

NEW RECORDS OF LABOULBENIALES (ASCOMYCOTA) FROM THE CZECH REPUBLIC AND SLOVAKIA*

WALTER ROSSI, JAN MÁČA & JIŘÍ VÁVRA

Abstract. Twenty-seven species of Laboulbeniales are reported for the first time in the Czech Republic and/or Slovakia: *Cantharomyces numidicus* Maire, *C. orientalis* Speg., *Euzodiomyces lathrobii* Thaxt., *Helodiomyces elegans* F. Picard, *Laboulbenia benjaminii* Balazuc ex Santam., *L. calathi* T. Majewski, *L. elaphri* Speg., *L. eubradycelli* Huldén, *L. giardii* Cépède & F. Picard, *L. leisti* J. Siemaszko & Siemaszko, *L. cf. ophoni* Thaxt., *L. pedicellata* Thaxt., *L. pseudomasei* Thaxt., *Misgomyces dyschirii* Thaxter, *Monoicomyces homalotae* Thaxt., *M. nigrescens* Thaxt., *Peyritschiella vulgata* (Thaxt.) I. I. Tav., *Rhachomyces furcatus* (Thaxt.) Thaxt., *R. lasiophorus* (Thaxt.) Thaxt., *R. philonthinus* (Thaxt.) Thaxt., *Stigmatomyces burdigalensis* (Balazuc) A. Weir & W. Rossi, *S. crassicolis* Thaxt., *S. limosinae* Thaxt., *S. majewskii* H. L. Dainat, Manier & Balazuc, *S. platensis* Speg., *S. triangulipicalis* T. Majewski, and *Symplectomyces vulgaris* Thaxt. With the present records the number of Laboulbeniales reported for the Czech Republic is raised to 56, and to 22 for Slovakia.

Key words: Laboulbeniales, parasitic fungi, Coleoptera, Diptera, Czech Republic, Slovakia

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INTRODUCTION

A recent paper (Rossi & Máča 2006) reports several new records of Laboulbeniales from the Czech Republic and Slovakia, bringing the number of records for these two neighboring countries to 36 and 10 respectively. Here we add new records, raising these numbers to 56 for the Czech Republic and 22 for Slovakia. These figures are still very small; suffice it to say that 206 species of Laboulbeniales have been reported for nearby Poland (Majewski 2008).

Brief comments are given for some of the species. The new records have made it possible to characterize the variability of *Laboulbenia elaphri*, which has been the source of some confusion about this parasite.

MATERIALS AND METHODS

Most of the material used for this paper was obtained by careful examination of entomological collections in

which insects were preserved dried and pinned or in 75% ethanol. Parasitic thalli were removed from hosts with an entomological pin (size 3). Permanent slide mounts were prepared following the method of Benjamin (1971), using Amann's solution, a mixture of glycerol and lactic acid, as mounting medium, and ringed with nail polish. Permanent slides are kept in the collections of Walter Rossi and Jan Máča.

The text uses the following abbreviations: NP – National Park; NR – Nature Reserve. Names of localities are followed by grid numbers of the faunistic and floristic mapping system widely used in Central Europe (Pruner & Míka 1996).

TAXONOMY

Cantharomyces numidicus Maire

DISTRIBUTION. Described from Algeria and later reported from several European countries on *Thinodromus* spp. (Coleoptera, Staphylinidae, Oxytelinae) (Majewski 2008).

* This paper is dedicated to Professor Tomasz Majewski on the occasion of his 70th birthday.

NEW RECORD FROM SLOVAKIA. Dolina Petrikovo valley, 2 km WSW of Polomka (7185), shaded bank of Petrikovo stream, alt. 600 m, 23 Apr. 2009, *G. Makranczy*, on *Thinodromus arcuatus* (Stephens).

Cantharomyces orientalis Speg. Fig. 1

DISTRIBUTION. Reported from several European countries and from Algeria, chiefly on *Carpeлимus* spp. (Coleoptera, Staphylinidae, Oxytelinae) (Majewski 2008).

NEW RECORD FROM CZECH REPUBLIC. Moravia, Havraníky-Staré vinice (7161), UV light at night, 7 Aug. 2007, *J. Vávra*, on *Carpeлимus obesus* (Kiesenwetter).

NEW RECORD FROM SLOVAKIA. Hajnáčka (7785), UV light at night, 19-20 May 2007, *J. Vávra*, on *C. obesus*.

Euzodiomyces lathrobii Thaxt.

DISTRIBUTION. Reported on various species and genera of the Paederinae (Coleoptera, Staphylinidae) from several European countries, North America (U.S.A.), South America (Bolivia), North Africa (Algeria) and Asia (Japan) (Majewski 2008).

NEW RECORD FROM CZECH REPUBLIC. Moravia, Velká nad Veličkou (7171), 6 Dec. 2008, *J. Vávra*, on *Achenium humile* (Nicolai).

Helodiomyces elegans F. Picard Fig. 2

DISTRIBUTION. Parasitic on *Dryops* spp. (Coleoptera, Dryopidae), reported from several European countries and Algeria (Majewski 2008).

NEW RECORD FROM CZECH REPUBLIC. Bohemia, Horní Ředice, Žernov NR (5961b), in fen near brook bank with *Sphagnum* at Mordýř pond, 15 Apr. 2008, *M. Boukal*, on *Dryops anglicanus* Edwards.

Laboulbenia benjaminii Balazuc ex Santam. Fig. 3

DISTRIBUTION. Reported from a few European countries (Belgium, France, Poland, Spain) on species of *Badister* (*sensu lato*) (Coleoptera, Carabidae), and from Korea on *Stenolophus difficilis* Hope (Majewski 2008).

NEW RECORDS FROM CZECH REPUBLIC. Bohemia, Veselí nad Lužnicí (6854), alt. 420 m, 12 May 2007,

J. Máca, on *Badister bullatus* (Schrank) (= *B. bipustulatus* Fabricius); near Řevnice, Liteň (6050), Obora pond, 22 Sept. 2007, *P. Vonička*, on *B. dilatatus* Chaudoir.

Laboulbenia calathi T. Majewski Fig. 7

DISTRIBUTION. Associated with ground beetles (Carabidae) of the genus *Calathus*, reported from many European countries and doubtfully from Argentina (Majewski 2008).

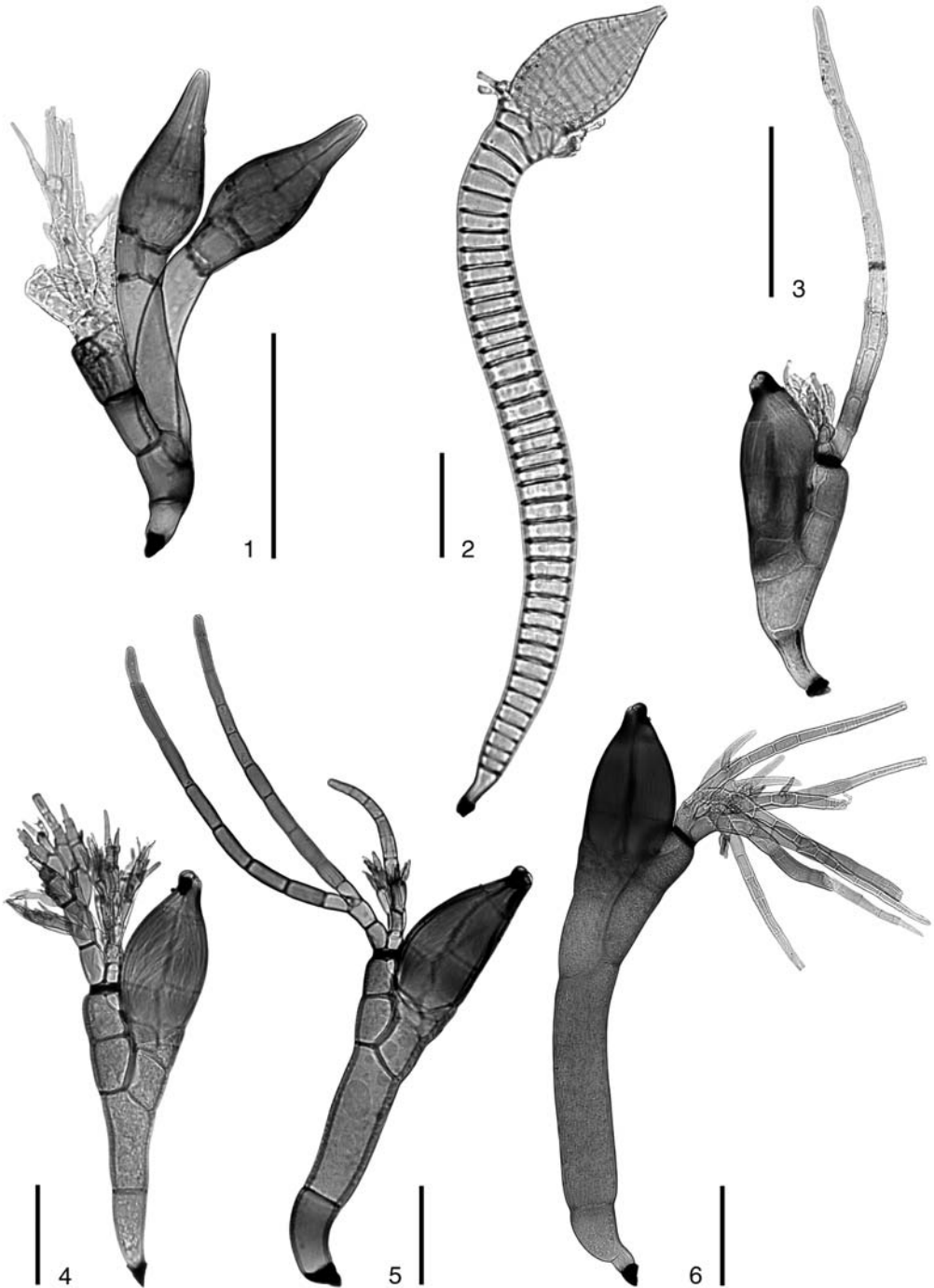
NEW RECORD FROM CZECH REPUBLIC. Bohemia, Kaplice (7252-53), pasture at forest edge near Jarošovský les forest, 28 Aug. 2007, *J. Máca*, on *Calathus melanocephalus* (L.); Lásenice, on waste ground (6955), 22 June 2010, *J. Máca*, on *C. melanocephalus*.

Laboulbenia elaphri Speg. Figs 4–6

DISTRIBUTION. Parasitic on *Elaphrus* spp. (Coleoptera, Carabidae), reported so far from Europe only (Majewski 2008); the record on *Nebria ochotica* Sahlberg from China (Lee & Lim 2000) requires confirmation.

NEW RECORDS FROM CZECH REPUBLIC. Bohemia, Čelákovice (5854), 18 May 1997, *Š. Táborská-Rajová*, on *Elaphrus cupreus* Duftschmid. Moravia, Oleksovice (7263), Oleksovická mokřina wetland, 27 June 2005, *V. Křivan*, on *E. cupreus*.

REMARKS. The thalli growing on the elytra and the pronotum of the host insects (Fig. 5) are very similar to those represented in the drawings accompanying the records of *Laboulbenia elaphri* from Poland by Majewski (1994, Pl. 45, figs 2 & 3) and from Latvia by De Kesel and Krastina-De Kesel (2006, Fig. 1a); these thalli are characterized by a stout habit, asymmetrical perithecium with the ventral side distinctly more convex than the dorsal side, large perithecial tip with an almost flattened apex, and outer appendage dividing in two subequal branches above the second cell. Thalli growing on mouthparts (Fig. 4) have the lower portion of the receptacle distinctly tapered and have more branched appendages. Thalli growing on fore femurs have a more elongate receptacle, more branched appendages, and cell V almost completely free from the perithecium (Fig. 6). Balazuc (1974) may have seen similar thalli when he reported *Laboulbenia flagellata* Peyr. on *Elaphrus*



Figs 1–6. 1 – *Cantharomyces orientalis* Speg. 2 – *Helodiomyces elegans* F. Picard. 3 – *Laboulbenia benjaminii* Balazuc ex Santam. from *Badister bullatus*. 4–6 – *Laboulbenia elaphri* Speg.: 4 – thallus from mouthparts; 5 – thallus from pronotum; 6 – thallus from fore femur. Scale bars = 100 μ m.

riparius (L.) from France. In any case, the presence in France of *Laboulbenia elaphri* is confirmed by the following unpublished record: SW Paris near Rambouillet, 15 May 1998, *W. Rossi*, on the elytra and pronotum of a specimen of *E. cupreus*.

Laboulbenia eubradycelli Huldén

DISTRIBUTION. Reported from several European countries including the Czech Republic, and from Mexico (Rossi & Máca 2006).

NEW RECORD FROM SLOVAKIA. Gemerský Jablonec (7885), 3 Apr. 2009, *J. Vávra*, on *Bradycellus harpalinus* (Audinet-Seville) (Coleoptera, Carabidae).

Laboulbenia giardii Cépède & F. Picard

DISTRIBUTION. Reported from several European countries on ground beetles (Coleoptera, Carabidae) of the genus *Dicheirotichus* (Santamaría *et al.* 1991; Santamaría 1998).

NEW RECORD FROM SLOVAKIA. Gemerský Jablonec (7885), 12 Apr. 2008, *J. Vávra*, on *Dicheirotichus rufithorax* (Sahlberg).

Laboulbenia leisti J. Siemaszko & Siemaszko

Fig. 8

DISTRIBUTION. Reported to date from Europe only, occurring on species of the genus *Leistus* (Coleoptera, Carabidae) (Majewski 2008).

NEW RECORD FROM CZECH REPUBLIC. Bohemia, Čelákovice (5854), 23 Feb. 1997, *Š. Táborská-Rajová*, on *Leistus ferrugineus* (L.).

NEW RECORD FROM SLOVAKIA. Gemerský Jablonec (7885), 12 Apr. 2008, *J. Vávra*, on *L. ferrugineus*.

Laboulbenia cf. *ophoni* Thaxt.

Fig. 9

DISTRIBUTION. Reported chiefly on species of the genus *Harpalus* (Coleoptera, Carabidae) from several European countries and from Algeria (Santamaría *et al.* 1991; Santamaría 1998; Majewski 2008); also recorded on *Amara apricaria* (Paykull) from Great Britain (Weir 1996).

NEW RECORD FROM SLOVAKIA. Muráň (7286), in village, 14 Sept. 2008, *J. Máca*, on *Amara (Bradytus) crenata* Dejean (Coleoptera, Carabidae).

REMARKS. One of the main characteristics of *Laboulbenia ophoni* is the vertical septum between cells IV and V. However, among the very many thalli found on the specimen of *Amara crenata* from Slovakia there are some with this septum distinctly vertical, some with the same strongly curved and not reaching cell III, and others somewhat intermediate, with the septum oblique and reaching cell III in its inner-upper angle, as in Figure 9.

Laboulbenia pedicellata Thaxt.

DISTRIBUTION. Cosmopolitan species parasitic on various genera of the Carabidae, mostly Bembiini; also common on *Dyschirius* and related genera (Majewski 2008).

NEW RECORD FROM SLOVAKIA. Boľ (7597), floodplain forest near Latorica River, 22 May 1973, *K. Hürka*, on *Dyschirioides chalybeus gibbifrons* (Apfelbeck).

Laboulbenia pseudomasei Thaxt. Fig. 10

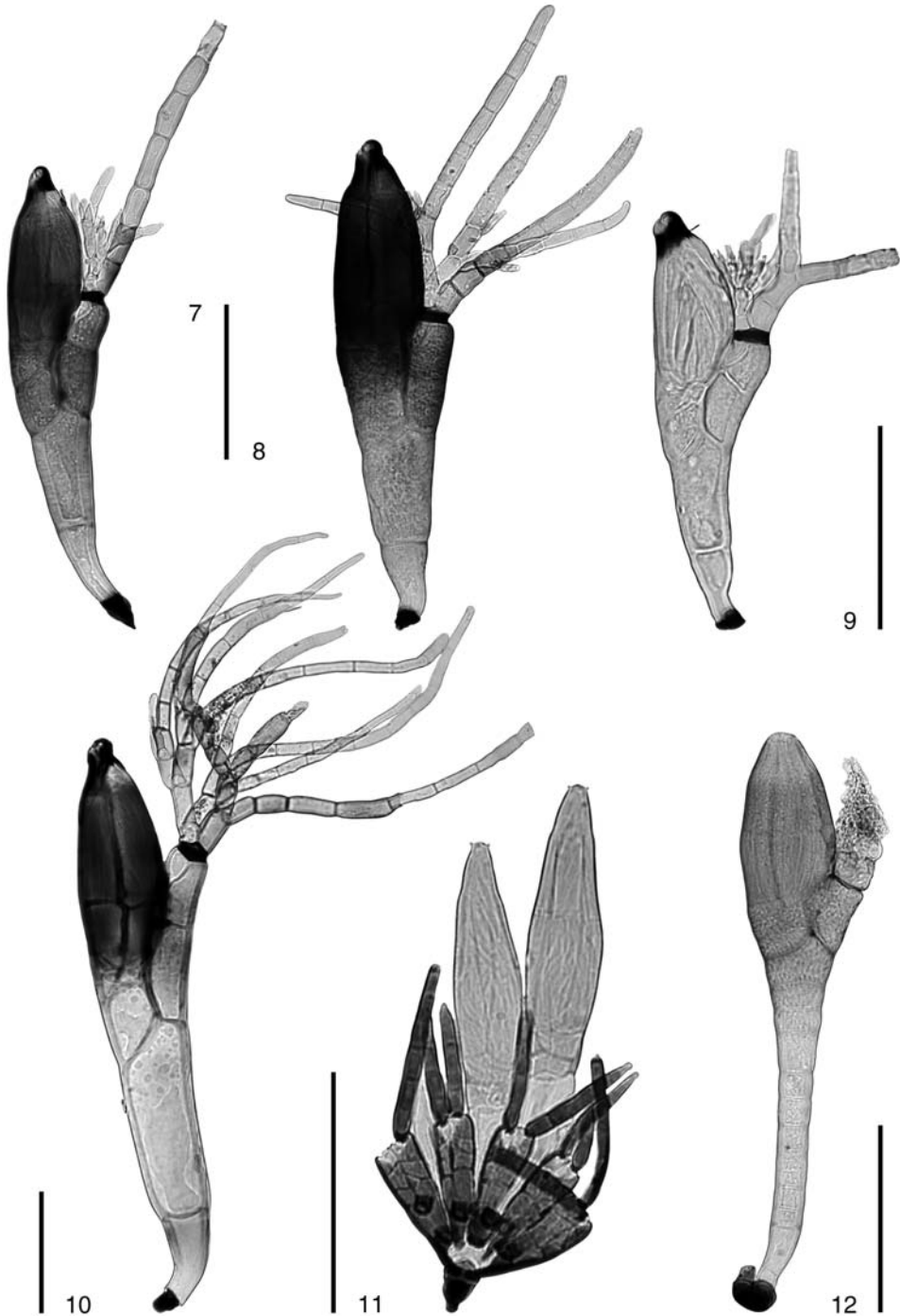
DISTRIBUTION. Because of its morphological variability there have been many misidentifications of *Laboulbenia pseudomasei*, which now make it impossible to determine its geographical distribution with certainty (Rossi & Weir 1997). It is widespread in the Holarctic region and possibly in South America on several species and genera of ground beetles (Carabidae), belonging chiefly to the tribe Pterostichini.

NEW RECORD FROM CZECH REPUBLIC. Moravia, Štítary (7060), near Jelení zátoka creek of Vranov Dam, 11 Aug. 2005, *A. Reiter*, on *Platysma (Melaninus) nigrita* (Paykull) (Coleoptera, Carabidae).

Misgomyces dyschirii Thaxt. Fig. 12

DISTRIBUTION. Widespread species in the Northern Hemisphere, reported from several European countries, North America (U.S.A.), Africa (Algeria, Canary Islands) and Asia (India, Iran, Israel, Korea, Japan, Palestine) on *Dyschirius* spp. and closely allied genera (Coleoptera, Carabidae, Scaritinae) (Huldén 1985; Kaur & Mukerji 1996).

NEW RECORDS FROM CZECH REPUBLIC. Bohemia, Praha-Hrnčiče (6252), 18 June 1991, *V. Švihla*, on



Figs 7–12. 7 – *Laboulbenia calathi* T. Majewski. 8 – *Laboulbenia leisti* J. Siemaszko & Siemaszko. 9 – *Laboulbenia* cf. *ophoni* Thaxt. 10 – *Laboulbenia pseudomasei* Thaxt. 11 – *Monoicomyces nigrescens* Thaxt. 12 – *Misgomyces dyschirii* Thaxt. from *Dyschirioides nitidus*. Scale bars = 100 μ m.

Dyschiriodes globosus (Herbst). Moravia, Bzenec-Přívov, Meandry Moravy NR (7070), 26 Aug. 2007, J. Blízek, on *D. nitidus* (Dejean); Bzenec-Přívov, sandy bank of Morava River (7070), 1 July 2007, L. Blažej, on *D. aeneus* (Dejean); Rakvice, Trkmanice (7166), 6 Aug. 2009, V. Zieris, on *D. aeneus*.

NEW RECORDS FROM SLOVAKIA. Štúrovo (8278), 17 July 1961, A. Strejčková, on *Dyschiriodes aeneus*; Tvrdšovce, salty meadow (78-7974), 14 July 1985, K. Húrka, on *D. chaldeus* (Erichson).

Monoicomyces homalotae Thaxt.

DISTRIBUTION. Cosmopolitan and common species, parasitic on various genera and species of the Staphylinidae Aleocharinae (Majewski 2008).

NEW RECORD FROM CZECH REPUBLIC. Bohemia, Kaplice (7252-53), on pasture at forest edge near Jarošovský les forest, 24 Aug. 2007, J. Máca, on *Atheta (Philhygra) luridipennis* (Mannerheim).

NEW RECORDS FROM SLOVAKIA. Muránska planina NP, 2 km ESE of Zlatno, 0.5 km N of Zlatnica cave (7186), alt. 780 m, slope of gorge, on roe deer dung, 28 July 2009, G. Makranczy, on *Atheta cinnamoptera* (Thomson); Muránska planina NP, 3.5 km WNW of Tisovec (7385), Suché doly, alt. 460 m, forested stream bank of Furmanec, plant debris, 25 Oct. 2009, G. Makranczy, on *Aloconota mihoki* (Bernhauer).

Monoicomyces nigrescens Thaxt. Fig. 11

DISTRIBUTION. Widely distributed species, reported on several genera of the Aleocharinae (Coleoptera Staphylinidae) in America, Asia and Europe (Majewski 2008).

NEW RECORD FROM CZECH REPUBLIC. Moravia, Lednice (7162), Horní les forest, 11 May 2008, J. Vávra, on *Atheta intermedia* (C. G. Thomson).

Peyritsiella vulgata (Thaxt.) I. I. Tav. Fig. 13

DISTRIBUTION. Cosmopolitan species associated with the genera *Philonthus* (*sensu lato*) and *Spatulonthus* (Coleoptera, Staphylinidae) (Majewski 2008).

NEW RECORD FROM CZECH REPUBLIC. Moravia, Hrubá Vrbka (7170), UV light at night, 23 July 2007, J. Vávra, on *Philonthus quisquiliarius* (Gyllenhal).

NEW RECORD FROM SLOVAKIA. Gemerský Jablonec (7885), 12 June 2008, J. Vávra, on *Philonthus corruscus* (Gravenhorst).

Rhachomyces furcatus (Thaxt.) Thaxt.

DISTRIBUTION. Associated with rove beetles (Staphylinidae) of the genus *Othius* in many European countries, Africa and Turkey (Majewski 2008); recently reported also from the Czech Republic (Rossi & Máca 2006).

NEW RECORD FROM SLOVAKIA. Muránska planina NP, Javorníková, 3.5 km W of Muráň, Mátožná hill (7286), in mixed forest 0.2 km W of hill top, 25 Oct. 2009, G. Makranczy, on *Othius punctulatus* (Goeze).

Rhachomyces lasiophorus (Thaxt.) Thaxt.

Fig. 14

DISTRIBUTION. Reported only from the Holarctic region, recorded from North America (U.S.A.), Asia (Korea) and a few European countries (Belgium, France, Germany, Italy, Poland, United Kingdom) on various species and genera of the Coleoptera Carabidae (Majewski 2008).

NEW RECORDS FROM CZECH REPUBLIC. Bohemia, near Kunžak, Člunek (6856), boggy meadow, 7 March 2007, J. Máca, on *Acupalpus flavicollis* (Sturm). Moravia, near Znojmo, Ječmeniště (7262), UV light at night, 21 July 2006, J. Vávra, on *Anthracus consputus* (Duftschmidt).

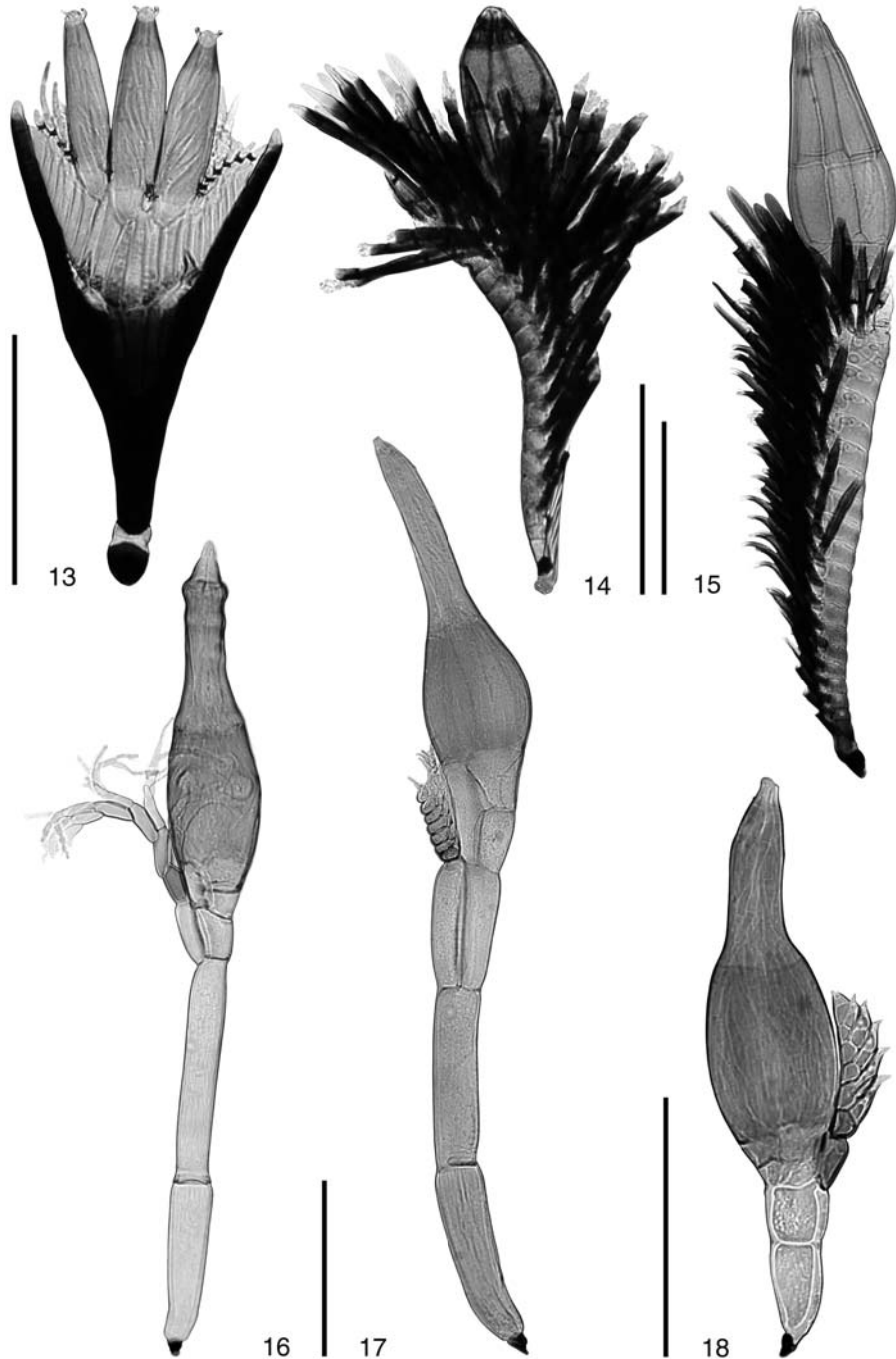
Rhachomyces philonthinus (Thaxt.) Thaxt.

Fig. 15

DISTRIBUTION. Common and widespread species, reported from Africa, North and South America, Asia and Europe on the genus *Philonthus* and allied genera (Coleoptera, Staphylinidae) (Santamaría *et al.* 1991; Proaño Castro & Rossi 2008).

NEW RECORD FROM CZECH REPUBLIC. Moravia, Hrubý Jeseník Mts., Velká Kotlina valley (5969), alt. 1100–1200 m, 13 June 2007, J. Vávra, on *Bisnius fimetarius* (Gravenhorst).

NEW RECORD FROM SLOVAKIA. Šiatorska Bukovinka, Šomoška NR (7885), 21 May 2007, J. Vávra, on *B. fimetarius*.



Figs 13–18. 13 – *Peyritsiella vulgata* (Thaxt.) I. I. Tav. from *Philonthus corruscus*. 14 – *Rhachomyces lasiophorus* (Thaxt.) Thaxt. from *Acupalpus flavicollis*. 15 – *Rhachomyces philonthinus* (Thaxt.) Thaxt. 16 – *Stigmatomyces burdigalensis* (Balazuc) A. Weir & W. Rossi. 17 – *Stigmatomyces limosinae* Thaxt. from *Spelobia (S.) clunipes*. 18 – *Stigmatomyces trianguliapicalis* T. Majewski. Scale bars = 100 μ m.

Stigmatomyces burdigalensis (Balazuc) A. Weir & W. Rossi Fig. 16

DISTRIBUTION. Parasitic on *Copromyza* spp. and *Crumomyia* spp. (Diptera, Sphaeroceridae), recorded only from Europe: Belgium, Finland, France and Great Britain (De Kesel & Hanssens 2007).

NEW RECORD FROM CZECH REPUBLIC. Moravia, near Telč, Volevčice (6858), sweeping *Carex paniculata* in boggy meadow, 24 June 2006, J. Roháček, on *Copromyza stercoraria* (Meigen).

Stigmatomyces crassicolis Thaxt.

DISTRIBUTION. A widespread species occurring on many genera and species of the Diptera (Sphaeroceridae), reported so far from several countries on all continents except Asia (De Kesel & Hanssens 2007).

NEW RECORD FROM SLOVAKIA. Near Hronec, Havranie skaly NR (8372-73), 26 May 2005, J. Roháček, on *Terrilimosina schmitzi* (Duda).

Stigmatomyces limosinae Thaxt. Fig. 17

DISTRIBUTION. This parasite occurs mainly but not only on species of the genus *Rachispoda* (Diptera, Sphaeroceridae); it has been reported so far from Europe, North and Central America, and New Zealand (De Kesel & Hanssens 2007; Majewski 2008).

NEW RECORDS FROM CZECH REPUBLIC. Moravia, Hrubý Jeseník Mts, Velká Kotlina valley, (5969), glacial cirque, alt. 1182 m, Malaise trap, 25 July – 4 Sept. 2006, J. Roháček & J. Ševčík, on *Spelobia* (*S.*) *clunipes* (Meigen) (Diptera, Sphaeroceridae); Moravia, Starý Bohumín (6075-76), Odra River meanders, sweeping over mud, 24 May 2006, J. Roháček, on *Rachispoda segem* (Roháček).

REMARKS. The parasites observed on *Spelobia clunipes* are distinctly longer (up to 535 µm) than those on *Rachispoda segem* (max. 350 µm).

Stigmatomyces majewskii H. L. Dainat, Manier & Balazuc

DISTRIBUTION. Reported so far only from France (Dainat *et al.* 1974) and Austria (Christian 2001) on *Drosophila* (*Sophophora*) *obscura*

(Diptera, Drosophilidae), but certainly much more widespread.

NEW RECORD FROM CZECH REPUBLIC. Bohemia, Pohorská Ves – Rapotice (7353), undergrowth of coniferous forest, 4 Sept. 2007, J. Máca, on *D. (S.) obscura*. Libějovice (6851), beer-trap in a lime alley, 19 June 2008, J. Máca, on *D. (S.) obscura*.

REMARKS. The record (Christian 2001) on *Scaptodrosophila rufifrons* (Loew) is wrong: the single thallus observed on the latter host has the axis of the appendage consisting of more than four cells (E. Christian, pers. comm.); an axis with four cells is a main characteristic of *Stigmatomyces majewskii*.

Stigmatomyces platensis Speg.

DISTRIBUTION. After the description on '*Limosina* sp.' from Argentina (Spegazzini 1917), this species was described again as *Stigmatomyces affinis* by Thaxter on '*Limosina* sp.' from Cameroon (Thaxter 1918), and then recorded by Thaxter (1931) on '*Limosina* sp.' from Sumatra; more recently this parasite was reported on *Pullimosina heteroneura* (Haliday) from Poland (Majewski 1990) and on *Paralimosina* spp. from Belgium (De Kesel & Hanssens 2007).

NEW RECORD FROM CZECH REPUBLIC. Moravia, Střítež nad Bečvou (6574), 12 Sept. 2008, M. Barták, on *Pullimosina vulgesta* Roháček (Diptera, Sphaeroceridae).

REMARKS. The thalli from the Czech Republic are identical with those reported by Majewski (1990) from Poland, and they differ somewhat, especially in the shape of the perithecial apex, from those observed by De Kesel and Hanssens (2007) on *Paralimosina fucata* (Rondani) and *P. subscibata* Roháček from Belgium. Because the hosts of *Stigmatomyces affinis* Thaxt. (= *S. platensis* Speg.) from Cameroon were identified by Steve Marshall (Canada; unpublished) as *Pullimosina heteroneura*, it could well be that the 'true' *Stigmatomyces platensis* is only found on flies of the genus *Pullimosina* and that the parasites of *Paralimosina* (which is not closely allied to *Pullimosina*) belong to a different species. This suggestion is supported by the following unpublished record:

Italy, near Lesina, 29 Sept. 1996, *L. D'Alfonso*, on *Pullimosina heteroneura*.

Stigmatomyces triangulipicalis T. Majewski
Fig. 18

DISTRIBUTION. Parasitic on several species of *Parydra* and also on *Pelina aenea* (Fallén) (Diptera, Ephydriidae), recorded from various European and African countries (Majewski 2008).

NEW RECORD FROM CZECH REPUBLIC. Bohemia, Polečnice (7250-51), sifting of *Sphagnum*, 11 Sept. 2006, *J. Máca*, on *Parydra pusilla* (Meigen).

Symplectromyces vulgaris Thaxt.

DISTRIBUTION. Recorded on several species of *Quedius* (Coleoptera, Staphylinidae, Staphylininae) in Europe, North America and South Asia (Majewski 2008).

NEW RECORD FROM CZECH REPUBLIC. Bohemia, Hluboká nad Vltavou (6952), under bark of oak, 7 June 2010, *J. Máca*, on *Quedius mesomelinus* (Marsham); near Ostrava, Nová Plesná (6174), swamp in mixed forest, 30 Sept. 2007, *J. Vávra*, on *Q. maurorufus* (Gravenhorst).

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REFERENCES

BALAZUC J. 1974. Laboulbeniales de France (suite). *Bull. Mens. Soc. Linn. Lyon* **43**(1): 12–21.
 BENJAMIN R. K. 1971. Introduction and supplement to Roland Thaxter's contribution towards a monograph of the Laboulbeniaceae. *Biblioth. Mycol.* **30**: 1–155.
 CHRISTIAN E. 2001. The coccinellid parasite *Hesperomyces virescens* and further species of the order Laboulbeniales (Ascomycotina) new to Austria. *Ann. Naturhist. Mus. Wien* **103B**: 599–603.
 DAINAT H., MANIER J.-F. & BALAZUC J. 1974. *Stigmatomyces majewskii* n. sp., *Stigmatomyces papuanus* Thaxter 1901, Laboulbeniales parasites de Diptères Acalyptérés. *Bull. Soc. Mycol. France* **90**: 171–178.

DE KESEL A. & HANSENS F. 2007. *Stigmatomyces* (Laboulbeniales, Ascomycetes) from Belgian Sphaeroceridae (Diptera). *Sterbeekia* **27**: 33–42.
 DE KESEL A. & KRASTINA-DE KESEL I. 2006. Laboulbeniales (Ascomycetes) from Latvia. *Acta Mycol.* **41**(1): 55–64.
 HULDÉN L. 1985. Floristic notes on Palaearctic Laboulbeniales. *Karstenia* **25**: 1–16.
 KAUR S. & MUKERJI K. G. 1996. Studies on Indian Laboulbeniales II. Three unrecorded species. *Nova Hedwigia* **62**: 151–156.
 LEE Y.-B. & LIM C.-K. 2000. Notes on Species of the Laboulbeniales from Yunnan Province of China. *Mycobiology* **28**(2): 110–114.
 MAJEWSKI T. 1990. Rare and new Laboulbeniales from Poland. *Acta Mycol.* **25**: 43–55.
 MAJEWSKI T. 1994. The Laboulbeniales of Poland. *Polish Bot. Stud.* **7**: 1–466.
 MAJEWSKI T. 2008. Atlas of the Geographical Distribution of Fungi in Poland. **4**. Laboulbeniales. W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków.
 PROAÑO CASTRO A. C. & ROSSI W. 2008. New records of Laboulbeniales (Fungi, Ascomycota) from Ecuador. In: P. M. GIACHINO (ed.), *Biodiversity of South America*, **1**. *Memoirs on Biodiversity* **1**: 11–18.
 PRUNER L. & MÍKA P. 1996. List of settlements in the Czech Republic with associated map field codes for faunistic grid mapping system. *Klapalekiana* **32**(Suppl.): 1–115.
 ROSSI W. & MÁCA J. 2006. Notes on the Laboulbeniales (Ascomycetes) from the Czech Republic. *Sydowia* **58**(1): 110–124.
 ROSSI W. & WEIR A. 1997. *Laboulbenia pterostichi* and its allies. *Mycol. Res.* **101**(1): 129–134.
 SANTAMARÍA S. 1998. Laboulbeniales, I. *Laboulbenia*. *Flora Mycologica Iberica*. **4**. J. Cramer in der Gebrüder Borntraeger Verlagsbuchhandlung, Madrid, Berlin, Stuttgart.
 SANTAMARÍA S., BALAZUC J. & TAVARES I. I. 1991. Distribution of the European Laboulbeniales (Fungi, Ascomycotina). An annotated list of species. *Treb. Inst. Bot. Barcelona* **14**: 1–123.
 SPEGAZZINI C. 1917. Revisión de las Laboulbeniales argentinas. *Anales Mus. Nac. Hist. Nat. Buenos Aires* **29**: 445–688.
 THAXTER R. 1918. Extra-American dipterophilous Laboulbeniales. *Proc. Amer. Acad. Arts* **53**: 695–749.
 THAXTER R. 1931. Contribution towards a monograph of the Laboulbeniaceae. Part V. *Mem. Amer. Acad. Arts* **16**: 1–435.
 WEIR A. 1996. A preliminary host-parasite list of British Laboulbeniales (Fungi, Ascomycotina). *Entomologist* **115**: 50–58.