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AERO-AQUATIC FUNGI COLONIZING DECAYING LEAVES IN WOODLAND SWAMPY POOLS OF AUKŠTADVARIS REGIONAL PARK (LITHUANIA)

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Abstract

Markovskaja S., 2012: Aero-aquatic fungi colonizing decaying leaves in woodland swampy pools of Aukštadvaris Regional Park (Lithuania) (Oro-vandens grybai kolonizuojantys pūvančius lapus užpelkėjusiose miško balose Aukštadvario regioniniame parke) – Bot. Lith., 18(2): 123–132.

Comparatively high diversity of fungi (26 species) decomposing leaf litter were found in small lentic habitats (swampy pools) in mixed Gubiškiai Forest of Aukštadvaris Regional Park. Together with widespread aquatic and terrestrial fungi, 14 species of aero-aquatic hyphomycetes were found colonizing freshly fallen leaves of *Quercus robur, Tilia cordata* and *Alnus glutinosa* in autumn 2011. Of these, six species, *Ardhachandra cristaspora, Candelabrum spinulosum, C. clathrosphaeroides, Dactylaria fusiformis, Helicodendron tubulosum* and *Xylomyces giganteus* were recorded for the first time in Lithuania. In addition, a noteworthy new aero-aquatic fungus, preliminary placed in the genus *Pseudospiropes* by morphological characterization, was found on decaying leaves of *Quercus robur*. New records to the country and rare species are illustrated, their morphological and ecological peculiarities are discussed herein.

Keywords: aero-aquatic fungi, anamorphic *Ascomycota*, biodiversity.

INTRODUCTION

A significant quantity of allochthonous material such as fallen leaves, twigs and branches accumulate in the forest litter every year and represent a crucial source of energy for many aquatic fungi and other organisms inhabiting various freshwater ecosystems located in forests (Bärlocher, 1992; Webster et al., 1990). The fungi are considered as aquatic when their reproduction takes place under water and among them mainly the aquatic hyphomycetes are responsible for decomposition of submerged litter in various lotic and bigger lentic water bodies (Dix & Webster, 1995). For the first time the term 'aero-aquatic' was proposed by Agathe van Beverwijk for amphibious fungi which produce propagules only above the water level (Beverwijk, 1951). The ecological group of aero-aquatic hyphomycetes being adapted to low oxygen concentrations predominate in small lentic water bodies – woodland ponds, swampy pools and ditches (Bärlocher et al., 1978; Fisher & Webster, 1979, 1981; Field & Webster, 1983). Their vegetative mycelium inhabit submerged decaying forest litter under semi-anaerobic conditions, but when blackened decaying leaves from the anaerobic depths or the lower leaf litter layers are brought to the water surface, sporulation is quickly initiated and fungal reproductive organs (apical parts of conidiophores with conidia) develop above the water surface in air (Abdullah & Webster, 1980a). Conidia of aero-aquatic hyphomycetes have buoyant structures that enclose air and their dispersal takes place at the surface of water body (Michaelides & Kendrick, 1982). These floating conidia quickly colonize freshly-fallen leaves, twigs and other detritus and initiate litter decomposition in small water bodies (Fisher, 1979; Premdas & Kendrick, 1991). Most of aero-aquatic hyphomycetes are characterized by cellulolytic and

lignin-destructing enzymatic activity and are able to degrade several plant cell polymers such as cellulose, hemicellulose, pectin and lignin during the leaf decomposition process (Abdullah & Taj-Aldeen, 1989; Fisher et al., 1977, 1983). Anamorphic aero-aquatic fungi inhabiting forest litter are characterized by wide adaptation abilities in different environments, but their species composition and ecology are still insufficiently known.

Studies on these fungi have been largely taxonomic, description of new genera and species pending. In total about 90 morphologically different species of *Candelabrum* (Beverwijk, 1951; Tubaki, 1975a; Voglmayr, 1998), *Beverwykella* (Michaelides & Kendrick, 1982; Nawawi & Kuthubutheen, 1988; Tubaki, 1975a; Voglmayr & Denglado-Rodríguez, 2003), *Cancellidium* (Tubaki, 1975b), *Dendroclathra* (Voglmayr & Denglado-Rodríguez, 2001; Voglmayr, 2011) *Fusticeps* (Webster & Davey, 1980), *Nakataea* (Shearer & Crane, 1979), *Pseudaegerita* (Abdullah & Webster, 1983), *Polyancora* (Voglmayr & Yube, 2006), *Triscelosporium* (Nawawi & Kuthubutheen, 1987a), *Xylomyces* (Goh et al., 1997) and other genera have been described as aero-aquatic. Current molecular data (Voglmayr, 2004, 2011) showed that morphologically similar aero-aquatic genera, such as *Spirosphaera* (Beverwijk, 1953; Hennebert, 1968; Abdullah et al., 1986, 1998; Voglmayr, 1997; Marvanová & Bärlocher, 1998) and *Clathrosporum* (Nawawi & Kuthubutheen, 1987b; Hennebert, 1998) in their present conception are highly polyphyletic. The same is true for the largest among aero-aquatic fungi and morphologically very similar helicosporous genera, *Helicodendron* (Abdullah, 1980; Abdullah et al., 1985; Goos et al., 1985; Voglmayr, 1997, 1998) and *Helicoön* (Beverwijk, 1954; Abdullah, 1980; Goos et al., 1986) as recent phylogenetic studies on helicosporous fungi based on ribosomal DNA sequences have proved. Especially this concerns the genus *Helicoön* which has evolved in different ascomycete orders (Tsui & Berbee, 2006). It is evident that more detailed molecular phylogenetic analyses are necessary in the future to reveal phylogenetic position of many aquatic and aero-aquatic species.

In Lithuania, studies on biodiversity and ecology of truly aquatic (Ingoldian) hyphomycetes inhabiting submerged leaf litter (Markovskaja, 1994, 1996, 2007; Markovskaja et al., 2002) have so far prevailed. The first data on some aero-aquatic hyphomycetes in combination with the data on Ingoldian hyphomycetes, straminipilous and terrestrial fungi inhabiting submerged forest litter in lotic habitats has been published only recently (Markovskaja, 2009). The aim of the present study was to provide additional data on biodiversity of freshwater mycobiota, with emphasis on poorly studied aero-aquatic hyphomycetes, colonizing decaying leaf litter in small lentic habitats.

MATERIALS AND METHODS

The fungi were studied on submerged decaying leaves of *Quercus robur* L., *Tilia cordata* Mill. and *Alnus glutinosa* (L.) Gaertn., which were collected from swampy pools of the deciduous Forest of Gubiškiai (Aukštadvaris Regional Park, Trakai district) in autumn 2011. Collected leaves were placed in polystyrene bags and brought to the laboratory. There the leaves were washed under a tap water to remove surface mud and other debris, placed in Petri dishes, covered with thin layer of distilled water to form a film over the surface and incubated at 15–20°C to induce fungal sporulation. After a few days submerged leaves were periodically (during a month) examined under a dissecting stereomicroscope (Nikon SMZ 745T) at the magnifications up to ×40 to detect developing fungi that produce conidiophores with conidia on their tips. Conidiophores were usually observed along the petiole, veins and leaf margin. The species were identified by examining the mode of fungal conidiogenesis and their morphological characters using a light microscope (Olympus CX 41) at ×400 and ×1000 magnification (after Ingold, 1975; Goos, 1992). Descriptions and photomicrographs were made from fresh preparations in distilled water and in lactic acid. Permanent slides of the examined species were mounted in lactophenol. The specimens of dried leaves are deposited at the Herbarium of the Institute of Botany, Nature Research Centre, Vilnius, Lithuania (BILAS).

RESULTS AND DISCUSSION

During the present study, 26 species of aquatic and aero-aquatic hyphomycetes were recorded in total. Among the recorded species more than a half was

typical aero-aquatic fungi, which produced conidia above the water surface. The records of aero-aquatic hyphomycetes species new to Lithuania are shortly described and illustrated below.

An unknown, undoubtedly aero-aquatic anamorphic fungus producing conidia above the water surface and resembling the genus *Preudospiropes* in its morphological characters was found. The species was obtained from *Quercus robur* leaves incubated for about a month in the laboratory. Attempts to obtain axenic cultures of this fungus were unsuccessful, therefore, we failed to perform its molecular examination. This refrained the author from the description of the new species, however, its detailed morphological characterization and illustrations are provided herein.

Ardhachandra cristaspora (Matsushima) Subramanian & Sudha 1978, Can. J. Bot., 56(7): 731, 1978. – Fig. 1.

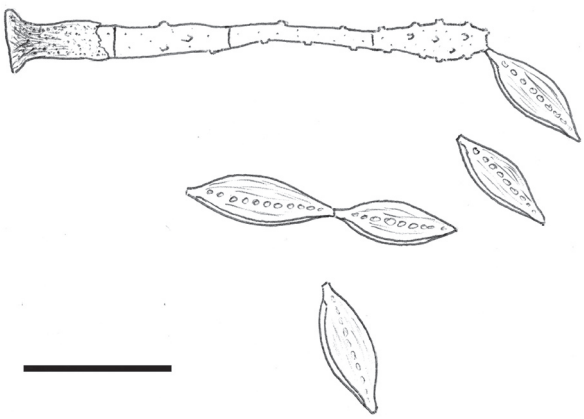

Fig. 1. *Ardhachandra cristaspora*, conidiophores and conidia. Scale bar 20 µm

Syn.: *Rhinocladiella cristaspora* Matsush., Microfungi of the Solomon Islands and Papua-New Guinea (Osaka): 49, 1971. – *Pseudobeltrania cristaspora* (Matsush.) de Hoog, in de Hoog & Hermanides-Nijhof, Stud. Mycol., 15: 199, 1977.

The fungus was found growing on *Tilia cordata* Mill. leaves. Submerged hyphae subhyaline, smooth, thin-walled, 1.5–3 µm wide, locally swollen up to 5 µm. Aerial hyphae subhyaline to pale brown, smooth, thin- or slightly thick-walled, 2–3 µm wide. Conidiogenous cells solitary, arising laterally or terminally from undifferentiated hyphae, pale brown, somewhat thick-walled, simple, cylindrical, but flexuose and often irregular, 4–5 µm wide, elongating by sympodial growth, at first continuous, soon each with 1–5 thin septa, cells about 10–15 µm long; conidium-bearing denticles scattered, peg-like, up to 1 µm long, often pointing out or curved downwards. Conidia dull brown, smooth often granulate, rather thick-walled, spindle-shaped with long acuminate base and mucronate apex, 22–25 × 6.5–7.8 µm.

Note: The taxonomic position of this fungus is still questionable, currently there are two conflicting opinions. According to Mycobank (Robert et al., 2005) the currently used name is reported as *Ardhachandra cristaspora*, but according to Index Fungorum (http://www.indexfungorum.org/Names/Names.asp., accessed 10-03-2012). – *Rhinocladiella cristaspora.* Originally, this fungus was described from Solomon Islands by Matsushima (1971) as *Rhinocladiella cristaspora*, but later Subramanian & Sudha (1978) transferred it to *Ardhachandra* and the new name was also adopted by Matsushima (1980). This saprobic fungus is able to colonize a wide range of substrates and although it was mainly known as foliicolous on debris of deciduous plants (Matsushima, 1971, 1980; Subramanian & Sudha, 1978), recently it has been isolated from decaying needles (Iwamoto & Tokumasu, 2001) and from a fruit body of an aphyllophoralean fungus in Japan (Watanabe et al., 2003). It seems to be cosmopolitan, currently is known from Asia, Africa, Australia, North and South America and Europe (Matsushima, 1971, 1980; Subramanian & Sudha, 1978; Watanabe et al., 2003; Onofri & Castagnola, 1983; Hyde, 1996; Pasqualetti et al., 2006; Barbosa et al., 2008; Raja et al., 2009).

Candelabrum clathrosphaeroides Voglmayr, Mycol. Res., 102(4): 412, 1998. – Fig. 2.

The fungus was found growing on *Quercus robur* L. leaves. Mycelium partly immersed consisting of hyaline, septate hyphae 1–3 µm wide. Conidiophores semimicronematous, apical or lateral, hyaline, short, unbranched, 15–35 µm long, 2–3 µm wide. Conidiogenous cells integrated, terminal, holoblastic. Conidia acrogenous, globose like a clathrate sphere, borne singly, hyaline, 20–30 µm in diam., three times dichotomously branched. Basal plate of the conidia divided into four major and eight minor lobes, out-

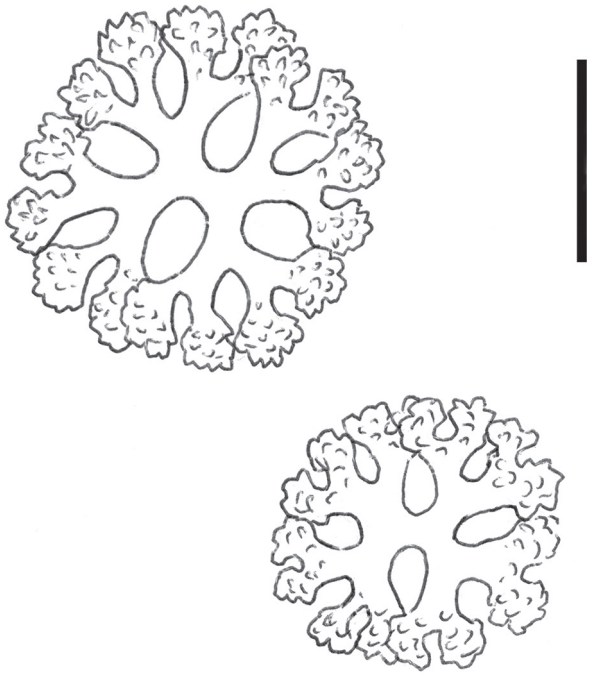

Fig. 2. *Candelabrum clathrosphaeroides*, conidia. Scale bar 20 μm

side verrucose except at the basal plate, trapping air in the centre of the conidium.

Note: Voglmayr described this species in 1998 from Austria, where it was isolated from submerged leaves and wood of *Fagus sylvatica* L. in mixed forests with *Alnus* and *Fraxinus*. At the same time *C. clathrosphaeroides* also was found in the USA (Voglmayr, 1998). In 2002, this fungus was recorded from Australia by J. A. Cooper (New Zealand Fungi, 2008). Notably, *Candelabrum*-like propagules probably belonging to *C. brochiatum* or to *C. clathrosphaeroides* were recorded as *Candelabrum* sp. together with *C. spinulosum* from Australia earlier (Swart, 1986). This aero-aquatic fungus presumably is widely distributed also in temperate climates together with *C. spinulosum*. In Lithuania, both species *C. clathrosphaeroides* and *C. spinulosum* were found growing together on submerged oak leaves.

Candelabrum spinulosum Beverw., Antonie van Leeuwenhoek, 17: 11, 1951. – Fig. 3.

The fungus was found growing on *Quercus robur* L. leaves. Mycelium mostly immersed, composing of hyaline, septate hyphae about 2 μm wide. Conidiophores simple, micronematous, hyaline,

Fig. 3. *Candelabrum spinulosum*, conidiophores and conidia. Scale bar 10 μm

producing terminal conidia. Conidia acrogenous, solitary, holoblastic, formed by an H-shaped basal body consisting of four central cells and four pairs of proximally elongated lateral cells attached to the apex of each central cell. The eight lateral cells are irregular, lobed and densely verrucose. Diameter of the cup-shaped conidium (12.5–)14–15(–17) μm in top view, 12.5–17 × 7.5–10 μm in side view, conidium resembling a four-armed chandelier.

Note: Beverwijk described this species in 1951 from decaying *Alnus, Betula, Carpinus, Quercus* leaves in the Netherlands, Switzerland and Sweden. *C. spinulosum* is also frequently found at wet terrestrial sites (Abdullah & Webster, 1980b). Currently the species is known from North and South America, Asia, Australia and Europe (Beverwijk, 1951, Matsushima, 1971, 1975; Tubaki, 1975a, Abdullah & Webster, 1980a, 1980b; Voglmayr, 1998; Swart, 1986; Schoenlein-Crusius & Grandi, 2003; Cooper, 2005).

Dactylaria fusiformis Shearer & J. L. Crane, Mycologia, 63(2): 243, 1971. – Fig. 4.

The fungus was found growing on decaying leaves of *Alnus glutinosa* (L.) Gaertn. Mycelium immersed and partly superficial, subhyaline to greyish brown. Conidiophores erect, straight, light brown, cylindrical, 50–100 × 3.0–6 μm, 3–5 septate, with thick walls, apical part hyaline, thin-walled, mostly swollen, bearing a cluster of short-cylindrical denti-

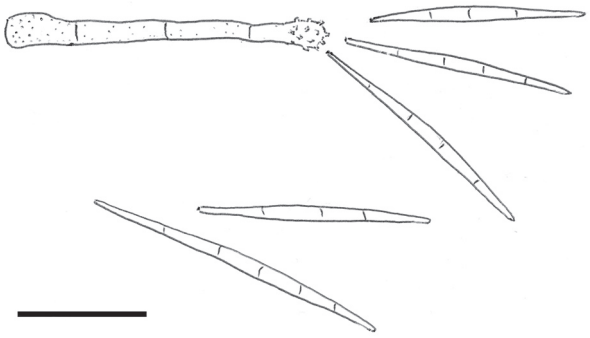

Fig. 4. *Dactylaria fusiformis*, conidiophores and conidia. Scale bar 20 µm

cles 0.6 µm in length. Conidia thin-walled, hyaline, 3 (–5) septate, with very thin septa, fusiform, (30–)35–47(–50) × 1.5–2(–3) µm.

Note: In our observations, the conidial septation has been shown to be variable in *D. fusiformis*. In their original description from the USA, Shearer & Crane (1971) noted that *D. fusiformis* produce 3-septate conidia but septa are very thin. However, in the description of this species from Japan, Matsushima (1975) noted that conidia were 3–4-septate and that *Mirandina typica* Matsush., which was described from the Solomon islands and characterized by producing 3 (–6)-septate conidia (Matsushima, 1971) is conspecific with *D. fusiformis*. Kirk (1986) observed 5–7-septate conidia in the U. K. In our specimen, we observed conidia with 3–4 (up to 5) septa, but morphology and size of conidiophores and conidia were similar to those described from the type material (Shearer & Crane, 1971). Variation in the number of septa (3–4–6) and size of conidia (23.5–60 × 1.5–3.0 µm) were noted also by other authors (Stefanovich & Halubkow, 1976; Onofri & Zucconi, 1984). Currently the species is known from North and South America, Africa, Asia and Europe (Shearer & Crane, 1971; Matsushima, 1971, 1975; Kirk, 1986; Stefanovich & Halubkow, 1976; Gamundí et al., 1977; Onofri & Zucconi, 1984).

Helicodendron tubulosum (Riess) Linder (anamorph), Ann. Mo. bot. Gdn, 16: 330, 1929. – Fig. 5.

Syn.: *Helicomyces tubulosus* Riess, Bot. Ztg., 11: 140, 1853. – *Helicoön tubulosum* (Riess) Sacc., Syll. fung. (Abellini), 11: 609, 1895. – *Helicodendron conglomeratum* Glen Bott, Trans. Brit. Mycol. Soc., 38(1): 21, 1955. – *Helicodendron tubulosum* var. *phialosporum* G. L. Barron, Can. J. Bot., 39: 1570, 1961.

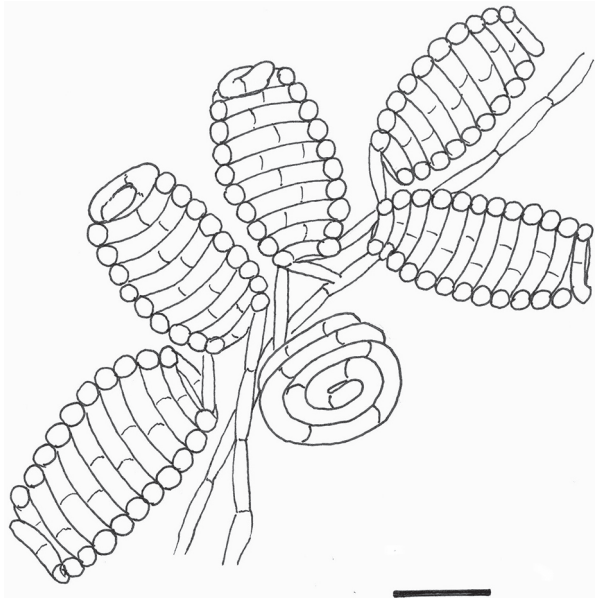

Fig. 5. *Helicodendron tubulosum,* conidia. Scale bar 20 µm

Teleomorph – *Lambertella tubulosa* Abdullah & J. Webster, Trans. Brit. Mycol. Soc., 76(2): 261, 1981.

The conidial stage was found growing on *Quercus robur* L. leaves. Mycelium partly immersed, composed of hyaline, branched and septate hyphae. Conidiophores semimacronematous, hyaline septate, branched, up to 60 µm, 3–4 µm in diam. Conidia hyaline, cylindrical to ovoid, sometimes after some months becoming pale brown, 50–70 × 25–30 µm, consisting of a sparsely septate hypha 3.5–6 µm thick, counter-clockwise coiled to form a three-dimensional helix of up to 10–14 coils, usually proliferating from the first conidial coil of the previous conidium.

Note: The fungus developed on *Quercus robur* L. leaves together with other helicosporous fungi – *Helicodendron triglitziense* (Jaap) Linder, *Helicoön fuscospoum* Linder and *Helicoön richonis* (Boud.) Linder. Morphologically by size and hyaline conidia *H. tubulosum* is close to immature *Helicoön fuscosporum* (mature conidia are fuscous or brown) and to *Helicoön farinosum* Linder (mature conidia hyaline), but in *Helicoön* conidia always are produced singly and proliferations never occur (Goos et al., 1986). *H. tubulosum* is cosmopolitan aero-aquatic fungus usually obtained from decaying leaf litter and

submerged wood of various trees in woodland ponds and other wet habitats (Abdullah & Webster, 1980; Abdullah et al., 1985; Matsushima, 1975; Goos et al., 1985; Cooper, 2005). Its teleomorph *Lambertella tubulosa* Abdullah & J. Webster has not been found in Lithuania.

Xylomyces giganteus Goh, W. H. Ho, K. D. Hyde & K. M. Tsui, Mycol. Res., 101(11): 1324, 1997. – Fig. 6.

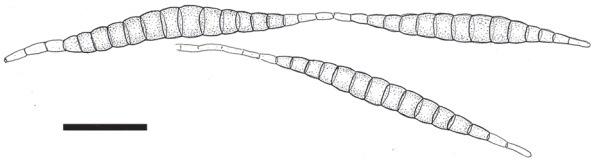

Fig. 6. *Xylomyces giganteus*, conidia. Scale bar 100 µm

The fungus was found colonizing *Quercus robur* L. leaves. On natural substratum abundant pale brown immersed and partly superficial mycelium with chlamydospores developed. Chlamydospores are narrowly fusiform, long, pale brown, solitary or in chains, 320–400 × 30–50 µm, 10–24 septate.

Note: By size of chlamydospores this fungus is close to *X. chlamidosporis*, but is the largest and produces much more septa, commonly colonizes submerged wood and is known from Europe, Africa and Australia (Goh et al., 1997).

***Pseudospiropes* sp.** – Fig. 7–9.

The fungus was found colonizing decaying submerged leaves of *Quercus robur* L. Colonies effuse, brownish to brown hairy. Mycelium subhyaline to pale brown, immersed. Conidiophores macronematous, pale brown to brown, paler toward the apex, smooth, usually unbranched, sympodially proliferating, with scars, 50–75–100 × 3–4 µm. Scars about 2–2.5 µm in diam. Conidiogenous cells polyblastic, integrated, terminal and intercalary. Conidia fusiform, brown, truncate at the base, (5–) 7–9 (–11) septate, smooth and thick walled, (40–) 43–50 (–55) × (2.5–) 5.7–7.5 µm, with pale apical and basal cells and subhyaline conidial sheath. Conidia together with sheath are 12.5–15 µm wide.

Note: By sympodial extension of conidiophores this fungus is very close to *Pseudospiropes obclavatus* M. B. Ellis (Iturriaga T. & Korf R., 1990), but differs by comparatively large and brown conidia and

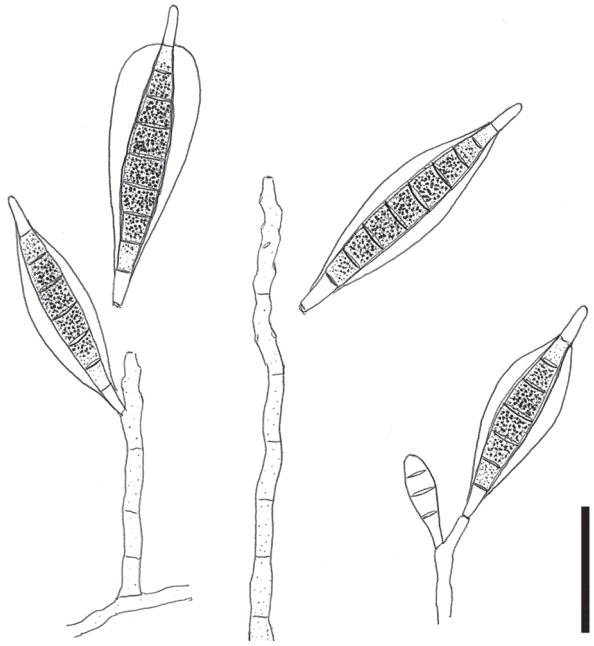

Fig. 7. *Pseudospiropes* sp., conidiophores and conidia. Scale bar 20 µm

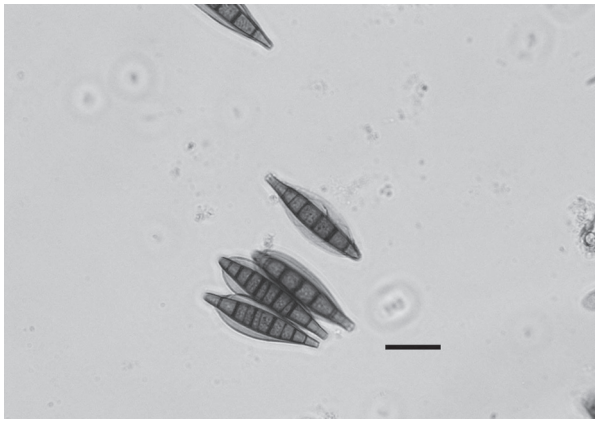

Fig. 8. *Pseudospiropes* sp., microphotographs of conidia with sheaths. Scale bar 20 µm

Fig. 9. *Pseudospiropes* sp., microphotographs of conidiophores and conidia. Scale bar 20 µm

especially by producing subhyaline sheaths around the conidia. Similar sheaths have been described in *Virgariella*-like anamorph of ascomycetous fungus *Effetia craspedoconidica* Bartoli, Maggi & Persiani isolated from tropical forest soil (Bartoli et al., 1984).

Additional list of aquatic and aero-aquatic anamorphic fungi obtained in woodland swampy pools of Gubiškiai Forest in Aukštadvaris Regional Park:

Anguillospora longissima (Sacc. & P. Syd.) Ingold – on leaves of *Alnus glutinosa* (L.) Gaertn.

Articulospora tetracladia f. *angulata* S. Nills – on leaves of *Quercus robur* L. and *Tilia cordata* Mill.

Cylindrocarpon aquaticum (Sv. Nilsson) Marvanová & Descals – on leaves of *Alnus glutinosa* (L.) Gaertn.

Diplocladiella scalaroides G. Arnaud ex M. B. Ellis – on leaves of *Alnus glutinosa* (L.) Gaertn.

Flabellospora crassa Alas. – on leaves of *Tilia cordata* Mill.

Fusicolla aquaeductuum (Radlk. & Rabenh.) Gräfenhan, Seifert & Schroers – on leaves of *Alnus glutinosa* (L.) Gaertn. and *Quercus robur* L.

Helicodendron triglitziense (Jaap) Linder – on leaves of *Tilia cordata* Mill. and *Quercus robur* L.

Helicoön fuscosporum Linder – on leaves of *Quercus robur* L.

Helicoön richonis (Boud.) Linder – on leaves of *Quercus robur* L.

Heliscus lugdunensis Sacc. & Therry – on leaves of *Alnus glutinosa* (L.) Gaertn.

Mycocentrospora acerina (R. Hartig) Deighton – on leaves of *Alnus glutinosa* (L.) Gaertn.

Xylomyces aquaticus (Dudka) K. D. Hyde & Goh – on leaves of *Quercus robur* L.

Tetrachaetum elegans Ingold – on leaves of *Tilia ccordata* Mill.

Tetracladium marchalianum De Wild. – on leaves of *Alnus glutinosa* (L.) Gaertn.

Tetracladium setigerum (Grove) Ingold – on leaves of *Alnus glutinosa* (L.) Gaertn.

Tripospermum camelopardus Ingold, Dann & P. J. McDougall – on leaves of *Alnus glutinosa* (L.) Gaertn. and *Quercus robur* L.

Tripospermum myrti (Lind) S. Hughes – on leaves of *Quercus robur* L.

Varicosporium elodea W. Kegel – on leaves of *Tilia cordata* Mill.

Varicosporium giganteum J. L. Crane – on leaves of *Tilia cordata* Mill. and *Quercus robur* L.

Most of the listed species are widespread in temperate region and are rather common in various freshwater ecosystems in Lithuania, colonizing a variety of substrates (Markovskaja, 1994, 1996, 2007, 2009; Markovskaja et al., 2002).

The presented data supplement the knowledge on aquatic and aero-aquatic hyphomycetes, on the ecological specificity and diversity in Lithuania and on the worldwide geographical distribution.

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ORO-VANDENS GRYBAI, KOLONIZUOJANTYS PŪVANČIUS LAPUS UŽPELKĖJUSIOSE MIŠKO BALOSE AUKŠTADVARIO REGIONINIAME PARKE

Svetlana Markovskaja

Santrauka

Straipsnyje skelbiami duomenys apie vandens grybų tyrimus, vykdytus 2011 metų rudenį smulkiuose lentiniuose vandens telkiniuose Aukštadvario regioniniame parke. Tyrimų eigoje buvo nustatyta gana didelė anamorfinių grybų (26 rūšys), kolonizuojančių pūvančius įvairių lapuočių medžių lapus užpelkėjusiose balose mišriame Gubiškių miške. Kartu su plačiai paplitusiais vandens ir sausumos grybais buvo nustatytos 14 rūšių hifomicetų, priskirtų labai specifinei oro-vandens grybų ekologinei grupei, kurie kolonizavo neseniai nukritusius *Quercus robur*, *Tilia cordata* ir *Alnus glutinosa* lapus. Šešios jų rūšys – *Ardhachandra cristaspora*, *Candelabrum spinulosum*, *C. clathrosphaeroides*, *Dactylaria fusiformis*, *Helicodendron tubulosum*, ir *Xylomyces giganteus* rastos pirmą kartą Lietuvoje. Be to, buvo rastas neaprašytas grybas, preliminariai priskirtas *Pseudospiropes* genčiai. Straipsnyje pateikti naujų Lietuvai rūšių trumpi morfologiniai aprašymai, originalios iliustracijos, aptartas paplitimas ir ekologiniai ypatumai. Gauti duomenys papildo žinias apie Lietuvos mikobiotos įvairovę, ekologiją bei vandens grybų geografinį paplitimą.