

SPECIES OF DITOMYIIDAE AND MYCETOPHILIDAE (DIPTERA: SCIAROIDEA) NEW FOR THE LITHUANIAN FAUNA, FOUND IN DEAD ASH AND ASPEN WOOD*INA GORBAN*¹, *JOLANTA RIMŠAITĖ*², *VIRGINIJA PODĖNIENĖ*³¹Life Sciences Center, Saulėtekio al. 7, Vilnius, inagorban@gmail.com²Nature Research Centre, Akademijos 2, Vilnius, entlab@gmail.com³Life Sciences Center, Saulėtekio al. 7, Vilnius, virginija.podeniene@gmail.com**Introduction**

Dead wood is an important part of forest ecosystem. It provides a habitat and is a source of food for many insects, which can be called saproxylic (Speight, 1989). Most species found are saprophagous or mycetophagous, as dead wood is penetrated with fungal mycelia (Stokland, 2012). One of the most abundant families found is Mycetophilidae.

More than 1700 species of fungus gnats (insects belonging to families Bolitophilidae, Diadocidiidae, Keroplatidae and Mycetophilidae) are known from Europe (Kurina *et al.*, 2011). The Lithuanian list of fungus gnats until now comprises 230 species, including 11 species of Bolitophilidae, 2 species of Ditomyiidae, 2 species of Diadocidiidae, 24 species of Keroplatidae and 191 species of Mycetophilidae (Rimšaitė, 2014). The investigation of fungus gnats distribution in Lithuania and, investigation on fungus gnats trophic relation with various groups of Macromycetes was carried out from 1997, and stays insufficiently known (Rimšaitė, 1998; 2014).

The aim of this publication is to present the list of new records of Mycetophilidae and Ditomyiidae to the Lithuanian fauna, found during the investigation on dead wood inhabitants.

Material and Methods

The research was carried out in Būda botanical-zoological reserve, in Kaišiadorys district in 2016.

List of localities

Locality	Coordinates (LAT, LONG)
Būda botanical-zoological reserve (1), fallen ash tree	54.88136, 24.35836
Būda botanical-zoological reserve (2), fallen ash tree	54.88142, 24.35894
Būda botanical-zoological reserve (3), fallen aspen tree	54.88131, 24.35572
Būda botanical-zoological reserve (4), fallen ash tree	54.88139, 24.35697
Būda botanical-zoological reserve (5), fallen ash tree	54.88233, 24.35533

Emergence traps were used to study the diversity of insects and they were set on one aspen and four ash fallen trees (Fig. 1). Traps were placed in May and insects were collected during warm season till November. All collected material was sorted at the laboratory and identified to species. The identification key presented in publications of Krivosheina *et al.* (1986); Hudson *et al.* (1990); Zaitzev (1990, 1994) and Kurina (1999).



Fig. 1. Emergence trap on a fallen tree

List of species

FAMILY DITOMYIIDAE

Symmerus nobilis Lackschewitz, 1937

Būda botanical-zoological reserve (2), 10 07 2016, 2♂ (Fig. 2.).

FAMILY MYCETOPHILIDAE

Subfamily Sciophilinae

Coelophthina thoracica (Winnertz, 1863)

Būda botanical-zoological reserve (1), 08 09 2016, 1♂ (Fig. 3.).

Subfamily Mycetophilinae

Allodia (Brachycampta) subpistillata Ševčík, 1999

Būda botanical-zoological reserve (1), 08 09 2016, 1♂ (Fig. 4.).

Exechia confinis Winnertz, 1863

Būda botanical-zoological reserve (5), 30 07 2016, 1♂ (Fig. 5.).

Exechia exigua Lundström, 1909

Būda botanical-zoological reserve (5), 29 08 2016, 1♂ (Fig. 6.).

Exechia parvula (Zetterstedt, 1852)

Būda botanical-zoological reserve (1), 29 08 2016, 2♂, 08 09 2016, 8♂, 18 09 2016, 1♂, 30 10 2016, 1♂; Būda botanical-zoological reserve (2), 08 10 2016, 1♂, 08 11 2016, 1♂; Būda botanical-zoological reserve (5), 30 07 2016, 1♂, 09 08 2016, 5♂, 29 08 2016, 3♂ (Fig. 7.).

Exechia repandoides Caspers, 1984

Būda botanical-zoological reserve (5), 09 08 2016, 1♂ (Fig. 8.).

Exechia unifasciata Lackschewitz, 1937

Būda botanical-zoological reserve (1), 08 09 2016, 2♂; Būda botanical-zoological reserve (4), 10 06 2016, 1♂ (Fig. 9.).

***Exechiopsis (Exechiopsis) fimbriata* (Lundström, 1909)**

Būda botanical-zoological reserve (1), 08 09 2016, 1♂, 18 09 2016, 1♂, 08 10 2016, 4♂; Būda botanical-zoological reserve (2), 18 09 2016, 2♂, Būda botanical-zoological reserve (5), 29 08 2016, 2♂ (Fig. 10.).

***Rymosia bifida* Edwards, 1925**

Būda botanical-zoological reserve (1), 19 08 2016, 1♂1♀, 29 08 2016, 4♂, 08 09 2016, 2♂, 18 09 2016, 2♂; Būda botanical-zoological reserve (2), 29 08 2016, 1♂; Būda botanical-zoological reserve (3), 08 09 2019, 2♂; Būda botanical-zoological reserve (5), 09 08 2016, 1♂, 29 08 2016, 2♂ (Fig. 11.).

Discussion

The knowledge of species in dead wood in Lithuania is still insufficient. Especially, there is very little data on dipterans in dead wood.

10 species of fungus gnats (Diptera: Sciaroidea) new to the Lithuanian fauna were found during our research. Nine species of them are Mycetophilidae, one species – Ditomyiidae.

Symmerus nobilis (Ditomyiidae) is distributed in West, East, North-East Europe (Chandler, 2013). It was described from Latvia (Lackschewitz, 1937). The larvae of this species were found in dead decaying wood of beech (*Fagus* sp.) (Zaitzev, 1994). The species is considered as rare everywhere in Europe and is included in Red list of threatened species of Finland. All collecting records of adults were from broadleaved forests, with the exception of Russian Karelia which lies entirely in the boreal forest zone. Both the Finnish and the Karelian sites are old growth forests on fertile soils, with a high amount of dead aspen wood, in which larvae of the species most likely develop (Jakovlev *et al.*, 2014).

Coelophthinia thoracica is distributed in North and Central Europe, North, Northwest and Central European Russia (Chandler, 2013). There have been established the trophic relation with macromycetes of the genera *Boletus* sp., *Hydnum* sp. (Zaitzev, 1994; Hudson *et al.*, 2013).

Allodia (Brachycampta) subpistillata is distributed in the Czech Republic, Finland, Sweden and North European Russia (Chandler, 2013; Jakovlev, 2014). The species was described from the Czech Republic (Ševčík, 1999), and has been recorded from Sweden (Kjaerandsen *et al.*, 2007). The species is very similar to *Allodia pistillata*. Male genitalia with medioventral processes of gonocoxites in ventral view apically rounded. Internal processes of gonostylus differently formed apically (Ševčík, 1999). Biology of this species is still unknown. Sampling sites of this species in Finland was a headwater stream and a swampy lake shore (Jakovlev *et al.*, 2014), the holotype was found in peat bog (Ševčík, 1999).

Exechia confinis is widespread in Europe, including North, Northwest, Central European Russia. It was recorded trophic relations from fungi *Paxillus involutus*, *Lactarius piperatus* (Jakovlev, 1994; Kurina, 1999; Ševčík, 2006). In Estonia the overwintering of the species have been found in caves (Kurina, 1999). According to literature the activity of imagoes is recorded in autumn and winter (Kurina, 1999), but we caught specimens in July.

Exechia exigua is widespread in Europe (Chandler, 2013). Biology of this species is still unknown.



Fig. 2. *Symmerus nobilis*

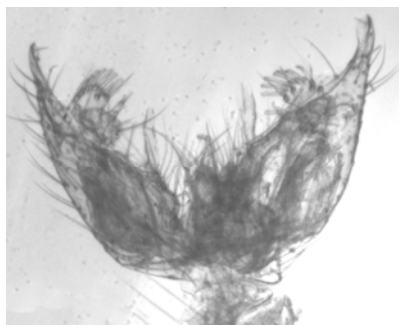


Fig. 3. *Coelophthinia thoracica*



Fig. 4. *Allodia subpistillata*

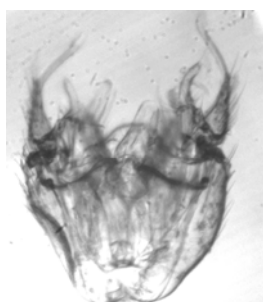


Fig. 5. *Exechia confinis*

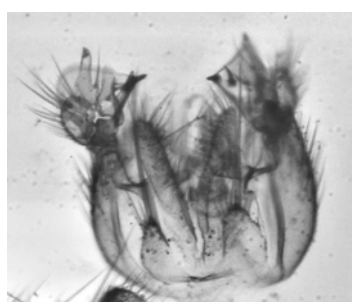


Fig. 6. *Exechia exigua*

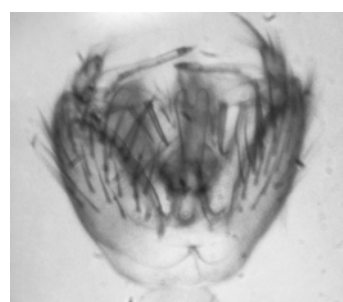
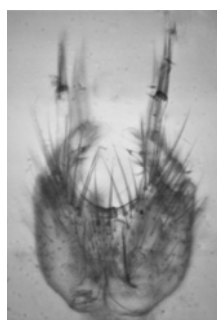
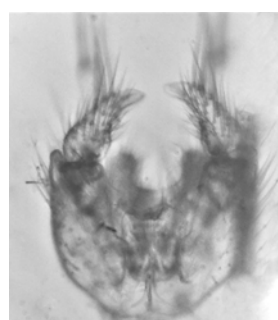


Fig. 7. *Exechia parvula*



A



B

Fig. 8. *Exechia repandoides*: A – ventral, B-dorsal view

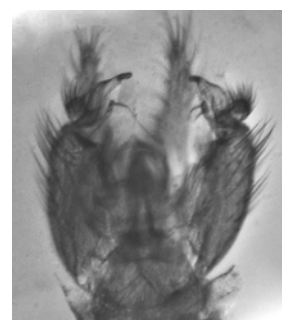


Fig. 9. *Exechia unifasciata*



A

Fig. 10. *Exechiopsis fimbriata*

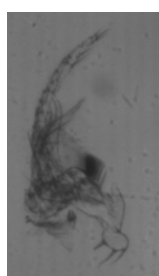
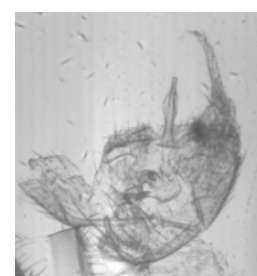


Fig. 11. *Rymosia bifida*: A – gonostylus; B-general view



Exechia parvula has a wide distribution in Europe (Chandler, 2013). There have been established the trophic relation with macromycetes of the genus *Inocybe* (Krivosheina *et al.*, 1986).

Exechia repandoides is distributed in Germany, Austria, Great Britain, Czech Republic, Estonia, Germany, Hungary, Italian, Switzerland (Chandler, 2013). During the investigation in the Czech Republic there were established trophic relations with the fungus *Tricholoma sejunctum* (Ševčík, 2006).

Exechia unifasciata is distributed in Central, North and East Europe (Chandler, 2013). The larvae develop in the fruit bodies of *Suillus* and *Russula* (Jakovlev 1994; Krivosheina *et al.*, 1986).

Exechiopsis (Exechiopsis) fimbriata is a Palaearctic species, widespread in Europe (Chandler, 2013). The larvae of *Exechiopsis* live individually in the stems of small agarics fungus, such as *Laccaria laccata* (Ševčík, 2006).

Rymosia bifida is a Palearctic species, widespread in Europe (Chandler, 2013). The larvae develop in fruit bodies of *Inocybe geophylla*, *Psathyrella spadicea* and *Inocybe lacera* (Jakovlev, 1994; Ševčík, 2006).

The most abundant species during our investigation were *Rymosia bifida*, *Exechiopsis (Exechiopsis) fimbriata*, *Exechia parvula*. Most of the species were caught in traps on dead wood are trophically associated with fruit bodies of different, mostly mycorrhizal macromycetes. Fallen trees are proper hiding place for adult fungus gnats and that can explain occurrences of this fungus gnat in the traps. *Symmerus nobilis* (Ditomyiidae) is the only typical inhabitant of dead decaying wood.

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Naujos Lietuvos faunos Dytomyiidae ir Mycetophilidae šeimų rūšys (Diptera: Sciaroidea), surinktos negyvoje uosio ir drebulės medienoje

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Santrauka

Lietuvoje mažai turima duomenų apie negyvoje medienoje aptinkamas vabzdžių rūšis, kurios vadinamos saproksilinėmis. Šių rūšių lervinės stadijos vystosi, maitinasi arba žiemoja negyvoje medienoje. Dažniausiai tai saprofaginės arba mycetofaginės rūšys. Publikacijoje pateikiami duomenys apie 10 naujų grybinių uodukų (Dytomyiidae ir Mycetophilidae) rūšių, surinktų gaudyklėmis, įrengtomis prie negyvos medienos, Būdos botaniniame-zoologiniame draustinyje, 2016 metais.

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