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Macromycetes of the proposed nature reserve Wilcze Uroczysko–Olszanka in the Odra estuary

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The paper presents a characterisation of the mycoflora on the cupola-type rised bog in the Odra river valley. The characteristic of each species includes: type of substrate and plant community, date of fruitbody occurence, and the forest unit, where the species was observed. Systematic, ecological and sociological analyses of the mycoflora have been performed, and the protected and endangered species singled out.

Key words: *Macromycetes*, *Ascomycotina*, *Basidiomycotina*, nature reserve.

INTRODUCTION

A characteristic of mycoflora, presented in this work, forms an additional support for the idea of establishment of a nature reserve named Wilcze Uroczysko–Olszanka. The proposed reserve consists of a domed, atlantic-type rised bog, which was studied and described by J a s n o w s k i (1958, 1959, 1962), and was considered by this author a highly valuable object, worthy of legal protection. However, only as late as in 1985, it has been possible to establish a nature reserve Wilcze Uroczysko, covering a fraction of the bog, and protecting a population of fern *Osmunda regalis* (C e l i ń s k i 1956; J a s n o w s k a 1985). At present, due to a favourable set of circumstances, a proposal for the enlargement of the existing reserve has been formulated (J a s n o w s k a et al. 1994). It should contain the whole rised bog area, thus enabling an efficient protection of the complete ecosystem (F r i e d r i c h and M a r k o w s k i 1996).

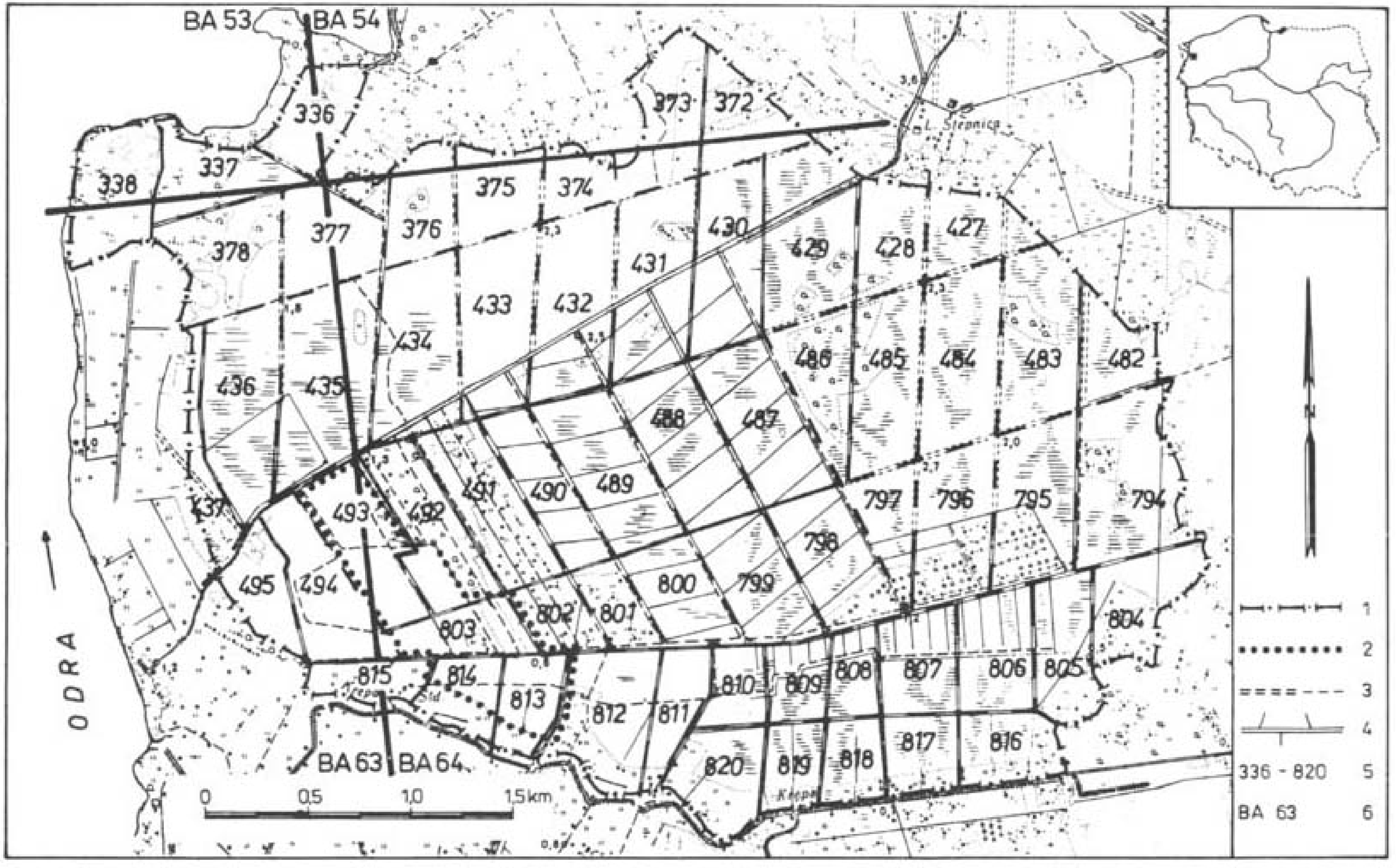

Fig. 1. Location and outline of the proposed nature reserve Wilcze Uroczysko—Olszanka
1 — border of the proposed nature reserve Wilcze Uroczysko—Olszanka, 2 — border of the reserve Wilcze Uroczysko, 3 — forest roads, 4 — canals and drainage ditches, 5 — number of forest unit, 6 — number of ATPOL grid square

The proposed reserve would cover an area of 1351 ha, situated at the eastern bank of Odra estuary. It is located within Goleniów and Stepnica communes, Szczecin voievodeship, and is administered by the Goleniów Headforestry (Fig. 1). Forests cover over 82% of the reserve's area.

The mire is situated within the Lower Odra Valley meso-region, belonging to the Szczecin Coastland macro-region, and the Southern Baltic Coastland sub-province (K o n d r a c k i 1978).

The Olszanka mire is a domed, atlantic-type rised bog. It has a form of an extensive cupola, sloping considerably towards its margins. The central part of the bog rises 2.7 to 3.0 m above the level of its margins, and culminates at 3.32 m a.s.l. (J a s n o w s k i 1959).

METHODOLOGICAL REMARKS

Macromycetes were studied parallel to standard investigations of vegetation and stratigraphy of the peat deposit, mostly during the vegetation season of 1993. Less intense mycological observations were also carried out on collecting trips, in the years 1994-1996. Each observation consisted of a fungi species lists, their classification into ecological groups, and the abundance value. Sampling areas of about 400 m^2 each, were described phytosociologically, and localised in the forest unit.

The Olszanka bog is situated at the outskirts of the Goleniów Woods, and for that reason has been partly investigated by F r i e d r i c h (1984, 1985a, 1985b) within the framework of a wider study of that forest area. Two study plots, located in two forest associations: *Sphagnetum magellanici pinetosum* and *Vaccinio uliginosi-Pinetum*, were studied. Altogether 64 species of fungi were found, and the occurrence of all these species has been confirmed at present, both on previous locations, and in area of the whole object.

CHARACTERISATION OF THE MYCOFLORA

In the course of mycological investigations, 183 taxa in the rank of species or variety, have been recorded. *Basidiomycetes* dominate in the mycoflora of the reserve, constituting over 92% of the total species number (Tab. 1). Within this class 10 orders are represented, among which *Agaricales* are the most numerous with 92 determined taxa. The collected specimens belong to 94 genera, among which the richest in species are genera: *Mycena* – 15 species and *Lactarius* – 10 species.

Table 1

Number of *macromycetes* taxa in the mycoflora of the Wilcze Uroczysko–Olszanka reserve

Class	Order	Number of genera	Number of species
ASCOMYCOTINA	*Helotiales*	5	6
	Pezizales	2	3
	Sphaeriales	3	5
BASIDIOMYCOTINA	*Tremellales*	2	3
	Dacrymycetales	2	4
	Aphyllophorales	27	36
	Boletales	6	10
	Agaricales	39	92
	Russulales	2	17
	Nidulariales	2	2
	Sclerodermatales	1	1
	Lycoperdales	2	3
	Phallales	1	1
Total:		94	183

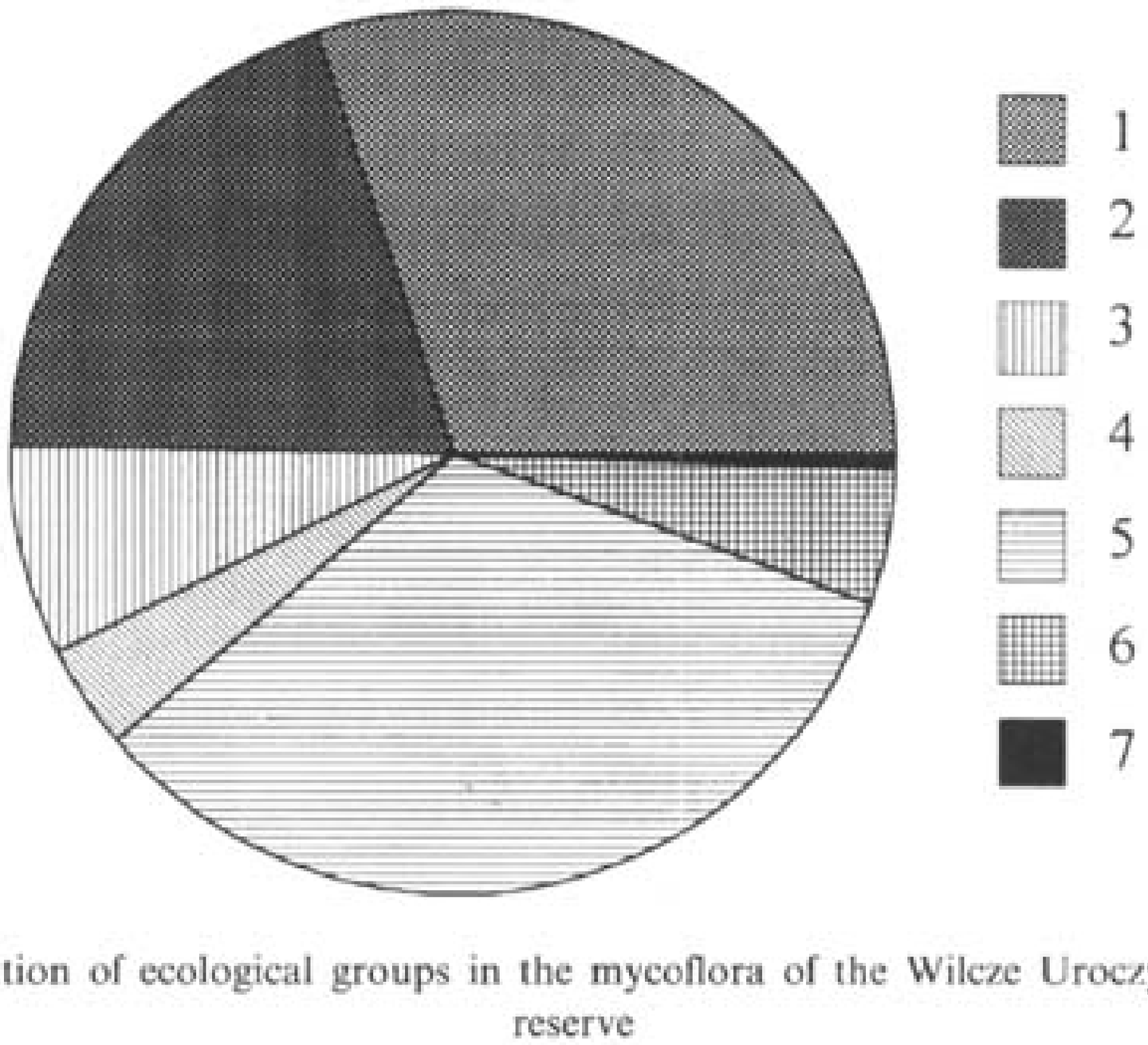

Fig. 2. Participation of ecological groups in the mycoflora of the Wilcze Uroczysko–Olszanka reserve

1 – terrestrial fungi (mycorrhizal, and humicolous saprotrophs), 2 – fungi on litter and among bryophytes, 3–6 – fungi on wood (3 – on fallen twigs, 4 – on fallen branches, 5 – on stumps, logs and trunks, 6 – on trunks and roots of living trees), 7 – fungi on excrements

The observed fungi occupied a variety of habitats, which is a reflection of their life-forms. An analysis of the substrata and the growth form of the fruiting bodies has been a background for the differentiation of several ecological groups (Fig. 2). Thus 55 species of the collected *macromycetes* belong to

terrestrial fungi, represented by 39 mycorrhizal species and 16 species of humicolous saprotrophs. Less numerous are fungi growing on litter and among mosses (36 species). The third group are lignicolous fungi (91 species), mostly belonging to saprotrophs. Fungi of this group grow mainly on stumps, logs and dead trunks of trees, less frequently on fallen twigs and branches. Richness of this ecological group is a result of high availability of suitable substratum and favourable wetness conditions in the majority of the investigated communities. Parasitic fungi, represented by 9 species, form a small group of little importance. *Macromycetes* of the reserve display multiple, often difficult to trace, relationships and connections with 10 species of dendroflora. The largest number of species is associated with *Pinus sylvestris*, *Almus glutinosa* and *Betula pendula* (39-37 species), slightly less with *Fagus sylvatica* and *Quercus robur* (29 and 25 species), and clearly less with *Betula pubescens* (15 species). The remaining tree species, such as: *Fraxinus excelsior*, *Picea abies*, *Salix alba* and *Larix decidua*, are associated with 1-6 species of fungi. *Pinus sylvestris* is the single tree species associated with the largest number (30 species) of macrofungi.

The mycoflora of the reserve contains 2 species totally protected by law and 15 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). Three species which belong to the Vulnerable category (V), have been found: *Hypholoma elongatum*, *Omphalina sphagnicola* and *Lactarius deliciosus*. Categories: Rare (R) and Indeterminate (I) have been represented by six species each. The following Rare species have been found: *Bulgaria inquinans*, *Phaeolus schweinitzii*, *Pycnoporus cinnabarinus*, *Sparassis crispa*, *Stereum subtomentosum* and *Hypholoma udum*. Indeterminate species were represented by: *Calocera furcata*, *Cortinarius saniosus*, *Galerina mycenoides*, *G. paludosa*, *G. sphagnorum* and *Tephrocybe palustris*. Most of the endangered species belong to the sphagnophilous group, associated with *Sphagnum* moss phytocoenoses of rised bogs. Due to the disappearance of such habitats, sphagnophilous fungi have been included in the „Red list". The protected species are *Sparassis crispa* – found only once in the reserve, and *Phallus impudicus*, which in the reserve is a common species, found frequently and in large numbers.

The majority of the collected species represent relatively common taxa, distributed in the whole area of Poland. Among them taxa listed by a the „Committee for mapping of *macromycetes* in Europe" (S k i r g i e ł ł o 1962), are worthy of mentioning. These are: *Amanita phalloides*, *A. porphyria*, *Armillaria mellea*, *Bulgaria inquinans*, *Coprinus comatus*, *Cystoderma carcharias*, *Fomes fomentarius*, *Galerina paludosa*, *Ganoderma applanatum*, *Kuehneromyces mutabilis*, *Phallus impudicus*, *Phlebia radiata*, *Piptoporus betulinus*, *Pycnoporus cinnabarinus*, *Russula claroflava*, *Schizophyllum commune*, *Tephrocybe palustris* and *Tylopilus felleus*.

Macromycetes were collected in seven plant associations (*Ribo nigri--Alnetum*, *Sphagno squarrosi-Alnetum*, *Circaeo-Alnetum*, *Salici-Populetum*, *Vaccinio uliginosi-Pinetum*, *Betuletum pubescentis*, *Sphagnetum magellanici pinetosum*) and in five plant communities (oakwood, beech – birch forest, beech – pine forest, birchwood, spruce forest). The highest numbers of species have been collected in *Ribo nigri-Alnetum* (65 species) and in *Vaccinio uliginosi-Pinetum* (59 species), less in *Betuletum pubescentis* (43 species) and in the oakwoods (40 species). The collected species have not completed the list of all fungi existing in these plant communities. To obtain an approximately complete list of species, at least five years long, systematic investigations on permanent plots, are necessary.

LIST OF SPECIES

Systematic order and nomenclature for representatives of *Ascomycetes* follow D e n n i s (1978), for *Basidiomycetes* – mostly M o s e r (1968) and J ü l i c h (1984).

For each species the following set of information has been given: type of substrate and habitat, plant community, date of fruit body occurence, and the forest unit. A map of the reserve (Fig. 1), containing borders of the forest units, has been supplemented with a grid of ATPOL squares. This will enable precise location of species in future.

Abbreviations: *Bp* – *Betuletum pubescentis*, *CA* – *Circaeo-Alnetum*, *RnA* – *Ribo nigri-Alnetum*, *Sm* – *Sphagnetum magellanici*, *Smp* – *Sphagnetum magellanici pinetosum*, *SP* – *Salici-Populetum*, *SsA* – *Sphagno squarrosi--Alnetum*, *VuP* – *Vaccinio uliginosi-Pinetum*, unit – forest unit.

ASCOMYCETES

Helotiales

Ascocoryne sarcoides (Jacq. ex S. F. Gray) Grov. et Wilson – on stumps of *Alnus glutinosa* and *Betula pendula*, *RnA*; IX 1981, VII, XI 1993; units: 373, 432, 493, 494.

Bulgaria inquinans Fr. – on log of *Quercus robur*, *CA*; IX-X 1995; unit 375.

Dasyscyphus niveus (Hedw.: Fr.) Sacc. – on fallen twigs of *Q. robur*, *RnA*, *CA*; VII 1993; units: 375, 376.

D. virgineus S.F. Gray – on fruit husks of *Fagus sylvatica*; beech-birch forest; VII 1993; unit 795.

Hymenoscyphus fructigenus (Bull.: Fr.) S.F. Gray – on fallen fruits of *Q. robur*, oak forest; IX 1993; unit 372.

Mollisia ligni (Desmaz.) P. Karst. – on fallen twigs of *Q. robur*, oak forest; VII 1993; unit 372.

Pezizales

Cyathiopodia macropus (Pers.: Fr.) Dennis – on ground, *RnA*; VIII 1993; unit 493.

Scutellinia scutellata (L.: Fr.) Lamb. – on logs and fallen branches of *A. glutinosa*, *RnA*, *CA*; VIII-IX 1993; units: 373, 494.

S. setosa (Fr.) O. Kuntze – on fallen branches of *A. glutinosa*, *RnA*; IX 1994; unit 377.

Sphaeriales

Daldinia concentrica (Bolt.: Fr.) Ces. et de Not. – on log of *B. pendula* and on trunk of *B. pubescens*, *Bp*; IX 1993; units: 372, 484, 490.

Nectria cinnabarina (Tode.: Fr.) Fr. – on fallen twigs of: *B. pendula*, *B. pubescens*, *Frangula alnus*, *Padus avium*, *Bp*, *RnA*, *CA*, oak forest; VII-XI 1993; units: 373, 376, 433, 487, 493, 820.

Xylaria carpophila (Per.) Fr. – on fruit husks of *F. sylvatica*, beech-pine forest, VII 1993; unit 435.

X. hypoxylon (L.: Fr.) Grev. – on stumps and logs of: *A. glutinosa*, *B. pendula*, *B. pubescens*, *RnA*, *CA*, *Bp*; VII 1993, VI, IX 1994; units: 373, 435, 799, 805, 820.

X. polymorpha (Pers.: Fr.) Grev. – on stumps of *F. sylvatica*; beech-pine forest; X 1996; unit 795.

BASIDIOMYCETES

Tremellales

Exidia plana (Wiggers) Donk – on logs of *A. glutinosa* and *Fraxinus excelsior*, *CA*, *RnA*; VIII-X 1993, X 1995; units: 373, 493, 819.

E. truncata Fr. – on fallen branches of *Q. robur*, oak forest; IX 1993; unit 372.

Tremella encephala Pers. – on fallen branches of *Pinus sylvestris*, *VuP*, *Smp*; XI 1980, XII 1993; units: 430, 435, 800.

Dacrymycetales

Calocera cornea (Batsch: Fr.) Fr. – on logs of *F. sylvatica* and *Q. robur*, beech-pine forest, oak forest; IX-X 1993, X 1995; units: 372, 435, 805.

C. furcata (Fr.) Fr. – on stumps and logs of *P. sylvestris*, *VuP*; IX-X 1993, IX 1995; units: 433, 795, 800.

C. viscosa (Pers.: Fr.) Fr. – on stump of *P. sylvestris*, *VuP*, beech-pine forest; IX 1993; units: 800, 805.

Dacrymyces stillatus Nees: Fr. — on logs and stumps of *P. sylvestris*, *VuP*, birch forest; VIII-X 1993, IX-X 1994; units: 373, 376, 433, 488, 800.

Aphyllophorales

Bjerkandera adusta (Willd.: Fr.) P. Karst. — on stumps of *B. pendula*, birch forest; VIII-X 1993-94; units: 429, 431, 434.

Clavulina cristata (Holmsk.: Fr.) Schroet. — on ground, *SsA*, *RnA*; VII 1993; units: 805, 819.

Daedalea quercina (L.: Fr.) Pers. — on stump of *Q. robur*, oak forest; 1993; unit 373.

Daedaleopsis confragosa (Bolt.: Fr.) Schroet. — on branches of *B. pendula*, birch forest; 1993; unit 432.

Fomes fomentarius (L.: Fr.) Fr. — on trunks, stumps and logs of *F. sylvatica* and *B. pendula*, *Bp*, *RnA VuP*, beech-pine forest; 1980-81, 1993-95; units: 372, 373, 375, 431, 432, 433, 435, 489, 805.

Fomitopsis pinicola (Sw.: Fr.) P. Karst. — on log of *A. glutinosa*, *RnA*; 1993; unit 373.

Ganoderma applanatum (Pers.) Pat. — on stumps of: *F. sylvatica*, *A. glutinosa*, *B. pendula*, *RnA*, *Bp*, beech-pine forest; 1993, 1994; units: 372, 377, 805, 809.

Gloeophyllum sepiarium (Wulf.: Fr.) P. Karst. — on stumps and logs of *P. sylvestris* and *Picea abies*, *VuP*, spruce forest; VII-IX 1993; units: 489, 797, 809.

Hapalopilus rutilans (Pers.: Fr.) P. Karst. — on log of *F. excelsior*, *CA*; IX 1995; unit 819.

Hymenochaete rubiginosa (Dicks.: Fr.) Lév. — on stumps of *Q. robur*; oak forest, *RnA*; IX-X 1993, 1994; units: 372, 376.

Inonotus radiatus (Sow.: Fr.) P. Karst. — on trunks of *A. glutinosa*, *RnA*; VII 1993; unit 377.

Laetiporus sulphureus (Bull.: Fr.) Murr. — on trunk of *Salix alba*, *SP*; VI 1993; unit 336.

Lenzites betulinus (L.: Fr.) Fr. — on stump of *B. pendula*, *Bp*; IX 1993; unit 798.

Merulius tremellosus Schrad.: Fr. — on logs of *B. pendula* and *A. glutinosa*, *Bp*, *RnA*; IX-X 1993; units: 376, 377, 487, 818.

Phaeolus schweinitzii (Fr.) Pat. — on stumps of *P. sylvestris*, *VuP*, *Bp*; VII 1993; units: 376, 483.

Phellinus igniarius (L.: Fr.) Quél. — on trunks of *S. alba*, *SP*; 1993; unit 336.

P. robustus (P. Karst.) Bourd. et Galz. — on trunk of *Q. robur*, oak forest; 1993; unit 472.

Phlebia radiata Fr. — on fallen twigs of *A. glutinosa*, *RnA*; IX 1993; units: 377, 435.

Piptoporus betulinus (Bull.: Fr.) P. Karst. — on trunks, logs and branches of *B. pendula* and *B. pubescens*, *RnA*, *Bp*, *VuP*, birch forest, beech-birch forest; 1980, 1981, 1993-95; units: 372, 432-434, 482, 487, 489, 797, 805.

Polyporus brumalis (Pers.): Fr. — on fallen branches and twigs of: *B. pendula*, *B. pubescens*, *A. glutinosa*, *VuP*, *RnA*, *Bp*; IV 1981, VII 1993; units: 373, 433, 490.

P. ciliatus Fr.: Fr. — on fallen twigs of *B. pendula*, *Bp*; VII 1993; unit 799.

Postia caesia (Schrad.: Fr.) P. Karst. — on logs and stumps of *P. sylvestris*, *VuP*, *RnA*; VII-IX 1993; units: 377, 432, 809.

P. stiptica (Pers.: Fr.) Jülich — on logs and stumps of *P. sylvestris*, *VuP*; IX 1993, X 1994; units: 489, 800, 809.

Pycnoporus cinnabarinus (Jacq.: Fr.) P. Karst. — on logs of *B. pendula*, *RnA*, *Bp*, birch forest; X 1979, VII 1993; units: 431, 435.

Schizophyllum commune Fr.: Fr. — on trunks, logs and fallen branches of: *Q. robur*, *B. pendula*, *F. sylvatica*, *RnA*, *Bp*, oak forest, beech-birch forest; 1993-95; units: 372, 373, 483, 805.

Sparassis crispa (Wulf.): Fr. — on roots of *P. sylvestris*, *VuP*; IX 1995; unit 800.

Stereum gausapatum (Fr.) Fr. — on stumps of *Q. robur*, oak forest; X 1993; units: 372, 373.

S. hirsutum (Willd.: Fr.) S. F. Gray — on logs and fallen branches of: *A. glutinosa*, *B. pendula*, *F. sylvatica*, *RnA*, *VuP*, *Smp*, beech-birch forest; 1993-95; units: 337, 372, 373, 377, 489, 493, 797, 805, 809.

S. rugosum (Pers.: Fr.) Fr. — on dead trunk of *Q. robur*, oak forest; X 1995; unit 806.

S. sanguinolentum (Alb. et Schw.: Fr.) Fr. — on logs of *P. sylvestris* and *P. abies*, *VuP*, spruce forest; IX 1993, X 1995; units: 430, 433, 800, 806.

S. subtomentosum Pouzar — on logs of *A. glutinosa* and *B. pendula*, *RnA*, *Bp*; 1993-94; units: 373, 377, 435, 486, 809, 811.

Thelephora terrestris Ehrh. ex Willd.: Fr. — on fallen twigs of *P. sylvestris*, *Bp*; VIII-X 1993; unit 797.

Trametes hirsuta (Wulf.: Fr.) Pilát — on logs and fallen branches of *Q. robur* and *B. pendula*, *Bp*, oak forest; 1993, 1994; units: 372, 430, 431.

T. versicolor (L.: Fr.) Pilát — on stumps of *F. sylvatica*, beech-birch forest; 1993, unit 805.

Trichaptum abietinum (Pers. in J. F. Gmelin: Fr.) Ryv. — on logs of *P. sylvestris*, *VuP*, *RnA*, *Bp*; infrequent; 1993-95; forest divisions: 431, 488, 798, 809.

T. fuscoviolaceum (Ehrenb.: Fr.) Ryv. — on logs and stumps of *Pinus sylvestris*; *VuP*, *Smp*, *RnA*; 1977-81, 1993-95; units: 431, 433, 435, 489, 493, 797, 800.

Boletales

Hygrophoropsis aurantiaca (Wulf.: Fr.) R. Mre. — on ground, *VuP*; X 1981, IX 1993; units: 431, 433.

Leccinum scabrum (Bull.: Fr.) S. F. Gray — on ground under *B. pendula*, birch forest, *Bp*; IX 1980, VIII-IX 1993; units: 372, 383, 487.

L. versipelle (Fr. in Fr. et Hök) Snell — on ground under *B. pendula*, birch forest; IX 1993; unit 430.

Paxillus involutus (Batsch.: Fr.) Fr. — on ground, *Bp*, *Smp*, beech-birch forest, *VuP*, oak forest, *RnA*; VII-VIII 1980-81, VII-IX 1993-94; units: 372, 378, 431, 432, 435, 488, 489, 493, 797, 800, 805, 813.

Suillus grevillei (Klotzsch: Fr.) Sing. — on ground under *Larix decidua*, forest roads; IX 1994; unit 800.

S. variegatus (Swartz: Fr.) O. Kuntze — among Sphagna, *Smp*, *VuP*; VII-IX 1980, VII 1993; units: 435, 488, 797.

Tylopilus felleus (Bull.: Fr.) P. Karst. — on ground under *P. sylvestris*, *VuP*, beech-pine forest; IX 1993; units: 433, 805.

Xerocomus badius (Fr.) Kühn. ex Gilb. — on ground, beech-pine forest; VII 1993; unit 805.

X. chrysenteron (Bull.) Quél. — on ground, beech-pine forest; IX 1993, X 1995; unit 795.

X. subtomentosus (L.: Fr.) Quél. — on ground, beech-pine forest; X 1994; unit 795.

Agaricales

Amanita fulva Sing. — on ground, among mosses and Sphagna, *VuP*, *Smp*, *Bp*, birch forest; VIII 1980, IX 1981, VII 1993, IX 1994; units: 372, 432, 433, 435, 487, 805.

A. phalloides (Fr.) Link — on ground under *Q. robur*, oak forest; VIII 1993; unit 372.

A. porphyria Alb. et Schw.: Fr. — on ground, *VuP*; X 1994; unit 800.

Armillaria mellea (Vahl.: Fr.) Kumm. (s.l.) — on logs and stumps of: *B. pendula*, *Q. robur*, *F. sylvatica*, *A. glutinosa*, *RnA*, birch forest, oak forest, beech-birch forest; VII-IX 1993, IX 1994, X 1995; units: 372, 374, 377, 493, 805, 814.

Clitocybe clavipes (Pers.: Fr.) Kummer — on ground, *VuP*; IX 1993; unit 431.

C. fragrans (Sow.: Fr.) Kummer — on broadleaved litter, *RnA*, *SP*; VII-VIII 1993; units: 336, 374, 805.

C. langei Hora — on coniferous litter, *VuP*; IX 1993, X 1995; units: 432, 433, 488, 800.

Collybia butyracea (Bull.: Fr.) Quél. var. *asema* Fr. — on broadleaved litter, *Bp*, birch forest, *VuP*, beech-birch forest, oak forest; VII-VIII 1993; units: 373, 430, 432, 433, 805, 811.

C. dryophila (Bull.: Fr.) Kummer – on broadleaved litter, oak forest, *Smp*; VIII 1980, VII 1993; units: 372, 376, 435.

C. peronata (Bolt.: Fr.) Sing. – on broadleaved litter, oak forest, beech-pine forest, *VuP*, *Bp*; VIII 1980, IX 1981, VII 1993, IX 1994; units: 375, 432, 433, 488, 795, 805.

Conocybe tenera (Schaff.: Fr.) Fayod – on ground, *RnA*, *CA*; X 1980, VIII-IX 1993; units: 373, 378, 493, 794, 806, 819.

Coprinus atramentarius (Bull.: Fr.) Fr. – on ground, forest roads; IX 1981, VIII 1993; units: 430, 432.

C. comatus (Müll.: Fr.) Pers. – on ground, forest roads; IX 1978, VIII 1993; units: 429, 433, 434.

C. disseminatus (Pers.: Fr.) S. F. Gray – on ground and stumps of *A. glutinosa*, *CA RnA*; VIII 1980, 1993; units: 373, 377, 794, 819.

C. micaceus (Bull.: Fr.) Fr. – on stump of *A. glutinosa* and *F. sylvatica*, *RnA*, beech-birch forest; VIII-IX 1993; units: 493, 805.

C. plicatilis (Curt.: Fr.) Fr. – on ground, *CA*, *RnA*; VIII 1993; units: 377, 794.

Cortinarius bibulus Quél. – on ground, *RnA*, *CA*; VIII-IX 1993, IX 1994; units: 337, 374, 493, 794, 819.

C. saniosus (Fr.) Fr. – among Sphagna, *Smp*, *VuP*; IX 1977, VIII 1993; units: 435, 797, 798.

Crepidotus pubescens Bres. – on fallen twigs of *A. glutinosa*, *SsA*, *RnA*; IX 1993; units: 377, 493, 805.

C. variabilis (Pers.: Fr.) Kummer – on fallen twigs of *B. pubescens*, *Bp*; VIII 1993, unit 487.

Cystoderma amiantinum (Scop.: Fr.) Fay. – on ground, *VuP*; IX 1994; unit 800.

C. carcharias (Pers.) Fay. – on ground, *VuP*; X 1994; unit 800.

Delicatula integrella (Pers.: Fr.) Fay. – on stumps of *A. glutinosa*, *RnA*, *CA*; VIII 1993; units: 377, 794, 819.

Dermocybe cinnamomeolutea (Orton) Mos. – on ground, among Sphagna, *VuP*, *Smp*; IX 1980, X 1994; units: 433, 435, 488, 489.

D. semisanguinea (Fr.) Mos. – on ground, among mosses, *VuP*, *Smp*; IX 1981, VIII 1993; units: 435, 488, 808.

Entoloma rhodopolium (Fr.: Fr.) Kummer – on ground, *CA*; IX 1994; unit 375.

Flammulina velutipes (Curt.: Fr.) Karst. – on trunks of *F. sylvatica* and *S. alba*, beech-birch forest, *SP*; XI 1979, II 1997; units: 336, 805.

Galerina hypnorum (Schrank: Fr.) Kühn. – among mosses, *Smp*, *VuP*, *RnA*, *Bp*, *CA*; IX 1980, VIII 1981, VII 1993, IX 1994; units: 434, 435, 488, 493, 794.

G. mycenoides (Fr.) Kühn. – among Sphagna, *Smp*, *VuP*; IX 1979, VII 1993; units: 435, 489, 797.

G. paludosa (Fr.) Kühn. – among Sphagna, *Smp*, *VuP*; VI-XII 1977-81, VII 1993; units: 435, 488, 489, 797, 798.

G. pumila (Pers.: Fr.) M. Lge. ex Sing. — among mosses, *Bp*; VII 1993; units: 797, 799.

G. sphagnorum (Pers.: Fr.) Kühn. — among Sphagna, *Smp*, *VuP*; VI-X 1979-81, VII 1993, VIII 1994; units: 435, 488, 797, 798, 807.

G. vittiformis (Fr.) Sing. — among mosses (*Polytrichum commune*), *Bp*; VII 1993; unit 797.

Gymnopilus hybridus (Fr.: Fr.) Sing. — on stumps and fallen twigs of *P. sylvestris*, *VuP*; IX 1993, IX 1995; units: 433, 483, 800, 806.

Hemimycena lactea (Pers.: Fr.) Sing. [=*H. delicatella* (Peck.) Sing.] — on coniferous litter, *Smp*, *VuP*; XI 1977, X 1993; units: 435, 488.

Hygrocybe turunda (Fr.: Fr.) Karst. — among Sphagna, *Smp*; VII 1980, VIII 1993; units: 435, 797.

Hypholoma elongatum (Pers. emend. Fr.) Ricken — among Sphagna, *Smp*; IX-X 1978, 1980-81, VII 1993; units: 435, 797.

H. fusciculare (Huds.: Fr.) Kummer — on stumps and on fallen branches of: *P. sylvestris*, *B. pendula*, *F. sylvatica*, *VuP*, *Bp*, oak forest, beech-birch forest; VII-XI 1977-81, VIII 1993; units: 372, 375, 430, 433, 805.

H. sublateritium (Fr.) Quél. — on stumps of: *B. pendula*, *Q. robur* and *A. glutinosa*, *RnA*, *CA*, oak forest; XI 1981, IX 1993, X 1995; units: 372, 377, 794, 819.

H. udum (Pers.: Fr.) Kühn. — among Sphagna, *Smp*, *VuP*; VIII-X 1978-79, VIII 1993; units: 435, 488, 489, 797.

Inocybe geophylla (Sow.: Fr.) Kummer — on ground, *RnA*, oak forest; IX 1993, X 1995; units: 372, 377, 378, 493.

Kuehneromyces mutabilis (Schaeff.: Fr.) Sing. et Smith — on stumps of *A. glutinosa* and *B. pendula*, *RnA*, *SsA*, *CA*, *Bp*; VIII-X 1993, IX 1994, X 1995; units: 374, 378, 435, 794, 805, 819.

Laccaria laccata (Scop.: Fr.) Bk. et Br. — on ground, on broadleaved litter, *RnA*, *Bp*, *SP*, oak forest, beech-birch forest; VIII-IX 1993, IX 1994; units: 336, 372, 373, 376, 435, 794, 813.

L. proxima (Boud.) Pat. — among Sphagna, *VuP*, *Smp*; VIII-XI 1978-81, VIII 1993, IX 1994; units: 431, 433, 435, 488.

L. tortilis (Bolt.) Cke. — on ground, *CA*, *RnA*; VIII 1993, IX 1994; units: 373, 435, 794, 819.

Lepiota cristata (A. et S.: Fr.) Kummer — on ground, *SP*, birch forest; VIII 1993; units: 336, 373, 432.

Lepista inversa (Scop.: Fr.) Pat. — on coniferous litter, *VuP*; IX 1993; unit 432.

Marasmiellus ramealis (Bull.: Fr.) Sing. — on fallen twigs of *A. glutinosa* and *F. excelsior*, *RnA*, *CA*; VIII-IX 1993; units: 794, 819.

Marasmius androsaceus (L.: Fr.) Fr. — on coniferous litter, *VuP*, *Smp*; VIII-XI 1979-81, VIII-X 1993, IX 1994, X 1995; units: 430, 431, 433, 435, 488, 797, 800.

M. oreades (Bolt.: Fr.) Fr. – on ground among grasses, forest roads; VII 1993; units: 430, 433.

M. rotula (Scop.: Fr.) Fr. – on fallen twigs of *F. sylvatica*; beech-birch forest, VII 1993; unit 435.

Mycena alcalina (Fr.: Fr.) Kummer – on stumps of *P. sylvestris*, *VuP*; IX 1993; unit 432.

M. epipterygia (Scop.: Fr.) S. F. Gray – on coniferous litter, *VuP*, *Smp*; IX-XI 1977-81, IX 1993, X 1994; units: 431, 433, 435, 489, 797, 799.

M. filopes (Bull.: Fr.) Kummer – on broadleaved litter, *CA*; X 1993, XI 1994; units: 375, 376.

M. galericulata (Scop.: Fr.) S. F. Gray – on stumps and logs of: *A. glutinosa*, *B. pendula*, *B. pubescens*, *F. excelsior*, *Q. robur*, birch forest, *Bp*, oak forest, *RnA*, *VuP*, *CA*; VII-XII 1977-81, VII-IX 1993, IX 1994, X 1995; units: 372, 373, 375, 376, 377, 431, 433, 435, 489, 492, 794, 795, 813, 819.

M. galopoda (Pers.: Fr.) Kummer – on litter, *VuP*, *Bp*, *Smp*, *RnA*, oak forest; IX 1981, VII-VIII 1993, IX 1994; units: 372, 375, 377, 435, 488, 489, 797, 798, 805, 813, 819.

M. haematopoda (Pers.: Fr.) Kummer – on stumps and logs: *A. glutinosa*, *Q. robur*, *F. sylvatica*, *RnA*, *CA*, oak forest, beech-birch forest; X 1981, VIII-IX 1993, IX 1994; units: 372, 375, 377, 435, 805, 809, 813, 819.

M. maculata Karst. – on stumps of *Q. robur*, oak forest; *CA*; X 1993, 1995; units: 327, 375, 814.

M. niveipes Murr. – on logs and branches, *RnA*, *CA*; VII 1993; units: 376, 819.

M. polygramma (Bull.: Fr.) S. F. Gray – on stump of *Q. robur*, oak forest; VII 1993; unit 805.

M. pura (Pers.: Fr.) Kummer – on ground, beech-birch forest; IX 1994; unit 795.

M. sanguinolenta (A. et S.: Fr.) Kummer – on litter, *VuP*, *Smp*, *Bp*, *RnA*, *SsA*, *SP*, oak forest; VII-X 1977-81, VII-IX 1993, X 1995; units: 336, 372, 375, 376, 431, 435, 488, 492, 805.

M. speirea (Fr.: Fr.) Gill. – on fallen twigs of *A. glutinosa*, *RnA*, *SsA*, *CA*; X 1980, VII-XI 1993, X 1994; units: 373, 377, 435, 492, 493, 794, 805, 819.

M. stylobates (Pers.: Fr.) Kummer – on fallen leaves of *Q. robur*, oak forest; VII 1993; unit 819.

M. vitilis (Fr.) Quél. – on fallen twigs of: *F. excelsior*, *A. glutinosa*, *Q. robur*, *CA*, *RnA*, oak forest; XI 1981, VII-VII 1993, X 1995; units: 372, 376, 492, 794, 795, 819.

M. zephirus (Fr.: Fr.) Kummer – on litter, *Vup*, *Bp*; X 1980, IX 1993, X 1995; units: 433, 487, 489, 798.

Naucoria escharoides (Fr.: Fr.) Kummer – on ground, *SsA*, *RnA*, *CA*; IX 1981, VIII-IX 1993, X 1994-95; units: 373, 377, 378, 435, 493, 794, 805, 819.

N. scolecina (Fr.) Quél. – on ground, *RnA*, *CA*; X-XI 1993, X 1995; units: 377, 435, 493, 820.

N. subconspersa (Kühn. ex Orton) Kühn. et Romagn. – on ground, *RnA*, *CA*; IX-X 1979-80, VII-VIII 1993, X 1994; units: 373, 377, 435, 794, 819.

Omphalina sphagnicola (Berk.) Mos. – among Sphagna, *Smp*, *VuP*; VI, X 1980-81, VII 1993, IX 1994; units: 435, 488, 489, 797.

Oudemansiella platyphylla (Pers.: Fr.) Mos. – on logs and stumps of *A. glutinosa* and *B. pendula*, *RnA*, birch forest; VII 1993; units: 376, 435.

O. radicata Relhan: Fr.) Sing – on roots of *F. sylvatica*, beech-birch forest; VII 1993; unit 805.

Panellus mitis (Pers.: Fr.) Sing. – on fallen branches and twigs of *P. sylvestris*, *VuP*, *Smp*; X-XII 1980, XI 1993, XI 1995; units: 431, 435, 489, 798, 808.

P. serotinus (Schrad.: Fr.) Kühn – on stump of *A. glutinosa*, *RnA*; XI 1993; unit 373.

P. stypticus (Bull.: Fr.) P. Karst. – on stumps of *A. glutinosa* and *Q. robur*, *RnA*, *CA*, oak forest; XI 1981, XI 1993, X 1994; units: 372, 376, 794.

Pholiota alnicola (Fr.) Sing. – on stumps of *A. glutinosa*, *RnA*; IX 1993; units: 377, 818.

P. aurivella (Batsch: Fr.) Kummer – on trunks of *S. alba* and *B. pendula*, *VuP*, *SP*; IX 1979, X 1995; units: 336, 433.

P. squarrosa (Pers.: Fr.) Kummer – on trunk of *F. excelsior*, *CA*; X 1994; unit 819.

Pleurotus ostreatus (Jacq.: Fr.) Kummer – on trunks of *A. glutinosa*, *RnA*; XI 1993; unit 373.

Pluteus atromarginatus Kuhn. – on stump of *P. sylvestris*, *VuP*; X 1995; unit 800.

P. cervinus (Schaeff.) Kummer [=*P. atricapillus* (Batsch) Fay] – on logs and stumps of: *A. glutinosa*, *Q. robur*, *F. sylvatica*, *B. pendula*, *CA*, *RnA*, *SsA*, beech-birch forest, oak forest; VI 1979, VII-VIII 1993, IX 1994, X 1995; units: 377, 435, 493, 794, 805, 819.

P. leoninus (Schaeff.: Fr.) Kummer – on logs of *Q. robur*, oak forest; VII 1993; unit 819.

P. salicinus (Pers.: Fr.) Kummer – on logs of *Q. robur*, oak forest; VII 1993, unit 373.

Psathyrella candolleana (Fr.: Fr.) Maire – on logs of *A. glutinosa* and *Q. robur*, *RnA*, *CA*, oak forest; VII 1993; units: 372, 373, 794.

P. hydrophila (Bull.) R. Maire – on stumps of *F. sylvatica*, beech-birch forest; IX 1993; unit 795.

Rickenella fibula (Bull.: Fr.) Raith. – among mosses, *RnA*, *CA*, *Bp*, oak forest; VIII 1979, X 1980, VII-X 1993; units: 372, 432, 435, 486, 794, 819.

R. setipes (Fr.: Fr.) Raith. – among mosses, *RnA*, *CA*; VII 1981, VIII 1993, X 1994; units: 376, 493, 794, 818.

Strobilurus stephanocystis (Hora) Sing. – on cones of *P. sylvestris*, *VuP*; V 1981, VIII 1993, X 1994; units: 431, 433, 807.

Stropharia aeruginosa (Curt.: Fr.) Quél. – on litter, *RnA*; IX 1993; unit 378.

S. semiglobata (Batsch: Fr.) Quél. – on excrements, *VuP*, *Smp*; VIII 1978, IX 1993; units: 432, 435.

Tephrocybe palustris (Peck) Donk – among Sphagna, *Sm*, *Smp*, *VuP*; V-X 1977-81, VII 1993, IX 1994, X 1995; units: 435, 488, 489, 797, 798, 808.

Xeromphalina campanella (Batsch: Fr.) R. Maire – on stumps of *P. sylvestris*, *VuP*; IX 1980, VIII 1993; units: 432, 433.

Russulales

Lactarius aurantiacus (Pers.: Fr.) S. F. Gray – under *B. pubescens* and *B. pendula*, *Bp*; VII-VIII 1993; units: 372, 432, 487.

L. camphoratus (Bull.): Fr. – under *F. sylvatica*, beech-birch forest; VII 1993; unit 805.

L. deliciosus (L.: Fr.) S.F. Gray – and among Sphagna under *P. sylvestris*, *Smp*, *VuP*; IX 1979, VIII 1993; units: 435, 488.

L. helvus (Fr.) Fr. – among Sphagna, *Smp*; VII-VIII 1977, VIII-IX 1981, VIII 1993; units: 435, 797.

L. mitissimus (Fr.) Fr. – under *B. pendula* and *B. pubescens*, *Bp*, birch forest; VII 1979, VIII 1993; units: 372, 431, 434.

L. obscuratus (Lasch: Fr.) Fr. – under *A. glutinosa*, *RnA*, *SsA*, *CA*; IX-X 1979-81, VIII 1993, X 1994; units: 373, 376, 377, 794, 805.

L. pubescens (Fr.) Fr. – under *B. pendula*, *Bp*; IX 1995, X 1996; units: 487, 807.

L. quietus (Fr.) Fr. – under *Q. robur*, oak forest; IX-X 1993, X 1994; units: 372, 376, 819.

L. torminosus (Schaeff.: Fr.) S.F. Gray – under *B. pubescens*, *Bp*; IX 1993; units: 435, 490.

L. rufus (Scop.: Fr.) Fr. – under *P. sylvestris*, *VuP*, *Smp*; VIII-X 1979-81, VII-IX 1993, X 1994; units: 431, 432, 435, 800.

Russula aeruginea Lindbl. – under *B. pendula* and *B. pubescens*, *Bp*, birch forest; VIII-IX 1993, IX 1994; units: 372, 429, 434, 487.

R. cyanoxantha (Schaeff.) Fr. – under *B. pendula*, *RnA*; IX 1993; unit 373.

R. emetica (Schaeff.) Pers.: Fr. – under *B. pendula* and *P. sylvestris*, *VuP*, *Smp*; IX-X 1980-81, VIII 1993; units: 431, 435.

R. emetica var. *betularum* (Hora) Romagn. – under *B. pubescens*, *Bp*; X 1993; unit 487.

R. claroflava Grove – under *B. pubescens*, among Sphagna, *Smp*; VII-VIII 1977, 1980, 1993; units: 435, 797.

R. fellea Fr. – under *F. sylvatica*, beech-birch forest; VIII 1993; unit 805.

R. mairei Sing. – under *F. sylvatica*, beech-birch forest; IX 1993; unit 805.

Nidulariales

Crucibulum laeve (Huds.) Kambly in Kambly et Lee — on fallen twigs, forest roads; VIII 1993; unit 430.

Sphaerobolus stellatus Tode: Pers. — on fallen twigs of *P. sylvestris*, *VuP*, beech-pine forest; IX 1993, X 1995; units: 432, 488, 806.

Sclerodermatales

Scleroderma citrinum Pers. — on ground, *RnA*, *Bp*, *VuP*, spruce forest, beech-pine forest, oak forest; VI-XI 1978-81, VII-X 1993, X 1994, IX 1995; units: 373, 432, 435, 483, 489, 805, 806, 809, 819.

Lycoperdales

Calvatia excipuliformis (Scop.: Pers.) Perdeck — on ground among grasses, forest roads; X 1994; unit 431.

Lycoperdon perlatum Pers.: Pers. — on ground, *Bp*, birch forest; VIII-IX 1993; units: 430, 432, 484.

L. pyriforme Schaeff.: Pers. — on logs and stumps of *Q. robur* and *F. sylvatica*, oak forest, beech-birch forest; IX-X 1993; units: 430, 795, 805.

Phallales

Phallus impudicus L.: Pers. — under: *B. pendula*, *B. pubescens*, *F. sylvatica*, *P. sylvestris*, *P. abies*, *Q. robur*, *A. glutinosa*, *RnA*, *Bp*, oak forest, beech-birch forest, spruce forest; VIII 1979, VII-X 1993, IX 1994, X 1995; units: 372, 373, 375-377, 432, 435, 483, 493, 805, 806, 819.

REFERENCES

Celiński F. 1956. Stanowisko długosza królewskiego koło Stepnicy nad Zalewem Szczecińskim. Chrońmy Przyr. Ojcz. 12 (1): 17-21.

Dennis R.W.G. 1978. British *Ascomycetes*. J. Cramer, Vaduz.

Friedrich S. 1984. Mikoflora Puszczy Goleniowskiej [Mycoflora of Goleniowska Woods]. Acta Mycol. 20 (2): 173-208.

Friedrich S. 1985 (1986). *Macromycetes* na tle zespołów leśnych Puszczy Goleniowskiej [*Macromycetes* in the plant associations of the Goleniowska Woods]. Acta Mycol. 21 (1): 43-76.

Friedrich S. 1985 (1987). Charakterystyka ekologiczno-fenologiczna *macromycetes* Puszczy Goleniowskiej [Ecological and phenological characteristics of *macromycetes* the Goleniowska Woods]. Acta Mycol. 21 (2): 143-164.

Friedrich S., Markowski S. 1996. Charakterystyka geobotaniczna projektowanego rezerwatu przyrody „Wilcze Uroczysko – Olszanka" w dolinie ujściowego odcinka Odry [Geobotanical characteristic of the proposed nature reserve „Wilcze Uroczysko – Olszanka" in the lower course of Odra valley]. Zesz. Nauk. AR Szczec. 173, Rol. 63: 109-126.

J a s n o w s k a J. 1985. Rezerwat torfowiskowy „Wilcze Uroczysko". (msc.) Urząd Woj. w Szczecinie.

J a s n o w s k a J., F r i e d r i c h S., M a r k o w s k i S. 1994. Rezerwat przyrody „Wilcze Uroczysko – Olszanka". (msc.) Urząd Woj. w Szczecinie.

J a s n o w s k i M. 1958. Dokumentacja geologiczna złoża torfu nad rzeką Krępą. (msc.) Minist. Górnictwa i Energetyki.

J a s n o w s k i M. 1959. Torfowisko wysokie w dolinie Odry u jej ujścia do Zalewu Szczecińskiego. Zesz. Probl. Post. Nauk Rol., 25: 99-124.

J a s n o w s k i M. 1962. Budowa i roślinność torfowisk Pomorza Szczecińskiego. Szcz. Tow. Nauk., Wydz. Nauk Przyrod.-Rol., X: 1-340.

J ü l i c h W. 1984. Die Nichtblätterpilze, Gallertpilze und Bauchpilze (*Aphyllophorales, Heterobasidiomycetes, Gastromycetes*). Kleine Kryptogamenflora, IIb/1. G. Fischer, Jena, pp. 626.

M o s e r M. 1978. Die Röhrlinge und Blätterpilze (*Polyporales, Boletales, Agaricales, Russulales*). Kleine Kryptogamenflora, IIb/2, Basidiomyceten 2, (4. ed.). G. Fischer, Jena, pp. 532.

S k i r g i e ł l o A. 1962. Apel „Committee for mapping of *macromycetes* in Europe". Wiad. Bot. 6: 339-346.

W o j e w o d a W., Ł a w r y n o w i c z M. 1992. Red list of threatened macrofungi in Poland. In: K. Z a r z y c k i, W. W o j e w o d a, Z. H e i n r i c h (eds.) List of threatened plants in Poland. PAN, Kraków: 27-56.

Macromycetes projektowanego rezerwatu przyrody Wilcze Uroczysko – Olszanka na obszarze ujściowego odcinka Odry

S t r e s z c z e n i e

W pracy przedstawiono charakterystykę mikoflory kopułowego torfowiska wysokiego typu atlantyckiego, które jest projektowanym rezerwatem przyrody Wilcze Uroczysko – Olszanka (Fig. 1).

Grzyby zbierano w siedmiu zespołach oraz w pięciu zbiorowiskach roślinnych. W mikoflorze rezerwatu liczącej 183 gatunki najbogatszym jest rząd *Agaricales* (92 gatunki) (Tab. 1). Analiza ekologiczna wykazała dominację grzybów nadrzewnych (91 gatunków), a wśród nich saprotrofów rozwijających się na pniakach, kłodach i pniach (Fig. 2). Grzybów tworzących związki mikoryzowe z drzewami zebrano 39 gatunków. Interesującą i szczególnie cenną dla rezerwatu grupą są grzyby rozwijające się wśród torfowców (17 gatunków). Grzyby wykazują różnorodne związki z 10 gatunkami drzew, najczęściej z *Pinus sylvestris*, *Alnus glutinosa* i *Betula pendula*.

O znacznej wartości mikoflory projektowanego rezerwatu świadczą: grzyby chronione (2 gatunki), grzyby znajdujące się na „czerwonej liście" (15 gatunków) oraz grzyby, których stanowiska kartowano w Europie (18 gatunków).