Bolopus furcatus (Fallén, 1826) (Diptera, Platypezidae) rediscovered in Finland

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The flat-footed fly *Bolopus furcatus* (Fallén, 1826) (Diptera, Platypezidae) was rediscovered in Finland (*Regio aboensis*, Raseborg, Billnäs) in 2011, and a second finding was made in 2012 (*Ab*: Raseborg, Fiskars). The species is monophagous on the bracket fungus *Polyporus squamosus*. We provide digital images of ovipositing females in association with the host fungus and images of second stage larva.

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Introduction

The Platypezidae (flat-footed flies, lattajalkakärpäset, plattfotsflugor/svampflugor) comprise three subfamilies, Callomyinae, Microsaniinae and Platypezinae. About 70 species in total are known from the Palaearctic region (Chandler & Shatalkin 1998), and 30 species are presently recorded from Finland (Ståhls & Kahanpää 2006). The adults and known larvae of the European species are keyed by Chandler (2001). All described Platypezidae larvae are fungivorous, with a preference for lignicolous fungi. Platypezidae spp. with larval development in bracket fungi are apparently mono- to oligophagous on one or a few species of the same fungal genus, while platypezid species developing in gill fungi have a broader host range but still narrower than that of most dipteran fungivores

The monotypic genus *Bolopus* Enderlein, 1932 (Platypezinae) is confined to Europe. Frey (1941) recorded *Bolopus furcatus* (Fallén, 1826) from Finland (as *Platypeza furcata*), but no specimen is present in MZH collections, and thus the species was omitted from the Finnish Diptera checklist of Hackman (1980). The taxon was not reported from Finland by Chandler (2001), for Scandinavia he indicated the taxon as frequent in Denmark and southern Sweden. *Bolopus furcatus* is recorded from most central European countries (Chandler 2001).

Biology

The fruiting bodies of the host fungus of *Bolopus furcatus*, *Polyporus squamosus* (Huds.: Fr.) (dryad's saddle, suomukääpä, fjällticka), are common in parks in Southern Finland, and may under suitable conditions appear from spring until autumn. The fruiting bodies have a size range up to 50-70 cm in diameter, and occur frequently on deciduous trees like *Ulmus glabra*, *Fraxinus excelsior*, and *Acer platanoides*, and more rarely on *Tilia cordata* and *Aesculus hippocastaneum* (Niemelä 2005). Chandler (2001) noted adult females visiting

Fig. 1. Females of *Bolopus furcatus* ovipositing underneath *Polyporus squamosus* on *Ulmus glabra* (*Ab*: Karis, Billnäs, 20.VI. 2011). [*Bolopus furcatus* -naaraita munimassa suomukääpien alla.] Photo: J. Muona.

Fig. 2. A female of *Bolopus furcatus* ovipositing underneath *Polyporus squamosus* on *Tilia cordata* stump (*Ab*: Raseborg, Fiskars, 18.VIII. 2012). [*Bolopus furcatus* -naaras munimassa suomukäävän alla]. Photo: G. Ståhls.

the fungus for oviposition from early May to August in Scandinavia and the present observations of ovipositing females from two sites in southwestern Finland are from June 2011 and August 2012. In both years ovipositing females were observed during a time period of less than two weeks, the number of female specimens simultaneously observed in year 2011 was much higher than in 2012. We observed individual females distributing eggs in multiple pores underneath the fungus (Figs. 1 and 2). No male specimens were observed in the nearby area around the fungi. The larvae feed (tunnel) within the relatively soft fungal tissue, leave the fungus through the dorsal surface and pupate in the ground. It is likely that the taxon has only one generation per year in Finland. The usually large sized fungi can apparently support a large local population of the taxon.

Identification

The body length of the adult fly is 3.5-4.0 mm. The wing veins show a characteristic pattern shared with the Holarctic genus *Seri* Kessel & Kessel, 1966: the median fork (M1+M2) arises midway between crossvein dm-cu and wing margin and vein M2 ends before wing margin (Fig. 2). The taxa can be distinguished based on number of notopleural bristles on thoracic dorsum, the single Palaearctic species *Seri obscuripennis* (Oldenberg, 1916) has 3 strong notopleural bristles while *Bolopus furcatus* has 4-5 notopleural bristles (adapted from Chandler 2001).

Immature stages

The immature stages (third stage larva and pupa) were illustrated in Chandler (2001), Rotheray et al. (2004) and Krivosheina (2008a) provided detailed descriptions of third stage larvae. The larvae resemble those of the genera *Seri* and *Polyporivora*, and are sub-cylindrical with short vestiture, characteristic of species developing within polypore fungi (Fig. 3). The first segment (head) bears a pair of long tapering projections distinctly longer than those on succeeding segments (Fig. 4), which distinguishes the taxon. The larva has been reared multiple times from *Polyporus squamosus*, which has been reported as the only host fungus for this species (Chandler 2001 and discussion therein, Sevčik 2001, 2006). Krivosheina (2008b), however, reported an unusual finding of *Bolopus larvae* from a myxomycete plasmodium.

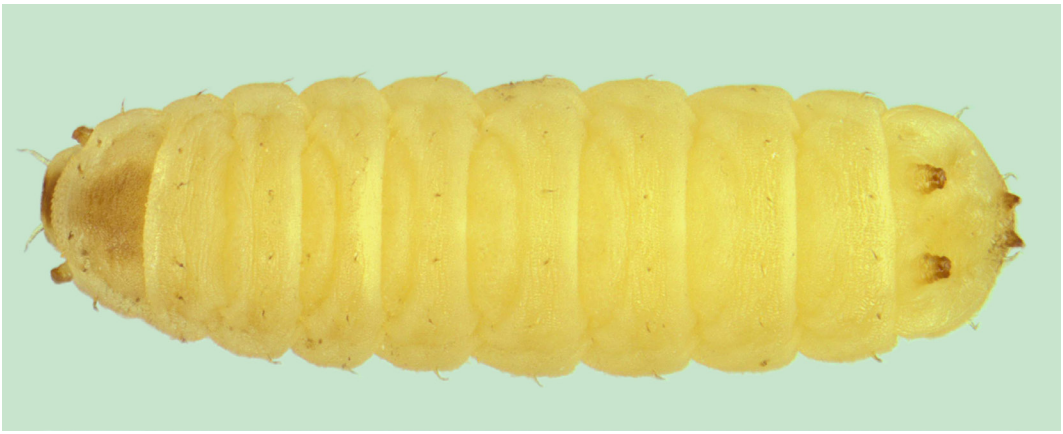

Fig. 3. Second stage larva of *Bolopus furcatus* (*Ab*: Karis, Billnäs, 20.VI. 2011), dorsal view. Anterior spiracular tubes on lateral sides of segment 1 (left), posterior spiracular tubes on dorsal side of metathoracic segment and a pair of separate protuberances on the anal segment. Length of larva ca 4 mm. [*Bolopus furcatus*, toisen toukkasteen toukka, selkäpuoli. Lyhyet, paksut hengitysputket ensimmäisen jaokkeen sivuilla ja viimeisen jaokkeen selkäpuolella]. Photo: E. Rättel.

Material

Finland, 66687:33131, *Ab*: Raseborg, Billnäs, 25.VI. 2011, J. Muona leg. E. Rättel det. Larva, DNA voucher specimen MZH_Y1552, ex. *Polyporus squamosus* growing on *Ulmus glabra*.

Finland, 66687:33131, *Ab*: Raseborg, Billnäs, 27.VI. 2011, J. Muona leg, G. Ståhls det.; adult female, DNA voucher specimen MZH_Y1553; 1 female, ídem. On *Polyporus squamosus* growing on *Ulmus glabra*. A high number of females were observed, but not sampled (Fig. 1).

Finland, 66739:33085, *Ab*: Raseborg, Fiskars, 11.VIII. 2012, J. Muona leg. G. Ståhls det., six females on *Polyporus squamosus* growing on *Tilia cordata*; Idem, 18.VIII. 2012, G. Ståhls & E. Rättel leg., G. Ståhls det., two females. Several additional females were observed but not sampled.

Sampled individuals were deposited in the insect collections of Zoological Museum (MZH) of the Finnish Museum of Natural History, Helsinki. The DNA sequences of the mitocondrial gene cytochrome c oxidase subunit I generated for both adult female and immature stages were identical.

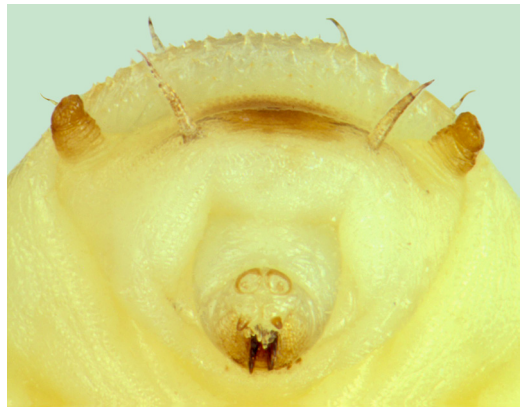

Fig. 4. Apicoventral view of anterior segments 1-2 (head and prothoracic segment) of second stage larva of *Bolopus furcatus* (locality data as in Fig.3). The first segment has a pair of long tapering projections between the anterior spiracular tubes. Sclerotized, dark mouth hooks (labial hooks) visible between the oral ridges, a pair of maxillary processes dorsal to the hooks and a paired antenna dorsal to these. [Toisen toukkavaiheen segmentit 1-2, pitkät parilliset ulokkeet näkyvät hengitysputkien välissä, kuvan alaosassa tummat kitinisoituneet suukoukut]. Photo: E. Rättel.

Acknowledgements

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Yhteenveto

Lattajalkakärpänen Bolopus furcatus (Diptera, Platypezidae) löydettiin uudelleen Suomesta

Raportoimme kaksi löytöä lattajalkakärpäslajista *Bolopus furcatus* (Diptera, Platypezidae) Raaseporista, vuonna 2011 Pinjaisista ja v. 2012 Fiskarsista. Lajin toukat kehittyvät suomukäävissä (*Polyporus squamosus*). Toukkia otettiin talteen käävistä, ja aikuisia naaraita kerättiin kääpien alta ja nämä talletettiin Luonnontieteellisen keskusmuseon kokoelmiin sekä DNA-tutkimuksia varten. Toukasta ja aikuisista yksilöistä tehdyt mitokondriaalisen COI-geenin sekvenssit olivat identtiset. Vuonna 2011 havaittiin suuri määrä naaraita munimassa suomukääpien alapuolella.