ACTA MYCOLOGICA
Vol. 35 (2): 217–241
2000

Macromycetes of various habitats of the nature reserve "Łężczok" near Racibórz (SW Poland)

MAREK HALAMA[1] and EUGENIUSZ PANEK[2]

Department of Taxonomy and Phytosociology, Institute of Botany, University of Wrocław
Kanonia 6/8, PL-50-328 Wrocław, Poland
[1] marhalamculex.biol.uni.wroc.pl
[2] panekebiol.uni.wroc.pl

H a l a m a M., P a n e k E.: *Macromycetes of various habitats of the nature reserve "Łężczok" near Racibórz (SW Poland)*. Acta Mycol. 35 (2): 217–241, 2000.

In the paper the results of two years' mycological studies carried out in the "Łężczok" reserve are presented. Due to specific habitat diversity an interesting distribution model of some fungal taxa was observed. The data on each taxon include: abundance, type of substrate, type of habitats and information on fruit-bodies occurrence.

Key words: macromycetes, *Ascomycota*, *Basidiomycota*, nature reserve Łężczok.

INTRODUCTION

First mycological data concerning the higher fungi of the "Łężczok" reserve one can find in the E i s e n r e i c h's (1924) and S e n d e k's (1966) works. They mention the following six species: *Armillaria mellea* (Vahl.: Fr.) Kumm., *Laetiporus sulphureus* (Bull.: Fr.) Murrill, *Peniophora quercina* (Fr.) Cooke, *Daedalea quercina* L.: Fr., *Phellinus igniarius* (L.: Fr.) Quél. and *Lycoperdon perlatum* Pers.: Pers. The data presented in the B a d u r a's paper (1964) concern the studies on soil *micromycetes*. Later data, which is included in notes, namely in those of W o j e w o d a (1981), S z c z e p k a (1985) and S o k ó ł, S z c z e p k a and T r z ą s k i (1986), present preliminary observations on macromycetes. At last, in the T r z ą s k i's work (1994) a detailed analysis of mainly lignicolous fungi occurring within the "Polish Hussars Alley" and the side alleys is presented.

This paper is the first attempt to present the results of comprehensive study on macromycetes in the "Łężczok" reserve.

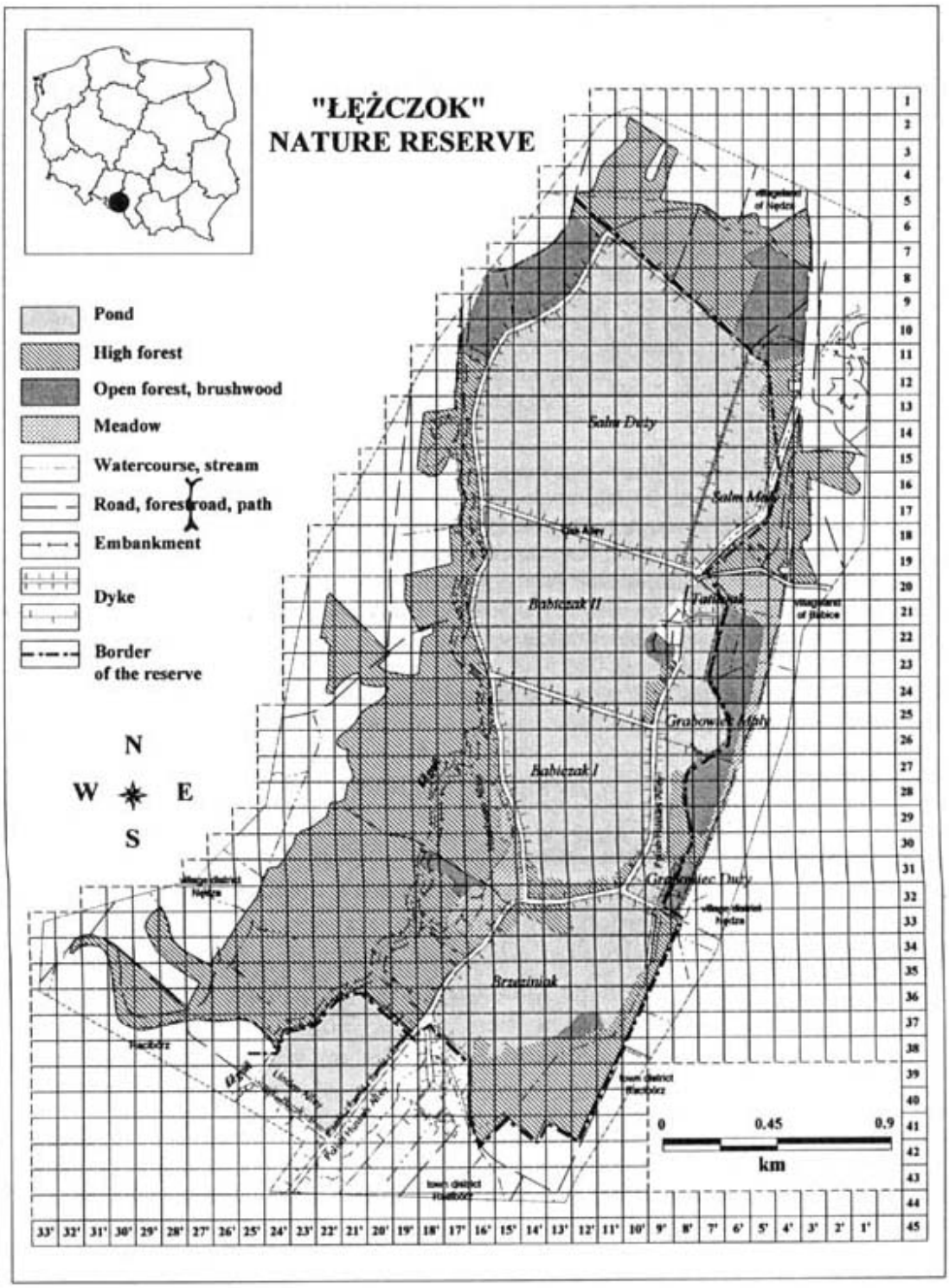

Fig. 1. Map of the investigated area

STUDY AREA

The reserve was established in 1957 in order to preserve a fragment of almost primeval nature remnants within significantly changed landscape of the upper Oder Valley. Preservation of natural standings of protected animal and plant species and conservation of a small part of riverside forest are the main purposes of the reserve existence.

The Łężczok reserve (Fig. 1) lies about 5 km to the northeast from Racibórz and is situated on the right bank of the Oder River. The reserve is situated within the boundaries of the "Cysterskie Kompozycje Krajobrazowe" Landscape Park. The territory of the Landscape Park is situated within the Racibórz Basin. With regard to the administrative aspect, the Łężczok reserve is situated within the boundaries of the present Silesia Province and within the Nędza commune. It covers 244.59 ha of ponds, 136.25 ha of forests, 7.35 ha of meadows and 23.69 ha of roads and dykes; the total area amounts to 408.88 ha (S e n d e k 1986).

The woodland and pond reserve shows great variety of habitats and plant communities. The west part of the reserve is covered by deciduous forest identified as the *Tilio-Carpinetum* association with a rich undergrowth and tree stand containing various species, predominantly *Carpinus betulus*, *Quercus robur* and *Tilia cordata*. In the eastern part with relatively high ground humidity, *Carici elongatae-Alnetum* as well as *Circaeo-Alnetum* phytocoenoses are preserved. Moreover, in the southwestern and southeastern parts of the forest complexes small pieces of coniferous monocultures are present. On the edge of the forests, pieces of the *Pruno-Crataegetum* association and thin communities of trees and shrubs occur. Communities of the alliance *Molinion*, *Calthion*, *Arrhenatherion*, *Cynosurion* and *Filipendulo-Petasition*, occupy a large part of the meadow area. The area surrounding the Łężczok reserve is a potential habitat of oak-lime-hornbeam forests and ash-alder flood plain forests (K r a w i e c o w a and K u c z y ń s k a 1964; B e r d o w s k i 1973; S e n d e k 1986; W i k a 1994).

METHODS AND DESCRIPTION OF THE STUDIED HABITATS

Macromycetes were studied during the period of two years (1997 – 1998). Less intense mycological observations were also carried out during the vegetative season of 1999. Observations were made once or twice a month. Due to the flooding in 1997 the area of the reserve was partly inaccessible and observations were difficult. The studied area included various types of habitats situated within the boundaries of the reserve and its nearest surroundings. During the observations plant communities were not defined. The hitherto existing phytosociological data were accepted (K r a w i e c o w a and K u c z y ń s k a 1964; B e r d o w s k i 1973; S e n d e k 1986; W i k a 1994) to analyse the occurrence of fungal taxa on the background of various habitats. The following types of habitat were selected (Fig. 1):

h i g h f o r e s t (H F): well developed forest complexes mostly representing oak-lime-hornbeam forest (*Tilio-Carpinetum*), bog-alder forest (*Carici elongatae-Alnetum*) and ash-alder flood plain forest (*Circaeo-Alnetum*) as well as forest communities with distortions and disturbances in their structure (mostly with the presence of coniferous trees);

o p e n f o r e s t (O F): thin communities of trees and shrubs, phytocoenoses of *Salici-Franguletum*, thicket communities of *Pruno-Crataegetum* that grow in the form of forest fringes as well as within the high forest complexes in the over-lighted places;

m e a d o w s (M S): various meadow communities mostly of the alliances *Molinion*, *Calthion*, *Arrhenatherion*, *Cynosurion* and *Filipendulo-Petasition*;

r o a d s (R S): mostly forest roads, forest paths and roadsides;

d y k e s (D S): alleys and their sides covered with specific vegetation representing, among other associations, *Euonymo-Coryletum*, *Pruno-Crataegetum*; *Urtico-Aegopodietum*, *Antriscetum sylvestris*, *Chaerophylletum aromatici*, *Torilidetum japonicae*, *Agropyro-Urticetum dioicae*, *Lolio-Plantaginetum*.

The analysis of substrates and growth forms of fruit-bodies is a basis for the classification of fungi into eight main ecological groups (F l i s i ń s k a 1997; F r i e d r i c h 1997). These are: t – terrestrial fungi (mycorrhizal, and humicolous saprotrophes); l – fungi on litter; m – fungi among bryophytes; g – fungi among grasses and on their remains; w_1 – fungi on fallen twigs and bits of wood; w_2 – fungi on rotten roots, on fallen branches, on logs, stumps and trunks; w_3 – fungi on roots, branches, logs and trunks of living trees and shrubs; p – fungi on fruit-bodies of other macromycetes.

Distribution of the ecological groups in particular habitats is presented in Fig. 2.

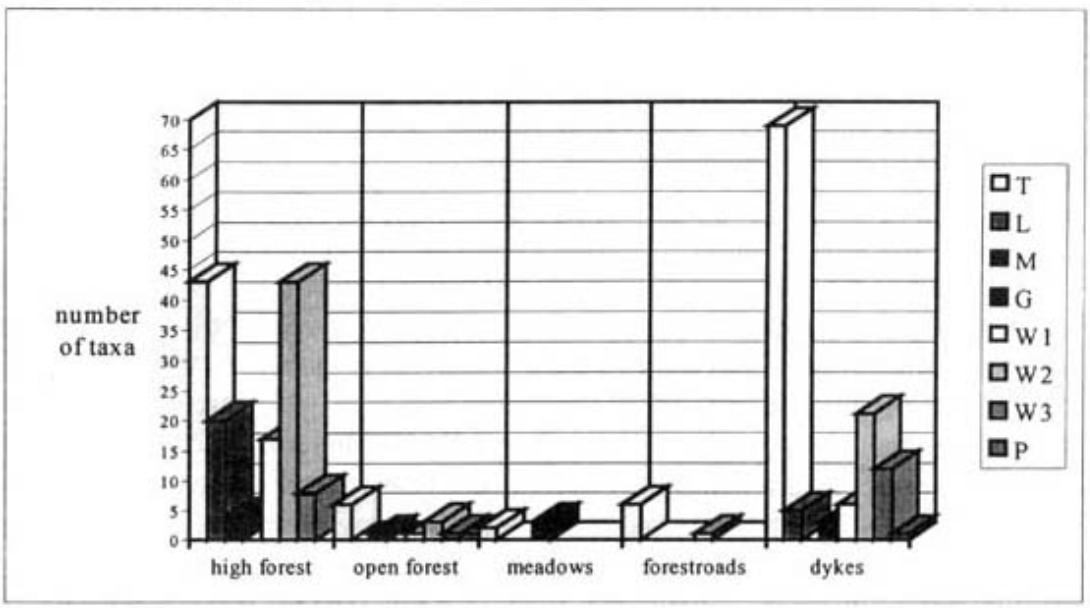

Fig. 2. The participation of ecological groups (T, L, M, G, W1, W2, W3, P) in particular type of habitats

Abundance of fructification of individual taxa were noted and designed after modifing the scale given by Nespiak (1959). The number of fruit-bodies which were recorded in the site during the observation was presented in the following way: + 1 fruit-body, I 2–5 fruit-bodies, II 6–20 fruit-bodies, III 21–100 fruit-bodies, IV 101–500 fruit-bodies, V > 500 fruit-bodies.

The sygnature maping and carthogram method were applied to illustrate the sites of recorded taxa. The investigated area was divided into the net of 100 × 100 m squares. One square was considered as one site (Fig. 1.). This enabled precise location of species and also will be helpful in the future.

For better illustrating, distribution of some recorded taxa in the studied area have been shown using sygnature method. The grid of squares was omited and the presence of at least one site of a taxon was marked by a sign in the shape of circle. The circle is equivalent with one square where the taxon was recorded (Fig. 3).

Colour pictures of the selected are also presented (Figs. 4–15).

Dry collection of gathered fungi was deposited in the herbarium of the Natural Museum of the Wrocław University (WRSL).

ANALYSIS OF THE MACROMYCETES

Taxonomic spectrum. According to the accessible data until 1994 about 69 taxa in the rank of species or variety had been known from the reserve.

During the years 1997–1999, 222 macromycetes taxa were recorded, among them 180 were new for the investigated area. Twenty-seven taxa reported earlier from the reserve were not found. Among the 222-recorded taxa, 212 were identified to species, 9 to genus and 2 to variety.

Basidiomycota dominate in the mycofolora of the area, constituting over 92% of the total number of taxa. Within this phyllum 9 orders are represented, and *Agaricales* are the most numerous (147 taxa) (Table 1). The collected specimens belong to 105 genera, among which the richest are: *Russula* – 12 species, *Boletus* – 10, *Mycena* – 10 and *Lactarius* – 9.

The observed fungi occupied a variety of habitats and that is a reflection of their life forms (Table 1). The most numerous ecological group in the investigated area are overground fungi. Ninety-nine taxa of the collected macromycetes belong to terrestrial fungi (t), represented by 68 mycorrhizal taxa and 31 taxa of humicolous saprotrophes. Less numerous are fungi growing on litter (l), which include 21 taxa. Arboreal fungi (91 taxa) grow on dead or living wood. Although most are saprobic (75 taxa), some are parasitic or pathogenic on trees and shrubs (16 taxa).

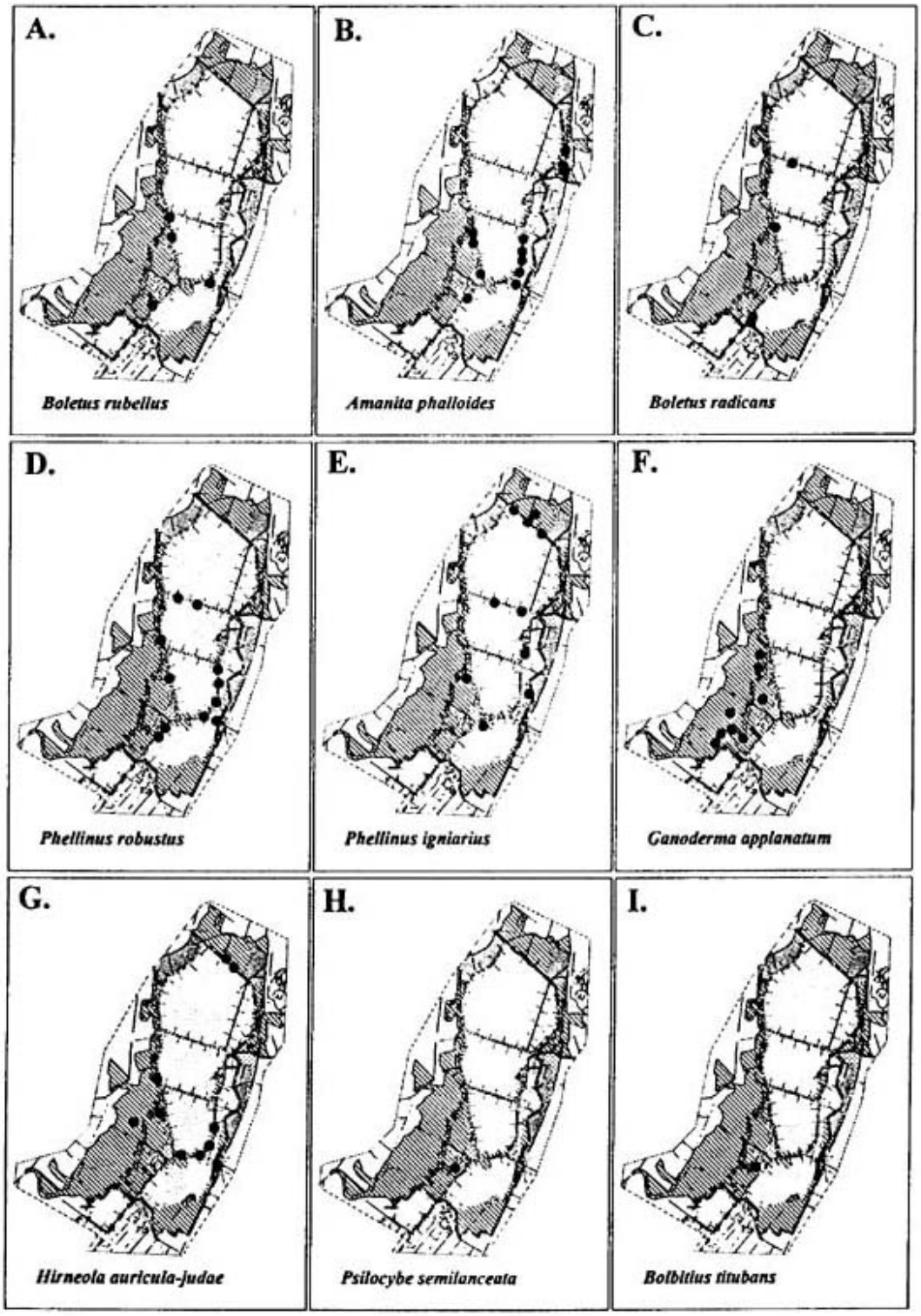

Fig. 3. Example sygnature maps of taxa distribution

Table 1
Numerical participation of recorded taxa in particular ecological groups and orders

Orders	ECOLOGICAL GROUPS									Total
	Overground			Arboreal			Other substrates			
	Rhizobionts	Saprotrophes		Saprotrophes		Parasites				
	T		L	W_1	W_2	W_3	G	M	P	*
Xylariales					3					3
Helotiales				1	1					2
Pezizales	1	6	2	2						11
Tremellales				1	1					2
Auriculariales	1				1					
Dacrymycetales				1	2					3
Agaricales	63	17	18	9	26	3	6	4	1	147
Aphyllophorales	2	2		4	21	12				41
Lycoperdales		5	1		1					7
Sclerodermatales	2									2
Phallales		1								1
Nidulariales				2						2
Total	68	31	21	20	55	16	6	4	1	
	120			91			11			222

* To find an explanation for symbols: T, L, W_1, W_2, W_3, G, M., P – see methodological remarks.

The macromycetes of explored area contain 4 species protected by law and 31 species listed in the Red list of threatened macrofungi in Poland (W o j e w o d a and Ł a w r y n o w i c z 1992). The protected species are *Boletus parasiticus* (Fig. 4), *Grifola frondosa*, *Meripilus giganteus* and *Phallus impudicus*.

Four species that belong to the Endangered (E) category were found: *Boletus radicans* (Fig. 5), *Bovista colorata*, *Ganoderma resinaceum* (Fig. 9) and *Phellinus torulosus*. The category Vulnerable (V) is represented by seven species: *Boletus edulis*, *Fistulina hepatica*, *Grifola frondosa*, *Hypholoma myosotis*, *Inonotus dryadeus*, *Leccinum melaneum* and *Xerula pudens*. The categories: Rare (R) and Indeterminate (I) are represented by ten species each. The following rare species were found: *Boletus parasiticus*, *Choiromyces meandriformis*, *Entoloma pleopodium*, *Ganoderma lucidum*, *Geastrum fimbriatum*, *Macrotyphula fistulosa* (Fig. 12), *Micromphale foetidum*, *Paxillus filamentosus*, *Pleurotus dryinus* and *Russula violeipes*. Indeterminate species are represented by: *Cantharellus cibarius*, *Lactarius lacunarum*, *Lycoperdon echinatum*,

Macrolepiota procera, *Macrolepiota rhacodes*, *Pluteus hispidulus*, *Pluteus pseudoroberti*, *Psathyrella corrugis* (Fig. 13), *Psilocybe squamosa* and *Volvariella bombycina* (Fig. 15).

Distribution of macromycetes within the reserve. An interesting diversity of habitats within the Łężczok reserve makes possible to perceive several essential relationships between fungi and accessible ecological conditions that they are depending on.

Habitat diversity as a result of an effect of various factors is the cause of an interesting distribution model of particular fungal taxa.

Large group of macromycetes is clearly connected to the following types of habitats: high forest, open forest, meadows, forest road and dykes. During the observations 89 taxa were noted exclusively within the high forest, 8 in the areas of open forest, 3 in meadows, 2 on forest roads and 66 only on dykes.

In general the majority of taxa were recorded within the high forest (135) and on dykes (117). Considerably fewer numbers of taxa were noted in the other types of habitats: 13 – within the open forest, 5 – on meadows and 8 – on forest roads.

The high forest habitats occupy the greatest part of Łężczok land area and provide macromycetes with necessary developmental conditions. These areas are abundant with woody and plant remains. Usually their taxonomic diversification in respect of higher plants is also high. Trees and shrubs function as a mycorrhizal hosts or refuge for wood-inhabiting fungi (including pathogens).

The most numerous ecological groups in the investigated forests are overground fungi and saprotrophes inhabiting decaying dead wood and bark; fungi growing on litter were also recorded frequently (Fig. 2).

A large number of recorded macromycetes occurred in the habitats of oak-hornbeam forests. Many of them were also noted in patches of various subassociations of *Tilio-Carpinetum* (Ławrynowicz 1973; Lisiewska 1979; Gumińska 1992; Flisińska 1997; Skirgiełło 1998; Wojewoda, Heinrich and Komorowska 1999) and *Galio-Carpinetum* (Lisiewska and Połczyńska 1998) in other regions in Poland. The fructifications of the following species were observed most frequently: *Collybia dryophila*, *Cyathus striatus*, *Daedalea quercina*, *Ganoderma applanatum* (Fig. 3 G), *Inocybe geophylla*, *I. geophylla* var. *lilacina*, *Marasmius quercophilus*, *M. rotula*, *Mycena galericulata*, *M. inclinata*, *M. vitilis*, *Russula cyanoxantha*. Worth of mentioning are also some species rarely found in Poland, such as: *Choiromyces meandriormis*, *Ganoderma lucidum* and *Psilocybe thrausta*.

Within the habitats referred to ash-alder flood plain forest and bog-alder forest common taxa that have been also noted by others in various types of flood-plain forests (Bujakiewicz 1992, 1999; Bujakiewicz and Fiebich 1992) occurred. These were: *Daedaleopsis confragosa*, *Hirneola auricula-judae*, *Naucoria submelinoides*, *Paxillus involutus*, *Pholiota alnicola*,

Fig. 4. *Boletus parasticus*

Fig. 5. *Boletus radicans*

Fig. 6. *Bulgaria inquinans*

Fig. 7. *Clavulina cinerea*

Fig. 8. *Cyathipodia macropus*

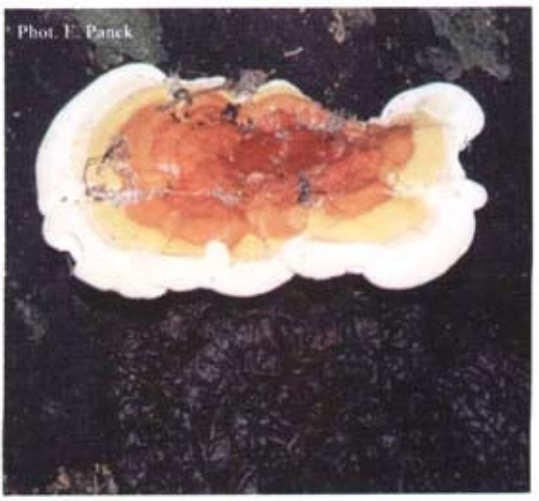

Fig. 9. *Ganoderma resinaceum*

Fig. 10. *Hohenbuehelia mastrucata*

Fig. 11. *Leptopodia koltzchiana*

Fig. 12. *Macrotyphula fistulosa*

Fig. 13. *Psathyrella corrugis*

Fig. 14. *Psilocybe semilanceata*

Fig. 15. *Volvariella bombycina*

Scutellinia scutellata. Also several rare or interesting species, namely: *Clavicorona pyxidata*, *Hypholoma myosotis*, *Laccaria proxima*, *Lactarius lacunarum*, *Leccinum melaneum*, *Otidea alutacea*, *Peziza saccardiana*, *Pluteus hispidulus* and *Russula luteotacta* were recorded.

Moreover, it should be emphasized that *Hirneola auricula-judae* is most frequently associated in the studied area with *Sambucus nigra*. Common elder is one of the components of the unnatural vegetation occupying sides of dykes and alleys. Thus the fungus occurs mainly within the phytocoenoses that arisen as a result of human activity (Fig. 3 G). The fact confirms W o j e w o d a's (1977) opinion that nowadays the species is not found in natural plant communities.

Dykes compared to forest complexes occupy considerably smaller area. The presence of a great number of aged trees, especially oaks and accompanying plant communities as well as abiotical factors having specific effect (elevation above the surface of ponds, vicinity of ponds, exposure to the sun, temperature, humidity, winds) and human activity, determine excellent conditions and refuge for terrestrial fungi and arboreal parasites. Among the distinguished habitats just on the dykes the fungi were observed most frequently and were most numerous (Fig. 2).

Pathogenic species thrive mainly on aged trees, especially on the specimens weak as a result of shortage of water, limiting amount of light, extensive mechanical harm of roots, trunks and treetops. Such trees are most numerous on the dykes. That explains frequent and numerous occurring on alley trees of the following fungi: *Fomes fomentarius*, *Laetiporus sulphureus*, *Phellinus igniarius* (Fig. 3 E), *P. robustus* (Fig. 3 D), *Schizophyllum commune* and *Trametes* sp. div. The species are specialized to enter wounds in living trees and to make their way to the heartwood. This happens in many specimens of trees when the lower branches become shaded and die. After falling off, the heartwood is exposed allowing the fungi to entry. According to T r z ą s k i (1994) heart rot fungi are the most important parasites causing extensive breaks of oak branches.

On the dykes several rare and very rare as well as interesting taxa of lignicolous fungi occurred. The species were recorded mostly on oaks. Here is the only locality of *Phellinus torulosus* in Poland (T r z ą s k i 1994). The fruit-bodies of this mycological curiosity were twice noted on living and dead trees. Also, the fruit-bodies of *Ganoderma resinaceum* (Fig. 9) and *Grifola frondosa* were rarely observed. *Fistulina hepatica* was observed more frequently. Moreover, on oak log fruit-bodies of *Hohenbuehelia mastrucata* (Fig. 10), a very interesting fungus because of its morphological and anatomical characters, were recorded. Finally, a few fruit-bodies of *Meripilus giganteus* were recorded at bases of *Fagus sylvatica*.

The occurrence of many specimens of robust trees is probably one of various factors determining the occurrence of many species of mycorrhizal fungi. Evidently due to the local extremely favourable developmental conditions the occurrence of these fungi is limited just to dykes. These are, among other fungi,

various species of *Amanita*, *Boletus*, *Inocybe*, *Cortinarius*, *Laccaria*, *Leccinum*, *Russula*, *Scleroderma*, *Tricholoma* as well as *Gyroporus castaneus* and *Paxillus filamentosus* (Fig. 3 A, B, C). It is worth mentioning that many *Boletus* species were recorded, especially thermophilous *Boletus aereus* as well as *B. radicans* (Fig. 3 C, Fig. 5) and also *B. rubellus* (Fig. 3 A). The observed fungi display multiple, often difficult to trace relationships and connections with local dendroflora. The largest number of taxa is associated with the following tree species: *Quercus robur*, *Qu. petraea*, *Betula pendula*, *Alnus glutinosa* and *Populus tremula*.

The fungi appearing within the areas of open forest belong to various ecological groups and two different categories. The first includes the taxa connected with various plant communities referred to flood-plain forests and preceding succession stage (*Salici-Franguletum*), with relatively high ground humidity. These are: *Clavulina cristata*, *Otidea alutacea*, *Peziza saccardiana*, *Galerina* sp. and *Pluteus* sp. The second category is mostly connected with thicket communities of various dynamic aspects of *Pruno-Crataegetum*, where *Calocera cornea*, *Dacrymyces stillatus*, *Leccinum scabrum* and *Volvariella bombycina* (Fig. 15) were noted.

The forest roads, roadsides and meadows studied within the forest and brushwood complexes were characterized with fewer numbers of species. These are, first of all, the fungi of grassy areas or fungi growing on grass remnants. Various grass communities occur within the meadows, forest roads as well as partially within dykes. Exclusively among grasses the fruit-bodies of *Psilocybe semilanceata* (Fig. 14), *Stropharia coronilla*, *Calvatia excipuliformis*, *Coprinus comatus*, *C. xanthothrix* and *C. plicatilis* were found. The first two were noted only in meadow areas (Fig. 3 H). *Bolbitius titubans* fructifications that grew on decaying grass remnants also were recorded there (Fig. 3 I). Within the discussed area several species not connected with grass vegetation were observed, too. Most of them are humicolous saprotrophes that occur on the forest roads, such as *Clitocybe nebularis*, *Helvella crispa* and *Macrolepiota procera*. Moreover, exclusively on roadside *Macrotyphula fistulosa* was noted. The fruit-bodies of this species appeared on various remnants of deciduous wood as well as on litter (Fig. 12).

The list of collected taxa is not complete; at least five years long, systematic investigations on permanent plots are necessary.

LIST OF TAXA

Taxonomy and nomenclature of the taxa mentioned in the paper follow well-known publications: Alexopoulos, Mims and Blackwell (1996); Domański (1974–1992), Hansen and Knudsen (1992); Moser (1968, 1983), Rudnicka-Jezierska (1991), and is supplemented by the works of other authors, included in the references.

Explanations: t, l, w_1, w_2, w_3, g, m, p – ecological groups; 1, 2, 7 – number of sites; +, I, II, III, IV, V – degrees of abundance; HF, OF, MS, RS, DS – types of habitats

Ascomycota

Hypocreales

Nectria cinnabarina (Tode.: Fr.) Fr. – T r z ą s k i (1994)

Xylariales

Hypoxylon fragiforme (Pers.: Fr.) Kickx – stromata on logs of *F. sylvatica*; Jan.-Dec. 1997, 1998; w_2; 1: V – HF

Ustulina deusta (Fr.) Petrak – W o j e w o d a (1981)

Xylaria hypoxylon (L.) Grev. – stromata on moss-overgrown stumps of deciduous trees; Sept. 1998; w_2; 2: I – HF, I – OF

Xylaria polymorpha (Pers.) Grev. – stromata on moss-overgrown log of *Quercus* sp., on stumps; July 1998; w_2; 2: III , II – HF

Helotiales

Bisporella citrina (Batsch) Carpent. et Korf – on bits of wood of *Quercus* sp., *C. betulus*; Aug. 1998; w_1; 3: III, II, II – HF

Bulgaria inquinans Fr. – on log of *Quercus* sp.; Aug. 1998; w_2; 1: II – HF

Pezizales

Aleuria aurantia (Fr.) Fuckel – on clay ground; Sept. 1998; t; 1: + – DS

Choiromyces meandriformis Vitt. – fruit-bodies partly buried in the soil; July 1998; t; 1: I – HF

Cyathipodia macropus (Pers.: Fr.) Dennis – on deciduous litter; Aug. 1998; l; 1: + – HF

Helvella crispa (Scop.) Fr. – on ground, among grasses and litter; Sept. 1998; t; 2: I – RS, I – DS

Humaria hemisphaerica (Wiggers: Fr.) Fuckel – on deciduous litter; July 1997, Aug. 1998; l; 1: I – HF

Leptopodia koltzchiana (Corda) Boud. – on ground; Aug. 1998; t; 1: + – DS

Otidea alutacea (Pers.) Mass. – on ground; Aug. 1998; t; 1: + – OF

Otidea onotica (Pers.) Fuckel – on ground; Aug. 1998; t; 1: I – HF

Peziza saccardiana Cke. – on muddy ground, on bits of wood; Aug. 1998; t; 1: I – OF

Peziza varia (Hedw.) Fr. – on ground, on rotten and wet bits of deciduous wood; May 1998; w_1; 1: II – HF

Scutellinia scutellata (L.: St. Amans) Moser – on muddy ground, on wet bits of wood; July 1998; w_1; 2: IV, II – HF

Basidiomycota

Tremellales

Exidia glandulosa (Bull.: St. Am.) Fr. – W o j e w o d a (1981); on log of *F. sylvatica*; on fallen twigs; Feb., July-Sept. 1998; w_1; 2: II, III – HF
Exidia pithya (Alb.: Schw.) Fr. – W o j e w o d a (1981)
Exidia truncata Fr. – W o j e w o d a (1981)
Tremella foliacea (Pers.) Pers. – T r z ą s k i (1994)
Tremella mesenterica Retz.: Fr. – on dead branches of deciduous trees; July 1998; w_2; 2: +, + – HF

Auriculariales

Hirneola auricola-judae (Bull.: St. Am.) Berk. – W o j e w o d a (1981), T r z ą s k i (1994); on twigs of *S. nigra*; Jan.-Dec. 1997, 1998; w_3; 3: I – HF, 7: I – DS

Dacrymycetales

Calocera cornea (Batsch: Fr.) Fr. – on log of *Populus* sp.; July-Aug. 1998; w_2; 1: I – OF
Calocera viscosa (Pers.: Fr.) Fr. – on moss-overgrown stumps of *P. abies;* July-Aug. 1998; w_2; 1: II – HF
Dacrymyces stillatus Nees: Fr. – W o j e w o d a (1981), T r z ą s k i (1994); on bits of deciduous wood; Feb. 1998; w_1; 1: IV – OF

Tulasnellales

Tulasnella pruinosa Bourd. et Galaz: W o j e w o d a (1981)

Agaricales

Agaricus altipes (Moell.) Pilát – on ground – among deciduous litter; Sept. 1998; t; 1: I – HF
Agaricus silvaticus Schaeff.: Secr. – on ground – among deciduous litter; Aug. 1998; t; 1: II – HF
Amanita citrina (Schaeff.) Pers. – on ground – among deciduous litter; July-Aug. 1998; t; 1: II – DS
Amanita fulva (Schaeff.) Pers. – on ground – among deciduous litter; July 1998; t; 2: +, + – HF
Amanita muscaria (L.: Fr.) Hooker – on ground – among deciduous litter; Sept. 1998; t; 2: II, I – DS
Amanita pantherina (DC.: Fr.) Krombh. – on ground – among deciduous litter; July-Sept. 1998; t; 3: III, II, II – DS

Amanita phalloides (Vaill.: Fr.) Link. – T r z ą s k i (1994); on ground – among deciduous litter; July-Sept. 1998; t; 9: II – DS, 3: II – HF

Amanita rubescens (Pers.: Fr.) S.F. Gray – on ground – among deciduous litter; July 1998; t; 3: I, I, II – DS

Amanita vaginata (Bull.: Fr.) Vitt. – on ground – among deciduous litter; July 1998; t; 2: + – RS, + – DS

Armillaria mellea (Vahl.: Fr.) Kumm. – E i s e n r e i c h (1924), S e n d e k (1966), T r z ą s k i (1994); on logs and stumps of *Quercus* sp.; Aug. 1997, 1998; w_2; 4: II – HF, 2: II – DS

Bolbitius titubans (Bull.: Fr.) Fr. – on moist remains of mowed grass; Sept. 1999; g; 1: II – MS

Boletus aereus Bull.: Fr. – T r z ą s k i (1994); on ground, in neighbourhood of *Qu. robur*; July 1998; t; 1: I – DS

Boletus badius (Fr.) Fr. – on ground – among grasses and deciduous litter, in neighbourhood of *Qu. robur*; July-Aug. 1998; t; 3: + – DS, +, I – HF

Boletus bicolor Peck var. *reticulatus* Smith et Thiers – taxon recorded by S o k ó ł et al. (1986)

Boletus edulis Bull.: Fr. – on ground, in neighbourhood of *Qu. robur*; Sept. 1998; t; 2: I, I – DS

Boletus erythropus (Fr.: Fr.) Krombh. – S o k ó ł et al. (1986); on ground, in neighbourhood of *Qu. robur*; Aug. 1998; t; 1: I – HF, I – DS

Boletus luridus Schaeff.: Fr. – on ground, in neighbourhood of *Qu. robur*; Aug. 1998; t; 1: I – DS

Boletus parasiticus Bull.: Fr. – on fruit-bodies of *Scleroderma citrinum*; Aug.-Sept. 1997, 1998; p; 4: II – OF, II, II, I – DS

Boletus pascuus (Pers.) Krombh. – on ground – among deciduous litters, in neighbourhood of *Qu. robur*; July-Aug. 1998; t; 3:I, II, I – DS

Boletus radicans Pers.: Fr. – T r z ą s k i (1994); on ground in neighbourhood of *Qu. robur*; Aug. 1998; t; 4: I, II, II, I – DS

Boletus rubellus Krombh. – on ground – among grasses, in neighbourhood of *Qu. robur*; July 1998; t; 4: II, II, II – DS, III – HF

Boletus subtomentosus L.: Fr. – on ground – among grasses and deciduous litter, in neighbourhood of *Qu. robur*; July-Sept. 1997, 1998; t; 4: I, +, I, I – DS

Boletus suspectus Krombh. – S o k ó ł et al. (1986) as *B. impolitus* Fr.

Clitocybe clavipes (Pers.: Fr.) Kumm. – on ground, among deciduous litter; Sept. 1998; t; 3:II, II – HF, I – DS

Clitocybe gibba (Pers.: Fr.) Kumm. – on deciduous litter; Sept. 1998; l; 3: I, I, I – HF

Clitocybe gilva (Pers.: Fr.) Pat. – on ground – among deciduous litter; Sept. 1998; t; 2: II – HF, I – DS

Clitocybe hydrogramma (Bull.: Fr.) Kumm. – on deciduous litter; Aug. 1998; l; 1: I – HF

Clitocybe nebularis (Batsch: Fr.) Kumm. – on ground – among deciduous litter and grasses; Sept. 1998; t; 2: I – OF, I – RS

Clitocybe odora (Bull.: Fr.) Kumm. – on deciduous litter; July-Aug. 1998; l; 1: I – HF

Clitocybe sp. [sekcja *Candicantes* Quél.] – on deciduous litter; Sept. 1998; l; 1: I – HF

Clitocybe vibecina (Fr.) Quél. – on deciduous litter; Aug. 1998; l; 2: II, II – HF

Collybia butyracea (Bull.: Fr.) Kumm. – on deciduous litter; July-Aug. 1998; l; 3: II, II, II – HF

Collybia dryophila (Bull.: Fr.) Kumm. – on deciduous litter; Aug. 1997, 1998; l; 1: III – DS, 6: III – HF

Collybia fusipes (Bull.: Fr.) Quél. – on ground – at the base of stump of *Qu. robur*; July-Aug. 1997, 1998; w_3; 1: II – HF

Collybia peronata (Bolt.: Fr.) Kumm. – on deciduous litter; July-Aug. 1998; l; 3:; I, III, II – HF

Coprinus atramentarius (Bull.: Fr.) Fr. – on ground – near rotten log of *Quercus* sp.; July 1998; w_2; 1: I – HF

Coprinus comatus (Müll.: Fr.) Pers. – on ground, among grasses; July-Aug. 1998; t; 3: I – MS, I – RS, II – DS

Coprinus micaceus (Bull.: Fr.) Fr. – on rotten bits of deciduous wood; July 1998; w_1; 1: I – HF

Coprinus plicatilis (Curt.: Fr.) Fr. – on ground (on plant remains) – among grasses; Aug. 1998; g; 1: I – DS

Coprinus xanthothrix Romagn. – on clay ground (on plant remains ?) – among grasses; Sept. 1998; g; 1: + – DS

Cortinarius sp. [subgen. *Telamonia*] – on ground; Sept.: 1998; t; 2: IV, III – DS

Cortinarius sp. [subgen. *Telamonia*] – on ground; Sept. 1998; t; 2: III, II – DS

Cortinarius sp. [subgen. *Phlegmacium*] – on ground; Sept. 1998; t; 1: + – HF

Crepidotus mollis (Bull.: Fr.) Staude – on rotten trunk of *A. glutinosa*; June, Sept. 1998; w_2; 1: II – HF

Crepidotus variabilis (Pers.: Fr.) Kumm. – on fallen twigs of deciduous trees; Sept. 1998; w_1; 2: II, II – HF

Delicatula integrella (Pers.: Fr.) Fayod – on a damp bit of wood (stump of deciduous tree); July 1998; w_2; 1: I – HF

Entoloma pleopodium (DC.: Fr.) Noordel. – among deciduous litter; Aug. 1998; t; 1: I – HF

Entoloma rhodopolium (Fr.) Kumm. – among grasses, in neighbourhood of *Salix* sp., among deciduous litter; Sept. 1998; t; 2: I – MS, I – DS

Galerina sp. – on rotten stump – among mosses; Aug. 1998; m; 1: I – OF

Gymnopilus junonius (Fr.: Fr.) Orton – on rotten stump of *Quercus* sp.; Sept. 1998; w_2; 1: I – DS

Gyroporus castaneus (Bull.: Fr.) Quél. – on ground, among deciduous litter, in neighbourhood of *Qu. robur*; Aug. 1998; t; 1: I – DS

Hebeloma crustuliniforme (Bull.) Quél. – on ground – among deciduous litter; Aug., Sept. 1998; t; 3: II, III – HF, II – DS

Hohenbuehelia mastrucata (Fr.: Fr.) Sing. – on rotted log of *Quercus* sp.; Sept. 1998; w_2; 1: I – DS

Hygrophoropsis aurantiaca (Wulf.: Fr.) Schroet. – on ground, on bits of coniferous wood, among mosses; Sept. 1998; m; 1: I – HF

Hypholoma capnoides (Fr.) Kumm. – near rotten stump of *P. abies*; Aug. 1998; w_2; 1: II – HF

Hypholoma fasciculare (Huds.: Fr.) Kumm. – W o j e w o d a (1981), T r z ą s k i (1994); on rotten stumps and bits of wood; Sept. 1998; w_2; 3: II – HF, III, II – DS

Hypholoma lateritium (Schaeff.: Fr.) Schroet. – T r z ą s k i (1994); at the bases of rotten stumps of deciduous trees; July-Aug. 1998; w_1; 1: II – DS

Hypholoma myosotis (Fr.) Moser – among mosses (humid place), on ground – among *Carex bryzoides*; July-Aug. 1998; m; 1: III – HF

Hypholoma subviride (Berk. et Curt.) Dennis – S o k ó ł et al. (1986)

Inocybe asterospora Quél. – on ground; Sept. 1998; t; 1: I – DS

Inocybe geophylla (Sow.: Fr.) Kumm. – on ground – among deciduous litter; Sept. 1998; t; 3: IV, III, III – HF

Inocybe geophylla (Sow.: Fr.) Kumm. var. lilacina (Peck) Gill. – on ground – among deciduous litter; Sept. 1998, 1999; t; 3: III, II, II – HF

Inocybe griseolilacina J. Lange – on ground; July 1998; t; 1: I – DS

Inocybe lanuginella (Schroet.) Konr. et Maubl. – on ground – among grasses; July-Aug. 1998; t; 2: + – DS, I – HF

Kuehneromyces mutabilis (Schaeff.: Fr.) Sing. et Smith – T r z ą s k i (1994); on trunk of *T. cordata*, on a bit of deciduous wood; Sept. 1998; w_2; 2: III – HF, II – DS

Laccaria amethystina Cook – on ground – among deciduous litter; July 1998; t; 3: II, II – HF, I – DS

Laccaria laccata (Scop.: Fr.) Berk et Br. – on ground – among deciduous litter; July-Aug. 1997, 1998; t; 3: III, III – HF, II – DS

Laccaria proxima (Boud.) Pat. – on ground – among mosses (humid place); Sept. 1998; t; 1: IV – HF

Laccaria tortilis (Bolt.) Cooke – on muddy ground; July 1998; t; 1: I – DS

Lactarius aurantiacus (Pers.: Fr.) S.F. Gray – among deciduous litter; Sept. 1998; t; 1: II – HF

Lactarius lacunarum Romagn. ex Hora – on muddy ground, among mosses; Aug. 1998; t; 1: V – HF

Lactarius mitissimus (Fr.) Fr. – among deciduous litter; Aug., Sept. 1998; t; 2: II – HF, II – DS

Lactarius necator (J.F. Gmel. : Fr.) Pers. – among deciduous litter; July, Aug. 1998; t; 3: II, II, I – DS

Lactarius quietus (Fr.) Fr. – among deciduous litter; Aug., Sept. 1998; t; 2: II – HF, I – DS

Lactarius rufus (Scop. : Fr.) Fr. – on ground, among deciduous litter; Sept. 1998; t; 1: II – HF

Lactarius torminosus (Schaeff. : Fr.) Pers. – on ground – among grasses; July 1998; t; 1: I – DS

Lactarius vellereus (Fr.) Fr. – among deciduous litter; Aug. 1998; t; 2: I, + – DS

Lactarius vietus (Fr.) Fr. – among deciduous litter, in neighbourhood of *B. pendula*; Oct. 1998; t; 1: I – DS

Leccinum aurantiacum (Bull.) S.F. Gray – among deciduous litter, in neighbourhood of *P. tremula*; Aug. 1998; t; 1: II – DS

Leccinum melaneum (Smotl.) Pilát et Dermek – on ground, among mosses, in neighbourhood of *B. pendula*; Sept. 1999; t; 1: I – HF

Leccinum quercinum (Pilát) Green et Watl. – on ground, in neighbourhood of *Qu. robur*; Aug. 1998; t; 1: I – DS

Leccinum scabrum (Bull.: Fr.) S.F. Gray – among deciduous litter, in neighbourhood of *B. pendula*; Sept. 1998; t; 3: I, I – DS, + – OF

Leccinum versipelle (Fr.) Snell – on ground, in neighbourhood of *B. pendula*; Aug. 1998; t; 1: I – DS

Lepiota castanea Quél. – on ground, in neighbourhood of *Qu. robur*; Aug. 1998; t; 2: I, I – DS

Lepiota cristata (Bolt.: Fr.) Kumm. – on ground, among deciduous litter, in neighbourhood of *Qu. robur*; Aug. 1998; t; 2: I, + – DS

Lepiota pseudohelveola Hora – on ground, among deciduous litter – in neighbourhood of *Qu. robur*; Aug. 1998; t; 1: I – DS

Lepista flaccida (Sow.: Fr.) Pat. – on deciduous litter; Aug. 1998; l; 1: II – HF

Lepista nuda (Bull.: Fr.) Cooke – in deciduous litter; Aug. 1998; t; 2: I – DS, III – HF

Lyophyllum decastes (Fr.: Fr.) Sing. – on ground – among grasses; Sept. 1998; t; 1: II – DS

Macrolepiota procera (Scop.: Fr.) Sing. – on ground – among deciduous litter, among grasses; Aug.-Sept. 1998; t; 4: I, +, + – DS, I – RS

Macrolepiota rhacodes (Vitt.) Sing. – in deciduous litter; Sept. 1998; t; 1: II – HF

Marasmiellus ramealis (Bull.: Fr.) Sing. – on fallen twigs of deciduous trees; June, Aug. 1998; w_1; 2: I – HF, I – DS

Marasmius quercophilus Pouz. – on deciduous litter; July 1998; l; 2: V, IV – HF

Marasmius rotula (Scop.: Fr.) Fr. – on deciduous litter, on fallen twigs and bits of deciduous wood; July-Aug. 1998; w_1; 7: III – HF; 2: III – DS

Megacollybia platyphylla (Pers.: Fr.) Kotl. et Pouz. – on rotten stumps and logs of deciduous trees, among deciduous litter; June 1998; w_2; 3: III, III, III – HF

Micromphale foetidum (Sow.: Fr.) Sing. – on trunk of *Qu. robur*; July-1998; W_2; 1: + – DS

Mycena acicula (Schff.: Fr.) Kumm. – on moss-overgrown log of *Quercus* sp., among mosses; June 1998; m; 1: I – HF

Mycena epipterygia (Scop.: Fr.) S.F. Gray var. *viscosa* (Maire) Ricken – on fallen twigs and on needles of *P. abies*; Aug. 1998; l; 1: III – HF

Mycena galericulata (Scop.: Fr.) S.F. Gray – mostly on rotten stumps of deciduous trees; July-Aug. 1998; w_2; 7: III – HF; 2: III – DS

Mycena galopus (Pers.: Fr.) Kumm. – on deciduous litter; July 1998; l; 3: II, II – HF, I – DS

Mycena inclinata (Fr.) Quél. – on rotten stumps of deciduous trees, on bits of deciduous wood; July-Aug. 1998; w_2; 5: V, IV, IV – HF, IV, III – DS

Mycena pura (Pers.: Fr.) Kumm. – on ground – among deciduous litter; Aug. 1998; l; 4: II – HF; 3II – DS

Mycena rosea (Bull.) Gramberg – in deciduous litter; Aug. 1998; t; 2: I, II – DS

Mycena sanguinolenta (Alb. et Schw.: Fr.) Kumm. – on deciduous litter; July-Aug. 1998; l; 3: II, II, III – HF

Mycena stylobates (Pers.: Fr.) Kumm. – on deciduous litter (fallen leaves); July 1998; l; 2: IV, III – HF

Mycena vitilis (Fr.) Quél. – on deciduous litter; July 1998; l; 5: II – HF, 2: II – DS

Naucoria submelinoides (Kühn.) Maire – on ground, in neighbourhood of *A. glutinosa*; Sept. 1998; t; 1: I – HF

Omphalina fibula (Bull.: Fr.) Quél. – on moss-overgrown log of *Quercus* sp.; June 1998; m; 1: I – HF

Paxillus filamentosus (Scop.) Fr. – on ground, among litter, in neighbourhood of *A. glutinosa*; Sept. 1997, 1998; t; 3: II, II, I – DS

Paxillus involutus (Batsch: Fr.) Fr. – on ground, in neighbourhood of deciduous trees; Sept. 1997, 1998; t; 2: I – DS, II – HF

Pholiota alnicola (Fr.: Fr.) Sing. – at the base of rotten stump of deciduous tree; Sept. 1998; w_2; 1: II – HF

Pholiota aurivellus (Batsch: Fr.) Kumm. – Trząski (1994); on logs of *Qu. robur*; Sept. 1998; w_2; 2: I – HF, I – DS

Pholiota squarrosa (Weig.: Fr.) Kumm. – Trząski (1994); on rotten stump; Aug. 1998; w_2; 1: II – HF

Pleurotus dryinus (Pers.: Fr.) Kumm. – on rotten log of *Quercus* sp.; Sept. 1998; w_2; 1: I – HF

Pleurotus ostreatus (Jacq.: Fr.) Kumm. – Trząski (1994); on branch of *T. cordata*; Sept. 1998; w_3; 1: I – DS

Pluteus atricapillus (Batsch) Fayod – Trząski (1994); mostly on rotten stumps and logs of deciduous trees; Jan., July-Sept. 1998; w_2; 5: I – HF; 2: I – DS

Pluteus hispidulus (Fr.: Fr.) Gill. – on moss-overgrown stumps of deciduous trees (humid places); July-Aug. 1998; w_2; 2: I, + – HF

Pluteus pseudoroberti Moser et Stangl – on log of *Qu. robur*; Aug. 1998; w_2; 1: + – HF

Pluteus sp. – on log of *F. silvatica*; June, Aug. 1998; w_2; 1: I – DS

Pluteus sp. – on twig of (*Salix* sp. ?); Sept. 1998; w_2; 1: + – OF

Psathyrella candolleana (Fr.: Fr.) Maire – Wojewoda (1981); on ground, on bits of deciduous wood; May-Sept. 1997, Aug. 1998; w_1; 4: II – HF; 3: II – DS

Psathyrella conopilus (Fr.: Fr.) Pears et Dennis – on ground – among deciduous litter; Sept. 1998; t; 1: III – DS

Psathyrella corrugis (Pers.: Fr.) Konr. et Maubl. – on twigs and rotten bits of deciduous wood; Sept. 1998; w_1; 1: III – HF

Psathyrella lacrymabunda (Bull.: Fr.) Moser – on ground – among grasses; July 1998; t; 2: I, I – DS

Psathyrella piluliformis (Bull.: Fr.) Orton – on rotten bits of deciduous wood, on stumps; Sept. 1998; w_2; 2: III, III – DS

Psathyrella sp.: among grasses; Sept. 1998; g; 1: II – DS

Psilocybe semilanceata (Fr.) Kumm. – among grasses (on grass remains); Sept. 1998; g; 1: II – MS

Psilocybe squamosa (Pers.: Fr.) Orton – on rotten twigs – among deciduous litter; July 1998; w_1; 1: I HF

Psilocybe thrausta (Schulz.) Bon – on bits of deciduous wood – among litter; Aug. 1998; w_1; 1: + – HF

Russula aeruginea Lindbl. – in deciduous litter, in neighbourhood of *B. pendula*; July, Aug. 1998; t; 2: I, II – DS

Russula cyanoxantha (Schaeff.) Fr. – in deciduous litter, in neighbourhood of *Qu. robur*; July, Aug. 1998; t; 2: II, I – HF

Russula delica Fr.: in deciduous litter, in neighbourhood of *Qu. robur*; Aug. 1998; t; 1: + – DS

Russula fellea (Fr.) Fr. – on ground – among grasses, in neighbourhood of *Qu. robur*; Aug. 1998; t; 1: I – DS

Russula lutea (Huds.: Fr.) S.F. Gray – on ground, in neighbourhood of *Qu. robur*; July 1998; t; 1: I – DS

Russula luteotacta Rea. – on muddy ground; Aug. 1998; t; 1: I – HF

Russula maculata Quél. – on ground – among grasses; July, Sept. 1998; t; 3: III, II – DS, I – HF

Russula nigricans Fr.: on ground – among deciduous litter; July 1998; t, 1: I – DS

Russula ochroleuca Pers. – on ground, in neighbourhood of *B. pendula*; Sept. 1998; t; 1: II – HF

Russula violeipes Quél. – on ground – among deciduous litter, in neighbourhood of *Qu. robur*; July, Aug. 1998; t; 2: I – HF, I – DS

Russula virescens (Schaeff.) Fr. – on ground – among deciduous litter, in neighbourhood of *Qu. robur*; July, Aug. 1998; t; 4: I, I, I, I – DS

Russula xerampelina (Schaeff.) Fr. – on ground – among grasses; July 1998; t; 1: II – HF

Stropharia aeruginosa (Curt.: Fr.) Quél. – on ground – among deciduous litter; June-Aug. 1998; l; 3: I, II – HF, I – DS

Stropharia coronilla (Bull.: Fr.) Quél. – among grasses; Sept. 1998; g, 1: II – MS

Tricholoma fulvum (DC.: Fr.) Sacc. – on ground – among deciduous litter, on ground – among mosses; Sept. 1998; t; 3: I, II – DS, III – HF

Tricholoma sulphureum (Bull.: Fr.) Kumm. – on ground – among deciduous litter; Sept.-Oct. 1998; t; 2: II, II – DS

Tricholomopsis rutilans (Schaeff.: Fr.) Sing. – at the bases of coniferous stumps; Aug. 1998; w_2; 3: I, I, I – HF

Tylopilus felleus (Bull.: Fr.) Karst. – on ground; Aug. 1998; t; 1: I – DS

Volvariella bombycina (Schaeff.: Fr.) Sing. – at the base of *Populus* sp. trunk; Aug. 1998; w_3; 1: I – OF

Xerula pudens (Pers.) Sing. – on ground, in neighbourhood of *Qu. robur*; June, Aug. 1998; w_2; 2: +, + – HF

Xerula radicata (Relhan: Fr.) Dörfelt – on ground – at the bases of *T. cordata* trunks; July 1998; w_2; 2: I – HF, I – DS

Aphyllophorales

Bjerkandera adusta (Willd: Fr.) P. Karst. – Wojewoda (1981), Trząski (1994); on log of *F. silvatica*, on rotten stump; Jan.-Dec. 1998; w_2; 2: III, I – HF

Cantharellus cibarius Fr. – on ground; July 1998; t; 1: + – DS

Chondrostereum purpureum (Pers.: Fr.) Pouz. – Trząski (1994)

Clavicorona pyxidata (Fr.) Doty – on a bit of deciduous wood; Dec. 1999; w_1; 1: I – HF

Clavulina cinerea (Fr.) Schroet. – on ground – among deciduous litter; Aug. 1997, 1998; t; 2: I – HF, I – OF

Clavulina cristata (Fr.) Schroet. – on muddy ground – among deciduous litter; Aug.-Sept. 1998; t; 1: II – OF

Daedalea quercina L.: Fr. – Trząski (1994); on stumps of *Quercus* sp.; Jan.-Dec. 1997, 1998; w_2; 11: II – HF; 2: II – DS

Daedaleopsis confragosa (Bolt.: Fr.) Schroet. – Wojewoda (1981), Trząski (1994); on logs and stumps of deciduous trees; June-Sept. 1997, 1998; w_2; 7: I – HF; 2: I – DS

Datronia mollis (Sommerf.) Donk. – Wojewoda (1981)

Fistulina hepatica (Schaeff.): Fr. – Sokół et al. (1986), Trząski (1994); at the bases of trunks of *Quercus* sp.; July-Sept. 1998; w_3; 1: + – HF; 6: + – DS

Fomes fomentarius (L.: Fr.) Kickx – Trząski (1994); on logs and trunks of deciduous trees; Jan.-Dec. 1997, 1998; w_3; 2: I – HF; 5: I – DS

Fomitopsis pinicola (Sw.: Fr.) P. Karst. – Trząski (1994); on stumps and trunks of *P. abies*; July-Sept. 1997, 1998; w_2; 2: +, II – HF

Fomitopsis rosea (Alb. et Schw.: Fr.) P. Karst. – Sokół et al. (1986)

Ganoderma applanatum (Pers.: Wallr.) Pat. – Wojewoda (1981), Trząski (1994); on logs and stumps of *Quercus* sp.; Jan.-Dec. 1997, 1998; w_2; 8: II – HF

Ganoderma lucidum (W. Curt.: Fr.) P. Karst. – Eisenreich (1924), Sendek (1964), Sokół et al. (1981); on root of *Quercus* sp.; Aug. 1998; w_3; 1: + – HF

Ganoderma resinaceum (Boud.) Pat. – Sokół et al. (1986), Trząski (1994); at the bases of trunks of *Quercus* sp.; Aug. 1997, 1998; w_3; 2: +, I – DS

Gloeophyllum odoratum (Wulf.: Fr.) Imazeki – Wojewoda (1981); on stump of *P. abies*; July 1998; w_2; 1: + – HF

Gloeophyllum sepiarium (Wulf.: Fr.) P. Karst. – Wojewoda (1981)

Grifola frondosa (Dicks.: Fr.) S.F. Gray – on ground – at the base of trunk of *Qu. robur*; Sept. 1997, 1998; w_3; 3: +, +, + – DS

Hapalopilus nidulans (Fr.) P. Karst. – on rotten logs of *B. pendula*; July, Aug. 1998; w_2; 1: II – DS

Heterobasidion annosus (Fr.) Bref. – at the base of rotten stump of *P. abies*; Aug. 1998; w_2; 1: I – HF

Hymenochaete rubiginosa (Dicks.: Fr.) Lév. – Wojewoda (1981); on stumps of *Quercus* sp.; July 1997; w_2; 3: II, II, II – HF

Hyphoderma sambuci (Pers.: Pers.) Jülich – Trząski (1994)

Inonotus dryadeus (Pers.: Fr.) Murrill – Szczepka (1985); Sokół et al. (1986), Trząski (1994); at the bases of trunks of *Quercus* sp.; Aug. 1998; w_3; 3: I, I, + – HF

Inonotus radiatus (Sow.: Fr.) P. Karst – Wojewoda (1981), Trząski (1994); on rotten stump of *A. glutinosa*; Feb. 1998; w_2; 1: III – HF

Ischnoderma benzoinum (Wahlenb.: Fr.) P. Karst. – Sokół at al. (1981)

Laetiporus sulphureus (Bull.: Fr.) Murrill – Eisenreich (1924), Sendek (1966), Wojewoda (1981), Trząski (1994); on trunks of *Quercus* sp. May-Sept. 1998; w_3; 1: II – HF, 13: II – DS

Lenzites betulina (L.: Fr.) Fr. – on logs of *B. pendula*; July-Sept. 1998; w_2; 1: I – HF

Macrotyphula fistulosa (Fr.) Petersen – on deciduous litter, on fallen twigs of deciduous trees; Aug. 1998; w_1; 1: III – RS

Meripilus giganteus (Pers.: Fr.) P. Karst. – Sokół et al. (1986), Trząski (1994); on ground – at the base of *F. silvatica*; Sept. 1997, 1998; w_3; 1: I – DS

Peniophora cinerea (Fr.) Cooke – Wojewoda (1981)

Peniophora incarnata (Fr.) Karst. – W o j e w o d a (1981), T r z ą s k i (1994); on branch of *A. glutinosa*; March 1998; w_3; 1: II – DS

Peniophora quercina (Fr.) Cooke – E i s e n r e i c h (1924), S e n d e k (1966), T r z ą s k i (1994)

Peniophora rufomarginata (Pers.) Litzk. – W o j e w o d a (1981), T r z ą s k i (1994)

Phellinus igniarius (L.: Fr.) Quél. – E i s e n r e i c h (1924), S e n d e k (1966), T r z ą s k i (1994); mostly on trunks of *Salix* (*alba ?*); Jan.-Dec. 1997, 1998; w_3; 4: I – HF, 6: I – DS

Phellinus robustus (P. Karst.) Bourd. et Galz. – W o j e w o d a (1981), S o k ó ł et al. (1986), T r z ą s k i (1994); on trunks of *Qu. robur*; Jan.-Dec. 1997, 1998; w_3; 11: II – DS

Phellinus torulosus (Pers.) Bourd. et Galz. – S o k ó ł et al. (1986), T r z ą s k i (1994); on trunks of *Qu. robur*; May-June 1999; w_3; 2: +, + – DS

Phlebia radiata Fr. – on log of *Qu. robur*; Aug. 1998; w_2; 1: I – DS

Phlebia tremellosa (Schrad.: Fr.) Nakas. et Burds. – T r z ą s k i (1994); on trunk of *F. silvatica*; Aug. 1998; w_2; 1: I – DS

Piptoporus betulinus (Bull.: Fr.) P. Karst. – on trunks and branches of *B. pendula*; Apr.-Dec. 1998; w_2; 3: III, II, I – HF

Polyporus badius (Pers.) Schw. – on fallen branch of *Salix* sp.; July 1998; w_2; 1: I – HF

Polyporus varius (Pers.) Fr. – on ground (on burried rotten bits of deciduous wood); Aug. 1998; w_1; 1: I – HF

Radulomyces confluens (Fr.) M.P. Christ. – W o j e w o d a (1981)

Ramaria sp.: on ground – among deciduous litter; Sept. 1998; t; 1: I – HF

Schizophyllum commune Fr.: Fr. – T r z ą s k i (1994); on fallen twigs and rotten logs of deciduous trees; Apr.-Dec. 1998; w_2; 1: III – HF; 9: III – DS

Schizopora carneolutea (Rodw. et Clel.) Kotl. et Pouz. – S o k ó ł et al. (1986), T r z ą s k i (1994)

Schizopora paradoxa (Fr.) Donk – W o j e w o d a (1981), S o k ó ł et al. (1986), T r z ą s k i (1994)

Schizopora radula (Pers.: Fr.) Hallenb. – S o k ó ł et al. (1986)

Steccherinum ochraceum (Pers.: Pers.) S.F. Gray – T r z ą s k i (1994)

Stereum gausapatum (Fr.) Fr. – W o j e w o d a (1981), T r z ą s k i (1994); on log of *Qu. robur*; Sept. 1997; w_2; 1: II – DS

Stereum hirsutum (Willd.: Fr.) S.F. Gray – W o j e w o d a (1981), T r z ą s k i (1994); mostly on logs of *F. silvatica*, *Qu. robur*; Jan.-Dec. 1998; w_2; 2: IV, II – HF,

Stereum rugosum (Pers.: Pers.) Fr. – W o j e w o d a (1981), T r z ą s k i (1994)

Stereum sanguinolentum (Alb. et Schw.: Fr.) Fr. – W o j e w o d a (1981)

Subulicystidium longisporum (Pat.) Parm. – W o j e w o d a (1981)

Thelephora terrestris Pers.: Fr. – on bits of deciduous wood; July 1997, 1998; w_1; 2: II – HF, + – DS

Trametes hirsuta (Wulf.: Fr.) Pilát – on log of *Qu. robur*; June 1998; w_2; 1: II – HF

Trametes versicolor (L.: Fr.) Quél. – Trząski (1994); on rotten stumps of deciduous trees; July 1998; w_2; 2: I, I – DS

Tyromyces caesius (Schrad.: Fr.) Murrill – on rotten stumps of coniferous trees; Aug. 1998; w_2; 3: I, I, + – HF

Vuilleminia comedens (Nees: Fr.) Maire – Wojewoda (1981)

Lycoperdales

Bovista colorata (Peck) Kreisel – on ground; Sept. 1998; t; 1: I – DS

Calvatia excipuliformis (Schaeff.: Pers.) Perdeck – on ground – among grasses; Aug. 1998; t; 1: I – RS

Geastrum fimbriatum Fr. – among decidous litter; Sept. 1998; l; 1: I – HF

Lycoperdon echinatum Pers.: Pers. – on ground – among deciduous litter; Aug. 1998; t; 1: + – HF

Lycoperdon perlatum Pers.: Pers. – Eisenreich (1924), Sendek (1966); on ground, among deciduous litter; July-Sept. 1997, 1998; t; 2: I, I – DS

Lycoperdon pyriforme Schaeff.: Pers. – on rotten stumps of deciduous trees; July-Sept. 1998; w_2; 2: II, I – HF

Lycoperdon umbrinum Pers.: Pers. – on ground – among deciduous litter; Aug. 1998; t; 1: + – HF

Sclerodermatales

Scleroderma citrinum Pers. – on ground; July-Aug. 1997, 1998; t; 3: I, I, I – DS

Scleroderma verrucosum Bull.: Pers. – on ground; Aug.-Sept. 1997, 1998; t; 3: II – HF, I, I – DS

Phallales

Phallus impudicus L.: Pers. – Trząski (1994); on ground – among deciduous litter; June-July 1997, 1998; t; 2: I, I – HF

Nidulariales

Cyathus striatus (Hudson): Pers. – Trząski (1994); on fallen twigs, on rotten bits of deciduous wood; July-Aug. 1998; w_1; 5: III – HF; 1: III – DS

Sphaerobolus stellatus Tode: Pers. – on deciduous litter, on bits of deciduous wood; Aug. 1998; w_1; 1: III – HF

REFERENCES

Alexopoulos C. J., Mimis C. W., Blackwell M. 1996. Introductory mycology. 4th ed., John Wiley & Sons, New York.

Badura L. 1964. Badania nad występowaniem grzybów glebowych na terenie rezerwatu „Łężczok". Acta Univ. Vratisl. 24 (4): 123–134.

Berdowski W. 1973. Brioflora rezerwatu „Łężczok" na Opolszczyźnie oraz jej udział w zbiorwiskach roślin naczyniowych. Acta Univ. Vratisl. 198, 17: 3–23.

Bujakiewicz A. 1992. Badania mikosocjologiczne w zespole *Ficario-Ulmetum campestris* w rezerwacie „Wielka Kępa Ostromecka" nad Wisłą. Acta Mycol. 27 (2): 277–290.

Bujakiewicz A., Fiebich R. 1992. Udział ekologicznych grup macromycetes w płatach olsu w Wielkopolskim Parku Narodowym. Acta Mycol. 27 (1): 63–91.

Bujakiewicz A.1999. Response of mof biotic microforms in the *Ribo nigri-Alnetum* in the Olszyny Niezgodzkie reserve. Acta Mycol. 34 (2): 267–280.

Domański S. 1974. Mała flora grzybów I. (1): *Bondarzewiaceae, Fistulinaceae, Ganodermataceae, Polyporaceae.* PWN, Kraków–Warszawa.

Domański S. 1978. Mała flora grzybów I. (3): *Amylariaceae, Aphelariaceae, Cantharelaceae, Gomphaceae, Physalacriaceae, Punctulariaceae, Sparassidaceae, Telephoraceae.* PWN, Kraków–Warszawa.

Domański S. 1984. Mała flora grzybów I. (4): *Clavariaceae, Clavariadelphaceae, Clavulinaceae, Pterulaceae, Ramariaceae, Stephanosporaceae, Gomphaceae* (II), *Hericiaceae* (II). PWN, Kraków–Warszawa.

Domański S. 1988. Mała flora grzybów I. (5): *Corticiaceae. Acanthobasidium-Irpicodon.* PWN, Kraków–Warszawa.

Domański S. 1991. Mała flora grzybów I. (6): *Corticiaceae. Kavinia-Rogersella, Stephanosporaceae. Lindtneria.* PWN, Kraków–Warszawa.

Domański S. 1991. Mała flora grzybów I. (7): *Corticiaceae. Sarcodontia-Ypsilonidium, Christiansenia* et *Syzygospora.* PWN, Kraków–Warszawa.

Eisenreich G. 1927. Das Lenszczok bei Ratibor. Der Oberschlesier (Natur und Landschaft in Oberschlesien). Oppeln, 9 (6).

Eisenreich G. 1927. Der Neuchammer Teich. Ibid. 9 (6).

Flisińska Z. 1997. Macromycetes of the Jastkowice Forest Reserve. Acta Mycol. 32 (2): 303–313.

Gumińska B. 1992. Higher fungi of the *Tilio-Carpinetum* forest association in the Skołczanka Reserve near Cracow. Acta Mycol. 27 (1): 137–158.

Hansen L., Knudsen H. (eds.) 1992. Nordic macromycetes. Vol. 2. *Polyporales, Boletales, Agaricales, Russulales.* Nordsvamp. Copenhagen, 474 pp.

Kocurek M. 1997. 40 lat rezerwatu „Łężczok". Przyroda Górnego Śląska 9. Suppl.

Krawiecowa A., Kuczyńska J. 1964. Roślinność rezerwatu „Łężczak". Acta Univ. Vratisl. 24 (4): 5–31.

Kuczera A., Waga J. M. 1998. Park Krajobrazowy „Cysterskie Kompozycje Krajobrazowe Rud Wielkich" ma już 5 lat. Przyroda Górnego Śląska 13: 8–9.

Kuczyńska I., Fabiszewski J. 1962. Rezerwat „Łężczak" koło Raciborza. Chrońmy Przyrodę Ojczystą. 18 (5): 11–17.

Lange J. E. 1935–1940. Flora Agaricina Danica. I–V. Recato A/S, Copenhaga.

Lisiewska M.1979. Flora macromycetes Świętokrzyskiego Parku Narodowego. Acta Mycol. 15 (1): 21–43.

Lisiewska M. 1987. Flora polska. Grzyby (*Mycota*) 17: *Mycena.* PWN, Warszawa–Kraków.

Lisiewska M., Połczyńska M. 1998. Changes in macromycetes of the oak-hornbeam forests in the "Dębina" reserve (Northern Wielkopolska). Acta Mycol. 33 (2): 191–230.

Ławrynowicz M. 1973. Higher macroscopic fungi in the oak-hornbeam forests of the central Poland. Acta Mycol. 9 (2): 133–204.

Ławrynowicz M. 1988. Flora polska. Grzyby (*Fungi*) 18: *Ascomycetes, Elaphomycetales, Tuberales.* PWN, Warszawa–Kraków.

Michael E., Hennig B. 1964. Handbuch für Pilzfreunde. Band 3. Blätterpilze-Helblättler. VEB, G. Fischer, Jena.

Michael E., Hennig B. 1967. Handbuch für Pilzfreunde. Band 4. Blätterpilze-Dunkelblättler. VEB, G. Fischer, Jena.

Michael E., Hennig B. 1968. Handbuch für Pilzfreunde. Band 1. Die wichtigsten und häufigsten Pilze. VEB, G. Fischer, Jena.

Michael E., Hennig B. 1970. Handbuch für Pilzfreunde. Band 5. Milchlinge-Täublinge. VEB, G. Fischer, Jena.

Michael E., Hennig B. 1971. Handbuch für Pilzfreunde. Band 2. Nichtblätterpilze. VEB, G. Fischer, Jena.

Michael E., Hennig B., Kreisel H. 1981. Handbuch für Pilzfreunde. Band 4. Blätterpilze-Dunkelblättler. VEB, G. Fischer, Jena.

Moser M. 1963. Ascomyceten. Kleine Kryptogamenflora. Band IIa. VEB, G. Fischer, Jena.

Moser M. 1967. Die Röhrlinge und Blätterpilze. Kleine Kryptogamenflora. Band II b/2, Basidiomyceten II. VEB, G. Fischer, Jena.

Moser M. 1983. Die Röhrlinge und Blätterpilze. Kleine Kryptogamenflora. Band II b/2, Basidiomyceten II. VEB, G. Fischer, Jena.

Nespiak A. 1959: Studia nad udziałem grzybów kapeluszowych w zespołach leśnych na terenie Białowieskiego Parku Narodowego. Monogr. Bot. 8: 3–141.

Nespiak A. 1990. Flora polska. Grzyby (*Mycota*) 19: *Inocybe.* PWN, Warszawa–Kraków.

Neuhoff W. 1956. Die Milchlinge (*Lactarii*). Die Pilze Mitteleuropas. IIb. J. Klinkhardt, Bad Heilbrunn.

Nezdoiminogo E. L. 1996. Definitorium Fungorum Rossiae. *Agaricales, Cortinariaceae.* Nauka, Petropoli.

Rostański K. 1994. Chronione i rzadkie wartości botaniczne na terenie Parku Krajobrazowego „Cysterskie Kompozycje Krajobrazowe Rud Wielkich". Scripta Rudensia 1: 1–77.

Rudnicka-Jezierska W. 1991. Flora polska. Grzyby (*Mycota*) 23: *Lycoperdales, Sclerodermatales, Tulostomatales, Nidulariales, Phallales, Podaxales.* PWN, Kraków.

Sendek A. 1966. „Łężczak" – przyrodniczy rezerwat częściowy. Wyd. Inst. Śląskiego, Komunikaty 75, Opole.

Sendek A. 1986. Charakterystyka flory rezerwatu „Łężczak" koło Raciborza. Opolskie Towarzystwo Przyjaciół Nauk. Zeszyty Przyrodnicze 24. PWN, Warszawa.

Skirgiełło A. 1991. Flora polska. Grzyby (*Fungi*), 20: *Russula.* PWN, Warszawa–Kraków.

Skirgiełło A.1998. Macromycetes of oak-hornbeam forests in the Białowieża National Park-Monitoring studies. Acta Mycol. 33 (2): 171–189.

Sokół S., Szczepka M. Z., Trząski L. 1986. Bemerkenswerte Fundorte von *Fomitopsis rosea* (Alb. et Schw.: Fr.) Karst. und anderen seltenen Pilzen im Łężczak-Naturschutzgebiet in Südpolen. Acta Biol. Silesiana, Bot. 4 (21): 141–155.

Szczepka M. Z. 1985. Włóknouszek płaczący, *Inonotus dryadeus*, ginący pasożyt starych dębów. Chrońmy Przyrodę Ojczystą 41 (1): 16–36.

Trząski L. 1994. Analiza zasiedlania opisywanych alei przez grzyby wielkoowocnikowe rozkładające drewno. In: S. Wika, W. Włocha (eds.) Aleja Husarii Polskiej z alejami bocznymi na tle rezerwatu Łężczak w Kotlinie Raciborskiej, Scripta Rudensia 3: 28–36. Rudy Wielkie.

Wachowska-Serwatka K., Serwatka J. 1964. Warunki ekologiczne rezerwatu „Łężczak". Acta Univ. Vratisl. 24 (4): 33–66.

Wika S. 1994. Analiza flory i roślinności w otulinie badanych alei. In: S. Wika, W. Włocha (eds.). Aleja Husarii Polskiej z alejami bocznymi na tle rezerwatu Łężczak w Kotlinie Raciborskiej, Scripta Rudensia 3: 14–27. Rudy Wielkie.

Wojewoda W. 1977. Flora Polska. Grzyby (*Mycota*) 8: *Tremellales.* PWN, Warszawa–Kraków.

Wojewoda W. 1981. Uwagi o grzybach wielkoowocnikowych rezerwatu Łężczak k. Raciborza. Chrońmy Przyrodę Ojczystą 37 (2): 53–55.
Wojewoda W., Ławrynowicz M. 1992. Red list of threatened macrofungi in Poland. In: K. Zarzycki, W. Wojewoda, Z. Heinrich (eds.). List of threatened plants in Poland. 2 ed.: 27–56. Instytut Botaniki im. W. Szafera PAN, Kraków.
Wojewoda W. 1999. Red List of Upper Silesian Macrofungi. In: J. B. Parusel (ed.). Reports-Opinions. 3.: 8–51. Centrum Dziedzictwa Przyrody Górnego Śląska, Katowice.
Wojewoda W., Heinrich Z., Komorowska H. 1999. Macromycetes of oak-lime-hornbeam woods in the Niepołomice Forest near Kraków (S Poland)-monitoring studies. Acta Mycol. 34 (2): 201–266.

Grzyby wielkoowocnikowe różnych siedlisk rezerwatu Łężczok koło Raciborza

Streszczenie

Obserwacje mikologiczne przeprowadzone w latach 1997–1999 obejmowały teren rezerwatu „Łężczok" oraz najbliższe jego otoczenie. W celu dokładnej lokalizacji obserwowanych grzybów zastosowano metodę kartowania wszystkich taksonów w sieci jednakowych pól podstawowych, tj. kwadratów o boku 100 m. Każdy taki kwadrat traktowano jako pojedyncze stanowisko (Fig. 1). Uzyskane dane dotyczące poszczególnych taksonów dotyczą w szczególności: rodzaju zasiedlanego substratu i siedliska, przynależności do określonej grupy ekologicznej, ilościowości oraz daty notowania.

Analiza taksonomiczna pozwoliła na wyróżnienie 222 taksonów grzybów wielkoowocnikowych reprezentujących 105 rodzajów. Nie odnaleziono 27 taksonów podawanych wcześniej z tego terenu. Wśród stwierdzonych przedstawicieli *macromycetes* dominują grzyby z rzędu *Agaricales* (147 taksonów) (Tabela 1).

Analiza ekologiczna wykazała dominację grzybów naziemnych (120 taksonów), a wśród nich symbiotycznych ryzobiontów i zasiedlających próchnicę grzybów saprofitycznych (Tabela 1).

Stwierdzono wiele interesujących i rzadkich przedstawicieli *macromycetes*. Zanotowano m.in. 4 gatunki grzybów będących pod całkowitą ochroną (*Boletus parasiticus* (Fig. 4), *Meripilus giganteus*, *Grifola frondosa* i *Phallus impudicus*) oraz 31 gatunków zamieszczonych na „czerwonej liście".

Ciekawe zróżnicowanie siedliskowe w obrębie rezerwatu Łężczok pozwoliło na dostrzeżenie kilku interesujących interakcji, którym podlegają grzyby wyższe w zależności od dostępnych warunków ekologicznych. Różnorodność siedliskowa będące efektem działania wielu różnych czynników stała się przyczyną interesującego schematu rozmieszczenia określonych taksonów grzybów na badanym terenie (Fig. 2, Fig. 3).