

Macromycetes occurring in floodplain forests near Ithaca, New York, USA

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B u j a k i e w i c z A.: *Macromycetes occurring in floodplain forests near Ithaca, New York, USA.*
Acta Mycol. XXI(2): 165-192, 1985 (1987).

Mycocoenological studies were carried out in 1982 on three permanent plots in floodplain forests of *Ulmus-Fraxinus* type. In one growing season 151 species of macrofungi were recorded during 13 collecting trips. In spite of floristic differences in vascular plants, the forests studied have the majority of macrofungi in common with European alluvial forests.

INTRODUCTION

Mycocoenological research in floodplain forests near Ithaca was undertaken in connection with studies carried out in alluvial and alder forests in Poland (B u j a k i e w i c z 1967, 1973) and in Europe (under way) and as a continuation of such studies performed in Kansas, USA (B u j a k i e w i c z 1977).

Papers on floodplain vegetation of northeastern United States consider such areas as New Jersey (B u e l l, W i s t e n d a h l 1955; W i s t e n d a h l 1958), Indiana (L e e 1945; L i n d s e y et al. 1961) and North Carolina (O o s t i n g 1942). No notes or papers have been written on the classification or phytosociology of the floodplain forests in New York State (M a r k s, personal communication).

Forest stands near Ithaca were chosen as study sites after several reconnaissance trips. The study sites were relatively well preserved floodplain forests, having lush, but somewhat disturbed, weedy ground-layer vegetation. They were different from the floodplain forests previously mentioned but showed some

floristic similarities with the Raritan River floodplains in New Jersey (B u e l l, W i n s t e n d a h l 1955; W i s t e n d a h l 1958; van V e c h t e n, B u e l l 1959).

There are many papers dealing with macrofungi of northeastern United States, mostly monographs on genera (C o k e r 1917, A n d e r s o n, I c k i s 1921; L o w e 1942; S m i t h 1947; S l y s h 1960; S m i t h, T h i e r s 1971) and other taxonomic groups (K o r f 1951). Very little attention has been given to the ecology of macrofungi in various forest types of the region (G r a h a m 1927) and no investigations have been made on macromycetes growing in floodplain forests.

All materials for this paper have been gathered during my stay at the Plant Pathology Herbarium of Cornell University, Ithaca, New York through the generosity of an Anna E. J e n k i n s Postdoctoral Fellowship and of The Brethren Service-Polish Agricultural Exchange Program.

I am deeply grateful to dr R. P. K o r f, Director of the Plant Pathology Herbarium at Cornell University for offering me such a wonderful opportunity to do research in the United States, and to Prof. dr S. A. P i e n i a ż e k, Director of the Polish Agricultural Exchange Program, Institute of Pomology in Skierniewice for kindness and generous help.

I greatly appreciate dr R. P. K o r f's generous help and invaluable assistance in identifying fungi, especially small *Discomycetes*. I also express warmest thanks for expert help on identifying and checking some species of fungi, to dr A. H. S m i t h (University of Michigan Ann Arbor), dr R. W a t l i n g (Royal Botanic Gardens, Edinburgh), dr A. Y. R o s s m a n (Plant Protection Institute, USDA, Beltsville, MD), dr C. T. R o g e r s o n (The New York Botanical Garden, Bronx, N. Y.), dr D. N. P e g l e r (Royal Botanic Gardens, Kew), dr R. A g e r e r (Institut für Systematische Botanik, Universität München) and dr M. N o o r d e l o o s (Rijksherbarium, Leiden).

Appreciation and thanks are due to dr P. M a r k s and R. W e s l e y (Department of Ecology and Systematics, Cornell University) for great help in determining vascular plants and for advice and helpful suggestions dealing with my studies.

Finally, my sincere thanks are extended to all my friends for assistance and thoughtfulness, especially to dr L. S p i e l m a n, T. C a p i e l l o, N. S h i s h k o f f and S. G r u f f (Plant Pathology Herbarium, Cornell University), dr T. B a r o n i (State University of New York, College at Cortland) and to dr W. G. C i b u l a (National Space Tech. Lab., Bay St. Louis, MS.).

GENERAL PHYSIOGRAPHY

The forests studied were located along Fall Creek and Sixmile Creek near Ithaca (Fig. 1) at 42°27'N latitude and 76°21'W longitude. This is the borderline between the Great Lake Section of the Appalachian Plateaus Province (F e n n e m a n 1938). Considering the vegetation it is the area of the transition zone where deciduous forests meet boreal forests. The physiographic regions correspond with forest regions of deciduous forest formations of eastern North America by B r a u n (1950).

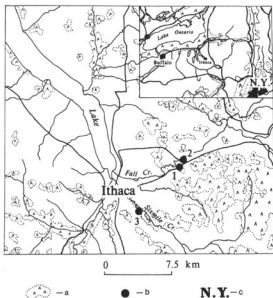


Fig. 1. Vicinity of Ithaca

a - forests, b - collecting places in floodplain forests, c - New York City

The area lies within the glaciated plateau of New York in the Cayuga Lake Basin (Wiegand, Eames 1926) approximately 127 m above sea level (Fenneman 1938). The surrounding hills attain a height of 400-600 m above sea level.

The topography is very diversified due to strong activity of the last Wisconsin glaciation. The ice sheet covered almost the whole of New York State.

The Basin is underlain Devonian-and Silurian-age rocks; consisting of alternating layers of sandstones, noncalcareous shales and flagstone with soft shales (Wiegand, Eames 1926). The position of alternation in hard and soft layers is horizontal and results in characteristic landscape of forested hills eroded by streams into ravines with precipitous multilayered cliffs rising to a height of 70 to 137 m. Many rivers and streams form cascades and falls especially when approaching the lakes. The plateau is covered with glacial till 60-300 cm thick (Fenneman 1938).

Climatic data for Ithaca, Cornell University Station, for the period 1950-1980 indicate a mean annual temperature of 7,8°C and an average yearly rainfall of 895,8 mm. The maximum precipitation occurs in June (97,4 mm) and July (89,7 mm) and the highest mean temperature – in July (20,4°C). The frost-free season at Ithaca lasts 5 months, on average from May 10 to October 10 (Wiegand, Eames 1926). The average monthly temperature during the growing season is 12,3 in May, 17,9 in June, 20,4 in July, 19,5 in August, 15,6 in September and 9,7 in October (Climatography 1982).

Fall Creek and Sixmile Creek empty into Cayuga Lake. Heavy floods appear mainly in early spring (March, April). Soils are due to river action and are of mud type, rich in organic matter.

METHODS OF INVESTIGATION

Mycocoenological studies were made in one growing season, 1982, on three observation plots, 100 m² each, marked in floodplain forests along Fall Creek, east of Ithaca (near Varna village) and along Sixmile Creek south of city of Ithaca (Fig. 1).

Phytosociological relevés using Braun-Blanquet method were made on the three plots in May and completed in June (Table 1). Since there are no references

Table 1
Floodplain forests near Ithaca, New York, USA

Locality	FC	FC	SC
No. of relevé	1	2	3
Date	26.V. 7.VI.	26.V. 7.VI.	27.V. 7.VI.
Altitude in m	200	200	150
Slope aspect	NW	NW	SW
Slope degree	0	0	0
Density of trees a ₁	70	70	40
" " a ₂	40	20	50
Density of shrubs b	60	50	30
Cover of field layer c ₁	40	50	20
" " c ₂	30	70	30
Cover of mosses d	25	20	.
Mean height of trees a ₁ in m ⁺	30	33	29
Mean d.b.h. in cm	46	40	28
Area of record in m ²	100	100	100
Number of species in one record	43	42	36
Overstorey trees a1			
Fraxinus americana a1	2.2	4.4	2.3
" " a2	.	.	2.2
" " b	.	+	+
" " c1	1.1	.	+
Carya cordiformis a1	3.3	1.1	.
" " a2	.	1.1	.
" " c1	1.1	+	.
Platanus occidentalis a1	.	.	3.3
" " a2	.	.	3.3
" " b	.	.	1.1
" " c1	.	.	+
Understorey trees a2			
Carpinus caroliniana a2	2.2	.	.
" " b	3.3	3.3	.
" " c1	1.1	.	.

<i>Tilia americana</i> a2	+	.	.
<i>Acer saccharum</i> a2	.	.	1.1
" " c1	.	.	+
Shrubs and vines b			
<i>Parthenocissus quinquefolia</i> b/c	2.3	4.3	2.3
<i>Vitis riparia</i> b/c	1.1	+	+
<i>Ulmus americana</i> b	+	1.1	.
" " c2	+	.	+
<i>Prunus serotina</i> b	.	1.1	+
" " c2	.	+	+
Herb layer c			
<i>Osmunda cinnamomea</i> c1	4.3	3.3	.
<i>Podophyllum peltatum</i> c1	2.2	3.3	.
<i>Carex laxiflora</i> v. <i>blanda</i> c1	2.3	2.3	.
<i>Symplocarpus foetidus</i> c2	2.2	1.2	.
<i>Veratrum viride</i> c2	1.2	1.2	.
<i>Thalictrum polygamum</i> c2	1.1	1.1	.
<i>Onoclea sensibilis</i> c1	1.1	+	.
<i>Mertensia virginica</i> c1	+	2.3	.
<i>Allium tricoccum</i> c1	+	+	.
<i>Trillium grandiflorum</i> c1	+	+	.
<i>Viola sororia</i> c2	3.3	2.2	2.3
<i>Geranium maculatum</i> c2	2.2	1.2	2.3
<i>Impatiens biflora</i> c1	2.3	2.3	1.2
<i>Solidago flexicaulis</i> c1	1.2	3.3	2.2
<i>Erythronium americanum</i> c2	2.1	2.1	1.1
<i>Circaea lutetiana</i> c2	2.1	1.1	1.1
<i>Arisaema triphyllum</i> c1	1.1	2.2	2.1
<i>Dentaria laciniata</i> c2	1.1	2.1	1.1
<i>Sailscina racemosa</i> c1	1.2	1.1	2.1
* <i>Lysimachia nummularia</i> c2	3.3	1.2	+
<i>Polygonum virginianum</i> c2	2.1	+	+
<i>Geum canadense</i> c2	1.1	1.1	+
<i>Viola pubescens</i> c2	+	2.1	+
<i>Dentaria diphylla</i> c2	1.1	.	1.1
<i>Cornus alternifolia</i> c2	+	.	1.1
<i>Aster lateriflorus</i> c1	+	+	+
* <i>Oxalis europaea</i> c2	+	+	+
* <i>Hesperis matronalis</i> c1	+	+	+
<i>Viola striata</i> c2	+	+	+
<i>Lithospermum latifolium</i> c1	.	1.1	.
<i>Sanguinaria canadensis</i> c2	.	.	2.1
<i>Hydrophyllum canadense</i> c1	.	.	1.1
Sporadic species: <i>Actaea alba</i> 3 c1, <i>Caulophyllum thalictroides</i> 3 c1, <i>Chelone glabra</i> 3 c1, <i>Crataegus</i> sp. 2 c1, <i>Elymus virginicus</i> 1 c2, <i>Eupatorium rugosum</i> 3 c1, * <i>Glechoma hederacea</i> 3 c2, * <i>Ligustrum vulgare</i> 1,2 c2, * <i>Lonicera tatarica</i> 3 c1, <i>Polygonatum biflorum</i> 3 c2, <i>Polygonatum</i> sp. 1 c2, * <i>Ranunculus repens</i> 1 c2, <i>Ribes grossularia</i> 2 c1, * <i>Rosa multiflora</i> 1,2 c1, <i>Sambucus canadensis</i> 3 c2, <i>Sailax</i> sp. 3 c2, <i>Viburnum lentago</i> 2 c1, <i>Zizia aurea</i> 3 c2.			
Mosses d			
<i>Fissidens taxifolius</i>	2.2	1.2	.
<i>Amblystegium varium</i>	1.2	1.2	.
Explanations: FC - Fall Creek SC - Sixmile Creek + - measured with Finnish Clinometer, Type PM-5/1520 Suunto Instrument * - weeds			

dealing with the floodplain forests of that area, studied forest communities were classified after Braun (1950) as streamside forests of elm-ash-maple type and differentiated according to dominant trees into *Ulmus-Fraxinus-Carya* forest along Fall Creek and *Ulmus-Fraxinus-Platanus* forest along Sixmile Creek. Table 1 gives the main structural features and dominant species of each stratum in the studied floodplain forests.

The carpophores of macrofungi were collected within the permanent plots (and close to them) during 13 one-day trips, from May 10 to November 24 inclusively. The fruit-bodies were counted, substratum was specified and changes in vegetation and mycoflora were noted.

Table 2

Macromycetes in floodplain forests near Ithaca, New York, USA

Forest community	U-P-C	U-P-O	U-P-P
Number of plots	1	1	1
Number of observations	13	13	13
Total number of species	70	71	72
<u>Ground:</u>			
<i>Conocybe vestita</i>	11F		
<i>Coprinus cortinatus</i>	11F		
<i>Lepiota haematosperma</i> f. <i>gracilis</i>	11F		
<i>Helvella sulcata</i>	22B	11	
<i>Inocybe violaceifolia</i>	22B	11	
<i>Macroscyphus macrospus</i>	11F	11	
<i>Conocybe parvula</i>	11F	22B	
<i>Conocybe filaris</i>	11F	11	
<i>Conocybe arrheni</i>	11F	11	22B
<i>Psathyrella orbitarum</i>	11F		22B
<i>Aleuria aurantia</i>		22B	
<i>Conocybe magnicapitata</i>		22B	
<i>Peziza ampliata</i>			22B
<i>Conocybe ambigua</i>			11
<i>Conocybe sordida</i>			11
<i>Conocybe tetraspora</i>			11
<i>Inocybe flocculosa</i>			11
<i>Inocybe retipes</i>			11
<i>Morchella esculenta</i>			11
<i>Conocybe piloselloides</i>			11
<u>Herb stems:</u>			
<i>Calyptella urbani</i>	11		
<i>Hymenoscyphus herbarum</i>	11		
<i>Hymenoscyphus caudatus</i>	11		22B
<i>Woldmaria crocea</i>	22B	11	
<i>Hymenoscyphus scutula</i>	22B	11	11
<i>Typhula sclerotioides</i>	22B	11	11
<i>Lachnum papyraceum</i>		11	11
<i>Delicatula cuspidata</i>		11	11
<i>Belonidium molissimum</i>			11
<i>Crocicreas coronatus</i>			11
<u>Twigs, leaves, fruits:</u>			
<i>Marasmius spongiosus</i>	11		
<i>Mycena osundicola</i>	11		
<i>Stereum sericeum</i>	11		
<i>Dacrymyces deliquescens</i> v. <i>minor</i>	11		
<i>Hymenoscyphus fructigenum</i>	11		
<i>Mycena roseipallens</i>	11		
<i>Mycena scicula</i>	11		
<i>Mycena speirea</i>	11		
<i>Mycena vitilis</i>	11		
<i>Nectria cinnabarina</i>		11	
<i>Tubercularia vulgaris</i>		11	
<i>Marasmiellus nigripes</i>		11	
<i>Marasmius delectans</i>		11	
<i>Microstoma floccosum</i>		11	
<i>Mycena delectabilis</i>		11	
<i>Mycena mirata</i>		11	
<i>Mycena stylobates</i>		11	
<i>Marasmius semihirtipes</i>			11
<i>Mycena iodolens</i>			11
<i>Lanzia longipes</i>			11
<i>Crucibulum laeve</i>			11
<u>Branches, bark:</u>			
<i>Favolus alveolaris</i>	11		
<i>Stereum hirsutum</i>	11		
<i>Mycena corticaticeps</i>	11		
<i>Schizopora paradoxa</i>	11		
<i>Crepidotus stipitatus</i>	11		
<i>Schizophyllum commune</i>	11		
<i>Xylaria polymorpha</i>	11		
<i>Marasmius retula</i>	11		
<i>Mycena haematopus</i>	11		
<i>Polyporus varius</i>	11		
<i>Delicatula integrella</i>	11		
<i>Mycena floccipes</i>	11		
<i>Psathyrella praestomata</i>	11		
<i>Dacryopinax elegans</i>	11		
<i>Steccherinum ochraceum</i>	11		
<i>Xylaria hypoxylon</i>	11		
<i>Ascotremella faginea</i>	11		
<i>Xeromphalina tenuipes</i>	11		
<i>Mycena luteopallens</i>	11		
<u>Insects:</u>			
<i>Cordyceps</i> sp.	11		

Table 2 cont.

Forest community	U-F-C	U-F-C	U-F-P
Number of plots	1	1	1
Number of observations	13	13	13
Total number of species	70	71	72
<u>Logs, stumps:</u>			
Coriolus hirsutus			
Dacrymyces punctiformis			
Bjerkandera adusta			
Mycena niveipes			
Panellus stypticus			
Bisporella iodocyanescens			
Dasyscypha nives			
Polyporus badius			
Trametes suaveolens			
Chondrostereum purpureum			
Lentinellus ursinus			
Polyporus brumalis			
Polyporus ciliatus			
Propolomyces farinosus			
Trametes trogii			
Merulius tremellosus			
Crepidotus applanatus			
Pluteus longistriatus			
Clitocybe epichysium			
Neuronectria peziza			
Daedaleopsis confragosa			
Scutellinia erinaceus			
Conocybe vexans			
Ustulina deusta			
Coriolus versicolor			
Ascocoryne cylichnium			
Polyporus squamosus			
Bisporella citrina			
Pluteus stricapillus			
Scutellinia scutellata			
Pluteus romellii			
Inocybe leptocystis			
Daldinia concentrica			
Tyromyces caesius			
Stereum subtomentosum			
Mycena corticola			
Pleurotus ostreatus			
Exidia glandulosa			
Crepidotus crocophyllus			
Flammulina velutipes			
Lasiosphaeria canescens			
Lasiosphaeria ovina			
Cyrtotrama aspreta			
Hohenbuehelia reniformis			
Lentinellus vulpinus			
Oxyporus populinus			
Pholiota aurivella			
Pluteus flavofuliginosus			
Psathyrella subtruncatispora			
Rosellinia subiculata			
Mycena Lesiana			
Gloeoporus dichrous			
Phaeoeramasium erinacellus			
Galerina autumnalis			
Simocybe centuncula			
Phlegiotis helvelloides			
Creopus gelatinosus			
Mycena galericulata			
Abortiporus fractipes			
Ciboria peckiana			
Arachnopeziza aurata			
Mycena algeriensis			
Pluteus salicinus			
Lachnum brevopilum			
Hypoxylon investans			
Hypocrea rufa			
Conocybe exannulata			
Lachnum pygmaeum			
Galerina triscopa			
Mycena pura			
Pluteus seticeps			
Psathyrella senex			
Tyromyces lacteus			
Lachnum virgineum			
perennial:			
Pomes fomentarius	13 ⁿ		
Ganoderma applanatum	13 ⁿ		
<u>Explanations:</u>	U-F-C	- Ulmus-Fraxinus-Carya forest	
	U-F-P	- Ulmus-Fraxinus-Platanus forest	
	r	- rare	
	n	- numerous	
	/1 ⁿ /	- abundant	
	/1 ^r /	- outside plot	

Table 2 gives the list of macrofungi collected on each observation plot. The sequence of plots is in accordance with decreasing moisture of the soil, that is from the river inward. Fungi are listed in five main ecological groups as regards substratum. The first figure in column gives the number of visits when the given species was noted and the letters in the potential exponent mark the range of abundance according to three-grade estimated scale of abundance, proposed by J a h n, N e s p i a k, T ü x e n (1967). Fungi collected outside the permanent plots are marked with brackets.

Collections of vascular plants and fungi were deposited in the Herbarium of the Department of Plant Ecology and Environment Protection at Adam Mickiewicz University in Poznań. Species of fungi marked in the list (mainly *Discomycetes*), were deposited also in the Plant Pathology Herbarium at Cornell University, Ithaca, New York, USA.

FOREST COMMUNITIES

The area of New York State is situated in a transition zone where beech-maple (*Fagus-Acer*) forest region meets hemlock-white pine (*Tsuga canadensis-Pinus strobus*) northern hardwood region (B r a u n 1950). According to the map of potential natural vegetation of the United States (K ü c h l e r 1965). Appalachian oak forests penetrates in this area into northern hardwoods of *Acer-Betula-Fagus-Tsuga* type.

The studied area lies within *Tsuga canadensis-Pinus strobus* northern hardwood region where conifers occur together with *Fagus grandifolia*, *Acer saccharum*, *A. rubrum* and other hardwood trees. On south- and west-facing upper slopes with acid soils *Quercus-Castanea* forest grow while lower slopes and well drained flats are covered with *Fagus-Acer* forests with a lush spring flowers.

The majority of the flora of Cayuga Lake Basin has a northern affinity and occurs on forested hills (W i e g a n d, E a m e s 1926). Valleys and ravines nourish different and richer vegetation.

Ulmus-Fraxinus-Carya forest

The riparian forests studied along Fall Creek occur in small meanders and are sheltered to the southeast by the steep bluffs of the river. The plateau above the river is covered with *Fagus-Acer* forest. The streamside forest forms a narrow (200-400 m wide) strip along the river. It is flooded usually several times a year. In 1982 the river flow was rather low and no flooding of the area was observed during the collecting season.

The habitat of this forest corresponds in general with the forest of *Mertensia*

"islands" described by B u e l l, W i s t e n d a h l (1955) along the Raritan River in New Jersey.

The substrate is higher and drier near the center and lower and wetter near the margins. Two plots were marked in this forest: the first one on the periphery and the second one near the center of the meander.

The alluvial soil had a greasy consistency and thin humus layer. It dried after flooding and became clogged, as was often observed in the dry summer of 1982, especially in the first plot, located close to the riverbed. Eroded material and flood debris were spread out on three trunks, indicating the height of water during major flooding. Sodden layers of litter covered large areas which often lacked vegetation.

The absence of *Alnus* and scanty occurrence of *Salix* indicate that this area was rather well drained.

The *Ulmus-Fraxinus-Carya* forest community was a dense, mesophytic forest with multilayered structure. The canopy was formed by magnificent trees of *Carya cordiformis* and *Fraxinus americana*, whereas *Ulmus americana* occurred only as a shrub or a small tree. Trees were tall and entwined with lianas such as *Parthenocissus quinquefolia* and *Vitis riparia* (Table 1). The shrub layer was rather scanty.

Herb cover was not complete but was represented by a large number of widely spaced individuals. It was double layered and showed distinct seasonal aspects. There was a great display of spring flowering herbs in that forest. After water level dropped by mid-April, the forest floor was covered with rosettes of *Viola sororia*, single specimens of *Erythronium americanum* and cone-like, tightly wrapped leaves of *Symplocarpus foetidus*. In May *Geranium maculatum*, *Arisaema triphyllum*, *Trillium grandiflorum*, *Podophyllum peltatum*, *Dentaria laciniata*, *D. diphylla* and *Mertensia virginica* were in flower. In late spring *Osmunda cinnamomea* formed dense and luxuriant tufts. The ground was covered with *Lysimachia nummularia*, native of Europe and carpets of *Parthenocissus quinquefolia*, which on trees was found only in small amounts while on the ground it was much more abundant. In the late spring and early summer *Osmunda cinnamomea* showed a very abundant growth. It started to senesce by mid-summer and continued to senesce in August and September. In summer *Impatiens biflora*, *Carex laxiflora* v. *blanda* and *Polygonum virginianum* showed an increase in cover while in autumn *Solidago flexicaulis* and *Aster lateriflorus* were abundant.

Many other trees and shrubs grew on the studied meander but outside the observation plots, e.g. *Acer rubrum*, *Betula lutea*, *Fagus grandifolia*, *Lindera benzoin*, *Ostrya virginiana*, *Populus deltoides*, *Platanus occidentalis*, *Prunus virginiana* and *Quercus bicolor*. Such a variety of tree species is generally characteristic of floodplain forests (O o s t i n g 1942) and indicates rich forests that must once have covered larger areas in valleys and ravines.

Ulmus-Fraxinus-Platanus forest

The third observation plot was marked in the *Ulmus-Fraxinus-Platanus* riverside forest along Sixmile Creek. The plot was located on a high terrace between the riverbed and the steep bluffs of the ravine to the northeast.

There was little herbaceous cover on that plot. A large accumulation of logs, boughs and branches mixed with gravel and eroded material covered forest floor in many places.

Platanus occidentalis was the dominant tree of dense canopy and *Acer saccharum* predominated in the understory.

In the scanty herb layer in spring *Sanguinaria canadensis*, *Geranium maculatum*, *Viola sororia* and *Arisaema triphyllum* were common. Later *Smilacina racemosa* and *Hydrophyllum canadense* prevailed, whereas in autumn *Solidago flexicaulis* was dominant. The moss layer did not develop here.

Thick leaf litter covered the plot starting in late September, reaching 90-100% in October.

Macrofungi in the studied forests

The floodplain forests occupy usually small areas, are subject to disturbance by frequent flooding and are distinguished by rich and luxuriant vegetation. All these features do not provide the best conditions for the development of macrofungi and terrestrial fleshy fungi in particular (B u j a k i e w i c z 1973, 1977).

Mycological studies performed in the riverside forests near Ithaca do not allow to draw, from only one collecting season, a thorough conclusions on the occurrence of fungi in that habitat (Table 2). 151 species of macrofungi were collected totally, which is almost three times more when compared with the forests studied in Kansas (B u j a k i e w i c z 1977).

The list of terrestrial fungi contains only 20 species. They all form tiny fruit-bodies, grow solitarly and are scarce.

In spring first fungi confined to soil occurred on the third (driest) observation plot along Sixmile Creek. It was the end of May when fruit-bodies of *Morchella esculenta*, *Psathyrella orbitarum*, *Conocybe sordida* and *Peziza ampliata* were recorded on that plot. It was not until August when the first terrestrial fungi were encountered along Fall Creek. *Helvella sulcata* and *Inocybe violaceifolia* were found first and their carpophores were scattered throughout the plots. Also in autumn terrestrial fungi were not abundant. Only *Conocybe arrheni*, *C. filaris* and *Aleuria aurantia* were more numerous.

Many macrofungi of that ecological group are indicative of rich soils and (or) disturbed places like paths, wastes, gardens etc. As many as 8 species of *Conocybe*

occurred in the studied floodplains. They are usually widespread and grow on rich soil, as *Conocybe arrheni* and *C. vestita* or occur in parks, at edges of paths and fields as *Conocybe filaris*, *C. magnicapitata* and *C. sordida* (van Waveren 1970; Watling 1982). Because of a large accumulation of plant and animal debris left by flooding, soil in the studied meander along Fall Creek contained probably a certain amount of nitrogen and H₂S. The occurrence of *Aleuria aurantia* on the second plot very likely indicates the presence of sulphuretted hydrogen in the soil (Petersen 1967).

Indicative of the rich soil was also the occurrence of *Coprinus cortinatus*, *Lepiota haematosperma* f. *gracilis* (Bujakiewicz 1973) and *Macroscyphus macropus* (Dissing 1966).

Interesting was the presence of *Peziza ampliata* (Svrček 1970) that grew on the mud and on old fallen leaves stuck to the ground with greasy mud. Noteworthy was the occurrence of *Helvella sulcata*. Smith-Webber (1972) distinguished two seasonal variants of that fungus in Michigan. In floodplain forests near Ithaca only an early terrestrial variant fruiting from June to August was recorded.

Very characteristic was the group of fungi growing on decaying herb stems (10 species) representing mainly tiny *Discomycetes* from *Hymenoscyphus* and *Lachnum* genera. They grow usually in wet places and occur in great abundance. In the forests studied they form an outstanding ecological group.

The majority of these fungi grew in autumn and the humidity of the forest floor was of prime importance for their development, e.g. *Hymenoscyphus caudatum*, *H. scutula*. Some showed strict connection with substratum, e.g. *Woldmaria crocea*, that appeared on old fronds of *Osmunda cinnamomea* in large abundance only short period in October. Also *Typhula sclerotioides* was numerous in autumn.

Among a total of 21 species of fungi growing on fallen twigs, leaves and fruits *Stereum striatum* was commonly represented. It grows throughout the year in swampy woods on dead twigs of *Carpinus caroliniana* (Burt 1920).

The development of fungi growing on twigs is generally less dependent on direct influence of rain but some show distinct increase of carpophores after rain, like *Mycena acicula* (Smith 1947). In late spring the occurrence of *Microstroma floccosum* and *Marasmius semihirtipes* was characteristic. Interesting pattern was demonstrated by *Mycena speirea*, that grew abundantly on the second observation plot. This plot provided the best conditions for the development of fruitbodies of that fungus, thus moderate and relatively constant humidity due to dense herb layer and almost no disturbance by flooding. *Mycena vitilis* and *M. iodiolens* occur late in the season (Smith 1947) what was also confirmed in the studied forests.

The most constant fungi of that group were: *Mycena speirea*, *M. roseipallens*, *Hymenoscyphus fructigenum* and *Mycena acicula*. The first two species, *Mycena speirea* and *M. roseipallens* seem to be typical of alluvial forests (B u j a k i e w i c z 1973). It was also confirmed by S m i t h (1947) that *Mycena roseipallens* grows on debris of *Ulmus* and *Fraxinus* while *Mycena speirea* in wet places on sticks buried in mud. The frequent occurrence of *Hymenoscyphus fructigenum* on nuts of *Carya cordiformis* is also characteristic. Along Sixmile Creek *Lanzia longipes* grew on old petioles of *Fraxinus americana*. This species is known only from North America (W h i t e 1941).

On fallen branches (19 species) *Schizophyllum commune* and *Favolus alveolaris* were the commonest and scattered throughout the season. Noteworthy was the occurrence of *Dacryopinax elegans* in late summer and in autumn and *Xeromphalina tenuipes* in late spring. The latter species grows on hardwood in the tropics and in south-eastern Canada and also in eastern to midwestern USA. It is circumglobal but absent from western North America and Europe (R e d h e a d 1980). *Mycena floccipes* recorded by S m i t h (1947) on fallen bark of *Ulmus* and *Carya* seems to be connected with the floodplain forests, however there is no basis for assuming that it is restricted to that habitat.

Wood-inhabiting fungi constitute the most abundant group in the studied forests. 76 species were recorded totally. Excluding perennials and some durable fungi (e.g. *Coriolus versicolor*) the most abundant were, in spring: *Polyporus squamosus*, in summer and early autumn: *Bisporella citrina*, *Clitocybe epichysium*, *Mycena leaiana*, *Scutellinia scutellata* and *Pleurotus ostreatus* and in late autumn: *Scutellinia erinacea*, *Neuronectria peziza* and *Galerina autumnalis*.

Xylophilous fungi are more closely connected with the substratum and the degree of decomposition of wood than with the climatic conditions. Remarkable was the fruiting of *Pleurotus ostreatus* early in the season only.

Noteworthy was the occurrence of *Simocybe centuncula* and *Mycena corticola*, both common in alluvial forests (B u j a k i e w i c z 1973). The latter occurred only on the second studied plot on one fallen log of *Carya* and fruited in great abundance from June till September. *Crepidotus crocophyllus* also seems to be connected with alluvial forests (L a z e b n i č e k 1970).

In Fall Creek meander *Bisporella iodocyanescens*, a new species for science was recorded on logs covered with stromata of *Melanomma pulvis-pyrius* (K o r f & B u j a k i e w i c z, in print).

Of great interest is the appearance of terrestrial *Conocybe vexans* and *Inocybe leptocystis* on wood. In alluvial forests some fungi confined to soil grow also on logs covered with thick layer of mud (B u j a k i e w i c z, in print). Mycelium may find that substratum more suitable for the development of carpophores in an unstable habitat of floodplain forest.

Phaeomarasmus erinacellus was recorded several times on thin, still standing

logs, growing always 50-70 cm above the ground. This habit resembles *Phaeomarasmius erinaceus* in Europe (B u j a k i e w i c z 1979, 1981).

In Fall Creek meander an interesting species *Cyptotrama asprata* was encountered. This fungus is more common in southern parts of the United States (L e w i s 1978) and other species of this genus are tropical or subtropical in distribution (S m i t h et al. 1973). *Cyptotrama asprata* shows almost identical distribution as demonstrated by *Xeromphalina tenuipes* (Redhead 1980).

Along Sixmile Creek on strongly rotten log, brought along with water, *Phlogiotis helvelloides* was recorded. Also *Creopus gelatinosus* grew there very often. Some species noted in that meander, namely *Ciboria peckiana* and *Mycena leatiana* are confined to North America. Very interesting was the occurrence of *Mycena algeriensis*, connected with *Ulmus* and *Abus* (S m i t h 1947), thus probably with the habitat of floodplain forests.

LIST OF SPECIES

Nomenclature accepted: generally - H a w k s w o r t h, S u t t o n, A i n s w o r t h (1983); *Ascomycetes* - D e n n i s (1978), K o r f (1973, 1982), M u n k (1957), R a i t v i i r (1970); *Basidiomycetes. Aphyllophorales* - O v e r h o l t s (1950), D o m a ń s k i (1974, 1975), *Tremellales* - M c N a b b (1973), *Agaricales* - G i l l i a m (1976), M o s e r (1983), S m i t h (1947), S m i t h, H e s l e r (1968), W a t l i n g (1982).

Abbreviations used: *UFC* - *Ulmus-Fraxinus-Carya* forest along Fall Creek; *UFP* - *Ulmus-Fraxinus-Platanus* forest along Sixmile Creek; I, II, III - observation plots; r - rare, n - numerous, a - abundant; + - deposited also in CUP (Cornell University, Plant Pathology Herbarium, Ithaca, New York, USA).

ASCOMYCOTINA

Phacidiales

Propolomyces farinosus (Pers.: Fr.) S h e r w o o d - *UFC*, outside I, on decorticated hardwood log, r, 24.XI. (det. R. P. Korf).

Clavicipitales

Cordyceps sp. - *UFC*, outside I, on larvae of *Erinnidae* (Diptera), r, 29.X. This is probably a new species and will be a subject of further elaboration. It resembles *Cordyceps corallomyces* Möller in growing on larvae of *Diptera*

(K o b a y a s i 1941) but has distinct subglobose and symmetrical fertile head which excludes it from subsectio *Laterales* (B a l a z y, personal communication).

Sphaeriales

- + *Creopus gelatinosus* (Tode: Fr.) L i n k. — *UFC*, outside II, on stump, r, 29.X.; *UFP*, III, on logs, n, 2.IX.-19.X. (det. R. P. Korf).
- Daldinia concentrica* (Bolt.: Fr.) Ces. & de Not. — *UFC*, outside I, on logs, a, 29.X.; *UFP*, outside III, on logs, a, 23.VIII.-28.IX.
- + *Hypocrea rufa* (Pers.: Fr.) — *UFP*, III, on bark of logs, n, 28.IX.; *UFC*, I, on log, a, 28.IX. (rev. C. R o g e r s o n).
- Hypoxyton investans* (Schw.) Curt. — *UFP*, outside III, on log, a, 24.XI. (det. C. R o g e r s o n).
- Lasiosphaeria canescens* (Pers.: Fr.) Karst. — *UFC*, II, on log, n, 19.X. (det. A. R o s s m a n).
- Lasiosphaeria ovina* (Pers.: Fr.) Cec. & de Not. — *UFC*, II, on decorticated hardwood log, n, 19.X. (det. A. R o s s m a n).
- Nectria cinnabarina* (Tode: Fr.) Fr. — *UFC*, II, on twigs of *Carpinus caroliniana*, a, 29.IX., together with conidial state *Tubercularia vulgaris* Tode: Fr. (rev. L. Spielman).
- + *Neuronectria peziza* (Tode: Fr.) Munk (= *Nectria peziza* (Tode: Fr.) Fr. — *UFC*, II, on decorticated logs, a, 28.IX.-19.X., also in upland forest *Fagus-Acer* along Fall Creek, on log, a, 24.XI. (det. R. P. Korf).
- Rosellinia subiculata* (Schw.: Fr.) Sacc. — *UFC*, II, on decorticated hardwood log, r, 19.X. (det. C. R o g e r s o n).
- Ustulina deusta* (Hoffm.: Fr.) Petrak — *UFC*, outside I, on dead standing *Ulmus americana* (?), n, 28.IX.-24.XI.; plot II, at the base of dead standing *Carpinus caroliniana*, on stumps and branches, n, 2.IX.-24.XI.; *UFP*, outside III, on logs, a, 9.XI.
- Xylaria hypoxyton* (L.: Fr.) Grev. — *UFP*, III, on fallen branch, n, 17.VI.
- Xylaria polymorpha* (Pers.: Fr.) Grev. — *UFC*, outside I, at the base of *Carpinus caroliniana*, n, 19.VIII.-24.XI.; outside II, on roots of *Carpinus caroliniana*, n, 8.X.; *UFP*, III, on branches and at the base of *Platanus occidentalis*, n, 17.VI., 23.VIII., 2.IX.

Helotiales

- + *Arachnopeziza aurata* Fuckel — *UFP*, III, on logs, n, 8.VI.-28.IX. (det. T. C a p i e l l o, rev. R. P. K o r f).

- + *Ascocoryne cylichnium* (Tul.) Korf — *UFC*, I, on logs and branches, n, 2.IX-19.X., plot II, on logs, n, 28.IX.-19.X.; *UFP*, III, on logs, n, 14.IX.-29.X.
- + *Ascotremella faginea* (Peck) Seaver — *UFP*, outside III, on fallen branches, r, 23.VIII. (det. R. P. K o r f).
- + *Belonidium molissimum* (Lasch) Raitv. — *UFP*, III, on herbaceous stem, n, 2.IX. (det. R. P. K o r f).
- + *Bisporella citrina* S. E. Carpenter — *UFC*, I, on logs, n, 2.IX.-14.IX., plot II, on logs, a, 2.IX.-24.XI.; *UFP*, outside III, a, 14.IX.-24.XI. (det. T. C a p i e l l o).
- + *Bisporella confluens* (Sacc.) Korf et Bujakiewicz comb. nov. (basionym: *Helotium confluens* Sacc., Syll. Fung. 8: 222. 1889, a new name (Art. 72 Note 1, ICBN) for *Peziza confluens* Schw. 1832 non *P. confluens* Pers. 1799). — Upland forest *Fagus-Acer* along Fall Creek, on log, n, 9.XI. (det. R. P. K o r f). It resembles *B. citrina* in the field but is much larger, has stipitate, often confluent apothecia and was originally described from North America by S c h w e i n i t z (K o r f & B u j a k i e w i c z, 1985).
- + *Bisporella iodocyanescens* Korf et Bujakiewicz sp. nov. — *UFC*, I, on log covered with stromata of *Melanomma pulvis-pyrius* (Pers.) F u c k., n, 8.X. (det. R. P. K o r f). Also resembles *B. citrina* in the field. "It is characterized by an ectal excipular layer of pyriform to globose cells in chains, immersed in gel that blues in M e l z e r's Reagent" (K o r f et B u j a k i e w i c z, 1985).
- + *Ciboria peckiana* (Cooke) Korf — *UFP*, III, on decaying wood, logs, stumps, n, 23.VIII., 2.IX. (det. R. P. K o r f).
- Crocicreas coronatum* (Bull.: Fr.) S. E. Carpenter — *UFP*, outside III, on herbaceous stems, n, 8.X.
- Dasyscyphella nivea* (Fr.: Fr.) Raitv. — *UFC*, III, on bark of logs, r, 19.X. (rev. R. P. K o r f).
- Hymenoscyphus caudatus* (Karst.) Dennis — *UFC*, I, II, on petioles of *Fraxinus*, *Carya*, *Platanus* and on herbaceous stems, a, 14.IX.-9.XI.; *UFP*, III, on petioles of *Acer*, *Platanus*, a, 28.IX.-24.XI. (rev. R. P. K o r f).
- Hymenoscyphus fructigenus* (Bull.: Fr.) S. F. Gray — *UFC*, I, II, on nuts of *Carya cordiformis*, a, 14.IX.-19.X.; *UFP*, III, on nuts of *Juglans cinerea* (?), r, 14.IX. (rev. R. P. K o r f).
- Hymenoscyphus herbarum* (Pers.: Fr.) Dennis *UFC*, I, on herbaceous debris, r, 19.X. (det. R. P. K o r f).
- Hymenoscyphus infraciens* (Ces.) Dennis — *UFC*, II, on dead stem of *Vitis riparia*, r, 2.IX. (det. T. C a p i e l l o).
- + *Hymenoscyphus scutula* (Pers.: Fr.) Phill. — *UFC*, I, II, on decaying herbaceous stems, n, 17.VI., 19.VIII., 29.X.; *UFP*, III, r, 2.IX. (rev. R. P. K o r f).
- Lachnum brevopilum* (Le Gal) Korf et Bujakiewicz comb. nov. (basionym:

- Dasyscypha brevipila* Le Gal., Rev. Mycol., Paris 4: 26. 1939) — *UFP*, III, on log, n, 14.IX. (det. R. P. K o r f).
- + *Lachnum papyraceum* (Karst.) Karst. — *UFC*, outside II, on herbaceous stems, fallen twigs, a, 7.VI.; *UFP*, III, on branches and twigs, a, 17.VI. (det. R. P. K o r f).
- Lachnum pygmaeum* (Fr.) B r e s. — *UFP*, III, on log, n, 2.IX. (det. R. P. K o r f).
- + *Lachnum virgineum* (Batsch: Fr.) Karst. — *UFP*, III, on logs covered with *Ustulina deusta*, a, 8.VI.-19.X.
- Lanzia longipes* (Cke. & Pk. in Cke.) Dumont & Korf in Korf & Gruff — *UFP*, III, on fallen petioles of *Fraxinus*, r, 23.VIII., 2.IX. (det. R. P. K o r f).

Pezizales

- + *Aleuria aurantia* (Fr.: Fr.) Fuckel — *UFC*, II, on the ground, r, 19.X.-9.XI.
- + *Helvella sulcata* Afz.: Fr. — *UFC*, I, on bare ground, r, 19.VIII., 14.IX., plot II, 14.IX. (det. N. S m i t h - W e b e r).
- Macroscyphus macropus* (Pers.: Fr.) S. F. Gray — *UFC*, I, outside II, on bare ground, r, 14.IX. (rev. R. P. K o r f).
- + *Microstoma floccosum* (Sch.) Raitv. — *UFC*, II, on twigs buried in mud, r, 17.VI. (det. L. S p i e l m a n, rev. R. P. K o r f).
- + *Morchella esculenta* Pers.: Fr. — *UFP*, outside III, on muddy ground, r, 27.V.
- + *Peziza arvernensis* Boud. — *UFP*, remote from plot III, on log, r, 28.IX. (det. R. P. K o r f).
- + *Peziza ampliata* Pers.: Fr. sensu Svrček — *UFP*, III, on bare mud and leaves of *Platanus* and *Acer* stuck to the ground, r, 27.V.-17.VI. (det. R. P. K o r f).
- + *Scutellinia scutellata* (L.: Fr.) Lamb. — *UFC*, outside I and II, on logs, on the ground, n, 17.VI., 29.X., 9.XI.; outside II, on logs, n, 19.X.; *UFP*, outside III, n, on logs, 2.IX.-24.XI. (rev. R. P. K o r f).
- + *Scutellinia erinaceus* (Schw.: Fr.) Kuntze [= *S. setosa* (Nees: Fr.) Seaver] — *UFC*, outside I, on logs, a, 8.X.-9.XI.; *UFP*, outside III, on log, n, 8.IX. (det. R. P. K o r f).

BASIDIOMYCOTINA

Tremellales

- Exidia glandulosa* Fr. — *UFC*, II, on logs of *Carpinus caroliniana*, r, 7, 17.VI., 28.IX.
- Phlogiotis helvelloides* (Fr.) Mart. — *UFP*, outside III, on log, r, 23.VIII.-9.XI.

Dacrymycetales

- Dacrymyces deliquescens* (Bull.) D u b y var. *minor* (Peck) Kennedy — *UFC*, I, II, on twigs, n, 17.VI.-8.X.
- Dacrymyces punctiformis* Neuh. — *UFC*, I, on decorticated log, r, 28.IX., 24.XI.
- Dacryopinax elegans* (Berk. & Curtis) Martin — *UFC*, outside II, on boughs and logs, n, 14.IX.-19.X.; *UFP*, outside III, on log among mosses *Entodon cladorrhizus* and *Hypnum* sp., r, 28.IX (det. R. P. K o r f).

Aphyllphorales

- Abortiporus fractipes* (Ber. & Curt.) Bond. — *UFP*, III, on log, n, 2.IX.-14.IX. (det. D. P e g l e r).
- Bjerkandera adusta* (Fr.) Karst. — *UFC*, I, II, on logs, n, 14.IX., 19.X. (det. D. P e g l e r).
- Chondrostereum purpureum* (Pers.: Fr.) Pouz. — *UFC*, I, on log of *Carpinus caroliniana*, r, 26.V.
- Coriolus hirsutus* (Wulf.: Fr.) Q u é l. — *UFC*, I, on logs, branches, n, 17.VI.-8.X. (det. D. P e g l e r).
- Coriolus versicolor* (L.: Fr.) Pat. — *UFC*, outside I, on logs, n, 8.X.-24.XI.; plot II, on logs, a, 10.V.-24.XI.; *UFP*, outside III, on log, n, 28.IX.
- Daedaleopsis confragosa* (Bolt.: Fr.) Schroet. — *UFC*, I, II, on logs, a, 10.V.-24.XI.
- Favolus alveolaris* (DC.: Fr.) Quél. — *UFC*, I, on fallen branches, twigs, r, 26.V., 7, 17.VI., 28.IX., 24.XI.
- Fomes fomentarius* (L.: Fr.) Kickx — *UFC*, II, on logs of *Carpinus caroliniana*, throughout the year.
- Ganoderma applanatum* (Pers. ex Wallr.) Pat. — *UFC*, II, on logs of *Carya cordiformis*, *Carpinus caroliniana*, throughout the year.
- Gloeoporus dichrous* (Fr.) Bres. — *UFC*, II, on logs, n, 14, 28.IX., *UFP*, outside III, on logs, n, 23.VIII.-8.IX. (rev. D. P e g l e r).
- Merulius tremellosus* Schrad.: Fr. — *UFC*, I, II, on logs, r, 2.IX., 29.X.
- Oxyporus populinus* (Fr.) Donk — *UFC*, outside II, on log of *Platanus occidentalis*, r, 19.X. (det. D. P e g l e r).
- Polyporus badius* (Pers. ex S. F. Gray) Schw. — *UFC*, outside I, on log, n, 29.X.
- Polyporus brumalis* Fr. — *UFC*, outside I, on log, r, 14.IX. (det. D. P e g l e r).
- Polyporus ciliatus* Fr. — *UFC*, outside I, on log, r, 9.XI. (det. D. P e g l e r).
- Polyporus squamosus* (Huds.) ex Fr. — *UFC*, outside I, on logs, r, 26.V., 17.VI.; plot II, on logs, r, 10, 26.V.; *UFP*, outside III, r, 27.V., 7, 17.VI.
- Polyporus varius* (Pers.) ex Fr. — *UFC*, II, on branches, r, 7.VI., 19.VIII.; *UFP*, III, on twigs, r, 23.VIII., 2.IX.
- Schizophyllum commune* Fr. — *UFC*, I, II, on branches, boughs, n, 7.VI.-24.XI.

- Schizopora paradoxa* (Fr.) Donk. — *UFC*, I, on branches, r, 24.XI. (det. D. Pegler).
- Steccherinum ochraceum* (Pers. ap. Gmel.: Fr.) S. F. Gray — *UFP*, III, on branches, r, 23.VIII.-28.IX.
- Stereum hirsutum* (Willd.: Fr.) S. F. Gray — *UFC*, I, on branches and logs, n, 19.VIII., 2.IX., 8.X.
- Stereum sericeum* Schweinitz (= *S. striatum* Fr.) — *UFC*, I, II, on twigs of *Carpinus caroliniana*, a, 19.VIII.-24.XI. (rev. H. Jahn and J. Eriksson).
- Stereum subtomentosum* Pouz. — *UFC*, II, on logs, n, 14.IX.-24.XI.; *UFP*, III on logs, n, 14.IX. (det. J. Eriksson).
- Trametes suaveolens* (L.: Fr.) Fr. — *UFC*, outside I, on logs of *Salix* sp., r, 29.X.
- Trametes trogii* Berk. — *UFC*, outside I, on log of *Salix* sp., r, 29.X. (det. D. Pegler).
- Tyromyces caesius* (Fr.) Murr. — *UFC*, outside I, on log, r, 19.X.; *UFP*, III, on logs of *Platanus occidentalis*, n, 23.VIII.-8.X. (det. D. Pegler).
- Tyromyces lacteus* (Fr.) Murr. — *UFP*, outside III, on log of *Fraxinus* sp., r, 2.IX. (det. D. Pegler).
- Typhula sclerotoides* (Pers.) Fr. — *UFC*, I, II, on herbaceous stems, a, 28.IX.-19.X.; *UFP*, outside III, on petioles of *Platanus occidentalis*, a, 8.X.

Agaricales

- Calyptella urbani* (P. Henn.) W. B. Cooke — *UFC*, I, on herbaceous debris, mainly stems, r, 28.IX. (det. R. Agerer).
- Clitocybe epichysium* (Pers.: Fr.) Bigelow — *UFC*, I, II and outside, on logs, 2.IX.-29.X. (det. T. Baroni).
- Clitocybe truncicola* (Pk.) Sacc. — *UFC*, outside II, on dead, standing *Platanus occidentalis*, n, 8.X. (det. A. H. Smith).
- Conocybe ambigua* (Kühn.) ex Kühn & Watl. — *UFP*, III, on bare ground, r, 28.IX. (det. R. Watling).
- Conocybe arrheni* (Fr.) Kits van Waveren — *UFC*, I, II, on bare ground under leaf litter, r, 8.X.; *UFP*, III, on bare ground, r, 8-29.X. (det. R. Watling).
- Conocybe exannulata* (Kühn.) Kühn. & Watl. — *UFP*, III, on log, r, 14.IX. (det. R. Watling).
- Conocybe filaris* (Fr.) Kühn. — *UFC*, I, II, on bare ground, r, 14.IX.-9.XI. (det. R. Watling).
- Conocybe magnicapitata* P. D. Orton — *UFC*, II, on bare ground, r, 8.X. (det. R. Watling).
- Conocybe parvula* Watling — *UFC*, I, II, on bare ground, r, 29.X.-9.XI. (det. R. Watling).

- Conocybe piloselloides* Watling – UFP, outside III, on bare ground, r, 29.IX. (det. R. W a t l i n g).
- Conocybe* cf. *sordida* (Kühn.) Kühn & Watl. – UFP, outside III, on bare ground, r, 29.V. (det. R. W a t l i n g).
- Conocybe tetraspora* Sing. – UFP, III, on bare ground, r, 23.VIII. (det. R. W a t l i n g).
- Conocybe vestita* (Fr. ap. Quél.) Kühn. – UFC, I, on decaying branch covered with mud, r, 19.VIII. (det. R. W a t l i n g).
- Conocybe vexans* P. D. Orton – UFC, I, II and outside, on logs among mosses, r, 28.IX., 8.X.; UFP, on logs, n, 8, 14.IX. (det. R. W a t l i n g).
- Coprinus cortinatus* Lange – UFC, I, on bare ground, r, 14.IX.
- Crepidotus applanatus* Pers. – UFC, outside, I, II, on log, r, 17.VI., 29.X. (det. A. H. S m i t h).
- Crepidotus crocophyllus* (Berk.) Sacc. – UFC, outside II, on dead, standing *Platanus occidentalis*, n, 8.X.
- Crepidotus stipitatus* Kauff. – UFC, I, on decaying wood, r, 2.IX.
- Crepidotus* cf. *versutus* (Pk.) Sacc. – UFP, outside III, in crevice of *Platanus occidentalis*, a, 8.VI. (leg. R. P. K o r f, det. A. H. S m i t h).
- Cyptotrama asprata* (Berk.) Redhead et Ginns (= *C. chrysopepla* (Berk. Curt.) Singer – UFC, outside II, on log of *Platanus occidentalis*, r, 8.X. (det. T. B a r o n i).
- Delicatula cuspidata* (Quél.) Čejp – UFC, II, on debris of *Osmunda cinnamomea*, r, 17.VI.
- Delicatula integrella* (Pers.: Fr.) Fay – UFC, II, on decaying wood, r, 2.IX.
- Flammulina velutipes* (Curt.: Fr.) Sing. – UFC, outside plots, on dead standing tree, n, 29.X.
- Galerina autumnalis* (Pk.) Smith & Sing. – UFC, outside II, on logs, n, 28.IX., 8, 29.X.; UFP, outside III, r, 28.IX.-29.X.
- Galerina triscopa* (Fr.) Kühn. – UFP, III, on log, r, 19.X. (det. A. H. S m i t h).
- Hohenbuehelia reniformis* (Fr.) S i n g. – UFC, II, on log, r, 7.VI.
- Inocybe flocculosa* (Berk.) Sacc. – UFP, III, on bare ground, r, 23.VIII. (det. A. H. S m i t h).
- Inocybe leptocystis* Atk. – UFC, outside I, II, on decaying logs and on bare ground, r, 14.IX., 8.X.; UFP, III, on logs, r, 23.VIII., 8, 19.X. (det. A. H. S m i t h).
- Inocybe* cf. *retipes* Atk. – UFP, III, on bare ground, r, 8.X. (det. A. H. S m i t h).
- Inocybe* cf. *violaceifolia* Pk. – UFC, I, II, on bare ground, n, 19.VIII.-2.IX. (det. A. H. S m i t h).
- Lentinellus ursinus* (Fr.) Kühn. – UFC, outside I, on log, r, 2.IX.
- Lentinellus vulpinus* (Fr.) Kühn. et Maire – UFC, outside II, on log of *Platanus occidentalis*, n, 19-29.X.

- Lepiota haematosperma* (Bull.) Boud. f. *gracilis* Lge. — UFC, I, on bare ground, r, 19.VIII.
- Marasmiellus nigripes* (Schw.) Sing. — UFC, II, on fallen twig, r, 19.VIII.
- Marasmius delectans* Morgan — UFC, II, on fallen twig, r, 19.VIII.
- Marasmius rotula* (Scop.: Fr.) — UFC, I, on bark at the base of *Carya cordiformis*, r, 17.VI., 2.IX.; UFP, III, on piece of bark, r, 2.IX.
- Marasmius semihirtipes* Pk. — UFP, III, and outside, on fallen twigs and branches, r, 27.V., 17.VI., 23.VIII.
- Marasmius spongiosus* Berk. et Curtis — UFC, I, on fallen twigs, r, 14, 28.IX.
- Mycena acicula* (Fr.) Quél. — UFC, I, II, UFP, III, on twigs and branches, r, 7, 17.VI.
- Mycena algeriensis* R. Maire — UFP, III, on logs, n, 28.IX., 8.X. (rev. A. H. Smith).
- Mycena corticaticeps* K a u f f . et S m i t h — UFC, I, on piece of wood, r, 9.XI. (det. A. H. S m i t h).
- Mycena corticola* (Fr.) S. F. Gray — UFC, II, on bark of log of *Carya cordiformis*, a, 7.VI.-2.IX.
- Mycena cylindrospora* Smith — UFP, outside III, on fallen twig, r, 29.X. (det. A. H. S. S m i t h).
- Mycena delectabilis* (Pk.) Sacc. — UFC, I, on fallen twigs, r, 17.VI.
- Mycena floccipes* (Fr.) Kühn. — UFC, II, on decaying wood, r, 17.VI. (det. A. H. S m i t h).
- Mycena galericulata* (Fr.) S. F. Gray — UFP, outside III, on logs and branches, n, 23.VIII.-29.X.
- Mycena haematopus* (Fr.) Quél. — UFC, I, II, on branches, bark, n, 19.VIII., 2.IX.; UFP, III, on logs, n, 2, 14.IX., 29.X.
- Mycena iodiolens* Lund. — UFP, III, on fallen twigs, r, 28.IX.-29.X.
- Mycena leaiana* (Berk.) Sacc. — UFC, II, on logs, a, 17.VI., 2, 14.IX.; UFP, outside III, on logs, n, 8.IX. (det. A. H. S m i t h).
- Mycena luteopallescens* (Pk.) Sacc. — UFP, outside III, on piece of bark, r, 28.IX. (rev. A. H. S m i t h).
- Mycena mirata* (Pk.) S a c c . — UFC, II, on fallen twig, r, 2.IX. (det. A. H. S m i t h).
- Mycena niveipes* Murr. — UFC, I, on logs and branches, r, 7, 17.VI.
- Mycena osmundicola* Lge. — UFC, I, on samara of *Fraxinus americana*, r, 19.VIII.
- Mycena pura* (Fr.) Quél. — UFP, III, on log of *Platanus occidentalis*, r, 17.VI. (det. A. H. S m i t h).
- Mycena roseipallens* Murr. — UFC, I, II, on wood chips, twigs, bark, n, 7.VI., 19.VIII., 2, 14.IX.; UFP, III, on pieces of bark, n, 23.VIII., 2, 29.IX., 29.X.
- Mycena speirea* (Fr.) Gill. — UFC, I, II, on fallen twigs, bark, logs, n, 7.VI.-24.XI.; UFP, III, on pieces of bark, twigs, n, 27.V.-24.XI.
- Mycena stylobates* (Fr.) Quél. — UFC, II, on nut of *Carya cordiformis*, r, 17.VI.

- Mycena vitilis* (Fr.) Quél. — *UFC*, II, on fallen twigs, r, 8.X.-9.XI.
- Panellus stypticus* (Bull.: Fr.) Karst. — *UFC*, outside I, on logs, n, 29.X.
- Phaeomarasmius erinacellus* (Peck) Sing. — *UFC*, outside II, on log, r, 8.X.; *UFP*, III, on dead standing *Fraxinus* (?), 50-70 cm above the ground, r, 8, 17.VI. (det. T. B a r o n i).
- Pholiota aurivella* (Fr.) Kummer — *UFC*, II, on log, r, 14.IX.
- Pleurotus ostreatus* (Jacq.: Fr.) Kummer — *UFC*, II, on logs, a, 19.VIII.-28.IX. (det. A. H. S m i t h).
- Pluteus atricapillus* (Secr.) S i n g. — *UFC*, I, on logs and stumps, r, 19.VIII., 28.IX., 8.X.; *UFP*, outside III, on logs, r, 23.VIII., 2.IX., 8.X.
- Pluteus longistriatus* Peck — *UFC*, outside I, II, on logs, n, 14.IX., 19.X. (det. T. B a r o n i).
- Pluteus romellii* (B r i t z.) Sacc. (= *P. lutescens* (Fr.) Bres.) — *UFC*, I, on log, r, 2.IX.; *UFP*, III, on logs and boughs, r, 23.XII., 2, 28.IX., 8.X.
- Pluteus salicinus* (Pers.: Fr.) Kummer — *UFP*, outside III, on logs, r, 23.VIII., 8.X.
- Pluteus seticeps* Atk. — *UFP*, III, on log, r, 2.IX. (det. A. H. S m i t h).
- Pluteus flavofuliginus* Atk. — *UFC*, outside II, on logs, r, 8.X. (det. A. H. S m i t h).
- Psathyrella orbicularum* (Romagn.) Mos. (= *P. prona* sensu Lange) — *UFC*, outside I, on bare ground, 19.VIII.; *UFP*, III, on loamy mud, r, 27.V., 17.VI.
- Psathyrella praeatomata* Smith — *UFC*, II, on fallen branch, r, 28.IX. (det. A. H. S m i t h).
- Psathyrella* cf. *senex* (Pk.) Smith — *UFP*, III, on mud covering a log, r, 19.X. (det. A. H. S m i t h).
- Psathyrella subtruncatispora* Smith — *UFC*, outside II, on log, r, 8.X. (det. A. H. S m i t h).
- Simocybe centunculus* (Fr.) Sing. — *UFC*, II, on logs, r, 19.VIII., 2, 14.IX., 8.X.; *UFP*, III, on logs, r, 23.VIII.-19.X.
- Xeromphalina tenuipes* (Schw.) A. H. Smith — *UFP*, III, on fallen twigs, branches, r, 8.VI.
- Woldmaria crocea* (Karst.) W. B. Cooke — *UFC*, I, II, at the base of old fronds of *Osmunda cinnamomea*, a, 8.X.-9.XI. (det. R. A g e r e r).

Gasteromycetes

- Crucibulum laeve* (Huds. ex Relh.) Kambly — *UFP*, III, on fallen twig, r, 2.IX.

SUMMARY

Mycocoenological studies were performed in the forests in central part of New York State near Ithaca, located on southern end of Cayuga Lake (Fig. 1).

The area studied lies within the Allegheny Plateau and the *Tsuga canadensis*-*Pinus strobus* northern hardwood region (B r a u n 1950).

Observations on macrofungi were carried out in one growing season 1982, on three permanent plots, 100 m² each, marked in the floodplain forest community of *Ulmus-Fraxinus* type, namely in *Ulmus-Fraxinus-Carya* forest along Fall Creek (two plots) and *Ulmus-Fraxinus-Platanus* forest along Sixmile Creek (one plot). They were recognized according to B r a u n (1950), distinguished on the basis of dominating trees and documented with phytosociological relevés (Table 1).

Since the humidity of the forest floor is of prime importance for the development of carpophores, the studied floodplain forests created an excellent habitat in that term.

In one growing season 151 species of macrofungi were recorded during 13 collecting trips (from May 10 to November 24) on all three permanent plots. The forests near Ithaca are much richer in macrofungi than forests studied along Marais des Cygnes River in Kansas (B u j a k i e w i c z 1977), where only 51 species were recorded during 6 collecting trips. It maybe accounted for by much weaker river action and shorter time of flooding near Ithaca. Moreover the scope of studies was not limited to fleshy macrofungi but was extended to tiny macromycetes, mainly *Discomycetes* and *Pyrenomycetes*.

The most numerous groups of macrofungi recorded were: *Agaricales* (76 species), *Aphyllorphorales* (28) and *Helotiales* (20).

Five main ecological groups of fungi were distinguished as regards substratum (Table 2). There were mostly saprophytes on wood and debris growing in these forests. As many as 70 species (46%) were noted only once and often in a single collection.

Soil macrofungi are rare and of scattered occurrence. They all form small carpophores and grow mostly solitarily. No fleshy terrestrial fungi were noted. Worthy of notice is lack of mycorrhizal fungi, e.g. *Boletinellus merulioides* that grows on moist ground usually under *Fraxinus* (S m i t h, T h i e r s 1971).

Interesting is the occurrence of 8 species of *Conocybe* that indicate rich soils and (or) disturbed places with large accumulation of debris. The floodplain forests near Ithaca are disturbed, having many species of weeds in the ground layer (Table 1), e.g. *Glechoma hederacea*, *Rosa multiflora* (M ü h l e n b a c h 1979), *Hesperis matronalis*, *Lonicera tatarica*, *Lysimachia nummularia*, *Oxalis europaea*, *Ranunculus repens* (M a r k s, personal communication). The disturbance in the field layer was distinctly reflected in the mycoflora, namely in the occurrence of as many as 11 species of *Conocybe* growing usually in disturbed places and in numerous share of fruitbodies of *Inocybe* that also occur in ruderal places (paths, dumps etc.).

Some fungi indicative of fertile soil are in common with alluvial forests in

Poland, e.g. *Coprinus cortinatus* and *Lepiota haematosperma* f. *gracilis* (B u j a k i e w i c z 1973). Two terrestrial fungi, *Conocybe vexans* and *Inocybe leptocystis* grew in the studied forests on wood.

Fungi growing on herb stems, mainly tiny *Discomycetes* form an outstanding ecological group in the studied forests and occur in great abundance, especially in autumn. Noteworthy is the occurrence of *Woldmaria crocea* (*Cyphellaceae*) on old fronds of *Osmunda cinnamomea*.

Mycena roseipallens, *M. speirea*, *M. acicula* and *Hymenoscyphus fructigenum* were the most important on fallen twigs. It confirms the results obtained from alluvial forests in Poland (B u j a k i e w i c z 1973).

Floodplain forests are sites where the rate of decomposition of leaf litter is very rapid. The occurrence of as much as 20 species of *Mycena* in the studied forests is significant. They grow mostly on wood debris and leaves and are the most important decomposers of an organic matter (B u r o v a 1971; H e r i n k 1972).

Wood inhabiting fungi, growing on logs and stumps were the most common and the most abundant in the floodplains studied. Many of them are known as frequent throughout the temperate zone of the northern hemisphere, e.g. *Polyporus squamosus*, *Bisporella citrina*, *Pleurotus ostreatus*, *Neuronectria peziza* and *Galerina autumnalis*. Some are restricted to North America, e.g. *Mycena Leaiana*, *Ciboria peckiana*, *Cyptotrampa asprata* or to North and South America as *Dacryopinax elegans* (M c N a b b 1965).

Interesting was the occurrence of *Simocybe centuncula* and *Mycena corticola*. It confirmed the results of studies in alluvial forests in Poland (B u j a k i e w i c z 1973). The habit of *Phaeomarasmium erinacellus* resembled that of *Ph.erinaceus* in Europe (B u j a k i e w i c z 1979, 1981).

The first in season fresh carpophores of terrestrial fungi were found in the third observation plot, remote from the riverbed, thus the driest one. Other two plots (along Fall Creek) were probably too boggy for the development of fungi at that time. Generally the most abundant occurrence of macrofungi in the whole season was observed in the second plot along Fall Creek, where saprophytes on wood and debris predominated.

Of group of fungi in common with alluvial forests in Poland the most important were, on soil: *Psathyrella orbitarum*, *Lepiota haematosperma* f. *gracilis*, *Coprinus cortinatus*, *Macroscyphus macropus*; on fruits: *Hymenoscyphus fructigenum*; on herb stems: *Crocioreas coronatum*, *Hymenoscyphus herbarum*, *H. caudatum*, *H. scutula* and on twigs: *Mycena speirea*, *M. roseipallens*, *M. vitilis* and *M. acicula*.

The floodplain forests near Ithaca are distinguished by the occurrence of American saprophytes growing on wood, such as: *Ciboria peckiana*, *Cyptotrampa asprata*, *Dacryopinax elegans*, *Favolus alveolaris*, *Lanzia longipes*, *Microstoma*

floccosum, *Mycena Leaiana*, *Pluteus longistriatus*, *Stereum sericeum* and *Xeromphalina tenuipes*.

It turned out that inspite of great floristic differences in vascular plants the forests studied have as much as 80% of species of macrofungi in common with European forests. Judging from our present knowledge in distribution of macromycetes in North America and in Europe, only 20% of studied macrofungi are confined to North America or in few cases also to tropical America.

The floristical and sociological studies on corresponding forest associations in the eastern North America and in Central Europe were carried out by *M e d w e c k a - K o r n a ś* (1965). Many similarities and ecologically corresponding forests units were found on both continents.

Studies on macrofungi in floodplain forests near Ithaca and along Marais des Cygnes River in Kansas (*B u j a k i e w i c z* 1977) and in Europe (*B u j a k i e w i c z* 1967, 1973, 1984) prove great affinity between the forest sites on different continents (*A r n o l d s* 1981).

Występowanie macromycetes w lasach zalewowych w okolicach Ithaca, stan New York, USA

Streszczenie

Studia mikocenologiczne prowadzono w sezonie wegetacyjnym 1982 na trzech stałych powierzchniach obserwacyjnych w lasach zalewowych typu *Ulmus-Fraxinus*. Zebrano łącznie 151 gatunków grzybów. Pomimo znacznych różnic florystycznych między lasami liściastymi Prowincji Atlantyckiej Ameryki Północnej i lasami liściastymi Europy, większość grzybów zebranych w lasach w okolicach Ithaca to gatunki występujące również w lasach liściastych w Europie Centralnej. Szereg z tych gatunków wykazuje przywiązanie do siedliska lasów lęgowych.

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