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Hydromycoflora fungi of small forest lakes "Suchary" in the Wigry National Park

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C z e c z u g a B.: *Hydromycoflora fungi of small forest lakes "Suchary" in the Wigry National Park*. Acta Mycol. 30 (2): 167-180, 1995.

One hundred and fifteen species of fungi were found in the small forest lakes "Suchary" in the Wigry National Park. The following fungi were recorded for the first time from Poland: *Blastociadella simplex*, *Rhizoclosmatium globosum*, *R. hyalinum*, *Rhopalophlyctis sarcoptoides*, *Condylospora spumigena*, *Gyoerffyella myrmecophagiformis*, *Helicon pluriseptatum* and *Kontospora halophila*.

Key words: hydromycoflora

INTRODUCTION

In the early 19th century, a team taking stock of the Wigry national properties (Wykaz Hypoteczny, 1826) noticed that local people used the name "Suchary" to call small forest lakes. According to F a l k (1941 a) this was the first written reference to small forest water bodies in the region of Lake Wigry. F a l k (1939), who was a Swedish expert in toponymy of Wigry and Hucian waters reported that the name "Suchar" was used by local people to call a small forest lake with no inlet nor outlet and where no larger tree was found on wet mossy banks. These small lakes had never been economically important and therefore were probably not included on the list of lakes in the Register of 1569 which is the oldest known catalogue of the Suwałki lakes (L i t y ń s k i, 1935; F a l k, 1939, 1941 b; C z e c z u g a, 1970).

Hydrochemical studies showed that the water of "Suchary" exhibited specific environmental conditions (S t a n g e n b e r g, 1936), such as low Ca content, presence of humus compounds and acid nature. These factors determine the specific character of flora and fauna in these water bodies, as revealed in the studies on green hydrosulphuric acid bacteria (C z e cz u g a, 1979 a), their photosyntesizing pigments (C z e c z u g a, 1968, 1974), their production of organic matter (C z e c z u g a, 1968 a, b, 1972, 1973), chemosynthesis (C z e c z u g a, G r ą d z k i, 1967) and iron

bacteria (Czeczuga, 1979 b). Particular attention was also paid to phytoplankton (Ryppowa, 1927), chlorophyll content in the seston of some "Suchary" (Solski, 1962), plankton shellfish (Passowicz, 1939) and *Oligochaeta* (Moszyński, 1935). In Wądołek Lake, the degree of water mixing in respective seasons of the year was examined (Passowicz, 1938; Czeczuga, 1966).

Since "Suchary" constitute a typological group of Polish lakes (Bowkiewicz, 1935; Stangenberg, 1936; Wiszniewski, 1953), we decided to supplement their characteristic with the studies on species composition of aquatic fungi.

STUDY AREA

The "Suchary" investigated are situated in two agglomerations west of Lake Wigry and east Hucian Lakes. In the region west of Wigry (the region of former Dumbrowa) – six "Suchary" are found from the north to the south as follows: Suchar Nieznany, Suchar Północny, Suchar Wschodni, Suchar Dębowskich, Suchar Wielki and Suchar Rzepiskowy.

There are seven Hucian Suchary grouped in the forest between the Hucian Lake Czarne and the village Leszczewo. Local people define them (from the south to the north) as the first, the second and so on. Only one, "suchary" is situated 200 m away from the gamekeeper's cottage in Nowa Wieś near Samle and is called Wądołek. Six suchary belonging to these two clusters were investigated. Their morphological data and catchment area characteristics are presented in Table 1.

METHODS

Samples of water were collected once a month over the years 1991-1993 for hydrochemical analysis and for studies on species composition of hydromycoflora. For determinations of different chemicals in water, the methods recommended by Standard Methods (Golterman, Clymo, 1971) were employed (for details see: Czeczuga, Próba, 1980).

Aquatic zooosporic fungi were analysed by direct microscopic examination of the water as well as from materials collected in the water, and by means of the bait method (onion skin, hemp-seeds, clover-seeds, hairs and fillings of horn) applied in environmental studies and in the laboratory Fuller and Jaworski (1986). In addition (for *Hyphomycetes*), the foam collected from the surface of eddies in running water or at the edges of stagnant water was examined directly under a microscope (Arnold, 1968). The samples were fixed in formalin-acetic-alcohol immediately after collection and brough to the laboratory.

For identification of the fungi the following keys were used: Skirgiełło, 1954; Johnson, 1956; Sparrow, 1960; Seymour, 1970; Batko, 1975; Ingold, 1975; Karling, 1977; Dudka, 1974, 1985; Dick, 1990).

Table 1

Characteristics of the investigated Suchary

Suchar	Area in ha	Depth in m		Transparency in m	Catchment area in km^2	Type of catchment area	Afforestation of catchment area in %
		maximal	mean				
Suchar I	0.9	4.0	2.5	1.8	0.157	clayey-sandy	100
Suchar II	2.6	9.5	3.6	1.9	0.082	clayey-sandy	100
Suchar III	0.3	4.0	1.9	2.0	0.205	clayey-sandy	94
Suchar IV	1.2	8.0	3.2	1.6	0.109	clayey-sandy	100
Suchar Wielki	8.9	9.0	3.6	2.7	0.988	sandy	100
Wądołek	1.0	15.0	8.6	2.6	0.110	clayey-sandy	82

RESULTS AND DISCUSSION

One hundred and fifteen species of aquatic fungi were found, including 60 zoosporic and 55 conidial species (Table 3). The studies on vertical distribution of aquatic fungi in the water of Suchar IV (Table 4) showed that their highest concentration was in the surface layer.

Hydrochemical data regarding water at the sites where samples were collected to determine the presence of fungi are presented in Table 2. Except for such properties as temperature, carbon dioxide content, oxydability and all forms of nitrogen, the remaining parameters studied were significantly lower than those observed in other types of water bodies in the north-east of Poland.

Among saprophytic zoosporic fungi – *Blastocladiella simplex* is new to the mycoflora of Poland. It was encountered autumn, in the surface layer of Suchar IV. At that site, water had the lowest value of pH and oxydability, the lowest amount of $N\text{-}NO_3$, undetectable amounts of phosphorus and Mg as well as the highest concentration of CO_2, $N\text{-}NH_3$, and chloride. *Eurychasmidium tumefasciens* and *Pythiogeton utriforme* were observed in the surface layer of Suchar IV in autumn. The former is a parasite of red seaweeds of the genus *Ceramium* (B a t k o, 1975), while *Pythiogeton utriforme* belongs to phytosaprophyte found on fruit, branches and grass leaves. The occurrence of *Rhopalophlyctis sarcoptoides* and two representatives of the genus *Rhizoclosmatium* in the suchar water must be connected with the presence of chitin substances in the water, since thse species have been reported so far from exuviae of aquatic insects (K a r l i n g, 1977). *Rhizoclosmatium globosum* and *R. sarcoptoides* grew in Suchar II in autumn, white *R. hyalinum* was found in Wądołęk. The waters of Suchar II had the highest oxydability and the highest content of Mg ans sulphates, while Suchar III did not differ from the others. In autumn *Sclerospora graminicola*, a parasite found mainly on grass of the genus *Setaria* (S k i r g i e ł ł o, 1954), was found in the surface layer of Suchar IV, near its edge.

The presence of *Tricladium procerum*, a *Hyphomycetes* representative, noted in Suchar IV in September is worthy of notice. The a forementianed species was first described by M a r v a n o v a (1988) in May 1986 from a moorland stream on *Juncus* stems in Bystranska valley in the Slovenske Beskidy. Thus, Suchar IV would be the second site of this fungus in the world and the first in Poland.

Baverwykella pulmonaria was observed only in spring at various depths of Suchar IV, except for the bottom layer. It was first found in the Netherlands on fallen leaves in water (van B e v e r w i j k, 1954). At the same time the above author also encountered *Helicon pluriseptatum* on fragments of vegetable material found in water. We observed it in Suchar IV at a depth of 4 m only in autumn. Also in autumn, we found *Gyoerffyella myrmecophagiformis* in a water sample collected from this Suchar at a depth of 3 m. This species was reported by D u d k a and M e l n i k (1990) to be found in the terrestial environment. The species of the genus *Gyoerffyella* are known to occurr both in the aqueous and terrestial environment (M a r v a n o v a, M a r v a n, R u z i c k a, 1967; D u d k a, 1985). *Gyoerffyella myrmecophagiformis*

has been hithert considered a terrestial species exclusively. In spring, we found *Gyoerffyella tricapillata* in the surface layer of Suchar IV which was the only species described by I n g o l d (1964) on decaying leaves of *Prunus* sp. and *Rosa* sp. in the pond water. It was found in many flowing water bodies of the European and Asiatic parts of the former Soviet Union (D u d k a, M e l n i k, 1990). In autumn, *Kontospora halophila* was found to develop in the surface layer of Suchar IV, and this is the second site of this fungus in the world. First, it was described in Spain from *Populus euphratica* leaves decaying in the stream water (R o l d a n, M a r v a n o v a, H o n r u b i a, 1990). *Canalisporium caribense* was found in a water sample collected at a depth of 5 m in Suchar IV; it was first described from the terrestrial habitat on Juventuol, a Carribean island (H o l u b o v a - J e c h o v a, M e r c a d o, 1984), and later reported from Kenya (K i r k, 1985) Uganda, Taiwan (M a t s u s h i m a, 1987) and Malaysia (N a w a w i, K u t h u b u t h e e n, 1989).

We revealed the presence of *Catenomycopsis rosea* in the water of Suchar IV collected from a depth of 4 m in autumn. This species had been found in terrestrial habitats (T i b e l l, C o n s t a n t i n e s c u, 1991). Also in autumn, *Clathrosporium intricatum* was found, in the surface layer of this water body while in spring *Condylospora spumigena* was reported from a depth of 4 m. *Clathrosporium intricatum* was reported as an aero-aquatic fungus from Malaysia (N a w a w i, K u t h u b u t h e e n, 1987), while *Condylospora spumigena* was found in water foam samples from the River Ulu Gombak also in Malaysia (N a w a w i, 1976). *Ceratosporium cornutum* has hitherto been found in rain water following from leaves of certain tree species. Thus, the presence of its conidia in the water of Suchar Wielki would be the first report of its occurrence in water bodies. It was first described in Osak from *Sasa* sp. leaves (M a t s u s h i m a, 1975) and then from forest tree leaves in Alabama in the USA (M a t s u s h i m a, 1981). A n d o and T u b a k i (1984 a) and C z e c z u g a and O r ł o w s k a (1994) has observed the growth of *Ceratosporium cornutum* in rain water flowing from tree leaves. We observed the growth of *Colispora elongata* at variuos depths in Suchar IV in autumn. This species was found in foam samples collected from a stream in the low Karpaty in Slovakia (M a r v a n o v a, 1988).

The fungus *Mycocentrospera anulgata* was first observed on the leaves of *Prunus* sp. decaying in water in South America (P e t e r s e n, 1962). Subsequently it was reported from the water bodies in Great Britain (I q b a l, 1974; C h a m i r, D i x o n, 1982) and also in the Far East of Russia (D u d k a, 1985). The water of Suchar IV in the Suwałki District is the first site of this fungus in Poland.

Taeniospora gracilis and *Tripospermum infalcatum* are also the new species to Polish hydromycoflora. The former was described by M a r v a n o v a (1977) from the stream water in Moravy. In our case, its growth was observed in a sample of water collected at a depth of 3 m from Suchar IV in spring. A sample collected at the same depth from this Suchar in autumn revealed the presence of *Tripospermum infalcatum* which had been reported from Japan to be found in rain water flowing from red pine needles (*Pinus densiflora* Sieb. et Zucc., see: A n d o, T u b a k i, 1984 b). This would be the first finding of this fungus in the water body.

Table 2

Chemical properties of waters in the Suchary studies (mg l^{-1})
(September)

Specification	Suchar (see Table 1)					
	I	II	III	IV	Wielki	Wądołek
Temperature °C	15.2	15.2	15.5	15.2	15.0	13.8
pH	6.16	6.14	5.82	5.34	6.35	6.54
O_2	4.2	5.2	7.8	8.4		
Oxydability	11.6	13.4	9.8	7.2	9.4	12.8
CO_2	33.0	23.1	22.3	33.4	19.8	20.9
Alkalinity in $CaCO_3$ (in mval l^{-1})	0.6	0.5	0.2	0.2	0.3	0.4
$N\text{-}NH_3$	0.725	0.754	0.462	1.098	0.143	0.472
$N\text{-}NO_2$	0.005	0.004	0.003	0.003	0.058	0.008
$N\text{-}NO_3$	0.042	0.084	0.025	0.012	0.156	0.092
PO_4	0.035	0.042	0.0	0.0	0.007	0.085
Cl	38.0	34.5	35.0	39.0	34.0	33.5
Total hardness in Ca	4.32	3.65	2.92	3.64	3.64	4.35
Total hardness in Mg	0.0	2.15	0.0	0.0	1.72	0.0
SO_4	4.94	9.84	5.35	9.05	8.23	7.82
Fe	0.01	0.01	0.01	0.01	0.02	0.03
Dry residue	4	6	3	4	20	47
Dissolved solids	0	0	0	1	1	39
Suspended solids	4	6	3	3	19	8

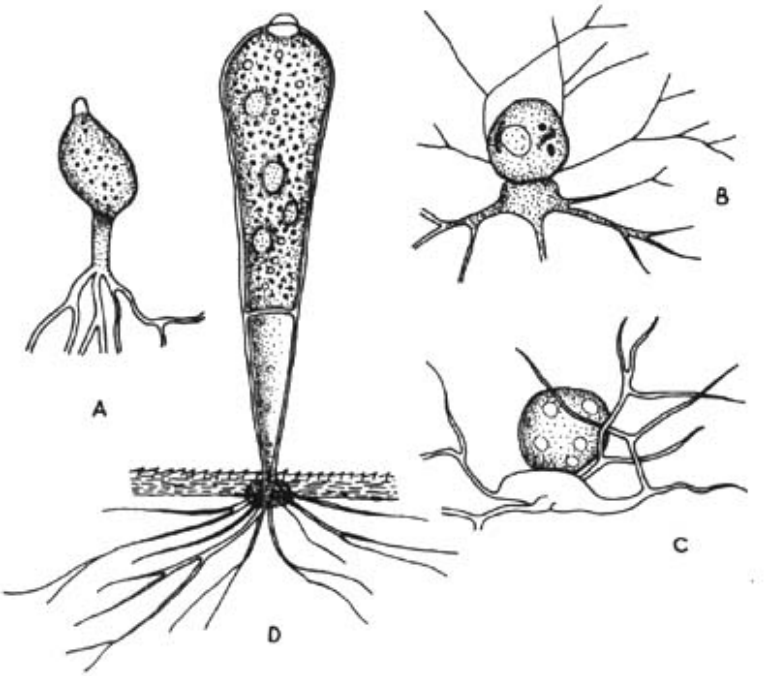

Fig. 1. Sporangia of some zoosporic fungi

A – *Blastocladiella simplex* (18-84 µm), B – *Rhizoclosmatium globosum* (10-20 µm), C – *Rhizoclosmatium hyalinum* (35-45 µm), D – *Rhopalophlyctis sarcoptoides* (20-160 x 6-30 µm)

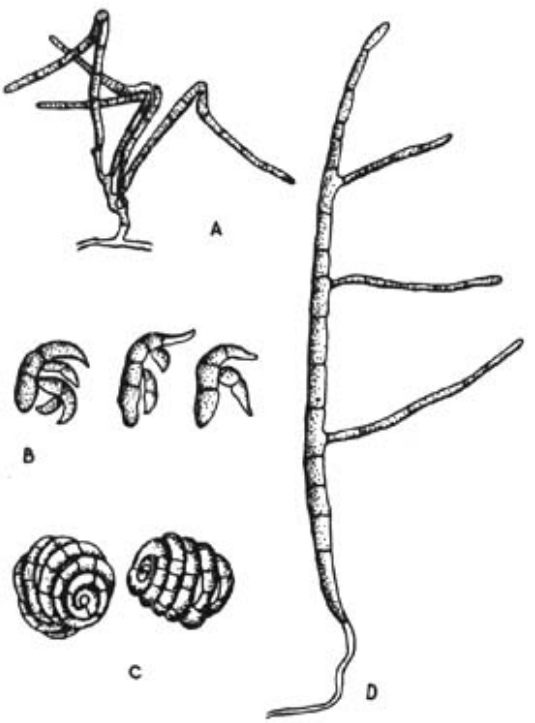

Fig. 2. Conidia of some *Hyphomycetes*

A – *Condylospora spumigena* (70-100 x 2.4 µm), B – *Gyoerffyella myrmecophagiformis* (30-45 x 5-6.5 µm), C – *Helicon pluriseptatum* (30-45 x 20-30 µm), D – *Kontospora halophila* (310-820 x 4.2-7.2 µm)

Table 3

Aquatic fungi found in particular Suchary

Fungi	Suchary (see Table 1)
Zoosporic fungi	
Achlya colorata Pringhs.	2
Achlya conspicua Coker	2
Achlya debaryana Humphrey	3
Achlya flagellata Coker	2, 6
Achlya glomerata Coker	4
Achlya klebsiana Pieters	1
Achlya megasperma Humphrey	3, 4, 5
Achlya oligacantha de Barry	1, 2, 3, 4, 5
Achlya papillosa Humphrey	1
Achlya prolifera Nees	2, 4
Achlya treleaseana (Humphrey) Kauffman	4
Allomycetes arbuscula Butler	4
Aplanes androgynus (Archer) Humphrey	4
Apodachlya pyrifera Zopf	2
Aphanomyces astaci Schikora	2
Aphanomyces irregularis Scott	1, 2, 3, 5
Aphanomyces keratinophilus (Ook. et Kob.) Seymour et Johanson	2
Aphanomyces laevis de Barry	4, 6
Aphanomyces parasiticus Coker	3
Blastocladia rostrata Minden	3
Blastocladiella britannica Horenst et Cant.	5, 6
Blastocladiella simplex Mathews*	4
Blastocladiopsis parva (Whiffen) Sparrow	2, 3, 4, 5
Catenaria anguillulae Sorokin	4, 6
Catenaria verrucosa Karling	5
Catenophlyctis variabilis (Karling) Karling	1, 4
Chytridium xylophilum Cornu	1, 2
Chytriomyces annulatus Dogma	1
Chytriomyces hyalinus Karling	3, 4
Chytriomyces poculatus Sparrow	4
Dictyuchus monosporus Leitgeb	1, 2, 3, 4, 6
Diplophlyctis complicata (Willeughby) Batko	2
Eurychasmidium tumefasciens (Magnus) Sparrow	4
Isoachlya anisospora (de Barry) Coker	2, 4
Isoachlya torulosa (de Barry) Cejp	4
Laptolegnia caudata de Barry	1, 2, 3
Leptolegniella keratinophila Huneycutt	4
Leptomitus lacteus (Roth) Agardh	4, 6
Nowakowskiella elegans (Nowak.) Schroeter	3
Olpidiopsis saprolegniae (Braun) Cornu	1
Polychytrium aggregatum Ajello	1
Pythiogeton nigricans Batko	5, 6
Phytiogeton utriforme Minden	4
Pythium artotrogus de Barry	1, 3
Rhipidium interruptum Cornu	4
Rhizidium verrucossum Karling	1
Rhizoclosmatium globosum Petersen*	3
Rhizoclosmatium hyalinum Karling*	6
Rhizophydium carpophilum (Zopf) Fischer	3, 4
Rhizophydium keratinophilum Karling	2, 5
Rhizophydium nodulosum Karling	1
Rhizophydium pollinis-pini (Braun) Zopf	3
Rhopalophlyctis sarcoptoides Petersen*	2
Rozellopsis inflata (Butler) Karling	3
Saprolegnia ferax (Gruith) Turnet	1, 2, 3, 4, 5, 6

Saprolegnia hypogyna (Pring.) de Bary	4
Saprolegnia monoica Pringsh.	4
Sclerospora graminicola (Sacc.) Schroeter	4
Thraustotheca clavata (de Barry) Humphrey	2, 4
Zoophagus insidians Sommerst	1, 2, 4
Conidial fungi	
Acrodictys similis Hol.-Jech.	4
Alatosessilispora bibrachiata Ando et Tubaki	4
Angulospora aquatica Nilsson	4
Arbusculina fragmentans Marvanova	1, 4
Articulospora tetracladia Ingold	4
Arthrobotrys oligospora Fres.	4
Aspergillus candidus Link	1, 4
Bacillispora aquatica Nilsson	3
Baverwykella pulmonaria (Beverwijk) Tubaki	4
Campylosporea chaetocladia Ranzoni	4
Canalisporium caribense (hol.-Jech. et Mercado) Naw. et Kuthub.	4
Catenomycopsis rosea Constantinescu	4
Ceratosporium cornutum Matsushima	4
Centrospora filiformis (Greathead) Petersen	6
Clathosporium intricatum Nawawi et Kuthubutheen	4
Colispora spumigena Marvanova	4
Condylospora elongata Nawawi	4
Colindrocarpon aquaticum (Nilsson) Marvanova et Descals	4
Dimorphospora follicola Tubaki	3, 4
Gyoerrffyella myrmecophagiformis Melnik et Dudka	4
Gyoerffyella tricapillata (Ingold) Marvanova	4
Helicoon pluriseptatum Beverwijk	4
Heliscus lugdunensis Sacc. et Therry	2, 3, 4
Knotospora halophila Roldan, Honrubia et Marvanova	4
Lemonniera aquatica de Wildeman	4
Lemonniera filiformis Petersen	4
Lemonniera curvula Ingold	1, 3, 6
Margaritispora aquatica Ingold	4, 6
Mirandia corticola Arnaud	4
Monotosporella microaquatica (Tubaki) Nilsson	3
Monotosporella angulata (Iqbal) Iqbal	4
Neta patuxentica Shearer et Crane	4
Polycladium equiseti Ingold	4
Pseudaegerita corticalis (Peck) Crane et Schok.	4
Pyramidospora fluminea Miura et Kudo	4
Sigmoidea prolifera (Petersen) Crane	4
Speriropsis irregularis Petersen	4
Taeniolina deightonii Crane et Schoknecht	4
Taeniospora gracilis Marvanova	4
Tetracladium marchalianum de Wildeman	1, 2
Tricellula aquatica Webster	4
Tricellula inaqualis Beverwijk	4
Tricladium attenuatum Iqbal	6
Tricladium giganteum Iqbal	4
Tricladium marylandicum Crane	2, 3, 4
Tricladium patulum Marvanova et Marvan	6
Tricladium procerum Marvanova	4
Trinacrium subtile Riess	4
Tripospermum camelopardus Ingold et al.	2, 4
Tripospermum infalcatum Ando et Tubaki	4
Trisulcosporium acerinum Hudson et Sutton	4
Triscelophorus monosporus Ingold	1
Vargomyces aquaticus (Dudka) Toth	3, 4
Varicosporium elodeae Kegel	4
Volucrispora aurantica Haskins	4

Table 4

Hydromycoflora of the Suchar IV in particular depths
(a – spring, b – autumn)

Fungi	Depth (m)						
	0	1	2	3	4	5	6
Zoosporic fungi							
Achlya glomerata Coker	–	b	–	–	–	–	–
Achlya oligacantha de Barry	b	–	–	–	–	–	–
Achlya prolifera Nees	b	–	–	–	–	–	–
Achlya treleaseana (Humph.) Kauffman	–	–	b	b	–	–	–
Aphanomyces laevis de Barry	b	–	–	–	–	–	–
Aplanes androgynus (Archer) Humphrey	ab	ab	–	ab	b	ab	–
Blastocladiella simplex Mathews	b	–	–	–	–	–	–
Blastocladiopsis parva (Whiffen) Sparrow	–	b	–	b	–	–	–
Dictyuchus monosporus Leitgeb	ab	a	a	–	ab	b	–
Eurychasmidium tumefasciens (Magnus) Sparrow	b	–	–	–	–	–	–
Isoachlya anisospora (de Barry) Coker	a	ab	ab	–	ab	–	–
Isoachlya torulosa (de Barry) Cejp	–	–	–	ab	–	–	b
Leptolegniella keratinophila Huneycutt	–	–	b	–	–	–	–
Leptomitus lacteus (Roth) Agardh	–	–	a	–	–	b	–
Pythiogeton utriforme Minden	b	b	–	–	–	–	–
Rhipidium interruptum Cornu	b	–	–	–	–	–	–
Saprolegnia ferax (Gruith) Turnet	ab	–	ab	a	–	ab	–
Saprolegnia hypogyna (Pring.) de Barry	b	a	–	–	–	–	–
Sclerospora gramnicola (Sacc.) Schroeter	b	–	–	–	–	–	–
Thraustotheca clavata (de Barry) Humphrey	–	–	–	–	b	–	–
Conidial fungi							
Acrodictys similis Hol.-Jech.	b	–	–	–	–	–	–
Alatosessilispora bibrachiata Ando et Tubaki	–	–	b	–	–	–	–
Angulospora aquatica Nilsson	b	–	–	b	–	–	b
Articulospora tetracladia Ingold	–	–	–	–	–	b	–
Beverwykella pulmonaria (Beverwijk) Tubaki	a	a	–	a	a	a	–
Canalisporium caribense (Hol.-Jech. et Merc.) Naw. et Kuthub.	–	–	–	–	–	b	–

Catenomycopsis rosea Constant.	–	–	–	–	b	–	–
Catenomycopsis intricatum Nawawi et Kuthub.	b	–	–	–	–	–	–
Colispora elongata Marvanova	–	–	b	b	–	b	–
Condylospora spumigena Nawawi*	–	–	–	–	a	–	–
Cylindrocarpon aquaticum (Nilsson) Marv. et Descals	–	–	a	–	–	–	a
Dimorphospora follicola Tubaki	b	–	b	–	–	–	–
Gyoerffyella myrmecophagiformis Melnik et Dudka*	–	–	–	b	–	–	–
Gyoerrffyella tricapillata (Ingold) Marvanova	a	–	–	–	–	–	–
Helicoon pluriseptatum Beverwijk *	–	–	–	–	b	–	–
Heliscus lugdunensis Sacc. et Therry	a	–	–	–	a	–	–
Kontospora halophila Roldan, Honrubia et Marvanova*	b	–	–	–	–	–	–
Lemonniera aquatica de Wildeman	b	–	–	–	–	–	–
Lemonniera filiformis Petersen	–	b	–	–	–	–	–
Margaritispora aquatica Ingold	ab	–	–	–	–	–	b
Mirandia corticola Arnould	a	a	a	a	a	a	–
Neta patuxentica Shearer et Crane	–	b	–	–	–	–	–
Polycladium equiseti Ingold	a	–	–	–	–	–	–
Pseudaegerita corticalis (Peck) Crane et Schok.	b	b	–	–	–	b	b
Pyramidospora fluminea Miura et Kudo	a	a	–	–	–	–	–
Sigmoidea prolifera (Petersen) Crane	b	–	–	–	–	–	–
Speiropsis irregularis Petersen	a	–	b	–	–	b	b
Taeniolina deightonii Crane et Schok.	b	–	b	–	b	–	b
Taenispora gracilis Marvanova	–	–	–	a	–	–	–
Tricellula aquatica Webster	ab	–	–	–	–	–	a
Tricellula inaequalis Beverwijk	a	–	–	–	–	–	–
Tricladium procerum Marvanova	ab	–	–	–	–	–	a
Trinacrum subtile Riess	b	–	–	–	–	–	–
Tripospermum camelopardus Ingold et al.	ab	–	a	a	–	a	–
Tripospermum infalcatum Ando et Tubaki	–	–	–	b	–	–	–
Trisulcosporium acerinum Hudson et Sutton	–	b	–	–	–	–	–
Vargomyces aquaticus (Dudka) Toth	–	–	b	–	–	–	–
Varicosporium aquaticum Vischnevskaja	b	–	–	–	–	–	–
Volucrispora aurantica Haskins	–	–	–	–	–	–	–
Total	36	14	16	14	11	12	9

*The species new to Polish mycoflora

Tricladium attenuatum was isolated first in Great Britain from *Crataegus monogyna* leaves decaying in water (I q b a l, 1971). Afterwards it was encountered in Ukrainian water flows (D u d k a, 1974). Suchar Wądołek is its third site in the world. *Tricladium giganteum* was also found on decaying leaves of *Crataegus monogyna* in Great Britain (I q b a l, 1971), and later reported from flows in Ukraina and the Far East of Russia (D u d k a, 1974). In north-eastern Poland, we observed the growth of this fungus in the water of Suchar Wielki.

In the waters of Suchar II, III and IV we observed in autumn months of 1992 the presence of *Tricladium marylandicum*, which had been found in the foam of several streams in the USA (C r a n e, 1968). This would be the second site of this rare *Hyphomycetes* representative. In autumn of 1992 we observed *Tricladium patulum* in Suchar Wądołek. It was first found in Czechoslovakia (M a r v a n o v a, M a r v a n, 1963) on the leaves of beech-tree (*Fagus sylvatica*) decaying in flowing water. Subsequently it was encountered in the waters of Japan (T u b a k i, 1966), Great Britain (A b d u l l a h, D e s c a l s, W e b s t e r, 1981) and at two sites in the Asiatic part of Russia (D u d k a, 1985). A rare species of the genus *Tricladium procerum* was found in Suchar IV in September 1991. It was first reported by M a r v a n o v a (1988) from samples collected in May 1986 from water flows in the Slovenske Beskidy. Suchar IV in the Suwałki District would be the second site of this fungus.

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