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ACALYPTRATAE OF ISRAEL: THE FAMILY MICROPEZIDAE (DIPTERA)

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ABSTRACT

The family Micropezidae is represented in Israel by 3 species of the genus *Micropeza: annuliventris (Hendel), grallatrix* Loew and *nigra* Loew. Morphological, distributional and phenological characteristics as well as a key for the separation of the three species are given.
KEY WORDS: Diptera, Micropezidae, *Micropeza annuliventris, M. grallatrix, M. nigra,* Israel.

INTRODUCTION

Among the acalyptrates of Israel the Micropezidae are unique in having extremely long and slender legs (Fig. 1). The family is further characterized by having a complete costal vein in the wing, strong subcostal vein, which is separate from vein r_1 distinct alula (which may be very narrow), hind legs more elongate than the other pairs, ocellar bristles reduced and fronto-orbital bristles absent. The female's 7th abdominal segment forms a conical or cylindrical oviscape, and the cerci are separate, not forming a rigid aculeus. The aedeagus is rigid and elongate, borne at the end of an elongate apodeme. These characters separate the Micropezidae from all other acalyptrate families that occur in Israel, and also from closely related taxa, such as the Neriidae, Calobatidae and Taeniapteridae, which are not known to occur in Israel.

Little is known about the biology and life history of members of the Micropezidae, and Hennig (1936:214) summarized the available knowledge up to that time. Colyer & Hammond (1951:200) claimed that adult Micropezidae prey on other insects, and recorded *Trepidaria* species as preying on aphids and small midges. They also illustrated the proboscis of *T. petronella* (Linnaeus) and drew attention to its resemblance to the proboscis of some other predatory Diptera. Muller (1957) reared larvae of *Micropeza corrigiolata* (Linnaeus) from root-nodules of Leguminae. Steyskal (1964) recorded some Micropezidae (sens. lat.) as pests of ginger *(Zingiber officinale),* but Hennig (1973:51) generalized about the larvae of the Micropezoidea saying that they are saprophagous.

Up to the present, Micropezidae have not been recorded from Israel. In this paper three species of *Micropeza,* namely *M. annuliventris* (Hendel), M. *grallatrix* Loew

and *M. nigra* Loew, are being recognized from this country. Nothing is known about the immature stages of these species and their feeding habits. While *M. nigra* and *M. annuliventris* have always been swept from herbaceous plants, sometimes in habitats where no trees grow, most specimens of *M. grallatrix* were swept from oaks. Whether this observation is indicative of the developmental sites of the larvae, is a matter for speculation. I have never observed adults of the local species feeding in the field, but in view of their small and soft mouthparts, I have doubts as to whether they are capable of a predatory mode of feeding.

The three species of *Micropeza* reviewed in this paper demonstrate the unique zoogeographical position of Israel. *M. grallatrix* is a European element reaching its southernmost border of distribution in the extreme north of Israel. *M. nigra* is a West Asiatic element, occurring in Israel throughout the northern half of the Mediterranean zone. *M. annuliventris* is a North African element, occurring in Israel only in springs and oases of the desert zone (Negev and Arava) (Fig. 2).

Micropeza nigra and *M. grallatrix* were identified using Czerny's (1930) key and compared with the original descriptions. *M. annuliventris* was compared with the original description. The material upon which this study is based is deposited in the entomological collection of Tel Aviv University. To the best of my knowledge this material comprises all Micropezidae specimens hitherto collected in Israel.

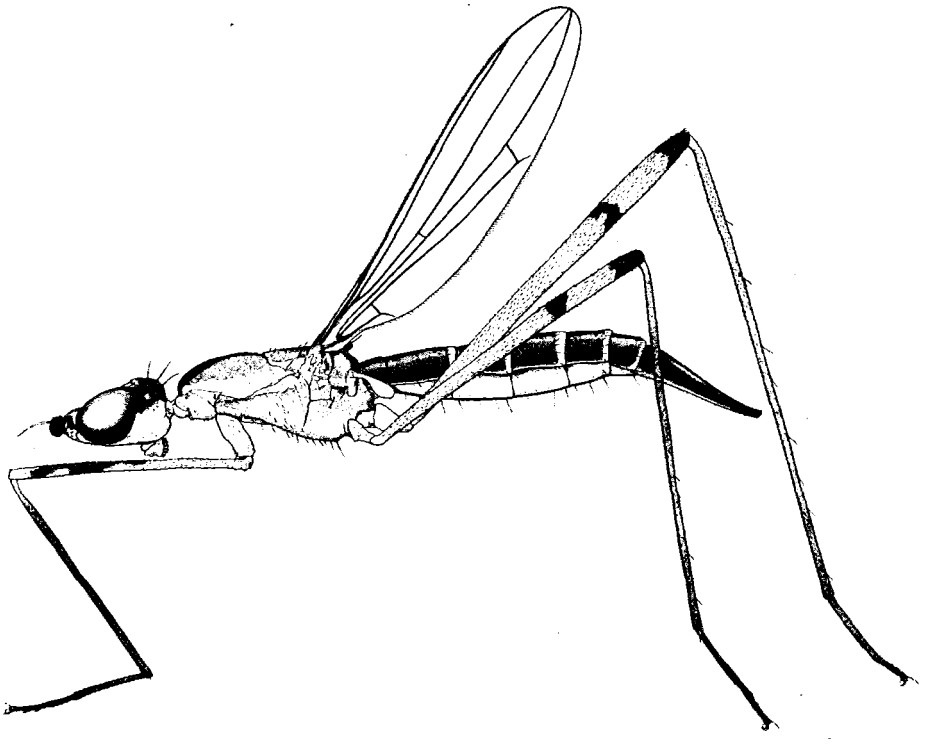


Fig. 1. Micropeza grallatrix, female habitus.

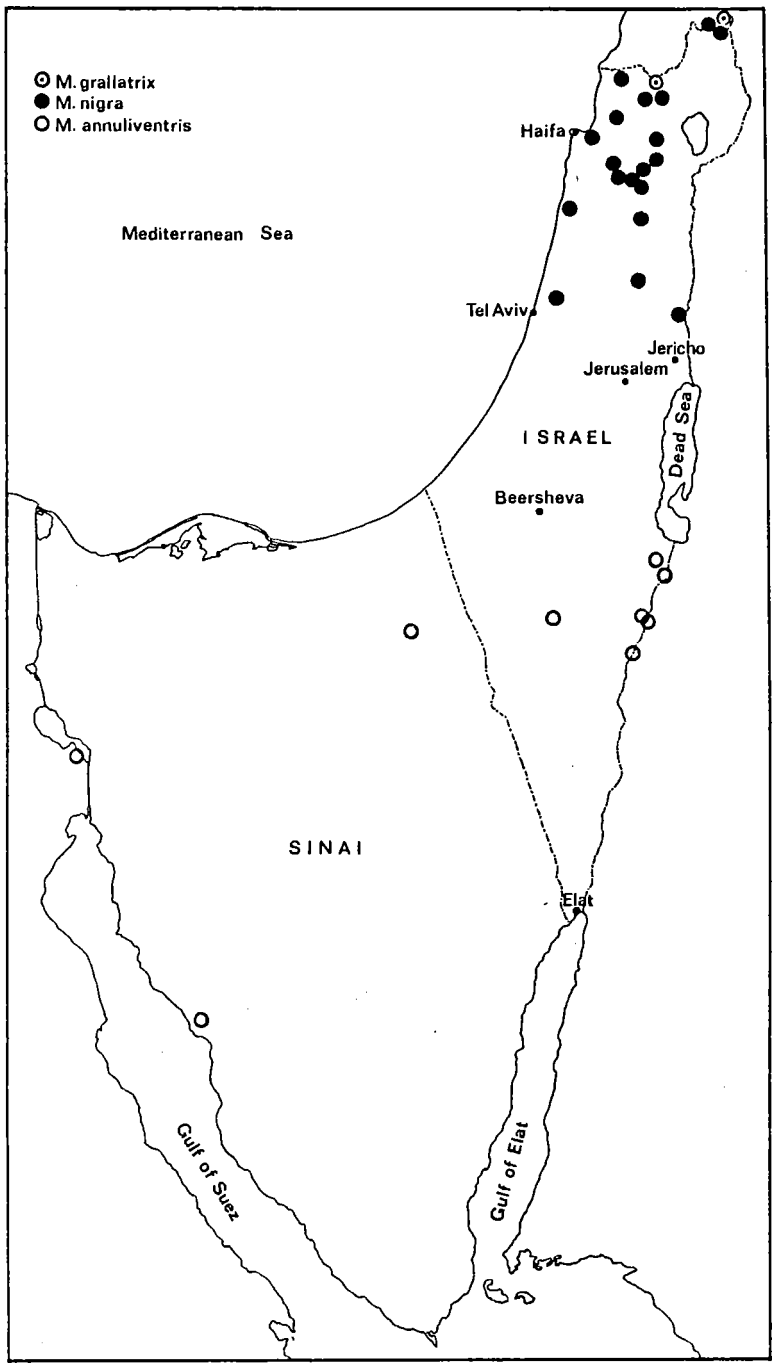


Fig. 2. Distribution of *Micropeza* species in Israel and adjacent areas.

Micropeza Meigen

Micropeza Meigen, 1803:276. Type species: *Musca corrigiolata* Linnaeus. Soós, 1975:187.
Tylos Meigen, 1800:31; Czerny, 1930:13 (*Tylus*, emend.); Hennig, 1936:137.
Synonymy in Hennig, 1936:137.

Diagnosis: Among the Palaearctic genera of Micropezidae, *Micropeza* is characterized by conical, often elongate head, large rounded eye, short antenna, with rounded flagellum and bare or almost bare arista. The thorax usually is strongly elongated. In the wing the pterostigma and bm-cu crossvein are lacking. Orbital and dorsocentral bristles lacking. According to the present study, there are 4 sclerotized spermathecae, 3 of which are similar in shape and approximated to each other. The spermathecal ducts of two of these spermathecae unite a short distance away from the spermathecae. The 4th spermatheca is a simple, cup-like structure, that does not seem to be directly associated with the other three.

According to Soós (1975), about 80 species of *Micropeza* are known from the Holarctic and Neotropic regions.

Key to the species of *Micropeza* in Israel

1. Thorax and abdomen entirely black; legs predominantly black . . *M. nigra* Loew
—. Thorax and abdomen partly yellow; legs predominantly yellow to brown 2
2. Thorax, including pleura, mainly black; antenna yellow . . . . . .*M. annuliventris* (Hendel)
—. Thorax, including pleura, mainly yellow or brown; antenna black . . . . . *M. grallatrix* Loew

Micropeza annuliventris (Hendel)

Figs. 3-8

Tylus annuliventris Hendel, 1931:61; Hennig, 1936:213 (list).
Micropeza annuliventris. Steyskal and El-Bialy, 1967:33 (list).

The description of this species (Hendel, 1931) was based on a single male from Geneifa (Egypt, see Fig. 2) and no other locality records have been available. Only a few remarks are needed to supplement this rather detailed description. The coloration of the thorax and abdomen is variable. The yellow on the thorax sometimes extends over the entire notopleural area, as well as dorsomedially, leaving a black median stripe anterior to the transverse suture, about as wide as the frons, and two isolated blackish spots laterally. The greater anterior part of the abdominal tergites is usually brownish, sometimes blackish. The inner vertical bristles are present and normal; probably broken off in the holotype. The legs (Fig. 3) are rather pale. Last section of vein m in the wing curves anteriorly rather distinctly resulting in a narrowly open cell R_5 (Fig. 4). The aedeagus is trumpet-like (Fig. 5), as in *M. grallatrix*, but unlike this species it

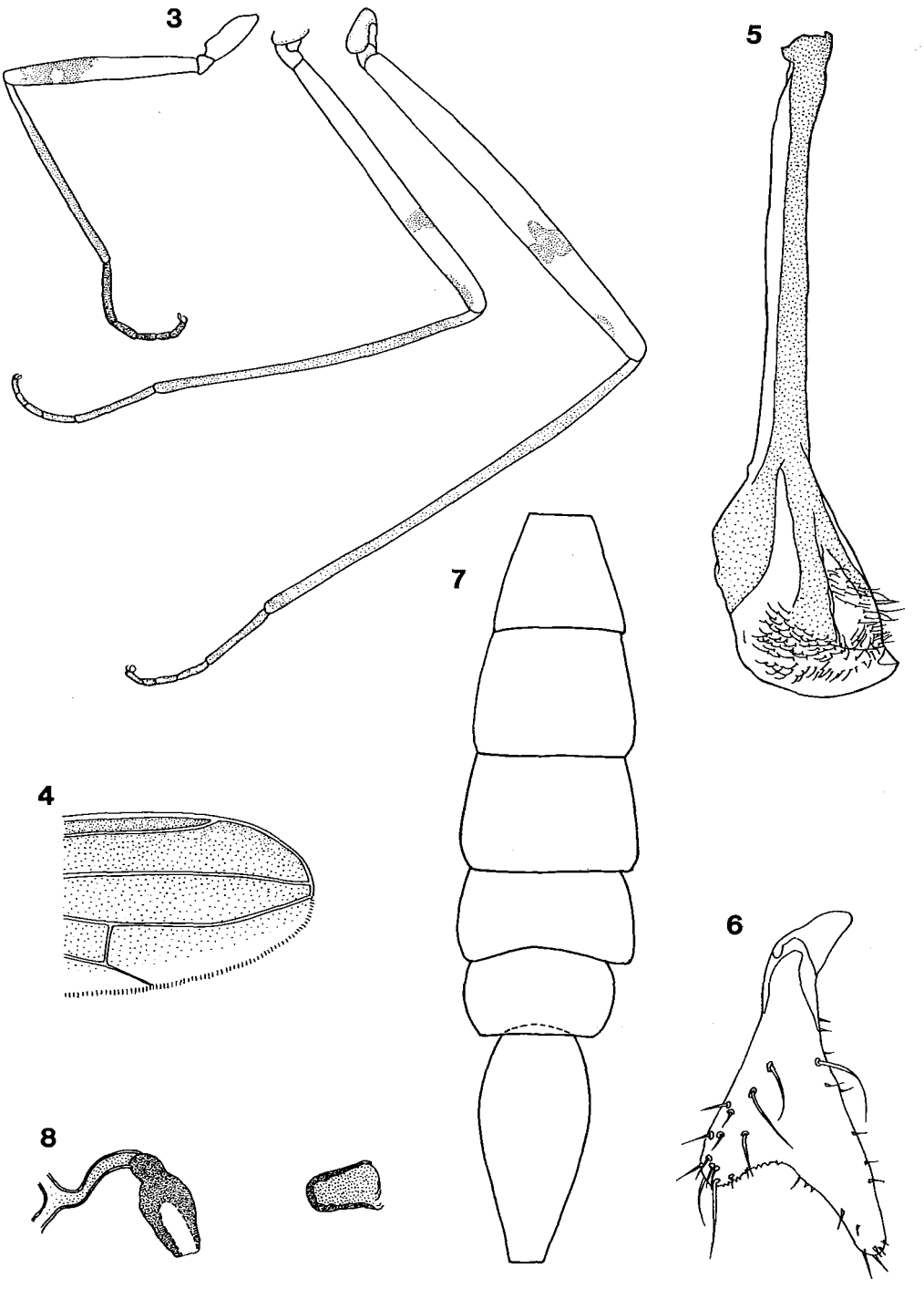


Fig. 3-8. Micropeza annuliventris. 3. Legs. 4. Wing. 5. Aedeagus, lateral view. 6. Left surstylus, posterior view. 7. Female abdomen, dorsal view. 8. Spermathecae.

bears many hairs, not teeth, near the apex. The surstylus is illustrated in Fig. 6. In the male, the lateral membrane of the abdomen, ventral of the last tergite, has a dark wrinkled area which has not been observed in the other two species. Similar structures in other Diptera have been considered as glandular tissues secreting sex attractants. The female resembles the male, except in the terminalia. The oviscape (Fig. 7) resembles the tergites in coloration; it is covered by sparse but bristly hairs, especially dorsally. The spermathecae (Fig. 8, only two illustrated) are distinctly more elongate than in the other two species. Body length of male: 5-6.5 mm, of female: 6-7 mm.

MATERIAL EXAMINED: ISRAEL. Dead Sea Area: En Arus, 5.IV.1963, Margalit (2♂♂), 11.IV.1963, Margalit (1♂); Ne'ot Hakikar, 20.IV.1966, J. Kugler (1♀), Arava Valley: Hazeva, 10.IV.1972, A. Freidberg (1♂, 1♀); En Gidron, 22.IV.1981, A. Freidberg (1♂, 1♀); En Yahav, 8.IX.1974, A. Freidberg (1♀); En Weiba, 3.V.1954, Y. Wahrman (1♀). Central Negev: En Akev, 8.VIII.1977, D. Simon (3♂♂,2♀♀). EGYPT. Central Sinai foothills: Qzaima, 1.VII.1972, A. Freidberg (1♂, 3♀♀). Southwestern Sinai: Wadi Teiba, 12.IV.1973, A. Freidberg and M. Kaplan (3♂♂).

ECOLOGICAL OBSERVATIONS: Most specimens were swept from low and grassy vegetation at small springs and marshes in the desert from spring to fall (April-September).

Micropeza grallatrix Loew

Figs. 1, 9-12

Micropeza grallatrix Loew, 1868:393; Becker, 1905:158 (catalog).
Tylos grallatrix. Czerny, 1930:16 (redescription, in *Tylus*); Hennig, 1936,140 (key) and 213 (list).

This species was described from Southern Europe (Loew, 1868) and later recorded from Italy, Spain and Southern Germany (Hennig, 1936). It is the largest and most elongate species of the local fauna, males ranging between 5.5-6.5 mm in length and females ranging between 7 and 9 mm, including the oviscape. It is easily recognizable by the key characters and by the scutal pattern which is comprised of a black median stripe, a brown area immediately lateral to it and a yellow notopleural area further laterally (Fig. 1). The median stripe is about as wide as the frons and usually widens behind the transverse suture. The brown stripe is pointed anteriorly and does not reach the anterior margin of the scutum. The yellow stripe extends from the humerus to the base of the halter. Cell R_5 in the wing is almost closed.

The aedeagus is trumpet-like (Fig. 9), as in *M. annuliventris,* but bears apical teeth, not hairs. The surstylus is illustrated in Fig. 10. The female's abdomen and spermathecae (two of four) are illustrated in Figs. 11 and 12, respectively. The latter are short and rounded, as in *M. nigra,* but unlike this species the 3 approximated spermathecae (two of four) are illustrated in Figs. 11 and 12, respectively. The latter are short and rounded, as in *M. nigra,* but unlike this species, each of the 3 approximated spermathecae contains an additional, apical, cup-like structure.

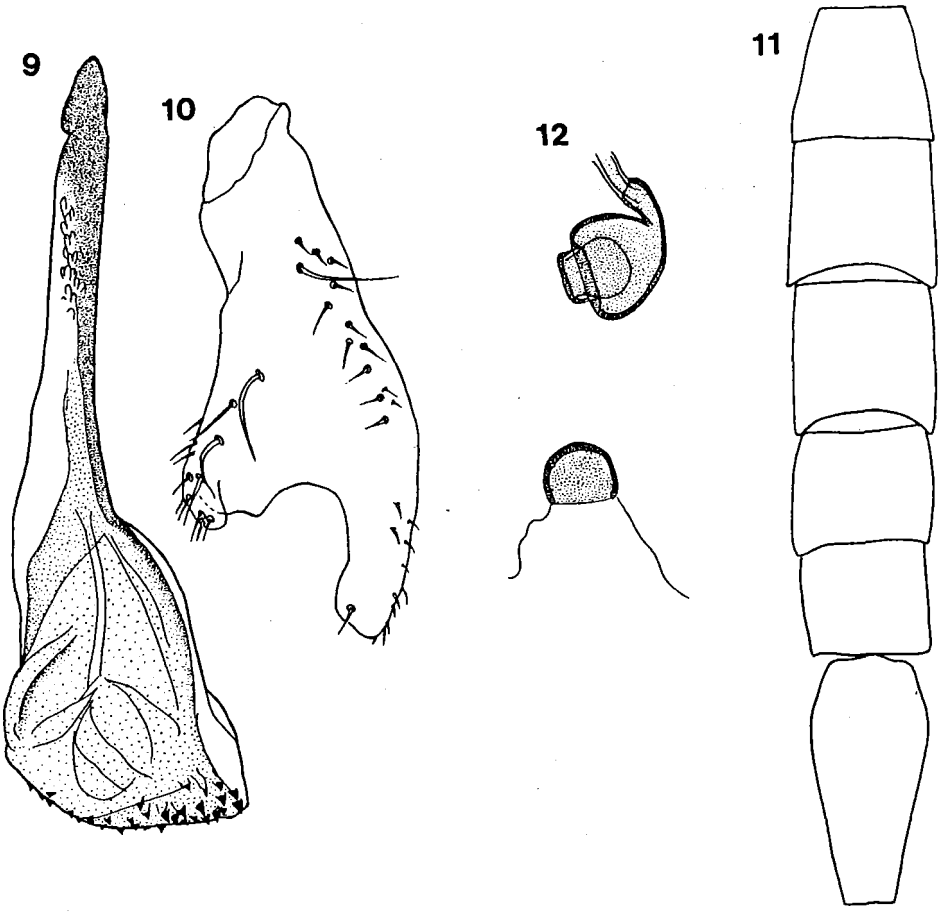


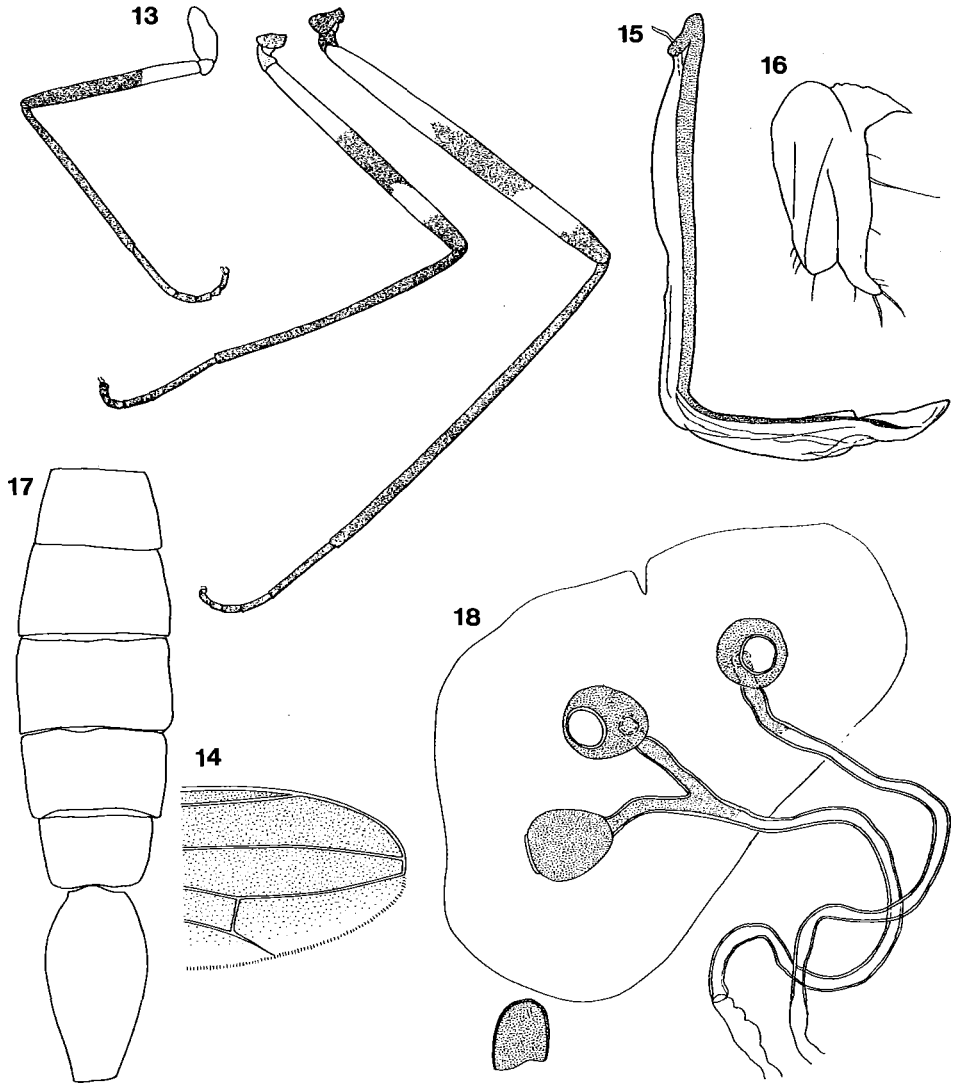
Fig. 9-12. Micropeza grallatrix. 9. Aedeagus, lateral view. 10. Left surstylus, posterior view. 11. Female abdomen, dorsal view. 12. Spermathecae.

MATERIAL EXAMINED: Mt. Hermon, 1800 m, 3.IX.1981 (1♂), 1600 m, 5.IX.1981 (1♀), 7.IX.1981 (1♂), 9.IX.1981 (1♀, malaise trap), A. Freidberg. Majdel Chams, 14.X.1982, A. Freidberg and F. Kaplan (2♂♂, 2♀♀). Upper Galilee: Mt. Meiron (1000-1200 m), 18.IX.1976 (1♂), 30.IX.1982 (3♂♂), A. Freidberg, 27.X.1977 (1♂), D. Furth.

ECOLOGICAL OBSERVATIONS: This species has a very restricted distribution in Israel and is recorded here only from the far north of the country. In this region it occurs sympatrically with *M. nigra.* However, all the specimens were collected in fall (September-October), while *M. nigra* is as typical vernal species. Furthermore, the specimens of *M. nigra* were swept from herbaceous plants, while most specimens of *M. grallatrix* were swept from oaks. Only the specimens from Majdel Chams were collected at a spring below the village, sweeping *Juncus* and *Mentha.*

Micropeza nigra Loew
Figs. 13-18

Micropeza nigra Loew, 1874:418; Becker, 1905:158 (catalog); Soós, 1977:137 (record from Afghanistan).
Micropeza diversipes Villeneuve, 1913:15 (record from Syria).
Tylos niger. Czerny, 1930:16 (redescription in *Tylus,* emend.); Hennig, 1936:140 (key to species) and 213 (list).



Figs. 13-18. Micropeza nigra. 13. Legs. 14. Wing. 15. Aedeagus, lateral view. 16. Left surstylus, posterior view. 17. Female abdomen, dorsal view. 18. Spermathecae.

This species was described from Iran (Loew, 1874) and later recorded from Syria (Damascus) (Villeneuve, 1913) and Afghanistan (Soós, 1977). in Israel it occurs abundantly in the northern half of the Mediterranean zone, as far south as the latitude of Tel Aviv, but is expected to occur further south. It is the only local species that has been collected in large numbers (e.g. 65 specimens near Afula, Valley of Yizre'el, on 19.IV.1976). It is easily distinguishable from the other two local congeners by its darker coloration (see key and Fig. 13 of the legs), as well as by other characters shown in the illustrations. Cell R_5 in the wing is relatively broadly open (Fig. 14). The aedeagus is flattened dorsoventrally and the apical 2/5 is directed posteriorly, forming a right angle with the basal part (Fig. 15). The surstylus is thick (Fig. 16), not rather flattened as in the other two species. The abdominal tergites and oviscape of the female (Fig. 17) are the shortest and widest among the three species. The spermathecae are short, rounded and simple, having a narrow ring-like structure apically (Fig. 18). Body length of male: 5-6 mm, of female: 6-7 mm.

MATERIAL EXAMINED: One hundred and thirty five specimens collected in all northern regions, as South as Central Coastal Plain, Samaria and Lower Jordan Valley (Fig. 2), mostly throughout March and April, but on Mt. Hermon (1000 m and 2000 m) also at the end of May. These specimens were collected by A. Freidberg, T. Furman, D. Furth, D. Gerling, F. Kaplan, M. Kaplan, D. Simon and I. Yarom.

ECOLOGICAL OBSERVATIONS: This is a typical vernal species, probably univoltine. Adults occur on young, mixed, spring vegetation, often along roadsides.

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