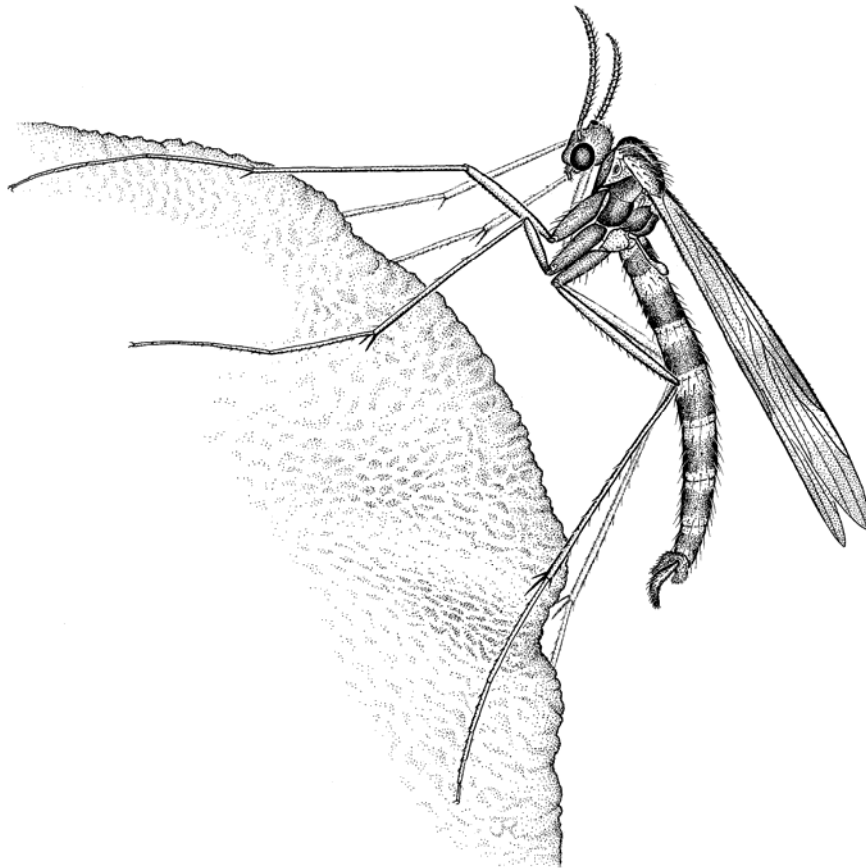


**Czech and Slovak Diptera
associated with fungi**

Jan Ševčík



Slezské zemské muzeum
Opava

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Abstract: This work summarizes data on 242 species of Diptera belonging to 27 families reared by the author from 248 species of macrofungi and myxomycetes collected in the Czech and Slovak Republics in the years 1998 – 2010. Most species recorded belong to the family Mycetophilidae (99 species), followed by the families Phoridae (21 spp.), Cecidomyiidae (19 spp.), Drosophilidae (15 spp.), Bolitophilidae (10 spp.), Platypezidae (10 spp.), Muscidae (10 spp.), Sphaeroceridae (8 spp.) and Heleomyzidae (6 spp.). The other families were represented by 5 or less species. For each species a list of hitherto known fungus hosts in the Czech and Slovak Republic is given, including the previous literature records. A systematic list of host fungi with associated insect species is also provided. The first record of any host fungus is given for *Mycetophila ostentanea* Zaitzev, 1998, *Mycetophila sordida* van der Wulp, 1874 and *Sceptonia flavipuncta* Edwards, 1925 (all Mycetophilidae). Comments are also made on larval parasitoids reared from Mycetophilidae and Phoridae.

Key words: Diptera, insects, fungi, mycetozoa, fungus hosts, parasitoids, mycophagy, biology, ecology, Czech Republic, Slovakia, Europe.

Čeští a slovenští dvoukřídlí (Diptera) vázaní na houby

Abstract: V práci jsou shrnuty údaje o 242 druzích dvoukřídleho hmyzu (Diptera) patřících do 27 čeledí, které byly vychovány autorem z 248 druhů vyšších hub (Fungi) a hlenek (Myxomycetes) nalezených v České a Slovenské republice v letech 1998 až 2010. Nejvíce zaznamenaných druhů patří do čeledi Mycetophilidae (99 druhů), následují čeledi Phoridae (21 spp.), Cecidomyiidae (19 spp.), Drosophilidae (15 spp.), Bolitophilidae (10 spp.), Platypezidae (10 spp.), Muscidae (10 spp.), Sphaeroceridae (8 spp.) a Heleomyzidae (6 spp.). Ostatní čeledi byly zastoupeny 5 nebo méně druhy. Ke každému druhu je podán přehled dosud známých hostitelských hub v České a Slovenské republice, včetně předchozích literárních údajů. Připojen je také systematický přehled hostitelských hub a příslušných druhů hmyzu. Poprvé je zaznamenána hostitelská houba pro druhy *Mycetophila ostentanea* Zaitzev, 1998, *Mycetophila sordida* van der Wulp, 1874 a *Sceptonia flavipuncta* Edwards, 1925 (vše Mycetophilidae). Uveden je také přehled parazitoidů larev čeledi Mycetophilidae a Phoridae.

Author's addresses:

RNDr. Jan Ševčík, Ph.D., University of Ostrava, Faculty of Science, Department of Biology and Ecology, Chittussiho 10, CZ-710 00 Ostrava, Czech Republic
& Silesian Museum, Tyršova 1, CZ-746 01 Opava, Czech Republic
e-mails: sevcikjan@email.cz, sevcikjan@hotmail.com, jan.sevcik@osu.cz

Reviewers:

PETER J. CHANDLER (Melksham, United Kingdom)

LÁSZLÓ PAPP (Budapest, Hungary)

JINDŘICH ROHÁČEK (Opava, Czech Republic)

Cover design: Jozef Böhm

Front cover photograph: Male of *Mycetophila (ruficollis* group) on *Armillaria* sp.

Back cover photograph: A pair of *Drosophila transversa* on *Verpa bohemica*

Illustration on page 1: Male of *Ditomyia fasciata* – orig. JINDŘICH ROHÁČEK

All photographs by Jan Ševčík unless stated otherwise.

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1. Introduction

Fruiting bodies of macrofungi and myxomycetes (= Mycetozoa) represent a suitable food source and habitat for the larvae of several insect groups, mainly flies (Diptera) and beetles (Coleoptera), but also tineid moths (Lepidoptera: Tineidae), springtails (Collembola), thrips (Thysanoptera) and hymenopteran parasitoids of all these insects. Most of the fungicolous insects (excluding parasitoids) are mycophagous or mycosaprophagous with various degree of specialisation on fungus host, while some groups are predaceous or polyphagous, but still more or less associated with fungi.

Two-winged flies (Diptera) belong to the most common and most frequent inhabitants of both the fresh and decaying fruit bodies of fungi, together with beetles (mainly from the families Ciidae, Staphylinidae, Erotylidae, Nitidulidae and Mycetophagidae), which usually prefer wood-decaying fungi (Polyporaceae). More than 25 families of Diptera have some species with fungicolous larvae and some of them as far as is known entirely comprise species associated with fungi (e.g. Bolitophilidae, Platypezidae).

In this work all available data on host fungi, parasitoids and habitat associations are summarized for Diptera reared by the author from fungi collected from 1998 to 2010 in the territory of the Czech Republic or Slovakia. Of the 115 families of Diptera currently known to occur in the Czech or Slovak Republics (Jedlička et al. 2009), species belonging to 27 families have been proved to develop in fungi in these countries.

This book is a new edition of the previous work (Ševčík 2006a), that was based on the field research carried out in the years 1998 – 2006, and it is updated with new records obtained in the last 4 years, including 54 additional species of Diptera, 60 species of fungi and 2 additional species of Mycetozoa. Several new colour photographs are also introduced in this edition.

Acknowledgements

This study was supported by the Czech Grant Agency (Grants No. 206/03/D078 and 206/08/1500). I am grateful to the mycologists V. Balner, H. Deckerová, M. Graca, J. Lazebníček, I. Nováková, D. Dvořák and P. Vampola, who helped me with the identification and collecting of host fungi. The following specialists (in alphabetical order) kindly identified the families of Diptera and Hymenoptera stated in the parentheses: M. Barták (Hybotidae), M. Čapek (Braconidae), R. H. L. Disney & B. Mocek (Phoridae), F. Gregor & R. Rozkošný (Muscidae, Fanniidae, Anthomyiidae), J.-P. Haenni (Scatopsidae), J. Holinka (Syrphidae), J. Ježek (Psychodidae), J. Knoz & A. Tóthová (Ceratopogonidae), Š. Kubík (Chloropidae), J. Máca (Drosophilidae), J. Macek (Diapriidae, Eucolidae, Proctotrupidae), V. Martinek, J. Preisler & L. Papp (Heleomyzidae), J. Roháček (Sphaeroceridae, Asteiidae, Chloropidae), H.-G. Rudzinski (Sciaridae), M. Skuhravá & M. Jaschhof (Cecidomyiidae), J. Starý (Trichoceridae, Pediciidae, Limoniidae), J. Šedivý (Ichneumonidae), J. Vaňhara (Platypezidae). My students at the University of Ostrava (M. Hora, G. Szczotková, P. Švarcová and M. Čech) provided me with interesting new material collected in the last three years. I am indebted to P. J. Chandler (Melksham, U.K.), L. Papp (Budapest) and J. Roháček (Opava) for the review of the manuscript. I am grateful especially to J. Roháček for many-sided help during the preparation of this book and for long-term support of my dipterological work.

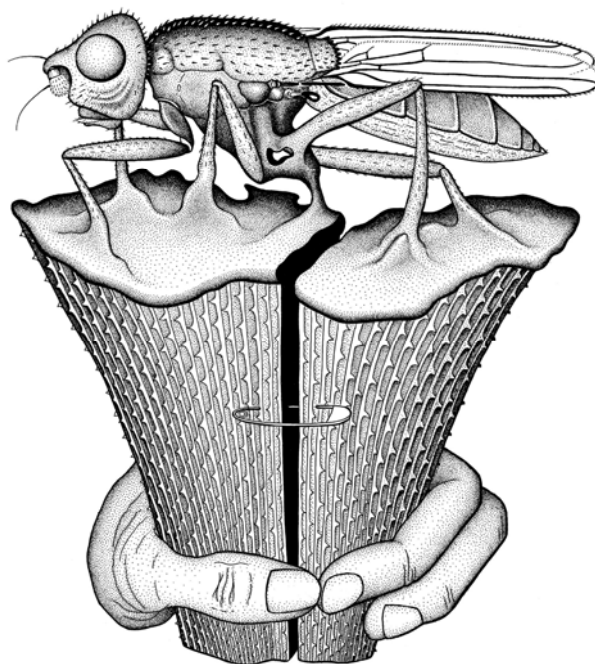


Fig. 1: A detail from the New Year's card by J. Roháček entitled "Only dipterists hold it together" depicting the close cooperation and friendship of the Czech and Slovak dipterists after separation of the former Czechoslovakia

2. Materials and methods

The samples of fungi were collected by the author and the collaborators mentioned above from April to November in the years 1998 - 2010. Altogether, more than 770 samples of fungi infested by Diptera were collected, out of which data from approximately 630 samples are recorded in this work.

The method of rearing was principally described by Laštovka (1971). The samples of fungi with insect larvae were placed into glass jars with a small amount of soil. Soil packaged for gardeners was used to avoid infestation of soil-living larvae. The jars were then closed by monofil (**Fig. 2**) and placed into a cellar with temperature around 10-15 °C. The samples were regularly sprayed with water to maintain the humidity. The mould growing on decaying fruit bodies of fungi was usually removed, but sometimes it was tolerated, because it was suitable habitat for Cecidomyiidae larvae. Additional fly specimens were reared from large fruiting bodies of *Meripilus giganteus* using plastic rearing boxes (for description of the method see Ševčík & Roháček 2008).



Fig. 2: The sampling jar

Most of the examined material of both the larvae and reared adults is preserved in ethanol in the author's collection. A lesser part is deposited in the collections of particular specialists. Some of the reared adults were prepared and pinned. The sampling localities, including habitats, are listed below. The systematic list of fungi species is presented in a separate chapter.

A total of 242 species belonging to 27 families of Diptera were reared from 248 species of fungi (including several named only to genus) in 1998-2010, see **Tab. 1** on page 55. All the rearing records are summarized below. Only Czech or Slovak well-documented rearing records from reliably identified fungi are listed and accidental observations of adult insects on fungi are not taken into account.

Each record is given in the following form: species name of insect - locality: collecting date/emerging date, number of males/ number of females, host fungus. In some cases the emergence dates were not documented, so they are missing.

3. List of localities and associated habitats

CZECH REPUBLIC

Bohemia. B1: Bor near Tišnov, coniferous forest; B2: Nový Vojítov near Nová Bystrice, coniferous forest; B3: Trutnov, town park; B4: Ulrichov, mixed forest; B5: Žacléf, spruce forest; B6: Žamberk, town park; B7: Živohošť, mixed forest near the Slapy reservoir.

Moravia & Silesia. M1: Bartošovice, pond dam with oak trees; M2: Bartošovice, hornbeam forest; M3: Brumovice-Pocheň, mixed forest; M4: Bohumín, metallurgical dump; M5: Děhylov, mixed forest; M6: Dětřichov near Jeseník, mixed forest; M7: Dolní Lomná, fir-beech forest; M8: Francova Lhota, mixed forest and meadows; M9: Hněvošice, deciduous forest; M10: Horní Lipová, mixed forest; M11: Hrubá Voda, mixed forest; M12: Hradec nad Moravicí, beech forest; M13: Hrubý Jeseník Mts., Klepáčov, spruce forest; M14: Hrubý Jeseník Mts, Praděd National Nature Reserve (= NNR), spruce and birch forest; M15: Hrubý Jeseník Mts, Rejvíz NNR, peat-bog; M16: Hrubý Jeseník Mts, Vidly, beech forest; M17: Hrubý Jeseník Mts, Vrbno pod Pradědem, Jelení Bučina Nature Reserve (= NR), maple-beech forest; M18: Hukovice, mixed forest; M19: Hukvaldy, beech forest; M20: Jistebník, pond dam with oak trees; M21: Karlov pod Pradědem, spruce

forest; M22: Karviná - Doly, dam of Mokroš tailing pond; M23: Krnov-Cvilín, coniferous forest; M24: Křtiny nr. Brno, botanical garden; M25: Kunín, Bařiny NR; M26: Kunín, Oderské louky-Panský les NR; M27: Malá Bystřice, beech forest; M28: Melč, garden; M29: Moravskoslezské Beskydy Mts, Bílá env., Velká Smradlava Valley, mixed forest; M30: Moravskoslezské Beskydy Mts, Bumbálka, meadow; M31: M. Beskydy Mts, Ostravice env., spruce-beech forest; M32: M. Beskydy Mts, Salajka NNR; M33: M. Beskydy Mts, Staré Hamry, spruce forest; M34: Lednice, park; M35: Oldřichovice, mixed forest; M36: Opava, town park; M37: Ostrava, mine dump “Ema”; M38: Ostrava, mine dumps “Lučina” and “Zárubek”; M39: Ostrava, town centre, Šmeralova street; M40: Ostrava-Michálkovice, recultivated coal mine dump; M41: Ostrava-Petřkovice, Lanek National Nature Monument, oak-beech forest; M42: Ostrava-Poruba, town park; M43: Ostrava-Svinov, Rezavka NR, deciduous forest and wet meadows; M44: Ostrava-Třebovice, town park; M45: Ostrava-Třebovice, Turkov Nature Monument, floodplain forest; M46: Pálava, Dolní Věstonice, mixed forest; M47: Podvihov near Opava, mixed forest; M48: Podyjí National Park (= NP), Havraníky, forest-steppe; M49: Podyjí NP, Hnanice, deciduous forest; M50: Podyjí NP, Lukov, deciduous forest; M51: Podyjí NP, Mašovice, Mločí údolí Valley, deciduous forest along brook; M52: Podyjí NP, Vranov nad Dyjí env., deciduous forest; M53: Polanka nad Odrou, pond dam with oak trees; M54: Polanka nad Odrou, Blücherův les, floodplain forest; M55: Přerov, floodplain forest; M56: Pulčín, rocky hill, mixed forest; M57: Rychvald, garden; M58: Skrochovice, meadow; M59: Studénka, Kotvice NR, pond dam with oak trees; M60: Studénka, pond dam with hornbeam and oak trees; M61: Studénka, floodplain forest; M62: Studénka, Mokřady Pustějovského potoka NR, wetland with willows; M63: Studénka-Hukovice, Mokřady Liščího potoka NR, wet mixed forest; M64: Suchdol nad Odrou, floodplain forest; M65: Šilheřovice, Černý les NR, beech forest; M66: Štramberk, limestone hill and its surroundings; M67: Úvalno, mixed forest; M68: Valašská Bystřice, spruce forest; M69: Vítkov-Podhradí, mixed forest.

SLOVAKIA

S1: Banská Štiavnica, mixed forest; S2: Horná Orava Mts., Nová Bystrica, alder growth along brook; S3: Muránska planina NP, Hrdzavá dolina Valley, beech forest; S4: Muránska planina NP, Nad Mišákovou, edge of mixed forest; S5: Oravské Veselé, alder growth in a spruce forest; S6: Polana Biosphere Reserve (= BR), Havranie skaly, mixed forest; S7: Polana BR, Hrochofská dolina Valley, mixed forest; S8: Polana BR, Hronček ponds, spruce forest; S9: Polana BR, Hrončecký grúň NNR, fir-beech forest; S10: Polana BR, Snohy, spruce forest; S11: Poloniny NP, Nová Sedlica, Stuzica NNR, fir-beech forest; S12: Poloniny NP, Nová Sedlica env., birch groves; S13: Poloniny NP, Stakčín, Hrúnok NR, deciduous forest; S14: Poloniny NP, Uličské Krivé, beech forest; S15: Slanské Vrchy Mts, Hermanovce nad Toplou, beech forest; S16: Slovakian Karst NP, Kováčová, grassland near Drieňová NNR; S17: Slovenský raj NP, Piecky NNR, montane spruce forest; S18: Tatra NP, Lake Batizovské pleso, spruce forest; S19: Trstená, spruce forest; S20: Važec, meadows.

Note: Some of the localities taken from the literature are not listed here as no information on habitat had been provided. They are cited under particular records in the form given in the original publication.

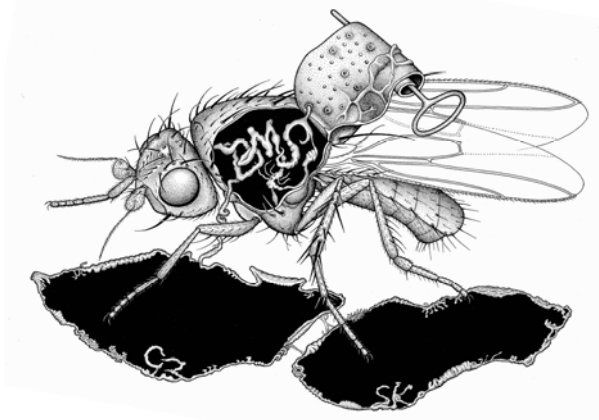


Fig. 3: Logo of the Checklist of the Czech and Slovak Diptera (Jedlička et al. 2009). Orig. J. ROHÁČEK

4. History of investigations

Many authors studied associations of Diptera with fungi in various parts of Europe (for a review see Jakovlev 1994), but also in Asia (e.g. Sasakawa 1979, Sasakawa & Ishizaki 1999, Disney & Ševčík 2009a) and North America (e.g. Kessel & Kessel 1939, Kessel et al. 1973, Pielou & Verma 1968). The old published data (e.g. Canzanelli 1941, Landrock 1940) are usually out-of-date due to advance in the taxonomy of both fungi and insects. The most comprehensive modern accounts were published by Buxton (1954, 1961, with Barnes 1953) and Chandler (2010) covering the British Isles, Eisfelder (1955, 1956) for Germany, Hackman & Meinander (1979) for Finland, Krivosheina (2008) and Krivosheina et al. (1986) for Russia, Jakovlev (1995) for Russian Karelia, Dely-Draskovits & Babos (1993) for Hungary. Jakovlev (1994, **Fig. 4**) provided the first comprehensive compilation of all published Palaearctic records of Diptera reared from fungi and myxomycetes. Among the unpublished accounts, the work by Trifourkis (1977) certainly deserves mention.

There are numerous papers providing data on fungus hosts for a particular group or species of Diptera, e.g. Kurina (1992) and Ribeiro (1990) for fungus gnats (Sciarioidea), Disney & Evans (1999) for Phoridae, Papp (1972) for Sphaeroceridae and Asteiidae, etc. On the other hand, insect fauna of selected groups of fungi, mainly polypores, has also been investigated (e.g. Jonsell et al. 1999, 2001, Økland 1995, Økland & Hågvar 1994). Many papers are devoted primarily to beetles (e.g. Kaila et al. 1994, Kula et al. 1999, Thunes 1994). The hymenopteran parasitoids of fungicolous Diptera were studied mainly by Jakovlev & Tobias (1992), Kolarov & Bechev (1995) and Šedivý & Ševčík (2003). Some theoretical aspects of fungivory were discussed by Hanski (1989).

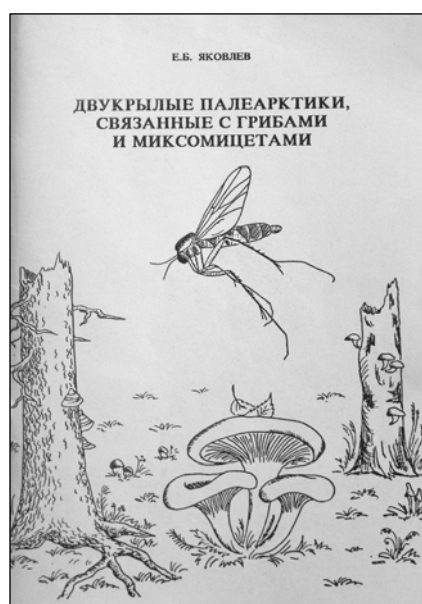


Fig. 4: Front cover of the book by Jakovlev (1994)

In the Czech Republic and Slovakia, most groups of fungicolous Diptera have been rather neglected up to the end of the 20th century. There are some old sporadic records of fungus hosts for several individual species, mainly fungus gnats, but they are usually outdated due to insufficient taxonomic knowledge. In the second half of the 20th century Petr Laštovka (1938 – 2005) was interested in rearing of insects from various species of fungi (cf. Laštovka 1972c). His results, however, remained mostly unpublished and only a few rearing records were published within the papers on the taxonomy and larval morphology of several genera of Mycetophilidae (Laštovka 1971, 1972a,b). Although Laštovka's manuscript remarks from the years 1958–1974 are now available to the author, they are of limited value, because host fungi were identified insufficiently, usually only to genus or family.

In 1998 the systematic study of Diptera living as larvae in fungi was started by the author. The results were successively published (Ševčík 2001a,b, 2003, 2004b,c, 2006a, Disney & Ševčík 2008, 2009b, Šedivý & Ševčík 2003). They are all summarized in the present volume and supplemented with new data.

5. Results and discussion

5.1 Systematic list of Diptera species

Trichoceridae

A small family with 50 species in Europe, 30 species in the Czech Republic and 32 in Slovakia (Starý 2009). The adults can be found in shady and wet places, often in large numbers and they occur typically in spring and in autumn, sometimes also in winter. The larvae are mainly saprophagous, but several species regularly develop in fungi.

Trichocera hiemalis (De Geer, 1776)

Published record (Ševčík 2001a): M53: 29.10.1999/3.12.1999, 1/0, ex *Entoloma nidorosum*.

T. hiemalis (Fig. 5) is a polyphagous species recorded from many species of fungi, as well as from other decaying material.

Trichocera rufescens Edwards, 1921

Published records (Ševčík 2001a, 2004b,c): M65: 3.10.1999/ 5.11.1999, 0/1, ex *Lepiota aspera*; M51: 11.10.2003/2.-9.11.2003, 5/6, ex *Pluteus cervinus*; M52: 11.10.2003/2.-6.11.2003, 2/2, ex *Armillaria gallica*. S12: 13.10.2001/11.-15.11.2001, 5/1, ex *Armillaria cepistipes*.

New record: M37: 1.11.2009, 0/2, ex *Cortinarius hinnuleus*.

This species has previously been recorded from *Hypholoma sublateritium* by Buxton (1961). All these records are from soft agarics growing in autumn.

Limoniidae

More than 500 species of the family Limoniidae are known to occur in Europe, of which 293 were recorded from the Czech Republic and 314 from Slovakia (Starý 2009). The adults of Limoniidae are predominantly associated with moist environments where their larvae develop. They are usually found in low vegetation along streams, lakes and other water bodies, in swamps and marshes of various types, in damp forests, and similar habitats. Larvae occur in water, waterlogged soil, under damp leaf mould, in decaying wood and in fungi. They are phytosaprophagous (including saproxylic species) or predatory, exceptionally mycophagous.

Achyrolimonia decemmaculata (Loew, 1873)

Published records (Ševčík 2001a, 2004b, 2006a): M54: 10.10.1998/1.11.1998, 1/1, ex *Merulius tremellosus*; M54: 29.10.1999/23.-28.11.1999, 5/0, ex *Merulius tremellosus*; M41: 19.8.2005/1.9.2005, 1/2, ex *Bjerkandera adusta*; M50: 27.10.2003/30.12.2003, 0/1, ex *Phaeolus schweinitzii*.

New records: M37: 7.7.2008, 1/1, ex *Daedaleopsis confragosa*; M65: 27.9.2010/27.9.-2.10.2010, 2/1, ex *Rigidoporus sanguinolentus*.

Most of the host fungi have rather inconspicuous fruit bodies covering the surface of dead tree trunks. On the other hand, *D. confragosa* has rather tough fruit body, so it is possible that the larva lived mainly in the space between the fungus and wood.



Figs 5-6: 5 – *Trichocera hiemalis*; 6 – *Metalimnobia quadrimaculata*.

***Discobola parvispinula* (Alexander, 1947)**

Published record (Ševčík 2006a): M49: 10.8.2006/2.9.2006, ex *Clavicornia pyxidata*.

Members of this genus are generally considered saproxylic, but there are several rearing records from fungi for *Discobola annulata* (Linnaeus, 1758). *Discobola parvispinula* was for the first time recorded from a named species of fungus by Ševčík (2006a).

***Metalmnobia bifasciata* (Schrank, 1781)**

Published records (Ševčík 2001a, 2004c): M3: 24.7.1999/13.8.1999, 1/0, ex *Lactarius vellereus*; M29: 17.9.2000/11.10.1999, 0/1, ex *Boletus edulis*; S20: 26.9.1999/28.10.1999, 0/1, ex *Lyophyllum loricatum*. S12: 24.8.2001/23.9.2001, 0/1, ex *Russula nigricans*.

New record: M37: 7.7.2008, 1/0, ex *Russula foetens*.

A common species with fungicolous and lignicolous larvae, known from many species of fungi. It apparently prefers, in contrast to the next species, terrestrial agarics and boletes.

***Metalmnobia quadrimaculata* (Linnaeus, 1761)**

Published records (Ševčík 2001a, 2004b, 2006a): M9: 13.6.1999/1.-4.7.1999, 0/2, ex *Bjerkandera adusta*; M54: 28.7.1999/15.8.1999, 0/2, ex *Abortiporus biennis*; M12: 14.6.2002/8.7.2002, 1/0, ex *B. adusta*. S9: 4.7.2006/23.7.2006, 2/1, ex *B. adusta*.

New records: M37: 7.7.2008, 1/1, ex *Bjerkandera adusta*, 3/1, ex *Daedaleopsis confragosa*, 1/0, ex *Trametes trogii*, 2/1, ex *Trametes gibbosa*; M61: 31.5.2010/26.6.2010, 1/1, ex *B. adusta*. S15: 12.9.2008/20.-23.10.2008, 1/1, ex *Ramaria flavescens*.

This limoniid species apparently prefers the soft polypore *Bjerkandera adusta*, but it was reared also from other species of fungi, as well as from decaying wood (Jakovlev 1994), probably due to the pupation of larvae there when the fungus has decomposed.

Pediciidae

A rather small family of 67 species in Europe, of which 38 were recorded from the Czech Republic and 41 from Slovakia (Starý 2009). Adult Pediciidae occupy similar habitats to Limoniidae and other Tipulomorpha, but most species prefer higher altitudes. They are chiefly found along rapidly flowing mountain streams. Larvae are mycophagous (species of *Ula*) or predatory (other genera).

***Ula bolitophila* (Loew, 1869)**

Published records (Ševčík 2001a, 2004b,c): M12: 20.7.2000/11.8.2000, 0/1, ex *Laetiporus sulphureus*; M17: 4.9.1999/22.9.1999, 1/0, ex *Peziza micropus*; M54: 10.10.1998/25.10.1998, 1/0, ex *Laetiporus sulphureus*; M41: 18.8.2002/6.-9.9.2002, 3/1, ex *Bjerkandera adusta*; M41: 18.5.2003/22.-26.6.2003, 2/1, ex *Polyporus brumalis*; M41: 22.6.2003/18.-21.7.2003, 1/2, ex *Pleurotus pulmonarius*; M41: 19.8.2005/30.8.2005, 1/1, ex *Bjerkandera adusta*; M45: 6.10.2002/ 3.11.2002, 1/1, ex *Climacocystis borealis*. S9: 4.7.2006/4.8.2006, 0/1, ex *Royoporus badius*; S10: 14.7.2005/3.8.2005, 0/1, ex *B. adusta*; S11: 13.10.2001/4.-8.11.2001, 0/3, ex *Postia caesia*.

New record: S17: 25.9.2009/3.11.2009, 1/1, ex *Climacocystis borealis*.

Ula bolitophila prefers lignicolous fungi (cf. Jakovlev 1994). It is an easily recognizable species of *Ula*, with characteristic wing markings.

Ula mollissima Haliday, 1833

Published records (Ševčík 2001a, 2004b,c, 2006a): M7: 24.9.2000/15.-16.10.2000, 15/6, ex *Polyporus squamosus*; M29: 17.9.2000/11.10.1999, 9/4, ex *Albatrellus ovinus*; M31: 25.9.1999/23.10.1999, 5/7, ex *Pleurocybella porrigens*; M12: 1.10.2003/6.-8.11.2003, 1/3, ex *Bondarzewia montana*; M41: 21.9.2002/18.-20.10.2002, 3/0, ex *Megacollybia platyphylla*; M41: 21.9.2002/25.10.2002, 1/1, ex *Grifola frondosa*; M15: 22.6.2003/21.7.2003, 1/1, ex *Pleurotus pulmonarius*; M60: 10.6.2001/11.7.2001, 1/0, ex *Royoporus badius*; M62: 19.5.2002/21.-30.6.2002, 3/4, ex *P. squamosus*. S12: 21.8.2001/21.-23.9.2001, 4/1, ex *Hydnum repandum*; S9: 4.7.2006/25.7.2006, 1/1, ex *Royoporus badius*; S12: 25.9.1999/20.10.1999, 1/2, ex *Lactarius scrobiculatus*; S12: 24.8.2001/23.9.2001, 1/0, ex *Russula nigricans*; S11: 13.10.2001/4.11.2001, 7/4, ex *H. repandum*.

New records: M8: 13.9.2009/ 11.-12.10.2009, 8/0, ex *Lactarius salmonicolor*; M18: 14.9.2010, 2/1, ex *Tapinella atrotomentosa*, M32: 18.9.2009/11.10.2009, 2/1, ex *Sparassis crispa*; M37: 7.7.2008, 1/1, ex *Russula foetens*; M45: 14.9.2008/20.-21.10.2008, 3/3, ex *Gymnopilus junonius*. S15: 12.9.2008/20.-23.10.2008, 2/2, ex *Ramaria flavescens*; S17: 25.9.2009/17.10.2009, 3/2, ex *Climacocystis borealis*.

A probably polycophagous species, recorded from more than 80 species of fungi (Jakovlev 1994). It appears to prefer wood-decaying fungi, but it also develops in terrestrial agarics.

Ula sylvatica (Meigen, 1818)

Published records (Ševčík 2001a, 2004b,c): M3: 24.7.1999/13.8.1999, 3/2, ex *Russula cyanoxantha*; M15: 5.9.2004/26.9.2004, 3/0, ex *Lactarius rufus*; M17: 4.9.1999/22.-26.9.1999, 5/7, ex *Peziza micropus*; M29: 17.9.1999/15.-17.10.1999, 2/1, ex *Sarcodon imbricatus*; M29: 17.9.2000/9.10.2000, 10/0, ex *Russula paludosa*; M29: 17.9.2000/9.10.2000, 4/0, ex *Albatrellus ovinus*; M29: 17.9.2000/8.10.2000, 3/1, ex *Hydnum repandum*; M47: 23.7.2000/13.-14.8.2000, 3/0, ex *Paxillus involutus*; S2: 30.9.2000/19.-20.10.2000, 6/0, ex *Paxillus filamentosus*; M5: 1.10.2000/21.10.2000, 2/0, ex *Lactarius deterrimus*; M3: 15.8.2002/2.9.2002, 1/1, ex *Hygrophorus* sp.; M41: 22.6.2003/21.7.2003, 1/2, ex *Pleurotus pulmonarius*; M62: 19.5.2002/17.6.2002, 1/0, ex *Polyporus squamosus*; M65: 24.9.2006/14.10.2006, 1/0, ex *Armillaria gallica*. S7: 9.5.2006/7.6.2006, 1/6, ex *Trametes versicolor*; S11: 13.10.2001/2.11.2001, 2/0, ex *Postia caesia*; S11: 13.10.2001/1.-4.11.2001, 5/2, ex *Hydnum repandum*; S12: 25.9.1999/20.10.1999, 1/3, ex *Lactarius scrobiculatus*. S12: 20.8.2001/12.9.2001, 1/1, ex *Tricholoma saponaceum*; S12: 13.10.2001/ 1.11.2001, 2/0, ex *Pseudohydnum gelatinosum*.

New records: M29: 2.9.2009/24.9.2009, 1/0, ex *Lactarius lignyotus*; M32: 18.9.2009/5.10.2009, 2/1, ex *Lactarius vellereus*; S15: 12.9.2008/20.-23.10.2008, 1/0, ex *Ramaria flavescens*.

This is a common species, recorded from more than 70 species of fungi belonging to various genera and families (cf. Jakovlev 1994). The larvae of *Ula* have rather long development in the fungus, usually 3 or 4 weeks, being the last insect group emerging from the sample, similarly to most fungivorous beetles.

Bolitophilidae

Bolitophilids are medium-sized flies (5-9 mm, **Fig. 7**) with slender body and long legs. The larvae are white, with head capsule dark, strongly sclerotized, bearing well developed short antennae (**Fig. 8**). They develop in soft or wood-decaying fungi and pupate in the fungus or in the humose layer of the soil. The pupa is free, without a web or cocoon. The adults occur mostly in the undergrowth of mixed forests especially in mountains, in shady places along streams. Some species aestivate and hibernate in caves. There are nearly 40 species in Europe, 17 species are known from the Czech Republic and 18 from Slovakia. The family comprises only one genus *Bolitophila* Meigen, 1818, including two subgenera with slightly different wing venation, *Bolitophila* s. str. and *Cliopisa* Enderlein, 1936.

All the species of Bolitophilidae, where the biology is known, have mycophagous larvae and often restricted to only one species, genus or family of fungi. A relatively large number of host fungi were recorded only in *B. cinerea* and *B. tenella*, but they usually develop in *Hypholoma* or *Lepiota*.

***Bolitophila (Bolitophila s. str.) cinerea* Meigen, 1818**

Published records (Ševčík 2001a, 2004b,c, 2006a): M17: 9.10.1999/19.-22.10.1999, 12/4, ex *Hypholoma sublateritium*; M54: 10.10.1998/22.10.1998, 1/3, ex *Hypholoma fasciculare*; M52: 26.10.2003/14.11.2003, 1/2, ex *Hypholoma sublateritium*. S10: 8.10.2005/20.10.2005, 3/3, ex *Pholiota squarrosa*; S12: 13.10.2001/22.10.-23.11.2001, 5/3, ex *Armillaria cepistipes*.

New record: M37: 26.10.2008, 6/10, ex *Hypholoma sublateritium*.

Although most species of *Bolitophila* are oligophagous or even monophagous, this species has been recorded from more than 30 species of fungi, but only Agaricales. However, the typical host fungi for this species are *Hypholoma* and *Pholiota*.

***Bolitophila (B.) saundersii* (Curtis, 1836)**

New record: M33: 5.9.2010/11.9.2010, 1/0, ex *Pholiota squarrosa*.

An uncommon species in the Czech Republic, reared by other authors from several genera of host fungi, most often from *Hypholoma fasciculare*. Interestingly, it is the commonest species of *Bolitophila* in Great Britain (P. Chandler, pers. comm.).

***Bolitophila (B.) tenella* Winnertz, 1863**

Published records (Ševčík 2001a, 2006a): M12: 6.11.1999/19.-21.11.1999, 29/5, ex *Pholiota lenta*. S10: 1.10.2006/9.10.2006, 1/1, ex *Pholiota lubrica*.

An uncommon species, apparently preferring several species of *Pholiota*.

***Bolitophila (Cliopisa) bimaculata* Zetterstedt, 1838**

Published record (Ševčík 2001a): S20: 26.9.1999/3.-9.10.1999, 12/6, ex *Lyophyllum loricatum*.

B. bimaculata has been reared from several species of *Tricholoma* and *Lyophyllum* (cf. Jakovlev 1994).

***Bolitophila (C.) hybrida* (Meigen, 1804)**

Published records (Ševčík 2001a, 2006a): M47: 23.7.2000/13.-14.8.2000, 3/1, ex *Paxillus involutus*; S2: 1.10.2000/10.10.2000, 3/1, ex *Paxillus filamentosus*; M5: 30.9.2000/8.-10.10.2000, 24/13, ex *Paxillus filamentosus*.

New record: M37: 1.11.2009, 2/2, ex *Paxillus involutus*.

B. hybrida is known to prefer *Paxillus involutus* and the closely related *P. filamentosus*.

***Bolitophila (C.) modesta* Lackschewitz, 1937**

Published record (Ševčík 2001a): M54: 25.9.2001/28.10.2001, 1/1, ex *Melanoleuca grammopodia*.

New record: M4: 8.11.2009, 5/9, ex *Melanoleuca* sp.

A rather rare species, known to develop in *Melanoleuca melaleuca* (Pers.) Murrill (cf. Hackman & Meinander 1979) and some other fungi, mainly from the family Tricholomataceae.



Figs 7-8: *Bolitophila cinerea*. 7 – adult fly; 8 – larvae in *Hypholoma sublateritium*.

***Bolitophila (C.) oclusa* Edwards, 1913**

Published records (Ševčík 2001a, 2004c): B4: 23.10.1999/4.-16.11.1999, 4/4, ex *Postia caesia*; M11: 26.9.1998/10.10.1998, 1/0, ex *Postia caesia*; M54: 10.10.1998/ 28.10.1998, 1/0, ex *Postia tephroleuca*; S11: 13.10.2001/28.10.2001, 1/1, ex *Postia caesia*.

New record: S3: 27.9.2009/9.-10.10.2009, 3/1, ex *Postia* sp.

Postia (= *Tyromyces*, = *Oligoporus*) *caesia* is a typical host fungus for this species.

***Bolitophila (C.) pseudohybrida* Landrock, 1912**

Published records (Ševčík 2004c): S12: 13.10.2001/29.-30.10.2001, 2/0, ex *Lepista nuda*; S13: 15.10.2001/1.11.2001, 2/0, ex *Lepista nuda*.

Wood Blewit (*Lepista nuda*) is the usual fungus host of *B. pseudohybrida*.

***Bolitophila (C.) rectangulata* Lundström, 1913**

Published records (Ševčík 2001a, 2004b): M54: 26.5.1999/2.-8.6.1999, 9/2, ex *Laetiporus sulphureus*; M60: 25.8.1999/31.8.-4.9.1999, 18/11, ex *L. sulphureus*; M69: 20.6.1998/24.6.-13.7.1998, 6/5, ex *L. sulphureus*. M41: 18.5.2002/25.-28.5.2002, 9/8, ex *Laetiporus sulphureus*.

B. rectangulata has been repeatedly reared from *L. sulphureus* (cf. Jakovlev 1994, Kurina 1998) and is apparently confined to this fungus.

***Bolitophila (C.)* sp.**

Published record (Ševčík 2006a): S10: 1.10.2006/9.-11.10.2006, 9/7, ex *Pholiota lubrica*.

This species is figured by Zaitzev (1994: 51) under the most probably misidentified name *B. modesta*. At present, it is reliably known from central Slovakia and northern Europe. However, according to J. Kjaerandsen (pers. comm.), who has seen some Japanese material of this genus, it is possibly identical with *Bolitophila tarsata* Okada, 1935 (nec Mayer, 1951) but this opinion needs confirmation as the type specimens have not been studied by him. The type material of *B. tarsata* was reared from *Tricholoma personatum* and *T. pessundatum* (see Okada 1939).

Ditomyiidae

A small family, formerly included in the Mycetophilidae, with 4 European species and all of them occur in both the Czech and Slovak Republics. The larvae of *Ditomyia* Winnertz, 1846 are mycophagous, living in fruiting bodies of various tree fungi, where they pupate, those of *Symmerus* Walker, 1848 develop probably in rotting wood. The adults occur mostly in the undergrowth of deciduous or mixed forests, mainly in shady and wet places along streams. Of the two European species of *Ditomyia*, *D. fasciata* is a common and easily recognizable species with banded wings and abdomen (Fig. 9 and page 1), while the much rarer *D. macroptera* Winnertz, 1852, included in the Czech Red book of threatened animals (Ševčík 2005b), has the wings clear.

***Ditomyia fasciata* (Meigen, 1818)**

Published records (Ševčík 2001a, 2004b,c, Ševčík 2006a): B5: 23.10.1999/24.10.-9.11.1999, 14/9, ex *Trametes versicolor*; M12: 6.11.1999/13.11.1999, 1/0, ex *T. versicolor*; M54: 26.5.1999/12.-14.6.1999, 4/3, ex *Poly-porus badius*; M54: 26.6.1999/9.7.1999, 0/1, ex *B. adusta*; M54: 28.7.1999/10.8.1999, 1/2, ex *Abortiporus biennis*; M54: 29.10.1999/5.-21.11.2000, 6/4, ex *Inonotus radiatus*; M54: 22.10.2000/10.11.2000, 8/5, ex *I. radiatus*; M67: 26.9.1999/11.10.1999, 2/1, ex *T. versicolor*; M25: 9.8.2002/ 13.8.2002, 1/0, ex *Stereum hirsutum*; M31: 1.8.2005/15.-18.8.2005, 5/6, ex *Trametes versicolor*; M41: 1.6.2002/9.-11.6.2002, 4/1, ex *B. adusta*; M45: 6.10.2002/12.-15.10.2002, 1/1, ex *Climacocystis borealis*;



Figs 9-10: *Ditomyia fasciata*. 9 – adult fly; 10 – larva on *Inonotus radiatus*.

M50: 27.10.2003/22.11.-8.12.2003, 8/7, ex *I. radiatus*; M52: 11.10.2003/ 26.11.2003, 0/1, ex *T. versicolor*; M52: 26.10.2003/8.12.2003, 1/0, ex *B. adusta*; M62: 19.5.2002/1.-6.6.2002, 1/0, ex *Polyporus squamosus*; M28: 10.6.2001/17.6.-3.7.2001, 3/2, ex *Royoporus badius*. S7: 9.5.2006/28.5.2006, 1/1, ex *T. versicolor*; S12: 21.8.2001/26.8.2001, 0/1, ex *Polyporus varius*; S12: 14.10.2001/6.11.2001, 1/0, ex *T. versicolor*; S13: 15.10.2001/3.-7.11.2001, 3/2, ex *B. adusta*.

New records: M38: 21.1.2007/1.-4.2.2007, 2/2, ex *Bjerkandera adusta*; M38: 31.3.2007/4.4.2007, 0/1, ex *Trametes versicolor*; M61: 31.5.2010/9.6.2010, 1/0, ex *B. adusta*. S17: 25.9.2009/8.-10.10.2009, 5/4, ex *B. adusta*.

A common oligophagous species, restricted to polypores. *Trametes versicolor* and *Bjerkandera adusta* are its most frequent fungus hosts.

Keroplastidae

A morphologically diverse group of fungus gnats (Sciarioidea) with about 100 species in Europe, 60 in the Czech Republic and 45 in Slovakia (Ševčík & Košel 2009). This family was also formerly included in the Mycetophilidae. Many species of the subfamily Keroplastinae have the antennae laterally flattened and most Macrocerinae have the antennae very long (in some species several times longer than body). Also mouthparts are in several genera elongated. Wings are often with dark markings. The larvae are predaceous or mycophagous, usually associated with wood-decaying fungi. The larvae of *Keroplastus* Bosc, 1792 and some other genera are known for their bioluminescence. Adults occur in the undergrowth of forests, especially in shaded places alongside streams and on tree trunks, but also in meadow and steppe habitats.

The larvae of *Keroplastus* are relatively large (up to 30 mm), usually larger than the adults. They mainly live individually on the lower side of fruit bodies of various polypores in typical mucilaginous flat webs (Fig. 20), where they feed on fungal spores or they are possibly carnivorous. There are, however, only a few precisely documented rearing records of Keroplastidae from named fungi in the literature and the biology of numerous species is still undocumented.

Keroplastus testaceus (Dalman, 1818)

Published records (Ševčík 2001a, 2004b,c, 2006a): M54: 5.9.1999/17.9.1999, 1/0, ex *Royoporus badius*; M41: 15.6.2002/25.6.2002, 1/0, ex *Trametes gibbosa*; M41: 22.6.2003/6.7.2003, 1/0, ex *Hapalopilus nidulans*; M41: 6.7.2003/18.7.2003, 1/0, ex *Stereum hirsutum*. S7: 15.7.2005/27.7.2005, 1/0, ex *Pleurotus pulmonarius*; S12: 21.8.2001/8.9.2001, 0/1, ex *T. gibbosa*.

The larvae of this species were recorded on the surface of various lignicolous fungi, mainly polypores, but also on the surface of decaying wood and in one case on the sporophore of *Russula* (cf. Jakovlev 1994). *Pleurotus* was recorded as a new host fungus by Ševčík (2006a).

Keroplastus tuvensis A. Zaitzev, 1991

Published record (Ševčík 2001a): M60: 10.6.2000/20.6.2000, 1/0, ex *Polyporus varius*.

This species was recently separated from the former species, differing in small details on the male terminalia. It is still the only record of *K. tuvensis* from a named species of fungi.

Mycetophilidae

Fungus gnats (Mycetophilidae) are a species-rich group of insects with nearly 1000 species in Europe, 542 species in the Czech Republic and 445 in Slovakia (Ševčík & Košel 2009). Many species are still undescribed or known only from a single locality. The typical features of mycetophilids are hump-backed thorax, long coxae and legs usually with numerous bristles. The larvae are mainly mycophagous, feeding on the mycelia or fruit bodies of various fungi or myxomycetes, but the biology of many species still remains unknown. The adults occur in the undergrowth of forests and other habitats, especially in shaded places alongside streams. They are particularly common in cavities under tree roots and overhanging stream banks. Several species aestivate or hibernate in caves.

Mycomya levis (Dziedzicki, 1885)

New record: M15: 5.9.2004/15.-18.9.2004, 1/1 ex *Thelephora terrestris*.

A rare species with hitherto unknown biology. The larvae of some other species of this genus, as far as is known, develop on the surface of lignicolous fungi or in mycelium on rotting wood. This is also a confirmation of the recent occurrence of this species in the Czech Republic because the only previous record was based on dubious finding in "Österr. Schlesien" by Strobl (1900) as "*M. pseudocinerascens* var. *abruptinervis*". Ševčík (2009a) recently recorded this species from central Slovakia.

Neoempheria striata (Meigen, 1818)

New record: M4: 21.7.2009, 1/2, ex *Thelephora caryophyllea*.

A rather rare Palearctic species known to develop at the surface of various fungi, including *Thelephora terrestris* (see Jakovlev 1994), but also on rotting wood covered with mycelia (Zaitzev 1994).

Leptomorphus forcipatus Landrock, 1918

Published records (Ševčík 2004c, Zaitzev & Ševčík 2003): M64: 24.7.2002/30.7.2002, 1/0 ex *Stereum subtomentosum*; S12: 24.8.2001/26.8.2001, 1/1, ex *Stereum hirsutum*.

This species was reinstated as valid by Zaitzev & Ševčík (2003). They also designated a lectotype, which comes from Slovakia. Larvae of this species live on the lower side of fruit bodies of *Stereum* and *Trichaptum* (cf. Jakovlev 1994). The adults were observed to copulate soon after emerging from the pupae (see fig. 8 in Ševčík 2006a).

Sciophila antiqua Chandler, 1987

Published record (Ševčík 2006a): M41: 22.6.2003/6.7.2003, 1/0, ex *Pleurotus pulmonarius*.

The larvae of *Sciophila* Meigen, 1818 (Fig. 12) build a typical silk web on the surface of the fungus, in which they live and pupate (Fig. 38). They probably feed on spores. Komonen et al. (2001) reared this rare species from the polypore *Amylocystis lapponica* growing on spruce (*Picea abies*), but they misidentified it as *Sciophila hebes* Joh. (see Falk & Chandler 2005).

Sciophila baltica Zaitzev, 1982

Published records (Ševčík 2004c, 2005a): M29: 17.9.2000/17.10.2000, 1/1, ex *Hydnum repandum*; S11: 13.10.2001/25.-29.10.2001, 46/21, ex *Hydnum repandum*.

Association of *S. baltica* with *Hydnum repandum* has not yet been recorded in the literature although several other species of *Sciophila* are known to develop in this fungus, e.g. *S. varia* (see

below). The larvae of *Sciophila* were common in both the above mentioned samples and they occurred also in burrows inside the fruit body.

***Sciophila buxtoni* Freeman, 1956**

Published records (Ševčík 2003): M67: 26.9.1999/10.10.1999, 1/0, ex *Trametes versicolor*; M14: 20.7.2000/6.-15.8.2000, 2/4, ex *Fomitopsis pinicola*.

New record: M38: 14.7.2008, 3/0, ex *Xylaria polymorpha*.

This species has been reared from several species of polypores, including both the above-mentioned species but *Xylaria* is an interesting new host record (cf. Jakovlev 1994).

***Sciophila hirta* Meigen, 1818**

Published record (Ševčík 2006a): M38 : 27.10.2003/28.11.2003, 1/0, ex *Inonotus radiatus*.

New record: S3: 7.10.2010/27.-29.10.2010, 1/3, ex *Stereum* sp.

A relatively common species (see **Figs 11-12**), known from numerous fungus hosts including *Stereum* (see Jakovlev 1994).

***Sciophila lutea* Macquart, 1826**

Published records (Ševčík 2004c): M14: 27.9.2004/16.10.2004, 1/1, ex *Peziza badia*; M59: 1.8.1999/16.8.1999, 1/0, ex *Russula luteotacta*; M59: 9.9.1999/ 29.9.1999, 1/0, ex *Lactarius acerrimus*; S12: 13.10.2001/6.11.2001, 1/0, ex *Lepista nuda*.

New record: M42: 13.9.2010/2.10.2010, 2/2, ex *Cortinarius hinnuleus*; M66: 25.7.2008/12.8.2008, 1/0, ex *Russula* sp.

Also this species was previously reared from a number of host fungi (Jakovlev 1994).

***Sciophila plurisetosa* Edwards, 1921**

Published record (Ševčík 2005a): M40: 11.7.2003/24.7.2003, 1/0, ex *Auricularia auricula-judae*.

This species has only been reared previously from *Hydnum repandum*, together with *S. varia* (Chandler 1987).

***Sciophila pseudoflexuosa* Kurina, 1991**

Published records (Ševčík 2005a): M3: 24.7.1999/9.-18.8.1999, 3/1, ex *Lactarius vellereus*; M59: 9.9.1999/29.9.1999, 5/6, ex *Lactarius acerrimus*; M15: 5.9.2004/26.9.2004, 1/3, ex *Lactarius pilatii*; M29: 17.9.2000/6.10.2000, 2/0, ex *Albatrellus ovinus*.

New record: M8: 13.9.2009/ 28.9.2009, 1/0, ex *Lactarius salmonicolor*.

This species apparently prefers *Lactarius*. The type material was reared from *Lactarius helvus* (cf. Kurina 1991).

***Sciophila rufa* Meigen, 1830**

Published record (Ševčík 2003): B4: Ulrichov, 23.7.2002, 2/0, ex *Fomes fomentarius*.

New record: M22: 5.8.2007/10.8.2007, 1/2, ex *Phellinus igniarius*.

The larvae of *S. rufa* prefer the tough bracket fungus *Fomes fomentarius* (cf. Jakovlev 1994, Falk & Chandler 2005). The new host, *Phellinus igniarius*, is habitually very similar (**Fig. 38**).



Figs 11-12: *Sciophila hirta*. 11 – adult female; 12 – larva on *Stereum* sp.

***Sciophila varia* (Winnertz, 1863)**

Published record (Šedivý & Ševčík 2003): M29: 17.9.2000/30.9.-2.10.2000, 6/10, ex *Hydnum repandum*.

The larvae in this sample were parasitised by the ichneumonid *Hyperacmus crassicornis*. *S. varia* has been reared several times from *Hydnum repandum* (cf. Chandler 1987, Kurina 1994), but also from other species of fungi (Jakovlev 1994).

***Docosia gilvipes* (Walker, 1856)**

Published records (Ševčík 2004c, Laštovka & Ševčík 2006): M60: 9.9.1999/29.9.1999, 0/1, ex *Tricholoma sejunctum*; M13: 15.8.2002/29.8.2002, 1/0, ex *Hygrophorus* sp.; M15: 5.9.2004/26.9.2004, 0/1, ex *Cortinarius croceocoenus*; M15: 5.9.2004/21.9.2004, 1/0, ex *Lactarius rufus*; M14: 27.9.2004/ 13.10.2004, 1/1, ex *Peziza badia*. S12: 13.10.2001/30.10.2001, 1/0, ex *Lepista nuda*. S20: 19.10.2001/ 13.11.2001, 0/2, ex *Cortinarius cumatilis*.

New records: M38: 13.4.2008/30.4.2008, 2/0, ex *Verpa bohemica*.

A polymycophagous species, known to develop in more than 40 species of fungi, mainly agarics (Jakovlev 1994, Kurina 1994). *Verpa* (= *Ptychoverpa*) *bohemica* is a new host record.

***Leia bimaculata* (Meigen, 1804)**

Published records (Ševčík 2004c, 2006a): M59: 9.9.1999/29.9.1999, 0/1, ex *Lactarius acerrimus*; M60: 3.8.2000/21.8.2000, 1/0, ex *Amanita pantherina*. S12: 21.8.2001/13.9.2001, 0/1, ex *Lactarius volemus*; S12: 22.8.2001/7.-8.9.2001, 1/2, ex *Cantharellus amethysteus*.

New records: B7: 22.8.2010/13.-19.9.2010, 1/1, ex *Lactarius vellereus*; M37: 14.7.2008, 1/0, ex *Gymnopus dryophilus*; M37: 26.8.2008, 0/1, ex *Otidea alutacea*; S3: 7.10.2010/27.10.2010, 1/0, ex *Leucopaxillus* sp.

One of the commonest species of the genus. It has been recorded from more than 10 genera of fungi (Jakovlev 1994).

***Leia crucigera* Zetterstedt, 1838**

Published record (Ševčík 2004c): S12: 8.5.2002/4.6.2002, 0/1, ex *Lentinus tigrinus*.

This is the only record of this species from a named fungus.

***Rondaniella dimidiata* (Meigen, 1804)**

Published records (Ševčík 2004c): S11: 21.8.2001/4.-8.9.2001, 4/2, ex *Ramaria bataillei*; S12: 23.8.2001/9.-13.9.2001, 2/1, ex *Ramaria bataillei*; S12: 13.10.2001/8.-13.11.2001, 4/0, ex *Lepista nuda*; S12: 14.10.2001/19.11.2001, 0/1, ex *Trametes versicolor*; S20: 25.9.1999/26.10.1999, 1/0, ex *Lactarius scrobiculatus*.

New record: M32: 18.9.2009/11.10.2009, 1/0, ex *Sparassis crispa*; S15: 12.9.2008/3.10.2008, 1/0, ex *Ramaria flavescens*.

R. dimidiata has been reared from a variety of fungus hosts (Jakovlev 1994). *Ramaria flavescens* is a new host record.

***Dynatosoma fuscicorne* (Meigen, 1818)**

Published records (Laštovka 1972a, Ševčík 2003, 2006a): B: Komořany, 18.9.1958, ex *Trametes versicolor*, Dobřichovice, 25.9.1960, ex *Postia caesia*, Milovice, 12.10.1960, ex *Inonotus* sp.; M41: 24.4.1999/8.-12.5.1999, 1/5, ex *Piptoporus betulinus*; M9: 13.6.1999/27.6.1999, 1/0, ex *Bjerkandera adusta*; M45: 6.10.2002/27.10.-3.11.2002, 1/1, ex *Climacocystis borealis*; M60: 10.6.2000/13.7.2000, 1/0, ex *Polyporus varius*; M54: 22.10.2000/14.-30.11.2000, 3/2, ex *Inonotus radiatus*; M50: 27.10.2003/27.11.2003, 1/0, ex *Inonotus radiatus*.

D. fuscicorne is the commonest European species of *Dynatosoma* Winnertz, 1863. The larvae of all species in this genus, where the biology is known, develop in polypores. Altogether 18 species of polypores are known as larval food of *D. fuscicorne* (cf. Jakovlev 1994).

***Dynatosoma thoracicum* (Zetterstedt, 1838)**

= *Dynatosoma norwegiense* Zaitzev & Økland, 1994 (see Kjærandsen et al. 2007)

Published record (Ševčík 2004c): S12: 24.8.2001/9.-13.9.2001, 1/4, ex *Tyromyces chioneus*.

This is the only record of the biology of this species as currently understood. Laštovka (1972a) reared from *Postia caesia* the very similar *D. thoracicum* (Zetterstedt, 1838) sensu Zaitzev (2003), which is now considered by Kjærandsen et al. (2007) as a different probably undescribed species. This is also the only known named host fungus reported for that species in the literature, but it has not yet been confirmed by the present author. It is, however, also possible that Laštovka's record (as *D. rufithorax* Strobl, 1895, see Laštovka 1972a) indeed refer to *D. thoracicum* sensu Kjærandsen et al. (2007).

***Mycetophila adumbrata* Mik, 1884**

Published record (Ševčík et al. 2005): M51: 24.7.2005/31.7.-2.8.2005, 1/5, ex *Lycogala epidendrum*.

This rare species has already been reared from unnamed myxomycetes by Krivosheina et al. (1986) and thus belongs to a distinct ecological group within the genus, together with *Mycetophila vittipes* Zetterstedt, 1852, that was reared from *Arcyria* spp. by Buxton (1954). Also both European species of *Platurocypta* Enderlein are known to develop in myxomycetes (Buxton 1954, Kinel & Noskiewicz 1931, Laštovka 1972a). The larvae of *M. adumbrata* develop in rather dry stages of aethalia (**Fig. 13**) and pupate inside them.

***Mycetophila alea* Laffoon, 1965**

Published records (Ševčík 2004c, Šedivý & Ševčík 2003): M3: 24.7.1999/30.7.1999, 7/8, ex *Russula nigricans*; M69: 5.9.1998/12.9.1998, 5/3, ex *Russula nigricans*; M23: 25.7.2000/30.7.2000, 1/4, ex *R. nigricans*; S7: 30.9.2006/8.10.2006, 2/1, ex *Lactarius piperatus*; S12: 24.8.2001/29.-30.8.2001, 4/6, ex *R. nigricans*.

Russula nigricans is a well known host of this oligophagous and common species. Occasionally it develops also in other fungi, such as *Lactarius* and other genera. The larvae were parasitized by ichneumonids *Aperipleptus albipalpus* and *A. microspilus* (see Šedivý & Ševčík 2003).

***Mycetophila attonsa* Laffoon, 1965**

Published record (Ševčík 2001b): M14: 20.7.2000/3.8.2000, 2/0, ex *Fomitopsis pinicola*.

A rare montane species with Holarctic distribution. It was reared from the common polypore *F. pinicola* both in North America and in Europe (Ševčík 2001b). Another Holarctic species, *Mycetophila laeta*, is also associated with this fungus.

***Mycetophila bialorussica* Dziedzicki, 1884**

Published records (Ševčík 2004a, 2006a): M29: 13.5.2001/19.-24.5.2001, 7/14, ex *Polyporus brumalis*. S7: 30.9.2006/8.10.2006, 5/6, ex *Polyporus brumalis*.

This species appears to be specific to *Polyporus brumalis* (**Fig. 14**), but it may well be associated also with other small polypores. These are the only available rearing records.

***Mycetophila blanda* Winnertz, 1863**

Published records (Ševčík 2006a): M29: 17.9.1999/23.-28.9.2000, 9/8, ex *Lactarius deterrimus*; M29: 17.9.1999/24.-28.9.2000, 5/3, ex *Lactarius salmonicolor*; M5: 1.10.2000/10.10.2000, 8/5, ex *Lactarius deterrimus*.

New record: M8: 13.9.2009/ 24.9.2009, 0/1, ex *Lactarius salmonicolor*.

An oligophagous species associated mainly with *Lactarius deliciosus* group, but also with other species of *Lactarius*. There are some dubious records from *Lentinus* and *Russula*, which need confirmation (cf. Dely-Draskovits 1974).

***Mycetophila cingulum* Meigen, 1830**

Published records (Ševčík 2003, 2006a): M41: 10.10.2001/18.10.2001, 6/5, ex *Grifola frondosa*; M62: 19.5.2002/29.5.2002, 0/1, ex *Polyporus squamosus*; M41: 21.9.2002/30.9.-3.10.2002, 8/8, ex *G. frondosa*; M60: 25.8.1999/2.9.1999, 2/4, ex *P. squamosus*.

New record: M53: 7.5.2007/16.-20.5.2007, 4/8, ex *Polyporus squamosus*.

Another oligophagous species, associated with large polypores. These are the only reliable records of *M. cingulum* from *G. frondosa*; the other literature sources (cf. Jakovlev 1994) refer only to *Polyporus squamosus*, except Chandler (1993), who observed it assembling in numbers on *Grifola frondosa*.

***Mycetophila dentata* Lundström, 1913**

Published record (Ševčík 2006a): M41: 22.6.2003/1.7.2003, 6/5, ex *Pleurotus pulmonarius*.

New record: M38: 17.9.2007/ 25.9.-30.9.2007, 17/9, ex *Royoporus badius*.

This species was reared from the same sample with *Mycetophila luctuosa*. Jakovlev (1994) listed the following hosts for *M. dentata*: *Piptoporus betulinus*, *Leccinum scabrum* and *Mycena* sp.

***Mycetophila distigma* Meigen, 1830**

Published record (Ševčík 2004a): M54: 10.10.1998/25.10.1998, 1/1, ex *Bjerkandera adusta*.

This is the only known fungus host of this uncommon species.

***Mycetophila estonica* Kurina, 1992**

Published records (Ševčík 2006a): M29: 17.9.1999/28.9.1999, 2/1, ex *Lactarius deterrimus*; M29: 17.9.1999/28.9.1999, 1/0, ex *Lactarius salmonicolor*.

A recently described species, reported as new for the Czech Republic by Ševčík (2006a). It is closely related to *Mycetophila blanda*, which also develops in *Lactarius* spp. and to *M. signatoides*, associated with Boletaceae. Kurina (1992) reared the type material from *Lactarius deterrimus*.

***Mycetophila evanida* Laštovka, 1972**

Published record (Ševčík 2006a, Šedivý & Ševčík 2003): M29: 17.9.1999/28.9.1999, 1/1, ex *Lactarius deterrimus*. M16: 19.7.2000/30.7.2000, 5/1, ex *Lactarius fulvissimus*; M43: 2.10.2003/14.10.2003, 3/2, ex *Hebeloma sacchariolens*; M60: 25.8.1999/31.8.-4.9.1999, 6/4, ex *Russula luteotacta*.

This species belongs to the *M. ruficollis* group of very similar species, differing only in small details on the male terminalia. It is thus possible that some literature records may be based on misidentification. Laštovka (1972b) reared this species from *Lactarius rufus*.



Figs 13-14: 13 – *Mycetophila adumbrata*, larvae in *Lycogala epidendrum*; 14 – *Mycetophila bialorussica*, larvae in *Polyporus brumalis*.

***Mycetophila finlandica* Edwards, 1913**

Published record (Šedivý & Ševčík 2003): M: 17.9.2000/8.10.2000, 3/2, ex *Tricholomopsis decora*.

The association of *M. finlandica* with *Tricholomopsis rutilans* has been confirmed by several authors (Jakovlev 1994). *T. decora* is closely related.

***Mycetophila forcipata* Lundström, 1913**

Published record (Ševčík 2004c): S12: 14.10.2001/25.-30.10.2001, 3/8, ex *Piptoporus betulinus*.

An oligophagous species, hitherto reared repeatedly from *P. betulinus* and once from *Polyporus squamosus* (Jakovlev 1994).

***Mycetophila fungorum* (De Geer, 1776)**

Published records (Šedivý & Ševčík 2003, Ševčík 2001a, 2004c, 2006a, only host fungi listed): *Agrocybe praecox*, *Amanita muscaria*, *A. pantherina*, *A. rubescens*, *A. spissa*, *Armillaria gallica*, *Boletus calopus*, *B. chrysenteron*, *B. edulis*, *B. impolitus*, *B. rubellus*, *B. subtomentosus*, *Chlorophyllum rhacodes*, *Rhodocollybia butyracea*, *Collybia* sp.; *Cortinarius amenolens*, *Entoloma clypeatum*, *Entoloma* sp., *Hebeloma crustuliniforme*, *Hygrophorus chrysodon*, *Lactarius salmonicolor*, *Lentinus tigrinus*; *Lepiota aspera*, *Macrolepiota procera*, *Megacollybia platyphylla*, *Pleurotus ostreatus*, *Pluteus cervinus*, *Polyporus ciliatus*, *Psathyrella candolleana*, *Russula carpini*, *R. cyanoxantha*, *R. luteotacta*, *R. pectinata*, *R. pulchella*; *R. virescens*, *Stropharia rugosoannulata*, *Suillus granulatus*, *S. luteus*, *S. collinitus*, *Tricholoma populinum*.

New records: M6: 31.8.2008/14.9.2008, 1/2, ex *Tylopilus porphyrosporus*; M29: 2.9.2009/ 11.9.2009, 4/3, ex *Russula vinosa*; M43: 9.9.2010/21.9.2010, 2/3, ex *Panaeolus papilionaceus*; M37: 19.10.2008, 1/0, ex *Cortinarius trivialis*; M37: 19.10.2008, 3/2, ex *Russula aeruginea*; M53: 7.5.2007/ 16.-20.5.2007, 2/5, ex *Polyporus squamosus*.

A common and polymycophagous species, reared by this author from 46 species of fungi, most frequently *Russula* spp. and other agarics. It sometimes occurs together with other polyphagous mycetophilids, such as *Allodia ornaticollis* or *Exechia fusca*.

***Mycetophila hetschkoi* Landrock, 1918**

New record: S15: 12.9.2008/3.10.2008, 2/5, ex *Ramaria flavescens*.

In this case a rare fungus gnat (described from Komorní Lhotka in present Czech Republic) was reared from a rare fungus (included in the Czech Red list of fungi as data deficient, Holec & Beran 2006). *M. hetschkoi* was previously recorded from *Ramaria formosa* by Dely-Draskovits (1974) and from *Ramaria aurea*, *Ramaria* sp., *Clavariadelphus truncatus* and *Bankera fuligineoalba* (see Jakovlev 1994).

***Mycetophila idonea* Laštovka, 1972**

Published record (Ševčík 2004c): S12: 10.5.2002/23.5.2002, 2/3, ex *Lentinus tigrinus*.

A member of the *M. ruficollis* species group, known from many species of fungi.

***Mycetophila ichneumonea* Say, 1823**

Published record (Ševčík 2006a): M9: 13.6.1999/24.6.1999, 3/2, ex *Collybia dryophila*.

Another member of the *M. ruficollis* group, also known from many species of fungi. Laštovka (1971) described the last instar of the larvae reared from *Lactarius rufus*, *Rhodopaxillus nudus* and *Stropharia aeruginosa*. He also reared the proctotrupid parasitoid *Cryptoserphus aculeator*.

***Mycetophila laeta* Walker, 1848**

Published records (Ševčík 2001b, 2006a): M14: 20.7.2000/28.7.2000, 1/0, ex *Fomitopsis pinicola*; M65: 26.8.1998/4.-5.9.1998, 2/0, ex *F. pinicola*.

The larvae of this uncommon species live in the young fruit bodies of the common bracket fungus *Fomitopsis pinicola* growing on *Picea abies*. There is a record from *Polyporus* sp. by Laštovka (1966), but this name was used in the wide sense to indicate a polypore without closer determination, so it may well be *F. pinicola*. Kurina (1991), however, reared *M. laeta* from *Phellinus igniarius*.

***Mycetophila luctuosa* Meigen, 1830**

Published record (Ševčík 2004c): M15: 5.9.2004/15.9.2004, 1/2, ex *Lactarius pilatii*; M41: 22.6.2003/28.6.-1.7.2003, 11/11, ex *Pleurotus pulmonarius*; M46: 9.6.2004/19.6.2004, 1/4, ex *Pleurotus cornucopiae*. S12: 8.5.2002/18.-19.5.2002, 9/7, ex *Lentinus tigrinus*.

New records: M36: 1.10.2010/1.-10.10.2010, 1/1, ex *Meripilus giganteus*; M38: 17.9.2007/ 25.9.-30.9.2007, 1/0, ex *Royoporus badius*; M32: 18.9.2009/28.9.2009, 2/2, ex *Lactarius vellereus*.

This species develops in terrestrial agarics of the genera *Lactarius* and *Russula* (cf. Jakovlev 1994), but also in polypores and other lignicolous fungi.

***Mycetophila marginata* Winnertz, 1863**

Published record (Ševčík 2006a): M31: 25.9.1999/4.-13.10.1999, 1/4, ex *Pleurocybella porrigens*.

Only a few rearing records are available for this common fungus gnat. Most records are from lignicolous fungi.

***Mycetophila mohilevensis* Dziedzicki, 1884**

Published record (Ševčík 2004c): S12: 24.8.2001/6.9.2001, 1/1, ex *Tyromyces chioneus*.

This is the only record of the biology of this rare species.

***Mycetophila morosa* Winnertz, 1863**

Published record (Ševčík 2006a): S7: 9.5.2006/17.5.2006, 2/0, ex *Trametes versicolor*.

This is the only known record of host fungus for this rare species.

***Mycetophila ornata* Stephens, 1829**

Published record (Šedivý & Ševčík 2003): M29: 17.9.2000/2.10.2000, 2/0, ex *Bondarzewia montana*; M29: 2.10.2003/19.10.2003, 3/0, ex *Bondarzewia montana*.

This species was recorded from several species of polypores, most often from *Meripilus giganteus* (see Jakovlev 1994). Laštovka (1971) reared it from *Meripilus giganteus* and described the last instar of the larvae. There is, however, stated in his manuscript remarks from 1966 that it was “*Grifola gigantea* on *Picea abies*”. As this fungus (*Meripilus* != *Grifola giganteus*) grows almost exclusively on beech (*Fagus sylvatica*), it is possible that this record actually refers to the little known fungus *Bondarzewia montana*. Šedivý & Ševčík (2003) reported for *M. ornata* the ichneumonid parasitoid *Proclitus praetor*.

***Mycetophila ostentanea* Zaitzev, 1998**

New record: M14: 8.10.2009, 5/7, ex *Postia undosa* (leg. & det. D. Dvořák).

A recently described species, hitherto known only from 3 localities in Russia and the Czech Republic. This is the first record of its biology.

***Mycetophila ruficollis* Meigen, 1818**

Published records (Ševčík 2006a): M65: 27.7.1998/5.-8.8.1998, 2/1, 15.8.1998/24.8.1998, 1/2, ex *Pholiota squarrosa*; M54: 10.9.1998/18.-20.9.1998, 22/17, ex *Mycena haematopus*; M54: 26.5.1999/5.6.1999, 1/3, 5.9.1999/ 13.9.1999, 1/2, ex *Mycena galericulata*; M3: 24.7.1999/31.7.1999, 2/2, ex *Tricholomopsis rutilans*; M: 4.6.2000/10.6.2000, 1/1, ex *Crepidotus mollis*; M41: 18.5.2003/28.-30.5.2003, 6/2, ex *Mycena galericulata*.

New record: M18: 9.8.2010/18.8.2010, 2/1, ex *Pluteus cervinus*; M18: 9.10.2010/ 24.10.2010, 4/4, ex *Mycena tintinnabulum*; M37: 11.8.2008, 2/2, ex *Hypholoma fasciculare*; M59: 11.9.2010/21.9.2010, 2/4, ex *Mycena inclinata*.

This species apparently prefers soft lignicolous agarics, such as *Mycena*. Ribeiro (1990) surprisingly listed several species of *Russula* and *Lactarius*, which are typical host fungi for other species of the *M. ruficollis* group. Considering difficult identification, these records possibly refer to the entire species group, rather than *M. ruficollis* s. str. or they refer to *M. britannica* Laštovka & Kidd, 1975, which is the commonest species of the *ruficollis* group in southern Europe and the Mediterranean region generally.

***Mycetophila sigmoides* Loew, 1869**

New record: M37: 11.8.2008, 2/0, ex *Daedaleopsis confragosa*.

According to Zaitzev (2003), this species was previously reared from polypores belonging to the genera *Fomitopsis*, *Daedaleopsis* and *Coriolus*.

***Mycetophila signatoides* Dziedzicki, 1884**

Published records (Ševčík 2006a): M65: 21.8.1999/31.8.-1.9.1999, 6/9, ex *Boletus chrysenteron*; M: 25.8.1999/ 6.9.1999, 1/1, ex *Boletus reticulatus*; M: 8.9.1999/18.9.1999, 1/2, ex *Boletus aereus*; M65: 24.9.2006/ 1.10.2006, 3/1, ex *Paxillus involutus*; S2: 1.10.2000/11.10.2000, 1/0, ex *Paxillus filamentosus*.

This species is usually specific to Boletaceae and the related family Paxillaceae, but there are also reliable records from *Russula* and *Lactarius* by Kurina (1991). **Fig. 16** shows the larva in the gills of *Paxillus involutus* covered by the imperfect stadium of the ascomycete fungus *Hypomyces chrysospermus*.

***Mycetophila sordida* van der Wulp, 1874**

New record: M56: 14.9.2008/25.-30.9.2008, 8/4, ex *Thelephora palmata*.

The biology of this rare species has not been recorded up to the present. It is probably also the first named insect reared from this rare fungus.

***Mycetophila spectabilis* Winnertz, 1863**

Published record (Ševčík 2006a): M46: 9.6.2004/19.-22.6.2004, 4/2, ex *Pleurotus cornucopiae*.

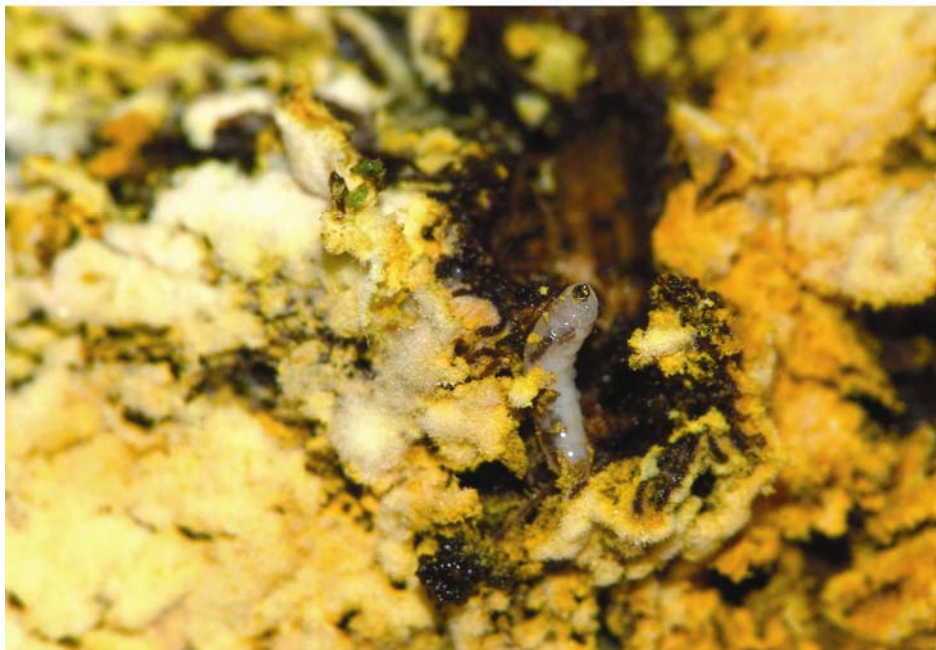
New record: M32: 18.9.2009/30.9.2009, 2/2, ex *Lactarius vellereus*.

This species has already been reared from *Pleurotus* by Dely-Draskovits (1974). There are also several records from other agarics from the families Tricholomataceae, Boletaceae and Russulaceae, including *Lactarius piperatus* (cf. Jakovlev 1994).

***Mycetophila strigata* Staeger, 1840**

Published record (Ševčík 2004a): M33: 8.6.2002/23.-25.6.2002, 3/0, ex *Calocybe gambosa*.

This is still the only known host fungus of this uncommon species.



Figs 15-16: **15** – *Mycetophila ruficollis*, a pair on *Armillaria gallica*; **16** – *Mycetophila signatoides*, larva in *Paxillus involutus* covered by *Hypomyces chrysospermus*.

***Mycetophila strigatoides* (Landrock, 1927)**

Published records (Ševčík 2001b, 2004c): M40: 9.5.1999/20.5.1999, 1/5, ex *Polyporus ciliatus*; S12: 24.8.2001/30.8.-3.9.2001, 6/8, ex *Polyporus melanopus*; S12: 10.5.2002/19.-23.5.2002, 6/9, ex *Lentinus tigrinus*; S12: 11.5.2002/25.5.2002, 0/1, ex *Polyporus ciliatus*.

This species is principally associated with *Polyporus*, but there are some other rearing records from unnamed species of *Trametes*, *Polyporus* and *Russula* (cf. Jakovlev 1994), which need confirmation, especially in the case of *Russula*.

***Mycetophila strobli* Laštovka, 1972**

Published records (Ševčík 2004c): M3: 24.7.1999/2.8.1999, 2/5, ex *Lactarius vellereus*; S12: 25.9.1999/9.10.1999, 2/2, ex *Lactarius scrobiculatus*; M: 2.10.2000/17.10.2000, 3/3, ex *Lactarius rufus*; M41: 9.9.2002/21.9.2002, 1/2, ex *Lactarius decipiens*; M: 5.9.2004/18.9.2004, 1/2, ex *Lactarius rufus*; M15: 5.9.2004/15.9.2004, 8/5, ex *Lactarius pilatii*. S12: 21.8.2001/30.8.3001, 2/0, ex *Lactarius volemus*; S12: 24.8.2001/2.9.2001, 2/0, ex *Clitocybe odora*.

This species from the *ruficollis* group prefers *Lactarius* and *Russula*.

***Mycetophila trinotata* Staeger, 1840**

Published records (Ševčík 2003, Ševčík et al. 2005): M9: 13.6.1999/21.6.1999, 2/1, ex *Bjerkandera adusta*; M41: 13.10.2004/22.10.2004, 1/1, ex *B. adusta*; M52: 26.10.2003/8.11.2003, 2/0, ex *B. adusta*; M65: 24.9.2006/7.10.2006, 0/1, ex *B. adusta*; M67: 26.9.1999/3.-7.10.1999, 2/3, ex *B. adusta*.

New record: M61: 31.5.2010/6.6.2010, 3/1, ex *Bjerkandera adusta*.

M. trinotata appears to be specific to the common fungus *Bjerkandera adusta*, although there are some dubious records from other polypores (cf. Jakovlev 1994), although Edwards (1925) claimed to have reared it several times from *Trametes versicolor* but only once from *B. adusta*.

***Phronia siebeckii* Dzedzicki, 1889**

Published record (Ševčík 2006a): M14: 27.9.2004/10.10.2004, 2/1, ex *Calocera viscosa*.

This confirms the association with this fungus, previously recorded by Buxton (1961).

***Platurocypta testata* (Edwards, 1925)**

Published records (Laštovka 1972a): B: Krkonoše Mts., Liščí Hora, 3.8.1966, ex *Reticularia lycoperdon*, Svináře near Beroun, 15.9.1968, ex *R. lycoperdon*; M: Velké Karlovice, 9.7.1969, ex *Lycogala epidendrum*.

New record: M38: 7.7.2008, 1/1, ex *Fuligo septica*.

An interesting finding, confirming the association of this species with myxomycetes (= Mycetozoa). *F. septica* is a new host record. Buxton (1954) reared *P. testata* from *R. lycoperdon* and several saprophagous species of Diptera (e.g. Sciaridae) from *Fuligo septica*.

***Sceptonia flavipuncta* Edwards, 1925**

New record: M38: 11.8.2008, 2/1, ex *Rhodocybe gemina*.

This is another important finding, as it is the first reliable record of the biology of the genus *Sceptonia* Winnertz, 1863. Edwards (1925) mentions Bouché's record of *Sceptonia nigra* (Meigen, 1804) from rotten unnamed fungi. Most of the twenty European species of *Sceptonia* are rare and they are usually collected only with Malaise traps, or by sweeping from tree foliage.

***Trichonta icenica* Edwards, 1925**

Published record (Ševčík 2006a): M14: 27.9.2004/5.10.2004, 1/2, ex *Calocera viscosa*.

This is still the only known fungus host for this species. The biology of *Trichonta* Winnertz, 1863 is generally poorly known, but there is a record of *Trichonta apicalis* Strobl, 1898 from *Calocera cornea* (see Buxton 1961).

***Trichonta* sp. 1**

Published record (Ševčík 2004c): S12: 13.10.2001/28.-29.10.2001, 0/2, ex *Pseudohydnum gelatinosum*.

Unfortunately only females emerged from this sample, partially due to strong parasitism by a proctotrupoid wasp of the genus *Aclista* Förster, 1856 (Hymenoptera: Diapriidae). The reliable identification of *Trichonta* species is based on the structure of the male terminalia.

***Trichonta* sp. 2**

Published record (Ševčík 2006a): M49: 23.7.2005/4.8.2005, 1/2, ex *Clavicornia pyxidata*.

A probably undescribed species, but further material is needed for description.

***Allodia* (*Allodia* s. str.) *anglofennica* Edwards, 1921**

Published record (Ševčík 2006a): M29: 8.5.1999/22.5.1999, 1/0, ex *Conocybe aporos*.

Three species of *Allodia* s. str. emerged from this sample. Host fungi of this uncommon species are little known, there are only several previous records from *Collybia*, *Entoloma*, *Hebeloma*, *Inocybe*, *Suillus* and *Peziza* (cf. Jakovlev 1994).

***Allodia* (*A.*) *lugens* (Wiedemann, 1817)**

Published records (Ševčík 2004c, 2006a): B5: 23.10.1999/9.11.1999, 3/2, ex *Rhodocollybia butyracea*; B4: 23.10.1999/4.11.1999, 1/0, ex *Rhodocollybia butyracea*; M5: 29.10.2000/14.-16.11.2000, 4/1, ex *Galerina marginata*; S8: 9.10.2006/22.10.2006, 1/0, ex *Rhodocollybia butyracea*; S13: 15.10.2001/31.10.2001, 1/0, ex *Stropharia aeruginosa*.

New record: M4: 29.11.2009, 2/3, ex *Flammulina velutipes*. M33: 14.10.2010/ 31.10.2010, 1/1, ex *Mycena tintinnabulum*.

A relatively common species, known from many species of fungi (Jakovlev 1994). It appears to prefer small agarics growing in autumn.

***Allodia* (*A.*) *ornaticollis* (Meigen, 1818)**

Published records (Ševčík 2006a): B5: 23.10.1999/5.11.1999, 1/2, ex *Rhodocollybia butyracea*; M54: 10.9.1998/19.9.1998, 2/7, ex *Pluteus cervinus*; M60: 10.4.1999/18.-20.4.1999, 5/3, ex *Nolanea verna*, M40: 24.4.1999/3.5.1999, 10/4, ex *Cortinarius romagnesi*; M29: 8.5.1999/17.5.1999, 2/2, ex *Conocybe aporos*; M67: 27.6.1999/5.7.1999, 2/1, ex *Mycena pura*; M60: 25.8.1999/2.9.1999, 1/0, ex *Psathyrella candolleana*; M54: 5.9.1999/13.9.1999, 1/0, ex *Mycena galericulata*; M60: 9.9.1999/16.9.1999, 6/3, ex *Inocybe geophylla*; M67: 26.9.1999/3.-7.10.1999, 5/7, ex *Crepidotus mollis*; M65: 3.10.1999/14.10.1999, 1/0, ex *Marasmius alliaceus*; M60: 24.10.1999/5.11.1999, 1/1, ex *Hebeloma crustuliniforme*; M53: 3.8.2000/10.8.2000, 2/3, ex *Russula luteotacta*; M29: 5.5.2001/20.5.2001, 1/0, ex *Entoloma hirtipes*; M12: 26.9.2001/6.10.2001, 4/0, ex *Agrocybe erebia*.

New record: M37: 19.10.2008, 12/9, ex *Hebeloma mesophaeum*; M38: 26.10.2008, 6/10, ex *Russula nitida*; M38: 28.7.2009, 5/4, ex *Inocybe albomarginata*; M38: 28.7.2009, 4/2, ex *Russula velenovskyi*; M43: 9.9.2010/21.9.2010, 1/6, ex *Panaeolus papilionaceus*.

A common species, which develops mainly in small agarics.

***Allodia (A.) zaitzevi* Kurina, 1998**

Published records (Ševčík 2006a): M29: 8.5.1999/22.5.1999, 1/0, ex *Conocybe aporos*; M29: 17.9.2000/26.9.2000, 1/1, ex *Russula* sp.; S12: 19.10.2001/6.11.2001, 2/1, ex *Cortinarius cumatilis*; S8: 9.10.2006/22.10.2006, 1/0, ex *Rhodocollybia butyracea*.

A recently distinguished species from the *A. ornatocollis* group, previously confused with *A. pyxidiiformis* Zaitzev, 1983 or true *A. ornatocollis*. Jakovlev (1994) listed several species of *Boletus*, *Amanita*, *Russula* and other fungi for *A. pyxidiiformis*.

***Allodia (Brachycampta) alternans* (Zetterstedt, 1838)**

Published record (Ševčík 2006a): M28: 2.6.2006/17.6.2006, 2/0, ex *Collybia ocior*.

This species is known from both ascomycetes and various agarics (Jakovlev 1994). *Collybia* is a new host record.

***Allodia (B.) barbata* (Lundström, 1909)**

Published records (Ševčík 2006a): M53: 3.5.2006/14.-17.5.2006, 6/8, ex *Peziza micropus*; M65: 1.5.1999/10.-14.5.1999, 19/14, ex *Peziza micropus*.

New record: S4: 6.9.2008/14.-15.9.2008, 3/4, ex *Peziza badia*.

Members of the subgenus *Brachycampta* are known to develop in the ascomycete cup fungi. Also *A. sylvatica* and *A. foliifera* are specific to *Peziza* (see below).

***Allodia (B.) czernyi* (Landrock, 1912)**

Published records (Ševčík 2006a): M23: 25.7.2000/11.8.2000, 1/6, ex *Tricholoma sulphureum*; M15: 5.9.2004/21.9.2004, 2/1, ex *Cortinarius croceoconus*; M5: 1.10.2000/16.10.2000, 1/0, ex *Dermocybe cinnamomeoluteus*.

This uncommon species (new to Slovakia) has been reared from several soft agarics (Jakovlev 1994). *Tricholoma* was added as a new host record by Ševčík (2006a).

***Allodia (B.) foliifera* (Strobl, 1910)**

Published record (Šedivý & Ševčík 2003): M17: 4.9.1999/19.9.1999, 3/1, ex *Peziza micropus*.

New record: M6, 31.8.2008/11.9.2008, 2/4, ex *Peziza micropus*.

Buxton (1961) reared this species from *Peziza repanda* and Jakovlev (1994) from *Peziza* sp. These records were published under the misidentified name *A. triangularis* (Strobl, 1895). Šedivý & Ševčík (2003) reported from this fungus gnat the ichneumonid parasitoid *Plectiscidea cinctula*.

***Allodia (B.) grata* (Meigen, 1830)**

Published records (Ševčík 2001a, 2003, 2006a): 20/03 ex *Fistulina hepatica*; M59: 25.8.1999/7.9.1999, 3/2, ex *Leccinum scabrum*; M44: 22.5.1999/4.6.1999, 2/0, ex *Calocybe gambosa*; M1: 29.5.1999/11.6.1999, 1/0, ex *Boletus impolitus*; M65: 3.10.1999/20.10.1999, 3/2, ex *Lepiota aspera*; M53: 3.8.2000/12.8.2000, 4/5, ex *Amanita pantherina*; M62: 4.5.2002/19.5.2002, 2/3, ex *Entoloma clypeatum*; M41: 9.9.2002/22.9.2002, 2/4, ex *Russula rigida*; M41: 21.9.2002/7.10.2002, 2/3, ex *Megacollybia platyphylla*; M41: 18.5.2003/3.6.2003, 1/0, ex *Mycena galericulata*, M41: 6.7.2003/17.7.2003, 2/4, ex *Pluteus cervinus*.

New record: M37: 11.8.2008, 1/1, ex *Pluteus salicinus*; M38: 14.7.2008, 2/0, ex *Pluteus cervinus*; M38: 28.7.2009, 2/0, ex *Russula velenovskyi*.

A relatively common species, reported from more than 40 species of agarics.

***Allodia (B.) neglecta* Edwards, 1925**

New record: M38: 28.7.2009, 1/1, ex *Helvella crispa*.

This species was previously reared only from the ascomycetes *Gyromitra fastigiata*, *Verpa bohemica* and the basidiomycete *Kuehneromyces vernalis* (cf. Jakovlev 1994). *H. crispa* is a new host record.

***Allodia (B.) silvatica* (Landrock, 1912)**

Published records (Ševčík 2006a): M60: 9.9.1999/23.-25.9.1999, 2/0, ex *Peziza* sp.; M14: 27.9.2004/10.-13.10.2004, 1/5, ex *Peziza badia*.

This species is specific to ascomycetes, mainly to the cup fungi of the genus *Peziza*. Buxton (1961) reared it from *Peziza repanda*. Jakovlev (1994) summarizes records from other ascomycetes.

***Allodiopsis domestica* (Meigen, 1830)**

New record: M58: 4.10.2007/18.-21.10.2007, 13/2, ex *Leucopaxillus giganteus*.

This species has been sometimes confused with the more common *Allodiopsis rustica* (see below), so also records of its host fungi require confirmation. Most literature records are from *Clitocybe* and *Lepista*. *Leucopaxillus* is apparently a new host record.

***Allodiopsis gracai* Ševčík & Papp, 2003**

Published record (Ševčík & Papp 2003): M40: 9.7.2000/23.7.2000, 1/2, ex *Lycoperdon perlatum*.

A rare species recently described from the Czech Republic and Hungary and subsequently recorded in Slovakia (Ševčík 2004a) and Finland (Jakovlev et al. 2006). The record by Jakovlev (1994) of *Allodiopsis pseudodomestica* (Lackschewitz, 1937) from *Lycoperdon perlatum* may refer to *A. gracai*, because these two similar species had not been distinguished at that time.

***Allodiopsis rustica* (Edwards, 1941)**

Published records (Ševčík 2004c, 2006a): B1: 16.10.1999/9.-11.11.1999, 3/0, ex *Clitocybe inversa*; B5: 23.10.1999/11.11.1999, 1/2, ex *Rhodocollybia butyracea*; M47: 6.11.1999/1.12.1999, 3/1, ex *Lepista nuda*; M65: 14.10.2000/1.12.2000, 1/1, ex *Lepista nuda*; M20: 2.10.2003/24.10.2003, 3/2, ex *Limacella guttata*. S7: 30.9.2006/21.10.2006, 1/2, ex *Clitocybe nebularis*; S13: 15.10.2001/3.11.2001, 1/1, ex *Lepista nuda*.

The larvae of this common fungus gnat develop mainly in fruit bodies of *Clitocybe* and *Lepista*. The mature larvae aggregate in the swollen basal part of the stem and eventually pupate in the soil.

***Anatella lenis* Dzedzicki, 1923**

Published record (Ševčík 2006a): M54: 29.10.1999/12.-20.11.1999, 8/4, ex *Ascocoryne sarcoides*.

The only previous rearing record is from *Exidia glandulosa* (cf. Jakovlev 1994). Chandler (1993) reported the rearing by R.E. Evans of another species of the genus, *A. flavomaculata* Edwards, 1925, from *Cudoniella acicularis* (Bull.) Schroet.

***Brachypeza armata* Winnertz, 1863**

Published record (Ševčík 2004a, 2006a): M46: 9.6.2004/19.6.2004, 1/1, ex *Pleurotus cornucopiae*; M65: 16.6.1998/28.6.-7.7.1998, 4/3 ex *Pleurotus pulmonarius*; M65: 30.5.1999/ 12.6.1999, 1/2, ex *P. pulmonarius*; M65: 3.10.1999/19.10.1999, 4/3, ex *Pleurotus pulmonarius*.

All species of *Brachypeza* Winnertz, 1863 are oligophagous and restricted to *Pleurotus*, although there are sporadic records from other fungi (Jakovlev 1994).

***Brachypeza bisignata* Winnertz, 1863**

Published records (Ševčík 2004a, 2006a): M24: 15.5.2003/28.-30.5.2003, 5/3, ex *Pleurotus pulmonarius*; M65: 3.10.1999/19.10.1999, 2/3, ex *Pleurotus pulmonarius*; M65: 17.5.1998/30.5.1998, 4/1, ex *Pleurotus pulmonarius*.

This species is associated with *Pleurotus*, but there are also records from *Clitocybe* and *Lycoperdon* (see Jakovlev 1994).

***Brachypeza radiata* Jenkinson, 1908**

Published record (Ševčík 2006a): M46: 9.6.2004/19.6.2004, 1/1, 2/04 ex *Pleurotus cornucopiae*.

The larvae of this rare species also live in *Pleurotus* spp., as the previous species. Kurina (1992) surprisingly reared one male of *B. radiata* from *Armillaria mellea*.

***Cordyla brevicornis* (Steger, 1840)**

Published records (Ševčík 2006a): M69: 5.9.1998/12.9.1998, 5/10, ex *Amanita rubescens*; M53: 29.5.1999/6.6.1999, 1/1, ex *Russula grisea*; M53: 16.6.1999/25.6.1999, 2/20, ex *Boletus impolitus*; M65: 21.8.1999/29.8.1999, 1/0, ex *Amanita spissa*; M59: 25.8.1999/31.8.1999, 5/4, ex *Boletus reticulatus*; M60: 9.9.1999/16.9.1999, 2/2, ex *Amanita pantherina*; M23: 25.7.2000/1.8.2000, 2/4, ex *Boletus edulis*; M29: 17.9.2000/28.9.2000, 3/0, ex *Russula cyanoxantha*; M20: 27.5.2001/3.6.2001, 2/5, ex *Boletus reticulatus*; M33: 25.9.2001/6.10.2001, 5/1, ex *Rozites caperata*.

New record: M37: 1.11.2009, 1/0, ex *Cortinarius trivialis*.

The larvae of this species typically develop in the stipe of the fruit body of various species from the families Amanitaceae, Boletaceae and Russulaceae. *Cortinarius* is a rather unusual host fungus of *Cordyla brevicornis*, only Dely-Draskovits (1974) reared it from *C. hinnuleus*. Recently recorded by Kurina (1991) from *Rozites caperata*.

***Cordyla fusca* Meigen, 1804**

Published records (Ševčík 2006a): M29: 9.8.1998/18.9.1998, 4/5, ex *Russula* sp.; M29: 17.9.2000/24.-26.9.2000, 4/11, ex *Russula* sp.

This species prefers *Russula*, but it has been reared also from other fungi, e.g. *Boletus edulis*.

***Cordyla murina* Winnertz, 1863**

Published records (Ševčík 2006a): S12: 19.10.2001/31.10.-2.11.2001, 2/3, ex *Gomphidius glutinosus*; S12: 19.10.2001/30.-31.10.2001, 1/1, ex *Suillus luteus*.

There are only a few rearing records for this species. Eisfelder (1955) reared it from *Lactarius torminosus* and Dely-Draskovits (1974) from *Leucopaxillus* and *Boletus*. *Gomphidius* and *Suillus* are new rearing records added by Ševčík (2006a).

***Cordyla nitidula* Edwards, 1925**

Published records (Ševčík 2006a): M29: 9.8.1998/18.9.1998, 4/5, ex *Russula* sp.; M3: 24.7.1999/30.7.1999, 2/0, ex *Russula cyanoxantha*; M65: 21.8.1999/30.8.1999, 3/0, ex *Russula violeipes*; M40: 9.7.2000/15.-18.7.2000, 1/3 ex *Russula amoenicolor*.

New record: M38: 28.7.2009, 7/2, ex *Russula velenovskyi*.

Most rearing records of this species are from *Russula* spp. (cf. Jakovlev 1994).

***Exechia bicincta* (Staeger, 1840)**

Published records (Šedivý & Ševčík 2003, Ševčík 2006a): M29: 17.9.2000/25.9.2000, 1/0, ex *Boletellus pruinosus*; M33: 2.9.2000/13.9.2000, 4/3, ex *Russula violeipes*; M34: 11.7.2004/18.7.2004, 5/5, ex *Boletus subtomentosus*; M59: 25.8.1999/31.8.1999, 2/5, ex *Boletus impolitus*; M60: 9.9.1999/17.9.1999, 3/4, ex *Mycena galericulata*.

Mycena galericulata has previously been known as a host fungus for this species (Dely-Draskovits 1974). Jakovlev (1994) listed 10 species of fungi from various genera for this *Exechia* species and Chandler (1993) added *Pluteus salicinus*.

***Exechia confinis* Winnertz, 1863**

Published record (Ševčík 2006a): M47: 23.7.2000/30.7.2000, 1/0, ex *Paxillus involutus*.

A rather rare species, probably specific to *Paxillus*. It was recorded from this fungus by Hackman & Meinander (1979) and Jakovlev (1994, 1995).

***Exechia dizona* Edwards, 1924**

New record: M30: 12.9.2010/ 21.9.2010, 3/0, ex *Hygrocybe chlorophana*.

An uncommon species, previously reared only from *Mycena*, *Russula* and *Stropharia* (see Jakovlev 1994).

***Exechia dorsalis* (Staeger, 1840)**

Published record (Ševčík 2006a): M14: 27.9.2004/10.10.2004, 1/0, ex *Laccaria amethystina*.

New record: M29: 2.9.2009/11.9.2009, 3/2, ex *Laccaria laccata*; M37: 19.10.2008, 1/0, ex *Hebeloma mesophaeum*; M38: 28.7.2009, 2/0, ex *Gymnopus aquosus*; M27: 26.8.2010, 2/1, ex *Amanita phalloides*.

This species has been recorded from many agarics, mainly Tricholomataceae. *G. aquosus* is a new host record.

***Exechia fusca* (Meigen, 1804)**

Published records (Ševčík 2006a): M29: 8.5.1999/18.5.1999, 1/0, ex *Conocybe aporos*; M3: 27.6.1999/5.7.1999, 1/0, ex *Russula carpini*; M65: 21.8.1999/29.8.1999, 1/0, ex *Amanita spissa*; M3: 26.9.1999/3.10.1999, 1/2, ex *Mycena polygramma*; M43: 10.10.1999/29.10.1999, 3/1, ex *Leucoagaricus pudicus*; B3: 23.10.1999/ 4.11.1999, 1/0, ex *Rhodocollybia butyracea*; B5: 23.10.1999/1.11.1999, 1/0, ex *Hygrophoropsis aurantiaca*; M60: 24.10.1999/4.11.1999, 1/0, ex *Hebeloma crustuliniforme*; M12: 6.11.1999/19.11.1999, 1/2, ex *Psilocybe bohémica*; M47: 6.11.1999/19.11.1999, 1/0, ex *Macrolepiota procera*; M12: 26.9.2001/ 6.10.2001, 5/2, ex *Agrocybe erebia*; M15: 7.6.2004/16.6.2004, 1/2, ex *Entoloma cetratum*; M15: 26.6.2004/5.7.2004, 1/0, ex *Galerina paludosa*; M15: 5.9.2004/19.9.2004, 1/0, ex *Russula grisescens*.

New record: M19: 11.9.2010/21.9.2010, 1/1, ex *Oudemansiella mucida*; M37: 11.8.2008, 1/2, ex *Pluteus salicinus*; M37: 19.10.2008, 1/2, ex *Tricholoma scalpturatum*; M37: 1.11.2009, 2/2, ex *Cortinarius trivialis*; M4: 29.11.2009, 2/3, ex *Flammulina velutipes*; M30: 12.9.2010/ 23.9.2010, 3/4, ex *Hygrocybe calyptriformis*; M30: 12.9.2010/ 21.9.2010, 2/0, ex *Hygrocybe chlorophana*; M42: 13.9.2010/21.9.2010, 3/1, ex *Cortinarius hinnuleus*; M45: 11.9.2010/21.9.2010, 1/4, ex *Leratiomyces squamosus*; M68: 19.9.2009, 2/3, ex *Amanita muscaria*.

A common and polyphagous species, with a preference for soft agarics. Most of these samples were collected rather late in the year.

***Exechia lundstroemi* Landrock, 1923**

Published records (Ševčík 2006a): B2: 28.7.2000/4.-6.8.2000, 2/0, ex *Boletus badius*; M29: 17.9.2000/27.-28.9.2000, 18/14, ex *Albatrellus ovinus*; M33: 25.9.2001/3.10.2001, 1/3, ex *Gomphidius glutinosus*.

New record: M8: 13.9.2009/23.9.2009, 3/2, ex *Chalciporus piperatus*.

A rare species, published as new for the Czech Republic by Ševčík (2006a), similar to *Exechia cornuta* Lundström, 1914. Six species of host fungi are listed for this species by Jakovlev (1994). *Chalciporus piperatus* is a new host record.

***Exechia macula* Chandler, 2001 = *E. maculipennis* Stannius, 1831**

Published record (Ševčík 2006a): B6: 5.7.2004/11.7.2004, 2/1, ex *Agaricus* sp.

Three other species of agarics are recorded by Jakovlev (1994) for this species.

***Exechia repanda* Johannsen, 1912**

Published record (Ševčík 2006a): S12: 26.9.1999/9.10.1999, 1/2, ex *Lyophyllum loricatum*.

Several species of agarics are listed in Jakovlev (1994) for this species, recorded as new to Slovakia by Ševčík (2006a).

***Exechia repandoides* Caspers, 1984**

Published records (Ševčík 2004a, 2006a): M60: 9.9.1999/17.9.1999, 1/0, ex *Tricholoma sejunctum*; M60: 9.9.1999/16.9.1999, 1/0, ex *Cortinarius* sp.

These are the only records of host fungi for this recently separated species.

***Exechia separata* Lundström, 1912**

Published record (Ševčík 2006a): S12: 19.10.2001/30.-31.10.2001, 3/0, ex *Gomphidius glutinosus*.

This species is known from a number of host fungi, including *G. glutinosus* (see Jakovlev 1994).

***Exechia seriata* (Meigen, 1830)**

Published records (Ševčík 2006a): M65: 15.8.1998/22.8.1999, 1/1, ex *Russula violeipes*; M: 16.6.1999/23.-26.6.1999, 1/2, ex *R. luteotacta*; M: 3.8.2000/10.8.2000, 1/0, ex *R. luteotacta*; M15: 5.9.2004/12.9.2004, 1/0, ex *R. griseascens*.

New record: M38: 28.7.2009, 2/0, ex *Russula velenovskyi*.

This species of *Exechia* prefers *Russula*, but there are several records from other fungi.

***Exechia spinuligera* Lundström, 1912**

Published record (Ševčík 2006a): M40: 24.4.1999/2.5.1999, 1/2, ex *Cortinarius romagnesii*.

This rare fungus grows early in spring on recultivated mine dumps in the industrial town of Ostrava. These dumps form a specific habitat with peculiar communities of fungi.

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

Published record (Ševčík 2006a): M54: 29.10.1999/9.11.1999, ex *Laccaria laccata*.

The larvae of *Exechiopsis* live individually in the stem of small agarics, such as *Laccaria*. This confirms the association of *E. fimbriata* with *L. laccata* recorded by Kurina (1991).

***Exechiopsis intersecta* (Meigen, 1818)**

Published record (Ševčík 2006a): M52: 11.10.2003/24.10.2003, 2/2, ex *Mycena* sp.

The only previous rearing record was from *Tricholoma saponaceum* (cf. Chandler 1978).

***Pseudexechia trivittata* (Staeger, 1840)**

New record: M37: 26.10.2008, 4/6, ex *Psathyrella candolleana*.

Previous rearing records of this species were from *P. candolleana*, as well as from *Panaeolus papilionaceus* (see Chandler 1993) and *Coprinopsis radicans* (see Jakovlev 1994).

***Rymosia bifida* Edwards, 1925**

Published record (Ševčík 2006a): M60: 9.9.1999/16.9.1999, 1/1, ex *Inocybe geophylla*.

New record: M38: 28.7.2009, 1/0, ex *Inocybe albomarginata*.

Previously reared from *Psathyrella spadicea* and *Inocybe lacera* by Jakovlev (1994). The new record suggests its preference for *Inocybe*.

***Rymosia placida* Winnertz, 1863**

New record: S3: 27.9.2009/10.10.2009, 1/0, ex *Podostroma alutaceum*.

This is the first record of a host fungus for this species. *Podostroma alutaceum* (**Fig. 38**) is a very rare fungus that has not yet been recorded from the Muránska planina National Park and it is considered extinct in the Czech Republic (Holec & Beran 2006).

***Rymosia spinipes* Winnertz, 1863**

New record: M42: 11.9.2010/21.9.2010, 2/3, ex *Inocybe mixtilis*.

A rather rare species, hitherto reared from *Cortinarius*, *Entoloma*, *Inocybe*, *Laccaria*, *Tricholoma* and *Tremellales* (see Jakovlev 1994).

***Rymosia virens* Dzedzicki, 1910**

Published record (Ševčík 2006a): M40: 22.5.1999/1.6.1999, 1/0, ex *Cortinarius romagnesii*.

New record: M6: 31.8.2008/11.9.2008, 2/2, ex *Laccaria amethystina*; M29: 2.9.2009/11.9.2009, 1/0, ex *Laccaria laccata*.

The only previous rearing record is from *Laccaria amethystina* (cf. Jakovlev 1994) that is herewith confirmed.

***Tarnania fenestralis* (Meigen, 1818)**

New record: M37: 19.10.2008, 1/1, ex *Cortinarius hinnuleus*; M38: 19.10.2008, 1/0, ex *Clitocybe nebularis*.

A relatively common species, known from many species of fungi, mainly agarics (cf. Jakovlev 1994).

***Tarnania tarnanii* (Dzedzicki, 1910)**

Published record (Ševčík 2006a): M29: 17.9.2000/28.9.2000, 1/0, ex *Ramaria* sp.

New record: M29: 2.9.2009/16.-17.9.2009, 1/1, ex *Cortinarius brunneus*.

An uncommon species, known from many species of agarics, e.g. *Hygrophorus*, *Tricholoma*, *Armillaria*, *Hebeloma* and *Cortinarius* (cf. Jakovlev 1994).

Sciaridae

A species-rich family of small black midges with uniform appearance. There are more than 600 described species in Europe and additional species are described every year. The Czech and Slovak fauna is still relatively little known, because of the lack of expertise in home institutions and only occasional samples of sciarids have been studied by foreign specialists. In the last checklist, 230 species were reported from the Czech Republic and 135 from Slovakia (Heller & Menzel 2009). The larvae of most Sciaridae are typical soil inhabitants, where they feed on various decaying plant material. A well known pest in greenhouses and households is the cosmopolitan and synanthropic *Bradysia ocellaris* (Comstock, 1882). This species was common also in the soil used by the author for rearing, but no association with fungi in these samples is supposed. This applies also to *Pnyxia scabiei* (Hopkins, 1895), which was reared by the author from one sample in 2006. Both species have not yet been formally published from the Czech Republic as it is not clear if they occur also externally, outside greenhouses. The following two species are considered at least occasionally associated with fungi.

Lycoriella ingenua (Dufour, 1834)

Published record (Ševčík 2004b): M52: 11.10.2003/9.11.2003, 1/0, ex *Bjerkandera adusta*.

A fungicolous species, also known under the junior synonyms *Lycoriella solani* (Winnertz, 1871) and *L. mali* (Fitsch, 1863). Menzel & Müller (2008) reared this polyphagous sciarid from *Fuligo septica*, obtained from male flowers of alder (*Alnus* spp.) in Germany.

Scatopsciara neglecta Menzel & Möhrig, 1998

Published record (Ševčík 2001a): M54: 10.10.1998/31.10.1998, 2/0, ex *Merulius tremellosus*.

This species has been confused with the closely related *Scatopsciara pusilla* (Meigen, 1818), which was recorded from *Ganoderma applanatum*. This record may suggest the association with wood-decaying fungi.

Cecidomyiidae

A species-rich family of minute and fragile midges. A total of 1700 species are known to occur in Europe, 559 species in Czech Republic and in 380 Slovakia (Skuhravá 2009). Larvae are phytophagous, mycophagous, saprophagous or zoophagous. Many phytophagous larvae are gall makers inducing galls on various plants. Zoophagous larvae are predators of other gall midges, aphids, mites, coccids, or other small arthropods.

Mycophagous, saprophagous and some of the zoophagous larvae are associated with various fungi. They live usually in mould cover on the surface of the fruit body. Altogether 18 species of Cecidomyiidae, reared by the author or other colleagues from fungi, are recorded below. Some of them and several additional samples still remain undetermined and will possibly be treated in separate publications.

Brachineura (Spaniocera) squamigera Winnertz, 1863

Published record (Ševčík 2001a, Skuhravá 2004): S2:1.10.2000/31.10.2000, 1/0, ex *Paxillus filamentosus*.

A mainly phytosaprophagous species. This is the only record from a fungus.

***Camptodiplosis auriculariae* Buxton & Barnes, 1953**

Published records (Ševčík 2004b, Skuhravá 2004): M16: 11.7.2003/25.-29.7.2003, 14/8, ex *Auricularia auricula-judae*; M51: 11.10.2003/23.-27.12.2003, 6/1, ex *A. auricula-judae*; M63: 24.7.2002/6.-25.8.2002, 5/9, ex *A. auricula-judae*.

New record: M22: 24.6.2007/9.-16.7.2007, 1/5, ex *A. auricula-judae*.

An apparently monophagous species (Fig. 17) restricted to *A. auricula-judae*. Chandler (in litt.) reared this species from the same fungus collected at Windsor Forest, Berkshire, England. Larvae (Fig. 18) can be observed within the fungus tissue as this is translucent. They are pink or orange coloured and, according to Buxton & Barnes (1953), they are capable of jumping.

***Camptodiplosis boleti* (Kieffer, 1901)**

Published records (Ševčík 2001a, 2004b,c, Skuhravá 2004): M17: 24.9.1998/4.10.1998, 0/1, ex *Meripilus giganteus*; M54: 26.5.1999/4.6.1999, 14/6, ex *Laetiporus sulphureus*; M54: 26.5.1999/7.6.1999, 10/7, ex *Royoporus badius*; M69: 20.6.1998/29.6.-1.7.1998, 5/2, ex *Laetiporus sulphureus*. M1: 26.9.2003/7.10.2003, 1/1, ex *Lentinus tigrinus*; M41: 10.10.2001/8.-17.11.2001, 3/1, ex *Grifola frondosa*; M41: 15.6.2002/27.6.-1.7.2002, 1/1, ex *Trametes gibbosa*; M41: 6.8.2003/16.-17.8.2003, 14/23, ex *Fistulina hepatica*; S1: 3.9.2003/16.9.2003, 0/1, ex *Fomitopsis pinicola*; S1: 3.9.2003/18.9.2003, 1/2, ex *Pycnoporus cinnabarinus*; S9: 4.7.2006/4.8.2006, 1/1, ex *Royoporus badius*; S12: 21.8.2001/11.9.2001, 3/5, ex *Trametes gibbosa*; S12: 24.8.2001/4.9.2001, 1/0, ex *Polyporus melanopus*.

New records: M36: 24.9.2009/7.10.2009, 7/7, ex *Meripilus giganteus*; M53: 7.5.2007/16.-20.5.2007, 2/1, ex *Polyporus squamosus*. S17: 25.9.2009/10.10.2009, 1/10, ex *Climacocystis borealis*.

A common mycophagous species associated with polypores (cf. Jakovlev 1994, Ševčík 2003).

***Heteropeza pygmaea* Winnertz, 1846**

Published records (Ševčík 2004b, Skuhravá 2004): M24: 15.5.2003/14.-20.6.2003, 0/17, ex *Pleurotus pulmonarius*; M: Vyškov, ex *Pleurotus ostreatus*.

This is a characteristic species with reduced wing venation (see Fig. 16 in Ševčík 2006a). It was previously reared only from *Daldinia* sp. (Hingley 1971) and cultivated mushrooms (Wyatt 1964, Hussey 1962 and earlier literature on control of mushroom pests).

***Karschomyia* sp.**

New record: M41: 22.6.2003/9.-21.7.2003, 3/0, ex *Pleurotus pulmonarius* (covered with mould).

This species has not yet been identified. An unidentified species of *Karschomyia* was reared also by Jakovlev (1994) from *Russula* sp.

***Lestodiplosis inermis* Kieffer, 1912**

Published records (Ševčík 2004c, Skuhravá 2004): S11: 21.8./10.9.2001, 1/0, ex *Collybia confluens*.

A presumably zoophagous species, which has hitherto been known only from France (Skuhravá, pers. comm.).

***Lestodiplosis polypori* (H. Loew, 1850)**

Published records (Ševčík 2001a, 2004b,c, Skuhrová 2004): M17: 24.9.1998/4.-10.10.1998, 1/1, ex *Meripilus giganteus*; M23: 25.7.2000/4.-11.8.2000, 1/1, ex *Postia stiptica*; M29: 17.9.2000/11.10.2000, 2/0, ex *Albatrellus confluens*; M54: 29.10.1999/7.12.1999, 0/1, ex *Inonotus radiatus*; M60: 10.6.2000/20.-28.6.2000, 0/3, ex *Bjerkandera adusta*; M64: 27.5.2000/9.-12.6.2000, 4/5, ex *Trametes hirsuta*; M41: 15.6.2002/27.-30.6.2002, 4/4, ex *T. gibbosa*; M41: 22.6.2003/6.7.2003, 1/0, ex *Hapalopilus nidulans*; M41: 6.7.2003/19.7.2003, 0/3, ex *Antrodiella romellii*; M41: 6.8.2003/28.8.-9.9.2003, 1/1, ex *Ganoderma applanatum*; M51: 11.10.2003/12.12.2003, 0/1, ex *B. adusta*; M52: 26.10.2003/12.12.2003, 0/2, ex *T. versicolor*; M62: 19.5.2002/2.6.2002, 0/1, ex *Polyporus squamosus*; M66: 14.6.2003/26.6.-10.7.2003, 5/2, ex *T. versicolor*. S12: 21.8.2001/3.9.2001, 0/1, ex *Hydnum repandum*; S12: 21.8.2001/11.9.2001, 1/1, ex *Trametes gibbosa*; S12: 24.8.2001/4.-10. 9.2001, 2/4, ex *Polyporus melanopus*; S11: 21.8.2001/15.-16.9.2001, 0/2, ex *Hericium cirrhatum*; S12: 14.10.2001/16.11.2001, 0/1, ex *B. adusta*; S13: 11.5.2002/24.-28.5.2002, 8/10, ex *Trametes versicolor*.

New record: M32: 18.9.2009/1.10.2009, 0/5, ex *Datronia mollis*; M41: 9.8.2007/19.-25.8.2007, 2/2, ex *Bjerkandera adusta*.

L. polypori is one of the commonest gall-midge species associated with wood-decaying fungi (cf. Økland 1995, Ševčík 2003). It is, however, predaceous, attacking the other species living in fungi (Skuhrová, pers. comm.).

***Monardia (Trichopterymyia) modesta* (Williston, 1896)**

Published record (Ševčík 2001a, Skuhrová 2004): M7: 24.9.2000/5.-18.11.2000, 4/2, ex *Hericium alpestre*.

This is the only information about the biology of this cosmopolitan species.

***Monardia obsoleta* Edwards, 1938**

New record: M38: 17.9.2007/30.9. 2007, 1/1, ex *Royoporus badius* (covered with mould).

A Palaearctic species, hitherto not reported from the Czech Republic. The biology of its larvae is little known. There is only one record from *Coriolus* sp. (= *Trametes*) in Jaschhof (1998).

***Mycodiplosis* sp.**

New record: M41: 9.9.2002/26.-30.9.2002, 4/3, ex *Lactarius decipiens* (covered with mould).

This material has not yet been identified to species level. The larvae were reared together with the larvae of *Stomatosema nemorum*. Several species of *Mycodiplosis* were reported from rusts and mildews by Chandler (2010).

***Mycophila fungicola* Felt, 1911**

Published record (Skuhrová 2004): S: Senec near Bratislava, ex *Pleurotus ostreatus*.

A cosmopolitan species known to develop in cultivated mushrooms (Chandler 2010).

***Peromyia edwardsi* Berest, 1994**

New record: M32: 18.9.2009/28.-30.9.2009, 2/1, ex *Sparassis crispa* (covered with mould).

A Palaearctic species described from the Ukraine, hitherto not reported from the Czech Republic, but see the comment under *Peromyia fungicola* below. Nothing has been known about the biology of its larvae up to the present.



Figs 17-18: *Camptodiplosis auriculariae*. 17 – male and female; 18 – larvae in *Auricularia auricula-judae*.

***Peromyia impexa* (Skuse, 1888)**

New record: B7: 22.8.2010/13.-19.9.2010, 2/1, ex *Lactarius vellereus*.

A Holarctic species, known under the junior synonym *P. palustris* (Kieffer, 1895), hitherto not reported from the Czech Republic, but see the comment under *Peromyia fungicola* below. Nothing has been known about the biology of its larvae up to the present.

***Peromyia fungicola* (Kieffer, 1898)**

Published records (Ševčík 2001a, 2004b,c, 2006a, Skuhrová 2004): M29: 17.9.2000/30.9.-3.10.2000, 2/7, ex *Ramaria* sp. M51: 11.10.2003/30.10.2003, 2/0, ex *A. auricula-judae*; M62: 19.5.2002/1.-2.6.2002, 4/3, ex *Polyporus squamosus* (erroneously recorded by Skuhrová 2004 as *Polyporus mori*). S7: 30.9.2006/8.10.2006, 2/1, ex *Lactarius piperatus*; S12: 21.8./31.8.2001, 1/3, ex *Russula alutacea*.

New record: M38: 17.9.2007/30.9.2007, 1/1, ex *Royoporus badius* (covered with mould).

Species of the subfamily Micromyinae are relatively common in fungi, particularly on fruit bodies covered with mould. The specific identification of *Peromyia* Kieffer, 1894 is, however, rather difficult and some of the published records above may actually belong to different species. The Czech and Slovak Lestremiinae and Micromyinae are now being revised by Mathias Jaschhof, so new and revised records will be published later in a separate paper. Jaschhof (1998) listed the following host fungi for *Peromyia fungicola*: *Lactarius piperatus*, *Grifola frondosa* and *Hygrophorus camarophyllus*.

***Stomatosema nemorum* Kieffer, 1904**

Published record (Ševčík 2004b, Skuhrová 2004): M41: 9.9.2002/26.-30.9.2002, 2/6, ex *Lactarius decipiens* (covered with mould).

This is still the only information about the biology of this species.

***Tricholaba trifolii* Rübsaamen, 1917**

Published record (Ševčík 2004c): S12: 24.8./15.9.2001, 0/1, ex *Russula nigricans*.

A mainly phytosaprophagous species, this is the only record from fungi.

***Winnertzia lugubris* (Winnertz, 1853)**

Published records (Ševčík 2004b, Skuhrová 2004): M12: 14.6.2002/6.-8.7.2002, 2/0, ex *Bjerkandera adusta*; M41: 18.5.2003/12.-24.6.2003, 2/3, ex *Bjerkandera adusta*.

New record: M61: 31.5.2010/8.6.-3.7.2010, 12/10, ex *Bjerkandera adusta*.

The identification of this species is only preliminary but it seems to be specific to *B. adusta*. There are also some old records of species identified as *W. lugubris* from *Trametes versicolor* and *Fomitopsis pinicola* (see Jakovlev 1994).

Cecidomyiinae gen. sp. 1

New record: M41: 18.8.2002/30.8.-1.9.2002, 20/18, ex *Schizophyllum commune*.

This species has not yet been identified. The larvae lived in the mould on the surface of the fruit body.

Porricondylinae gen. sp. 1

New record: M68: 17.9.2010, 4/3, ex *Amanita porphyria*.

Also this species has not yet been identified and will be revised by M. Jaschhof.

Psychodidae

Small flies (1-5 mm, so-called moth flies) thickly clothed with greyish hairs and scales, with typical broad lancet-shaped wings laid roof-like on the abdomen, giving them the overall moth-like appearance. The larvae of non-biting moth flies are mainly semi-aquatic and they feed on various decaying organic matter. Almost 500 species are known to occur in Europe, 166 of them in the Czech Republic and 97 in Slovakia (Ježek 2009). Fungicolous larvae of this family develop mainly in decaying fruiting bodies of fungi.

Chodopsycha buxtoni (Withers, 1988)

Published records (Ševčík 2001a, 2004b,c): M65: 30.5.1999/6.-11.6.1999, 10/10, ex *Pluteus cervinus*; M65: 3.7.1999/10.-12.7.1999, 2/3, ex *Amanita rubescens*; M16: 11.7.2003/18.-21.7.2003, 1/1, ex *Ramaria* sp. S12: 21.8.2001/26.-27.8.2001, 2/1, ex *Hydnum repandum*; S12: 21.8.2001/28.-31.8.2001, 3/1, ex *Amanita spissa*; S12: 21.8.2001/29.8.2001, 4/1, ex *Leccinum quercinum*.

This species was recently separated from the following species and appears to be polymycophagous. Withers (1988) recorded it from *Boletus* sp.

Chodopsycha lobata (Tonnoir, 1940)

Published records (Ševčík 2001a, 2004b,c): M2: 5.8.2000/14.8.2000, 2/0, ex *Amanita phalloides*; M17: 4.9.1999/14.9.1999, 8/4, ex *Amanita rubescens*; M29: 17.9.2000/27.9.2000, 8/3, ex *Amanita spissa*; M29: 17.9.2000/27.9.2000, 8/3, ex *Albatrellus ovinus*; M65: 10.10.2000/21.10.2000, 1/1, ex *Armillaria gallica*; M13: 15.8.2002/23.-25.8.2002, 8/22, ex *Hygrophorus* sp.; M16: 11.7.2003/18.-21.7.2003, 1/0, ex *Ramaria* sp. (decaying). S7: 30.9.2006/8.10.2006, 2/2, ex *Sarcodon imbricatus*; S7: 30.9.2006/8.10.2006, 2/2, ex *Boletus chrysenteron*; S12: 21.8.2001/28.-31.8.2001, 2/0, ex *Lactarius volemus*; S12: 21.8.2001/28.-31.8.2001, 1/0, ex *Amanita spissa*.

New records: M29: 2.9.2009/ 11.9.2009, 2/2, ex *Russula vinosa*; S4: 6.9.2008/16.9.2008, 5/1, ex *Peziza badia*.

A common European species, known from many fungus species (Jakovlev 1994), usually in decaying fruiting bodies.

Logima satchelli (Qate, 1955)

New record: M36: 16.9.2010/16.9.-24.9.2010, 0/4, ex *Meripilus giganteus*.

A common eurybiont Holarctic species, hitherto not explicitly recorded from fungi.

Psychomora mycophila (Vaillant, 1988)

= *Psychomora vanharai* Ježek, 1995

Published records (Ševčík 2001a, 2004b,c): M2: 5.8.2000/14.8.2000, 2/0, ex *Amanita phalloides*; M41: 22.6.2003/4.7.2003, 1/0, ex *Pleurotus pulmonarius*. S12: 21.8.2001/28.-31.8.2001, 7/2, ex *Lactarius volemus*; S12: ex *Hydnum repandum*.

These are the only records of host fungi for this species.

Anisopodidae

Window gnats (Anisopodidae) are medium-sized (5-10 mm) insects with elongated body and legs. Wings have a characteristic pattern of dark markings. The larvae are found in various decaying organic material, e.g. stems and roots of umbelliferous plants (Hancock 1989). Only two species (*Sylvicola cinctus* and *S. fenestralis*) have been reared also from fungi. The adults

occur mainly in forest habitats, but frequently also in gardens or on windows; they feed on nectar and other liquids. Altogether 9 species are known to occur in Europe, 5 of them are currently known from the Czech Republic (Ševčík 2009b) and 7 from Slovakia (Ševčík, in prep.).

***Sylvicola cinctus* (Fabricius, 1787)**

Published record (Ševčík 2001a): M7: 24.9.2000/15.-16.10.2000, 1/1, ex *Polyporus squamosus*.

New record: M37: 7.7.2008, 1/0, ex *Russula foetens*.

Larvae of this species are found in a variety of rotting vegetable matter, especially roots of umbelliferous plants (Hancock 1989) and at sap runs from trees. There are also sporadic records from fungi, which do not appear to be typical breeding material for flies from this family. *S. cinctus* has been often confused with the less frequently recorded *S. fenestralis* (Scopoli, 1763).

Scatopsidae

A rather small family with some 350 species in the world and 46 species in the Czech Republic (Haenni 2009). The adults are 1 to 5 mm long with usually dark or yellowish elongated body. All known larvae are saprophagous, living in a wide variety of media, such as rotten wood, plants, and fruits, under the bark of dead trees, in leaf litter, decaying fungi etc. (Haenni 2009). The adults may be found in various habitats, but more frequently in open and marshy areas.

***Apiloscatopse flavicollis* (Meigen, 1818)**

New record: M36: 16.9.2010/8.-15.10.2010, 0/1, ex *Meripilus giganteus*.

A widespread European species. There is only one previous record from fungus (*Tricholoma pessundatum*) in Jakovlev (1994).

***Coboldia fuscipes* (Meigen, 1830)**

New record: M36: 16.9.2010/16.-24.9.2010, 0/19, 24.9.-1.10., 0/34, 1.10.2010/22.10-1.11.2010, 0/1, ex *Meripilus giganteus*.

A common polysaprophagous and cosmopolitan species, known to develop also in fungi.

***Scatopse notata* (Linnaeus, 1758)**

New record: M36: 16.9.2010/16.-24.9.2010, 0/1, 24.9.-1.10., 0/7, 1.-8.10.2010, 0/3, ex *M. giganteus*.

A common cosmopolitan species with phytosaprophagous larvae. Several records from fungi are summarized by Jakovlev (1994).

Chironomidae

A species-rich family with a diverse life history. Most of the species have aquatic larvae, but there are also groups of terrestrial species, which develop in soil or various plant materials, and several species are carnivorous or parasitic. Five species from 4 genera have been recorded from fungi (see Jakovlev 1994).

The species composition of the chironomid fauna in both the Czech and Slovak Republics is rather poorly known and most data concern the aquatic larvae and pupal exuviae. The terrestrial species are particularly little known and further research is needed.



Figs 19-20: 19 – larva of *Bryophaenocladus* sp. in *Trichaptum biforme* (adult male on the right); 20 – larvae of *Keroplatus testaceus* on the lower side of *Piptoporus betulinus*.

Some 200 species of chironomids have so far been reported from the Czech Republic, which represent probably only a third of the real number of species.

***Bryophaenocladus* sp.**

Published record (Ševčík 2004c): S14: 23.8.2001/5.-30.9.2001, 11/9, ex *Trichaptum biforme*.

A possibly new species, which will be described elsewhere. Its larvae were common in the fruit body of *Trichaptum biforme*, growing on a beech branch lying on the ground. The larvae are apparently mycophagous and feed within the fungal tissue (**Fig. 19**). Two other species of *Bryophaenocladus* Thienemann, 1934 were recorded from fungi by Jakovlev (1994). *B. ictericus* (Meigen, 1818) was recorded by Buxton (1961, as *Eudactylocladius icterica*). The fungus name *Xylospheera* used in Chandler (1978) is a synonym of *Xylaria* [the current name] used by Buxton and refers to the same record, although listed separately by Jakovlev (1994).

Ceratopogonidae

This family comprises relatively small midges with diverse biology. Many species have ectoparasitic blood-sucking females while males are usually nectar feeders. Species both with aquatic and terrestrial larvae are included. Ten species belonging to the genera *Culicoides* and *Forcipomyia* have so far been recorded from fungi (Jakovlev 1994).

Almost 600 species of ceratopogonids are known from Europe, 202 species have been found in the Czech Republic and 140 in Slovakia (Tóthová & Knoz 2009).

***Atrichopogon rostratus* (Winnertz, 1852)**

Published record (Ševčík 2001a): M3: 24.7.1999/10.8.1999, 0/1, ex *Russula cyanoxantha*.

Jakovlev (1994) did not include *Atrichopogon* among fungivorous Ceratopogonidae.

***Culicoides scoticus* Downes & Kettle, 1952**

Published records (Ševčík 2001a, 2004b,c, Ševčík 2006a): B2: 28.7.2000/18.8.2000, 1/0, ex *Boletus badius*; B2: 28.7.2000/18.8.2000, 3/1, ex *Boletus pinophilus*; M3: 24.7.1999/10.8.1999, 1/1, ex *Russula cyanoxantha*; M3: 15.8.2002/28.8.2002, 4/0, ex *Lactarius* sp.; M15: 5.9.2004/26.9.2004, 1/1, ex *Lactarius rufus*; M15: 5.9.2004/23.9.2004, 2/7, ex *Lactarius pilatii*; M23: 25.7.2000/12.8.2000, 1/1, ex *Russula nigricans*; M29: 17.9.2000/6.10.2000, 2/4, ex *Albatrellus ovinus*; M29: 17.9.2000/8.10.2000, 1/0, ex *Amanita spissa*; M29: 17.9.2000/7.10.2000, 0/7, ex *Bondarzewia montana*; M65: 24.9.2006/10.10.2006, 8/7, ex *Armillaria gallica*; M67: 26.9.1999/17.10.1999, 5/1, ex *Bjerkandera adusta*; M5: 1.10.2000/19.10.2000, 1/0, ex *Lactarius deterrimus*; S9: 4.7.2006/4.8.2006, 3/4, ex *Royoporus badius*; S10: 1.10.2006/18.10.2006, 2/0, ex *Armillaria ostoyae*; S20: 25.9.1999/20.10.1999, 1/2, ex *Lactarius scrobiculatus*; S12: 21.8.2001/4.-9.9.2001, 5/0, ex *Lactarius volemus*; S12: 22.8.2001/9.-16.9.2001, 16/16, ex *Cantharellus cibarius*; S12: 24.8.2001/12.9.2001, 1/0, ex *Russula aeruginea*.

New records: M29: 2.9.2009/14.9.2009, 10/4, ex *Russula vinosa*; M32: 18.9.2009/5.10.2009, 12/7, ex *Lactarius vellereus*; 18.9.2009/14.10.2009, 0/2, ex *Sparassis crispa*. S17: 25.9.2009/17.10.2009, 1/0, ex *Climacocystis borealis*.

The most frequent species of Ceratopogonidae in fungi, apparently polymycophagous. It has been recorded from more than 20 species of fungi.

***Forcipomyia bipunctata* (Linnaeus, 1767)**

Published record (Ševčík 2006a): S9: 4.7.2006/23.7.2006, 1/1, ex *Royoporus badius*.

There is one previous record from a named fungus (*Phellinus gilvus*, see Jakovlev 1994).

***Forcipomyia nigra* (Winnertz, 1852)**

Published records (Ševčík 2004b,c): M16: 11.7.2003/24.-25.7.2003, 3/1, ex *Royoporus badius*. S12: 24.8.2001/13.9.2001, 1/0, ex *Tyromyces chioneus*.

New record: S3: 27.9.2009/10.10.2009, 1/0, ex *Podostroma alutaceum*.

This species has previously been reared from *Entoloma clypeatum*, and also found in decaying plants and under the bark of deciduous trees (Jakovlev 1994). The records from Moravia and Slovakia suggest a possible association with wood-decaying fungi.

Hybotidae

This family has formerly been included in the Empididae and comprises in this restricted form some 200 species in the Czech Republic. Larvae live in soil, decaying wood or in excrement and they are predators. Findings in fungi are exceptional.

***Ocydromia glabricula* (Fallén, 1816)**

Published record (Ševčík 2004b): M41: 1.6.2002/27.6.2002, 1/0, ex *Bjerkandera adusta*.

Larvae of this species are predaceous, hitherto not recorded from fungi.

Platyezidae

Platyezids, or flat-footed flies, are a group of small to medium-sized (5-8 mm) brachycerous flies with relatively short body, broad head and typically enlarged tarsi on hind legs. The males are usually velvet black while females are often more brightly coloured, at least with grey or yellow bands on the abdomen (**Fig. 23**). The larvae of most genera are typical mycobionts and are usually restricted to one or a few fungus hosts. The family was recently reviewed in the monograph by Chandler (2001). There are 45 species recorded from Europe, 35 species occur in the Czech Republic and 31 from Slovakia (Vaňhara 2009).

***Agathomyia antennata* (Zetterstedt, 1819)**

Published records (Ševčík 2001a, 2004b,c): M9: 13.6.1999/2.-4.7.1999, 4/4, ex *Bjerkandera adusta*; M41: 18.8.2002/6.-9.9.2002, 1/2, ex *B. adusta*; 19.8.2005/1.9.2005, 1/0, ex *B. adusta*; M54: 26.6.1999/18.7.1999, 2/4, ex *B. adusta*; M60: 10.6.2000/28.6.-6.7.2000, 3/1, ex *B. adusta*; M61: 10.6.2000/28.6.-8.7.2000, 1/1, ex *B. adusta*. M41: 1.6.2002/18.6.2002, 1/0, ex *B. adusta*; M49: 10.7.2004/8.8.2004, 3/0, ex *B. adusta*. S10: 14.7.2005/3.8.2005, 1/0, ex *B. adusta*.

New records: M41: 9.8.2007/8.-12.9.2007, 10/5, ex *B. adusta*.

This is the only reliably known fungus host for this species (**Fig. 21**) and no other species of Platyezidae has been reared from this fungus by the author. Laštovka's old record from *Trametes versicolor*, published by Vaňhara (1984), is most probably based on misidentification of the host fungus, considering the fact that the fruit bodies of *B. adusta* are similar to the highly variable *T. versicolor*. In Laštovka's manuscript remarks from June 1960 there is written under this record only: "Polyporaceae gen. sp."

***Bolopus furcatus* (Fallén, 1826)**

Published records (Ševčík 2001a, 2004b,c): M7: 24.9.2000/3.11.2000, 1/0, ex *Polyporus squamosus*; M62: 19.5.2002/16.6.2002, 1/0, ex *P. squamosus*. S11: 9.5.2002, females ovipositing on *P. squamosus*.

These are confirmations of its association with the only known fungus host. Tollet (1958) first stated *P. squamosus* as the larval habitat for *Bolopus furcatus*.

***Kesselimyia chandleri* Vaňhara, 1981**

Published record (Vaňhara 1981): M48, ex *Macrolepiota* sp.

The type material of this species is from Havraníky in the Czech Republic. It is currently known only from the Czech Republic, Hungary and European Russia (Chandler 2001). In Hungary, *K. chandleri* was reared from *Macrolepiota procera*, *Albatrellus cristatus* and *Inocybe corydalina* (see Chandler 2001).

***Lindneromyia dorsalis* (Meigen, 1804)**

Published record (Ševčík 2004b): M39: 17.6.2002/1.-6.7.2002, 2/3, ex *Agaricus bitorquis*.

New record: M4: 21.7.2009, 18/15, ex *Agaricus altipes*.

This species has been several times reared from various species of *Agaricus*, including *A. bitorquis* (cf. Dely-Draskovits & Babos 1993, Chandler 2001).

***Lindneromyia hungarica* Chandler, 2001**

Published records (Tkoč & Vaňhara 2006, Roháček & Ševčík 2007): M: Buchlovské vrchy Hills, 20.8.2006/1.9.2006, 2/0, ex *Agaricus arvensis*. S7: 21.8.2007/11.-23.9.2007, 3/2, ex *Agaricus* sp. (**Fig. 22**).

A recently described species, very similar to *L. dorsalis*. It was reared from several species of *Agaricus* in Hungary (Chandler 2001).

***Paraplatypeza atra* (Meigen, 1804)**

Published records (Ševčík 2001a, 2004b): M40: 9.7.2000/20.-21.7.2000, ex *Pluteus cervinus*. M26: 2.8.2002/11.-17.8.2002, 0/3, ex *Pluteus salicinus*; M41: 18.8.2002/27.8.2002, 1/0, ex *Pluteus cervinus*.

New record: M38: 14.7.2008, 3/4, ex *Pluteus cervinus*.

Pluteus cervinus and related species of *Pluteus* are regular fungus hosts of this species.

***Platypeza consobrina* Zetterstedt, 1844**

Published record (Ševčík 2004b): M33: 30.9.2003/1.-5.11.2003, 3/1, ex *Armillaria ostoyae*; M65: 24.9.2006/5.11.2006, 1/0, ex *Armillaria gallica*.

New records: M5: 1.11.2007/24.11.2007, 3/2, ex *Armillaria* sp.; S3: 27.9.2009/5.11.2009, 1/0, ex *Armillaria* sp.

Armillaria is the only confirmed fungus host for this species (Chandler 2001).

***Polyporivora ornata* (Meigen, 1838)**

Published record (Ševčík 2004b, 2006a): M3: 15.8.2002/23.-27.8.2002, 5/8, ex *Trametes versicolor*; M6: 5.7.2006/17.7.2006, 1/2, ex *Trametes versicolor*.

These are a further confirmations of the association of *P. ornata* with its only known fungus host.



Figs 21-22: 21 – larva of *Agathomyia antennata* in *Bjerkandera adusta*; 22 – larvae of *Lindneromyia hungarica* in *Agaricus* sp.

***Protoclythia modesta* (Zetterstedt, 1844)**

Published records (Ševčík 2004b): M51: 11.10.2003/29.11.-3.12.2003, 0/2, ex *Armillaria gallica*; M52: 11.10.2003/28.11.-5.12.2003, 3/12, ex *Armillaria gallica*. S10: 1.10.2006/7.11.2006, 0/1, ex *Armillaria ostoyae*.

Larvae of this species (**Fig. 24**) are common in various recently distinguished species of *Armillaria*. The adults are often seen on the host fungus (**Fig. 23**).

***Seri obscuripennis* (Oldenberg, 1916)**

Published records (Ševčík 2001a, 2004c): M54: 26.5.1999/8.-9.6.1999, 18/5, ex *Royoporus badius*; M60: 10.6.2000/27.6.2000, 0/2, ex *Polyporus varius*. S9: 4.7.2006/ 9.-11.7.2006, 7/1, ex *Royoporus badius*; S12: 24.8.2001/31.8.-7.9.2001, 14/16, ex *Polyporus melanopus*.

New record: M38: 17.9.2007/ 25.9.-30.9.2007, 1/1, ex *Royoporus badius*.

This species is restricted to larger species of *Polyporus*.

Phoridae

Scuttle flies (Phoridae) are small (up to 5 mm) humpbacked flies, black or yellowish, with a characteristically simplified wing venation. A total of 230 species are currently known from the Czech Republic, 208 from Slovakia and some 600 species occur in Europe (Mocek 2009).

The biology and systematics of the family was reviewed by Disney (1994). The larvae have very diverse natural history. Many species are predators or parasitoids of various invertebrates, others live in dung, carrion, wasp nests etc., and for most species the larval biology is unknown. More than 40 species, almost exclusively from the large genus *Megaselia* Rondani, 1856, are known to develop in fungi.

***Megaselia berndseni* (Schmitz, 1919)**

Published records (Ševčík 2001a, 2004c, 2006a, Disney & Ševčík 2008, 2009b): M1: 29.5.1999/17.6.1999, 1/3, ex *Boletus impolitus*; M6: 31.8.2008/14.9.2008, 2/0, ex *Tylopilus porphyrosporus*; M24: 27.4.2000/14.5.2000, 14/13, ex *Calocybe gambosa*; M36: 18.6.2006/2.7.2006, 2/0, ex *Inocybe erubescens*; M53: 7.5.2007/16.-20.5.2007, 2/5, ex *Polyporus squamosus*. S12: 21.8.2001/4.9.2001, 2/2, ex *Leccinum molle*. S12: 10.5.2002/30.5.-2.6.2002, 2/8, ex *Lentinus tigrinus*.

New record: M38: 28.7.2009, 1/0, ex *Russula pectinatoides*.

M. berndseni is known from a number of host fungi, including *Inocybe erubescens* (= *I. patouillardii*). This confirms Eisfelder's (1956) report of this species being reared from this poisonous fungus. It is also the only phorid species known to develop in *Tylopilus porphyrosporus*. *Polyporus squamosus* is still the only known host of *M. berndseni* from any Polyporaceae. *R. pectinatoides* is a new host record.

***Megaselia cinereifrons* (Strobl, 1910)**

Published record (Ševčík 2001a): M29: 17.9.2000/7.10.2000, 8/3, ex *Albatrellus ovinus*.

This species has already been reported from this fungus by Disney (1994). The other scarce rearing records are also from polypores.



Figs 23-24: *Protoclythia modesta*. **23** – female on *Armillaria gallica*; **24** – larvae in host fungus.

***Megaselia flava* (Fallén, 1823)**

Published records (Ševčík 2001a, Disney & Ševčík 2009b): M6, 31.8.2008/19.-20.9.2008, 9/12, ex *Peziza micropus*; M65: 15.8.1998/4.9.1998, 1/2, ex *Russula violeipes*.

A polymycophagous species, recorded from many species of fungi, including *Peziza micropus* and three species of *Russula* (see Jakovlev 1994).

***Megaselia flavicans* Schmitz, 1935**

Published records (Ševčík 2001a, 2004b,c, 2006a): M38: 3.5.2006/22.5.2006, 5/2, ex *Gyromitra fastigiata*; M38: 2.9.2006/20.9.2006, 2/1, ex *Russula pulchella*; M65: 3.7.1999/24.7.1999, 1/0, ex *R. grisea*; M55: 2.5.2002/18.-19.5.2002, 27/32, ex *Morchella esculenta*; M55: 2.5.2002/19.5.2002, 2/5, ex *Mitrophora semilibera*. S12: 21.8./4.-5.9.2001, 3/2, ex *R. alutacea*. S12: 8.5./26.-28.5.2002, 5/4, ex *Entoloma clypeatum*.

Another polymycophagous species, known from a number of fungi. This is the first named phorid species reared from *Gyromitra fastigiata*.

***Megaselia frameata* Schmitz, 1927**

Published records (Ševčík 2001a, 2004c, 2006a): M35: 19.9.1999/10.10.1999, 4/2, ex *Bondarzewia montana*; M41: 22.6.2003/7.7.2003, 1/2, ex *Pleurotus pulmonarius*; M43: 4.6.2000/19.6.2000, 2/0, ex *Crepidotus mollis*; M49: 23.7.2005/8.8.2005, 1/0, ex *Clavicornia pyxidata*; M54: 26.5.1999/14.-16.6.1999, 1/1, ex *Laetiporus sulphureus*; M54: 26.6.1999/13.7.1999, 4/0, ex *Bjerkandera adusta*; M65: 15.8.1998/3.9.1998, 1/0, ex *Pholiota squarrosa*; M69: 20.6.1998/6.7.1998, 1/0, ex *Laetiporus sulphureus*. S9: 4.7.2006/ 19.7.2006, 3/0, ex *Royoporus badius*; S12: 14.10.2001/10.11.2001, 0/1, ex *B. adusta*.

New record: M32: 12.9.2010/ 28.9.-4.10.2010, 2/4, ex *Albatrellus cristatus*.

All these records confirm that *M. frameata* prefers Polyporaceae and other lignicolous fungi. It is also the first named species of Phoridae reared from *Pleurotus pulmonarius*, *Royoporus badius* and *Clavicornia pyxidata*. *A. cristatus* is a new host record.

***Megaselia giraudii* (Egger, 1862)**

Published record (Disney & Ševčík 2008): M66: 9.9.2007/18.-21.10.2007, 5/12, ex *Boletus satanas*.

This species normally develops in decaying organic materials, especially dead insects, only rarely in fungi (Disney & Ševčík 2008). Buxton (1961) recorded *Coprinus micaceus* and *Pleurotus cornucopiae* as its host fungi.

***Megaselia hilaris* Schmitz, 1927**

Published record (Ševčík 2004c): S12: 8.5.2002/26.5.2002, 1/0, ex *Entoloma clypeatum*.

This is the only record of the rearing of *M. hilaris* from anything.

***Megaselia hirtiventris* (Wood, 1909)**

Published record (Ševčík 2004b): M20: 29.5.1999/24.-26.6.1999, 7/15, ex *Agaricus xanthoderma*.

This confirms the previous records of this oligophagous fly from *Agaricus* spp.

***Megaselia lata* (Wood, 1910)**

Published records (Ševčík 2001a, 2004b,c, 2006a): B2: 28.7.2000/15.8.2000, 9/6, ex *Boletus edulis*; M20: 27.5.2001/15.6.2001, 16/31, ex *Boletus reticulatus*; M21: 11.8.2000/23.-24.8.2000, 12/37, ex *Amanita muscaria*; M23: 25.7.2000/9.-11.7.2000, 1/2, ex *Boletus edulis*; M65: 19.9.2006/7.10.2006, 4/5, ex *Amanita rubescens*. S12: 21.8.2001/8.-12.9.2001, 31/51, ex *B. edulis*; S12: 21.8.2001/5.9.2001, 3/6, ex *A. spissa*.

Amanita, *Boletus* and *Russula* are usual host fungi of this species. Two braconid species were confirmed to parasitise the larvae of *M. lata* - *Aspilota caudata* and *Orthostigma pumilus*.

***Megaselia latior* Schmitz, 1936**

Published record (Ševčík 2001a): M43: 4.6.2000/20.6.2000, 1/0, ex *Psathyrella candolleana*.

This confirms the association recorded by Disney & Evans (1999) with this fungus

***Megaselia lutea* (Meigen, 1830)**

Published records (Ševčík 2001a, 2004b): M40: 30.7.2000/21.-22.8.2000, 2/4, ex *Suillus granulatus*; M57: 22.5.2000/14.6.2000, 3/2, ex *Entoloma clypeatum*; M59: 9.9.1999/3.10.1999, 2/0, ex *Lactarius acerrimus*; M65: 3.7.1999/24.7.1999, 1/1, ex *Russula grisea*. S20: 25.9.1999/24.10.1999, 2/2, ex *Lactarius scrobiculatus*; S12: 24.8.2001/18.9.2001, 1/0, ex *Russula aeruginea*; S13: 15.10.2001/11.11.2001, 1/2, ex *Lactarius subdulcis*.

New record: M29: 2.9.2009/28.9.2009, 5/6, ex *Lactarius picinus*.

Many species of *Russula* and *Lactarius* are known as its host fungi (cf. Jakovlev 1994, Disney & Evans 1999).

***Megaselia maura* (Wood, 1910)**

Published record (Ševčík 2001a): M40: 9.5.1999/20.5.1999, 13/16, ex *Agrocybe praecox*.

This species was previously known only from *Gymnopilus* and *Hypholoma*.

***Megaselia nigra* (Meigen, 1830)**

Published records (Ševčík 2001a, 2004b): M1: 5.8.2000/22.-24.8.2000, 4/12, ex *Agaricus bohusii*; M39: 17.6.2002/7.-8.7.2002, 1/2, ex *Agaricus bitorquis*.

This phorid species apparently prefers *Agaricus*, although it has been reared from several other fungus species (Disney & Evans 1999).

***Megaselia ostravaensis* Disney, 2008**

Published record (Disney, 2008): M38: 2.9.2006/24.9.2006, 2/1, ex *Russula pulchella*.

A recently described species (Disney 2008) hitherto known only from the type locality represented by a mine dump in the city of Ostrava (**Fig. 32**).

***Megaselia rufipes* (Meigen, 1804)**

New record: M36: 16.9.2010/8.-15.11.2010, 1/1, ex *Meripilus giganteus*.

The larvae of *M. rufipes* are primarily feeders on decaying organic materials, including decaying fungi (Disney, pers. comm.). It has not been recorded from this fungus before.

***Megaselia scutellaris* (Wood, 1909)**

New record: M65: 19.9.2006/22.10.2006, 2/2, ex *Amanita rubescens*.

This species was reared from *Amanita rubescens* already by Eisfelder (1955). It is also known from other species of *Amanita*, as well as *Russula*, *Tricholoma*, *Cortinarius* and other fungi (cf. Jakovlev 1994).

***Megaselia sevciki* Disney in Ševčík (2006a)**

Published records (Ševčík 2006a, Disney & Ševčík 2008): M1: 18.8.2007/12.-18.9.2007, 6/3, ex *Calvatia gigantea*; M38: 7.6.2006/20.6.2006, 5/6, ex *Bovista pusilla*; M56, 8.7.2009/22.7.2009, 1/2, ex *Lycoperdon echinatum*. S16: 5.9.2008/20.-27.9.2008, 21/37, ex *Lycoperdon utriforme*.

This species (Figs 25-26) is apparently specific to puffballs of the former family Lycoperdaceae (currently included in Agaricaceae).

***Megaselia shawi* Disney, 2006**

New record: M36: 16.9.2010/8.-15.11.2010, 1/0, ex *Meripilus giganteus*.

M. shawi was described by Disney (2006) as a sibling species of *M. frameata*. “*M. frameata*” (under its synonym *M. imberbis*) was recorded from this fungus by Colyer (1954) but it may have been *M. shawi* (Disney, pers. comm.). This is the first record from the Czech Republic as well as from mainland Europe.

***Megaselia sylvatica* (Wood, 1910)**

New record: M32: 18.9.2009/ 12.10.2009, 1/0, ex *Pluteus hispidulus*.

This is the first record of this species from the Czech Republic and also the first record of a named phorid species from this fungus.

***Megaselia uliginosa* (Wood, 1909)**

Published records (Ševčík 2001a, 2004c): M21: 11.8.2000/24.8.2000, 7/5, ex *Lepista nuda*. S13: 15.10.2001/6.-11.11.2001, 2/7, ex *Lepista nuda*.

This is probably a monophagous phorid species, restricted to two closely related species of *Lepista*.

***Megaselia* sp.**

New record: M8: 13.9.2009/ 28.9.2009, 4/1, ex *Melanoleuca verrucipes*.

An undescribed species, which will be treated in a separate paper (Disney in prep.). No species of Phoridae has been reared from this fungus before.

Syrphidae

Hoverflies (Syrphidae) are a well-known and popular family of medium-sized and usually brightly coloured flies. At least 700 species are known to occur in Europe, 401 species occur in the Czech Republic and 384 in Slovakia (Mazánek 2009). While the adults of most species visit flowers, the larval biology is more diverse. They are aphidophagous, phytophagous or saprophagous and include both terrestrial and aquatic species. Only a few species of *Cheilosia* Meigen, 1822 are mycophagous.

***Cheilosia scutellata* (Fallén, 1817)**

Published records (Ševčík 2001a, 2004c): M1: 29.5.1999/24.6.1999, 0/1, ex *Boletus impolitus*. S12: 21.8.2001/13.-14.9.2001, 4/2, ex *Leccinum molle*; S12: 22.8.2001/15.9.2001, 2/1, ex *Leccinum quercinum*.

Three European species of *Cheilosia* Meigen, 1822 develop in fungi, especially in Boletaceae, and *Ch.scutellata* is the commonest (Jakovlev 1994).



Figs 25-26: *Megaselia sevciki*. 25 – adults emerged from *Lycoperdon utriforme*; 26 – larvae in *Bovista pusilla*.

Lonchaeidae

Small to medium sized, metallic black or dark blue flies with dorsoventrally flattened abdomen. Females have a conspicuous aculeated ovipositor. More than 90 species of this family are known from Europe, 61 species are currently known from the Czech Republic and 35 from Slovakia (Máca 2009). The larvae are mainly phytosaprophagous, often associated with tree bark, sometimes living in the galleries of bark beetles but the species recorded here is not associated with trees. Records from fungi are only sporadic.

Lonchaea chorea (Fabricius, 1781)

Published record (Ševčík 2004b): M24: 15.5.2003/16.6.2003, 0/1, ex *Pleurotus pulmonarius*.

This species was previously reared twice from the myxomycete *Fuligo septica* (Buxton 1961, as *L. vaginalis*) but also develops in a wide range of decaying plant material and in dung. Two other species of *Lonchaea* are recorded from fungi and decaying plant material by Jakovlev (1994).

Lonchaea contigua Collin, 1953

New record: M61: 31.5.2010/26.6.-28.6.2010, 1/1, ex *Bjerkandera adusta*.

This species is typical of beach forests. It has not yet been recorded from named fungi.

Asteiidae

Small (1-3 mm), often weakly sclerotised flies with relatively narrow wings and somewhat reduced venation. Biology little known. The Central European species belong to two, ecologically different groups. *Leiomyza* species have mycophagous larvae and the adults are sylvicolous. The larvae of *Asteia* are considered saprophagous and adults occur mainly on grasslands. Altogether 18 species in four genera are known from Europe and the adjacent island areas, 9 species occur in the Czech Republic and 8 in Slovakia (Roháček 2009, Roháček & Máca 2010).

Leiomyza birkheadi Gibbs in Gibbs & Papp, 2007

New record: M48: 29.8.2007/25.9.2007, 1/0, ex *Macrolepiota procera*.

This species was recently separated from *Leiomyza laevigata* (Meigen, 1830) by Gibbs & Papp (2007). Both the species currently occur in the Czech Republic and *L. birkheadi* appears to be more common (Roháček & Máca 2010). *L. laevigata* was recorded from several species of *Agaricus*, *Calocybe gambosa* and *Clitopilus prunulus* by Papp (1972). Recently, Gibbs & Papp (2007) and Chandler (2010) listed *Polyporus squamosus*, *Agaricus arvensis*, *Volvariella bombycina* and *Amanita phalloides* as host fungi of *L. birkheadi*.

Leiomyza dudai Sabrosky, 1956

Published records (Ševčík 2001a, 2004b): M53: 3.8.2000/19.-28.8.2000, 1/4, ex *Amanita pantherina*. M41: 18.8.2002/6.9.2002, 0/1, ex *Pluteus cervinus*.

New record: M48: 29.8.2007/25.9.2007, 0/1, ex *Macrolepiota procera*.

L. dudai is the commonest species of the genus, recorded from many agarics (see Papp 1972).



Figs 27-28: 27 – *Leiomyza dudai* on *Meripilus giganteus*; 28 – *Spelobia parapusio*.
Photo by J. Roháček.

Chloropidae

Chloropids are small blackish or yellowish flies (2-5 mm) occurring in various habitats. The larvae are phytophagous, saprophagous, mycophagous and rarely also predaceous. Almost 400 species of the family Chloropidae are known to occur in Europe, of which 205 are recorded from the Czech Republic and 169 from Slovakia (Kubík 2009). Several species of *Tricimba* and *Gaurax* are associated with fungi.

Gaurax fascipes Becker, 1910

New record: M61: 31.5.2010/8.6.-3.7.2010, 12/10, ex *Bjerkandera adusta*.

A rather rare Palearctic species. The closely related *G. dubius* (Macquart, 1835) is known to develop in *Piptoporus betulinus* (see Smith 1964).

Tricimba albiseta Dely-Draskovits, 1983

Published record (2004b): M66: 14.6.2003/24.-31.7.2003, 7/3, ex *Trametes versicolor*.

This is the only known host record for this species (cf. Jakovlev 1994).

Tricimba cincta (Meigen, 1830)

Published records (Ševčík 2001a, 2004c, 2006a): M3: 24.7.1999/16.8.1999, 1/0, ex *Lactarius vellereus*; M36: 18.6.2006/2.7.2006, 2/1, ex *Inocybe erubescens*; M41: 17.8.2003/31.8.2003, 2/3, ex *Boletus chrysenteron*. S9: 4.7.2006/25.7.2006, 2/2, ex *Pleurotus pulmonarius*.

T. cincta Meigen has also been reported from many species of fungi, mainly *Russula* and *Amanita* (Jakovlev 1994).

Tricimba lineella (Fallén, 1830)

Published record (Ševčík 2001a): M44: 22.5.1999/12.-13.6.1999, 1/2, ex *Calocybe gambosa*.

New record: M38: 28.7.2009, 3/0, ex *Gymnopus aquosus*.

T. lineella is known from several species of agarics including *Calocybe gambosa*. *G. aquosus* is a new host record.

Heleomyzidae

A medium sized family comprising some 150 species in Europe, 84 species in the Czech Republic and 74 in Slovakia (Dvořáková 2009). The adults are usually yellowish brown robust flies, up to 1 cm in length. The larvae are saprophagous, mycophagous (*Suillia* spp.), phytophagous, coprophagous or necrophagous. Biology and ecology of many species are unknown. It is interesting that only a few species have been reared during this study, in spite of the fact that *Suillia* species are known from numerous species of fungi. A possible reason may be that this research has primarily been directed to mycetophilids and the fruiting bodies without mycetophilid larvae were usually not collected. Hackman & Meinander (1979) observed that the species of *Suillia* sometimes occur in fungi avoided by other Diptera.

Heleomyza captiosa (Gorodkov, 1962)

New record: M36: 8.11.2010/15.11.2010, 1/0, ex *Meripilus giganteus*.

A common saprophagous and coprophagous species, hitherto not recorded from fungi.

***Neoleria ruficeps* (Zetterstedt, 1838)**

Published record (Ševčík 2004b): M12: 17.9.2000/14.4.2001, 1/2, ex *Bondarzewia montana*.

This species has already been reared from several species of fungi, e.g. *Amanita*, *Boletus* and *Fomes fomentarius* (Jakovlev 1994).

***Suillia atricornis* (Meigen, 1830)**

New record: M52: 11.10.2003/10.12.2003, 0/1, ex *Armillaria gallica*.

A common polymycophagous species, recorded from a number of host fungi, including *Armillaria*.

***Suillia bicolor* (Zetterstedt, 1838)**

Published record (Ševčík 2004b): S2: 30.9.2000/18.11.2000, 0/1, ex *Paxillus filamentosus*.

New record: M41: 11.10.2010/10.12.2010, 1/0, ex *Armillaria gallica*.

Another polymycophagous species, known from more than 100 species of host fungi (cf. Dely-Draskovits 1974).

***Suillia variegata* (Loew, 1862)**

New record: B7: 22.8.2010/13.-19.9.2010, 0/2, ex *Lactarius vellereus*.

A rather rare mycophagous species, recorded from many host fungi, including several species of *Lactarius* (cf. Jakovlev 1994).

***Tephrochlamys tarsalis* (Zetterstedt, 1847)**

New record: M36: 22.10.2010/1.11.2010, 0/3, 8.11.2010/15.11.2010, 0/4, ex *Meripilus giganteus*.

A common cosmopolitan and polyphagous species, recorded also from several fungi. Buxton (1961) reared it from *Meripilus giganteus*.

Sphaeroceridae

Small (1-5 mm), rather robust, dark coloured flies, characterized by the shortened and dilated basitarsus of hind legs. The larvae are generally saprophagous, developing in various decaying substrates, including dung, rotting vegetation, carrion or fungi.

More than 250 species are known from Europe, of which 160 occur in the Czech Republic and 152 in Slovakia (Roháček 2009). Some 23 species of Sphaeroceridae have hitherto been reared from various fungi (Jakovlev 1994, Chandler 1990) and 8 of them are recorded here. The other species recorded in the literature are possibly rather saprophagous than mycophagous.

***Apteromyia claviventris* (Strobl, 1909)**

New record: M36: 7.7.2010/15.-22.11.2010, 1/0, ex *Meripilus giganteus*.

A Holarctic species living in leaf litter and various underground cavities. Jakovlev (1994) lists 14 species of host fungi for this species. It was recorded from *M. giganteus* among a further 7 species of fungi from which it was reared by Chandler (1990).

***Coproica vagans* (Haliday, 1833)**

New record: M36: 16.9.2010/8.-15.11.2010, 0/1, ex *Meripilus giganteus*.

A common cosmopolitan and polysaprophagous species. Jakovlev (1994) lists only *Coproica ferruginata* (Stenhammar, 1855) among the Sphaeroceridae associated with fungi. *C. vagans* was previously observed on decaying fungi by J. Roháček (Chandler 1990).

***Minilimosina parvula* (Stenhammar, 1855)**

New record: M36: 16.9.2010/16.-24.9.2010, 0/1, ex *Meripilus giganteus*.

A common Holarctic species, usually necrophagous but often occurring on decaying fungi. This is the only record from a named fungus but Papp's (1979) rearing records of *M. fungicola* (Haliday, 1836) from fungi may in fact refer to *M. parvula* (not recognised from the related *M. fungicola* before 1983).

***Opalimosina (Hackmanina) czernyi* (Duda, 1918)**

New record: M36: 16.9.2010/22.10.-1.11.2010, 0/1, ex *Meripilus giganteus*.

A Palaearctic species, considered as associated with fungi (cf. Roháček 1983) but its mycophagy is confirmed only by the above rearing record. This is the first record of rearing from a named fungus, although the adults were observed on *Hypholoma*, *Russula*, *Lactarius* and *Pleurotus* (see Chandler 1990).

***Opalimosina (Pappiella) liliputana* (Rondani, 1880)**

New record: M36: 16.9.2010/16.-24.9.2010, 1/0, ex *Meripilus giganteus*.

A Holarctic polysaprophagous species occurring on various rotting substrates. This is the first record from a named fungus, although there are several records of adults visiting decaying fungi (Chandler 1990).

***Pullimosina (Pullimosina) heteroneura* (Haliday, 1836)**

New record: M36: 16.9.2010/8.-15.11.2010, 0/1, ex *Meripilus giganteus*.

A common cosmopolitan, polysaprophagous and eurytopic species. It is not included in the list by Jakovlev (1994) although it was reared by Hackman & Meinander (1979) from *Leccinum scabrum* group. The larvae are known to infest cultivated mushrooms (Marshall & Brown 1984).

***Spelobia parapusio* (Dahl, 1909)**

Published records (Ševčík 2001a, 2004b,c, 2006a): M3: 15.8.2002/28.8.2002, 0/4, ex *Lactarius* sp.; M41: 10.10.2001/30.10.2001, 0/1, ex *Grifola frondosa*; M12: 20.7.2000/3.8.2000, 0/2, ex *Laetiporus sulphureus*; M61: 10.6.2000/22.6.2000, 0/1, ex *Amanita rubescens*; M65: 30.5.1999/10.-11.6.1999, 0/4, ex *Pluteus cervinus*; M69: 6.6.1999/22.6.1999, 0/2, ex *Collybia confluens*; M29: 17.9.2000/30.9.2000, 0/1, ex *Amanita spissa*; M29: 17.9.2000/3.10.2000, 0/1, ex *Albatrellus ovinus*; M15: 5.9.2004/19.9.2004, 0/1, ex *Russula griseocens*; M15: 5.9.2004/18.9.2004, 0/1, ex *Lactarius rufus*; M15: 5.9.2004/17.9.2004, 0/4, ex *Lactarius pilatii*; M38: 2.9.2006/16.9.2006, 0/5, *Russula pulchella*; M65: 24.9.2006/8.10.2006, 0/5, ex *Armillaria gallica*. S12: 21.8.2001/1.9.2001, 0/1, ex *Lactarius volemus*.

New records: M37: 7.7.2008, 0/1, ex *Russula foetens*; M18: 14.9.2010, 0/2, ex *Paxillus atrotomentosus*; M29: 2.9.2009/ 14.9.2009, 0/4, ex *Russula vinosa*; M32: 18.9.2009/28.9.2009, 0/3, ex *Lactarius vellereus*; M36: 16.9.2010/24.-30.9.2010, 0/2, ex *Meripilus giganteus*.

A polymycophagous and parthenogenetic species (only females occur in Central Europe). It has been reared from more than 30 species of fungi, mainly Agaricales, but also ascomycetes and polypores (cf. Jakovlev 1994).

***Telomerina flavipes* (Meigen, 1830)**

New record: M36: 16.9.2010/16.-24.9.2010, 1/0, ex *Meripilus giganteus*.

A subcosmopolitan and partly synanthropic species, predominantly necrophagous. It has previously been reared from *Coprinopsis atramentaria* (see Papp 1972) and there is an earlier record from *Boletus edulis* (see Chandler 1990).

Drosophilidae

A well known family comprising some 120 species in Europe, 75 species in the Czech Republic and 70 in Slovakia (Máca 2009). The adults usually concentrate around fermenting plant substrates, such as fruits, fungi, sap runs, etc. They occur in virtually all terrestrial habitats from lowlands to alpine meadows. Some of the synanthropic species are bred as important laboratory animals, especially in genetic research. Larvae of Drosophilidae develop mostly in fermenting substrates, which are sometimes different from the substrates visited by the adults. More than 25 species from several genera are known to develop in fungi. Some of them belong to the most frequent mycophagous or mycosaprophagous insects. The identification of drosophilid species associated with fungi is relatively easy, mostly based on the coloration of the abdomen.

***Drosophila busckii* Coquillett, 1901**

Published records (Ševčík 2001a, 2004b,c): M65: 14.10.2000/30.10.2000, 7/1, ex *Armillaria gallica*; M10: 22.8.2002/30.8.2002, 0/1, ex *Leccinum rufum*. S11: 21.8.2001/3.-7.9.2001, 15/26, ex *Hericiium cirrhatum*.

New record: M27: 26.8.2010, 4/1, ex *Amanita muscaria*.

A cosmopolitan and polyphagous species with typically banded thorax and abdomen. It is predominantly synanthropic, but there are also numerous rearing records from fungi without any host specificity (Jakovlev 1994).

***Drosophila funebris* (Fabricius, 1787)**

New records: M27: 26.8.2010, 0/1, ex *Amanita phalloides*; M36: 24.9.2009/1.10.2009, 6/4, ex *Meripilus giganteus*; M33: 5.9.2010/14.9.2010, 4/1, ex *Tricholomopsis rutilans*.

A common cosmopolitan and mostly synanthropic species, known from many species of fungi including *Meripilus giganteus*.

***Drosophila histrio* Meigen, 1830**

Published records (Ševčík 2004c): S12: 21.8.2001/31.8.2001, 2/4, ex *Leccinum molle*; S12: 22.8.2001/2.9.2001, 3/9, ex *Leccinum quercinum*; S12: 21.8.2001/31.8.2001, 1/1, ex *Boletus edulis*.

New record: M29: 2.9.2009/ 14.9.2009, 4/5, ex *Russula vinosa*.

An uncommon sylvicolous species, known from several species of fungi.

***Drosophila immigrans* Sturtevant, 1921**

New record: M36: 16.9.2010/16.-24.9.2010, 1/0, ex *Meripilus giganteus*.

A cosmopolitan and mainly synanthropic species, in Europe established some 100 years ago. It was previously reared from *Phallus impudicus* by Driessen et al. (1990).

***Drosophila kuntzei* Duda, 1924**

Published records (Ševčík 2001a, 2004b,c): M40: 9.7.2000/22..7.2000, 0/1, ex *Russula amoenicolor*. M41: 6.7.2003/16.-19.7.2003, 3/1, ex *Pluteus cervinus*; M41: 9.9.2002/21.-30.9.2002, 1/4, ex *Lactarius decipiens*; M41: 21.9.2002/6.-7.10.2002, 1/0, ex *Megacollybia platyphylla*; M41: 17.8.2003/31.8.2003, 2/0, ex *Boletus chrysenteron*; M16: 11.7.2003/21.-23.7.2003, 2/6, ex *Ramaria* sp. S9: 4.7.2006/19.7.2006, 0/11, ex *Pleurotus pulmonarius*; S12: 21.8.2001/31.8.2001, 0/1, ex *Tricholoma saponaceum*.

New record: M27: 13.8.2010, 3/4, ex *Amanita phalloides*; M68: 13.9.2009, 1/0, ex *Amanita citrina*; 17.9.2010, 2/3, ex *Amanita muscaria*.

A rather common polymycophagous species, typical for beech forests. The three species of *Amanita* are new host records, although it was reared from *Amanita rubescens* and *A. vaginata* (see Jakovlev 1994).

***Drosophila melanogaster* Meigen, 1830**

Published record (Ševčík 2004b): S18: 7.9.2002/26.-28.9.2002, 1/1, ex *Suillus granulatus*.

A common synanthropic species, which is not frequent in fungi. This sample was collected in high mountains.

***Drosophila phalerata* Meigen, 1830**

Published records (Ševčík 2001a, 2004b,c, 2006a): M3: 27.6.1999/8.-9.7.1999, 1/1, ex *Russula carpini*; M3: 24.7.1999/3.8.1999, 1/1, ex *Boletus chrysenteron*; M40: 9.5.1999/23.5.1999, 0/1, ex *Stropharia rugosoannulata*; M69: 6.6.1999/22.6.1999, 0/2, ex *Collybia confluens*. M7: 27.5.2001/10.-12.6.2001, 2/1, ex *Boletus reticulatus*; M26: 2.8.2002/11.-13.8.2002, 2/3, ex *Pluteus salicinus*; M41: 18.5.2002/2.-4.6.2002, 2/1, ex *Laetiporus sulphureus*; M41: 18.8.2002/29.8.2002, 3/0, ex *Pluteus cervinus*; M41: 9.9.2002/23.9.2002, 1/0, ex *Russula rigida*; M41: 21.9.2002/6.-7.10.2002, 0/2, ex *Megacollybia platyphylla*; M40: 4.5.2002/16.-20.5.2002, 9/7, ex *Entoloma clypeatum*; M28: 10.6.2001/23.6.2001, 5/1, ex *Boletus impolitus*; M65: 24.9.2006/8.10.2006, 0/1, ex *Armillaria gallica*. S12: 21.8.2001/31.8.2001, 1/0, ex *Tricholoma saponaceum*; S12: 21.8.2001/30.8.2001, 3/2, ex *Lactarius volemus*; S12: 21.8.2001/4.9.2001, 1/0, ex *Russula alutacea*; S12: 21.8.2001/31.8.2001, 1/1, ex *Amanita spissa*; S12: 22.8.2001/6.9.2001, 1/1, ex *Boletus edulis*; S12: 24.8.2001/5.9.2001, 2/0, ex *Russula aeruginea*.

New records: M6: 31.8.2008/11.9.2008, 1/0, ex *Tylopilus porphyrosporus*; 31.8.2008/ 11.9.2008, 6/6, ex *Tricholoma ustale*; M8: 13.9.2009/ 28.9.2009, 2/2, ex *Melanoleuca verrucipes*; M29: 2.9.2009/ 17.9.2009, 1/1, ex *Lactarius lignyotus*; M29: 2.9.2009/16.-17.9.2009, 5/2, ex *Cortinarius brunneus*; M36: 16.9.2010/16.-24.9.2010, 1/0, ex *Meripilus giganteus*; M38: 9.6.2008, 2/0, ex *Phallus impudicus*.

This is the commonest drosophilid species associated with fungi, reared from more than 150 species of fungi (Jakovlev 1994).

***Drosophila testacea* von Roser, 1840**

Published records (Ševčík 2004b,c): M41: 18.5.2002/2.6.2002, 1/1, ex *Laetiporus sulphureus*; M41: 18.8.2002/27.-30.8.2002, 2/0, ex *Bjerkandera adusta*; M41: 22.6.2003/4.7.2003, 1/1, ex *Pleurotus pulmonarius*; M41: 6.7.2003/16.-19.7.2003, 4/1, ex *Pluteus cervinus*; M41: 9.9.2002/21.-30.9.2002, 1/2, ex *Lactarius decipiens*; M16: 11.7.2003/21.-23.7.2003, 1/1, ex *Ramaria* sp. S12: 21.8.2001/30.8.2001, 1/0, ex *Lactarius volemus*; S12: 21.8.2001/28.8.2001, 2/2, *Hydnum repandum*; S12: 22.8.2001/2.9.2001, 2/0, ex *Leccinum quercinum*; S12: 21.8.2001/6.9.2001, 0/1, ex *Boletus edulis*; S12: 21.8.2001/4.-5.9.2001, 2/0, *Cantharellus amethysteus*; S12: 24.8.2001/9.9.2001, 0/1, ex *Russula nigricans*.

A sylvicolous and mycophagous species, known from a number of species of fungi but not from Polyporaceae (Jakovlev 1994).



Figs 29-30: 29 – *Hirtodrosophila oldenbergi* visiting its host fungus *A. auricula-judae*; 30 – *Hirtodrosophila trivittata*, adult fly on *Pleurotus pulmonarius*.

***Drosophila transversa* Fallén, 1823**

Published records (Ševčík 2001a, 2004b,c): M3: 15.8.2002/27.8.2002, 0/1, ex *Laccaria amethystina*; M38: 3.5.2006/17.5.2006, 2/0, ex *Gyromitra fastigiata*; M40: 9.5.1999/23.5.1999, 0/1, ex *Stropharia rugosoannulata*; M55: 2.5.2002/14.5.2002, 2/1, ex *Morchella esculenta*; M55: 2.5.2002/13.5.2002, 1/2, ex *Morchella semilibera*. S12: 21.8.2001/31.8.2001, 14/15, ex *Leccinum molle*; S12: 22.8.2001/7.9.2001, 1/0, ex *Cantharellus cibarius*.

New records: M36: 24.9.2009/1.10.2009, 1/0, ex *Meripilus giganteus*; M38: 13.4.2008/28.-30.4.2008, 5/1, ex *Verpa bohemica*; M30: 12.9.2010/ 28.9.2010, 2/4, ex *Hygrocybe calyptriformis*; M66: 9.9.2007/18.-21.10.2007, 5/12, ex *Boletus satanas*.

Another common and polycyphagous species. *Hygrocybe calyptriformis* and *Boletus satanas* are new host records.

***Hirtodrosophila confusa* (Staeger, 1844)**

Published records (Ševčík 2001a, 2004b,c): M3: 24.7.1999/9.8.1999, 2/1, ex *Lactarius vellereus*; M7: 24.9.2000/10.10.2000, 1/0, ex *Polyporus squamosus*; M60: 25.8.1999/10.9.1999, 2/1, ex *Polyporus squamosus*; M65: 30.5.1999/8.-11.6.1999, 1/1, ex *Pluteus cervinus*. M41: 18.5.2002/2.-4.6.2002, 3/1, ex *Laetiporus sulphureus*; M62: 19.5.2002/6.6.2002, 1/0, ex *Polyporus squamosus*. S9: 4.7.2006/19.7.2006, 1/2, ex *Pleurotus pulmonarius*; S11: 21.8.2001/9.9.2001, 1/0, ex *Hericium cirrhatum*.

New record: M36: 24.9.2009/1.10.2009, 0/4, ex *Meripilus giganteus*, 16.9.2010/24.-30.9.2010, 0/1, ex *Meripilus giganteus*; M37: 11.8.2008, 0/2, ex *Hypoloma fasciculare*; M53: 7.5.2007/24.-25.5.2007, 5/3, ex *Polyporus squamosus*.

This species is typical for beech forests and is associated mainly with polypores and other lignicolous fungi, but there are also some records from terrestrial agarics.

***Hirtodrosophila lundstroemi* (Duda, 1935)**

Published records (Ševčík 2004b,c, 2006a): M41: 18.8.2002/27.8.-8.9.2002, 7/5, ex *Auricularia auricula-judae*; M16: 11.7.2003/25.-28.7.2003, 5/11, ex *A. auricula-judae*; M49: 10.8.2006/3.9.2006, 4/6, ex *A. auricula-judae*; M63: 24.7.2002/20.8.2002, 1/0, ex *A. auricula-judae*.

New record: M22: 29.7.2008/7.-16.8.2008, 6/5, ex *A. auricula-judae*.

A monophagous species restricted to *A. auricula-judae*. The only previous rearing record is that by Dely-Draskovits & Babos (1993) from the same fungus.

***Hirtodrosophila oldenbergi* (Duda, 1924)**

Published record (Ševčík & Máca 2007): M22: 24.6.2007/9.-16.7.2007, 6/1, ex *A. auricula-judae*.

This is the only record of the larval biology of this rare species (**Fig. 29**) and its only known Czech locality (Ševčík & Máca 2007). The closely related *H. lundstroemi* has been repeatedly reared from the same fungus (see above).

***Hirtodrosophila trivittata* (Strobl, 1893)**

Published records (Ševčík 2001a, 2004b, 2006a): M54: 26.5.1999/10.-11.6.1999, 3/4, ex *Royoporus badius*; M65: 30.5.1999/13.-15.6.1999, 37/43, ex *Pleurotus pulmonarius*. M41: 22.6.2003/4.-9.7.2003, 14/26, ex *P. pulmonarius*; M5: 14.8.2003/26.-27.8.2003, 11/45, ex *P. pulmonarius*; S9: 4.7.2006/19.-20.7.2006, 1/0, ex *P. pulmonarius*.

An oligophagous species, restricted to *Pleurotus*. It is particularly common in beech forests on *Pleurotus* spp. and it can be easily distinguished in the field by the three longitudinal stripes on mesonotum (see **Fig. 30**).

***Leucophenga maculata* (Dufour, 1839)**

Published records (Ševčík 2001a, 2004b, 2006a): M46: 9.6.2004/23.6.2004, 1/0, ex *Pleurotus cornucopiae*; M54: 26.5.1999/10. 6.1999, 1/1, ex *Royoporus badius*; M54: 28.7.1999/11.8.1999, 1/0, ex *Abortiporus biennis*; M65: 30.5.1999/17.-18.6.1999, 1/1, ex *Kretzschmaria deusta*. M16: 11.7.2003/26.-29.7.2003, 1/8, ex *Royoporus badius*. S9: 4.7.2006/19.7.2006, 1/0, ex *Trametes hirsuta*.

New record: M37: 11.8.2008, 1/1, ex *Daedaleopsis confragosa*; M53: 7.5.2007/20.5.2007, 0/1, ex *Polyporus squamosus*.

Leucophenga maculata is principally associated with lignicolous fungi, but there are some dubious old records from *Boletus*, *Amanita* and *Russula* (see Canzanelli 1941).

***Mycodrosophila poecilogastra* (Loew, 1874)**

Published records (Ševčík 2001a, 2004b, 2006a): M41: 18.8.2002/31.8.-1.9.2002, 7/4, ex *Schizophyllum commune*; M41: 18.8.2002/30.8.-1.9.2002, 1/3, ex *Bjerkandera adusta*, 19.8.2005/23.-30.8.2005, 4/3, ex *B. adusta*; M41: 22.6.2003/4.-9.7.2003, 4/2, ex *Pleurotus pulmonarius*; M54: 26.5.1999/10.-11.6.1999, 3/4, ex *Royoporus badius*; M54: 28.7.1999/11.8.1999, 0/1, ex *Abortiporus biennis*.

New records: M38: 17.9.2007/ 25.9.-30.9.2007, 1/7, ex *Royoporus badius*; M37: 7.7.2008, 0/1, ex *Trametes trogii*, 1/1, ex *Trametes gibbosa*; M36: 24.9.2009/1.10.2009, 1/1, ex *Meripilus giganteus*, 16.9.2010/24.-30.9.2010, 0/1, ex *Meripilus giganteus*; M61: 31.5.2010/11.6.2010, 0/2, ex *Bjerkandera adusta*; M65: 27.9.2010/2.10.2010, 0/1, ex *Rigidoporus sanguinolentus*.

Host fungi of the rare *M. poecilogastra* are poorly known and this species is not included in the survey by Jakovlev (1994). It appears to be associated with wood-decaying fungi.

Anthomyiidae

Anthomyiids are robust muscoid flies with yellowish brown to black coloration. Almost 500 species have been found in Europe, 234 species were recorded from the Czech Republic and 170 from Slovakia (Komzáková 2009). Larvae of most species of this family are phytophagous and some of them are important pests in agriculture and forestry, but there are several fungivorous species of *Pegomya*. No special attention has been devoted to anthomyiids by the author and they are certainly more common than it could be concluded from this study. Hackman & Meinander (1979) recorded in Finland 17 species of *Pegomya* from various species of fungi.

***Pegomya geniculata* (Bouché, 1834)**

Published record (Ševčík 2001a): M65: 14.10.2000, 0/1, collected when ovipositing between gills of *Stropharia aeruginosa*.

P. geniculata is a polymycophagous species, but according to Hackman & Meinander (1979) it avoids Boletaceae.

***Pegomya pulchripes* (Loew, 1857)**

Published record (Ševčík 2001a): M60: 25.8.1999/13.9.1999, 1/0, ex *Xerula radicata*.

P. pulchripes is reported being associated with *Leccinum* (Jakovlev 1994).

Fanniidae

Fanniids are small to medium sized (3-5 mm) blackish flies with the abdomen partly yellow in some species. In total 83 species in three genera are known to occur in Europe, and 64 of them have been found in the Czech Republic and 50 in Slovakia (Rozkošný et al. 1997, Gregor & Rozkošný 2009a). Larvae are generally saprophagous and mostly feed on decaying organic matter. A relatively large number of species have been reared from various fungi.

Fannia canicularis (Linnaeus, 1761)

Published records (Ševčík 2001a): M3: 24.7.1999/29.8.1999, 1/0, ex *Lactarius vellereus*; M39: 17.6.2002/10.7.2002, 5/2, ex *Agaricus bitorquis*.

New record: M38: 9.6.2008, 1/0, ex *Phallus impudicus*.

This is a saprophagous species reported from many species of fungi as well as from other decaying material. From *Agaricus bitorquis* reported by Dely-Draskovits & Babos (1993).

Fannia lepida (Wiedemann, 1817)

Published record (Ševčík 2004c): S12: 22.8.2001/11.9.2001, 1/0, ex *Leccinum quercinum*.

According to Rozkošný et al. (1997) it is a saprophagous forest species, which develops also in fungi. It is included in the survey by Jakovlev (1994) under the name *Fannia mutica* (Zett.), but without any concrete species of fungi. This is probably the only record from a named fungus.

Fannia monilis (Haliday, 1838)

Published records (Ševčík 2004c): S12: 21.8.2001/9.-15.9.2001, 3/2, ex *Hydnum repandum*; S12: 22.8.2001/11.9.2001, 0/1, ex *Leccinum quercinum*.

New records: M36: 24.9.2009/10.-15.12.2009, 1/5, ex *Meripilus giganteus*; 16.9.2010/24.9.-1.10.2010, 0/2, ex *M. giganteus*. S9: 23.8.2007/14.-15.9.2007, 2/4, ex *Polyporus squamosus*.

This species is recorded from 7 different species of fungi by Jakovlev (1994) and Rozkošný et al. (1997). It was also found in nests of birds and decaying plant material.

Fannia umbrosa (Stein, 1895)

Published record (Ševčík 2004b): M66: 14.6.2003/24.-31.7.2003, 7/3, ex *Trametes versicolor*.

Larvae of this species have been found in decaying fallen leaves of oak, under the bark of ash and sap of oaks (Rozkošný et al. 1997). This is the only record from fungi.

Piezura graminicola (Zetterstedt, 1846)

= *Piezura boletorum* (Rondani, 1866)

New record: M66: 14.7.2008, 1/0, ex *Psathyrella candolleana*.

An uncommon Holarctic species. It has already been recorded from *Psathyrella candolleana* (see Rozkošný et al. 1997).

Muscidae

A familiar group of medium sized to large robust flies, grey to black coloured. A total of 562 species are known to occur in Europe, 301 of them have been found in the Czech Republic and 251 in Slovakia (Gregor & Rozkošný 2009b). Larvae of several species are saprophagous, developing in various decaying matter, but the majority of larvae are facultative or obligatory

carnivores in a wide range of different habitats (under bark and in rotten wood, in soil, fungi, decaying plant remains, dung and human faeces). Gregor et al. (2002) summarized the morphology of adults, development and biology, diagnostic characters and distribution of all Central European species. Nine species have been reared from fungi within the present study.

***Muscina levida* (Harris, 1780)**

Published records (Ševčík 2001a, 2004b): M40: 9.7.2000/24.-28.7.2000, 1/1, ex *Russula amoenicolor*; M53: 29.5.1999/17.6.1999, 1/1, ex *Boletus reticulatus*; M65: 3.7.1999/19.7.1999, 1/0, ex *Leccinum carpini*. - M39: 17.6.2002/30.6.-8.7.2002, 3/1, ex *Agaricus bitorquis*; M55: 2.5.2002/30.5.2002, 1/0, ex *Morchella esculenta*.

New records: M1: 25.7.2008/7.-8.8.2008, 1/2, ex *Boletus legaliae*; M37: 7.7.2008, 1/1, ex *Mutinus ravenelii*.

A common mycosaprophagous and saprophagous species, known from many species of fungi, but it also develops in excrement, dead snails etc. Dely-Draskovits & Babos (1993) reared this fly (among other fungi) from *A. bitorquis* and from *Verpa bohemica* (related to *Morchella* species). According to Chandler (2010), Hackman & Meinander (1979) and other authors, at least the last larval instar of *Muscina*, *Mydaea* and *Phaonia* is carnivorous. The rare fungus *Mutinus ravenelii* is a new host record.

***Muscina stabulans* (Fallén, 1817)**

Published records (Ševčík 2001a, 2004b): M53: 17.5.1999/10.6.1999, 0/1, ex *Calocybe gambosa*; M39: 17.6.2002/30.6.2002, 0/1, ex *Agaricus bitorquis*.

A common coprophagous and predatory species, also known from many species of fungi.

***Mydaea corni* (Scopoli, 1763)**

Published records (Ševčík 2001a): M3: 24.7.1999/11.8.1999, 1/0, ex *Russula nigricans*; M59: 1.8.1999/22.8.1999, 0/1, ex *Russula luteotacta*; M29: 17.9.1999/14.10.1999, 0/1, ex *Lactarius deterrimus*.

It is interesting that only *Lactarius* and *Russula* are reported as host fungi of *Mydaea corni* by Jakovlev (1994) and this has been confirmed by the above records.

***Mydaea electa* (Zetterstedt, 1860)**

New record: M36: 24.9.2009/10.-15.12.2009, 0/1, ex *Meripilus giganteus*.

This species is recorded from many species of fungi by Jakovlev (1994) but mainly Boletales and Agaricales. This is the first record from a lignicolous fungus.

***Mydaea humeralis* Robineau-Desvoidy, 1830**

Published record (Ševčík 2001a): M59: 1.8.1999/22.8.1999, 1/0, ex *Russula luteotacta*; M65: 3.7.1999/27.8.1999, 1/0, ex *Russula grisea*. S20: 26.9.1999/28.10.1999, 0/1, ex *Lyophyllum loricatum*.

This species is known from more than 100 species of fungi (Jakovlev 1994).

***Mydaea nubila* Stein, 1916**

Published record (Ševčík 2004b): M41: 22.6.2003/17.7.2003, 1/0, ex *Pleurotus pulmonarius*.

The biology of this species has not previously been recorded (cf. Gregor et al. 2002).

***Mydaea setifemur* Ringdahl, 1924**

New record: M66: 14.7.2008, 0/2, ex *Psathyrella candolleana*.

A rather common Eurosiberian species. It is known to develop in many agarics (see Jakovlev 1994) but *Psathyrella candolleana* is a new host record.

***Phaonia pallida* (Fabricius, 1787)**

Published record (Ševčík 2001a, 2004b): M21: 11.8.2000/10.9.2000, 0/1, ex *Clitocybe nebularis*; M41: 6.7.2003/23.-24.7.2003, 1/1, ex *Xerula radicata*.

This species was previously recorded from *Clitocybe inversa* and *Amanita rubescens* (cf. Jakovlev 1994).

***Phaonia rufiventris* (Scopoli, 1763)**

Published record (Ševčík 2001a): M54: 7.11.1998/9.12.1998, 1/0, ex *Merulius tremellosus*.

This species was reared from several lignicolous fungi (Jakovlev 1994), also found under the bark of trees (Chandler 2010).

***Phaonia subventa* (Harris, 1780)**

Published record (Ševčík 2004b): M52: 26.10.2003/3.12.2003, 1/0, ex *Armillaria gallica*.

New record: M32: 18.9.2009/31.10.2009, 1/0, ex *Sparassis crispa*.

This species has been reared from many species of fungi (Jakovlev 1994), including *Armillaria* (cf. Buxton 1961). *S. crispa* is a new host record.

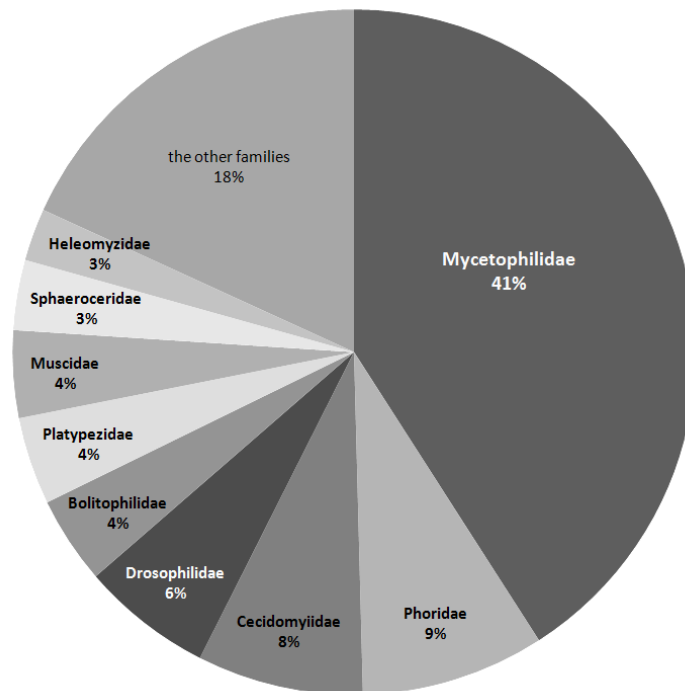


Fig. 31: The nine most frequent families of Diptera associated with fungi account for 82 % of species recorded in this study.

Tab. 1 - Numbers of Palaearctic species of Diptera in particular families recorded to develop in fungi

No.	Family	No. of spp. recorded in the literature (Jakovlev 1994)	No. of spp. recorded in this study (1998–2010)
1	Trichoceridae	5	2
2	Limoniidae	17	4
3	Pediciidae	5	3
4	Bolitophilidae	24	10
5	Ditomyiidae	6	1
6	Keroplastidae	21	2
7	Mycetophilidae	252	99
8	Sciaridae	33	2
9	Cecidomyiidae	51	19
10	Psychodidae	3	4
11	Anisopodidae	2	1
12	Scatopsidae	4	3
13	Chironomidae	5	1
14	Ceratopogonidae	11	4
15	Hybotidae	2	1
16	Platypezidae	17	10
17	Phoridae	42	21
18	Syrphidae	4	1
19	Lonchaeidae	3	2
20	Asteiidae	3	2
21	Chloropidae	7	4
22	Heleomyzidae	25	6
23	Sphaeroceridae	20	8
24	Drosophilidae	27	15
25	Anthomyiidae	37	2
26	Fanniidae	13	5
27	Muscidae	25	10
	Total	660	242

5.2 Species composition of Diptera communities associated with fungi

Two-winged insects (Diptera), with more than 150 000 described species in the world, represent the second most species-rich order of organisms in our planet (more than 10 % of all known species), after beetles (Coleoptera) with some 350 000 described species. Some 45 000 species of Diptera are known from the Palaearctic Region (Pape et al. 2009) and more than 8800 species in 111 families have hitherto been recorded from the Czech and Slovak Republics (Jedlička et al. 2009), representing the most species-rich insect order in these countries.

Altogether 242 species of 27 families of Diptera have been reared from fungi by the present author. Numbers of species in particular families of Diptera reared from fungi within this study and comparison with literature data are given in **Tab. 1**. The majority of species belong to the family Mycetophilidae (99 species), followed by the families Phoridae (21 spp.), Cecidomyiidae (19 spp.), Drosophilidae (15 spp.), Bolitophilidae (10 spp.), Platypezidae (10 spp.), Muscidae (10 spp.), Sphaeroceridae (8 spp.) and Heleomyzidae (6 spp.), see **Fig. 31**. The other families were represented by 5 or less species. Comparing with the literature data summarized by Jakovlev (1994), relatively few species have been recorded in the families Keroplatidae, Sciaridae, Heleomyzidae, Sphaeroceridae and Anthomyiidae. Members of the families Sciaridae and Sphaeroceridae are not typical mycobionts, they are rather mycosaprophagous, so that they possibly colonize the fungus relatively late, during the decaying process, and thus many of the species have simply not been present in the fruit bodies when collected relatively fresh. Concerning the families Heleomyzidae and Anthomyiidae, the low number of species is probably caused by the unequal choice of fungi collected by the author, who focused the attention primarily on fungi containing the larvae of Mycetophilidae and also to lignicolous fungi, which have so far been less studied than the terrestrial agarics.

Fifteen families recorded from fungi by Jakovlev (1994) have not been recorded during this study at all (Tipulidae, Diadocidiidae, Rhagionidae, Stratiomyidae, Scenopinidae, Dolichopodidae, Platystomatidae, Dryomyzidae, Sepsidae, Lauxaniidae, Piophilidae, Anthomyzidae, Carnidae, Ephydriidae and Scathophagidae). All these families contain only a few mycophagous species and they are reared from fungi only exceptionally.

As a rule, flies of at least two different families of Diptera emerged from one sample of fungi. Small species usually emerge first (e.g. Psychodidae), followed by the larger specimens (e.g. Pediciidae, Muscidae). There are even differences within one family, e.g. in Mycetophilidae smaller species develop relatively quickly (e.g. *Cordyla* spp.) and larger ones may take longer (e.g. *Allodiopsis* spp.).

5.3 Habitats of fungicolous Diptera

Habitat selection of fungicolous Diptera depends primarily on the occurrence of host fungi, especially in oligophagous species, which follow the distribution of their host. For example, members of the mycetophilid genus *Brachypeza* develop in *Pleurotus* spp., which grows mainly in beech forests. Similarly the gall midge species *Camptodiplosis auriculariae* occurs in localities with *Sambucus nigra*, on which its host fungus grows. On the other hand, polyphagous species, such as *Drosophila phalerata* or *Mycetophila fungorum*, occur in a wide range of habitat types. The distribution of mycophagous Diptera is, however, influenced also by the climate, elevation and other ecological factors at the locality. The same fungus species may host different insect species in temperate lowland forest than in extreme peat-bog in high mountains. Some of the species supposed to be associated with fungi are sometimes reared from other material, e.g. grass tussocks (see Ševčík & Roháček 2008).

Specific Diptera communities occur in artificial, man-made habitats, such as recultivated mine dumps (Fig. 32-33), metallurgical dumps, town parks and pond dams. They are often situated in the centre of an industrial town, surrounded by factories or busy communications and affected by atmospheric pollution. The first results from recultivated mine dumps in Ostrava, a relatively large industrial town with some 300 000 inhabitants, indicate that several rare species penetrated to these specific ecosystems. Three species of Diptera new to science (*Allodiopsis gracai* and 2 spp. of *Megaselia*) have been recently discovered in two coal mine dumps with different stages of succession in the city of Ostrava. The communities of fungi on these sites are very unusual and comprise some rare and interesting species (cf. Holec et al. 2003). Some of these dumps are still burning and form unique habitats with specific environmental conditions. Also dams of ponds in the surroundings of Ostrava represent very suitable habitat for several rare fungi, e.g. *Boletus impolitus* and *Russula luteotacta*.

5.4 Host specialisation

5.4.1 Oligophagous and monophagous species

Most of the Diptera species recorded in the present study can be classified as oligophagous, restricted to a particular group of fungi. Typical examples of this are members of the families Bolitophilidae, Ditomyiidae and Platypezidae. The common fungus gnat *Bolitophila cinerea* is associated with *Hypholoma* and *Pholiota*, although it was several times reared also from other lignicolous agarics, such as *Armillaria*. *Bolitophila occlusa* is specific to *Postia* polypores. *Ditomyia fasciata* was reared from a number of fungus species, but all of them are polypores. Also *Ula bolitophila* (Pediidae), *Camptodiplosis boleti* (Cecidomyiidae) and *Mycodrosophila poecilogastra* (Drosophilidae) appear to be restricted to polypores. Several species of scuttle flies (Phoridae) may be also classified as oligophagous, e.g. *Megaselia sevciki* (specific to Lycoperdaceae) or *M. hirtiventris* and *M. nigra* (both prefer *Agaricus* spp.). *Cheilosia scutellata* (Syrphidae) develops almost exclusively in Boletales (*Boletus*, *Leccinum*, *Paxillus*, *Suillus*). Several species of fungus gnats (Mycetophilidae), e.g. *Mycetophila adumbrata* and *Platurocypta testata*, develop only in slime moulds (Mycetozoa, or Myxomycetes).

Some of the flies associated with fungi can be considered as monophagous, specialized on one species of fungus, e.g. *Bolitophila rectangulata* (Bolitophilidae) on the polypore *Laetiporus sulphureus*, the platypezids *Agathomyia antennata* on *Bjerkandera adusta*, *Bolopus furcatus*

on *Polyporus squamosus*, *Polyporivora ornata* on *Trametes versicolor*. Other examples of apparently monophagous species are *Camptodiplosis auriculariae* (Cecidomyiidae) and *Hirtodrosophila lundstroemi* (Drosophilidae), both specific to *Auricularia auricula-judae*. *Mycetophila trinotata* (Mycetophilidae) and *Winnertzia lugubris* (Cecidomyiidae) appear to be restricted to the polypore *Bjerkandera adusta*. In all these cases the host of the monophagous consumer is a widely distributed and common fungus. At least two species of fungus gnats (Mycetophilidae), *Phronia siebeckii* and *Trichonta icenica*, are regularly associated with *Calocera viscosa*, suggesting a possible monophagy. Similarly *Allodia barbata*, *A. foliifera* and *A. silvatica* (Mycetophilidae) are specific to *Peziza* spp.

In some cases the monophagy is only a tentative assumption, until the rearings from the same fungus are repeated several times. This is the case, for example, of *Lindneromyia dorsalis* (Platyppezidae), traditionally considered restricted to *Agaricus*, where frequent rearings from other hosts suggest the tendency towards polyphagy (Chandler 2001) or *Mycetophila cingulum* (Mycetophilidae), long considered confined to *Polyporus squamosus* was proved to develop also in *Grifola frondosa*. On the other hand, the identity of the fly may sometimes be a problem and a wide range of fungus hosts recorded in the literature may be caused by possible misidentifications (e.g. *Bolitophila hybrida*, *Mycetophila ruficollis* group).

5.4.2 Polymycophagous and polyphagous species

Polyphagous species are usually found among groups of Diptera developing as larvae in decaying fungi (e.g. Anisopodidae, Psychodidae, Sphaeroceridae, Fanniidae). Most of them are saprophagous or sometimes predaceous (Muscidae) and usually have a wider range of larval habitats (Chandler, 2010, Krivosheina 2008).

Polymycophagous species are represented in this study mainly by *Mycetophila fungorum* (Mycetophilidae) recorded here from 46 species of fungi, followed by *Drosophila phalerata* (Drosophilidae, 26 spp. of host fungi), *Culicoides scoticus* (Ceratopogonidae, 23 spp. of host fungi), *Ula sylvatica* and *Ula mollissima* (both Pediciidae, 22 and 20 host fungi respectively), *Allodia ornaticollis* and *Exechia fusca* (both Mycetophilidae, with 20 and 24 host fungi respectively) and *Spelobia parapusio* (Sphaeroceridae, 19 spp. of host fungi).

5.5 Attractiveness of poisonous and edible fungi to insects

There are almost 100 000 described species of fungi in the world (Kirk et al. 2008) and only a minor part of them can be considered as poisonous or edible to humans. The fungi poisonous for humans are usually used normally as larval food by insects. Many of the poisonous species of *Amanita*, such as *A. pantherina* and *A. muscaria*, are regularly infested mainly by mycetophilid larvae, especially the polyphagous *Cordyla brevicornis*, *Allodia ornaticollis* and *Mycetophila fungorum*. The fresh fruiting bodies of the strongly poisonous *Amanita phalloides* are apparently less attractive for insects than are other *Amanita* species, but decaying fruit bodies are sometimes infested by Drosophilidae and Psychodidae. Hackman & Meinander (1979) stated that 13 species of Diptera were reared from *A. phalloides* by various authors.

The hallucinogenic *Psilocybe bohemica* has been proved to be normally consumed by insect larvae, e.g. the polyphagous fungus gnat *Exechia fusca*. This applies also to other fungi considered as hallucinogenic, e.g. *Panaeolus sphinctrinus* or *Stropharia squamosa*. Also *Marasmius alliaceus* with strong garlic smell often hosts insect larvae, e.g. *Allodia ornaticollis*.



Figs 32-33: Mine dumps in various stages of succession represent suitable habitat for fungicolous Diptera. **32** – view from the top of the central heap of the mine dump “Ema” in the centre of Ostrava; **33** – view from the mine dump “Zárubek”.

Some other non-poisonous fungi are, however, strictly avoided by insects. For example *Tylopilus felleus*, the common bolete with sour taste, has never been seen infested by larvae, as pointed out already by Hackman & Meinander (1979). Also *Paxillus atrotomentosus* or the polypore *Daedalea quercina* are usually avoided by insects. Interestingly, soft fresh fruiting bodies of *Piptoporus betulinus* are not very attractive to Diptera although it is preferred by some beetles, and one species of fungus gnat, *Mycetophila forcipata*, is specific to it. Even several edible and tasty species for humans are not attractive for Diptera and other insects. For example, most species of *Agaricus* are rarely infested by larvae and then usually by Phoridae or Platypezidae (never by fungus gnats). Also some genera of Ascomycetes (*Morchella*, *Helvella*) and Gasteromycetes (*Lycoperdon*) are rarely used as food by insect larvae. The common stinkhorn (*Phallus impudicus*) attracts flies mainly by its strong smell but otherwise only a few species of Diptera develop inside its fruit bodies (cf. Driessen et al. 1990, Nielsen 1963, Smith 1956)

5.6 Most attractive groups of fungi

Species principally belonging to the families Polyporaceae, Tricholomataceae, Boletaceae and Russulaceae comprise the most attractive fungi for Diptera. The following species and genera of fungi were the most attractive for insects during this study (see **Fig. 34**): 27 species from 10 families have been reared from *Meripilus giganteus*, 23 spp. from 10 families of Diptera from *Pleurotus pulmonarius* or *P. ostreatus*, 18 spp. of Diptera belonging to 13 families were reared from *Bjerkandera adusta*, 16 spp. of Diptera belonging to 8 families were reared from *Royoporus badius*, 14 spp. of Diptera from 10 families from *Armillaria* spp., 12 spp. belonging to 8 families from *Polyporus squamosus*, 12 spp. belonging to 7 families from *Pluteus cervinus*, 14 species from 7 families were associated with various species of *Amanita* and 31 species from 9 families were reared from various species of *Russula*.

5.7 Parasitoids reared

Hymenoptera: Braconidae: Alysiinae

Aspilota caudata Thomson, 1895

Published records (Ševčík 2001a): B2: 28.7.2000/17.-18.8.2000, 1/1, ex *Boletus edulis*, reared together with *Megaselia lata* (Phoridae); M21: 11.8.2000/5.9.2000, 0/1, ex *Amanita muscaria*, reared together with *Megaselia lata* (Phoridae) and *Mycetophila fungorum* (Mycetophilidae).

In this case it was confirmed that the host of this braconid was a fly of the genus *Megaselia*. The author dissected several puparia of *Megaselia lata* from the first sample and found a developing braconid inside one of them.



Fig 34: Lignicolous fungi belong to the most attractive species of fungi to Diptera. From left to right: *Pleurotus pulmonarius*, *Laetiporus sulphureus*, *Bjerkandera adusta* (photo V. Balner), *Royoporus badius* and *Meripilus giganteus* (photo J. Roháček).

***Orthostigma longicorne* Königsmann, 1969**

Published record (Ševčík 2006a): M53: 16.6.1999/12.7.1999, 1/1, ex *Boletus impolitus*, reared together with *Cordyla brevicornis* and *Mycetophila fungorum* (Mycetophilidae).

Although no adult specimen of Phoridae emerged, the occurrence of the larvae of *Megaselia* is not excluded. It is, however, possible that mycetophilids were the hosts.

***Orthostigma pumilum* (Nees, 1834)**

Published record (Ševčík 2006a): M23: 25.7.2000/28.8.2000, 1/1, ex *Boletus edulis*, reared together with *Megaselia lata* (Phoridae) and *Cordyla brevicornis* (Mycetophilidae).

One puparium of *Megaselia* with developing braconid inside was dissected to confirm the host. Members of the genus *Orthostigma* have already been recorded as the parasitoids of *Megaselia* (cf. Disney 1994).

***Orthostigma sculpturatum* Tobias, 1962**

Published record (Ševčík 2001a): M59: 25.8.1999/15.-17.9.1999, 9/0, ex *Leccinum scabrum*, reared together with *Megaselia flavicans* (Phoridae) and *Allodia grata* (Mycetophilidae).

Considering the size of the larvae, *Megaselia* was most probably the host of this braconid.

***Synaldis globipes* Fischer, 1962**

Published record (Ševčík 2001a): M21: 11.8.2000/5.9.2000, 0/1, ex *Amanita muscaria*, reared together with *Megaselia lata* (Phoridae) and *Mycetophila fungorum* (Mycetophilidae).

This small braconid wasp developed most probably in *Megaselia* larvae, which are of similar size. Jakovlev & Tobias (1992) described a new species of *Synaldis* reared from two species of *Russula* together with *Megaselia rubella* and *Chodopsycha lobata*.

Hymenoptera: Cynipoidea: Eucoilidae

***Kleidotoma formicaria* (Kieffer, 1902)**

Published record (Ševčík 2001a): M65: 30.5.1999/29.6.-2.7.1999, 1/1, ex *Pluteus atricapillus*, reared together with *Chodopsycha buxtoni* (Psychodidae), *Hirtodrosophila confusa* (Drosophilidae), *Spelobia parapasio* (Sphaeroceridae) and *Allodia grata* (Mycetophilidae).

***Kleidotoma bicolor* (Kieffer, 1902)**

Published record (Ševčík 2001a): M65: 30.5.1999/29.6.-2.7.1999, 1/1, ex *Pluteus atricapillus*, the same possible hosts as above.

The real host of both these parasitoid species is not clear from the above mentioned records. According to J. Macek (pers. comm.), usual hosts of *Kleidotoma* are acalyptrate Diptera.

Hymenoptera: Diapriidae

Only a part of the material has been identified. Some of the specimens require further study or represent undescribed species.

Aclista alticollis (Thompson, 1858)

Published record (Ševčík 2006a): M40: 3/99: 24.4.1999/9.5.1999, 1/0, ex *Allodia ornaticollis* (Mycetophilidae) in *Cortinarius romagnesii*.

A common European species. *Allodia ornaticollis* remains the only reliably known host of this species.

Aclista cantiana (Curtis, 1831)

Published records (Ševčík 2006a): M44: 22.5.1999/5.-9.6.1999, 4/1, ex *Allodia grata* (Mycetophilidae) in *Calocybe gambosa*; M53: 16.6.1999/12.7.1999, 1/1, ex *Cordyla brevicornis* and *Mycetophila fungorum* (Mycetophilidae) in *Boletus impolitus*.

Another common species. Mycetophilids are hosts also of this species.

Aclista modesta (Kieffer, 1909)

Published record (Ševčík 2006a): S13: 15.10.2001/23.11.2001, 1/0, ex *Bolitophila pseudohybrida* (Bolitophilidae) and *Allodiopsis domestica* (Mycetophilidae) in *Lepista nuda*.

This species is known from the Czech Republic, Germany and Slovakia. These are its only known hosts.

Cinetus cameroni Kieffer, 1910

New record: M33: 14.10.2010, 0/1, ex *Exechia fusca* (Mycetophilidae) in *Armillaria ostoyae*.

A European species with hitherto unknown hosts.

Cinetus fuscipes Kieffer, 1907

New record: M38: 17.9.2007/ 1.-10.10.2007, 0/2, ex *Mycetophila dentata*, *M. luctuosa* (Mycetophilidae) and *Seri obsuripennis* (Platypezidae) in *Royoporus badius*.

A little-known European species, hitherto not reported from the Czech Republic. It was not, however, confirmed which of the above species was its real host.

Cinetus piceus Thompson, 1859

Published record (Ševčík 2006a): S12: 24.8.2001/20.-21.9.2001, 1/1, ex *Mycetophila alea* (Mycetophilidae) in *Russula nigricans*.

New record: M38: 17.9.2007/ 1.-10.10.2007, 1/0, ex *Mycetophila dentata*, *M. luctuosa* (Mycetophilidae) and *Seri obsuripennis* (Platypezidae) in *Royoporus badius*.

A rather common European species. This is a confirmation of *Mycetophila* spp. as its hosts.

Miota acuminata (Zetterstedt, 1840)

New record: M38: 17.9.2007/ 1.-10.10.2007, 0/1, ex *Mycetophila dentata*, *M. luctuosa* (Mycetophilidae) and *Seri obsuripennis* (Platypezidae) in *Royoporus badius*.

A rather common European species. Its hosts have been unknown up to the present.

***Scorpioteleia compressa* (Kieffer, 1910)**

Published records (Laštovka 1971, Ševčík 2006a): M3: 8.8.1998/24.8.1998, 0/1, ex *Mycetophila fungorum* (Mycetophilidae) in *Russula lepida*; M67: 27.6.1999/16.-18.7.1999, 4/10, ex *Mycetophila fungorum* in *Boletus chrysenteron*; M43: 4.6.2000/25.-27.6.2000, 0/3, ex *Mycetophila fungorum* in *Psathyrella candolleana*.

New records:

The above records clearly show that *Mycetophila fungorum* is the host of this parasitoid. It is, however, the only one from the five European species of *Scorpioteleia* in which host insect is known (Macek 2006).

Hymenoptera: Proctotrupidae

***Cryptoserphus aculeator* (Haliday, 1839)**

Published records (Laštovka 1971, Ševčík 2006a): *Mycetophila ichneumonea* (Mycetophilidae) in *Lactarius rufus*. M65: 27.7.1998/9.8.1998, 2/0, ex *Allodia grata* (Mycetophilidae) in *Pluteus* sp.

New record: S4: 6.9.2008/23.9.2008, 0/1, ex *Allodia barbata* (Mycetophilidae) in *Peziza badia*.

A rather common Palaearctic species. The new record confirms the Mycetophilidae as its hosts.

***Cryptoserphus flavipes* (Provancher, 1881)**

Published records (Ševčík 2006a): M40: 30.7.2000/17.-20.7.2000, 1/2, ex *Mycetophila fungorum* (Mycetophilidae) in *Suillus granulatus*; M29: 17.9.2000/8.10.2000, 2/1, ex *Mycetophila fungorum* in *Boletus calopus*.

An uncommon European species. It apparently develops in *Mycetophila fungorum* larvae.

***Cryptoserphus longitarsis* (Thompson, 1858)**

New records: M3: 8.8.1998/24.8.1998, 0/2, ex *Mycetophila fungorum* (Mycetophilidae) in *Russula lepida*; M29: 17.9.2000/28.9.2000, 1/0, ex *Mycetophila fungorum* in *Amanita spissa*.

A common species, known from Central and Northern Europe.

Hymenoptera: Ichneumonidae

Šedivý & Ševčík (2003) summarized data about the ichneumonid parasitoids of fungus gnats from the years 1998–2000. They identified 21 species of ichneumonids belonging to 9 genera and ascertained the degree of parasitism as 25 %. This means that on average every fourth sample with mycetophilids was parasitised by ichneumonids. Numerous specimens reared in 2001–2010 have not yet been identified.

***Hyperacmus crassicornis* Förster, 1871**

Published host (Šedivý & Ševčík 2003): *Sciophila varia* in *Hydnum repandum*.

This is the only known host of this parasitoid.

***Aniseres palipes* Förster, 1871**

Published hosts (Šedivý & Ševčík 2003): *Mycetophila fungorum* in *Entoloma nidorosum*; *Mycetophila ruficollis* group in *Lactarius* sp.

Kolarov & Bechev (1995) recorded this ichneumonid species from *Mycetophila fungorum* and *Mycetophila forcipata*.

***Aperileptus albipalpus* Gravenhorst, 1829**

Published host (Šedivý & Ševčík 2003): *Mycetophila alea* in *Russula nigricans*.

Laštovka (1971) reared this ichneumonid from *Mycetophila fungorum*. *Mycetophila alea* (= *M. guttata* Dziedzicki, 1884) was recorded as the host of *A. albipalpus* by Thompson (1957).

***Aperileptus microspilus* Förster, 1871**

Published host (Šedivý & Ševčík 2003): *Mycetophila alea* in *Russula nigricans*.

This is the only known host of this parasitoid.

***Aperileptus plagiatus* Förster, 1871**

Published host (Šedivý & Ševčík 2003): *Mycetophila evanida* in *Russula luteotacta*.

This is the only known host of this parasitoid.

***Aperileptus viduatus* Förster, 1871**

Published host (Šedivý & Ševčík 2003): *Exechia bicincta* in *Mycena galericulata*.

This is the only known host of this parasitoid.

***Entypoma robustum* Förster, 1871**

Published host (Šedivý & Ševčík 2003): *Mycetophila fungorum* in *Pluteus cervinus*.

Kolarov & Bechev (1995) also recorded *Mycetophila alea* as a host.

***Entypoma suspiciosum* Förster, 1871**

Published hosts (Šedivý & Ševčík 2003): *Mycetophila* sp. (probably *M. cingulum*, adults have not been reared, only larvae studied) in *Polyporus squamosus*; *Allodia ornaticollis* and *Exechia spinuligera* in *Cortinarius romagnesii*.

These are the only known hosts of this parasitoid.

***Hemiphanes gravator* Förster, 1871**

Published hosts (Šedivý & Ševčík 2003): *Ditomyia fasciata*, *Mycetophila trinotata*, *Ula bolitophila*, *Agathomyia antennata* and *Megaselia frameata* in *Bjerkandera adusta*.

Bjerkandera adusta is one of the most attractive species of fungi for insects and this makes problems with the identification of the real host of this ichneumonid species. Considering the size of the adults of *Hemiphanes*, *M. trinotata* seems to be the most probable host.

***Orthocentrus asper* (Gravenhorst, 1829)**

Published host (Šedivý & Ševčík 2003): *Sciophila lutea* on *Russula luteotacta*.

Three other species of *Orthocentrus* have been recorded in the literature (Kolarov & Bechev 1995) as parasitoids of the genus *Sciophila*.

***Pantisarthrus luridus* Förster, 1871**

Published host (Šedivý & Ševčík 2003): *Cordyla nitidula* and *Cordyla fusca* in *Russula* sp.

There are no other reports about the biology of this ichneumonid species.

***Plectiscidea agitator* (Förster, 1871)**

Published host (Šedivý & Ševčík 2003): *Allodia grata* in *Pluteus* sp.

This is the only known host of this parasitoid.

***Plectiscidea canaliculata* (Förster, 1871)**

Published host (Šedivý & Ševčík 2003): *Allodia grata* in *Calocybe gambosa*.

This is the only known host of this parasitoid.

***Plectiscidea cinctula* (Förster, 1871)**

Published host (Šedivý & Ševčík 2003): *Allodia foliifera* in *Peziza micropus*.

This is the only known host of this parasitoid.

***Plectiscidea collaris* (Gravenhorst, 1829)**

Published hosts (Šedivý & Ševčík 2003): *Mycetophila fungorum*, *Exechia fusca* and *Allodia ornatcollis* in *Hebeloma crustuliniforme*; *Mycetophila fungorum* in *Entoloma nidorosum*.

These are the only known hosts of this parasitoid.

***Plectiscidea deterior* (Förster, 1871)**

Published host (Šedivý & Ševčík 2003): *Allodiopsis* sp. in *Clitocybe odora*.

This is the only known host of this parasitoid.

***Plectiscidea monticola* (Förster, 1871)**

Published host (Šedivý & Ševčík 2003): *Mycetophila* sp. (*ruficollis* group) in *Collybia confluens*.

This is the only known host of this parasitoid.

***Plectiscidea vagator* (Förster, 1871)**

Published hosts (Šedivý & Ševčík 2003): *Allodia ornatcollis* and *Exechia* sp. in *Mycena pura*.

This is the only known host of this parasitoid.

***Proclitus paganus* (Haliday in Curtis, 1838)**

Published hosts (Šedivý & Ševčík 2003): *Allodia zaitzevi* and *Cordyla fusca* in *Russula* sp.

Bolitophila glabrata Loew, 1869 was recorded as the host by Kolarov & Bechev (1995).

***Proclitus praetor* (Haliday in Curtis, 1838)**

Published hosts (Šedivý & Ševčík 2003): *Mycetophila fungorum* in *Russula* sp.; *Mycetophila fungorum* and *Allodia ornatcollis* in *Psathyrella candolleana*; *Mycetophila finlandica* in *Tricholomopsis decora*; *Mycetophila ornata* in *Bondarzewia montana*.

This ichneumonid species is probably common. Its hosts are, however, little known. Preference for larger species of *Mycetophila* is apparent from the above records.

***Proclitus subsulcatus* Förster, 1871**

Published hosts (Šedivý & Ševčík 2003): *Mycetophila fungorum*, *Cordyla nitidula* and *Ula sylvatica* in *Russula cyanoxantha*.

This is the only known host of this parasitoid.



Figs 35-37: Habitats of fungicolous Diptera. **35** – dam of pond in Studénka (M60); **36** – beech forest in Hrončecký grůň (S9, photo J. Roháček); **37** – spruce forest in Bílá (M29).

5.8 Systematic list of fungi and myxomycetes examined with associated Diptera species

(the system follows www.indexfungorum.org and Kirk et al. 2008)

FUNGI

Phylum ASCOMYCOTA

Discinaceae

Gyromitra fastigiata (Krombh.) Rehm

Phoridae: *Megaselia flavicans*; Drosophilidae: *Drosophila transversa*.

Helotiaceae

Ascocoryne sarcoides (Jacq.) J.W. Groves & D.E. Wilson

Mycetophilidae: *Anatella lenis*.

Helvellaceae

Helvella crispa (Scop.) Fr.

Mycetophilidae: *Allodia neglecta*.

Hypocreaceae

Podostroma alutaceum (Pers.) G.F. Atk.

Mycetophilidae: *Rymosia placida*; Ceratopogonidae: *Forcipomyia nigra*.

Morchellaceae

Morchella esculenta (L.) Pers.

Phoridae: *Megaselia flavicans*; Drosophilidae: *Drosophila transversa*; Muscidae: *Muscina levida*.

Mitrophora semilibera (DC.) Lév.

Phoridae: *Megaselia flavicans*; Drosophilidae: *Drosophila transversa*.

Verpa bohemica (Krombh.) J. Schröt. / = *Ptychoverpa bohemica* (Krombh.) Boud. /
Mycetophilidae: *Docosia gilvipes*; Drosophilidae: *Drosophila transversa*.

Pezizaceae

Peziza badia Pers.

Mycetophilidae: *Sciophila lutea*, *Docosia gilvipes*, *Allodia barbata*, *Allodia silvatica*;
Psychodidae: *Chodopsycha lobata*.

Peziza micropus Pers.

Pediciidae: *Ula bolitophila* Mycetophilidae: *Allodia barbata*, *Allodia foliifera*.

Pyronemataceae

Otidea alutacea (Pers.) Masee

Mycetophilidae: *Leia bimaculata*.

Xylariaceae

Kretzschmaria deusta (Hoffm.) P.M.D. Martin /= *Ustulina deusta* (Hoffm.) Lindl/

Drosophilidae: *Leucophenga maculata*.

Xylaria polymorpha (Pers.) Grev.

Mycetophilidae: *Sciophila buxtoni*.

Phylum BASIDIOMYCOTA

Class TREMELLOMYCETES

Order TREMELLALES

Exidiaceae

Pseudohydnum gelatinosum (Scop.) P. Karst.

Pediciidae: *Ula sylvatica*; Mycetophilidae: *Trichonta* sp.

Class DACRYMYCETES

Order **DACRYMYCETALES**

Dacrymycetaceae

Calocera viscosa (Pers.) Fr.

Mycetophilidae: *Phronia siebeckii*, *Trichonta icenica*.

Class AGARICOMYCETES

Order **AURICULARIALES**

Auriculariaceae

Auricularia auricula-judae (Fr.) Quél.

Mycetophilidae: *Sciophila plurisetosa*; Cecidomyiidae: *Camptodiplosis auriculariae*, *Peromyia fungicola*; Drosophilidae: *Hirtodrosophila lundstroemi*.

Order **POLYPORALES**

Ganodermataceae

Ganoderma applanatum (Pers.) Pat.

Cecidomyiidae: *Lestodiplosis polypori*; Platypezidae: *Agathomyia wankowiczii* (Schnabl, 1884) - galls common on the lower side of the fruit bodies, but no successful rearing of adults by the author until now.

Meruliaceae

Merulius tremellosus Schrad. != *Phlebia tremellosa* (Schrad.) Nakasone et Burds. /

Limoniidae: *Achyrolimonia decemmaculata*; Sciaridae: *Scatopsciara neglecta*; Muscidae: *Phaonia rufiventris*.

Schizophyllaceae

Schizophyllum commune Fr.

Cecidomyiidae: *Cecidomyiinae* gen. sp.; Drosophilidae: *Mycodrosophila poecilogastra*.

Steccherinaceae

Antrodiella romellii (Donk) Niemelä

Cecidomyiidae: *Lestodiplosis polypori*.

Fomitopsidaceae

Fomitopsis pinicola (Sw.) P. Karst.

Mycetophilidae: *Mycetophila attonsa*, *Mycetophila laeta*, *Sciophila buxtoni*.

Kula et al. (1999) reported 35 species of beetles (Coleoptera) from this and the following fungus, including accidentally occurring species, as well as several hymenopteran parasitoids and tineid moths.

Piptoporus betulinus (Bull.) P. Karst.

Mycetophilidae: *Dynatosoma fuscicorne*, *Mycetophila forcipata*.

Postia caesia (Schrad.) P. Karst. / = *Oligoporus caesius* Gilb. et Ryvarden /

Pediciidae: *Ula bolitophila*, *Ula sylvatica*; Bolitophilidae: *Bolitophila oclusa*; Mycetophilidae: *Dynatosoma fuscicorne*.

Postia stiptica (Pers.) Jülich / = *Oligoporus stipticus* (Pers.) Gilb. et Ryvarden /

Cecidomyiidae: *Lestodiplosis polypori*.

Postia tephroleuca (Fr.) Jülich / = *Oligoporus tephroleucus* (Fr.) Gilb. et Ryvarden /

Bolitophilidae: *Bolitophila oclusa*.

Postia undosa (Peck) Jülich / = *Oligoporus undosus* (Peck) Gilb. & Ryvarden /

Mycetophilidae: *Mycetophila ostentanea*.

Hapalopilaceae

Bjerkandera adusta (Willd.) P. Karst.

Limoniidae: *Metalimnobia quadrimaculata*, *Achyrolimonia decemmaculata*; Pediciidae: *Ula bolitophila*; Ditomyiidae: *Ditomyia fasciata*; Mycetophilidae: *Dynatosoma fuscicorne*, *Mycetophila trinotata*; Sciaridae: *Lycoriella ingenua*; Cecidomyiidae: *Lestodiplosis polypori*, *Winnertzia lugubris*; Ceratopogonidae: *Culicoides scoticus*; Hybotidae: *Ocydromia glabricula*; Platypezidae: *Agathomyia antennata*; Phoridae: *Megaselia frameata*; Lonchaeidae: *Lonchaea contigua*; Chloropidae: *Gaurax fascipes*, *Tricimba cincta*; Drosophilidae: *Drosophila testacea*, *Mycodrosophila poecilogastra*.

Several species of beetles and other insects associated with this fungus were recently recorded by Ševčík & Čapek (2003) and Šedivý & Ševčík (2003).

***Climacocystis borealis* (Fr.) Kotl. & Pouzar**

Pediciidae: *Ula bolitophila*, *Ula mollissima*; Ditomyiidae: *Ditomyia fasciata*; Mycetophilidae: *Dynatosoma fuscicorne*; Ceratopogonidae: *Culicoides scoticus*; Cecidomyiidae: *Camptodiplosis boleti*.

***Hapalopilus nidulans* (Fr.) P. Karst. /= *Hapalopilus rutilans* (Pers.) P. Karst./**

Keroplastidae: *Keroplastus testaceus*; Cecidomyiidae: *Lestodiplosis polypori*.

Meripilaceae

***Abortiporus biennis* (Bull.) Singer**

Limoniidae: *Metalimnobia quadrimaculata*; Ditomyiidae: *Ditomyia fasciata*; Drosophilidae: *Leucopenga maculata*, *Mycodrosophila poecilogastra*.

***Grifola frondosa* (Dicks.) Gray**

Pediciidae: *Ula mollissima*; Mycetophilidae: *Mycetophila cingulum*; Cecidomyiidae: *Camptodiplosis boleti*.

***Meripilus giganteus* (Pers.) P. Karst.**

Ditomyiidae: *Ditomyia fasciata*; Mycetophilidae: *Mycetophila luctuosa*, *Mycetophila ornata*; Cecidomyiidae: *Camptodiplosis boleti*, *Lestodiplosis polypori*; Psychodidae: *Logima satchelli*; Scatopsidae: *Apiloscatopse flavicollis*, *Coboldia fuscipes*, *Scatopse notata*; Heleomyzidae: *Heleomyza captiosa*, *Tephrochlamys tarsalis*; Sphaeroceridae: *Apteromyia claviventris*, *Coproica vagans*, *Minilimosina parvula*, *Opalimosina czernyi*, *Opalimosina liliputana*, *Pullimosina heteroneura*, *Spelobia parapusio*, *Telomerina flavipes*; Drosophilidae: *Drosophila funebris*, *D. immigrans*, *D. phalerata*, *D. transversa*, *Hirtodrosophila confusa*, *Mycodrosophila poecilogastra*; Fanniidae: *Fannia monilis*; Muscidae: *Mydaea electa*.

***Rigidoporus sanguinolentus* (Alb. & Schwein.) Donk**

Limoniidae: *Achyrolimonia decemmaculata*; Drosophilidae: *Mycodrosophila poecilogastra*.

Albatrellaceae

***Albatrellus ovinus* (Schaeff.) Kotl. et Pouzar**

Pediciidae: *Ula mollissima*, *Ula sylvatica*; Mycetophilidae: *Exechia lundstroemi*; Psychodidae: *Chodopsycha lobata*; Ceratopogonidae: *Culicoides scoticus*; Phoridae: *Megaselia cinereifrons*; Sphaeroceridae: *Spelobia parapusio*.

***Albatrellus confluens* (Alb. et Schwein.) Kotl. et Pouzar**

Cecidomyiidae: *Lestodiplosis polypori*.

***Albatrellus cristatus* (Schaeff.) Kotl. & Pouzar**

Phoridae: *Megaselia frameata*.

Polyporaceae

***Daedaleopsis confragosa* (Bolton) J. Schröt.**

Limoniidae: *Achyrolimonia decemmaculata*; *Metalimnobia quadrimaculata*; Mycetophilidae: *Mycetophila sigmoides*; Drosophilidae: *Leucophenga maculata*.

***Datronia mollis* (Sommerf.) Donk**

Cecidomyiidae: *Lestodiplosis polypori*.

***Phaeolus schweinitzii* (Fr.) Pat.**

Limoniidae: *Achyrolimonia decemmaculata*.

***Pycnoporus cinnabarinus* (Jacq.) Fr.**

Cecidomyiidae: *Lestodiplosis polypori*.

***Tyromyces chioneus* (Fr.) P. Karst.**

Bolitophilidae: *Bolitophila occlusa*; Mycetophilidae: *Dynatosoma thoracicum* (= *norwegiense*), *Mycetophila mohilevensis*; Ceratopogonidae: *Forcipomyia nigra*.

***Trichaptum biforme* (Fr.) Ryvarden**

Chironomidae: *Bryophaenocladus* sp..

***Trametes gibbosa* (Pers.) Fr.**

Keroplastidae: *Keroplastus testaceus*; Cecidomyiidae: *Camptodiplosis boleti*, *Lestodiplosis polypori*.

Beetles of the family Ciidae frequently develop in this fungus as well as in the other species of *Trametes* (cf. Jelínek 1990).

***Trametes hirsuta* (Wulfen) Pilát**

Cecidomyiidae: *Lestodiplosis polypori*; Drosophilidae: *Leucophenga maculata*.

***Trametes trogii* Berk. / = *Funalia trogii* (Berk.) Bondartsev & Singer, 1941 /**

Limoniidae: *Metalimnobia quadrimaculata*; Drosophilidae: *Mycodrosophila poecilogastra*.

***Trametes versicolor* (L.) Lloyd**

Pediciidae: *Ula sylvatica*; Ditomyiidae: *Ditomyia fasciata*; Mycetophilidae: *Sciophila buxtoni*, *Rondaniella dimidiata*, *Dynatosoma fuscicorne*, *Mycetophila morosa*; Cecidomyiidae: *Lestodiplosis polypori*; Platypezidae: *Polyporivora ornata*; Chloropidae: *Tricimba albisetia*; Fanniidae: *Fannia umbrosa*.

***Fomes fomentarius* (L.) J.J. Kickx**

Mycetophilidae: *Sciophila rufa*.

Although many species of beetles and other insects have been recorded from this fungus (cf. Jelínek 1990, Kula et al. 1999), dipterous larvae are not common in this tough polypore.

***Laetiporus sulphureus* (Bull.) Murrill**

Pediciidae: *Ula bolitophila*; Bolitophilidae: *Bolitophila rectangularata*; Cecidomyiidae: *Camptodiplosis boleti*; Phoridae: *Megaselia frameata*; Sphaeroceridae: *Spelobia parapusio*.

***Lentinus tigrinus* (Bull.) Fr.**

Mycetophilidae: *Leia crucigera*, *Mycetophila fungorum*, *Mycetophila idonea*, *Mycetophila luctuosa*, *Mycetophila strigatoides*; Cecidomyiidae: *Camptodiplosis boleti*; Phoridae: *Megaselia berndseni*.

***Polyporus brumalis* (Pers.) Fr.**

Mycetophilidae: *Mycetophila bialorussica*.

***Polyporus ciliatus* Fr.**

Mycetophilidae: *Mycetophila fungorum*, *Mycetophila strigatoides*.

***Polyporus squamosus* (Huds.) Fr.**

Pediciidae: *Ula mollissima*, *Ula sylvatica*; Ditomyiidae: *Ditomyia fasciata*; Mycetophilidae: *Mycetophila cingulum*, *Mycetophila fungorum*; Cecidomyiidae: *Camptodiplosis boleti*, *Lestodiplosis polypori*, *Peromyia fungicola*; Anisopodidae: *Sylvicola cinctus*; Platypezidae: *Bolopus furcatus*; Drosophilidae: *Hirtodrosophila confusa*; Fanniidae: *Fannia monilis*.

***Polyporus melanopus* (Sw.) Fr.**

Mycetophilidae: *Mycetophila strigatoides*; Cecidomyiidae: *Camptodiplosis boleti*, *Lestodiplosis polypori*; Platypezidae: *Seri obscuripennis*.

***Polyporus varius* (Pers.) Fr.**

Ditomyiidae: *Ditomyia fasciata*; Keroplastidae: *Keroplastus tuvensis*, *Dynatosoma fuscicorne*; Platypezidae: *Seri obscuripennis*.

***Royoporus badius* (Pers.) A.B. De / = *Polyporus badius* (Pers.) Schwein./**

Pediciidae: *Ula bolitophila*; Ditomyiidae: *Ditomyia fasciata*; Keroplastidae: *Keroplastus testaceus*; Mycetophilidae: *Mycetophila dentata*, *Mycetophila luctuosa*; Cecidomyiidae: *Camptodiplosis boleti*, *Monardia obsoleta*, *Peromyia fungicola*; Ceratopogonidae: *Culicoides scoticus*, *Forcipomyia bipunctata*, *Forcipomyia nigra*; Platypezidae: *Seri obscuripennis*; *Megaselia frameata*; Drosophilidae: *Hirtodrosophila trivittata*, *Leucophenga maculata*, *Mycodrosophila poecilogastra*.

Sparassidaceae

***Sparassis crispa* (Wulfen) Fr.**

Pediciidae: *Ula mollissima*; Mycetophilidae: *Rondaniella dimidiata*; Cecidomyiidae: *Peromyia edwardsi*; Ceratopogonidae: *Culicoides scoticus*; Muscidae: *Phaonia subventa*.

Order AGARICALES

Fistulinaceae

***Fistulina hepatica* (Schaeff.) With.**

Mycetophilidae: *Allodia grata*; Cecidomyiidae: *Camptodiplosis boleti*.

Pleurotaceae

***Pleurocybella porrigens* (Pers.) Sing.**

Pediciidae: *Ula mollissima*; Mycetophilidae: *Mycetophila marginata*.

***Pleurotus cornucopiae* Paulet (Rolland)**

Mycetophilidae: *Mycetophila luctuosa*, *Mycetophila spectabilis*, *Brachypeza armata*, *Brachypeza radiata*; Drosophilidae: *Leucophenga maculata*.

***Pleurotus ostreatus* (Jacq.) P. Kumm.**

Mycetophilidae: *Mycetophila fungorum*; Cecidomyiidae: *Heteropeza pygmaea*, *Mycophila fungicola*.

***Pleurotus pulmonarius* (Fr.) Quél.**

Pediciidae: *Ula mollissima*, *Ula sylvatica*; Keroplastidae: *Keroplastus testaceus*; Mycetophilidae: *Sciophila antiqua*, *Mycetophila dentata*, *Mycetophila luctuosa*, *Brachypeza armata*, *Brachypeza bisignata*; Cecidomyiidae: *Heteropeza pygmaea*, *Karschomyia* sp.; Psychodidae: *Psychomora vanharai*; Phoridae: *Megaselia frameata*; Lonchaeidae: *Lonchaea chorea*; Chloropidae: *Tricimba cincta*; Drosophilidae: *Drosophila kuntzei*, *Drosophila testacea*, *Hirtodrosophila confusa*, *Hirtodrosophila trivittata*, *Mycodrosophila poecilogastra*; Muscidae: *Mydaea nubila*.

Hygrophoraceae

***Hygrocybe calyptriformis* (Berk.) Fayod**

Mycetophilidae: *Exechia fusca*.

***Hygrocybe chlorophana* (Fr.) Wünsche**

Mycetophilidae: *Exechia dizona*, *Exechia fusca*.

***Hygrophorus chrysodon* (Batsch.) Fr.**

Mycetophilidae: *Mycetophila fungorum*.

***Hygrophorus* sp.**

Pediciidae: *Ula sylvatica*; Mycetophilidae: *Docosia gilvipes*, *Chodopsycha lobata*.

***Hygrophoropsis aurantiaca* (Wulfen) Maire**

Mycetophilidae: *Exechia fusca*.

Marasmiaceae

***Gymnopus aquosus* (Bull.) Antonín & Noordel.**

Mycetophilidae: *Exechia dorsalis*; Chloropidae: *Tricimba lineella*.

***Gymnopus dryophilus* (Bull.) Murrill**

Mycetophilidae: *Leia bimaculata*.

***Gymnopus ocior* (Pers.) Antonín & Noordel**

/ = *Collybia ocior* (Pers.) Vilgalys & O. K. Mill /

Mycetophilidae: *Allodia alternans*.

***Marasmius alliaceus* (Jacq.) Fr.**

Mycetophilidae: *Allodia ornatcollis*.

Physalacriaceae

***Armillaria cepistipes* Velen.**

Trichoceridae: *Trichocera rufescens*.

***Armillaria gallica* Marxm. & Romagn. / = *A. bulbosa* (J.B. Barla) Romagn. /**

Trichoceridae: *Trichocera rufescens*; Pediciidae: *Ula sylvatica*; Mycetophilidae: *Mycetophila fungorum*, *Mycetophila ruficollis*; Psychodidae: *Chodopsycha lobata*; Ceratopogonidae: *Culicoides scoticus*; Platypezidae: *Platypeza consobrina*, *Protoclythia modesta*; Heleomyzidae: *Suillia atricornis*, *Suillia bicolor*; Sphaeroceridae: *Spelobia parapusio*; Drosophilidae: *Drosophila busckii*, *Drosophila phalerata*; Muscidae: *Phaonia subventa*. (Records from *Armillaria* sp. also included.)

***Armillaria ostoyae* (Romagn.) Herink**

Platypezidae: *Platypeza consobrina*, *Protoclythia modesta*; Ceratopogonidae: *Culicoides scoticus*.

***Flammulina velutipes* (Curtis) Singer**

Mycetophilidae: *Allodia lugens*, *Exechia fusca*.

***Oudemansiella mucida* (Schrad.) Höhn.**

Mycetophilidae: *Exechia fusca*.

***Xerula* (= *Oudemansiella*) *radicata* (Relhan) Dorfelt.**

Anthomyiidae: *Pegomya pulchripes*; Muscidae: *Phaonia pallida*.

Cortinariaceae

***Cortinarius amoenolens* Rob. Henry & P. D. Orton**

Mycetophilidae: *Mycetophila fungorum*.

***Cortinarius brunneus* (Pers.) Fr.**

Mycetophilidae: *Tarnania tarnanii*; Drosophilidae: *Drosophila phalerata*.

***Cortinarius cinnamomeoluteus* Rob. Henry**

Mycetophilidae: *Allodia czernyi*.

***Cortinarius croceoconus* Fr.**

Mycetophilidae: *Docosia gilvipes*, *Allodia czernyi*.

***Cortinarius cumatilis* Fr.**

Mycetophilidae: *Docosia gilvipes*, *Allodia zaitzevi*.

***Cortinarius hinnuleus* Fr.**

Trichoceridae: *Trichocera rufescens*; Mycetophilidae: *Sciophila lutea*, *Exechia fusca*, *Tarnania fenestralis*.

***Cortinarius romagnesii* Rob. Henry**

Mycetophilidae: *Allodia ornaticollis*, *Exechia spinuligera*, *Rymosia virens*.

***Cortinarius trivialis* J.E. Lange**

Mycetophilidae: *Mycetophila fungorum*, *Cordyla brevicornis*, *Exechia fusca*.

***Crepidotus mollis* (Schaeff.) Staude**

Mycetophilidae: *Mycetophila ruficollis*, *Allodia ornaticollis*; Phoridae: *Megaselia frameata*.

***Galerina marginata* (Batsch) Kühner**

Mycetophilidae: *Allodia lugens*.

***Galerina paludosa* (Fr.) Kühner**

Mycetophilidae: *Exechia fusca*.

***Rozites caperata* (Pers.) P. Karst.**

Mycetophilidae: *Cordyla brevicornis*.

Inocybaceae

***Inocybe albomarginata* Velen.**

Mycetophilidae: *Allodia ornaticollis*, *Rymosia bifida*.

***Inocybe geophylla* (Fr.) P. Kumm.**

Mycetophilidae: *Allodia ornaticollis*, *Rymosia bifida*.

***Inocybe erubescens* A. Blytt / = *I. patouillardii* Bres. /**

Phoridae: *Megaselia berndseni*; Chloropidae: *Tricimba cincta*.

***Inocybe mixtilis* (Britzelm.) Sacc.**

Mycetophilidae: *Rymosia spinipes*.

Hydnangiaceae

***Laccaria amethystina* Cooke**

Mycetophilidae: *Exechia dorsalis*, *Rymosia virens*; Drosophilidae: *Drosophila transversa*.

***Laccaria laccata* (Scop.) Fr.**

Mycetophilidae: *Exechia dorsalis*, *Exechiopsis fimbriata*, *Rymosia virens*.

Tricholomataceae

***Calocybe gambosa* (Fr.) Donk**

Mycetophilidae: *Mycetophila strigata*, *Allodia grata*; Phoridae: *Megaselia berndseni*; Chloropidae: *Tricimba lineella*; Muscidae: *Muscina stabulans*.

***Clitocybe nebularis* (Batsch) Quél.**

Mycetophilidae: *Allodiopsis rustica*, *Tarnania fenestralis*; Muscidae: *Phaonia pallida*.

***Clitocybe inversa* (Scop.) Quél.**

Mycetophilidae: *Allodiopsis rustica*.

***Collybia confluens* (Pers.) P. Kumm.**

Cecidomyiidae: *Lestodiplosis inermis*; Sphaeroceridae: *Spelobia parapusio*; Drosophilidae: *Drosophila phalerata*.

***Collybia dryophila* (Bull.) P. Kumm.**

Mycetophilidae: *Mycetophila ichneumonea*.

***Lepista nuda* (Bull.) Cooke**

Bolitophilidae: *Bolitophila pseudohybrida*; Mycetophilidae: *Sciophila lutea*, *Docosia gilvipes*, *Rondaniella dimidiata*, *Allodiopsis rustica*; Phoridae: *Megaselia uliginosa*.

***Leucopaxillus giganteus* (Sowerby) Singer**

Mycetophilidae: *Allodiopsis domestica*.

***Leucopaxillus* sp.**

Mycetophilidae: *Leia bimaculata*.

***Lyophyllum loricatum* (Fr.) Kühner ex Kalamees**

Limoniidae: *Metalimnobia bifasciata*; Bolitophilidae: *Bolitophila bimaculata*; Mycetophilidae: *Exechia repanda*.

***Megacollybia platyphylla* (Pers.) Kotl. & Pouzar**

Pediciidae: *Ula mollissima*; Mycetophilidae: *Mycetophila fungorum*, *Allodia grata*; Drosophilidae: *Drosophila kuntzei*, *Drosophila phalerata*.

***Melanoleuca grammopodia* (Bull.) Murrill**

Bolitophilidae: *Bolitophila modesta*.

***Melanoleuca verrucipes* (Fr.) Singer**

Phoridae: *Megaselia* sp.; Drosophilidae: *Drosophila phalerata*.

***Melanoleuca* sp.**

Bolitophilidae: *Bolitophila modesta*.

***Mycena galericulata* (Scop.) Gray**

Mycetophilidae: *Mycetophila ruficollis*, *Allodia ornaticollis*, *Allodia grata*, *Exechia bicincta*.

***Mycena haematopus* (Pers.) P. Kumm.**

Mycetophilidae: *Mycetophila ruficollis*.

***Mycena inclinata* (Fr.) Quél.**

Mycetophilidae: *Mycetophila ruficollis*.

***Mycena polygramma* (Bull.) Gray**

Mycetophilidae: *Exechia fusca*.

***Mycena pura* (Pers.) P. Kumm.**

Mycetophilidae: *Allodia ornaticollis*.

***Mycena tintinnabulum* (Batsch) Quél.**

Mycetophilidae: *Mycetophila ruficollis*, *Allodia lugens*.

***Rhodocollybia butyracea* f. *asema* Antonín, Halling & Noordel, 1997**

/ = *C. asema* (Fr.) P. Kumm. /

Mycetophilidae: *Mycetophila fungorum*, *Allodia lugens*, *Allodia ornaticollis*, *Allodia zaitzevi*, *Allodiopsis rustica*, *Exechia fusca*.

***Tricholoma populinum* J. E. Lange**

Mycetophilidae: *Mycetophila fungorum*.

***Tricholoma saponaceum* (Fr.) P. Kumm.**

Pediciidae: *Ula sylvatica*; Drosophilidae: *Drosophila kuntzei*, *Drosophila phalerata*.

***Tricholoma sculpturatum* (Fr.) Quél.**

Mycetophilidae: *Exechia fusca*.

***Tricholoma sejunctum* (Sowerby) Quél.**

Mycetophilidae: *Docosia gilvipes*, *Exechia repandoides*.

***Tricholoma sulphureum* (Bull.) P. Kumm.**

Mycetophilidae: *Allodia czernyi*.

***Tricholomopsis decora* (Fr.) Singer**

Mycetophilidae: *Mycetophila finlandica*.

***Tricholomopsis rutilans* (Schaeff.) Singer**

Mycetophilidae: *Mycetophila ruficollis*.

Gomphidiaceae

***Gomphidius glutinosus* (Schaeff.) Fr.**

Mycetophilidae: *Cordyla murina*, *Exechia lundstroemi*, *Exechia separata*.

Psathyrellaceae

***Psathyrella candolleana* (Fr.) Maire**

Mycetophilidae: *Mycetophila fungorum*, *Allodia ornaticollis*, *Pseudexechia trivittata*; Phoridae: *Megaselia latior*; Fanniidae: *Piezura graminicola*.

Pluteaceae

***Limacella guttata* (Pers.) Konrad & Maubl**

Mycetophilidae: *Allodiopsis rustica*.

***Pluteus cervinus* (Schaeff.) P. Kumm. / = *P. atricapillus* (Batsch) Fayod/**

Trichoceridae: *Trichocera rufescens*; Mycetophilidae: *Mycetophila fungorum*, *Mycetophila ruficollis*, *Allodia ornaticollis*, *Allodia grata*; Psychodidae: *Chodopsycha buxtoni*; Platypezidae: *Paraplatypeza atra*; Asteiidae: *Leiomyza dudai*; Sphaeroceridae: *Spelobia parapusio*; Drosophilidae: *Drosophila kuntzei*, *Drosophila phalerata*, *Drosophila testacea*.

***Pluteus hispidulus* (Fr.) Gillet**

Phoridae: *Megaselia sylvatica*.

***Pluteus salicinus* (Pers.) P. Kumm.**

Mycetophilidae: *Allodia grata*, *Exechia fusca*; Platypezidae: *Paraplatypeza atra*; Drosophilidae: *Drosophila phalerata*.

Amanitaceae

***Amanita muscaria* (L.) Pers.**

Mycetophilidae: *Mycetophila fungorum*, *Exechia fusca*; Phoridae: *Megaselia lata*;
Drosophilidae: *Drosophila busckii*, *Drosophila kuntzei*.

***Amanita pantherina* (DC.) Krombh.**

Mycetophilidae: *Leia bimaculata*, *Allodia grata*, *Cordyla brevicornis*; Asteiidae: *Leiomyza dudai*.

***Amanita phalloides* (Fr.) Link**

Mycetophilidae: *Exechia dorsalis*; Psychodidae: *Chodopsycha lobata*, *Psychomora vanharai*.
Drosophilidae: *Drosophila funebris*, *Drosophila kuntzei*.

***Amanita porphyria* Alb. & Schwein.**

Cecidomyiidae: *Porricondylinae* gen. sp.

***Amanita rubescens* Pers.**

Mycetophilidae: *Mycetophila fungorum*, *Cordyla brevicornis*; Psychodidae: *Chodopsycha buxtoni*, *Chodopsycha lobata*; Phoridae: *Megaselia lata*, *Megaselia scutellaris*; Sphaeroceridae: *Spelobia parapusio*.

***Amanita spissa* (Fr.) Opiz**

Mycetophilidae: *Mycetophila fungorum*, *Cordyla brevicornis*, *Exechia fusca*; Psychodidae: *Chodopsycha buxtoni*, *Chodopsycha lobata*; Ceratopogonidae: *Culicoides scoticus*; Phoridae: *Megaselia lata*; Sphaeroceridae: *Spelobia parapusio*; Drosophilidae: *Drosophila phalerata*.

Agaricaceae

/including the former Lycoperdaceae/

***Agaricus altipes* (F.H. Møller) F.H. Møller /= *Agaricus aestivalis* (F.H. Møller) Pilát/**

Platypezidae: *Lindneromyia dorsalis*.

***Agaricus arvensis* Schaeff.**

Platypezidae: *Lindneromyia hungarica* (also in *Agaricus* sp.).

***Agaricus bohusii* Bon**

Phoridae: *Megaselia nigra*.

***Agaricus bitorquis* (Quél.) Sacc.**

Platypezidae: *Lindneromyia dorsalis*; Phoridae: *Megaselia nigra*; Fanniidae: *Fannia canicularis*;
Muscidae: *Muscina levida*, *Muscina stabulans*.

***Agaricus xanthoderma* Genev.**

Phoridae: *Megaselia hirtiventris*.

***Calvatia gigantea* (Batsch) Lloyd / = *Langermannia gigantea* (Batsch) Rostk. /**

Phoridae: *Megaselia sevciki*.

***Chlorophyllum rhacodes* (Vittad.) Vellinga / = *Lepiota rhacodes* (Vittad.) Quél. /**

Mycetophilidae: *Mycetophila fungorum*.

***Lepiota aspera* (Pers.) Quél.**

Trichoceridae: *Trichocera rufescens*; Mycetophilidae: *Mycetophila fungorum*, *Allodia grata*.

***Leucoagaricus pudicus* (Bull.) Bon**

Mycetophilidae: *Exechia fusca*.

***Bovista pusilla* (Batsch.) Pers.**

Phoridae: *Megaselia sevciki*.

***Lycoperdon echinatum* Pers.**

Phoridae: *Megaselia sevciki*.

***Lycoperdon perlatum* Pers.**

Mycetophilidae: *Allodiopsis gracai*.

***Lycoperdon utriforme* Bull.**

Phoridae: *Megaselia sevciki*.

***Macrolepiota procera* (Scop.) Singer**

Mycetophilidae: *Mycetophila fungorum*, *Exechia fusca*; Platypezidae: *Kesselimyia chandleri* (as *Macrolepiota* sp.); Asteiidae: *Leiomyza birkheadi*, *Leiomyza dudai*.

Strophariaceae

***Agrocybe erebia* (Fr.) Kühner**

Mycetophilidae: *Allodia ornaticollis*, *Exechia fusca*.

***Agrocybe praecox* (Pers.) Fayod**

Mycetophilidae: *Mycetophila fungorum*; Phoridae: *Megaselia maura*.

***Conocybe aporos* Kits van Wav.**

Mycetophilidae: *Allodia anglofennica*, *Allodia ornaticollis*, *Allodia zaitzevi*, *Exechia fusca*.

Gymnopilus junonius (Fr.) P.D. Orton / = *G. spectabilis* sensu A.H. Smith, auct. /

Pediciidae: *Ula mollissima*; Bolitophilidae: *Bolitophila*.

Hebeloma crustuliniforme (Bull.) Quél.

Mycetophilidae: *Mycetophila fungorum*, *Allodia ornaticollis*, *Exechia fusca*.

Hebeloma mesophaeum (Pers.) Quél.

Mycetophilidae: *Allodia ornaticollis*, *Exechia dorsalis*.

Hebeloma sacchariolens Quél.

Mycetophilidae: *Mycetophila evanida*.

Hypholoma fasciculare (Huds.) P. Kumm.

Bolitophilidae: *Bolitophila cinerea*; Mycetophilidae: *Mycetophila ruficollis*.

Hypholoma sublateritium (Schaeff.) Quél.

Bolitophilidae: *Bolitophila cinerea*.

Leratiomyces squamosus (Pers.) Bridge & Spooner

/ = *Stropharia squamosa* (Pers.) Quél. /

Mycetophilidae: *Exechia fusca*.

Panaeolus papilionaceus (Bull.) Quél. / = *Panaeolus sphinctrinus* (Fr.) Quél. /

Mycetophilidae: *Mycetophila fungorum*, *Allodia ornaticollis*.

Psilocybe bohemica Šebek

Mycetophilidae: *Exechia fusca*.

Stropharia aeruginosa (M.A. Curtis) Quél.

Mycetophilidae: *Allodia lugens*; Muscidae: *Pegomya geniculata*.

Stropharia rugosoannulata Farlow

Mycetophilidae: *Mycetophila fungorum*; Drosophilidae: *Drosophila phalerata*, *Drosophila transversa*.

Pholiota lenta (Pers.) Singer

Bolitophilidae: *Bolitophila tenella*.

Pholiota lubrica (Pers.) Singer

Bolitophilidae: *Bolitophila tenella*, *Bolitophila* (*Cliopisa*) sp.

Pholiota squarrosa (Weigel) P. Kumm.

Bolitophilidae: *Bolitophila cinerea*, *Bolitophila saundersii*; Mycetophilidae: *Mycetophila ruficollis*;
Phoridae: *Megaselia frameata*.

Entolomataceae

Entoloma cetratum (Fr.) Mos.

Mycetophilidae: *Exechia fusca*.

Entoloma clypeatum (L.) P. Kumm.

Mycetophilidae: *Mycetophila fungorum*, *Allodia grata*; Phoridae: *Megaselia flavicans*, *Megaselia hilaris*, *Megaselia lutea*; Drosophilidae: *Drosophila phalerata*.

Entoloma hirtipes (Schumach.) Moser

Mycetophilidae: *Allodia ornaticollis*.

Entoloma nidorosum (Fr.) Quél.

Trichoceridae: *Trichocera hiemalis*; Mycetophilidae: *Mycetophila fungorum*.

Entoloma vernum S. Lundell.

Mycetophilidae: *Allodia ornaticollis*.

Rhodocybe gemina (Paulet) Kuyper & Noordel.

Mycetophilidae: *Sceptonia flavipuncta*.

Tapinellaceae

Tapinella atrotomentosa (Batsch) Šutara / = *Paxillus atrotomentosus* (Batsch) Fr. /

Pediciidae: *Ula mollissima*; Sphaeroceridae: *Spelobia parapusio*.

Order BOLETALES

Paxillaceae

Paxillus filamentosus (Scop.) Fr.

Pediciidae: *Ula sylvatica*; Bolitophilidae: *Bolitophila hybrida*; Mycetophilidae: *Mycetophila signatoides*; Cecidomyiidae: *Spaniocera squamigera*; Heleomyzidae: *Suillia bicolor*.

Paxillus involutus (Batsch) Fr.

Pediciidae: *Ula sylvatica*; Bolitophilidae: *Bolitophila hybrida*; Mycetophilidae: *Mycetophila signatoides*, *Exechia confinis*.

Boletaceae

***Boletus aereus* Bull.**

Mycetophilidae: *Mycetophila signatoides*.

***Boletus badius* (Fr.) Fr. / = *Xerocomus badius* (Fr.) J.-E. Gilbert /**

Mycetophilidae: *Exechia lundstroemi*; Ceratopogonidae: *Culicoides scoticus*.

***Boletus calopus* Pers.**

Mycetophilidae: *Mycetophila fungorum*.

***Boletus chrysenteron* Bull. / = *Xerocomus chrysenteron* (Bull.) Quél. /**

Mycetophilidae: *Mycetophila fungorum*, *Mycetophila signatoides*; Psychodidae: *Chodopsycha lobata*; Chloropidae: *Tricimba cincta*; Drosophilidae: *Drosophila kuntzei*, *Drosophila phalerata*.

***Boletus edulis* Bull.**

Limoniidae: *Metalimnobia bifasciata*; Mycetophilidae: *Mycetophila fungorum*, *Cordyla brevicornis*; Phoridae: *Megaselia lata*; Drosophilidae: *Drosophila histrio*, *Drosophila phalerata*, *Drosophila testacea*.

***Boletus impolitus* Fr.**

Mycetophilidae: *Mycetophila fungorum*, *Allodia grata*, *Cordyla brevicornis*, *Exechia bicincta*; Phoridae: *Megaselia berndseni*; Syrphidae: *Cheilosia scutellata*; Drosophilidae: *Drosophila phalerata*.

***Boletus legaliae* Pilát**

Muscidae: *Muscina levida*.

***Boletus pinophilus* Pilát & Dermek**

Ceratopogonidae: *Culicoides scoticus*.

***Boletus reticulatus* Schaeff.**

Mycetophilidae: *Mycetophila signatoides*, *Cordyla brevicornis*; Phoridae: *Megaselia lata*; Drosophilidae: *Drosophila phalerata*; Muscidae: *Muscina levida*.

***Boletus rubellus* Krombh. / = *Xerocomus rubellus* (Krombh.) Quél. /**

Mycetophilidae: *Mycetophila fungorum*.

***Boletus satanas* Lenz**

Phoridae: *Megaselia giraudii*; Drosophilidae: *Drosophila transversa*.

***Boletus subtomentosus* (L.) Quél.**

Mycetophilidae: *Mycetophila fungorum*, *Exechia bicincta*.

***Boletellus pruinaeus* Klotzsch & Grisai-Greilh.**

Mycetophilidae: *Exechia bicincta*.

***Chalciporus piperatus* (Bull.) Bataille**

Mycetophilidae: *Exechia lundstroemi*.

***Suillus collinitus* (Fr.) Kuntze**

Mycetophilidae: *Mycetophila fungorum*.

***Suillus granulatus* (L.) Roussel**

Mycetophilidae: *Mycetophila fungorum*; Phoridae: *Megaselia lutea*; Drosophilidae: *Drosophila melanogaster*.

***Suillus luteus* (L.) Gray**

Mycetophilidae: *Mycetophila fungorum*, *Cordyla murina*.

***Leccinum carpini* (Schulzer) M. M. Moser**

Mycetophilidae: *Muscina levida*.

***Leccinum molle* (Bon) Bon**

Phoridae: *Megaselia berndseni*; Syrphidae: *Cheilosia scutellata*; Drosophilidae: *Drosophila histrio*, *Drosophila transversa*.

***Leccinum quercinum* (Pilát) Green & Watling**

Psychodidae: *Chodopsycha buxtoni*; Syrphidae: *Cheilosia scutellata*; Drosophilidae: *Drosophila histrio*, *Drosophila testacea*; Fanniidae: *Fannia lepida*, *Fannia monilis*.

***Leccinum rufum* (Schaeff.) Kreisel**

Drosophilidae: *Drosophila busckii*.

***Leccinum scabrum* (Bull.) Gray**

Mycetophilidae: *Allodia grata*.

***Tylopilus porphyrosporus* (Fr. & Hök) A.H. Sm. & Thiers**

/ = *Porphyrellus porphyrosporus* (Fr. & Hök) E.-J. Gilbert /

Mycetophilidae: *Mycetophila fungorum*; Phoridae: *Megaselia berndseni*; Drosophilidae: *Drosophila phalerata*.

Order RUSSULALES

Auriscalpiaceae

***Clavicornia pyxidata* (Pers.) Doty**

Limoniidae: *Achyrolimonia decemmaculata*; Mycetophilidae: *Mycetophila evanida*, *Trichonta* sp.; Phoridae: *Megaselia frameata*.

Bondarzewiaceae

Bondarzewia montana (Quél.) Singer /= *B. mesenterica* (Schaeff.) Kreisel /

Pediciidae: *Ula mollissima*; Ditomyiidae: *Ditomyia fasciata*; Mycetophilidae: *Mycetophila ornata*; Ceratopogonidae: *Culicoides scoticus*; Phoridae: *Megaselia frameata*; Heleomyzidae: *Neoleria ruficeps*.

Russulaceae

***Lactarius acerrimus* Britzelm.**

Mycetophilidae: *Sciophila lutea*, *Sciophila pseudoflexuosa*, *Leia bimaculata*; Phoridae: *Megaselia lutea*.

***Lactarius decipiens* Quél.**

Mycetophilidae: *Mycetophila strobli*; Cecidomyiidae: *Mycodiplosis* sp., *Stomatosema nemorum*; Drosophilidae: *Drosophila kuntzei*, *Drosophila testacea*.

***Lactarius deterrimus* Gröger**

Pediciidae: *Ula sylvatica*; Mycetophilidae: *Mycetophila blanda*, *Mycetophila estonica*, *Mycetophila evanida*; Ceratopogonidae: *Culicoides scoticus*; Muscidae: *Mydaea corni*.

***Lactarius fulvissimus* Romagn.**

Mycetophilidae: *Mycetophila evanida*.

***Lactarius lignyotus* Fr.**

Pediciidae: *Ula sylvatica*; Drosophilidae: *Drosophila phalerata*.

***Lactarius picinus* Fr.**

Phoridae: *Megaselia lutea*.

***Lactarius pilatii* Z. Schaef.**

Mycetophilidae: *Mycetophila luctuosa*, *Mycetophila strobli*; Ceratopogonidae: *Culicoides scoticus*; Sphaeroceridae: *Spelobia parapusio*.

***Lactarius piperatus* (L.) Gray**

Mycetophilidae: *Mycetophila alea*; Cecidomyiidae: *Peromyia fungicola*.

***Lactarius rufus* (Scop.) Fr.**

Pediciidae: *Ula sylvatica*; Mycetophilidae: *Docosia gilvipes*, *Mycetophila strobli*; Ceratopogonidae: *Culicoides scoticus*; Sphaeroceridae: *Spelobia parapusio*.

***Lactarius salmonicolor* R. Heim & Leclair**

Pediciidae: *Ula mollissima*; Mycetophilidae: *Mycetophila blanda*, *Mycetophila estonica*, *Mycetophila fungorum*, *Sciophila pseudoflexuosa*.

***Lactarius scrobiculatus* (Scop.) Fr.**

Pediciidae: *Ula mollissima*, *Ula sylvatica*; Mycetophilidae: *Rondaniella dimidiata*, *Mycetophila strobli*; Ceratopogonidae: *Culicoides scoticus*; Phoridae: *Megaselia lutea*.

***Lactarius subdulcis* (Bull.) Gray**

Phoridae: *Megaselia lutea*.

***Lactarius vellereus* (Fr.) Fr.**

Limoniidae: *Metalimnobia bifasciata*; Pediciidae: *Ula sylvatica*; Mycetophilidae: *Sciophila pseudo-flexuosa*, *Leia bimaculata*, *Mycetophila luctuosa*, *Mycetophila spectabilis*, *Mycetophila strobli*; Cecidomyiidae: *Peromyia impexa*; Ceratopogonidae: *Culicoides scoticus*; Chloropidae: *Tricimba cincta*; Heleomyzidae: *Suillia variegata*; Sphaeroceridae: *Spelobia parapusio*; Drosophilidae: *Hirtodrosophila confusa*; Fanniidae: *Fannia canicularis*.

***Lactarius volemus* (Fr.) Fr.**

Mycetophilidae: *Leia bimaculata*, *Mycetophila strobli*; Psychodidae: *Chodopsycha lobata*, *Psychomora vanharai*; Ceratopogonidae: *Culicoides scoticus*; Sphaeroceridae: *Spelobia parapusio*; Drosophilidae: *Drosophila phalerata*, *Drosophila testacea*.

***Russula aeruginea* Lindblad**

Mycetophilidae: *Mycetophila fungorum*; Ceratopogonidae: *Culicoides scoticus*; Phoridae: *Megaselia lutea*; Drosophilidae: *Drosophila phalerata*.

***Russula alutacea* (Pers.) Fr.**

Cecidomyiidae: *Peromyia fungicola*; Phoridae: *Megaselia flavicans*; Drosophilidae: *Drosophila phalerata*.

***Russula amoenicolor* Romagn.**

Mycetophilidae: *Cordyla nitidula*; Drosophilidae: *Drosophila kuntzei*; Muscidae: *Muscina levida*.

***Russula carpini* Heinem. et R. Girard**

Mycetophilidae: *Mycetophila fungorum*, *Exechia fusca*; Drosophilidae: *Drosophila phalerata*.

***Russula cyanoxantha* (Schaeff.) Fr.**

Pediciidae: *Ula sylvatica*; Mycetophilidae: *Mycetophila fungorum*, *Cordyla brevicornis*; Ceratopogonidae: *Atrichopogon rostratus*, *Culicoides scoticus*.

***Russula foetens* (Pers.) Pers.**

Limoniidae: *Metalimnobia bifasciata*; Pediciidae: *Ula mollissima*; Anisopodidae: *Sylvicola cinctus*; Sphaeroceridae: *Spelobia parapusio*.

***Russula grisea* (Pers.) Fr.**

Mycetophilidae: *Cordyla brevicornis*, *Cordyla nitidula*; Phoridae: *Megaselia flavicans*, *Megaselia lutea*; Muscidae: *Mydaea humeralis*.

***Russula grisescens* (Bon & Gaugué) Marti**

Mycetophilidae: *Allodia grata*, *Exechia fusca*, *Exechia seriata*; Psychodidae: *Chodopsycha lobata*; Sphaeroceridae: *Spelobia parapusio*.

***Russula luteotacta* Rea**

Mycetophilidae: *Sciophila lutea*, *Mycetophila evanida*, *Mycetophila fungorum*, *Allodia ornatcollis*, *Exechia seriata*; Muscidae: *Mydaea corni*, *Mydaea humeralis*.

***Russula nigricans* (Bull.) Fr.**

Limoniidae: *Metalimnobia bifasciata*; Pediciidae: *Ula mollissima*; Mycetophilidae: *Mycetophila alea*; Cecidomyiidae: *Tricholaba trifolii*; Ceratopogonidae: *Culicoides scoticus*; Drosophilidae: *Drosophila testacea*; Muscidae: *Mydaea corni*.

***Russula nitida* (Pers.) Fr.**

Mycetophilidae: *Allodia ornatcollis*.

***Russula paludosa* Britz.**

Pediciidae: *Ula sylvatica*.

***Russula pectinata* Fr.**

Mycetophilidae: *Mycetophila fungorum*.

***Russula pectinatoides* Peck**

Phoridae: *Megaselia berndseni*.

***Russula pulchella* Borsz.**

Mycetophilidae: *Mycetophila fungorum*; Phoridae: *Megaselia flavicans*, *Megaselia ostravaensis*; Sphaeroceridae: *Spelobia parapusio*.

***Russula rigida* Velen.**

Mycetophilidae: *Allodia grata*; Drosophilidae: *Drosophila phalerata*.

***Russula velenovskyi* Melzer & Zvára**

Mycetophilidae: *Allodia grata*, *Allodia ornatcollis*, *Cordyla nitidula*, *Exechia seriata*.

***Russula vinosa* Lindblad**

Mycetophilidae: *Mycetophila fungorum*; Ceratopogonidae: *Culicoides scoticus*; Psychodidae: *Chodopsycha lobata*; Sphaeroceridae: *Spelobia parapusio*; Drosophilidae: *Drosophila histrio*.

***Russula violeipes* Quél.**

Mycetophilidae: *Cordyla nitidula*, *Exechia bicincta*, *Exechia seriata*; Phoridae: *Megaselia flava*.

***Russula virescens* (Schaeff.) Fr.**

Mycetophilidae: *Mycetophila fungorum*.

Hericiaceae

Hericium cirrhatum (Pers.) Nikol / = *Creolophus cirrhatus* (Pers.) P. Karst. /

Drosophilidae: *Drosophila busckii*, *Hirtodrosophila confusa*.

Hericium alpestre Pers. / = *H. flagellum* (Scop.) Pers. /

Cecidomyiidae: *Monardia modesta*.

Stereaceae

Stereum hirsutum (Willd.) Gray

Ditomyiidae: *Ditomyia fasciata*; Mycetophilidae: *Leptomorphus focipatus*; *Sciophila hirta* (as *Stereum* sp.)

Hoplothrips fungi Zetterstedt, 1828 (Thysanoptera) was recorded from this fungus by Ševčík (2003).

Stereum subtomentosum Pouzar

Mycetophilidae: *Leptomorphus focipatus*.

Order THELEPHORALES

Bankeraceae

Sarcodon imbricatus (L.) P. Karst.

Pediciidae: *Ula sylvatica*; Psychodidae: *Chodopsycha lobata*.

Thelephoraceae

Thelephora caryophyllea (Schaeff.) Pers.

Mycetophilidae: *Neoempheria striata*.

Thelephora palmata (Scop.) Fr.

Mycetophilidae: *Mycetophila sordida*.

Thelephora terrestris Ehrh.

Mycetophilidae: *Mycomya levis*.

Order HYMENOGYSALES

Hymenochaetaceae

***Inonotus radiatus* (Sowerby) P. Karst.**

Ditomyiidae: *Ditomyia fasciata*; Cecidomyiidae: *Lestodiplosis polypori*; Mycetophilidae: *Sciophila hirta*, *Dynatosoma fuscicorne*.

***Phellinus igniarius* (L.) Quél. / = *Phellinus alni* (Bondartsev) Parmasto /**

Mycetophilidae: *Sciophila rufa*.

Order CANTHARELLALES

Cantharellaceae

***Cantharellus amethysteus* Quél.**

Mycetophilidae: *Leia bimaculata*; Drosophilidae: *Drosophila testacea*.

***Cantharellus cibarius* Fr.**

Ceratopogonidae: *Culicoides scoticus*; Drosophilidae: *Drosophila transversa*.

Hydnaceae

***Hydnum repandum* L.**

Pediciidae: *Ula sylvatica*; Mycetophilidae: *Sciophila baltica*, *Sciophila varia*; Psychodidae: *Chodopsycha buxtoni*, *Psychomora vanharai*; Drosophilidae: *Drosophila testacea*; Fanniidae: *Fannia monilis*.

Order GOMPHALES

Gomphaceae

***Ramaria bataillei* (Maire) Corner**

Mycetophilidae: *Rondaniella dimidiata*.

***Ramaria flavescens* (Schaeff.) R.H. Petersen**

Limoniidae: *Metalimnobia quadrimaculata*; Pediciidae: *Ula sylvatica*, *Ula mollissima*; Mycetophilidae: *Rondaniella dimidiata*, *Mycetophila hetschkoi*.

***Ramaria* sp.**

Mycetophilidae: *Tarnania tarnanii*; Cecidomyiidae: *Peromyia fungicola*; Psychodidae: *Chodopsycha buxtoni*, *Chodopsycha lobata*; Drosophilidae: *Drosophila kuntzei*, *Drosophila testacea*.

Order PHALLALES

Phallaceae

***Mutinus ravenelii* (Berk. & M.A. Curtis) E. Fisch.**

Muscidae: *Muscina levida*.

***Phallus impudicus* L.**

Drosophilidae: *Drosophila phalerata*; Fanniidae: *Fannia canicularis*.

MYCETOZOA

Class MYXOMYCETES

***Fuligo septica* (L.) F.H. Wigg.**

Mycetophilidae: *Platurocypta testata*.

***Lycogala epidendrum* (L.) Fr.**

Mycetophilidae: *Mycetophila adumbrata*.

***Reticularia lycoperdon* Bull.**

Mycetophilidae: *Platurocypta testata*.



Fig. 38: Examples of host fungi recorded in this study. From left to right: *Boletus edulis* (with *Suillia* sp. sitting on its stipe, photo J. Roháček), *Verpa bohemica*, *Podostroma alutaceum*, *Phellinus igniarius* (with *Sciophila* larvae in silk webs on the surface of fruit body) and *Russula nigricans* (fruit body on the right infested with *Mycetophila alea* larvae).

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Opava, 2010

Printed by RETIS Group s.r.o., Krnov, Czech Republic

ISBN 978-80-86224-84-8