10, 15, 23, 26, 31, 34, 50, 52, 53, 58.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lecanora conizaeoides* Nyl. ex Cromb.**

On bark of trees, on wood. Collecting sites: 1, 2, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 17, 19, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 34, 35, 38, 39, 41, 42, 44, 45, 47, 48, 49, 50, 52, 56.

***Lecanora crenulata* Hook.**

On concrete. Collecting sites: 33, 41.

***Lecanora dispersa* (Pers.) Sommerf.**

On concrete, boulders, sandstone, fir and willow. Collecting sites: 29, 31, 33, 34, 28, 50.



HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* [UGDA; Polakowska 2002 as *Lecanora umbrina* (Ach.) A. Massal.]

***Lecanora expallens*** Ach.

On bark of fir, willow, pear tree and sycamore. Collecting sites: 38, 44, 46, 50.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lecanora hagenii*** (Ach.) Ach.

On concrete. Collecting sites: 33, 43, 46, 50.

***Lecanora glabrata*** (Ach.) Malme

On bark of fir; Folsz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lecanora intricata*** (Ach.) Ach.

On sandstone boulders; Kornuty Reserve (EG-1969) (Sulma 1936).

***Lecanora muralis*** (Schreb.) Rabenh.

On sandstone. Collecting site: 50.

***Lecanora persimilis*** (Th. Fr.) Nyl.

On bark of sycamore. Collecting site: 58. (!)

***Lecanora polyropa*** (Hoffm.) Rabenh.

On sandstone. Collecting sites: 33, 51, 56.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lecanora pulicaris*** (Pers.) Ach.

On bark of deciduous trees, pine and fir. Collecting sites: 1, 10, 15, 16, 17, 19, 22, 23, 26, 28, 33, 34, 35, 39, 53.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lecanora rupicola*** (L.) Zahlbr.

On boulder; Diabli Kamień Mt. (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lecanora saligna*** (Schrad.) Zahlbr. *s.l.*

On bark of deciduous trees and wood. Collecting sites: 16, 39, 41, 50, 56, 57.

HISTORICAL DATA: Folsz – stream valley (FG-1041),

Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

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

On sandstone and concrete. Collecting sites: 33, 42, 46, 50. (!)

***Lecanora sulphurea*** (Hoffm.) Ach.

On boulder; Diabli Kamień Mt. (FG-1041), 1936, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lecanora symmicta*** (Ach.) Ach.

On wood and bark of deciduous trees. Collecting sites: 10, 11, 27, 39, 40.

***Lecidella carpathica*** Körb.

On rock. Collecting site: 2.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1955, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lecidella elaeochroma*** (Ach.) M. Choisy

On wood and bark of deciduous trees. Collecting sites: 10, 15, 16, 26, 34, 41, 46, 44, 47.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lecidella flavosorediata*** (Vězda) Hertel & Leuckert

On bark of deciduous trees and fir. Collecting sites: 33, 44, 58.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002); Świerzowa Ruska (FG-2003), Czarne near Nieznajowa (FG-2082), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003).

NOTE. A usually sterile, sorediate lichen, C+ orange due to the presence of xanthones (arthothelin, granulysin) in the thallus. It resembles some other species, often accompanying it, which show similar reactions (e.g., *Lecanora expallens*, *L. compallens*, *Lecidella subviridis*) but differs chemically (see, e.g., Purvis & James 2009). Sometimes it forms black, shimmering at least initially, margined apothecia. In the Polish Carpathians known from the Beskid Żywiecki Mts (Czarnota & Kukwa 2004), Gorce Mts (Czarnota 2010) and Tatras (Śliwa & Kukwa 2012), as well as the Góry Sanocko-Turczańskie Mts and Bieszczady Mts (Kościelniak & Kiszka 2003).

Certainly more frequent in this part of Poland than reported in the published data.

***Lecidella scabra*** (Taylor) Hertel & Leuckert

On sandstone. Collecting site: 50. (!)

***Lecidella stigmatea*** (Ach.) Hertel & Leuckert

On concrete, sandstone and granite post. Collecting sites: 41, 46, 50, 56.

***Lecidella subviridis*** Tønsberg

On bark of sycamore and birch. Collecting sites: 1, 2. (!)

NOTE. A sorediate, yellowish-green lichen known in Poland only in its sterile form. The thallus contains xanthonenes (thiophanic acid, arthothelin, expallens unknown, which stain KC+ orange) and atranorin, which distinguish this species from several other species that are morphologically similar (e.g., *Lecidella flavosorediata*, *Lecanora compallens*, *Micarea viridileprosa*). Previously noted in the Polish Carpathians from the Gorce Mts, Babia Góra Massif and the Tatras (Czarnota & Kukwa 2004; Czarnota 2010, 2012; Śliwa & Kukwa 2012); definitely much more widespread. Also reported from the Eastern Carpathians in Romania (Ardelean *et al.* 2013).

***Leimonis erratica*** (Körb.) R. C. Harris & Lendemer

*Micarea erratica* (Körb.) Hertel, Rambold & Pietschmann

On sandstone rocks. Collecting sites: 50, 51. (!)

***Lepraria crassissima*** (Hue) Lettau

On rock; Diabli Kamień Mt. (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lepraria eburnea*** J. R. Laundon

On concrete and bark of poplar. Collecting sites: 1, 50. (!)

***Lepraria elobata*** Tønsberg

On bark of deciduous trees and fir, wood and sandstone boulders. Collecting sites: 1, 2, 5, 7, 8, 15, 17, 24, 27, 35, 38, 46, 42, 50, 52.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lepraria finkii*** (de Lesd.) R. C. Harris

*L. lobificans* auct. non Nyl.

On bark of deciduous trees, epiphytic and epilithic bryophytes, wood, concrete and rock. Collecting sites: 1, 2, 5, 7, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 24, 26, 29, 30, 31, 33, 34, 43, 44, 51, 53.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lepraria incana*** (L.) Ach.

On bark of deciduous and coniferous trees, wood, rock and concrete. Collecting sites: 2, 6, 10, 13, 15, 17, 19, 25, 26, 29, 31, 34, 38.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lepraria jackii*** Tønsberg

On bark of deciduous trees, fir and pine, on wood and boulder. Collecting sites: 6, 16, 17, 21, 31, 34, 38.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lepraria membranacea*** (Dicks.) Vain.

On humus; Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA).

***Lepraria neglecta*** (Nyl.) Lettau

*Lepraria caesioalba* (B. de Lesd.) J. R. Laundon

On rock and on bark of fir. Collecting site: 2.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954–55, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lepraria rigidula*** (B. de Lesd.) Tønsberg

On bark of deciduous trees and fir, on wood. Collecting sites: 10, 35, 42, 50.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954–57, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Lepraria vouauxii*** (Hue) R. C. Harris

On bark of deciduous trees, on rock. Collecting sites: 2, 7, 10, 11, 27, 44, 46. (!)

**#*Licea parasitica*** (Zukal) Martin

On thallus of *Biatora epixanthoides* growing on bark of beech. Collecting site: 15. (!)

NOTE. A facultatively lichenicolous myxomycete. It is known from a few lowland sites in Poland (Czyżewska & Kukwa 2009) and was also

recorded from the Polish Carpathians but only in the Kotlina Orawsko-Nowotarska basin (Kukwa & Jabłońska 2008).

\**Lichenocodium erodens* M. S. Christ.  
& D. Hawksw.

On *Lecanora conizaeoides* (thalli and apothecia) and on thalli of *Hypocenomyce scalaris*, *Hypogymnia physodes* and *Pseudevernia furfuracea* growing on bark of trees and on wood. Collecting sites: 2, 6, 8, 12, 37.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002, Kukwa 2005).

\**Lichenocodium lecanorae* (Jaap) D. Hawksw.

On apothecia of *Lecanora conizaeoides* growing on bark of trees. Collecting sites: 1, 2, 6, 9, 10, 25, 34, 35, 38.

\**Lichenodiplis lecanorae* (Vouaux) Dyko  
& D. Hawksw.

On *Caloplaca* sp. growing on concrete. Collecting site: 50. (!)

*Loxospora elatina* (Ach.) A. Massal.

On bark of sycamore and pine. Collecting sites: 29, 34. (!)

*Melanelixia glabratula* (Lamy) Sandler & Arup  
*M. fuliginosa* subsp. *glabratula* (Lamy) J. R. Laundon,  
*Melanelia fuliginosa* subsp. *glabratula* (Lamy) Coppins  
On bark of deciduous trees. Collecting sites: 1, 7, 10, 11, 12, 13, 15, 26, 27, 29, 33, 34, 35, 38, 40, 42, 44, 46, 49, 50, 52, 53.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Melanelixia subaurifera* (Nyl.) O. Blanco, A. Crespo,  
Divakar, Essl., D. Hawksw. & Lumbsch

*Melanelia subaurifera* (Nyl.) Essl.

On bark of fir, beech and sycamore. Collecting sites: 15, 16, 39.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–57, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Melanohalea elegantula* (Zahlbr.) O. Blanco,  
A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch  
*Melanelia elegantula* (Zahlbr.) Essl.

On bark of apple tree. Collecting site: 10.

*Melanohalea exasperatula* (Nyl.) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch  
*Melanelia exasperatula* (Nyl.) Essl.

On bark of deciduous trees. Collecting sites: 26, 27, 28, 29, 30, 31, 33, 34, 56.

*Menegazzia terebrata* (Hoffm.) Körb.

On bark of beech; Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1954–62, *leg. T. Sulma* (UGDA; Sulma 1936; Sulma & Fałtynowicz 1988; Polakowska 2002).

*Micarea botryoides* (Nyl.) Coppins

On wood and in one locality on rock. Collecting sites: 2, 7, 8, 21, 29. (!)

*Micarea denigrata* (Fr.) Hedl.

On wood and sandstone boulder. Collecting sites: 39, 41, 50.

HISTORICAL DATA: Nieznajowa (FG-2073), 1985, *leg. L. Lipnicki* (Czarnota 2007); Skarpoty (FG-2079), 1979, *leg. J. Nowak* (KRAM; Czarnota 2007).

*Micarea lithinella* (Nyl.) Hedl.

On small sandstone rocks and on boulder in forest. Collecting sites: 12, 38, 46, 47, 48. (!)

*Micarea micrococca* (Körb.) Gams *ex* Coppins

On bark of deciduous trees and fir, on wood. Collecting sites: 2, 7, 6, 8, 15, 17, 19, 21, 24, 26, 29, 48, 53, 54. (!)

*Micarea misella* (Nyl.) Hedl.

On wood. Collecting sites: 15, 51.

HISTORICAL DATA: Nieznajowa (FG-2073), 1979, *leg. J. Nowak* (KRAM; Czarnota 2007).

*Micarea nitschkeana* (Lahm *ex* Rabenh.) Harm.

On bark of ash. Collecting site: 53.

*Micarea peliocarpa* (Anzi) Coppins & R. Sant.

On small sandstone rocks and on larger rock. Collecting sites: 2, 47.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Micarea prasina* Fr. *s.l.*

incl. *M. prasina* Fr. *s.str.*

On wood and bark of pine, on decayed fir. Collecting sites: 1, 2, 5, 6, 7, 9, 8, 15, 17, 19, 21, 24, 34, 35, 38, 47, 51, 52, 54.

HISTORICAL DATA: Cyrła Mt. NE slope (FG-2057), 1979, *leg. J. Nowak* (KRAM; Czarnota 2007).

NOTE. Because the majority of data come from notes taken in the field, the taxon is treated *sensu lato*.

***Micarea viridileprosa*** Coppins & van den Boom

On sandstone rock. Collecting site: 2. (!)

NOTE. A sterile, sorediate species characterized by the presence of gyrophoric acid, the thallus of which gives a C+ red reaction. The species is widespread in Western Europe. So far recorded in the Polish Carpathians only in their western part, but in the Polish lowlands it is locally frequent at the base of pines in coniferous forests (Czarnota 2007). Recently also found in the Eastern Carpathians in Romania (Ardelean *et al.* 2013).

**\**Monodictys epilepraria*** Kukwa & Diederich

On *Lepraria* cf. *incana* growing on sycamore. Collecting site: 38. (!)

NOTE. A representative of the lichenicolous hyphomycetes characterized by its small, brown, muriform, smooth-walled conidia developing on discolored patches of the host (*Lepraria* spp.). The species is relatively widespread in Poland, recorded from numerous lowland sites (Kukwa & Diederich 2005; Czyżewska & Kukwa 2009; Schiefelbein *et al.* 2012; Kowalewska & Kukwa 2013; Kukwa *et al.* 2013) and mountain ranges including the Karkonosze Mts, Beskid Sądecki Mts, Gorce Mts, Babia Góra Massif and the Bieszczady Mts (Kukwa & Diederich 2005; Kukwa & Flakus 2009; Kukwa *et al.* 2010).

***Montanelia disjuncta*** (Erichsen) Divakar, A. Crespo, Wedin & Essl.

*Melanelia disjuncta* (Erichsen) Essl.

On sandstone rock. Collecting site: 2.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Sulma, Fałtynowicz 1988; Polakowska 2002).

***Multiclavula mucida*** (Pers.) R. H. Petersen

On decaying wood of fir. Collecting site: 47. (!)

NOTE. A lichenized fungus of the Basidiomycota, with an inconspicuous, thin, membrane-like thallus and club-shaped, white-cream basidiocarps up to ca 1 cm high. The fruiting bodies are ephemeral; probably this is why its distribution is poorly known. Reported from one locality in the Polish lowland (Czyżewska *et al.* 2005) and three localities in the Bieszczady Mts (Kościelniak 2013). Known from the Western Carpathians in Slovakia (Guttová & Palice 1999; Lisická 2005; Guttová *et al.* 2012) and the Eastern Carpathians in Ukraine (Vondrák *et al.* 2010a; Dymytrova *et al.* 2013).

**+*Mycocalicium subtile*** (Pers.) Szatala

On wood of fir. Collecting sites: 7, 24, 34.

HISTORICAL DATA: Nieznajowa (FG-2063), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003).

**+*Mycomicrothelia confusa*** D. Hawksw.

On bark of alder. Collecting site: 35. (!)

NOTE. A species reported from a few localities in Europe (e.g., Hawksworth & Orange 2009). Although known from the Sudetes Mts from historical records (Fałtynowicz 2003), it is new for the Polish Carpathians.

***Nephroma parile*** (Ach.) Ach.

Habitat not given; Folsuz – stream valley (FG-1041), 1955, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Normandina pulchella*** (Borrer) Nyl.

On bark of apple tree in abandoned orchard and on bark of willow by river. Collecting sites: 20, 44.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), 1955, *leg. T. Sulma* (UGDA; Fałtynowicz 1999).

***Ochrolechia androgyna*** (Hoffm.) Arnold

On bark of sycamore, beech and fir. Collecting site: 31.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954–55, *leg. T. Sulma* (UGDA; Polakowska 2002; Kukwa 2011).

***Ochrolechia arborea*** (Kreyer) Almb.

On bark of beech and fir; Diabli Kamień Mt. (FG-1041), 1954–55, *leg. T. Sulma* (UGDA; Kukwa 2011).

*Ochrolechia microstictoides* Räsänen

On bark of fir; Folsuz – stream valley (FG-1041), *s.d.*, leg. *T. Sulma* (UGDA; Polakowska 2002).

*Opegrapha niveoatra* (Borrer) J. R. Laundon

*O. vulgata* var. *subsiderella* Nyl.

On bark of sycamore. Collecting site: 38.

*Opegrapha vermicellifera* (Kunze) J. R. Laundon

On bark of beech and hornbeam; Nieznajowa (FG-2063), Las Słodki FG-2068, 1979, leg. *J. Nowak* (KRAM; Bielczyk 2003).

*Parmelia omphalodes* (L.) Ach.

On boulder. Collecting site: 2.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–62, leg. *T. Sulma* (UGDA; Polakowska 2002).

*Parmelia saxatilis* (L.) Ach. *s.l.*

On bark of deciduous trees, fir and pine, on rock. Collecting sites: 2, 10, 15, 16, 28, 31, 39.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1954–62, leg. *T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

NOTE. Because the majority of data come from notes taken in the field, the taxon was treated *sensu lato*.

*Parmelia submontana* Nádv. *ex* Hale

On bark of sycamore and beech, on boulder. Collecting site: 16.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954; leg. *T. Sulma* (UGDA; Sulma & Fałtynowicz 1988; Polakowska 2002).

*Parmelia sulcata* Taylor

Mainly on bark of deciduous trees and fir, rarely on wood and boulder. Collecting sites: 10, 11, 15, 16, 27, 28, 29, 31, 33, 34, 35, 37, 38, 39, 41, 42, 44, 46, 50, 56, 58.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1936, 1954–62, leg. *T. Sulma* (UGDA; Sulma 1936; Sulma & Fałtynowicz 1988; Polakowska 2002).

*Parmelina tiliacea* (Hoffm.) Hale

On bark of willow, beech and ash. Collecting site: 44.

HISTORICAL DATA: Kornuty Reserve (EG-1969) (Sulma 1936); Nieznajowa (FG-2073), 1979; leg. *J. Nowak* (KRAM).

*Parmeliopsis ambigua* (Wulfen) Nyl.

On bark of deciduous trees, fir and pine. Collecting sites: 2, 10, 15, 16, 21, 34, 50, 56.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–62, leg. *T. Sulma* (UGDA; Polakowska 2002).

*Peltigera didactyla* (With.) J. R. Laundon

On soil; Folsuz – stream valley (FG-1041), 1936; leg. *T. Sulma* (UGDA; Polakowska 2002); Nieznajowa (FG-2073), 1985, leg. *J. Nowak* (KRAM; Bielczyk 2003; Bielczyk & Kozik 2009).

*Peltigera praetextata* (Sommerf.) Zopf

On bryophytes growing on sandstone boulder. Collecting site: 54.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), 1954–55, leg. *T. Sulma* (UGDA; Polakowska 2002).

*Peltigera rufescens* (Weiss) Humb.

On soil. Collecting sites: 41, 49.

*Pertusaria albescens* (Huds.) M. Choisy & Werner

On bark of deciduous trees and fir. Collecting sites: 10, 16, 27, 31, 33, 37, 39, 45, 44, 46.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–55, leg. *T. Sulma* (UGDA; Polakowska 2002).

*Pertusaria amara* (Ach.) Nyl.

On bark of deciduous trees and fir. Collecting sites: 9, 15, 16, 17, 18, 33, 41.

HISTORICAL DATA: Folsuz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–57, leg. *T. Sulma* (UGDA; Polakowska 2002); Skarpoty (FG-2079), 1979, leg. *J. Nowak* (KRAM).

*Pertusaria aspergilla* (Ach.) J. R. Laundon

*P. dealbescens* auct.

On boulder; Diabli Kamień Mt. (FG-1041), 1955, leg. *T. Sulma* (UGDA; Polakowska 2002).

*Pertusaria coccodes* (Ach.) Nyl.

On bark of beech and fir; Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1954–57, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

*Pertusaria coronata* (Ach.) Th. Fr.

On bark of pine, beech and sycamore; Diabli Kamień Mt. (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002); Niedźwiedzie FG-2180, 1979, *leg. J. Nowak* (KRAM).

*Pertusaria leioplaca* DC.

On bark of beech. Collecting sites: 22, 54.

*Pertusaria ocellata* Körb.

Substrate not given; Diabli Kamień Mt. (FG-1041), 1962, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Pertusaria pertusa* (Weigel) Tuck.

On bark of beech and sycamore. Collecting sites: 16, 17, 19, 34.

HISTORICAL DATA: Las Słodki FG-2068, Skarpoty (FG-2079), 1979, *leg. J. Nowak* (KRAM).

*Pertusaria pupillaris* (Nyl.) Th. Fr.

On bark of fir; Diabli Kamień Mt. (FG-1041), 1962, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Phaeophyscia nigricans* (Flörke) Moberg

On concrete and willow. Collecting sites: 28, 41, 46.

*Phaeophyscia orbicularis* (Necker) Moberg

On bark of deciduous trees and concrete. Collecting sites: 10, 28, 34, 41, 42, 50, 58.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

\**Phaeopyxis punctum* (A. Massal.) Rambold, Triebel & Coppins

On *Cladonia* sp.; Diabli Kamień Mt. (FG-1041), *s.d.*, *leg. T. Sulma* (UGDA; Kukwa 2005).

*Phlyctis argena* (Spreng.) Flot.

On bark of deciduous trees. Collecting sites: 10, 14, 15, 16, 17, 18, 19, 27, 31, 33, 34, 38, 39, 41, 44, 46, 50, 53, 56, 57, 58.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–57, *leg. T. Sulma*

(UGDA; Polakowska 2002); Skarpoty (FG-2079), 1979, *leg. J. Nowak* (KRAM; Bielczyk & Kozik 2009).

*Physcia adscendens* (Fr.) H. Olivier

On bark of deciduous trees, on wood and concrete. Collecting sites: 1, 10, 28, 33, 39, 41, 42, 46, 50, 56, 58.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002); Wilsznia village (FG-2291), 1979, *leg. J. Nowak* (KRAM; Nowak 1993; Bielczyk & Kozik 2009).

*Physcia aipolia* (Ehrh. ex Humb.) Fühmb.

On bark of ash; Nieznajowa (FG-2073), 1979, *leg. J. Nowak* (KRAM; Nowak 1993).

*Physcia caesia* (Hoffm.) Fühnr.

On wood and concrete. Collecting sites: 33, 42.

*Physcia dubia* (Hoffm.) Lettau

On sandstone, on bark of deciduous trees. Collecting sites: 33, 34, 41, 56.

HISTORICAL DATA: Świerzowa Ruska (FG-2003), Wilsznia village (FG-2291), 1979, *leg. J. Nowak* (KRAM; Nowak 1993).

*Physcia stellaris* (L.) Nyl.

On bark of willow and poplar. Collecting site: 33.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Physcia tenella* (Scop.) DC.

On bark of deciduous trees, on concrete. Collecting sites: 10, 20, 27, 28, 29, 33, 36, 38, 39, 41, 42, 50, 56, 57, 58.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Physconia distorta* (With.) J. R. Laundon

On bark of ash and willow; Folsz – stream valley (FG-1041), *s.d.*, *leg. T. Sulma* (UGDA; Polakowska 2002); Świerzowa Ruska (FG-2003), Nieznajowa (FG-2073), 1979, *leg. J. Nowak* (KRAM; Nowak 1993; Bielczyk & Kozik 2009).

*Physconia enteroxantha* (Nyl.) Poelt

On bark of deciduous trees. Collecting sites: 41, 50.

HISTORICAL DATA: Nieznajowa (FG-2073), 1979, *leg. J. Nowak* (KRAM; Nowak 1993).

***Physconia grisea* (Lam.) Poelt**

On bark of sycamore; Folusz – stream valley (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002); Żydowskie (FG-2089), 1979, *leg. J. Nowak* (KRAM; Nowak 1993).

***Physconia perisidiosa* (Erichsen) Moberg**

On bark of old willow; Nieznajowa (FG-2073), 1979, *leg. J. Nowak* (KRAM; Nowak 1993; Bielczyk & Kozik 2009).

***Placynthiella dasaea* (Stirt.) Tønsberg**

On wood, humus and bark of trees. Collecting sites: 1, 2, 6, 7, 8, 15, 21, 27, 31, 35, 40, 41, 48, 51, 50.

HISTORICAL DATA: Folusz – stream valley (FG-1041), 1962, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Placynthiella icmalea* (Ach.) Coppins & P. James**

On wood, humus and bark of trees. Collecting sites: 2, 8, 14, 15, 16, 21, 31, 38, 40, 50, 56.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1955, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Placynthiella uliginosa* (Schrad.) Coppins & P. James**

On decaying stumps; Diabli Kamień Mt. (FG-1041), 1955, *leg. T. Sulma* (UGDA; Polakowska 2002); Świerzowa Ruska (FG-2003), Nieznajowa (FG-2064), Skarpoty (FG-2079), Huta Krempska (FG-2162), 1979, *leg. J. Nowak* (KRAM; Bielczyk & Kozik 2009).

***Platismatia glauca* (L.) W. L. Culb. & C. F. Culb.**

On bark of pine, birch, ash and sycamore. Collecting sites: 15, 44.

HISTORICAL DATA: Folusz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1936, 1954–62, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

***Polycauliona candelaria* (L.) Frödén, Arup & Söchting**

*Xanthoria candelaria* (L.) Th. Fr.

On bark of ash. Collecting site: 41.

***Polycauliona polycarpa* (Hoffm.) Frödén, Arup & Söchting**

*Xanthoria polycarpa* (Hoffm.) Rieber

On bark of deciduous trees, on wood. Collecting sites: 29, 33, 41, 44, 56, 57.

HISTORICAL DATA: Folusz – stream valley (FG-1041), *s.d.*, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Polysporina simplex* (Davies) Vězda**

On sandstone boulder. Collecting site: 50.

***Polysporina subfuscescens* (Nyl.) K. Knudsen & Kocourk.**

*Polysporina lapponica* auct. non (Schaer.) Degel

On sandstone boulder; Wilsznia village (FG-2291), 1979, *leg. J. Nowak* (KRAM).

***Porina aenea* (Wallr.) Zahlbr.**

*Pseudosagedia aenea* (Wallr.) Hafellner & Kalb

On bark of deciduous trees and fir, on wood, in one locality on sandstone. Collecting sites: 2, 5, 7, 9, 12, 15, 16, 17, 18, 19, 22, 23, 24, 28, 34, 35, 38, 50, 52, 54.

HISTORICAL DATA: Kremrna (FG-2151), 1979, *leg. J. Nowak* (KRAM; Bielczyk & Kozik 2009).

***Porina chlorotica* (Ach.) Müll. Arg.**

*Pseudosagedia chlorotica* (Ach.) Hafellner & Kalb

On wet rocks and boulders. Collecting sites: 1, 3, 7, 9, 35, 50. (!)

***Porpidia crustulata* (Ach.) Hertel & Knoph**

On sandstone rocks, boulders and pebbles. Collecting sites: 5, 10, 11, 17, 20, 33, 34, 47, 48, 51, 56, 57.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002); Majdan Mt. (FG-1093), Kremrna (FG-2140, 2151, 2152), 1979, *leg. J. Nowak* (KRAM; Bielczyk & Kozik 2009).

***Porpidia macrocarpa* (DC.) Hertel & A. J. Schwab.**

On sandstone. Collecting sites: 5, 33.

HISTORICAL DATA: Kornuty Reserve (EG-1969) (Sulma 1936).

***Porpidia soledizodes* (Lamy ex Nyl.) J. R. Laundon**

On sandstone. Collecting sites: 2, 6, 7, 12, 15, 40.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Porpidia tuberculosa* (Sm.) Hertel & Knoph**

On sandstone; Rostajne (FG-2074), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003; Bielczyk & Kozik 2009).

***Protoblastenia rupestris*** (Scop.) J. Steiner

On calcareous stone. Collecting site: 33.

***Protoparmelia badia*** (Hoffm.) Hafellner

On sandstone boulders; Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1936, 1954–57, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

***Pseudevernia furfuracea*** (L.) Zopf

On bark of deciduous trees, pine and fir, less often on wood, on rock in one locality. Collecting sites: 2, 15, 16, 18, 19, 27, 29, 37, 39.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1936, 1954–62, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

***Pseudoschimatomma rufescens*** (Pers.) Ertz & Tehler

*Opegrapha rufescens* Pers.

On bark of beech; Kornuty Reserve (EG-1969) (Sulma 1936).

***Psilolechia lucida*** (Ach.) M. Choisy

On sandstone boulder. Collecting site: 15. (!)

***Punctelia jeckeri*** (Roum.) Kalb.

On willows by stream. Collecting site: 32. (!)

NOTE. A relatively widespread foliose species occurring on various tree species, but not distinguished from *P. subrudecta* until recently (Kalb 2007); numerous Polish records of the latter species may refer to *P. jeckeri* (Kościelniak 2013).

***Punctelia subrudecta*** (Nyl.) Krog

On bark of fir and ash; Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002); Krempna (FG-2142), 1979, *leg. J. Nowak* (KRAM).

***Pyrenula nitida*** (Weigel) Ach.

On bark of beech, hornbeam and sycamore. Collecting sites: 8, 9, 12, 15, 18, 19, 22, 23, 31, 34, 38, 46, 47, 52, 54.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Kornuty Reserve (EG-1969), 1957, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002); Skarpoty (FG-2079), Krempna (FG-2152), Niedźwiedzie (FG-2180), 1979, *leg. J. Nowak* (KRAM).

***Ramalina farinacea*** (L.) Ach.

On bark of beech; Folsz – stream valley (FG-1041), 1955, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Ramalina fastigiata*** (Pers.) Ach.

On bark of beech; Folsz – stream valley (FG-1041), Kornuty Reserve (EG-1969), 1955, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

***Ramalina fraxinea*** (L.) Ach.

On bark of sycamore. Collecting site: 41.

HISTORICAL DATA: Folsz – stream valley (FG-1041), *s.d.*, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Ramalina obtusata*** (Arnold) Bitter

On bark of fir; Folsz – stream valley (FG-1041), 1936, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Ramalina pollinaria*** (Westr.) Ach.

On bark of beech; Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1954, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

***Rhizocarpon badioatrum*** (Flörke ex Spreng.) Th. Fr.

On stones. Collecting sites: 33, 56.

***Rhizocarpon geographicum*** (L.) DC.

On sandstone. Collecting site: 56.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1936, *leg. T. Sulma* (UGDA; Sulma 1936; Polakowska 2002).

***Rhizocarpon grande*** (Flörke) Arnold

On boulder; Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Rhizocarpon reductum*** Th. Fr.

*Rhizocarpon obscuratum* auct.

On sandstone. Collecting site: 56.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002); Rostajne (FG-2074), 1979, *leg. J. Nowak* (KRAM; Bielczyk & Kozik 2009).

***Rinodina exigua*** (Ach.) Gray

On bark of willow and alder. Collecting sites: 33, 56.

***Rinodina griseosoralifera*** Coppins

On bark of apple tree. Collecting site: 39. (!)



NOTE. A corticolous, sterile species characterized by its blue-grey soralia and the presence of atranorin and zeorin in the thallus. *Buellia griseovirens* is another common corticolous species with a similar tinge of the soralia, but they appear yellowish when abraded and its thallus contains atranorin and norstictic acid as major secondary compounds (Coppins 1989). In Poland *Rinodina griseosoralifera* is known from the Gorce Mts (Czarnota & Kukwa 2007). Besides the Polish localities, for the whole Carpathian range it was recorded only in the Eastern Carpathians in Ukraine (Coppins *et al.* 2005).

***Rinodina oleae*** Bagl.

*R. gennarii* Bagl.

On concrete. Collecting site: 50.

***Rusavskia elegans*** (Link) S. Y. Kondr. & Kärnefelt.

*Xanthoria elegans* (Link.) Th.Fr.

On concrete. Collecting sites: 41, 46.

***Sarcogyne regularis*** Körb.

On concrete and stones. Collecting sites: 4, 37, 41. (!)

HISTORICAL DATA: Świerzowa Ruska (FG-2003), 1979, *leg. J. Nowak* (KRAM).

***Sarcosagium campestre*** var. ***macrosporum*** Coppins & P. James

On bark of elm and decaying stump of fir. Collecting site: 38.

HISTORICAL DATA: Świerzowa Mt. (FG-1074); Nieznajowa (FG-2073), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003).

**+*Sarea difformis*** (Fr.) Fr.

On resin on bark of larch. Collecting site: 1. (!)

***Schaereria fuscocinerea*** (Nyl.) Clauzade & Cl. Roux

On rock. Collecting site: 2. (!)

***Sclerophora nivea*** (Hoffm) Tibell

On bark of beech; Skarpoty (FG-2079), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003).

***Scoliciosporum chlorococcum*** (Graewe ex Stenh.) Vězda

On bark of trees and bushes, rarely on wood. Collecting

sites: 1, 2, 6, 10, 15, 16, 18, 21, 26, 27, 28, 31, 33, 34, 38, 41.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954–62, *leg. T. Sulma* (UGDA; Polakowska 2002); Rostajne (FG-2074), Skarpoty (FG-2079), Krempna (FG-2151), 1979, *leg. J. Nowak* (KRAM).

***Scoliciosporum sarothamni*** (Vain.) Vězda

On bark of deciduous trees and larch. Collecting sites: 1, 5, 10, 36, 38, 44, 53. (!)

***Scoliciosporum umbrinum*** (Ach.) Arnold

On sandstone. Collecting sites: 2, 17, 20, 50.

***Stereocaulon vesuvianum*** Pers.

On boulder; Diabli Kamień Mt. (FG-1041), 1936, *leg. T. Sulma* (UGDA; Polakowska 2002).

**\**Stigmidium fuscatae*** (Arnold) R. Sant.

On *Acarospora fuscata*; Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Kukwa 2005).

***Strangospora pinicola*** (A. Massal.) Körb.

On bark of sycamore and wood of pine. Collecting sites: 39, 40, 58. (!)

HISTORICAL DATA: between Magura Wątkowska and Kornyty Reserve (FG-1061), 1977, *leg. J. Nowak* (KRAM).

***Tephromela atra*** (Huds.) Hafellner

On boulder; Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Thelidium minutulum*** Körb.

On stone sprinkled with water. Collecting site: 40. (!)

***Thelocarpon epibolum*** Nyl.

On decaying stump. Collecting site: 8.

HISTORICAL DATA: Niedźwiedzie (FG-2180), 1979, *leg. J. Nowak* (KRAM; Bielczyk 2003).

**+*Thelocarpon lichenicola*** (Fueckel) Poelt & Hafellner

On sandstone. Collecting sites: 47, 50.

NOTE. This species is known from the Western Beskid Mts (Bielczyk 2003) and Góry Sannocko-Turczańskie Mts (Kościelniak 2004). In the Beskid Niski Mts (but outside MNP) it was found in the vicinity of Jaśliska (KRAM, Bielczyk 2003).

*Thelocarpon magnussonii* G. Salisb.

On sandstone by stream; Żydowskie (FG-2180), 1979, leg. J. Nowak (KRAM; Bielczyk 2003; Bielczyk & Kozik 2009).

*Thelocarpon robustum* Eitner

On sandstone by stream; Wyszowatka towards Rostajne (FG-2095), Żydowskie (FG-2180), 1979, leg. J. Nowak (KRAM).

*Thelopsis rubella* Nyl.

On bark of old beech; Krempna (FG-2069), 1977, leg. J. Nowak (KRAM; Bielczyk 2003).

*Trapelia coarctata* (Sm.) M. Choisy

On rock and sandstone. Collecting sites: 4, 5, 6, 7, 9, 13, 15, 17, 24, 31, 34, 36, 50, 51.

HISTORICAL DATA: Świerzowa Ruska (FG-2003), Nieznajowa (FG-2073), Rostajne (FG-2074), Żydowskie (FG-2190), 1979, leg. J. Nowak (KRAM; Bielczyk & Kozik 2009).

*Trapelia glebulosa* (Sm.) J. R. Laudon

*Trapelia involuta* (Taylor) Hertel

On sandstone rocks. Collecting sites: 4, 15, 31, 34, 47, 48.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1955, leg. T. Sulma (UGDA; Polakowska 2002).

*Trapelia obtegens* (Th. Fr.) Hertel

On boulder in forest. Collecting site: 40. (!)

*Trapelia placodioides* Coppins & P. James

On rock, boulders, stones and gravestone. Collecting sites: 2, 7, 6, 5, 1, 9, 12, 17, 50.

HISTORICAL DATA: Żydowskie (FG-2089), 1979; leg. J. Nowak (KRAM; Bielczyk 2003; Bielczyk & Kozik 2009).

*Trapeliopsis flexuosa* (Fr.) Coppins & P. James

On wood and bark of trees, in one locality on boulder. Collecting sites: 1, 2, 13, 14, 15, 16, 26, 31, 34, 35, 36, 39, 50.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1957, leg. T. Sulma (UGDA; Polakowska 2002).

*Trapeliopsis granulosa* (Hoffm.) Lumbsch

On soil, bark of pine, wood. Collecting sites: 15, 19, 56.

HISTORICAL DATA: Folsz – stream valley (FG-1041),

Diabli Kamień Mt. (FG-1041), 1954–57, leg. T. Sulma (UGDA; Polakowska 2002).

*Trapeliopsis pseudogranulosa* Coppins & P. James

On soil, humus and rock waste. Collecting sites: 14, 15.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1957–63, leg. T. Sulma (UGDA; Polakowska 2002).

*Trapeliopsis viridescens* (Schrad.) Coppins & P. James

On decaying stump; Diabli Kamień Mt. (FG-1041), 1957, leg. T. Sulma (UGDA; Polakowska 2002); Kornuty Reserve (EG-1979), 1974, leg. J. Nowak (KRAM; Bielczyk 2003; Bielczyk & Kozik 2009).

*\*Tremella cladoniae* Diederich & M. S. Christ.

On thalli of *Cladonia coniocraea* growing on bark of hawthorn, on *Cladonia chlorophaea* on bark of ash. Collecting site: 10. (!)

*\*Tremella phaeophysciae* Diederich & M. S. Christ.

On epiphytic thallus of *Phaeophyscia orbicularis*; Folsz – stream valley (FG-1041), 1954, leg. T. Sulma (UGDA; Kukwa 2005).

*Umbilicaria deusta* (L.) Baumg.

On sandstone rock; Diabli Kamień Mt. (FG-1041), 1936, leg. T. Sulma (UGDA; Polakowska 2002).

*Umbilicaria hirsuta* (Sw. ex Westr.) Hoffm.

On sandstone rock. Collecting site: 2.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), Kornuty Reserve (EG-1969), 1936–62, leg. T. Sulma (UGDA; Sulma 1936; Śliwa & Krzewicka 2002).

*Usnea fulvoreaegens* (Räsänen) Räsänen

On bark of beech; Folsz – stream valley (FG-1041), 1955, leg. T. Sulma (UGDA; Polakowska 2002).

*Usnea hirta* (L.) Weber ex F. H. Wigg.

On wooden fence. Collecting site: 41.

*Usnea intermedia* (A. Massal.) Jatta

*U. faginea* Mot.

On bark of fir; Diabli Kamień Mt. (FG-1041), 1954, leg. T. Sulma (UGDA; Polakowska 2002).

*Usnea* sp.

On bark of linden. Collecting site: 42.

NOTE. Identification of the species requires laboratory studies but the genus is legally protected; a sample could not be taken.

*Usnea wasmuthii* Räsänen

On bark of pine; Diabli Kamień Mt. (FG-1041), 1936, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Varicellaria hemisphaerica* (Flörke) Schmitt & Lumbsch

*Pertusaria hemisphaerica* (Flörke) Erichsen

On bark of fir, sycamore and beech. Collecting sites: 29, 31, 34.

HISTORICAL DATA: Folsz – stream valley (FG-1041), Diabli Kamień Mt. (FG-1041), 1954–57, *leg. T. Sulma* (UGDA; Polakowska 2002); Skarpoty (FG-2079), Niedźwiedzie (FG-2180), 1979, *leg. J. Nowak* (KRAM).

*Varicellaria lactea* (L.) Schmitt & Lumbsch

*Pertusaria lactea* (L.) Arnold

On boulder; Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

*Verrucaria acrotella* Ach.

On boulder. Collecting site: 20. (!)

NOTE. This species is poorly distinguished due to its uncertain systematic status (Krzewicka 2012); so far it is unrecorded in the Polish Carpathians. It is known from the Western Carpathians in Slovakia (Bielczyk *et al.* 2004) and the Eastern Carpathians in Ukraine and Romania (Kondratyuk *et al.* 2003).

*Verrucaria aquatilis* Mudd

On boulder sprinkled with water. Collecting site: 40.

HISTORICAL DATA: Świerzowa Ruska (FG-2003), Nieznajowa (FG-2063); Rostajne (FG-2075); Czarne near Nieznajowa (FG-2082); Żydowskie (FG-2099); Krempna, by Wisłoka (FG-2152); Ostryszne near Krempna (FG-2153); Huta Krempska (FG-2162); Polany (FG-2186); Olchowiec, by Wilsznia river (FG-2199), 1979, *leg. J. Nowak* (KRAM; Krzewicka 2009).

*Verrucaria dolosa* Hepp

On stones and concrete. Collecting sites: 33, 57.

HISTORICAL DATA: Czarne near Nieznajowa (FG-2082), Ostryszne near Krempna (FG-2153), Krempna (FG-2151), 1979, *leg. J. Nowak* (KRAM; Krzewicka 2009).

*Verrucaria elaeina* Borrer

On sandstone boulders in wet places; Majdan (FG-1093), Kotań (FG-2028), Czarne near Nieznajowa (FG-2082), Żydowskie (FG-2099), Krempna (FG-2152), Olchowiec, by Wilsznia river (FG-2199), 1979, *leg. J. Nowak* (KRAM; Krzewicka 2009).

*Verrucaria elaeomelaena* (A. Massal.) Arnold

On boulder in stream. Collecting site: 20.

HISTORICAL DATA: Huta Krempska (FG-2162), 1979, *leg. J. Nowak* (KRAM; Krzewicka 2009).

*Verrucaria hydrophila* Orange

*V. denudata* Zschacke, *V. hydrela* auct.

On rock by water and on wet stones. Collecting sites: 7, 50.

HISTORICAL DATA: Olchowiec, by Wilsznia river (FG-2199), Nieznajowa (FG-2063), 1979, *leg. J. Nowak* (KRAM; Krzewicka 2009, 2012)

*Verrucaria latebrosa* Körb.

On boulders and stones by stream; Bednarka Stream FG-1928, Krempna (FG-2151), Huta Krempska (FG-2162), Wilsznia village (FG-2291), 1975–79, *leg. J. Nowak* (KRAM; Krzewicka 2009).

*Verrucaria margacea* (Wahlenb.) Wahlenb.

On boulders and stones by stream; Las Spelży (FG-2062), Olchowiec, by Wilsznia river (FG-2199), 1979, *leg. J. Nowak* (KRAM; Krzewicka 2012).

*Verrucaria muralis* Ach.

On concrete and boulder. Collecting sites: 5, 15, 33, 46.

HISTORICAL DATA: Kotań (FG-2028), Nieznajowa (FG-2064), Rostajne (FG-2075), Czarne near Nieznajowa (FG-2082), Ostryszne near Krempna (FG-2153), Wilsznia village (FG-2291), 1979, *leg. J. Nowak* (KRAM; Krzewicka 2009).

*Verrucaria murina* Leight.

*V. myriocarpa* Hepp.

On boulder. Collecting site: 20.

HISTORICAL DATA: Huta Krempska (FG-2162), Ciechania (FG-3121), 1979, *leg. J. Nowak* (KRAM; Krzewicka 2009).

*Verrucaria nigrescens* Pers.

On concrete and stones. Collecting sites: 33, 43.

HISTORICAL DATA: Ciechania (FG-3121), 1979, *leg. J. Nowak* (KRAM; Krzewicka 2009).

***Verrucaria obfuscans*** Nyl.

On concrete. Collecting site: 33.

***Verrucaria policensis*** Servit

On stone by road. Collecting site: 33. (!)

NOTE. A species poorly known in Europe, reported only from the Czech Republic and Poland (Wyżyna Krakowsko-Częstochowska and Wyżyna Woźnicko-Wieluńska uplands) (Krzewicka 2012). The species is new for the Carpathians.

***Verrucaria praetermissa*** (Trevisan) Anzi

On sandstone rock and boulder by stream, on wet stones and concrete. Collecting sites: 1, 4, 7, 12, 20, 40, 46, 50, 53.

HISTORICAL DATA: Świerzowa Ruska (FG-2003), Rostajne (FG-2074), Las Słodki (FG-2077), Czarne near Nieznajowa (FG-2082), Kremarna, by Wisłoka river (FG-2152), Ostryszne near Kremarna (FG-2153), Huta Kremarska (FG-2162), Olchowiec, by Wilsznia river (FG-2199), 1979, *leg. J. Nowak* (KRAM; Krzewicka 2009).

***Verrucaria sublobulata*** Eitner *ex* Servit

On wet sandstone and concrete. Collecting site: 35.

HISTORICAL DATA: Żydowskie (FG-2097), 1979, *leg. J. Nowak* (KRAM; Krzewicka 2009).

***Verrucaria submersella*** Servit

On stones in stream, on boulder and concrete. Collecting sites: 1, 11, 46.

***Verrucaria tectorum*** (A. Massal.) Körb.

On concrete. Collecting site: 33. (!)

***Verrucaria viridula*** (Schrad.) Ach.

On stone. Collecting site: 5.

***Violella fucata*** (Stirt.) T. Sprib.

*Mycoblastus fucatus* (Stirt.) Zahlbr.

On bark of maple and sycamore. Collecting sites: 31, 34, 58.

HISTORICAL DATA: on bark of fir; Diabli Kamień Mt. (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

\****Vouauxiella lichenicola*** (Linds.) Petr. & Syd.

On *Lecanora pulicaris* (thallus and apothecia) growing on apple tree. Collecting site: 39. (!)

\****Vouauxiomyces truncatus*** (B. de Lesd.) Dyko & D. Hawksw.

On thallus of epiphytic *Flavoparmelia caperata*; Folsz – stream valley (FG-1041), 1954, *leg. T. Sulma* (UGDA; Kukwa 2005).

***Vulpicida pinastri*** (Scop.) J.-E. Mattsson & M. J. Lai

On wooden fence, bark of pear tree and pine. Collecting sites: 39, 41, 50.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1954, *leg. T. Sulma* (UGDA; Sulma & Faltynowicz 1988; Polakowska 2002).

***Xanthoparmelia conspersa*** (Ach.) Hale

On sandstone. Collecting site: 2.

HISTORICAL DATA: Diabli Kamień Mt. (FG-1041), 1955, *leg. T. Sulma* (UGDA; Polakowska 2002); Rostajne (FG-2074), 1979, *leg. J. Nowak* (KRAM; Bielczyk & Kozik 2009).

***Xanthoparmelia loxodes*** (Nyl.) O. Blanco, A. Crespo, Elix, D. Hawksw. & Lumbsch

*Neofuscelia loxodes* (Nyl.) Essl.

On boulder; Diabli Kamień Mt. (FG-1041), 1954–55, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Xanthoria parietina*** (L.) Th. Fr.

On bark of deciduous trees and on concrete. Collecting sites: 11, 27, 28, 29, 46.

HISTORICAL DATA: Folsz – stream valley (FG-1041), 1954, *leg. T. Sulma* (UGDA; Polakowska 2002).

***Xylographa parallela*** (Ach.: Fr.) Behlen & Desberger

*X. abietina* (Pers.) Zahlbr.

On decaying stump; Rostajne (FG-2074), 1979, *leg. J. Nowak* (KRAM).

***Xylopsora caradocensis*** (Leight. *ex* Nyl.)

Bendiksby & Timdal

*Hypocenomyce caradocensis* (Leight. *ex* Nyl.) P. James & Gotth. Schneid.

On bark of fir and beech, on wood. Collecting sites: 15, 16, 17, 44.

HISTORICAL DATA: Skarpoty (FG-2079), 1979, *leg.*

*J. Nowak* (KRAM; Bielczyk 2003; Bielczyk & Kozik 2009).

*Zwackhia viridis* (Ach.) Poetsch & Schied.

*Opegrapha viridis* (Ach.) Behlen & Desberger

On bark of beech; Folusz – stream valley (FG-1041), 1957, *leg. T. Sulma* (UGDA; Polakowska 2002).

## DISCUSSION

The number of species of lichens and allied fungi reported from Magurski National Park, 337, is significant though lower than in other Carpathian national parks, for example Gorce National Park (Czarnota 2010) or Bieszczady National Park (Kościelniak 2013). The lower diversity of the lichen biota there is connected with natural conditions such as the low elevation of the hills and the low variability of geological substrate, including the absence of limestone. It should be noted, however, that lichenological research in the Beskid Niski Mts was not as comprehensive as in the two national parks mentioned.

As a result of the 2009 fieldwork, 112 species were reported as new for MNP, including 75 new for the Beskid Niski range; these include (1) species recently described as new to science, (2) rather inconspicuous species easily overlooked in the field, and (3) species that require the application of modern methods for their identification. Of the newly reported taxa, 15 species are fungi allied with lichens, which in recent years have been a subject of more intensive lichenological research.

The presented results enrich our knowledge of the species diversity and distribution of lichens not only in the Carpathians but also in Poland. Two lichenicolous fungi, *Intralichen lichenicola* and *Burgoa angulosa*, are reported here as new for Poland and indeed for the Carpathians; both species are known from only a few localities in Europe (Hawksworth & Cole 2002; Diederich & Lawrey 2007). The record of *Verrucaria policensis* from the vicinity of Nieznajowa is new for the Carpathians; it is poorly known in Europe and recorded only from the Czech Republic and Poland (Wyżyna Woźnicka and Wyżyna Olkуска uplands) (Krzewicka 2012). *Fuscidea arboricola*

is new for the Western Carpathians; it is known from a few localities in the Eastern Carpathians in Slovakia, Ukraine (Kondratyuk *et al.* 2003; Coppins *et al.* 2005) and Romania (Ardelean *et al.* 2013), so its locality on Kamień Mt. extends its western range. *Halecania viridescens*, a species so far reported only from the north of Poland (Kukwa & Jabłońska 2009; Schiefelbein *et al.* 2012), is newly recorded for the Polish Carpathians, as is *Mycomicrothelia confusa*, a species known in Poland only from 19<sup>th</sup>-century reports from the Sudetes (Fałtynowicz 2003). *Epigloea urosperma*, a lichenicolous fungus, has its second locality in the Carpathians, in addition to Babia Góra Massif (Czarnota & Hernik 2013). *Rinodina griseosoralifera* is a species known in Poland only from the Gorce Mts (Czarnota & Kukwa 2007) and in the Carpathians only from its eastern part situated in Ukraine (Coppins *et al.* 2005). Other very rare species in Poland recorded for the second time in the Polish Carpathians are *Absoconditella pauxilla*, a species found in one locality in the Tatras (Czarnota 2012); *Collema crispum*, known from the Góry Słonne Mts (Kiszka & Piórecki 1992); and *Licea parasitica*, collected in the Kotlina Orawsko-Nowotarska basin (Kukwa & Jabłońska 2008).

Two species of a small group of lichenicolous basidiomycetes deserve attention. *Dictyocatenuata alba* was found in a shady *Dentario glandulosae-Fagetum* community in two localities: stream valleys of Baranie and Olchowczyk. Previously it was known only from the Gorce Mts in Poland, besides the Western Carpathians in Slovakia and the Eastern Carpathians in Slovakia and Ukraine (Diederich *et al.* 2008). The other species, *Multi-clavula mucida*, had been reported from only one locality in the Polish lowland (Czyżewska *et al.* 2005) and three localities in the Bieszczady Mts (Kościelniak 2013).

The lichenological importance of Magurski National Park is emphasized by the presence of some rare and interesting species, eight of which are under strict legal protection (*Montanella disjuncta*, *Normandina pulchella*, *Parmelia omphalodes*, *P. submontana*, *Parmelina tiliacea*, *Peltigera praetextata*, *Punctelia jeckeri*, *Ramalina fraxinea*) and four of which are under partial

protection (*Hypogymnia tubulosa*, *Imshaugia aleurites*, *Usnea hirta*, *Vulpicida pinastris*). The park also contains a significant number of nationally red-listed species (Cieśliński *et al.* 2006), including 37 threatened ones (Table 1). Many of these have ecological niches in MNP area which ensure their survival, making the park an important refuge for numerous lichen species endangered in the country. Moreover, the strategy of nature protection adopted in MNP (Szafranski 2009) gives some positive perspective for the development of favorable conditions for lichens in the future.

Unfortunately, the process of lichen impoverishment which has intensified since the mid 20<sup>th</sup> century can also be observed in MNP. At present, 94 species reported by T. Sulma from MNP in the 1930s, 1950s and 1960s and by J. Nowak in the 1960s and 1970s have not been refound. The number includes species with tiny, inconspicuous thalli, which may have been overlooked, but mainly these are rare species, such as *Cryptodiscus gloeocapsa*, *Thelopsis rubella*, *Thelocarpon magnussonii* and lichenicolous fungi. The fact that others were not refound may be due to confusion resulting from their external similarity to other

**Table 1.** Species of Magurski National Park included in the red list of lichens in Poland.

Threat category		Name of species	Number of species
CR	Present	<i>Bacidina egenula</i>	1
	Not confirmed	<i>Bryoria capillaris</i> , <i>Chrysothrix candelaris</i> , <i>Evernia divaricata</i> , <i>E. mesomorpha</i> , <i>Gyalecta ulmi</i> , <i>Menegazzia terebrata</i> , <i>Nephroma parile</i> , <i>Usnea fulvorenans</i> , <i>U. intermedia</i> , <i>U. wasmuthii</i>	10
EN	Present	<i>Arthonia atra</i> , <i>Bacidia subincompta</i> , <i>Chaenotheca brunneola</i> , <i>Ch. phaeocephala</i> , <i>Ch. stemonea</i> , <i>Cladonia caespiticia</i> , <i>Cl. parasitica</i> , <i>Loxospora elatina</i> , <i>Normandina pulchella</i> , <i>Parmelia omphalodes</i> , <i>Ramalina fraxinea</i>	11
	Not confirmed	<i>Anaptychia ciliaris</i> , <i>Caloplaca cerinella</i> , <i>Flavoparmelia caperata</i> , <i>Lecanora albella</i> , <i>Opegrapha vermicellifera</i> , <i>Physconia distorta</i> , <i>Ramalina fastigiata</i> , <i>R. obtusata</i> , <i>Rhizocarpon grande</i> , <i>Verrucaria latebrosa</i> , <i>Xylographa parallella</i>	12
VU	Present	<i>Acrocordia gemmata</i> , <i>Bacidia rubella</i> , <i>Biatora efflorescens</i> , <i>Calicium viride</i> , <i>Chaenotheca xyloxaena</i> , <i>Hydropunctaria rheitrophila</i> , <i>Melanohalea elegantula</i> , <i>Montanelia disjuncta</i> , <i>Ochrolechia androgyna</i> , <i>Opegrapha niveoatra</i> , <i>Parmelia submontana</i> , <i>Parmelina tiliacea</i> , <i>Peltigera praetextata</i> , <i>Pyrenula nitida</i> , <i>Rhizocarpon badioatrum</i> , <i>Rinodina exigua</i> , <i>Umbilicaria hirsuta</i> , <i>Usnea hirta</i> , <i>Varicellaria hemisphaerica</i> , <i>Verrucaria aquatilis</i> , <i>V. hydrophila</i> , <i>V. viridula</i>	22
	Not confirmed	<i>Aspicilia laevata</i> , <i>Caloplaca cerina</i> , <i>Cetraria chlorophylla</i> , <i>C. islandica</i> , <i>Cladonia macroceras</i> , <i>Cryptodictus gloeocapsa</i> , <i>Diploschistes gypsaceus</i> , <i>Lecanora sulphurea</i> , <i>Ochrolechia arborea</i> , <i>Opegrapha rufescens</i> , <i>Pertusaria aspergilla</i> , <i>P. coronata</i> , <i>P. pertusa</i> , <i>Punctelia subrudecta</i> , <i>Ramalina farinacea</i> , <i>R. pollinaria</i> , <i>Stereocaulon vesuvianum</i> , <i>Verrucaria margacea</i> , <i>Zwackhia viridis</i>	19
NT	Present	<i>Alyxoria varia</i> , <i>Arthothelium ruanum</i> , <i>Bacidina arnoldiana</i> , <i>Chaenotheca furfuracea</i> , <i>Ch. trichialis</i> , <i>Dibaeis baemyces</i> , <i>Evernia prunastri</i> , <i>Graphis scripta</i> , <i>Hypogymnia tubulosa</i> , <i>Lecidella scabra</i> , <i>Leimonis erratica</i> , <i>Thelidium minutulum</i> , <i>V. praetermissa</i> , <i>Vulpicida pinastris</i>	14
	Not confirmed	<i>Acarospora umbilicata</i> , <i>Pertusaria coccodes</i> , <i>P. leioplaca</i> , <i>P. pupillaris</i> , <i>Physcia aipolia</i> , <i>Polysporina subfuscescens</i> , <i>Protoparmelia badia</i> , <i>Tephromela atra</i> , <i>Trapeziopsis viridescens</i>	9
LC	Present	<i>Porpidia macrocarpa</i> , <i>Psilolechia lucida</i> , <i>Strangospora pinicola</i> , <i>Thelocarpon epibohum</i>	4
	Not confirmed	<i>Umbilicaria deusta</i> , <i>Varicellaria lactea</i>	2
DD	Present	<i>Lecanora persimilis</i> , <i>Punctelia jeckeri</i> , <i>Schaereria fuscocinerea</i> , <i>Verrucaria murina</i> , <i>V. sublobulata</i>	5
	Not confirmed	<i>Cladonia macrophyllodes</i> , <i>Ionaspis ceracea</i> , <i>Thelocarpon robustum</i> , <i>Thelopsis rubella</i>	4

species, as in the case of *Verrucaria elaeina*, which is likely to be confused with *V. muralis*. However, many previously reported lichens, especially epiphytic and wood-inhabiting species, should now be considered extinct or at least very rare; 56 of them are red-listed in Poland (e.g., *Anaptychia ciliaris*, *Bryoria capillaris*, *Chrysothrix candelaris*, *Evernia divaricata*, *E. mesomorpha*, *Flavoparmelia caperata*, *Lecanora albella*, *Menegazzia terebrata*, *Nephroma parile*, *Punctelia subrudecta*, *Usnea fulvoreaegens*, *U. intermedia*, *U. wasmuthii*) (Table 1). These species are particularly sensitive to all kinds of habitat disturbances, especially air pollution, which is considered the main reason for their extinction. Another factor responsible for the elimination of some species could be changed light conditions in localities formerly rich in lichens, as for example Diabli Kamień rock, where two saxicolous species, *Stereocaulon vesuvianum* and *Umbilicaria deusta*, became extinct.

Anthropogenic factors do not always have a negative impact on lichen biota. Many species in MNP occur frequently or exclusively in secondary habitats such as abandoned villages where epilithic lichens grow on walls of old churches, graveyards, outbuildings and old bridges. This group includes *Acarospora moenium*, *Lecanora crenulata*, *L. hagenii*, *Lecidella stigmathea*, *Rinodina oleae*, *Rusavskia elagans* and *Trapelia placodioides*, as well as representatives of the genera *Caloplaca* and *Verrucaria*. Among the numerous epiphytes recorded on single trees, the following are worth mentioning: *Alyxoria varia*, *Arthonia atra*, *Biatora chrysantha* and *Normandina pulchella*. These species are usually confined to forest habitats but they are also found in old orchards or groves in churchyards, etc. Colonization of forest lichen species in anthropogenic habitats as a result of habitat restoration is well documented in the Bieszczady Mts, a region neighboring the Beskid Niski Mts (Kościelniak 2004, 2013).

On the basis of the presented results, we conclude that Magurski National Park is of great lichenological importance and worthy of protection. Its incorporation into the European Natura 2000 network as the Ostoja Magurska habitat refuge contributes to the preservation of lichen diversity

and protection of critical species, especially those sensitive to human impacts. As a consequence of environmental improvement, some species that have disappeared from MNP can be expected to return.

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