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Contribution to lichenicolous fungi from the Świętokrzyski National Park (Central Poland)

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Łubek A.: *Contribution to lichenicolous fungi from the Świętokrzyski National Park (Central Poland).* Acta Mycol. 37 (1/2): 93–100, 2002.

Sixteen species of lichenicolous fungi occurring in the Świętokrzyski National Park and its protective zone are presented on the base of recent collection and revision of the herbarial material from this area. Two of the recorded fungi, *Stigmidium congestum* and *Muellerella lichenicola*, are very rare in Poland. All presented species are new to the Świętokrzyskie Mountains.

Key words: lichenicolous fungi, Świętokrzyskie Mountains

INTRODUCTION

Lichenicolous fungi are research subjects for a long time in abroad, for example: Christiansen (1980), Hawksworth (1983), Hawksworth and Diederich (1991), Motiejūnaité (1999), Cole and Hawksworth (2001). In recent years in Poland often appear reports about lichenicolous fungi (Czyżewska 1998, 2002; Kukwa 2000a, b; Czyżewska et al. 2001). Some species had been taken already note in the sixties 20. century (Zielińska 1963; Starmachowa and Kiszka 1965).

During the author's own lichenological research in the Świętokrzyski National Park (ŚNP) conducted between 1999 and 2001, lichenicolous fungi were found. In the past lichenological studies in the ŚNP were also carried out by Halicz and Kuziel (1965, 1966) and Cieśliński (1981, 1985, 1986, 1991). Author analysed historical herbarial materials of lichens collected by B. Halicz and S. Kuziel in the period 1955-1959 and M. Sroczyński in 1960 year (deposited in the herbarium at the University of Łódź – LOD) and material collected by S. Cieśliński in the period 1962-1985 (deposited in the herbarium at the Świętokrzyska Academy – KTC).

Sixteen species of lichenicolous fungi were found during lichenological studies and analysed materials come from the ŚNP and its protective zone. The investigated area include about 28 000 ha and it is situated in Świętokrzyskie Mountains, the ol-

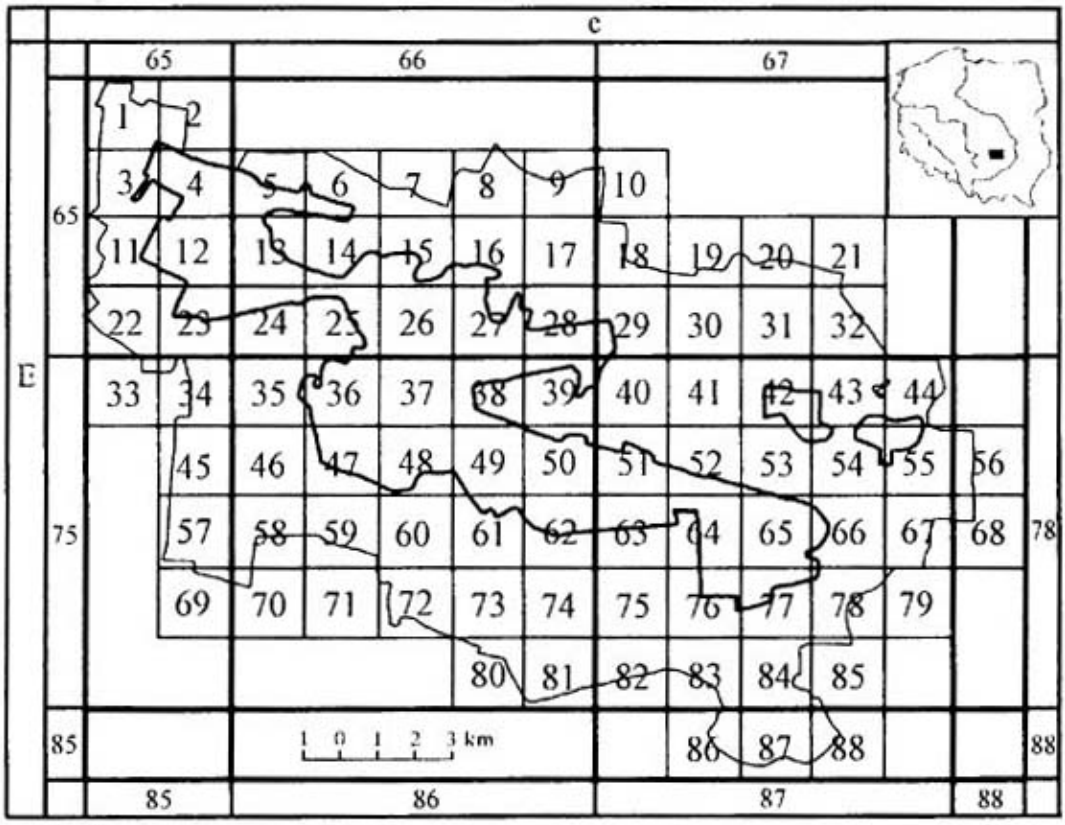

Fig. 1. Świętokrzyski National Park and it's protective zone 1-88 – investigated squares (sites)

dest Mountains in Europe. ŚNP is situated between latitude 20°48'25" and 21°07'25" E, and between latitude 50°50'25" and 50°58'25" N, approximately 15 km north-east of the town of Kielce (Ćmak and Wojdan 2000). It includes the highest and the best preservation range of the Świętokrzyskie Mountains – Łysogórskie Range – with the highest mountains: Łysica (612 m above sea level) and Łysa Mountain (595 m above sea level).

Distribution of the species examined is given in the 10×10 km ATPOL grid square system (acc. to Cieśliński and Fałtynowicz 1993), divided into 2 km squares (sites) (Fig. 1). Species nomenclature follows Hawksworth (1983) and Diederich (1996).

Abbreviations: MS – M. Sroczyński; BH, SK – B. Halicz and S. Kuziel; KC – K. Czyżewska, SC – S. Cieśliński; JM – J. Motiejūnaité; AŁ – A. Łubek

LIST OF SPECIES

Athelia arachnoidea (Berk.) Jülich – on thalli of *Lecanora conizaeoides, Scoliciosporum chlorococcum, Physcia tenella, Ph. stellaris, Hypogymnia physodes* and *Hypocenomyce scalaris* growing on *Abies alba, Fagus sylvatica, Pinus sylvestris, Alnus glutinosa, Salix fragilis* and *Populus nigra.*

Specimens examined: **Ee 65**: sites 1, 3, 4 (leg. MS 1960, AŁ 2001; det. KC), 11, 22; **Ee 66**: sites 24, 27; **Ee 76**: sites 36, 37, 38, 39, 47, 48, 49, 50, 62; **Ee 77**: sites 43, 51, 54 (det. KC), 55, 64, 65, 77, 82, 83; **Ee 87**: site 8.

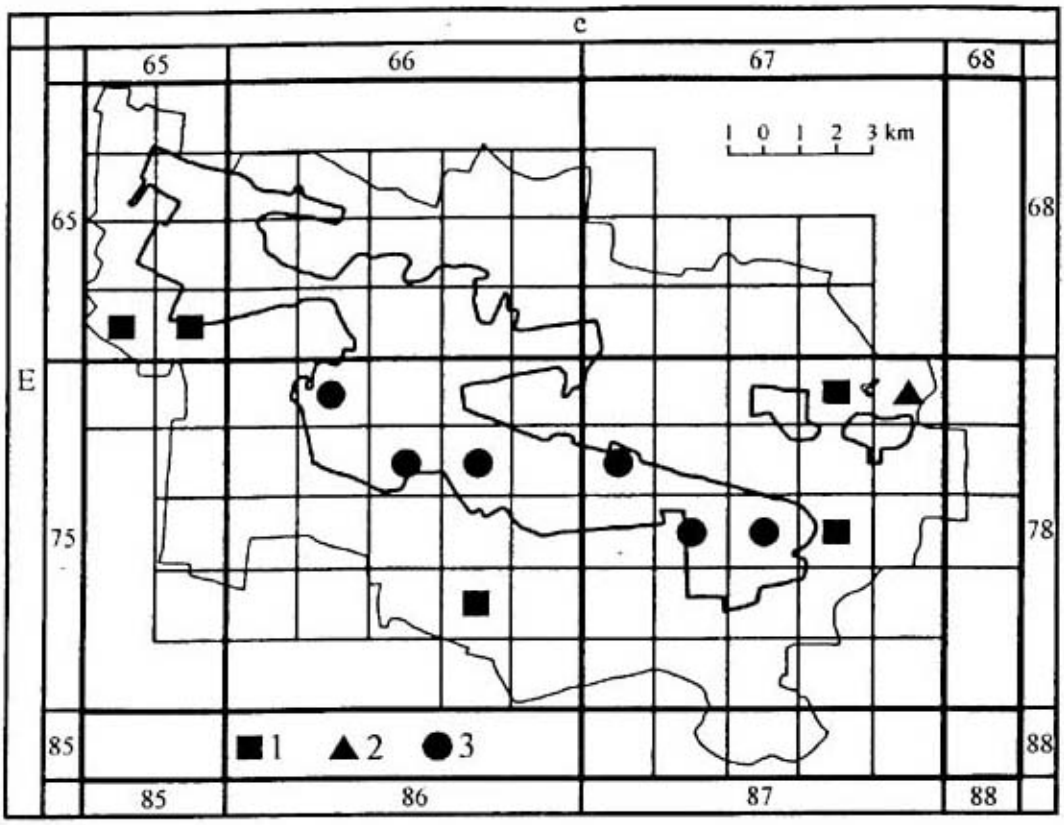

Fig. 2. Distribution of *Bispora christiansenii* (1), *Illosporium carneum* (2) and *Muellerella lichenicola* (3)

Bispora christiansenii D. Hawksw. – on apothecia of *Candelariella aurella, Lecanora crenulata, L. albescens* and *L. dispersa* growing on concrete and limestones (Fig. 2).

Specimens examined: **Ee 65**: site 22; **Ee 66**: site 24; **Ee 76**: site 73; **Ee 77**: sites 66 (leg. BH, SK 1957; det. KC), 43 (leg. SC, AŁ 1997).

Clypeococcum hypocenomycis D. Hawksw. – on thallus *Hypocenomyce scalaris* growing on *P. sylvestris, Larix polonica, A. alba* and *Quercus robur.*

Specimens examined: **Ee 65**: site 22; **Ee 66**: sites 15 (det. KC), 24 (leg. BH, SK 1957, 1959), 25, 26, 27; **Ee 76**: site 39 (det. KC); **Ee 77**: sites 54 (leg. BH, SK 1958), 55 (leg. SC 1962), 65 (leg. BH, SK 1957).

Illosporium carneum Fr. – on thallus of *Peltigera didactyla* var. *didactyla* growing on soil (Fig. 2).

Specimen examined: **Ee 77**: site 44 (det. KC).

Lichenoconium erodens M. S. Christ. et. D. Hawksw. – on thalli *Lecanora conizaeoides, Cladonia furcata, C. fimbriata, C. cenotea, C. digitata, C. coniocraea, Pseudevernia furfuracea, Hypocenomyce scalaris, Pertusaria hemisphaerica, Hypogymnia physodes, Lecanora intumescens, Physcia tenella, Ph. adscendens, Imshaugia aleurites, Flavoparmelia caperata, Parmelia sulcata* and *Evernia prunastri* growing on *A. alba, L. polonica, P. sylvestris, Q. robur, Q. petraea, A. glutinosa, Sorbus aucuparia, F. sylvatica, Betula pendula, Salix fragilis* and lignum (Fig. 3).

Specimens examined: **Ee 65**: sites 1, 3, 4 (leg. MS 1960, det. KC; leg., det. AŁ 2001), 11, 22, 23; **Ee 66**: sites 15 (det. KC, det. AŁ), 24 (leg. BH, SK 1959, det. KC;

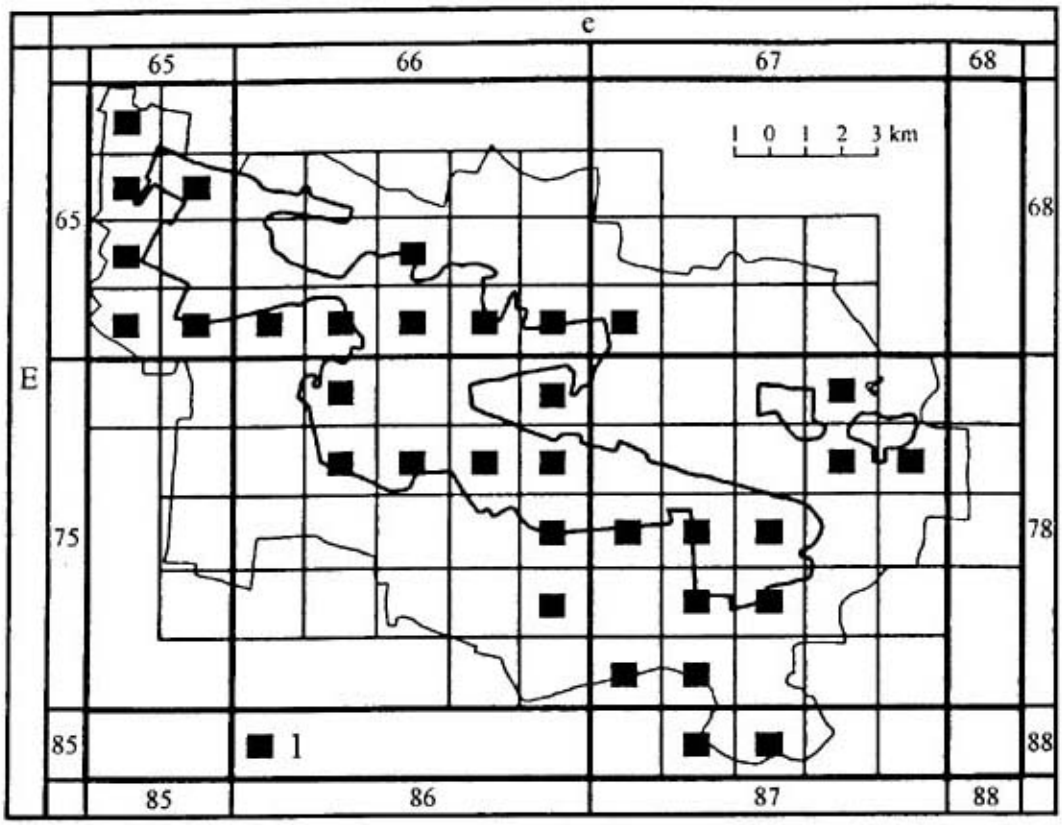

Fig. 3. Distribution of *Lichenoconium erodens* (1)

leg., det. AŁ 2001), 25 (leg. BH, SK 1958, AŁ 2000), 26 (leg. SC 1985, AŁ 2001), 27, 28; **Ee 67**: site 29; **Ee 76**: sites 36, 39 (det. KC), 47 (leg. SC 1965, det. AŁ; leg. AŁ 2000), 48, 49, 50, 62, 74; **Ee 77**: sites 43, 54 (leg. BH, SK 1958, AŁ 2001), 55 (leg. SC 1965), 63, 64, 65 (leg. SC 1965, AŁ 2000), 76, 77, 82, 83; **Ee 87**: sites 87, 88.

Lichenoconium lecanorae (Jaap) D. Hawksw. – on apothecia and sometimes on thalli of *Lecanora conizaeoides, L. carpinea, L. argentata, L. albescens, L. subrugosa, L. intumescens, Evernia prunastri, Caloplaca saxicola* growing on *P. sylvestris, A. alba, F. sylvatica, L. polonica, Q. robur, Q. petraea, A. glutinosa, S. aucuparia, B. pendula, Populus tremula, Acer pseudoplatanus, Vaccinium myrtillus,* lignum and mortar.

Specimens examined: **Ee 65**: sites 3, 4 (leg. BH, SK 1957, det. AŁ; leg. MS 1960, det. KC; leg., det. AŁ 2001), 11, 23; **Ee 66**: sites 6, 13, 15, 25, 26 (leg. SC 1963, AŁ 2001), 27; **Ee 67**: sites 29 (det. KC); **Ee 76**: sites 36 (leg. BH, SK 1957, SC 1963, AŁ 2000), 39, 47, 48, 50, 61, 74; **Ee 77**: sites 43, 51, 64 (det. KC), 65 (leg. BH, SK 1958, SC 1982, AŁ 2001), 66 (leg. BH, SK 1957), 77; **Ee 87**: sites 87, 88.

Lichenoconium pyxidatae (Oudem.) Petr. et Syd. – on *Cladonia ochrochlora* and *C. cervicornis* ssp. *verticillata* growing on lignum and soil.

Specimens examined: **Ee 76**: sites 48, 73 (det. KC); **Ee 77**: site 55.

Lichenodiplis lecanorae (Vouaux) Dyko et D. Hawksw. – on apothecia of *Lecanora saligna* and *L. umbrina* growing on *A. alba, B. pendula* and *Q. robur* (Fig. 4).

Specimens examined: **Ee 66**: site 27; **Ee 77**: sites 43 (leg. SC 1965), 64; **Ee 67**: site 49.

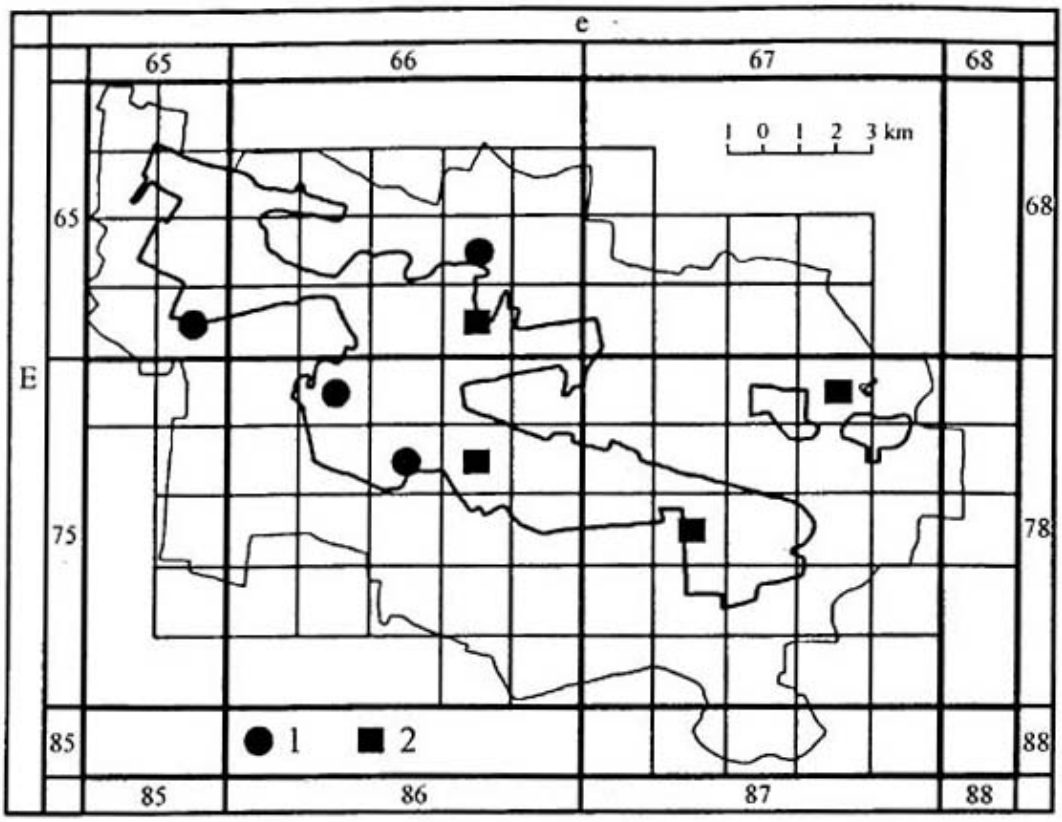

Fig. 4. Distribution of *Tremella cladoniae* (1) and *Lichenodiplis lecanorae* (2)

Muellerella lichenicola (Sommerf.: Fr.) D. Hawksw. – on thalli of *Porpidia macrocarpa*, *P. tuberculosa*, *Lecanora intricata*, *Rhizocarpon geographicum* and *Rh. polycarpum* growing on acidic stones (Fig. 2).

Specimens examined: **Ee 76**: sites 36 (leg. BH, SK 1959, AŁ 2000), 48, 49 (leg. SC 1982); **Ee 77**: sites 51, 64, 65 (leg. BH, SK 1957, det. JM; leg. BH, SK 1957, 1958, SC 1965, AŁ 2000).

Phoma cytospora (Vouaux) D. Hawksw. – on thalli of *Hypogymnia physodes* and *Platismatia glauca* growing on *P. sylvestris*, *Q. robur*, *Q. petraea*, *A. alba*, *B. pendula* and lignum.

Specimens examined: **Ee 65**: sites 11, 23; **Ee 66**: sites 25, 26, 27; **Ee 76**: site 47; **Ee 77**: site 42; **Ee 87**: sites 87 (det. KC), 88.

Stigmidium congestum Triebel in Rambold et Triebel – on apothecia of *Lecanora subrugosa* and *L. argentata* growing on *P. tremula*.

Specimen examined: **Ee 76**: site 36 (leg. SC 1963, rev. JM).

Tremella cladoniae Diederich et M. S. Christ. – on *Cladonia rei*, *C. cornuta*, *C. coniocraea* and *C. ochrochlora* growing on lignum and *P. sylvestris* (Fig. 4).

Specimens examined: **Ee 65**: site 23; **Ee 66**: site 16; **Ee 76**: sites 36 (leg. SC 1983), 48 (det. KC).

Tremella hypogymniae Diederich et M. S. Christ. – on thalli of *Hypogymnia physodes* and *H. tubulosa* growing on *A. glutinosa*, *P. sylvestris*, *S. aucuparia*, *Q. robur*, *B. pendula*, *A. alba*, *L. polonica*, and lignum.

Specimens examined: **Ee 65**: site 23; **Ee 66**: sites 16 (leg. SC 1982), 25 (leg. BH, SK 1957), 26, 28; **Ee 67**: sites 36 (leg. BH, SK 1958, det. KC), 38, 48, 49; **Ee 77**: sites 65 (leg. BH, SK 1957, SC 1982), 77, 85.

Tremella lichenicola Diederich – on thallus of *Mycoblastus fucatus* growing on *F. sylvatica, A. glutinosa, A. pseudoplatanus* and *S. aucuparia.*

Specimens examined: **Ee 65**: sites 11, 12; **Ee 66**: sites 26 (det. KC), 48; **Ee 77**: site 64 (leg. SC 1983, AŁ 2000).

Vouauxiella lichenicola (Linds.) Petr. et Syd. – on apothecia and on thallus of *Lecanora pulicaris, L. argentata* and *L. intumescens* growing on *F. sylvatica, Carpinus betulus, Tilia cordata, S. aucuparia* and *A. pseudoplatanus.*

Specimens examined: **Ee 76**: sites 36 (leg. BH, SK 1958, SC 1982), 37, 49 (leg. SC 1982), **Ee 77**: sites 64 (leg. BH, SK 1959, AŁ 2001), 65 (leg. BH, SK 1957, 1958, SC 1964, 1982).

"*Phlyctis erythrosora* Erichsen" – on *L. polonica, Q. robur, F. sylvatica, P. tremula, A. pseudoplatanus* and on *C. betulus.*

Specimens examined: **Ee 65**: site 4 (leg. MS 1960); **Ee 66**: sites 15 (leg. SC 1982), 16 (leg. BH, SK 1957), 25 (leg. BH, SK 1957, SC 1963), 26 (leg. SC 1963), 28 (leg. SC 1982); **Ee 76**: sites 36 (leg. BH, SK 1957), 62 (leg. SC 1982); **Ee 77**: sites 43 (leg. SC 1963), 54 (leg. BH, SK 1957, SC 1982), 55 (leg. BH, SK 1957, SC 1982), 64 (leg. BH, SK 1957), 65 (leg. BH, SK 1957, SC 1963, 1982) (see also Hawksworth and Diederich 1991 and Czyżewska et al. 2001).

CONCLUSIONS

The majority of the lichenicolous fungi recorded are species common both in the ŚNP and in Poland (Czyżewska 1998, 2002; Kukwa and Motiejūnaitė 1999; Kukwa 2000a; Czyżewska et al. 2001). The species that belong to *Deuteromycotina* were most numerous (50%), while species that belong to *Basidiomycotina* (31%) and *Ascomycotina* (19%) were significantly less frequent. *Lichenoconium erodens* – 33 sites (Fig. 3), *L. lecanorae* – 26, and *Athelia arachnoiedea* – 26, were the most frequent species in the study area. They occur on almost all tree species, and most frequently develop on thalli and fruit-bodies of common lichen, *Lecanora conizaeoides*.

Some lichenicolous fungi, recorded only in individual localities, have distinct habitat preferences. *Muellerella lichenicola*, which grows on crustaceous lichens, occurs on the acidic rock substrate (Fig. 2). Block fields of quartzitic sandstones in the ridge of Łysogórskie Range are the main places of its occurrence. The species may also occur in block fields of other ridges, such as the Jeleniowskie Range. *Bispora christiansenii* (Fig. 2) grows on fruit-bodies of crustaceous lichens that develop on natural and anthropogenic rock limestone substrates. The localities of this species within the ŚNP are distributed chiefly in the outline of the Park and in limestone outcrops.

Stigmidium congestum and *Muellerella lichenicola* (Fig. 2), very rare species in Poland, deserve special attention. In the past, localities of *Stigmidium congestum* were recorded in Lower Silesia and Beskid Śląski Range, where the species occurred on apothecia of *Lecanora chlarotera* (Starmachowa and Kiszka 1965). *S. congestum* is also known from Lithuania (Motiejūnaitė et al. 1998; Motiejūnaitė 1999), where the species occurs on thalli and apothecia of *Lecanora carpinea* and *L. caro-*

inea. *Muellerella lichenicola*, as well as *M. pygmaea*, was also recorded in Slovakia (Lisická and Lackovičová 1999).

All the recorded lichenicolous fungi occurred in the area studied in the past (herbarial material). *Stigmidium congestum* was not found during these studies. The species may still occur but may have been overlooked during field studies.

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Przyczynek do grzybów naporostowych występujących w Świętokrzyskim Parku Narodowym (Polska Środkowa)

Streszczenie

Grzyby rozwijające się na plechach i owocnikach porostów nie były dotychczas podawane ze Świętokrzyskiego Parku Narodowego (ŚPN), a także z Gór Świętokrzyskich. W pracy przedstawiono 16 gatunków grzybów naporostowych występujących na terenie ŚPN i jego strefy ochronnej.

Materiał badawczy pochodzi z dwóch źródeł: z badań własnych przeprowadzonych w latach 1999-2001 oraz z materiałów zielnikowych zgromadzonych w latach 1955-1959 przez B. Halicza i S. Kuziel, w roku 1960 przez M. Sroczyńskiego i w latach 1962-1985 przez S. Cieślińskiego.

Większość stwierdzonych grzybów naporostowych to gatunki pospolite w ŚPN i w całej w Polsce. Najliczniejszą grupę stanowią gatunki należące do *Deuteromycotina* (50%), znacznie mniej – do *Basidiomycotina* (31%) oraz – do *Ascomycotina* (19%). Gatunkami najpospolitszymi na badanym terenie są *Lichenoconium erodens* – 33 stanowiska, *L. lecanorae* – 25 oraz *Athelia arachnoidea* – 26. Niektóre gatunki grzybów naporostowych wykazują wyraźne preferencje siedliskowe. *Muellerella lichenicola* rośnie na porostach skorupiastych występujących na kwaśnym podłożu skalnym na gołoborzach piaskowców kwarcytowych. *Bispora christiansenii* porasta owocniki skorupiastych porostów rozwijających się na wapiennym podłożu skalnym naturalnym lub pochodzenia antropogenicznego. Na szczególną uwagę zasługują *Muellerella lichenicola* oraz *Stigmidium congestum* gatunki bardzo rzadko podawane z terenu Polski.