

New records of the flat-footed flies (Diptera: Platypezidae) from the Czech Republic and Slovakia

Nové nálezy stlačenkovitých (Diptera: Platypezidae) z České republiky a Slovenska

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Abstract. Reports of rare species of flat-footed flies (Diptera: Platypezidae), including species new for the fauna of Czech Republic and Slovakia, are presented. *Kesselimyia chandleri* Vaňhara, 1981 is reported here for the first time from Slovakia and *Lindneromyia hungarica* Chandler, 2001 and *Platypeza aterrima* Walker, 1836 are reported as new for the fauna of Bohemia. In addition, records of three critically endangered species from the Czech Republic are given: *Agathomyia sexmaculata* (von Roser, 1840); *Platypezina connexa* (Boheman, 1858) and *Paraplatypeza bicincta* (Szilády, 1941). Short notes on the distribution, biology and conservation status of each species are given. The female of *K. chandleri* was collected ovipositing on *Macrolepiota mastoidea*, a new host fungus record for this species.

INTRODUCTION

The European fauna of flat-footed flies (Diptera: Platypezidae) comprises 43 species. Currently, 36 species are listed in the Diptera checklist of the Czech Republic and Slovakia (Vaňhara 2009). Recent additions to the checklist were made by Tkoč & Vaňhara (2006, 2008b) and Tkoč (2011) for the fauna of the Czech Republic and by Ševčík (2004) and Roháček & Ševčík (2007, 2009, 2011) for the fauna of Slovakia. Current numbers of species are 33 for the Czech Republic (25 in Bohemia and 32 in Moravia) and 32 for Slovakia. The records provided here are the most recent additions to the fauna of Slovakia and Bohemia. Additionally, records of species which are included in the Red List of threatened invertebrates of the Czech Republic (Vaňhara & Ševčík 2005) are presented because the species concerned are ranked as critically endangered (CR) and are very rarely collected (see comments under each species). None of these species are included in the Red (ecosozological) list of Diptera of Slovakia (Jedlička & Stloukalová 2001), where only two species of Platypezidae are listed in the data deficient (DD) category.

Generally, members of the family Platypezidae live in woodland habitats. The known larvae of Platypezidae are mycophagous and live in the fruiting bodies of many fungus species (Fungi, Basidiomycota). The adults can be spotted making fast, straight movements on

leaves, usually on vegetation close to the streams, rivers or close to forest edges, where they can be collected by sweeping. The females can be observed during oviposition on the host fungi and can be collected directly using a pooter. The fungus fruiting bodies can be also collected, and the larvae reared to adults under laboratory conditions. For methodology of such rearing see Ševčík (2010) and Tkoč (2011).

MATERIAL AND METHODS

The records presented here are rather occasional and were not part of any major faunistic survey, and are therefore published separately here. All specimens were identified by the first author using the key in Chandler (2001). The male genitalia of *Platypeza aterrima* Walker, 1836 and *Paraplatypeza bicincta* (Szilády, 1941) were dissected for accurate species identification. The nomenclature and classification of the Platypezidae used follows Chandler (2001). Information on biology and collecting circumstances derives from the first author's personal experience and from Chandler (2001). The following abbreviations are used in the paper: MT – Malaise trap, YPT – Yellow pan trap, PLA – Protected Landscape Area, NNR – National Nature Reserve, NR – Nature Reserve. The material listed in this paper is deposited in following collections:

CULSP Czech University of Life Sciences, Prague, Czech Republic;

NMPC National Museum, Prague, Czech Republic;

RMHK East Bohemian Museum, Hradec Králové, Czech Republic.

RESULTS

Agathomyia sexmaculata (von Roser, 1840)

Material examined. Czech Republic: Bohemia bor., Děčín-Čertova voda (5151), right shore of Labe river, 50°48'47.3"N, 14°13'35.3"E, 130 m a.s.l., meat baited MT, 10.ix.–27.x.2009, 1 ♀, M. Barták leg. (CULSP).

Distribution. Recorded from the Czech Republic, Denmark, Germany, Great Britain, Lithuania, the Netherlands, Poland, Switzerland, and European Russia (Chandler 2001, 2010).

Comments. Very rare species. This is the second record for the fauna of Bohemia (for the first record from Vratislavice nad Nisou in the Jizerské hory Mts. see Tkoč & Vaňhara 2008b) and the third record for the Czech Republic. The first record was from 1981 in the lowland forest of Horní Les near Lednice (Moravia), where two individuals were caught in a light trap (Vaňhara 1986). This species has not been recorded from Slovakia. In the Czech Red List *A. sexmaculata* is listed as a critically endangered (CR) species (Vaňhara & Ševčík 2005).

Platypezina connexa (Boheman, 1858)

Material examined. Czech Republic: Bohemia or., Pardubice district, Hoděšovice, Mazurovy chalupy NR (5861), damp meadow, 14.ix.1999, 1 ♀, B. Mocek leg. (RMHK). Moravia bor., Beskydy Mts. (PLA), Lysá hora Mt. (6476), 49°32'46"N, 18°26'53"E, 1323 m a.s.l., hilltop, MT, 29.vii.–27.viii.2004, 1 ♂, M. Barták leg. (CULSP).

Distribution. Recorded from the Czech Republic, Finland, Germany, Norway, Poland, Sweden, and European Russia (Chandler 2001, 2010).

Comments. Very rare species, usually found in habitats where fruiting bodies of fungus *Armillaria* sp. are growing. The flight period ranges from August to October, which correlates with the growth period of *Armillaria* species. However, the immature stages remain unknown. In the Czech Red List *P. connexa* is listed as a critically endangered (CR) species (Vaňhara & Ševčík 2005).

***Kesselimyia chandleri* Vaňhara, 1981 (Figs 1–4)**

Material examined. Slovakia occ., Malé Karpaty Mts. (PLA), Lošonec, Lošonský háj forest (7570), 48°28'26.4"N, 17°24'26.9"E, 277 m a.s.l., 10.x.2010, 2 ♀♀ (1 ♀ ovipositing on *Macrolepiota procera*, 1 ♀ ovipositing on *Macrolepiota mastoidea*), M. Tkoč leg. (NMPC).

Distribution. Recorded from the Czech Republic, Hungary, European Russia (Chandler 2001, 2010), and Bulgaria (Beschovski 2004). New genus and species for Slovakia.

Comments. Individuals of *K. chandleri* are almost impossible to obtain by sweeping but the females can be collected during oviposition on its host fungus (*Macrolepiota* spp., see Fig. 2). The larvae live between the gills and in the tissue of the host fungus (Figs 3, 4) and can be reared to adults. Two females were caught directly from fruiting bodies, where they were laying eggs between the gills of the fungus cap. Oviposition on *Macrolepiota mastoidea* is recorded here for the first time, and extends the list of known host fungi (see Chandler 2001). *K. chandleri* is listed as a critically endangered (CR) species on the Czech Red List (Vaňhara & Ševčík 2005). It has also been found in the Bílé Karpaty PLA and Chřiby Mts. in Moravia (M. Tkoč, in prep.).

***Platypeza aterrima* Walker, 1836 (Fig. 5)**

Material examined. Czech Republic: Bohemia or., Chlumec nad Cidlinou env., Lovčice, Kněžíčky NNR, part Bludy (formerly Bludy NR) (5858), 50°08'51"N, 15°22'32"E, Moericke trap (= YPT), 3.–11.x.2001, 1 ♂ [dissected genitalia] 1 ♀, B. Mocek leg. (RMHK).

Distribution. Recorded from Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Italia, Poland, Sweden, Switzerland, European Russia and Far East of Russia (Chandler 2001, 2010). New species for Bohemia.

Comments. Probably the rarest European species of the genus, associated with *Armillaria* spp. The adults can be obtained by sweeping of vegetation in sites with growing *Armillaria* spp., usually in October. Adult flight period ranges from August to October. In the Czech Red List *P. aterrima* is considered critically endangered (CR) (Vaňhara & Ševčík 2005).

***Paraplatypeza bicincta* (Szilády, 1941) (Fig. 6)**

Material examined. Czech Republic: Bohemia bor.: Děčín-Čertova voda (5151), right shore of Labe river, 50°48'47.3"N, 14°13'35.3"E, 130 m a.s.l., meat baited MT, 10.ix.–27.x.2009, 1 ♀, M. Barták leg. (CULSP); Vysoké Chvojno, Buky NR, 50°08'N, 15°59'E, 296 m a.s.l., deciduous forest, sweeping, 10.ix.1998, 1 ♂ [dissected genitalia], B. Mocek leg. (RMHK).

Distribution. Recorded from the Czech Republic, Finland, Germany, Great Britain, Hungary, Norway, Slovakia, Sweden, Switzerland, European Russia, Far East of Russia and Myanmar (= Burma) (Chandler 2001, 2010).

Comments. Rare species associated with *Pluteus* spp. Adults were reared several times by the first author from *Pluteus cervinus* (not published). Adult flight period is from August to October. In the Czech Red List *P. bicincta* is listed as a critically endangered (CR) species (Vaňhara & Ševčík 2005).

***Lindneromyia hungarica* Chandler, 2001**

Material examined. Czech Republic: Bohemia centr., Týnec nad Labem, Šibeník hill (5958), on *Agaricus* sp., 19.vii.2001, 3 ♀♀, B. Mocek leg. (RMHK). Moravia centr.: Javoříčko, Špraněk NNR (6367), along road, swept from *Arctium* sp., 20.viii.2008, 1 ♀, M. Tkoč leg. (NMPC);

Zubří env. (6574), meadow, 49°29'N, 18°04'E, 450 m a.s.l., YPT, viii.2008, 1 ♀, J. Frydrych leg. (CULSP). Moravia occ., Jihlava env. (6659), reared from *Agaricus* sp., 12.ix.2005, 3 ♂♂ 2 ♀♀, D. Dvořák leg. (NMPC). Moravia mer., Brno-Řečkovice, former military area, 49°15'03"N, 16°34'26"E, 310 m a.s.l., 29.vii.2008, 3 ♀♀ (ovipositing on *Agaricus xanthodermus*), 29.vii.–8.viii.2008, 1 ♂ 1 ♀ (reared from *A. xanthodermus*), 29.vii.–28.viii.2008, 1 ♀ (reared from *A. xanthodermus*), all M. Tkoč leg. (NMPC). **Distribution.** Recorded from Austria, Czech Republic, France, Germany, Hungary, Slovakia, Spain, and Switzerland (Chandler 2001, 2010). New species for Bohemia.

Comments. This species, recently separated from *Lindneromyia dorsalis* (Meigen, 1804), has been recorded so far from Moravia (Tkoč & Vaňhara 2006) and repeatedly from Slovakia (Roháček & Ševčík 2007, 2009, 2011). It has also been found in the Bílé Karpaty PLA and Chřibý Mts in Moravia (M. Tkoč, in prep.).

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REFERENCES

- BESCHOVSKI V. 2004: Genus *Kesselimyia*, *K. chandleri* and subfamily Platypezinae (Insecta: Diptera, Platypezidae): new taxa to the Bulgarian fauna. *Acta Zoologica Bulgarica* **56**: 237–238.
- CHANDLER P. J. 2001: *The flat-footed flies (Diptera: Opetiidae and Platypezidae) of Europe. Fauna Entomologica Scandinavica, Vol. 36*. Brill, Leiden, Boston, Köln, 276 pp.
- CHANDLER P. 2010: Fauna Europaea: Platypezidae. In: PAPE T. (ed.): *Fauna Europaea: Diptera, Brachycera. Fauna Europaea version 2.5*. Available on-line: <http://www.faunaeur.org>. (accessed 10 October 2012).
- JEDLIČKA L. & STLOUKALOVÁ V. 2001: Červený (ekosozologický) zoznam dvojkrídlovcov (Diptera) Slovenska. (Red (ecosozological) list of Diptera of Slovakia). Pp. 139–142. In: BALÁŽ D., MARHOLD K. & URBAN P. (eds): Červený zoznam rastlín a živočíchov Slovenska. (Red list of plants and animals of Slovakia). *Ochrana Prírody* (Bratislava) **20 (Supplement)**: 1–160 pp. (in Slovak, English abstract).
- ROHÁČEK J. & ŠEVČÍK J. 2007: Faunistic records from Czech Republic and Slovakia: Platypezidae. Pp. 255–256. In STLOUKALOVÁ V. (ed.): *Dipterologica bohemoslovaca*, Vol. 14. *Acta Zoologica Universitatis Comenianae* **47**: 1–256.
- ROHÁČEK J. & ŠEVČÍK J. 2009: Platypezidae. Pp. 151–155. In: ROHÁČEK J. & ŠEVČÍK J. (eds): *Diptera of the Poľana Protected Landscape Area – Biosphere Reserve (Central Slovakia)*. SNC SR, Administration of the PLA – BR Poľana, Zvolen, 340 pp.
- ROHÁČEK J. & ŠEVČÍK J. 2011: The fauna of Opetiidae and Platypezidae (Diptera) in the Gemer region (Central Slovakia). *Časopis Slezského Zemského Muzea, Série A – Vědy Přírodní* (Opava) **60**: 41–47.
- ŠEVČÍK J. 2004: Diptera associated with fungi in the Poloniny National Park (Bukovské vrchy Mts., East Slovakia). Pp. 293–304. In: BARTÁK M. & KUBÍK Š. (eds): *Dipterologica bohemoslovaca 13. Folia Facultatis Scientiarum Naturalium Universitatis Masarykianae Brunensis, Biologia* **109**: 1–346.
- ŠEVČÍK J. 2010: *Czech and Slovak Diptera associated with fungi*. Slezské zemské muzeum, Opava, 112 pp.
- TKOČ M. 2011: New records of *Polyporivora picta* (Meigen, 1830) from the Czech Republic and Greece with notes on its larval biology and distribution in Europe (Diptera: Platypezidae). *Časopis Slezského Zemského Muzea, Série A – Vědy Přírodní* (Opava) **60**: 263–267.
- TKOČ M. & VAŇHARA J. 2006: Faunistic Records: Diptera, Platypezidae, *Lindneromyia hungarica* Chandler, 2001. *Entomofauna Carpathica* **18**: 36.
- TKOČ M. & VAŇHARA J. 2008a: The puparium and mature larva of the flat-footed fly *Lindneromyia hungarica* Chandler, 2001 (Diptera: Platypezidae). *Zootaxa* **1730**: 59–64.



Figs 1–6. Larvae and adults of Platypezidae: 1–4 – *Kesselimyia chandleri* Vaňhara, 1981: 1 – female, 2 – two females ovipositing on *Macrolepiota procera*, 3 – larva on the fungus gills, 4 – larva in detail. 5 – *Platypeza aterrima* Walker, 1836, male. 6 – *Paraplatypeza bicincta* (Szilády, 1941), female. (All photos by M. Tkoč).

Obr. 1–6. Larvy a dospělci stlačenkovitých: 1–4 – *Kesselimyia chandleri* Vaňhara, 1981: 1 – samice, 2 – dvě samice během snůšky do bedly vysoké (*Macrolepiota procera*), 3 – larva na lupenech bedly, 4 – detail larvy. 5 – *Platypeza aterrima* Walker, 1836, samec. 6 – *Paraplatypeza bicincta* (Szilády, 1941), samice. (Všechny fotografie M. Tkoč).

- TKOČ M. & VAŇHARA J. 2008b: Stlačenkovití (Diptera: Opetiidae a Platypezidae) Jizerských hor a Frýdlantska. (Opetiidae and Platypezidae (Diptera) of the Jizerské hory Mts and Frýdlant region). *Sborník Severočeského Muzea, Přírodní Vědy* **26**: 255–260 (in Czech, English summary).
- VAŇHARA J. 1986: The flat-footed flies (Opetiidae and Platypezidae, Diptera) in a lowland forest. Pp. 79–84. In: OLEJNÍČEK J. & SPITZER K. (eds): *Dipterologica bohemoslovaca. Vol. 4. Jihočeské muzeum v Českých Budějovicích, České Budějovice*, 148 pp.
- VAŇHARA J. 1995: Recent distribution of flat-footed flies (Diptera: Opetiidae and Platypezidae) in Czech and Slovak Republics with a revised check list and species quality indexing. *Časopis Slezského Zemského Muzea, Série A – Vědy Přírodní* (Opava) **44**: 43–61.
- VAŇHARA J. 2009: Platypezidae Fallén, 1815. In: JEDLIČKA L., KÚDELA M. & STLOUKALOVÁ V. (eds): *Checklist of Diptera of the Czech Republic and Slovakia*. Electronic version 2. Available on-line: <http://zoology.fns.uniba.sk/diptera2009> + CD-ROM: ISBN 978-80-969629-4-5. (accessed 10 October 2012).
- VAŇHARA J., BARTÁK M. & KUBÍK Š. 2005: Platypezidae. Pp. 183–186. In: BARTÁK M. & KUBÍK Š. (eds): *Diptera of Podyjí National Park and its Environs*. Česká zemědělská univerzita v Praze, Praha, 432 pp.
- VAŇHARA J. & ŠEVČÍK J. 2005: Platypezidae. Pp. 296–298. In: FARKAČ J., KRÁL D. & ŠKORPÍK M. (eds): *Červený seznam ohrožených druhů České republiky. Bezobratlí. Red list of threatened species in the Czech Republic. Invertebrates*. Agentura ochrany přírody a krajiny ČR, Praha, 760 pp. (in Czech and English).

SOUHRN

Článek uvádí několik významných nálezů dvoukřídlých z čeledi stlačenkovitých (Diptera: Brachycera: Platypezidae). Z území Slovenska je zde poprvé uveden druh *Kesselimyia chandleri* Vaňhara, 1981 (obr. 1–4), kde byly prvním autorem nalezeny dvě samice při kladení vajíček do hostitelských plodnic – bedel (*Macrolepiota* spp.). Jako nové pro faunu Čech byly nalezeny druhy *Lindneromyia hungarica* Chandler, 2001 a *Platypeza aterrima* Walker, 1836 (obr. 5). Dále jsou zde uvedeny nálezy tří kriticky ohrožených druhů z České republiky: *Agathomyia sexmaculata* (von Roser, 1840); *Platypezina connexa* (Boheman, 1858) a *Paraplatypeza bicincta* (Szilády, 1941) (obr. 6). Ke každému z těchto šesti druhů jsou poskytnuty doplňující informace o jejich rozšíření, biologii a stavu z hlediska ochrany přírody.