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The Lonchaeidae (Diptera) of Israel, with descriptions of three new species

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ABSTRACT

The Lonchaeidae fauna of Israel is reviewed, and three new species are described: *Lonchaea longitarsis*, *Protearomyia hermonensis*, and *Silba israel. S. israel* is recorded also from the Democratic Republic of Congo, and some specimens of *S. adipata* are recorded from countries adjacent to Israel. A key is provided to the six genera and twelve species currently known from Israel, and locality records and general distribution are provided for all the species. Figures of male and/or female terminalia are provided for all the species.

KEY WORDS: Diptera, Lonchaeidae, Israel, new species, key.

INTRODUCTION

The Lonchaeidae are a small family of acalyptrate Diptera which forms part of the superfamily Tephritoidea. Some 500 species in nine genera are known worldwide and are found in a wide range of habitats from the Arctic Circle to the equator in all zoogeographical regions. In Europe there are just over 100 described species in eight genera. They are moderately small in size (3–6 mm), stout-bodied and hairy flies with black halteres and, in most genera, with an entirely matte to entirely shiny black body color, in some species with slight metallic hue. Adults of the genus *Lamprolonchaea* Bezzi have a shining metallic blue-green body. Many species exhibit a varying number of yellow tarsomeres, and a few species have silvered faces or a partly orange antennal 1st flagellomere. The wings are usually clear, though occasionally with a yellowish or brownish tinge. The females of all species have a very characteristic long, stiffened aculeus which, when extended, can be as long as the preabdomen. The aculeus is usually rather slim and pencil-like in appearance, but in some species it is greatly flattened and broadened to form a blade-like structure. The common name of the Lonchaeidae, lance-flies, is derived from this characteristic.

The biology of the Lonchaeidae is diverse, although primarily associated with living or decaying plant tissue, including herbs and trees (Kovalev and Morge, 1984; McAl-

pine, 1987). In Europe, many species, especially of *Lonchaea*, live under the bark of dead or dying trees, or in decomposed wood, sometimes being more or less host tree specific. Several *Earomyia* species are associated with conifers where they feed on the developing seeds, while others may develop in plant tissues. *Dasiops latifrons* (Meigen) develops in galls on grasses. The larvae of *Silba* and *Lamprolonchaea* usually develop in fruits and vegetables, sometimes being pests of commercial crops (Ferrar, 1987). However, larvae of the latter genus are usually secondary invaders of injured fruit and other plant material.

The Lonchaeidae of the Middle East are poorly known. A few specimens are deposited in European museums, but little has been published on the family in this region. Georghiou (1977) listed five species from Cyprus. Steyskal and El-Bialy (1967) recorded five species from Egypt. MacGowan (2007a) listed just two species from the United Arab Emirates: *Lamprolonchaea metatarsata* (Kertész) and an unidentified species of *Silba* Macquart.

Very little has been published on the Lonchaeidae of Israel. Bodenheimer (1937) listed three species: "*Lonchaea aristella* Beck. - (fruits du figuier); *L. lasiophthalmus* Macq.; and *L. vaginalis* Fln. - (fruits du figuier)". The first name is a synonym of *Silba virescens* Macquart (although the larval habitat — figs — may be an indication of a misidentification of *S. adipata* McAlpine), and the second name is a synonym of *Dasiops latifrons* (Meigen), both treated here. The third name is a synonym of *Lonchaea chorea* (Fabricius) and is a possible misidentification of *L. longitarsis*, a new species described here, although the suggested relation to figs would again suggest misidentification of *Silba adipata*.

Freidberg (1988) briefly characterized the zoogeographical aspect of the Lonchaeidae of Israel. Based on identifications made by J.F. McAlpine, he estimated the occurrence of a dozen species showing a "typical pattern of distribution", i.e., a mixture of Palaearctic and Afrotropical elements. He also mentioned two species, *Dasiops villiplatus* McAlpine and *Silba apodesma* McAlpine, which are misidentifications, the former of *D. mucronatus* Morge and the latter of *S. virescens* (Macquart).

In this publication we summarize all of the data available on the Lonchaeidae of Israel, including description of new species, locality records, general distribution, biological information, and keys for the identification of the taxa.

MATERIALS AND METHODS

Most of the material upon which this study is based is deposited in the National Collection of Insects, Zoological Museum, Tel Aviv University, Israel (TAUI). Some specimens are deposited in the collection of the Plant Protection and Inspection Services (PPIS) of the Ministry of Agriculture of Israel, and some specimens were studied from the Hungarian Natural History Museum, Budapest (HNHM) and Royal Museum for Central Africa, Tervuren, Belgium (MRAC). Male terminalia of some specimens were dissected, relaxed, and stored in microvials on the pin below the specimens.

Transliterated names of localities are according to the "Israel Touring Map"

(1:250,000) and "List of Settlements", published by the Survey of Israel, Ministry of Labor. Where names of localities have changed since the labels were prepared, the most recent Hebrew names are cited with the old names (Arabic or Latin) given in parentheses, as in the following example: 'En Hemed [Aquabella]'.

Localities and distribution are ordered from north to south and west to east. The number of specimens from each locality is given in parentheses.

Terminology essentially follows McAlpine (1981) and White et al. (1999).

The holotypes and most paratypes will be deposited in TAUI. Paratypes of *Lonchaea longitarsis* and *Protearomyia hermonensis* will be deposited at the Museum of Natural History, London (BMNH), Smithsonian Institution, Washington, DC (NMNH), and the National Museum of Scotland, Edinburgh (NMS).

TAXONOMY

KEY TO THE SUBFAMILIES, TRIBES, GENERA AND SPECIES OF LONCHAEIDAE IN ISRAEL

1. Poststigmatical setae present on sclerite dorsal to prothoracic spiracle; in the majority of species strong setae present on gena ventral to eye; lunule with at least some obvious setulae on dorsal margin; females of species in Israel usually (not in *D. calvus*) with broad and pointed aculeus; abdomen in male with six sternites ..... *Subfamily Dasiopinae* .... *Dasiops* Rondani..... **2**

–. Poststigmatical setae or setulae absent; females of species in Israel usually with narrow and pointed aculeus; abdomen in male with five sternites; other characters variable..... ..... *Subfamily Lonchaeinae*……. **4**

2. Scutellar margin with setulae present between the marginal setae, at least some of these anterior to lateral seta; large species, body length 4–6 mm; female aculeus as in Fig. 2. .... ***D. latifrons* Meigen**

–. Scutellar margin without setulae, only four marginal setae; smaller species, body length 3.0–3.5 mm; female aculeus as in Fig. 1 or Fig. 3..... **3**

3. Basal tarsomeres yellow; usually only one stigmatical seta; eyes bare; female frons often with lateral wrinkles; female aculeus (Fig. 1) narrow, rounded at apex..... ***D. calvus* Morge**

–. Basal tarsomeres black; more than one stigmatical setae; eyes densely hairy in the male; female frons smooth; female aculeus (Fig. 3) broad and pointed ..... ***D. mucronatus* Morge**

4. Lunule bare; scutellar margin with or without setulae between four setae; anepisternum with or without strong anterior setae; katepisternum with row of strong setae or setulae along dorsal margin, or with single seta posterodorsally ..... *Tribe Earomyiini* …… **5**

–. Lunule with setulae; scutellar margin always with setulae between four setae; anepisternum with strong anterior setae; katepisternum with one to two strong setae dorsally..... ..... *Tribe Lonchaeini*……. **7**

5. Margin of scutellum with only four setae, no intermediate setulae; body color blackish, legs entirely black; male terminalia as in Figs. 4–9..... ..... *Protearomyia* McAlpine…… **6**

–. Margin of scutellum with few setulae between four strong setae; body color metallic and shining, bluish or golden green; basal tarsomeres of all legs partly yellow; male terminalia as in Figs. 14–15 ..... *Lamprolonchaea* Bezzi: ***L. smaragdi* (Walker)**

6. Male abdomen with tergite 5 long, 4–5 times as long as tergite 4, laterally concave; male terminalia (Figs. 4-6) without serrated margins to surstylus and with slender phallus; female aculeus (Figs. 10-11) with cerci very slightly constricted at base, with dorsal setulae situated half way along ..... ***P. greciana*** **McAlpine**
–. Male with tergite 5 of more normal length, 2.0–2.5 times as long as tergite 4; male terminalia (Figs. 7–9) with serrated margins to surstylus and with stout phallus; female aculeus with cerci distinctly constricted basally, dorsal setulae situated on apical third (Figs. 12–13)..... ..... ***P. hermonensis*** **sp. n.**
7. Katepisternum with one long, thick seta near dorsal margin ..... *Lonchaea* Fallén.… **8**
–. Katepisternum with two long, thick setae near dorsal margin..... **9**
8. Male: basal tarsomere of foreleg very long, slightly longer than tibia (Fig. 16); hind femur posterodorsally with 3–5 long setae near apex (Fig. 17); mid tibia with basal swelling covered in setulae; male terminalia (Figs. 18–20) with very large, rectangular cerci often visible below tip of abdomen, phallus two-segmented; female frons with rather sparse, short interfrontal setulae, not meeting medially; female aculeus as in Figs. 21–22, with pair of dorsal setulae at base of cerci slightly longer than cerci..... ***L. longitarsis*** **sp. n.**
–. Male legs without such modifications, basal tarsomere of foreleg about 0.6 times as long as foretibia; male terminalia (Figs. 23–24) with smaller rhomboid cerci; phallus in one piece, female frons with numerous longer interfrontal setulae meeting medially; aculeus as in Figs. 27–28, with pair of dorsal setulae at base of the cerci usually not as long as cerci..... ..... ***L. tarsata*** **Fallén**
9. Arista bare; 1st flagellomere not extending to mouth margin; prosternum bare; sternite 1 with setulae laterally; fringe of calypteres with tuft of longer setulae medially, occasionally containing black as well as usual golden-yellow setulae; orbital plate usually with setulae dorsal to orbital seta; margin of scutellum with setulae in multiple rows; male terminalia without obvious teeth on surstylus (Figs. 25–26); female cerci with two long setulae situated dorsally at mid point (Figs. 29–30) .....*Setisquamalonchaea* Morge: ***S. fumosa*** **(Egger)**
–. Arista plumose; 1st flagellomere extending to mouth margin; prosternum with setulae; sternite 1 bare; fringe of calypteres of uniform length; orbital plate usually without setulae dorsal to orbital seta; margin of scutellum with setulae in single row; male terminalia with teeth on surstylus, female cerci without long dorsal setulae situated medially..... .....*Silba* Macquart …**10**
10. Basal and second tarsomeres of all legs yellow; male terminalia with cerci (Figs. 31–32) long and narrow, and phallus (Figs. 33–34) with pair of basal processes. Female aculeus as in Fig. 38 .....***S. israel*** **sp. n.**
–. Tarsomeres entirely black, male terminalia (Figs. 35–36): cerci not elongated; phallus without basal processes; female aculeus as in Figs. 37 or 39 ..... **11**
11. Gena anteriorly with obvious strong seta standing out from other setulae; scutellum without setulae between apical setae (only exceptionally present in females); anepisternum with only two well-developed anterodorsal setae; surstylus of male terminalia with large, rounded posterior process bearing small teeth (Fig. 36); female aculeus with cerci broader and not so acute at apex (Fig. 39).....***S. virescens*** **Macquart**
–. Gena anteriorly without strong setae; scutellum usually with at least pair of apical setulae between apical setae; anepisternum with three long, thick and one long, thin anterodorsal setae; surstylus of male terminalia without large rounded posterior process (Fig. 35); female aculeus with cerci narrowing evenly and rather acute at apex (Fig. 37) .....***S. adipata*** **McAlpine**

Subfamily DASIOPINAE
Tribe Dasiopini

DASIOPS RONDANI

There are approximately 40 named species of *Dasiops* worldwide, with 15 occurring in Europe. Although some species are associated with forested habitats, many others are associated with grassland environments. Larvae of *Dasiops* are variously associated with a range of substrates from dead wood to decaying fruits and to living tissues of grasses.

Dasiops calvus Morge
(Fig. 1)

Material examined

ISRAEL: Herzliyya, 22.vi.1981, Malaise trap (1♂), 23.vi.1981, Malaise trap (1♀), 16.vii.1981, Malaise trap (2♂), 28.vii.1981, Malaise trap (1♀); Herzliyya, 70 m, 32°09′N 34°51′E, 19.iv.2006 (1♂); Herzliyya, hill, 32°11′N 34°49′E, 18–20.iv.2008 (3♂), 28.iv.2007 (1♂), 6.v.2007 (1♀), 11.v.2007 (1♀), 1.vi.2007 (1♂, 1♀), 6.vi.2007 (1♀). All A. Freidberg, and all TAUI.

Distribution

England, France, Andorra, Spain, Switzerland, Hungary, Romania, Italy, Russia, Czech Republic, Slovakia, Israel.

Comments

All the specimens from Israel were collected in a small area within the town of Herzliyya: from AF's home garden (using a malaise trap) and by sweeping trees (introduced oaks) and ornamental shrubs (*Rhus* sp.) in a nearby disturbed open area. The aculeus of this species (Fig. 1) differs from that of the other two species, perhaps indicating a different larval biology.

Dasiops latifrons (Meigen)
(Fig. 2)

Material examined

ISRAEL: Har Hermon, 1600 m, 14.v.1981, A. Freidberg (1♂), 23.iv.1982, A. Freidberg (2♀); Har Hermon, 1500 m, 18.v.1976, A. Freidberg (1♀); Har Hermon, 1400 m, 5.v.1977, A. Freidberg (3♂, 2♀); Har Hermon, 1300 m, 23.iv.1982, F. Kaplan; [Har Hermon,] 'Emeq HaMan, 28.v.1985, I. Susman (1♀); Majdal Shams, 5.v.1979, D. Furth (1♂), 14.x.1982, A. Freidberg (1♀); Panyas [Banias], 26.xi.1978, A. Freidberg (1♂); Qiryat Shemona [Q. Sh.], 21.ii.1954, (1♂); Spring nr. Nahal Nimrod, 30.x.1985, A. Freidberg (2♂); Nimrod [Nemrod], 1000 m, 8.xi.1984, A. Freidberg (1♀); Nahal

Nimrod, 33°15′N 35°45′E, 4.x.2001, A. Freidberg and L. Friedman (2♂, 2♀); Merom Golan, 33º08′N 35º47′E, 9.v.2006, D. Dascalu (1♀); Merom Golan, 28.iv.1974, A. Freidberg (1♂), 28.iv.1974, D. Furth (2♂), 5.iv.1978, D. Furth (1♀), 4.v.1979, D. Furth (1♀), 2.xii.1992, Y. Zvik (1♀); Quneitra (now in Syria), 3.iv.1971, J. Kugler (1♂); 'En Ziwan, 9.iv.1987, I. Nussbaum (1♂); 10 km S Quneitra, 6.v.1977, A. Freidberg (1♂); Hal Nappah [K. Nafech], 14.iii.1975, A. Freidberg (1♂), 5.v.1975, I. Yarom and A. Freidberg (3♂, 1♀), 5.vi.1975, F. Kaplan (3♂); Nahal Zawitan, 6.iv.1987, I. Nussbaum (1♂, 1♀); Qusbīya [Qusbiye], 20.iv.1976, A. Freidberg (4♂), 3.v.1980, D. Furth (1♀), 17.iii.1981, A. Freidberg (1♂), 15.iv.1982, I. Yarom (1♂); Gamla, 21.iii.1984, I. Nussbaum (3♀); Avivim, 18.iv.1981, A. Freidberg (1♂, 3♀); Bar'am, 28.xi.1977, A. Freidberg (1♂, 1♀); 'Akko, 2.iv.1975, F. Kaplan (2♂); Rihaniya [Rihaniya], 16.iv.1992, A. Freidberg (2♂); Sifsufa, 14.v.1974, A. Freidberg (1♂); 'En Zetim, 33°00′N 35°29′E, 10.v.2006, A. Freidberg (1♀), 13.v.1998, A. Freidberg (1♂); Har Meron [Meiron], 20.iv.1972, A. Freidberg (1♂); Har Meron [Mount Meron or Mt. Meron], 1100 m, 9.iv.1977, A. Freidberg (1♂, 1♀), 16.iv.1992, A. Freidberg (1♀), 17.iv.2000, A. Freidberg (1♂); Har Meron Reserve, 'En haZaqen, 32°58′N 35°25′E, 24.iv.2002, A. Freidberg (2♂, 1♀); Har Meron Reserve, 'En Samura, 32°57′N 35°26′E, 24.iv.2002, A. Freidberg (1♀); Qeshet, 18.v.1983, A. Freidberg (1♂); Hispin, 7.iii.1984, I. Nussbaum (1♂),19.i.1989, I. Nussbaum (1♀); Park HaYarden, 4.iv.1984, A. Freidberg (1♀); Zomet Hammat Gader [Opposite Muheibe], 2.iii.1978, A. Freidberg (1♀); Arbel, 17.iv.1992, A. Freidberg (2♂); Haifa, 2.iv.1977, A. Freidberg (1♂), 10.iv.1982, A. Freidberg (1♀); Karmel [Carmel], 5.v.1976, A. Freidberg (1♂), 24.xii.1977, A. Freidberg (2♂, 1♀); Nahal Oren, 14.iv.1973, D. Furth (1♂); Ginosar, 28.ii.1977, A. Freidberg (1♂); Amir, 5.iv.1978, D. Furth (1♀); Horvat Tata, 3.iii.1982 (1♂); Mikhmoret, 23.xi.1975, A. Freidberg (1♂); Hadera, Berekhat Ya'ar [Hadera, Berekhat Atta], 1.v.1998, A. Freidberg (1♂); 'Anabta, 25.iv.1981, A. Freidberg (3♀); Nahal Tirza [W. Faria], 1.iii.1973, A. Freidberg (1♂); Jiftlik, 1.iv.1981, A. Freidberg (1♀); Nahal Poleg [Wadi Falik], 24.i.1972, M. Kaplan (1♀); Ga'ash, 10.iii.1976, F. Kaplan (1♂, 2♀); Herzliyya [Herzliyah], 15.iii.1951, O. Theodor (2♂); Herzliyya, 18.xii.2000, A. Freidberg, L. Friedman (1♀); Herzliyya Beach, 24.x.1984, A. Freidberg (1♀); Migdal Afeq [Migdal Zedek], 13.i.1982 (1♂), 2.iv.1984, I. Nussbaum (1♂); Tel Aviv swamp, 9.iv.1981, A. Freidberg (2♂); Tel Aviv, country club, 31.iii.1998, A. Freidberg (4♂); Tel Aviv, 5.i.1973, M. Kaplan (1♀), 26.iii.1974, A. Freidberg (1♂, 1♀), 30.iii.1975, F. Kaplan (1♂); Tel Aviv, Abu Kabir, 10.xii.1971, M. Kaplan (1♂); Tel Aviv, Abu Kabir [Abu Kabir], 3.iii.1972, J. Kugler (1♀); Petah Tiqwa, 16.i.1956, J. Kugler (1♂); Savion, 20.iii.1987, Y. Zvik (1♂); Yarhiv, 24.iii.1984, I. Yarom (1♂); Miqwe Yisra'el, 14.iv.1931, O. Theodor (1♀); Peza'el [Fazael], 28.iv.1976, D. Simon (1♀), 9.iv.1986, I. Susman (1♀); Rehovot, 2.i.1999, Y. Nussbaum, (1♀); Giv'at Brenner, 16.iv.1973, M. Kaplan (1♂); Ben Shemen, 19.iii.2002, A. Freidberg (1♂); Bet haKerem, Yerushalayim [Wadi Ruaz, Beth haKerem, Jerusalem], 29.iii.1931, O. Theodor (1♀); Bet haKerem, Yerushalayim [Beth haKerem, Jerusalem], 20.xii.1941, O. Theodor (2♂); Yerushalayim [Jerusalem], 26.ii.1964, student (1♀); Even Sapir, 12.xi.1964, S. Blondheim (1♀); Kefar Uriya, 12.iv.1964, J. Margalit (1♀); Zafririm, 12.xi.1983, I. Nussbaum (1♂, 1♀); Qiryat Gat, 19.iv.1977, F. Kaplan (1♂, 1♀), 19.iv.1977, A. Freidberg (1♂);

Bet Guvrin, 31.iii.1975, A. Freidberg (1♂), 31.iii.1975, F. Kaplan (1♂), 24.iii.1983, I. Yarom (1♂); Bitronot Ruhama, Nahal Hazav, 31°32′N 34°42′E, 5.iv.2005, L. Friedman (1♀), A. Freidberg (1♀); Bitronot Ruhama, Nahal Zedim, 31°33′N 34°41′E, 5.iv.2005, L. Friedman (1♂), A. Freidberg (1♂, 2♀); ‘En Besor, 31.iii.1975, F. Kaplan (1♂); Yeriho [Jericho], 27.iv.1973, M. Kaplan (1♂); Qalya [Kalia], 13.iii.1975, F. Kaplan (1♂), 18.iii.1976, F. Kaplan (1♂); ‘Arad Junction, 5 km S Devira, 21.iii.1985, I. Yarom (1♂), 21.iii.1985, A. Freidberg (1♂, 3♀), 21.iii.1985, F. Kaplan (1♂); Pura Nature Reserve, 16.iv.2007, L. Friedman (1♂); Zomet Lehavim, 15.iv.1997, L. Friedman (1♂, 1♀); Zomet Shoqet-Hura, 21.xi.1997, A. Freidberg (1♀) . All TAUI.

Distribution

Southern Europe, from France and Spain to the Middle East and Middle Asia, Morocco, Algeria, Egypt, Iran, Israel.

Comments

This species has been bred in Europe from galls formed on the grasses *Cynodon dactylon* (L.) Pers. and *Agropyron repens* (Beauvois) (Poaceae) (Morge, 1959). The former host is an extremely widespread and common weed all over Israel. Nevertheless such galls have not yet been discovered in Israel. Although *D. latifrons* is extremely common in Israel (over 160 specimens studied from over 100 collections and 70 localities), and despite the fact that one of its known hosts, *C. dactylon*, is common throughout the country, *D. latifrons* has only been found abundantly in the Mediterranean region of Israel, and its distribution penetrates only slightly into the northern part of the desert region (as far south as ‘En Besor in the western Negev (31°18′N 34°30′E) and Qalya in the Dead Sea area (31°45′N 35°28′E)). It is therefore assumed that ecological factors affect its distribution in Israel.

Dasiops mucronatus **Morge**

(Fig. 3)

Material examined

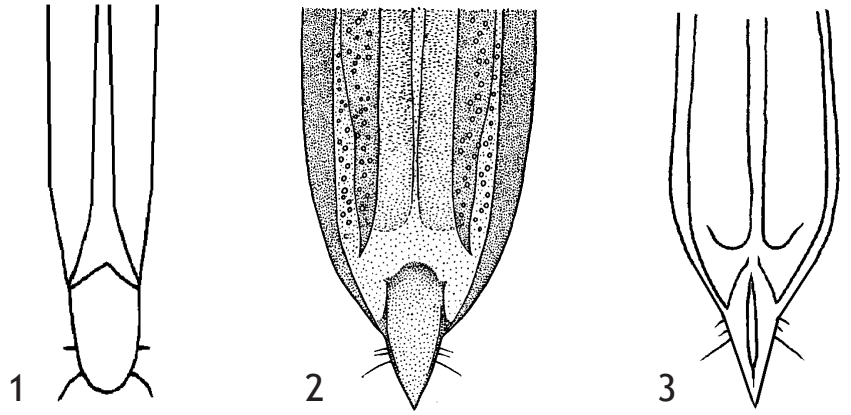
ISRAEL: Har [Mt.] Hermon, 1700 m, 22.v.1973, A. Freidberg (1♀), 16.v.1985, I. Nussbaum (1♀); Mt. Hermon, 1500 m, 21.v.1979, D. Furth (1♂). All TAUI.

Distribution

Ireland, United Kingdom, Sweden, Finland, Germany, Netherlands, Switzerland, Czech Republic, Israel.

Comments

The aculeus of this species (Fig. 3) is similar to that of *D. latifrons* (Fig. 2), which may relate to it having a similar larval biology and to the possibility that it is also cecidogenous on grasses.



Figs. 1–3. Female terminalia, dorsal view. 1. *Dasiops calvus*. 2. *Dasiops latifrons* (after Morge 1959). 3. *Dasiops mucronatus*.

LONCHAEINAE
Earomyiini

PROTEAROMYIA McALPINE

This is a small genus with some 4 species known from the Nearctic Region and 2 known from Europe. The two species recorded here expand the known distribution of the genus into Asia. Little is known regarding the larval associations of *Protearomyia* species. The adults are most often collected by sweeping in grassland habitats or when feeding on flowers of Apiaceae (Umbelliferae). Uffen and Chandler (1978) reared the central and northern European species, *P. nigra* (Meigen), from stems of thistles and other meadow plants.

Protearomyia greciana McAlpine
(Figs. 4–6, 10–11)

Material examined

ISRAEL: Har Dov, 21.v.1986, A. Freidberg (1♂); Nahal Nimrod [W. Nemrod], 10.vi.1976, A. Freidberg (1♂); Hermon field school, 27.v.2002, A. Freidberg (1♀); Panyas [Baniass], 24.iv.1982, A. Freidberg (1♂); Senir, 3.v.1994, A. Freidberg (1♀); N[ahal] Dishon, 21.v.1964, J. Kugler (1♀); Sasa, 18.iv.1981, A. Freidberg (1♂); Har Meron Reserve, Peqi'in, 32°59′N 35°20′E, 900 m, 25.iv.2002, A. Freidberg (8♂, 1♀); Har Meron [Meiron or Meron], 5.v.1975, F. Kaplan (2♀), 5.v.1975, A. Freidberg (1♀), 17.v.1995, I. Yarom, on oak (2♀); Har Meron [Mt. Meron], 1100 m, 28.v.1981, A. Freidberg (1♂), 30.iv.1981, A. Freidberg (3♂), 30.iv.1981, F. Kaplan (1♂), 26.v.1999, A. Freidberg (1♂, 1♀), 24.iv.2003, A. Freidberg (2♂); Har Meron Reserve Camping,

32°59′N 35°24′E, 1100 m, 25.iv.2002, A. Freidberg (2♂); Har Meron [Mt. Meron], 900 m, 28.v.1981, A. Freidberg (1♀); Har Meron, 900 m, 22.v.1994, A. Freidberg, F. Kaplan (4♀), 17.v.1995, A. Freidberg (4♀); Har Meron, 800 m, 22.v.1998, A. Freidberg (1♂); Har Meron Reserve, 'En Zeved, 32°59′N 35°26′E, 24.iv.2002, A. Freidberg (2♀); Kefar Shammay, 5.v.1987, A. Freidberg (1♀); Allone Abba, 14.iv.1999, A. Freidberg (1♀); Karmel [Carmel], 5.v.1976, A. Freidberg (1♀); Karmel, west of peak, 14.v.2002, A. Freidberg (1♀); Nahal Oren, north facing slope, 15.v.2002, L. Friedman (1♂); Nahal Oren, river bed, 14.v.2002, A. Freidberg (2♀); Zikhron Ya'aqov, 30.iv.1981, A. Freidberg (1♀), 3.v.1981, A. Freidberg (1♀); Zomet ha'Amaqim (Jalame), 26-30.v.1993, A. Freidberg (1♂); Zafririm Reserve, 15 km E Qiryat Gat, 6.iv.2000, A. Freidberg (7♂). All TAUI.

Distribution

Spain, Greece, Czech Republic (southern Moravia), Israel.

Comments

This species is similar and probably closely related to *P. hermonensis* sp. n. It readily differs from it by the male (Figs. 4–6) and female (Figs. 10–11) terminalia, as well as by the length of tergite 5 of the male. It was mostly swept from oaks (*Quercus calliprinos* Webb).

Protearomyia hermonensis MacGowan and Freidberg, sp. n.

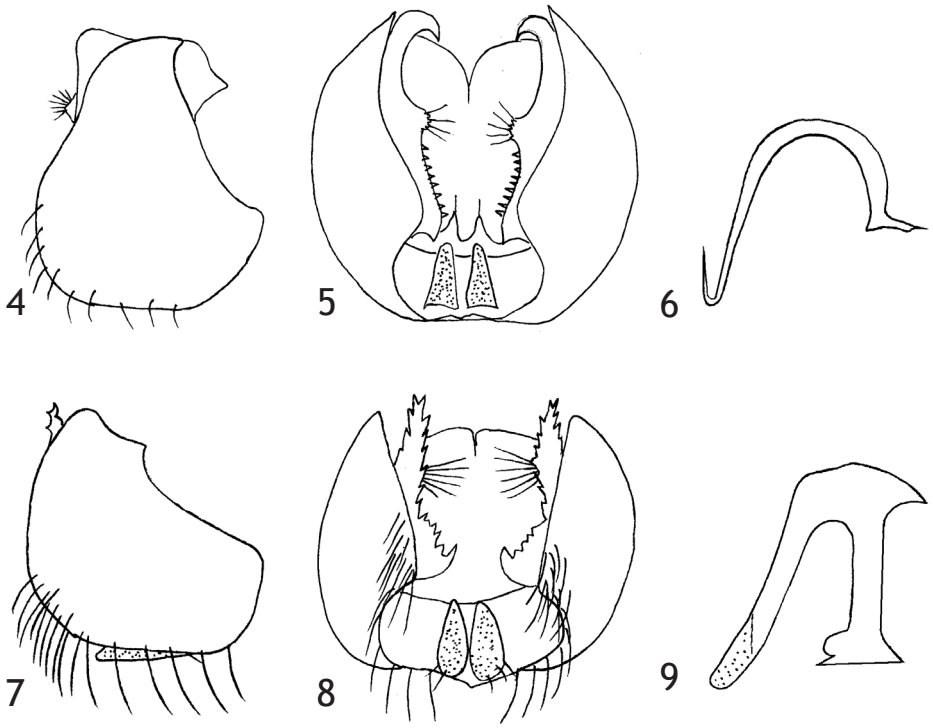
(Figs. 7–9, 12–13)

Description

Male

Head. Eye with sparse, very short, white hairs. Frons narrowing only slightly from level of ocellar triangle to level of antennal sockets, matte black; six to seven strong frontal setulae along eye margin on each side, these about one-third as long as orbital setae; about eight shorter interfrontal setulae present on central part of frons. Orbital plate bare and shining. Anterior genal setae in single row of 6–8 along mouth margin, these very strong although becoming slightly shorter anteriorly, half as long as lateral vertical seta. Lunule slightly covered with silver pollinosity. Antennal 1st flagellomere entirely black, slightly longer than deep, covered in tiny white setulae. Arista brownish at base, microscopically pubescent.

Thorax. Disc and pleura black, uniformly dulled by microtrichia. Notopleural depression bare. Five dorsocentral setae decreasing in size anteriorly. Anepisternum with no anterior setae, with three strong posterior setae. Katepisternum with two setae along dorsal margin, anterior seta slightly weaker than posterior, otherwise this sclerite bare. One propleural and one shorter stigmatical setae. Anepimeron bare. Calypteres pale yellow with pale margin. Scutellar disc dulled by microtrichia, bare apart from four long



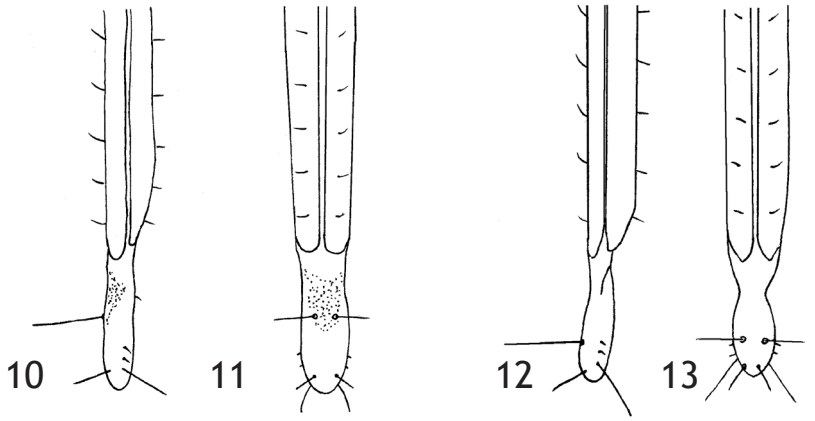
Figs. 4–6. *Protearomyia greciana*, male terminalia. 4. Epandrium and associated structures, lateral view. 5. Same, ventral view. 6. Phallus, lateral view. Figs. 7–9. *Protearomyia hermonensis*, male terminalia. 7. Epandrium and associated structures, lateral view. 8. Same, ventral view. 9. Phallus, lateral view.

setae, apical pair approximately 1.75 times as long as scutellum.

Wing. Clear with yellow veins. Wing length 3.0 mm. *Legs* entirely black.

Abdomen. Subshining black, ventrally at apex of tergite 5 with 4-5 short, strong setulae.

Male terminalia (Figs. 7–9). In lateral view epandrium as high as deep, rather square in shape apart from anterodorsal excavation, posterior margin of epandrium bearing regular row of short setulae and with denser cluster of setulae at posteroventral angle. Cerci small and just protruding from shell of epandrium, with only few fine setulae. Surstylus just visible anteriorly on ventral margin as irregular process. In ventral view surstylus indented half way along ventral margin, margin itself irregularly serrated, bearing group of approximately six setulae just anterior to mid way point. Phallus in one piece, roughly U-shaped, basal portion straight and upright with flattened top; apical portion lying at slight angle to basal, uniformly wide tube with apex rather membranous.



Figs. 10–11. *Protearomyia greciana*, female aculeus. 10. Lateral view. 11. Same, dorsal view. Figs. 12–13. *Protearomyia hermonensis*, female aculeus. 12. Lateral view. 13. Same, dorsal view.

Female

Similar to male but with wider frons and shorter setulae all over.

Female terminalia (Figs. 12–13). Cerci constricted on their basal half, dorsally with pair of long setulae situated on apical third, another pair half this length at apex, laterally with long pair, almost as long as long dorsal pair; situated at apex, two very short pairs anterior to these.

Differential diagnosis

There are only two other species of *Protearomyia* known from the Palaearctic Region: *P. nigra* (Meigen), which is widespread throughout much of sub-boreal Europe, and *P. greciana* McAlpine, which is known mostly from the Mediterranean area. This new species differs from both in that the male does not have a greatly elongated fifth tergite. The male terminalia, in which the epandrium is squarish with very small cerci, indicate that there is a closer relationship to *P. greciana* than to *P. nigra* but there are clear differences in the surstyli and in particular in the shape of the phallus. The female is very similar to *P. greciana* but the basally constricted cerci (Figs. 12–13) and the more apical placement of the pair of long dorsal setulae serve to distinguish this new species.

Material examined

Holotype ♂, ISRAEL: Har Hermon, 1500–1600 m, 33°18′N 35°46′E, 6.vi.2002, A. Freidberg. Paratypes: same locality data (8♂, 21♀). Additional paratypes: ISRAEL: Har Hermon, 1800 m, 12.vi.1996, A. Freidberg (1♂, 3♀), 11.vi.2003, A. Freidberg (2♂, 4♀), 11.vi.2003, L. Friedman (1♀), 12.vi.2003, A. Freidberg (2♂, 4♀); Har Hermon [Mt. Hermon], 1700 m, 9.vi.1983, A. Freidberg (2♂), 17.v.2009, A. Freidberg (7♂, 4♀),

L. Friedman (3♂); Har Hermon [Mt. Hermon], 1600 m, 20.v.1986, A. Freidberg (1♂); Har Hermon, 1600 m, 18.v.2009, A. Freidberg (1♀), L. Friedman (1♂, 2♀); 23.v.1994, F. Kaplan and A. Freidberg (1♂, 3♀), 23.v.1998, A. Freidberg (1♂, 2♀), 28.v.2000, L. Friedman (1♂), 29.v.2000, I. Yarom (1♂), 29.v.2000, A. Freidberg (2♂), 12.vi.2003, A. Freidberg (4♂, 7♀), 13.vi.1996, A. Freidberg (1♀); Har Hermon [Mt. Hermon], 1500 m, 17.v.2009, A. Freidberg (1♂), 29.v.1984, I. Yarom (1♂), 21.v.2002, L. Friedman (1♂).

The holotype is double-mounted, minutien pin on a plastic block, is in excellent condition, and is deposited in TAUI. Most paratypes are at TAUI. Paratypes have also been distributed among the BMNH, NHNM, and NMS.

Distribution

Known only from Israel (Mt. Hermon), but likely to be found at least in Syria and Lebanon.

Etymology

The specific epithet refers to Mount Hermon, the location of capture of the entire type series.

Comments

On Mt. Hermon, between 1500–1800 m, three species of oaks occur (*Quercus boissieri* Reut., *Q. cerris* L., and *Q. libani* Oliv.). The specimens comprising the type series were probably swept from all three species.

LAMPROLONCHAEA BEZZI

The small genus *Lamprolonchaea*, with 19 named species, has a mainly Afrotropical, Oriental and Australasian distribution. Its members are easily distinguished from other Lonchaeidae by the brilliant blue-green reflections on the thorax and abdomen. *Lamprolonchaea* larvae are thought to be predominantly associated with fruit.

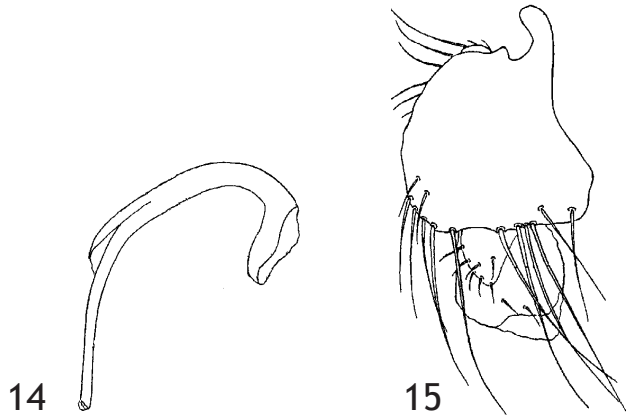
Lamprolonchaea smaragdi Walker

(Figs. 14–15)

Material examined

ISRAEL: Newe Ativ, 28–29.viii.1981, A. Freidberg (1♀); Tel Dan, 20–21.vii.1983, I. Nussbaum (1♂); Quneitra, 15.xi.1973, A. Freidberg (1♂, 1♀); Golan, Nahal Zawitan, near Qazrin, 30.v.1981, F. Kaplan (1♂); Golan, Ein-Tinne, 11.x.1968, D. Gerling (1♀); Upper Nahal Keziv [Upper N. Kziv], 5.x.1976, A. Freidberg (1♀); Bar'am, 11-14.xi.1977, A. Freidberg (1♂), 18–20.xi.1977, A. Freidberg (4♀); Gush Halav, 16.ix.1978, M. Kaplan (1♂, 2♀); Nahal 'Ammud [N. Amud], 27.viii.1973, J. Margalit, S. Blondheim (1♀), 1.ix.1973, A. Freidberg (2♀), 6.x.1974, A. Freidberg (1♀), 30.ix.1975, A. Freidberg (1♂); Ma'alot, 1.ix.1973, A. Freidberg (2♂); Zefat, 14.ix.1971, J. Kugler (1♀); Kefar Shammay [K. Shamai], 14.ix.1971, J. Kugler (2♂); Hispin, 3.i.1984, I.

Nussbaum (1♀); Hammat Gader [El Hamma], 2.iii.1978, A. Freidberg (1♂); Park HaYarden, 25.vii.1983, I. Nussbaum (1♂, 1♀); Ramot Junction, 16.ix.1982, F. Kaplan (1♂); Haifa, 21.viii.1974, A. Freidberg (9♂); Nahal Oren, 24.v.1995, A. Freidberg (1♀), 30.v.1998, A. Freidberg (1♂, 1♀), 6.v.1999, A. Freidberg (1♀), 14.v.2002, A. Freidberg (1♂), 2.vii.2002, A. Freidberg (7♂, 8♀), 17.v.2004, A. Freidberg (1♀), 14.iv.2006, A. Freidberg (1♀); Yizre'el, 7.vii.1973, M. Kaplan (1♀); Kokhav HaYarden, 20.ix.1987, A. Freidberg, on cotton (1♀), 25.iii.2001, L. Friedman (1♂); Moledet, 3.vii.2005, E. Zukerman, ex Sorghum (pupa), 15.vii.2005,(1♀), 3.vii.2005, E. Zukerman, ex Sorghum (pupa), 10-16.vii.2005 (2♂); Hefzi-Ba, 16.viii.1943, on cauliflower (1♂, 1♀); Lehavot Haviva, 21.vi.1973, A. Freidberg (19♂, 9♀), 21.vi.1973, A. Freidberg, ex rotten potato, 15.viii.1973 (8♂, 4♀); Sede Eliyyahu, 10.iv.1972, J. Kugler, ex *Solanum tuberosum* (2♂); Tel Diblaka, 1.vi.1986, Y. Zvik (1♂); SE Berekhat Ya'ar, 6.vi.2003, A. Freidberg (1♀); Ramot haShavim, 29.viii.1983, I. Yarom (1♀); Lower Nahal Tirza [Low. W. Faria], 27.v.1976, A. Freidberg (3♀); Nahal Qana Reserve, Qarne Shomeron, 6.5 km sw, 120 m, 32°08′N 35°02′E, 9.vii.2007, L. Friedman (1♀); Ma'ale Efrayim, 17.vii.1983, I. Nussbaum (4♂, 2♀); Herzliyya, 27.xi.1975, M. Kaplan (1♀), 28.viii.1977, F. Kaplan (1♀), 9.vi.1981, A. Freidberg (1♀), 22.vi.1981, A. Freidberg, Malaise trap (1♀), 7.xi.1981, A. Freidberg, Malaise trap (1♀), 14.iv.1982, A. Freidberg (1♀), 5.vi.1982, A. Freidberg (1♂), 22.vii.1982, A. Freidberg (1♀), 14.vii.1996, A. Freidberg (1♀), 8.xii.2006, A. Freidberg (2♀), 13.iv.2002, A. Freidberg (1♂), 4.xii.2005, A. Freidberg (1♂, 1♀); Herzliyya, 32°09′N 34°51′E, 70 m, 19.iv.2006, A. Freidberg (1♂, 1♀); Herzliyya, hill, 32°11′N 34°49′E, 17.iii.2008, A. Freidberg (2♀), 12–13.v.2006, A. Freidberg (1♂); Tel Aviv, Country Club, 13.x.1995, A. Freidberg (1♀); Tel Aviv, 5.vii.1943, ex Ficus carica fruit (2♀), 7.iii.1971, J. Kugler (1♂), 31.v.1971, J. Kugler (1♂), 15.x.1974, A. Freidberg (1♀), 13.ix.1978, A. Freidberg, ex avocado (2♂), 3.iv.1980, S. Kronenberg (1♀),



Figs. 14–15. *Lamprolonchaea smaragdi*, male terminalia. 14. Phallus**,** lateral view. 15. Epandrium and associated structures, lateral view.

15.ix.1982, Y. Zvik, ex bark, 16.ix.–7.x.1982 (1♀); Rosh ha'Ayin, 6.vii.1983, A. Freidberg, F. Kaplan (1♂); Migdal Afeq [Migdal Zedek], 25.vii.1976, A. Freidberg (1♂); Bat Yam, 18.v.1973, A. Freidberg (1♀); Nahal Tirza [W. Faria], 10.x.1971, J. Kugler (1♀); Yafit, nr. Peza'el, 6.ix.1995, A. Freidberg (1♀); Latrun, 17.ix.1973, A. Freidberg (2♂, 3♀); Bet Dagan, 7–8.viii.1985, A. Freidberg, Malaise trap (1♀), 9–25.viii.1985, I. Susman, Malaise trap (1♀), 15.ix.1986, I. Susman (1♀), 21–25.viii.1986, I. Susman, on cotton (3♂, 5♀), 12.viii.1987, A. Eitam, on cotton (1♂, 1♀), 8.ix.1987, I. Susman, on cotton (1♀); Yavne, 27.vii.1952, on tomato (2♀); Rehovot [Rehoboth, b. Jaffa], 29.ix.1931, J. Aharoni (1♂), 9.x.1931, J. Aharoni (1♀); Rehovot, 19.vii.1937, ex watermelon (2♀); Zomet Re`em, 16.viii.1987, I. Susman, on cotton (1♀); Zomet Re`em [Re`em Junction], 8.ix.1987, I. Susman, on cotton (1♀); Nahal Yativ [Ujja], 18.x.1978, A. Freidberg (1♀); 'En Hemed [Ein-Hemed], 3.x.1974, A. Freidberg (5♂, 4♀);Yerushalayim, Tomb of Prophet Shemu`el [Jerusalem, N. Shmuel], 15.xi.1941 (1♀); Yerushalayim, 12.viii.1959, J. Kugler (1♂); Yerushalayim, German Colony, 21.vii.1950, N. G. Gratz (1♀); Yerushalayim, Har haZofim [Mt. Scopus, Jerusalem], 18.xii.1930, O. Theodor (1♂), 21.x.1944, O. Theodor (1♂), 29.x.1947, O. Theodor (1♀); Qalya, 6.xi.1995, A. Freidberg, on Chenopodiaceae (1♀); Nahal Qumeran, 24.iii.1986, F. Kaplan (3♂), 2.v.1986, F. Kaplan (1♂, 2♀), 30.iii.1995, A. Freidberg (3♂, 1♀); 'Enot Zuqim [Ein Feshkha], 22.xi.1976, A. Freidberg (1♂); Rosh Zuqim, 24.iii.1986, G. Eldar (1♂); Nahal Qidron, 7.vi.1996, A. Freidberg (1♀), 23.v.2002, 31°40′N 35°26′E, A. Freidberg (1♂); 'En Gedi, 6.xi.1972, Peer-Li (1♂), 17.i.1973, A. Freidberg (1♂), 27.iv.1973, A. Freidberg (1♂); 'En Boqeq [Ein-Boqeq], 20.ix.1971, J. Kugler (1♂); Qiryat Gat, Phillip Farm, 12.x.2004, 31°31′N 34°47′E, I. Zonstein (1♂); Bet Guvrin, 21.iii.1975, A. Freidberg (1♂); Bitronot Ruhama, Nahal Hazav, 31°32′N 34°42′E, 5.iv.2005, A. Freidberg (1♀); Nahal Besor, 17.vii.1985, I. Susman (2♂); Gilat, 14.x.1958, Y. Harpaz, (1♂), 26.x.1958, Y. Harpaz, (2♀); Tel Sharuhen, 1.vii.1997, N. Dorchin (1♀); Lahav, 23.x.1974, A. Freidberg (1♂, 1♀); Be`er Sheva', 20.vi.1970, J. Kugler (1♀); Nahal Gerar (Berosh), 10.iv.1963, J. Margalit (1♂); Bor Mashash, 16.vi.1986, F. Kaplan (2♂, 2♀); Shivta, 8.xii.1980, A. Freidberg (1♂, 1♀); Revivim, 2.viii.1958, J. Krystal (1♂); Sede Boqer, 3.x.1984, A. Freidberg (1♀); Sedom, 26.vi.1976, A. Freidberg (2♂); Neot HaKikar, 20.v.1974, A. Freidberg (5♂, 4♀); Ne`ot Semadar [Shizzafon], orchard, 25.vi.1989, A. Eitam (1♂, 1♀); Ne`ot Semadar, 20.vi.1995, I. Yarom (2♂, 2♀), 7.viii.1995, A. Freidberg (1♂), 20.ix.1995, A. Freidberg (1♀); Nizzane Sinay, 12.iv.2002, L. Friedman (1♂); Qezi'ot, 5.ix.1985, I. Nussbaum (2♀); Nahal Lavan, Rt. 10, 7.v.1998, A. Freidberg (1♂); HaMeshar, 16.vi.1986, F. Kaplan (2♂); 'En 'Iddan, 20.vi.1995, A. Freidberg (1♂); 'En Gidron [Ein-Gidron], 27.xi.1975, F. Kaplan (1♀); Nahal Gidron, Hazeva Field School, 2 km N, -110 m, 30°46.77'N 35°14.58'E, 11.iii.1995, M. E. Irwin (1♂); Hazeva Field School, -120 m, 30°43'N 35°15'E, 3.xi.1997, A. Maklakov, Malaise trap (1♂), 12.xii.1997, A. Maklakov, Malaise trap (1♂), 20.iv.1998, E. Ashkenazi, Malaise trap (1♀); Hazeva Field School, 0.2 km N, small wadi, –116 m, 30°46.77′N 35°14.58′E, 12.iii.1995, M.E. Irwin, Sharkey Malaise trap (1♂); Hazeva, 10.iv.1972, J. Kugler (1♂); Shezaf Natural Reserve, Hazeva, –80 m, 30°46.01′N 35°15.37′E, 19.iii.1995, M.E. Irwin (1♀); Moshav Hazeva, Nahal Shahaq, between agricultural fields, –110 m, 30°46.33′N 35°16.32′E, 15.iii.1995

(1♀), 17.iii.1995 (1♂), 24.iii.1995 (1♂, 2♀), 3.iv.1995 (1♀), 6.iv.1995 (1♀), 16.iv.1995 (1♂), all M.E. Irwin, Sharkey Malaise trap; Nahal Shahaq, Shezaf Natural Reserve, –120 m, 30°45.98′N 35°15.18′E, 20.ii.1997, O. Niehuis (1♂), 30°45.10′N 35°15.32′E, 20.iii.1999, I. Yarom, Malaise trap (1♂), 12.iv.1999, I. Yarom, Malaise trap (1♂), 30°44.92′N 35°16.07′E, 24.xi.1999, I. Yarom, N. Zeevi, Malaise trap (1♂); Nahal Shezaf, Shezaf Natural Reserve, 30°43′N 36°16′E, 25.iv.1997, I. Yarom (1♀), 16.vi.1997, S. Plotkin (2♂), 31.x.1997, A. Maklakov, Malaise trap (1♀), 2.xi.1997, S. Plotkin, Malaise trap (1♀), 30°45.10'N 35°15.32'E, 14.vi.1999, I. Yarom, Malaise trap (1♂); Nahal Shezaf, Shezaf Natural Reserve, –120, 30°43′N 35°16′E, 18.xi.1997, A. Maklakov (1♂); Nahal Hiyyon, 17.iii.1988, A. Freidberg (1♀); Lotan Dunes, 18.iii.1988, F. Kaplan (1♀); Yotvata, 8.ix.1974, A. Freidberg (1♂, 1♀), 23.ix.1962, J. Kugler (13♂); Elifaz, sewage, 5.iv.1997, A. Freidberg (1♀); Elifaz, 4.iv.1997, L. Friedman (1♀); Timna', 16.iii.1982, A. Freidberg (1♂), 10.x.1995, A. Freidberg (1♀); Elat, 29.iv.1974, A. Freidberg (1♀).

Distribution

Mediterranean subregion (Canary Islands, Spain, Italy, Greece, Cyprus, Israel, Jordan); widespread in the Afrotropical region, including Madagascar and St. Helena; Hawaii, Bermuda.

Biology

In this study *L. smaragdi* was reared from sorghum, rotten potato, figs, avocado, and watermelon — all from central Israel, and probably all decaying. There is also one rearing record from bark, but there is the possibility that this may indicate a pupation site rather than an actual larval development site.

Comments

L. smaragdi is well known as a pest of cultivated tomatoes. It seems to be readily dispersed with the aid of man and has turned up on various remote islands such as St. Helena and has also been found in association with imported fruit in northern Europe. There is another *Lamprolonchaea* species in the Middle East, *L. metatarsata* Kertész, which has been recorded from the UAE (MacGowan, 2007a). The only sure way to separate these two species is by dissection of the male terminalia.

LONCHAEINI

LONCHAEA FALLÉN

This is the most species-rich genus of the family Lonchaeidae, with just over 200 species known world-wide, and with some 60 known from Europe. Although known from all the major biogeographical regions, *Lonchaea* reaches its greatest species diversity in the northern temperate and boreal woodlands. In Europe and North America the larvae of species in the genus *Lonchaea* are almost entirely associated with dead wood, developing under the bark of recently fallen trees. There are perhaps a few exceptions. Mac-

Gowan and Rotheray (2008) gave breeding records for nearly all British Lonchaeidae; but despite their extensive searching of dead wood habitats they did not find larvae of *Lonchaea tarsata* Fallén, one of the species recorded from Israel.

Lonchaea longitarsis MacGowan and Freidberg, sp. n.

(Figs. 16–22)

Description

Male

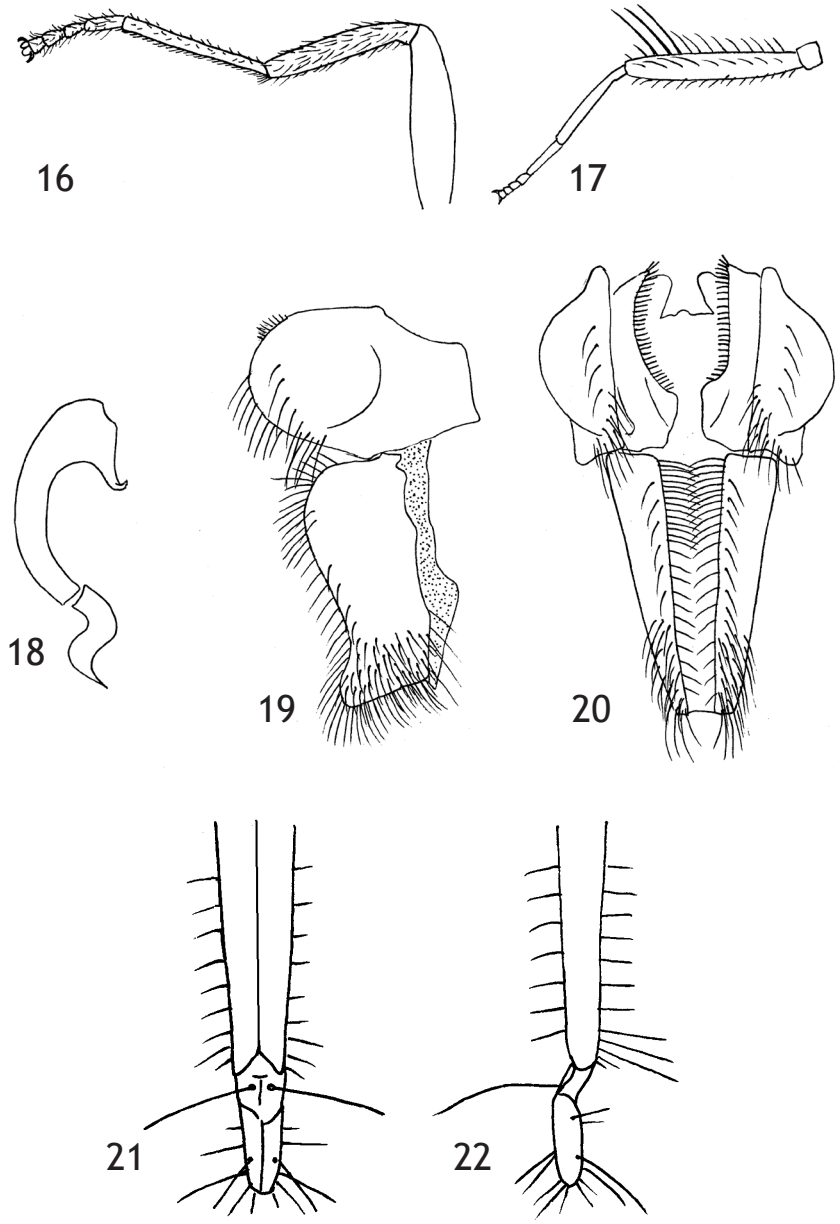
Head. Eye bare. Frons wide, parallel-sided, slightly protruding on its ventral half, approximately 0.8 times as wide as eye, subshining black and covered in fine microsculpture, with scattered interfrontal setulae approximately half as long as rather short orbital setae. Orbital plate bare, broad, and shining black. Lunule with about ten setulae, black in ground color. Parafacial shining black with slight silvering on ventral half. Face subshining black. Anterior genal setulae in multiple rows. Antennal flagellomere black, about twice as long as deep, just reaching mouth edge; arista brownish basally, practically bare.

Thorax. Disc subshining, covered in setulae approximately half as long as orbital setae. Notopleural depression bare. Thorax laterally rather densely microtrichose. Anepisternum with two long, thick setae anteriorly and three posteriorly, all of these setae only just discernable from long dense setulae on this sclerite. Katepisternum with one long, thick seta, no setulae below or posterior to it. One propleural and one stigmatical setae. Scutellum with 1–3 (usually 2) marginal setulae between apical and lateral setae and 2 such setulae between apical setae. These marginal setulae all long, almost half as long as setae. Calypteres grayish with dark margin and fringe.

Legs (Figs. 16–17). Black, on all legs basal tarsomere clear yellow, second tarsomere somewhat darkened, more so on foreleg, other tarsomeres dark. Foreleg with basal tarsomere remarkably long and narrow, longer than tibia and longer than combined length of all other tarsomeres, bearing some small dark spicules on its anterior surface. Other basal tarsomeres also elongated but not so much as on foreleg. Hindtibia with small ventral swelling one third of way from base to apex, this covered in short, dense setulae. Hindtibia somewhat thickened and curved on apical two thirds. Hindfemur anteriorly with 4–5 very long thick setae on apical third.

Wing. Clear with yellowish veins. Wing length 4.0 mm. Pterostigma twice as long as crossvein R-M.

Abdomen. **Male terminalia** (Figs. 18–20). In lateral view epandrium wider than high, on ventral half swollen and bulbous, without any obvious anterior process, bearing setulae along posteroventral margin and in vertical line just dorsal to these. Cerci massive and in most cases obviously extending beyond tip of abdomen, almost twice as high as epandrium and twice as high as wide, roughly rectangular in shape but slightly



Figs. 16–22. *Lonchaea longitarsis*. 16. Male left foreleg. 17. Male left hindleg. 18. Phallus, lateral view. 19. Epandrium and associated structures, lateral view. 20. Same, ventral view. 21. Female aculeus, dorsal view. 22. Same, lateral view.

emarginated on ventral face, bearing dense setulae on apical quarter and with relatively long setulae along ventral margin. Surstylus not visibly extending beyond epandrium. In ventral view swelling of epandrium more obvious; surstylus rather massive and chitinised, bearing row of short setulae along most of ventral margin; cerci on ventral margin with setulae on basal third longer and more closely spaced than on remainder of margin. Phallus two-segmented, basal portion almost C-shaped, apical portion only half as long as basal, S-shape.

Female

Frons as wide as eye; all setulae shorter than in male; basal tarsomere of foreleg not greatly elongated; without any ornamentation on legs.

Female terminalia (Figs. 21–22). Cerci with three pairs of setulae dorsally: basal pair longest, as long as length of segment, and two short pairs at apex; two pairs of setulae ventrally, apical pair as long as segment.

Differential diagnosis

With the combination of bare eyes, multiserial anterior genal setulae, a single stigmatical seta, dark calypter fringe, and yellow tarsomeres, this species shows closest affinities to *Lonchaea tarsata* Fallén, a widespread European and Mediterranean species which also has the epandrium swollen ventrally. The male of *L. longitarsis* is easily distinguished from that of *L. tarsata* by both the features on the legs and the characteristic genitalia. It is almost unique amongst described species of Lonchaeidae in having an elongate basal tarsomere of the foreleg. The females of both species are more difficult to separate, with the main distinguishing character being that in general females of *L. tarsata* are longer-haired than those of *L. longitarsis*. This is particularly noticeable on the frons, where in *L. tarsata* the interfrontal setulae are relatively numerous and long, and curve towards the mid-line of the frons, where the apices cross over with those from the opposite side; whereas in *L. longitarsis* the interfrontal setulae are sparse and short, not crossing over medially. In the female terminalia the cerci of the two species are rather similar in chaetotaxy but in general *L. longitarsis* has longer setulae on the cerci, particularly the dorsobasal pair, which in *L. longitarsis* are longer than the length of the cerci; whereas in *L. tarsata* these are usually just slightly less than the length of the cerci.

Material examined

Holotype ♂ ISRAEL: Herzliyya, 15.iii.1981, A. Freidberg. Paratypes: same collecting data (14♂, 3♀). Additional paratypes: ISRAEL: Har Hermon, 1800 m, 23.v.1998, A. Freidberg (2♀); Har Hermon, 1600 m, 29.v.2000, I. Yarom (1♂); Nahal Nimrod, 33°15′N 35°45′E, 4.x.2001, A. Freidberg (1♀); Panyas [Banias or Baniass], 4.v.1977, A. Freidberg (1♀), 24.iv.1982, I. Yarom (1♀), 24.iv.1982, A. Freidberg (1♀), 24.iv.1982, F. Kaplan (1♀), 26.iv.1984, A. Freidberg (2♀), 16.iv.1992, A. Freidberg (2♂, 3♀); Ya‘ar Odem or Netanya, G. Wizen, ex rotten wood, 18.iii.2006 (1♂); Metula, 6.v.1987, A. Freidberg (1♀); Nahal ‘Iyyon Reserve [Tanur], 6.v.1987, F. Kaplan (2♀); Tel Dan, 20.iv.1974, A. Freidberg (2♂), 13.iv.1983, A. Freidberg (1♀); Senir, 3.v.1994, A. Fre-

idberg (2♀); West to Har Shipon, 33°04.557′N 35°46.056′E, 30.iv.2006, L. Friedman (1♀); ‚Ani'am, 18.v.1983, F. Kaplan (1♂); Qazrin, 9.iv.1987, I. Nussbaum (1♀); Nahal Zawitan, near Qazrin [Golan, N. Zavitan, nr. Qatzrin], 7.v.1987, F. Kaplan (2♀); Qusbīya [Golan, Qusbiye], 15.iv.1982, F. Kaplan (2♀); 'En Teo [Ein Teo], 20.iv.1974, A. Freidberg (1♂, 1♀); Ramot Naftali, 23.v.1982, A. Freidberg (1♀); Nahal Dishon [N. Dishon], 8.v.1984, A. Freidberg (1♀); 'En Zetim, 33°00′N 35°29′E, 10.v.2006, L. Friedman (3♀); Sifsufa, 19.iv.1976, A. Freidberg (1♀); Har Meron, 1 km W. Ziv'on, 26.v.1999, A. Freidberg (1♀); Har Meron [Mt. Meron], 5.v.1987, A. Freidberg (1♀); Har Meron, 900 m, 17.v.1995, A. Freidberg (1♂, 1♀); Har Meron, 17.v.1995, I. Yarom, on oak (1♀); Har Meron, 800 m, 26.v.1999, A. Freidberg (1♀); Har Meron Reserve Camping, 32°59′N 35°24′E, 1100 m, 25.iv.2002, A. Freidberg (1♀); Har Meron Reserve, Camping under Kefar Meron, 32°58′N 35°26′E, 600 m, 25.iv.2002, A. Freidberg (1♂); Har Meron Reserve, 'En Zeved, 32°59′N 35°26′E, 24.iv.2002, A. Freidberg (1♂, 1♀), 24.iv.2002, L. Friedman (1♀); Upper Nahal 'Ammud [Upper N. Amud], 28.v.1981, A. Freidberg (1♀), 18.v.1983, A. Freidberg (1♀); Nahal 'Ammud [N. Amud], 21.iii.1974, A. Freidberg (1♀); Nahal 'Ammud, nr. Huqoq, 2.iv.1998, A. Freidberg (1♂); Huqoq [Huquq], 17.iii.1981, A. Freidberg (1♂); Zefat, 20.iv.1974, A. Freidberg (1♂); Park HaYarden, 7.v.1997, A. Freidberg (6♂, 18♀), 14.iv.1999, A. Freidberg (2♂, 2♀), 21.iii.2000, A. Freidberg (1♂, 1♀), 4.iv.1983, A. Freidberg (1♀), 7.v.1987, A. Freidberg (6♀), 7.v.1987, A. Shlagman (1♀); Kefar Nahum [K. Nahum], 17.iii.1981, T. Furman (1♂); Kare Deshe, 15.iv.1992, A. Freidberg (1♀); Karmel [Carmel], Ramot Remez, 2.v.2002, A. Freidberg (1♀); Nahal Oren, 6.v.1999, A. Freidberg (1♀), 14.iv.2006, A. Freidberg (2♂), 13.v.2007, A. Freidberg (1♀); Nahal Oren, 200 m, 11.v.1995, A. Freidberg (1♀); Nahal Oren river bed, 15.iv.2002, A. Freidberg (1♀), 16.iv.2003, A. Freidberg (1♀); Ginosar, 28.ii.1977, A. Freidberg (1♂); 'En Gev, 7.v.1997, A. Freidberg (1♀); Gilboa', 17.iii.1978, J. Kugler (1♂); Nahal Tavor, north facing slope, 26.iii.2001, L. Friedman (1♀); Nahal Tavor, shore, 25.iii.2001, L. Friedman (1♂); Kokhav HaYarden, 25.iii.2001, L. Friedman (1♀); Zikhron Ya'aqov, 1.v.1998, A. Freidberg (1♀), 30.iv.1981, A. Freidberg (1♀); Zomet ha'Amaqim (Jalame), 26–30.v.1993, A. Freidberg (3♀); Ma'agan Mikha'el, 20.iv.1986, A. Freidberg (1♀); Nahal Poleg, 30.iii.1996, A. Freidberg (1♂); Qedumim, 27.iii.2005, L. Friedman (1♀); Shoham, 31.iii.2006, L. Friedman (1♂); Herzliyya, 11.iv.1981 (3♀), 12.iv.1981 (1♂, 6♀), 13.iv.1981 (4♂, 2♀), 14.iv.1981 (6♂, 11♀), 15.iv.1981 (2♂, 10♀), 16.iv.1981 (1♂), 21.iv.1981 (1♂), 25.iv.1981 (3♀), 26.iv.1981 (1♀), 30.iv.1981 (1♀), 4.v.1981 (1♀), 6.v.1981 (1♀), 9.v.1981 (1♀), all A. Freidberg, Malaise trap; Herzliyya, 25.iii.1990 (2♂), 10.iv.1993, swarming over legs (17♂, 5♀), 14.iv.1994 (1♀), 4.iii.1995, swarming under branch (6♂), 13.iv.2002 (2♂, 4♀), 12.iv.2003 (3♂, 11♀), 13.iv.2003 (2♂, 2♀), all A. Freidberg; Herzliyya, hill, 32°11′N 34°49′E, 8.iv.2005 (1♀), 12-13.v.2006 (1♀), 1.iii.2006 (1♂), 7.iii.2007 (5♂), 17.iii.2008 (33♂, 14♀), 27.iii.2009 (4♂), 3.iv.2007 (6♂, 16♀), 13.iv.2007 (2♂, 4♀), 18-20.iv.2008 (1♂, 3♀), 19.iv.2007 (1♂, 4♀), 28.iv.2007 (2♀), 6.v.2007 (1♀), all A. Freidberg; Ramat HaSharon, 7.iii.1975, D. Simon (1♂), 1.iv.1981, T. Furman (1♀); Tel Aviv, Gelilot, 32°9.33'N 34°48.46'E, 19.iii.2005, A. Freidberg (2♂, 1♀); Tel Aviv, 15.iii.1971, J. Kugler (1♂), 2.iv.1971, J. Kugler (1♀), 14.iii.1973, A. Freidberg (4♂, 1♀), 26.iii.1973, A. Freidberg (1♂),

18.iii.1974, A. Freidberg (2♂), 5.iv.1978, A. Freidberg (4♀), 22.iv.1992, A. Freidberg (1♀); Tel Aviv, Abu Kabir [Abu Kabir], 28.iv.1981, A. Freidberg (1♀); Ramat-Chen, 15.iv.1972, J. Kugler (1♀); Petah Tiqwa [Petach-Tikva], 10.iv.1982, I. Nussbaum (1♀); Holon, 7.iii.1995, A. Freidberg, on tamarisk (3♀), 23.iii.1995, I. Yarom, on Tamarix sp. (1♀); Latrun, 10.iii.2004, L. Friedman (1♀); Kefar Menahem, 11.iii.1993, A. Freidberg (1♂); Zafririm Reserve, 15 km E Qiryat Gat, 6.iv.2000, A. Freidberg (1♀); Yerushalayim [Jerusalem], 6.iv.1962, Avigdor (1♀); Yerushalayim, Me Niftoah [Lifta], 21.v.1982, I. Nussbaum (1♀); Ma'ale Adummim, 21.v.1993, A. Freidberg (1♂); Nizzanim, 18.iv.2007, A. Freidberg (2♀), 23.iv.2007, A. Freidberg (1♂); Bet Guvrin, 31.iii.1975, A. Freidberg (1♂); Tel Maresha, Bet Guvrin, 30.iii.2002, A. Freidberg (1♀); Bitronot Ruhama, Nahal Hazav, 31°32′N 34°42′E, 5.iv.2005, A. Freidberg (1♀); Zomet Lakhish, 30.iii.2002, A. Freidberg (1♂, 1♀).

The holotype is double-mounted, minutien pin on a plastic block, is in excellent condition, and is deposited in TAUI. Most paratypes are at TAUI. Paratypes have also been distributed among the BMNH, NHNM and NMS.

Distribution

Israel (endemic, but likely to be found in neighboring countries to the east and to the north).

Biology

One specimen was reared from decaying wood brought from the Golan Heights.

Etymology

The specific epithet refers to the elongated basal tarsomere of the male foreleg.

Comments

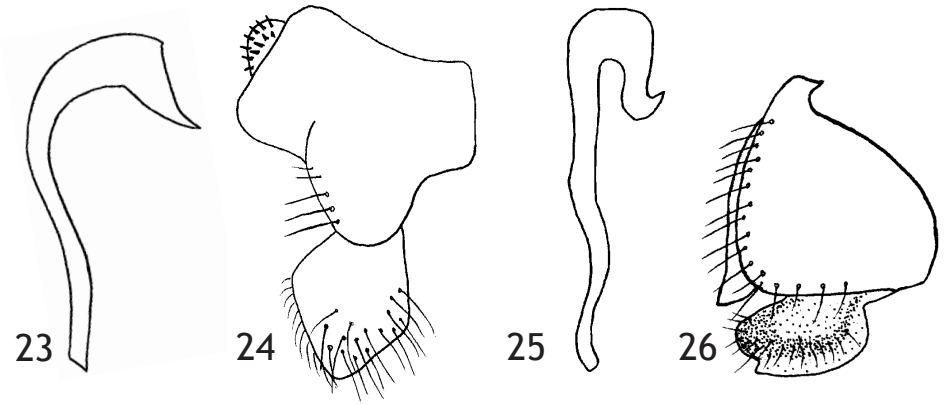
Most of the specimens collected in Herzliyya were swept from unidentified introduced oaks. In one case (4 March, 1995) six males were collected while swarming beneath the branch of a tree.

Lonchaea tarsata Fallén

(Figs. 23–24, 27–28)

Material examined

ISRAEL: Har Hermon [Mt. Hermon], 1600 m, 20.v.1986, A. Freidberg (2♂); Har Hermon, 1500 m, 16.v.1995, A. Freidberg (1♂); Mezudat Nimrod [Qala'at Nemrod], 24.iv.1983, F. Kaplan (1♀); Nahal Dishon, 8.v.1984, A. Freidberg (1♀); Mezudat Yesha', 6.iv.1990, A. Freidberg (7♂, 4♀); Rihaniya, 16.iv.1992, A. Freidberg (1♂); Har Meron [Mt. Meron], 9.iv.1977, A. Freidberg (1♂), 5.v.1987, F. Kaplan (1♂); Zefat, 20.iv.1974, A. Freidberg (2♀); 'Emeq haEla, 20.iv.2005, L. Friedman (1♂); Bet Shemesh, 10.iii.2005, L. Friedman (7♂, 1♀); Bet Guvrin, 24.iii.1983, A. Freidberg (1♂). All TAUI.



Figs. 23–24. *Lonchaea tarsata*, male terminalia. 23. Phallus, lateral view. 24. Epandrium and associated structures, lateral view. Figs. 25–26. *Setisquamalonchaea fumosa*, male terminalia. 25. Phallus, lateral view. 26. Epandrium and associated structures, lateral view.

Distribution

Ireland, England, Sweden, Finland, Denmark, Germany, Czech Republic, Austria, Hungary, France, Spain, Italy, Slovakia, Morocco, Israel. Records from the former USSR and Mongolia require verification.

Comments

The apparent disjunctive distribution in Israel (Mt. Hermon and Upper Galilee in the north, Judean Mts. in the center) may simply reflect a collection bias.

SETISQUAMALONCHAEA MORGE

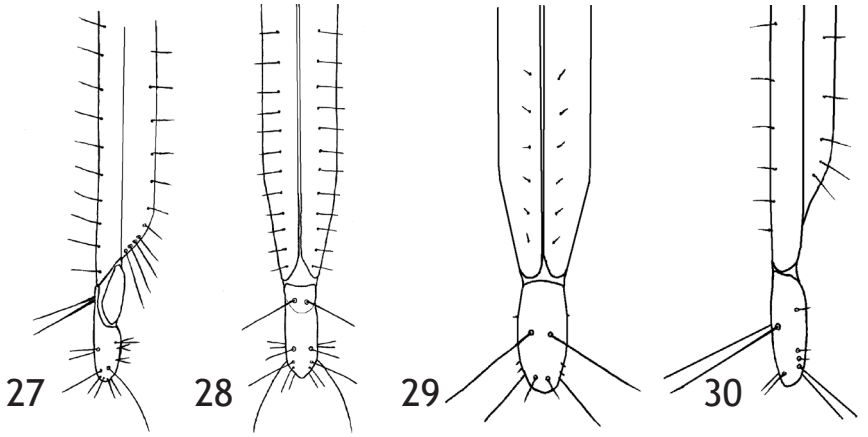
This is a small genus, and its relationship to the genus *Silba* is still unclear. Until recently there were only two known species, *S. fumosa* (Egger), which is discussed below, and *S. retalionis* McAlpine, which is only known from a few Palaearctic specimens. MacGowan (2007b) has recently described a further two species from Asia.

Setisquamalonchaea fumosa (Egger)

(Figs. 25–26, 29–30)

Material examined

ISRAEL: Har Hermon [Mt. Hermon], 1800 m, 12.vi.1996, A. Freidberg (1♂); Har Hermon [Mt. Hermon], 1750 m, 22.vi.1973, F. Nachbar (2♂), 26.vi.1997, A. Freidberg (2♂); Har Hermon [Mt. Hermon], 1700 m, 22.vi.1973, A. Freidberg (3♂, 6♀), 9.vi.1983, A. Freidberg (1♂); Har Hermon [Mt. Hermon], 1650 m, 8.vii.1975, A. Freidberg (5♂), 9.vii.1987, A. Freidberg (1♂, 1♀), 17-18.vii.1995, I. Yarom (1♀), 28.v.2000, L. Friedman (1♂); Har Hermon [Mt. Hermon], 1600 m, 22.vi.1973, A. Freidberg (3♂), 23.v.1978,



Figs. 27–28. *Lonchaea tarsata*, female aculeus. 27. Lateral view. 28. Same, dorsal view. Figs. 29–30. *Setisquamalonchaea fumosa*, female aculeus. 29. Dorsal view. 30. Same, lateral view.

A. Freidberg (1♂), 19.v.1983, I. Yarom (1♂), 2.vii.1986, A. Freidberg (1♂), 9.vii.1987, A. Freidberg (1♂), F. Kaplan (1♂), 18.vii.1995, A. Freidberg (1♀), 3.viii.1995, A. Freidberg (2♂, 1♀), 20.v.1997, I. Yarom (1♂); 23.v.1998, A. Freidberg (1♂), 17.v.1999, A. Freidberg (1♀), 29.v.2000, A. Freidberg (1♀), I. Yarom (1♀), 27.v.2003, L. Friedman (1♀), 27.v.2003, L. Friedman (1♀), 11.vi.2003, A. Freidberg (1♀), 12.vi.2003, A. Freidberg (2♂, 1♀), 5.viii.2004, L. Friedman (1♀), 5.viii.2004, I. Zonstein (1♀); Har Hermon [Mt. Hermon], 1500–1650 m, 22.v.1990, A. Freidberg (1♂, 1♀); Har Hermon [Mt. Hermon], 1500-1650 m, 33°18′N 35°46′E, 6.vi.2002, A. Freidberg (5♂, 6♀), L. Friedman (3♂); Har Hermon [Mt. Hermon], 1500 m, 16.v.1995, A. Freidberg (2♂); Har Hermon [Mt. Hermon], 1400–1600 m, 24.v.1983, A. Freidberg (5♂, 1♀); Har Hermon [Mt. Hermon], 1300 m, 21.v.2002, L. Friedman (1♀), 23.v.1988, A. Friedberg (1♂); Har Hermon [Mt. Hermon], 1100 m, 22.v.1993, A. Friedman (1♀); Har Dov, 8.vi.1983, A. Freidberg (3♂), 21.v.1986, (4♂); Nahal ‘Iyyon Reserve [Tanur], 26.vi.1974, F. Nachbar (1♂), 6.v.1987, (1♂); Panyas [Baniass], 19.vii.1977, A. Freidberg (1♂), 21.vi.1982, A. Freidberg (1♂), 26.iv.1984, A. Freidberg (1♂); H. Nappah [Golan, Kfar Nafach], 23.iv.1973, A. Freidberg (1♂); H. ‘En Samsam [Golan, Ein Semsem], 30.v.1981, F. Kaplan (7♂, 1♀); Nahal Zawitan, near Qazrin [Golan, N. Zavitan near Qatzrin], 30.v.1981, A. Freidberg (1♂, 1♀); Avivim, 18.iv.1981, A. Freidberg (1♀); Nahal Keziv, 1.vi.1983, Y. Zvik (1♂); Qusbīya [Qusbiye], 20.iv.1976, A. Freidberg (3♂); ‘En Zetim, 10.v.2006, 33°00′N 35°29′E, L. Friedman (1♂); Har Meron, 1200 m, 11.vi.1996, A. Freidberg (1♀); Har Meron, 1200 m, 33°00′N 35°25′E, 3.x.2001, A. Freidberg (1♀); Har Meron [Mt. Meron, Mt. Meiron], 1100 m, 17.vi.1977, A. Freidberg (2♀), Z. Feller (1♂, 1♀), 19.viii.1977, A. Freidberg (1♀), 17.ix.1978, A. Freidberg (2♀), 28.v.1981, A. Freidberg (1♂), 17.ix.1981, A. Freidberg (2♀), 22.v.1994, A. Freidberg & F. Kaplan (8♂, 2♀), 25.x.1994, A. Freidberg (1♀); Har Meron, 1000 m, 14.v.1973, D. Furth (1♂); Har Meron [Mt. Meiron], 900 m, 28.v.1981, A. Freidberg (1♂, 3♀); 24.v.1978, A. Friedberg (1♀); 17.v.1995,

A. Freidberg (1♂); Har Meron [Meron, Meiron, Mt. Meron, Mt. Meiron], 18.v.1965, J. Kugler (8♂), 13.vi.1971, J. Kugler (3♂), 22.iv.1973, D. Furth (1♂), 11.vi.1974, F. Nachbar (1♀), 14.v.1974, A. Freidberg (2♂, 1♀), 5.x.1976, A. Freidberg (1♂, 2♀), 30.ix.1976, A. Freidberg (5♀); Har Meron, 'En Samura, 32°57'N35°25'E, 24.iv.2002, L. Friedman (1♀); Park haYarden, 7.v.1987, A. Freidberg (1♀); Biq'at Bet Zayda [Bteicha], 14.iii.1975, F. Kaplan (1♂); Peqi'in, 14.v.1974, F. Nachbar (6♂); 'En Zetim, 28.v.2003, A. Freidberg (1♂); Nahal 'Ammud [N. Amud], 29.iv.1974, D. Furth (3♂), 10.vi.1987, F. Kaplan (1♂); Huqoq, 17.iii.1981, A. Freidberg (1♂); Yagur, 21.ii.1976, A. Freidberg (1♀); Haifa, 5.vi.1976, A. Freidberg (1♂); Karmel [Carmel], 27.v.1974, A. Freidberg (1♂), 13.vi.1974, A. Freidberg (1♂), 5.v.1976, A. Freidberg (2♂), 27.v.1977, A. Freidberg (1♂); Nahal Oren, 24.v.1995, A. Freidberg (1♀); Nahal Oren, riverbed, 14.v.2003, L. Friedman (1♀); Zomet ha'Amaqim (Jalame), 18–22.v.1993, A. Freidberg (1♂), 26-30.v.1993, A. Freidberg (4♂); Arbel, 17.iv.1992, A. Freidberg (1♀); Zomet Hammat Gader [Opposite Mucheibe], 2.iii.1978, M. Kaplan (1♀); Yizre'el, 24.iii.1973, M. Kaplan (2♂, 1♀); Kokhav haYarden, 25.iii.2001, L. Friedman (6♂); Kokhav ha-Yarden, moat of castle, 26.iii.2001, L. Friedman (3♂); Gilboa', 17.iii.1978, J. Kugler (1♂); Ma'ale Gilboa', 22.ii.1961, J. Kugler (1♀); Nurit, 6.v.1977, A. Freidberg (1♂); 'Olesh, 25.iv.1981, A. Freidberg (1♂); Herzliyya, 24.vi.1981, (1♀), 18.ii.1982, (1♀), 19.iv.1982, (1♂), 20.iv.1982, (1♂), 5.v.1982, (1♂), 11.v.1982, (1♂), 24.v.1982, (1♂), all A. Freidberg; Herzliyya, hill, 1.iii.2006, A. Freidberg (1♀), 12–13.v.2006, A. Freidberg (1♀); Tel Aviv, 30.iii.1972, J. Kugler, ex branch of *Opuntia ficus-indica*, 1.v.1972 (1♂), 26.ii.1973, A. Freidberg (1♂); 14.iii.1973, A. Freidberg (1♀); Rosh ha'Ayin, 13.v.1993, A. Freidberg (1♂); Ramat Razi`el, 29.iv.1972, J. Kugler (1♂); Yerushalayim, Me Niftoah [Lifta], 21.v.1982, Nussbaum (1♀); Ashqelon [Ashkelon], 26.iv.1973, D. Furth (1♂); Sederot, 27.ii.1974, A. Freidberg (7♂); Devira, 6.v.1971, J. Kugler (1♀); 'Enot Qane [Ein Tureiba], 27.iv.1973, A. Freidberg (1♀). All TAUI.

Distribution

Most of Europe north to Sweden, Israel, Canada (British Columbia), western USA.

Biology

One specimen was reared from a (probably decaying) branch of *Opuntia ficus-indica* (L.) Miller.

Comments

Setisquamalonchaea fumosa (Egger) is a relatively common species in Europe, especially in the south. MacGowan and Rotheray (2008) note its larval association with a wide range of decaying plant materials ranging from silage to the stem bases of the giant hogweed, *Heracleum mantegazzianum* Sommier and Levier. Here we record it from a presumably decaying branch of *Opuntia ficus-indica*.

Most of the studied specimens were collected in the northern part of the country, in particular on Mt. Hermon and Mt. Meron, indicating preference for altitudes higher than 1000 m. Relatively few specimens were collected in the central part of the country,

although several specimens were collected in Herzliyya and in Sederot. The record of ‘Enot Qane, an oasis at the shore of the Dead Sea, is unusual for an essentially Mediterranean species.

SILBA MACQUART

This genus currently contains some 90 named species but many others still await description. The majority of *Silba* species are associated with the tropical forests of Africa, Asia, and Australasia, where they have been reared from a wide range of fruits. Only two species, *S. adipata* and *S. virescens* (which seems to have a wider range of larval substrates), are known from Europe.

Silba adipata McAlpine
(Figs. 35, 37)

Material examined

ISRAEL: Har Hermon [Mt. Hermon], 2000 m, 15.viii.1976, A. Freidberg (1♂); Har Hermon [Mt. Hermon], 1700 m, 7.vii.1987, A. Friedberg, (1♂); Har Hermon [Mt. Hermon], 1600 m, 7.vii.1987, F. Kaplan (1♀); Har Hermon [Mt. Hermon], 1300 m, 7.viii.1974, F. Nachbar (1♀); Har Dov, 15.viii.1976, A. Freidberg (1♀); Har Dov, Brith Ben haBtarim, 1700 m, 17.vii.1995, A. Friedberg (1♂, 1♀); Newe Ativ, 16.viii.1976, A. Freidberg (4♂, 4♀), 28–29.viii.1981, A. Freidberg (6♂, 5♀); Panyas [Baniass or Banias], 10.vii.1975, A. Freidberg (1♂), 24.v.1978, A. Freidberg (1♂), 14.v.1981, A. Freidberg (1♂), 9.ix.1981, A. Freidberg (1♀), 11.ix.1981, A. Freidberg (1♂), 21.vi.1982, A. Freidberg (1♀), 4.v.1977, A. Freidberg (1♀), 19.vii.1977, A. Freidberg (2♂, 4♀), 21.vii.1983, I. Nussbaum (2♀), 25.vii.1985, A. Freidberg (1♂, 1♀); Panyas, 18.vii.1995, A. Freidberg (1♀), 18.vii.1995, I. Yarom (1♂, 1♀), 14.vi.1996, A. Freidberg (2♂), 24.ix.1997, A. Freidberg (1♂), 29.v.2000, L. Friedman (1♀), 29.v.2000, I. Yarom (3♀), 5.vi.2002, 33°15′N 35°42′E, A. Freidberg (1♂); Mezudat Nimrod [Qala’at Nemrod], 9.vi.1975, M. Kaplan (1♀); Mezudat Nimrod, 800 m, 13.vi.1996, A. Freidberg (1♀); Spring nr. Nahal Nemrod, 30.x.1976, A. Freidberg (1♀); Tel Dan, 18.vi.1971, J. Kugler (1♂), 9.vii.1975, M. Kaplan (1♂, 1♀), 10.vii.1975, A. Freidberg (1♂), 10.vii.1976, A. Freidberg (2♂, 1♀), 27.viii.1981, A. Freidberg (2♂, 3♀), 25.viii.1983, I. Yarom (1♂); Dan, 21.vii.1983, A. Freidberg (25♂, 6♀), 21.vii.1983, I. Nussbaum (2♀); Hermon Field School, 22.v.2002, A. Freidberg (1♀); Nahal Senir [Hatzbani], 17.v.1976, A. Freidberg (1♂, 1♀); Har Odem, 22.viii.1983, I. Yarom (2♂); Qazrin [Qatzrin], 30.v.1981, F. Kaplan (6♂); Ani’am, 18.v.1983, A. Freidberg (2♂, 1♀); Hula, 26.vi.1972, A. Freidberg (1♂); N[ahal] Bezet, 23.x.1986, I. Yarom (1♀); Monfort, 2.vi.1981, A. Freidberg (1♂, 2♀); Bar’am, 18–20.xi.1977, A. Freidberg (1♂, 1♀); Har Meron [Mt. Meiron], 26.vi.1978, H. Lev (1♀); Har Meron, 27.vi.1997, A. Freidberg (1♂); Upper Nahal ‘Ammud [Upper N. Amud], 28.v.1981, A. Freidberg (1♀), 28.v.1981, F. Kaplan (2♂, 1♀), 17.ix.1981, F. Kaplan (2♂, 2♀), 17.ix.1981, A. Freidberg (1♂, 2♀); Upper Nahal ‘Ammud [Up. N. Amud], 18.v.1983, F. Kaplan (1♂); Nahal ‘Ammud [N. Amud], 6.x.1974, F. Kaplan (1♂), 6.x.1974, A. Freidberg (11♂, 5♀), 24.vi.1981, M. Kaplan (4♀); Zefat

[Safed], 30.viii.1962, J. Kugler, ex *Ficus carica* (1♂, 1♀); Rosh Pina, 12.ix.1984, A. Freidberg, ex fig (1♂, 1♀); Park HaYarden, 14.vi.1982, A. Freidberg (1♂), 16.vi.1982, A. Freidberg (2♂, 1♀); Park HaYarden [P. hayarden], 25.vii.1983, I. Nussbaum (1♀); Tirat Zevi [T. Zvi], 20.iv.1982, R. Or (1♂), 31.v.1982, R. Or (1♂); Karmel, 17.vi.1965, ex fruit *Ficus carica,* Dr. Erdos (12♂♀; HNHM); Nahal Oren, 1.v.2001, L. Friedman (1♂), 14.v.2002, A. Freidberg (1♀); Nahal Oren, river bed, 14.v.2002, A. Freidberg (1♂); 'Usfiya, 21.vii.1982, I. Nussbaum (1♀); Yizre'el Valley [Emek], 10.iv.1934 (1 specimen); Zikhron Ya'aqov, 30.iv.1981, A. Freidberg (1♀); Zomet ha'Amaqim (Jalame), 26–30.v.1993, A. Freidberg (1♀); Ma'agan Mikha'el, 21.v.1973, A. Freidberg (1♂, 1♀); Pardes Hanna, 12.viii.1937, S. Duvdevani, ex *Ficus* fruit (2♂, 2♀); Lower Nahal Tirza [Low. W. Faria], 27.v.1976, A. Freidberg (1♂); Migdal Afeq [Migdal Zedek], 25.vii.1976, A. Freidberg (1♂), 24.ix.1981, F. Kaplan (1♂), 11.vi.1993, A. Freidberg (1♂), 13.v.1993, A. Freidberg (1♀), 13.xii.1997, A. Freidberg (1♀); Herzliyya [Herzeliyya], 28.iv.1975, A. Freidberg (3♀); Herzliyya, 28.viii.1977, A. Freidberg (1♀). 19.vii.1981, A. Freidberg (1♂), 17.vii.1981, A. Freidberg (1♀); Tel Aviv, 8.ii.1982, A. Freidberg (1♀), 15.vi.2004, A. Shlagman, ex fig (1♂, 1♀, 5 puparia); Tel Aviv, Abu Kabir, 28.iv.1981, A. Freidberg (2♂, 1♀); Rehovot, S. Coastal Plain, 20.vi.1993, Kuslitzky, [ex] fig fruit (4♂, 4♀, 8 puparia; PPIS); Latrun, 22.ix.1975, A. Freidberg (3♀); Park Canada, 11.vii.1993, A. Freidberg (3♂); Burma Road, near Bet Me'ir, 21.vii.2002, A. Freidberg (1♂, 1♀); Har haTayyasim, 21.vii.2002, A. Freidberg (1♀); Yerushalayim [Jerus.], 7.vii.1940 (1♀); Yerushalayim [Jerusalem], 7.vii.1940 (4♂, 4♀); Yerushalayim, Me Niftoah [Jerusalem, Lifta], 14.viii.1982, I. Yarom (1♀), 29.vi.1983, I. Yarom (1♂, 1♀); Yerushalayim, Me Niftoah [Lifta], 3.viii.1983, I. Nussbaum (1♀); Yerushalayim, Bet haKerem [Bethakerem], 15.vii.1947, O. Theodor (1♀); Yerushalayim, Bet haKerem, Wadi Ruaz [Jerusalem, Beth haKerem, Wadi Ruaz], 5.viii.1950, O. Theodor (6♂, 2♀); Mevo Betar, 6.vii.1985, I. Nussbaum (1♀); Nahal Perat [W. Kelt], 8.xi.1969, J. Kugler (3♂, 1♀); Nahal Perat [V. Kelt] 4.xi.1982, I. Nussbaum (2♂); Nu'eima, 11.iv.1981, A. Freidberg (3♂, 1♀); Yeriho [Jericho], 11.x.1972, A. Freidberg (2♀); Negba, 20.vi.1975, A. Freidberg (1♂, 1♀); 'Arad, 1.vii.1971, J. Kugler (1♀); 'En Gedi [Ein-Gedi], 17.i.1973, A. Freidberg (1♀); 'En Mor, 30.vi.1994, A. Freidberg (1♀); 'En Yahav, Makhteshim Res.,'En Shahaq, 2.5 km w hwy 90 at Km 150, 30°42.85′N 35°11.12′E, –60 m, 29.iii.1995, M.E. Irwin, Sharkey malaise over spring (1♂).

SYRIA: Beit Djan, 25.x.1973, A. Freidberg (1♂).

EGYPT [in some labels ISRAEL]: Sinai Mts., Wadi Geragenia, 2000 m, 16.vii.1974, A. Freidberg (1♂, 1♀); Sinai, Mt. Abbas, 14.viii.1971, J. Kugler (1♂); Sinai, St. Katharina, 40 km NE, 1000 m, 27.vi.1998, A. Freidberg, F. Kaplan (1♀); Sinai Mts., El-Arbain, 14.vii.1974, F. Kaplan (2♂, 1♀); Sinai, Dir Arba'in, 24.vi.1998, A. Freidberg, F. Kaplan (2♀); Sinai, Wadi Tubug 1600 m, 23.vi.1998, A. Freidberg, F. Kaplan (2♀); Sinai, Ein Hudra, 9.vii.1969, A. Freidberg (1♀). All TAUI, except when indicated otherwise.

Distribution

Spain (Mallorca), Italy, Greece, Cyprus, Canary Islands, Syria, Israel, Jordan, Egypt, South Africa.

Comments

The larvae of *Silba adipata*, also known as the black fig fly, are associated with figs, and this species can occur as a pest in agricultural areas (Katsoyannos, 1983; Giliomee et. al., 2007). Recorded here for the first time from Syria.

***Silba israel* MacGowan and Freidberg, sp. n.**

(Figs. 31–34, 38)

Description

Male

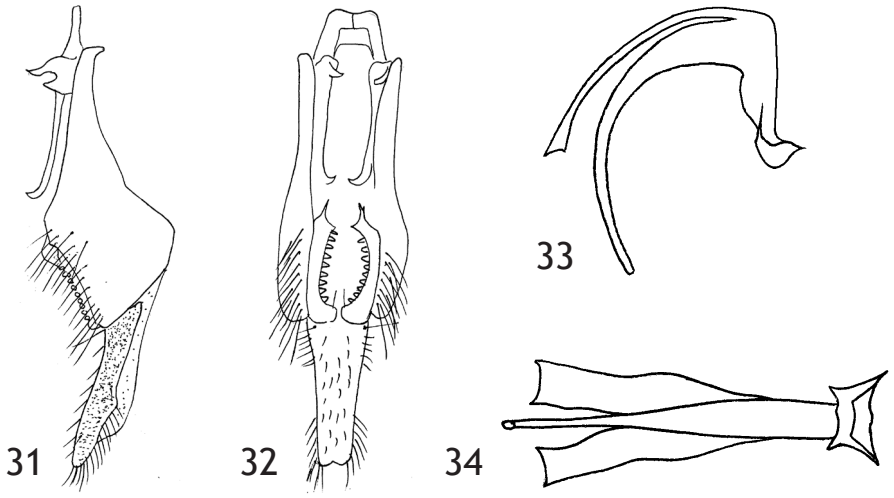
Head. Eye bare. Frons about half as wide as eye, parallel-sided, subshining, and covered in dense microsculpture, on ventral half with few scattered pock-mark depressions from which interfrontal setulae arise, dorsal half with large shallow depression just ventral to ocellar triangle, covered in sparse very short interfrontal setulae approximately 0.15 times as long as orbital seta. Orbital plate narrow, shining black, and bare. Lunule with 6–7 setulae, dark brown ground color with silvering. Face slightly silvered. Parafacial shining black on dorsal half and silvered ventrally beside genal setulae. Anterior genal setulae in single row of 6–7 along mouth edge, slightly separated from other setulae on gena, anterior group not longer or thicker than other setulae on gena. Scape and pedicel black, 1st flagellomere mainly black, on medial surface orange on basal quarter, this coloration sometimes extending ventrally half way along the flagellomere; 1st flagellomere long, approximately three times as long as deep, extending ventrally beyond mouth margin. Arista yellow basally, plumosity at its greatest extent just less than depth of 1st flagellomere.

Thorax. Disc subshining blue black, with short appressed setulae. Notopleural depression bare. One propleural and one rather weak stigmatical setae. Anepisternum with three strong setae anteriorly and three posteriorly. Katepisternum with usual two setae, posterior seta longer and thicker than anterior seta, sclerite otherwise bare apart from scattering of short setulae on anterior portion. Scutellar disc heavily gray microtrichose, margin with three short setulae between lateral and apical setae, none between apical setae. Calypteres white with white margin and fringe.

Legs. Black, foretibia with yellow streak ventrally on apical third, on all legs first and second tarsomeres orange, fore and hind first tarsomere with fringe of golden setulae ventrally.

Wing. Clear with yellow veins. Wing length 3.5–4.0 mm.

Abdomen. **Male terminalia** (Figs. 31–34). In lateral view epandrium 2.25 times as high as wide, broadly excavated anterodorsally, with few well-spaced setulae along posteroventral angle, otherwise bare. Cerci long and narrow, 0.75 times as high as epandrium, with short scattered setulae, these densest at apex and on ventral surface. Surstylus projecting beyond shell of epandrium posteroventrally, bearing nine relatively large teeth.



Figs. 31–34. *Silba israel*, male terminalia. 31. Epandrium and associated structures, lateral view. 32. Same, ventral view. 33. Phallus, lateral view. 34. Same, ventral view.

Phallus in lateral view approximately U–shaped, basally relatively narrow with slight bump on basal part of U, apically with narrow, upturned central process, flanked on each side by thin process almost as long as central process, in ventral view these lateral processes flattened and ribbon–like, apices squared and slightly flared.

Female

Female terminalia (Fig. 38). Aculeus dorsoventrally flattened, slightly broader than hindtibia at its apex. Cerci with basal third embedded in shaft of aculeus, slightly acute at tip, dorsobasally with pair of setulae less than half as long as cerci, ventrally with pair of setulae situated on apical third of, and just longer than, cerci, and approximately 5 pairs of very short setulae on lateral margins; all these setulae whitish. Rather similar in appearance to the aculeus and cerci of *S. virescens* (Fig. 39).

Differential diagnosis

Silba israel is a member of the *S. admiralis* McAlpine group of species characterized amongst *Silba* species by having pale tarsomeres and, in the male terminalia, by having tall, narrow cerci and a slightly protruding surstylus bearing a number of large teeth. The group includes *S. admiralis* from India, *S. apodesma* McAlpine, and *S. namibia* MacGowan from southern Africa, and *S. pappi* Soós from Afghanistan. There are also a large number of undescribed species from the Congo area in Central Africa. The main distinguishing feature between species in this group is the shape and ornamentation of the phallus. *S. israel* differs from these related species in that the phallus has two flattened, ribbon-like, lateral processes.

Material examined

Holotype ♂ ISRAEL: Ne'ot haKikkar, 29.iii.1996, A. Freidberg. Paratypes: ISRAEL: Nizzanim, 6.vi.2006, L. Friedman (1♀); Hula Reserve, 4.x.1965, J. Margalit, light trap (3♀); Biq'at Bet Zayda [Bteicha], 5.viii.1986, A. Freidberg (1♂); Kefar Rupin, 25.x.1978, A. Freidberg (1♀); 'Enot Zuqim [Ein Feshkha], 22.xi.1976, A. Freidberg (1♀); 'Enot Zuqim, 10.iv.1994 (1♀), 11.x.1994 (1♂, 1♀), both A. Freidberg and F. Kaplan; Ne'ot haKikkar, 25.vii.1997, A. Freidberg (1♀), 8.ix.1974, A. Freidberg (1♀).

Other material: Democratic Republic of Congo: Terr. Rutshuru, 13.viii.1937, leg. Miss[ion] Prophylactique (MRAC).

The holotype is double-mounted, minutien pin on a plastic block, is in excellent condition, and is deposited in TAUI. Most paratypes are at TAUI. Paratypes have also been deposited in the NMS.

Distribution

Israel, D.R. Congo (Zaire). Probably widespread in the Afrotropical Region and in the countries to the east and south of Israel.

Biology

Unknown.

Etymology

The specific epithet refers to the country of origin of the holotype, and is a noun in apposition.

Comments

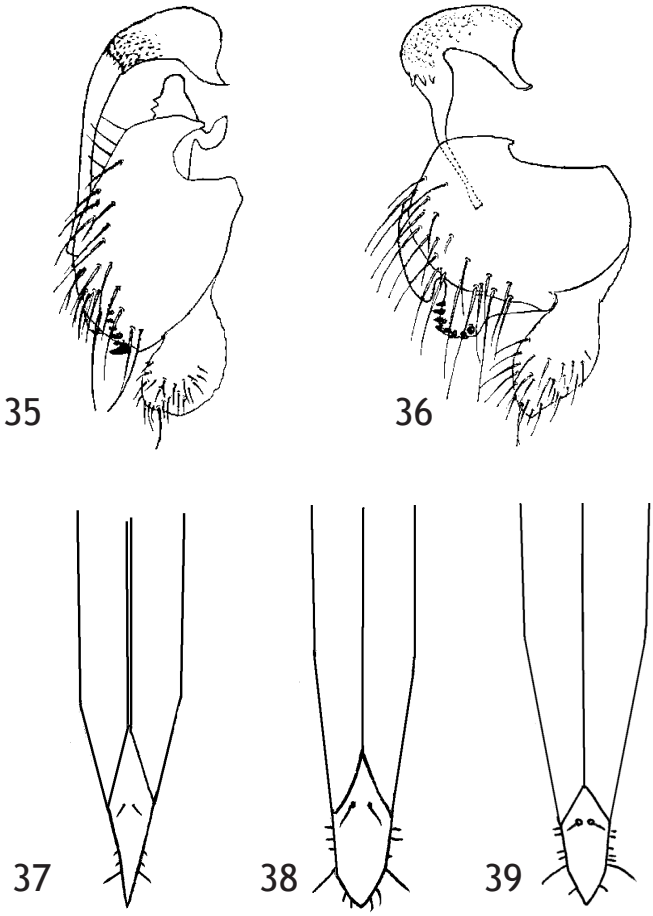
Twelve of the 13 type-specimens were collected in the Israeli part of the Rift Valley, and the 13th specimen — from the Central Coastal Plain. Although the total number of specimens is small, this distribution pattern may suggest that this species has invaded the Levant from the Afrotropical region along the Nile (and not along the Rift Valley) via the Pelusiac Branch (the petrified eastern arm of the River Nile delta (Tchernov, 1988)) to the coastal plain of Israel, from where it expanded via the Yizre'el Valley both northward, as far as the Hula, and southward, as far as Ne'ot HaKikkar.

Silba virescens Macquart

(Fig. 36, 39)

Material examined

ISRAEL: Hula, 16.x.1961, L. Fishelsohn (1♀), 1.vii.1993, A. Freidberg (2♂); Gadot, 25 km N Tiberias, 14.vi.1971, A. Kaisar (2♀), 20.vi.1971, A. Kaisar (1♀); Karmel, 26.ix.1970, J. Kugler (2♀); Kefar Rupin, 6.x.1970, A. Freidberg (2♀); Yizre'el, 31.x.1991, ex bulb *Amaryllis* (1♀); Moledet, 15.vi.2005, E. Zukerman, ex *Sorghum*, 25.vi.2005 (4♀), 3.vii.2005, E. Zukerman, ex *Sorghum*, 15.vii.2005 (6♂, 15♀), 3.vii.2005, E. Zukerman, ex *Sorghum*, pupa 10–16.vii.2005 (1♂, 3♀), viii.2005, E.



Figs. 35–36. Epandrium and associated structures, lateral view. 35. *Silba adipata* (after McAlpine, 1956). 36. *Silba virescens* (after McAlpine, 1956). Figs. 37–39. Female aculeus, dorsal view. 37. *Silba adipata.* 38. *Silba israel.* 39. *Silba virescens*.

Zukerman, ex *Sorghum* (4♂, 6♀); Nahal Tavor [N. Tabor], 10.x.1971, J. Kugler (1♂); Sede Eliyyahu, 1.ix.1986, I. Susman (1♂); Magal, 5.vi.2007, E. Zukerman, ex *Sorghum*, 15.vi.2007 (4♂, 1♀); ‘Olesh, E. Zukerman, ex *Sorghum*, 25.v.2007 (3♂, 1♀); Ma’anit, 20.vi.2007, E. Zukerman, ex *Sorghum,* 5.vii.2007 (8♂, 2♀); Ha’Ogen, 27.v.2007, E. Zukerman, ex *Sorghum*, 10.vi.2007 (3♂, 3♀); Giv’at Brenner, 14.ii.1971, J. Kugler, *Sorghum halepense* stems (1♀), 16.ii.1971, J. Kugler (1♀), 10.xi.1975, D. Gerling (1♂); Latrun, 3.x.1974, A. Freidberg (2♀); Elot [Eilot], 6.ix.1974, F. Kaplan (1♀), Yarkon Mill, 10 km east Tel Aviv, on leaves/ex tip of *Arundo donax*, 7–10.x.2008, D. Gerling (3♂, 3♀); Segula, 26.x.1973, D. Furth (1♂).

Distribution

Southern Spain, France, Italy, Greece, Morocco, Algeria, Libya, Egypt, Syria, Israel, Jordan, Saudi Arabia, Ethiopia, Oman, Gambia, Ghana, Nigeria, Democratic Republic of Congo (Zaire), Tanganyika, Malawi, South Africa, Réunion.

Comments

Silba virescens has a wide range of larval habitats. Most of the studied specimens were reared from cultivated sorghum (*Sorghum cernuum* Willd., Poaceae), although their pest status has not been determined. Other Diptera also emerged from the same stocks of plants, including at least three species of chloropids and *Atherigona soccata* Rondani (Muscidae), the latter species being a serious pest of this crop. One specimen was reared from a stem of the weed, *Sorghum halepense* (L.) Pers., and one specimen was reared from an *Amaryllis* bulb (Amaryllidaceae).

This species, although collected more profusely than *S. israel* n. sp. in both the Afrotropical and Palaearctic regions, shows the same general distribution pattern, both globally and in Israel. The same hypothesis, as detailed for *S. israel* on its expansion from the Afrotropical Region into the Levant, also applies for this species.

ZOOGEOGRAPHIC AND BIOLOGICAL COMMENTS

Israel is a small country that nevertheless, and compared to neighboring countries, features a great biodiversity, primarily due to its diverse geography and position as a biogeographical crossroads (Furth, 1975; Por, 1975). This attribute is illustrated even by relatively small groups such as the Lonchaeidae, as both Palaearctic and Afrotropical elements of this family co-occur in Israel. Most of the dozen local species are typical Palaearctic elements. Some of these are relatively widespread (e.g., *Dasiops latifrons*, which is widely West Palaearctic), whereas others have a restricted distribution, especially in Europe (*Dasiops calvus* and *D. mucronatus*) and the eastern Mediterranean (*Protearomyia* spp.). The two latter mentioned *Dasiops* species show a disjunct distribution between Europe and Israel, but this appears be the result of a collection bias, and they will probably eventually be discovered in countries between these two regions. *Setisquamalonchaea fumosa* is Holarctic. For most of the Palaearctic species Israel constitutes the southernmost range of distribution; while for *Silba israel* n. sp. (an apparently Afrotropical element, recorded here from the Democratic Republic of Congo) it constitutes the northern border of distribution. This latter species is widespread in Israel but only in the lowlands (Rift Valley and coastal plain). *Lamprolonchaea smaragdi* is even more widespread and common in Israel. It and *Silba virescens* are primarily Afrotropical species that have apparently penetrated into the Mediterranean subregion, but how much further to the north is still unclear. Finally, two of the three newly-described species, *Protearomyia hermonensis* and *Lonchaea longitarsis*, are still endemic to Israel, but as both of them were recorded from Mt. Hermon, it is very likely that they will eventually be discovered also in the neighboring countries (e.g., Syria and Lebanon).

The following larval substrates of five species were discovered during this study.

Although they augment the knowledge on the biology of the family, they do not add any dramatic innovation: decaying wood (*Lonchaea longitarsis*); fresh fruit (of *Ficus carica*) (*Silba adipata*); fresh *Sorghum* stems (*Silba virescens*); various plant materials (assumed to be decaying) (*Lamprolonchaea smaragdi, Setisquamalonchaea fumosa*). *Silba adipata* and *S. virescens* are pests of plants of economic importance. However, the pest status of the latter species is peculiar, as it infests cultivated sorghum (*Sorghum cernuum*) but also the weed, *Sorghum halepense*, and thus it is simultaneously both a pest and beneficial agent, at least potentially. Further attention should be paid to the biology of *Dasiops latifrons*, a proven cecidogenous species, and *D. mucronatus*, a suspected cecidogenous species. Galls of these species have not yet been found in Israel, but further attention may result in their discovery.

ACKNOWLEDGMENTS

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