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## A new species of *Megaselia* Rondani (Diptera: Phoridae) reared from a moth larva (Lepidoptera: Cossidae) in Italy. <sup>(1)</sup>

### INTRODUCTION

In May 1994 larvae of a leopard moth, *Zeuzera pyrina* (Linn.) (Lep. Cossidae) were extracted (by GC) from the twigs of apple trees, *Malus domestica* (Borkh.), in an orchard near Imola, Province of Bologna. Later in the laboratory, twelve larvae of Phoridae emerged from a moribund moth larva that had been removed from a twig of 2 cm diameter. These were placed in a container at 24 °C and 70% relative humidity in the dark. The soft tissues of the host were completely consumed by the phorid larvae, which vacated the remains of the host through holes made in its integument. They pupated nearby within 2-3 days. Two males and seven females emerged in about ten days. These were sent to RHL, who eventually established that they were a new species close to *Megaselia praeacuta* (Schmitz). The recognition of the latter species has proved troublesome until now. The mounting of the holotype on a slide, however, has allowed clarification and the recognition of a new synonym of this species. This is proposed below along a description of the new species.

*Megaselia praeacuta* (Schmitz, 1919).

*Aphiochaeta praeacuta* Schmitz, 1919: 115.

*Megaselia arietina* Disney, 1991, in Čakar & Disney, 1991: 21. Syn.n.

Schmitz described this species from a single male. He highlighted the black haltere knob, the brown legs and palps, and the hind tibia being narrowed apically. The latter feature was further emphasised by the specific epithet. The paler colour of the designated parts and the apical third of the hind tibia being of approximately equal width throughout distinguished *M. arietina* from *M. praeacuta*. However, the precise recognition of *M. praeacuta* was called into question by the acquisition of further material of *M. arietina*. Accordingly RHL has remounted

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Schmitz's specimen on a slide. This shows that the haltere knob is largely brown, the palps and legs are yellowish brown and one hind tibia is as in *M. arietina*. The other is indeed narrowed in its apical third, by a deflection of the ventral margin. This, when compared with the other tibia, is evidently a developmental fault and, therefore, of no taxonomic significance. Comparison of the hypopygia reveals that *M. praeacuta* and *M. arietina* are conspecific. The latter is therefore formally synonymised with *M. praeacuta*, whose hitherto undescribed female is covered by the description of the female of *M. arietina* along with a more detailed description of the male.

*Megaselia zeuzerae* Disney sp. n. figs 1-4.

Etymology-Named after the host moth.

Male. Frons brown, with 102-108 hairs and dense but fine microtrichia. Bristles and dimensions similar to female (fig.4) but frons a little narrower. Lower supra-antennal bristles finer and at most only just over half length of upper pair. With 3-6 bristles on cheek and two stronger bristles on jowl. Subglobose third antennal segment and arista greyish brown. Basal two segments of arista subequal in length, but latter a little narrower (about 2.8x as long as broad compared with about 2.4x). Swollen base of third segment a little longer but more slender still. Hairs of distal part of third segment about as long as greatest breadth of segment 1. Palps pale yellow lightly tinged brown and with six bristles and 8-10 hairs. Proboscis with pale yellowish brown labrum whose length is about 1.25x its greatest breadth and is a little less than diameter of third antennal segment. Labella pale whitish grey with dorsolateral pale greyish brown bands. Each with about sixty short blunt spinules below, not as broad as greatest breadth of labrum, and with very pale relatively short teeth on inner face. Thorax brown with bare mesopleuron. Each side of scutum with a humeral, two notopleurals, an intra-alar, a post alar and a pre-scutellar dorsocentral bristle. No notopleural cleft. Scutellum with posterior pair of bristles and an anterior pair of hairs, which are at most as strong as those at rear of scutum. Abdomen with brown tergites bearing very fine, short, sparse hairs. Only those postero-laterally on 6 are longer and longer and stronger. Venter greyish brown with obvious hairs only evident at rear of segment 6. A few weak hairs on 5 and only minute hairs on segments 4 and 5. Hypopygium with brown epandrium and paler brown hypandrium, apart from the short pale yellow posterior lobes and pale brown anal tube, and as fig. 3. Legs mainly brown, but front coxae largely pale and also parts of basal regions of mid and hind femora. Fifth tarsal segment of front leg a little longer than fourth and lacking posterodorsal hair palisade of segments 1-4. Dorsal hair palisade of mid tibia extends about three fifths of length. Hind femur somewhat broad (greatest breadth is almost two fifths of length) and with 6-8 hairs below basal half, of which at least four are longer than hairs of anteroventral row in distal half. Hind tibia with about twelve differentiated posterodorsals, of which at least a third (in upper half) are weak. Spines of apical comb of posterior face all simple. Wing 1.01-1.14 mm long. Costal index 0.38-0.41. Costal ratios 4.06-4.66: 1.32-1.34: 1. Costal cilia 0.05 mm long. A hair of similar size at base of vein 3. Two longer bristles on

axillary ridge. The straight vein Sc fades away before reaching vein 1 (R1). Vein 4 originates level with or just beyond fork of vein 3. Veins pale brown, but 7 paler. Membrane lightly tinged grey. Haltere mainly brown, with darker stem and base of knob.

**Female.** Colouring as male. Frons as fig 4, the lower supra-antennal bristle being a little longer and stronger than in male. Hairs more numerous (>150). Antennae as male but palp longer. Labrum about twice as long as male and much wider (length 1.1-1.2x breadth, which is about 1.2-1.3x as wide as third antennal segment). Labella a little narrower than in male, with only half as many short blunt spinules below, but with stronger teeth on inner faces adjacent to glossa. Thorax as male except anterior scutellars developed as small bristles, almost as strong as prescutellars but shorter and weaker than posterior scutellars. Abdomen with brown tergites bearing short, fine, hairs except for longer ones at rear of 6. Latter with a narrow median notch in anterior third. Venter greyish brown and with strong hairs at rear of segment 6 (fig. 1). Only small hairs at rear of segment 5 and minute (microscopic) hairs on preceding segments. Tergite 7 a narrow Y-shape and sternite 7 as fig 1. A posterior pair of hairy lobes at rear of sternum 8 (fig. 1). Internally with a simple, posteriorly rounded, Dufour's crop mechanism, four rectal papillae and a weakly sclerotised irregular hoop-shaped furca (sternite 9♂) (fig. 2). Behind the latter is a curious sclerotised atrial structure with transverse ribbing (fig. 2). Legs similar to male, except hind femur more slender (greatest breadth about one third of length) and strongest hairs below basal half of hind femur only a little longer than those of anteroventral row of distal half. Wings 1.36-1.53 mm long. Costal index 0.42-0.44. Costal ratios 3.20-3.65: 0.81-1.23: 1. Costal cilia 0.05-0.06 mm long. Otherwise it and halteres as male.

**Material examined.** Male holotype: Italy, Bologna Province, Imola, May 1994, reared from larva *Zeuzera pyrina* (G. Campadelli) (in University Museum of Zoology, Cambridge, England). 1 male and 7 female paratypes, same data as holotype.

**Affinities.** In the keys to British species (Disney, 1989) the males will run to couplet 182, but the combination of two noto-pleural bristles and no notopleural cleft prevents further progress. Of the Palaearctic species not covered by this key only *M. praeacuta* is at all similar. However the male of *M. zeuzerae* is immediately distinguished by the differentiated bristle on each side of the epandrium. The females will run to couplet 16 (page 674) in the key to Palaearctic species of Abteilung VI (Schmitz and Delage, 1981). The female of *M. prodroma* (Lundbeck) is larger (wing length about 2 mm), with weaker anterior scutellars, and longer costal cilia (0.12 mm). The female of *M. offuscata* Schmitz has costal section 1 less than twice length of section 2. The female of *M. beatricis* Colyer, whose male is unknown, is similar to *M. zeuzerae*, but it has hair-like anterior scutellars and clearly longer costal cilia. The species closest to *M. zeuzerae* is *M. praeacuta*. The latter species somewhat resembles *M. rivalis* (Wood), which, however, has the antero-lateral bristles almost level with the antials; but like it has no differentiated

bristle on each side of the male epandrium. The female of *M. zeuzerae* is most likely to be confused with the female of *M. praeacuta*. However, the latter has smaller posterior lobes at the rear of abdominal sternum 8, which are only about as long as broad, and longer cerci. In addition it lacks the sclerotised atrial structure adjacent to the furca.

Notes. The orange brown puparium is typical of the genus. The integument is covered with small pale denticles, of which the majority end in a microtrichium. Two dorsal plates and an anterior cap detach at eclosion. Respiratory horns (on eclosion plates) 0.16-0.20 mm long. Larval mandibles and cephalopharyngeal skeleton similar to *M. rufipes* (Meigen) (see fig. 3.4 in Disney, 1994). In gravid females 27-35 mature eggs are evident.

## DISCUSSION

Most records of Phoridae reared from the larvae or pupae of Lepidoptera can be attributed to species attracted to moribund hosts, usually those afflicted with a virus or bacterial infection. Indeed most records refer to polyphagous saprophage species, such as *M. rufipes* (Disney, 1994). However, in the one undoubted case of parasitoidism of Lepidoptera larvae by a species of *Megaselia* the larval mandibles resemble those of *M. rufipes* (Disney et alii, 1992). Whether *M. zeuzerae* is a true parasitoid or the ovipositing females are primarily attracted to diseased hosts remains to be discovered.

## SUMMARY

*Megaselia zeuzerae* n.sp. is described from a series reared from a larva of the moth *Zeuzera pyrina* (Linn.) (Lep. Cossidae) removed from a twig of an apple tree (*Malus domestica* Borkh.). The species resembles *M. praeacuta* (Schmitz), whose recognition has long been confused by the highlighting of a developmental fault in the holotype as a diagnostic character. The species *M. arietina* Disney is now recognised as a synonym of *M. praeacuta*.

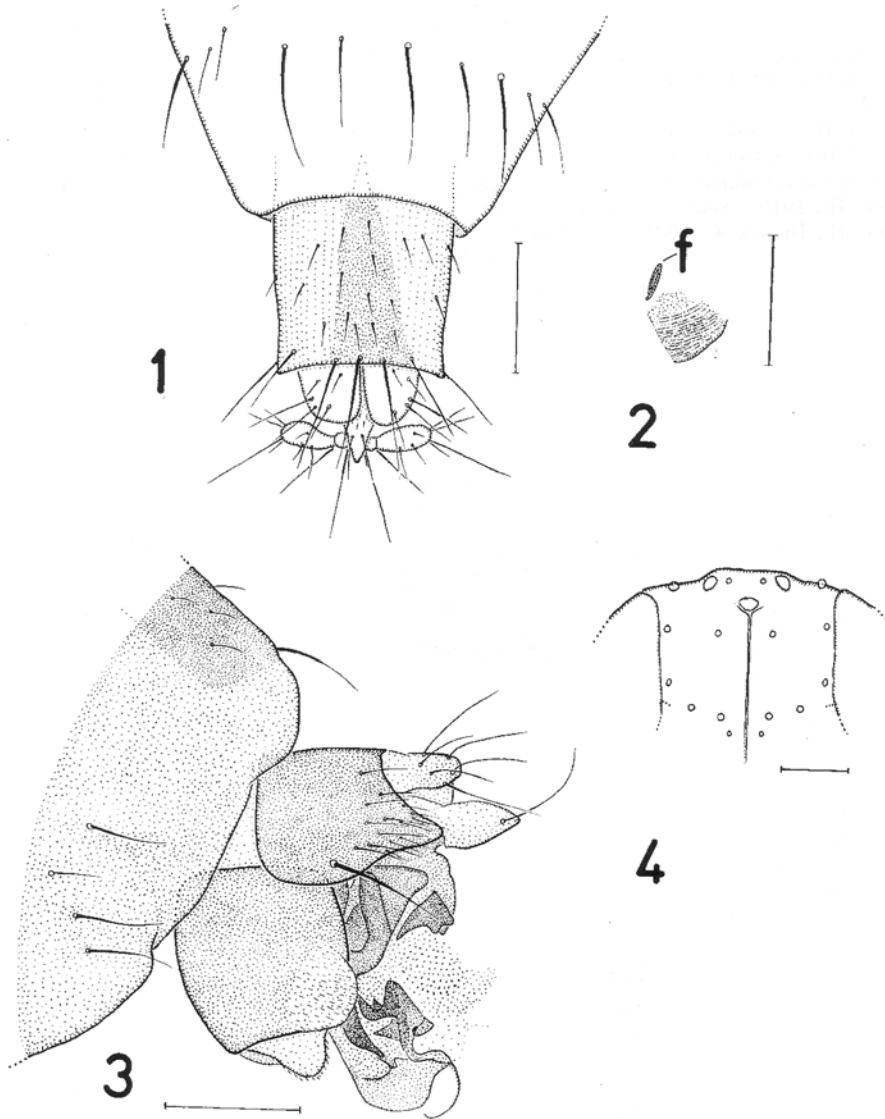
Una nuova specie di *Megaselia* Rondani (Diptera: Phoridae) allevata da una larva di *Zeuzera pyrina* (Linn.) (Lep.: Cossidae) in Italia.

## RIASSUNTO

*Megaselia zeuzerae* n.sp. è stata descritta su una serie di esemplari sfarfallati da una larva di *Zeuzera pyrina* estratta da un ramoscello di melo (*Malus domestica* Borkh.). La specie assomiglia a *M. praeacuta* (Schmitz) per la quale vi è stato, per lungo tempo, confusione nel riconoscimento: un carattere morfologico, derivante da imperfetto sviluppo, presente nell'olotipo veniva considerato come elemento diagnostico. La specie *M. arietina* Disney è ora riconosciuta come sinonimo di *M. praeacuta*.

## Acknowledgements

We thank Nigel Wyatt (Natural History Museum, London) for lending RHLD a cotype male of *M. rivalis* and Dr. Hans Ulrich (Museum Koenig, Bonn) for allowing RHLD to remount the holotype of *M. praeacuta*. RHLD's studies of Phoridae are funded by the Isaac Newton Trust (Trinity College, Cambridge).



Figs. I-IV - *Megaselia zeuzerae*. 1: female abdominal terminalia from below. 2: female, sclerotised features of atrium (f = furca). 3: male, left face of hypopygium. 4: female, frons with bristles represented by basal sockets only. Scale bars = 0.1 mm.

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