

ON SOME PSYCHODIDAE (DIPTERA) FROM ISRAEL

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ABSTRACT

The following Psychodidae Psychodinae are reported from Israel: *Tinearia alternata* (Say), *Tinearia alternicula* (Quate), *Psychoda cinerea* Banks, *Psychoda phalaenoides* Linnaeus, *Clogmia albipunctata* (Williston), *Paramormia ustulata* (Walker), *Telmatoscopus sarai* (Salamanna), and *Atrichobrunettia* sp.. *Panimerus freidbergi* n.sp., and *Pericoma kugleri* n.sp. are described and figured. *Tinearia alternicula* (Quate) is for the first time recorded outside the Nearctic region. It has possibly been introduced into Israel with fowling organic matter, which is the preferred larval habitat.

KEY WORDS: Psychodidae, Psychodinae, Israel, new species, new records.

INTRODUCTION

The dipteran family Psychodidae or "moth-flies" is divided into five subfamilies: Phlebotominae (females blood-sucking on mammals and birds, vectors of some diseases like papatasi fever); Bruchomyiinae; Sycoracinae (females blood-sucking on reptiles and amphibians); Trichomyiinae (larvae woodboring) and Psychodinae.

Keys for most of these subfamilies, usable also for Israel, have been provided by Jung & Theodor (1958) for Bruchomyiinae, Jung (1958) and Wagner (1982) for Trichomyiinae (including Sycoracinae) and Theodor (1958) for Phlebotominae. During the last decade Vaillant (1971-1983) has summarised our knowledge on Psychodinae from the Palearctic region, and his work will shortly be finished.

The present paper deals only with Psychodinae. The adults are small insects with a maximal size of 5 mm. Body and wings are thickly covered with long flattened hairs of various colours. The pattern of this vestiture is characteristic of genera or even species groups. Many species have developed secondary sex organs, some of which produce pheromones in the males. This subfamily has been divided into three tribes: Pericomini, Telmatoscopini and Psychodini.

Larvae of Psychodinae can easily be distinguished from other larvae of Diptera by the secondary division of body segments into "annuli". Thoracic segments and 1st abdominal segment each are divided into 2; 2nd to 7th abdominal segments into 3 annuli. Each annulus has 1 or more tergal plates, covered with setae and hairs. Their

size, shape and number are good features for specific recognition. The distal part of the body surrounding the posterior pair of spiracles, called "shiph", is in many cases a good feature to separate single genera. Vaillant (1971-1983) has also provided a key for larvae of Psychodinae.

Larvae are amphipneustic, and may be found in the hygropetric zone of springs and brooks. Throughout their life they need moisture and atmospheric oxygen. Larvae of Pericomini and Telmatoscopini may be numerous in clear and clean waters, whereas those of Psychodini have been used as indicators for sewage contaminated water (Wagner, 1978; Mastler & Wagner, 1984).

Psychodidae from the Palestine area have first been mentioned by Bodenheimer (1937), who listed 10 species of Phlebotominae and 6 species of Psychodinae. The records of *Psychoda alternata* Say (today in the genus *Tinearia* Schellenberg), *Psychoda phalaenoides* Linnaeus and *Telmatoscopus meridionalis* Eaton (= *Clogmia albipunctata* Williston) are confirmed in the present study, but those of *P. humeralis* (Meigen), *P. fusca* (Meigen) and *P. ocellaris* (Meigen) remain doubtful, as some new species belonging to the latter genus have recently been described. Two additional species have lately been recorded from the Middle East region, south of Turkey: *Pericoma becharreense* Wagner (1980), and *Bazarella jungi* (Wagner, in press). Based on larvae examined during the present study, more species are expected to be discovered in Israel.

I am grateful to all collectors of specimens and especially to Dr. A. Freidberg of Tel Aviv University, who made the collection available to me. All material is lodged at the entomological collection, Department of Zoology, Tel Aviv University.

SPECIES RECORDS

TRIBE PSYCHODINI

Tinearia alternata (Say, 1824)

(Fig. 1a)

Psychoda alternata Say, 1824:358

MATERIAL EXAMINED: 1 larva, without locality, 10.VIII.1963; Jerusalem 20.XI.1951, Grate (2♀); Jerusalem, Talbiah, 22.VII.1951, Grate (1♀); Tel Aviv, 12.V.1971, Kugler (1♀); Natanya 16.XII.1981 ex. *Arisarum vulgare* inflorescence, Koach (1♀); Yarkona, 2.III.1982, sewage, Koach (4♀); Tel Aviv 12.III.1981, *Arum hygrophilum* inflorescence, Koach (1♀); Beit Shemesh, 6.IV.1982, *Arum palestinum* inflorescence, Koach (♀); Qiryat Bialik, 30.III.1980, *Arum hygrophilum* inflorescence, Koach (6♂, 7♀); Yarkona, 2.III.1981, sewage, Koach (4♂); Tel Aviv, 29.VII.1982, Zoological garden, Koach (1♀); Tel Aviv, 15.VII.1982, UV trap, Koach, (1♀); Mt. Hermon, 2100 m, 2.-4.VI.1982 UV and CO₂ traps, Koach (2♀); Latrun 30.IX.1974, Freidberg, (numerous ♂♂ and ♀♀); Qiryat —, without date and collector, (numerous larvae and pupae).

Tinearia alternata is a cosmopolitan species. Its larvae are found in all kinds of decaying organic matter, and in sewage fields, where they feed on fungi and bacteria.

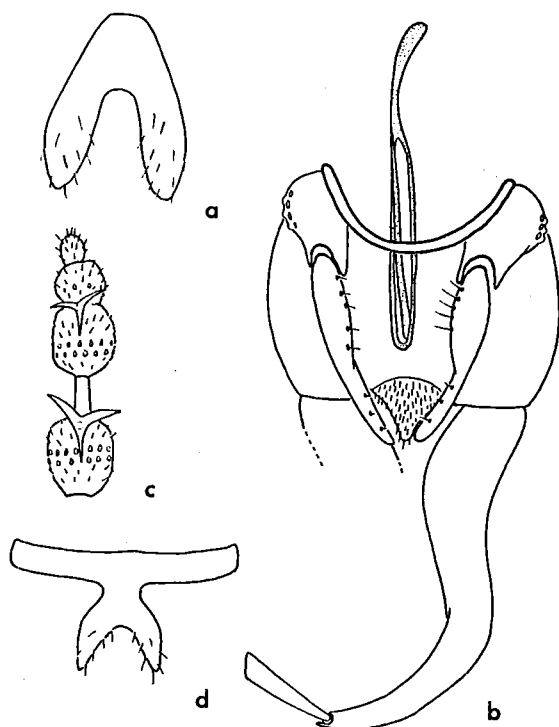


Fig. 1. *Tinearia alternata* (Sav). a. ♀, subgenital plate, ventral view. *Tinearia alternicula* (Quate). b. ♂, genitalia, ventral view; c. ♂, tip of antenna; d. ♀, subgenital plate, ventral view.

Tinearia alternicula (Quate, 1955)

(Fig. 1b-d)

Psychoda alternicula Quate, 1955: 222

MATERIAL EXAMINED: Tel Aviv, Zoological Garden, 29.VII.1982 in UV traps, Koach (4♂♂, 14♀♀); Tel Aviv, 15.VII.1982, UV trap, Koach (11♂♂, 20♀♀); Latrun, 30.IX.1974, Freidberg (numerous ♂♂ and ♀♀).

Tinearia alternicula was previously known only from the Nearctic Region. Possibly, this species has been introduced into Israel as larvae which live in all kinds of fowling organic matter. It can easily be separated from *Tinearia alternata* (Say) by the shape of male and female genitalia (Figs. 1b-d, and compare with Fig. 1a), and mainly by size, *Tinearia alternicula* Quate being much smaller than its relative.

Psychoda cinerea Banks (1894)

Psychoda cinerea Banks, 1894:331

MATERIAL EXAMINED: Yarkona, 24.II.1981, sewage, Koach (4♂♂); Tel Aviv, without date, Koach, (5♀♀); Giv'at Koach, 6.IV.1980, *Arum palestinum* inflorescence, Koach, (1♀); Yarkona, 3.III.1981, sewage, Koach, (5♀♀); Carmel, 20.IV.1980, *Arum dioscoridis* inflorescence, Koach (1♂); Qiryat Bialik, 1.III.1980, *Arum hygrophilum* inflorescence, Koach (5♂♂); Tel Aviv, Zoological Garden, 29.VII.1982, Koach (1♀).

Psychoda cinerea Banks is a cosmopolitan species. Like in other *Psychoda* species the larval habitat is fowling and decaying organic matter. The adults can be found in the vicinity of the larval habitat.

Psychoda phalaenoides (Linnaeus, 1758)

Tipula phalaenoides Linnaeus, 1758:588

MATERIAL EXAMINED: Tel Aviv, 18.IV.1982, *Arum italicum* inflorescence, Koach, (6♀♀); Jerusalem, Beth Hakerem, 22.III.1948, Theodor (1♀); Jerusalem, 4.IV.1950, collector not stated (1♀).

Psychoda phalaenoides Linnaeus is a cosmopolitan species. The larvae live in decaying organic matter, but seem to prefer cow and horse dung. Adults are very often found in great numbers in inflorescence of *Arum* species. In Central Europe, the flight activity of *Psychoda* species is closely linked with the opening time of inflorescences of *Arum maculatum* (Remmert, 1969).

TRIBE TELMATOSCPINI

Clogmia albipunctata (Williston, 1893)

Psychoda albipunctata (Williston, 1893:113).

MATERIAL EXAMINED: Tantara, 16.VIII.1954, Theodor, (1♀); Jerusalem Hebrew University, 27.V.1955, Wahrmann (1♀); Tel Aviv, Abu Kabir, 17.VII.1957, Kugler (1♀); 25.XI.1962, Kugler (1♂, 2♀); 15.VII.1975, Kaplan (1♀); 10.X.1977, Kaplan (1♀); 11.X.1977, Kaplan (1♀); 23.XI.1948, Bytinski-Salz (1♀); 20.VIII.1959, Kugler (1♂); 10.VI.1965, Kugler (1♂); 24.VI.1963, collector not stated (1♂); 15.VII.1982, UV trap, Koach (1♂, 5♀♀); Zoological Garden, 29.VII.1982, UV trap, Koach 91♀); 29.VIII.1968, collector not stated (16♂♂, 21♀♀); Qiryat Bialik, 30.VII.1980, indoor, Koach (1♀); Yarkona, 3.XII.1980, sewage, Koach (5♂♂); Yarkona, 15.XII.1980, sewage, Koach (2♂♂); Tel Aviv, 4.X.1979, collector not stated (15 larvae).

Clogmia albipunctata (Williston) is distributed in tropical and subtropical regions around the globe. Its larvae prefer habitats similar to those of *Psychoda* and *Tinearia* species. It is one of the most euryecious Psychodidae.

Paramormia ustulata (Walker, 1856)

Pericoma ustulata Walker, 1856:263

MATERIAL EXAMINED: Tel Aviv, 12.V.1971, Kugler (1♀); Ekron, 6.XI.1975, Kaplan (1♀).

Paramormia ustulata (Walker) is known from the western parts of the Palearctic Region. The larvae are very euryecious, but prefer psammic regions near the banks of streams and rivers.

Telmatoscopus sarai (Salamanna, 1975)

(Fig. 2a-d)

Panimerus sarai Salamanna, 1975:197

MATERIAL EXAMINED: Tel Aviv, 11.III.1981, in *Arum hygrophilum* inflorescence, Koach (1♂).

Telmatoscopus sarai (Salamanna) was previously known only from Italy (Puglia and Basilicata). The specimen from Israel is very similar to those from Italy, which could be compared by courtesy of Dr. Salamanna (Genova). The only difference found is in the number of tenacula, which is 7 in the Israeli specimen but may be up to 10 in specimens from Italy. Wings (Fig. 2c) have black dots at the distal ends of all radial and medial veins, at forks R_{2+3} , M_1 , M_2 and M_3 , just behind the medial fork, and immediately before the distal end of cubitus. Also, the distal end of subcosta and the proximal end of R_5 are darkened and swollen. The Italian specimens have these wing dots less clearly expressed than the Israeli specimen. The male's antenna and genitalia are illustrated in Fig. 2a, b, d.

Panimerus freidbergi n.sp.

(Fig. 3a-b)

Male:

Description: Eyes with 4 facet rows, distance between the eyes equal to 3.5 facet diameters. Head with a pair of elongate cornicula. Antenna 16 (?) segmented, distal segments missing. Scape elongate, about 4 times longer than wide. Pedicel triangular with a short outer prolongation, the side covered with numerous short bristles. All flagellar segments flask shaped. Segment 4 and each of the following with a pair of long simple ascoids. Relative lengths of palpus segments: 28 – 35 – 43 – 45.

Wing: Length: 2.6 mm. Medial angle 180° . Apical angle 58° . Genitalia (Fig. 3a-b) with a rectangular 9th tergite with rounded edges. Cercopodia slightly bent, with 9-10 distally fringed tenacula. Subgenital valve conical. Ventral bridge equally wide over its whole length. Basistyles cubic with rounded sides. Dististyles nearly twice as long as basistyles, S-shaped with tips bent medially. Aedeagus as usual in *Panimerus*, with a bipartite V-shaped aedeagal apodeme, distally linked with a pair of sickle shaped appendages of the "komplexe Bildungen" (sensu Vaillant, 1972). The inner edges of the "komplexe Bildungen" are parallel and without any teeth.

MATERIAL EXAMINED: Holotype ♂, Israel, Wadi Kabala, Judean Hills, Palestine, 9.V.1949, Theodor (Tel Aviv University).

Panimerus freidbergi n.sp. is a member of the *P. notabilis* – group. Its closest relatives seem to be *Panimerus albifacies* (Tonnoir) from NW and Central Europe, and *Panimerus kreki* Vaillant from the Alps and the Balkan area. It is distinguished from both species by the lower medial angle of the wing, and by the shape of the "komplexe Bildungen" of the genitalia. The inner sides of these "komplexe Bildungen" are not parallel and have small teeth in *P. kreki* and *P. albifacies*.

TRIBE PERICOMINI

Pericoma (Leptopericoma) kugleri n. sp.

(Fig. 3c-d)

Male

Description: Eyes with 4 rows of facets, distance between the eyes equal to 4

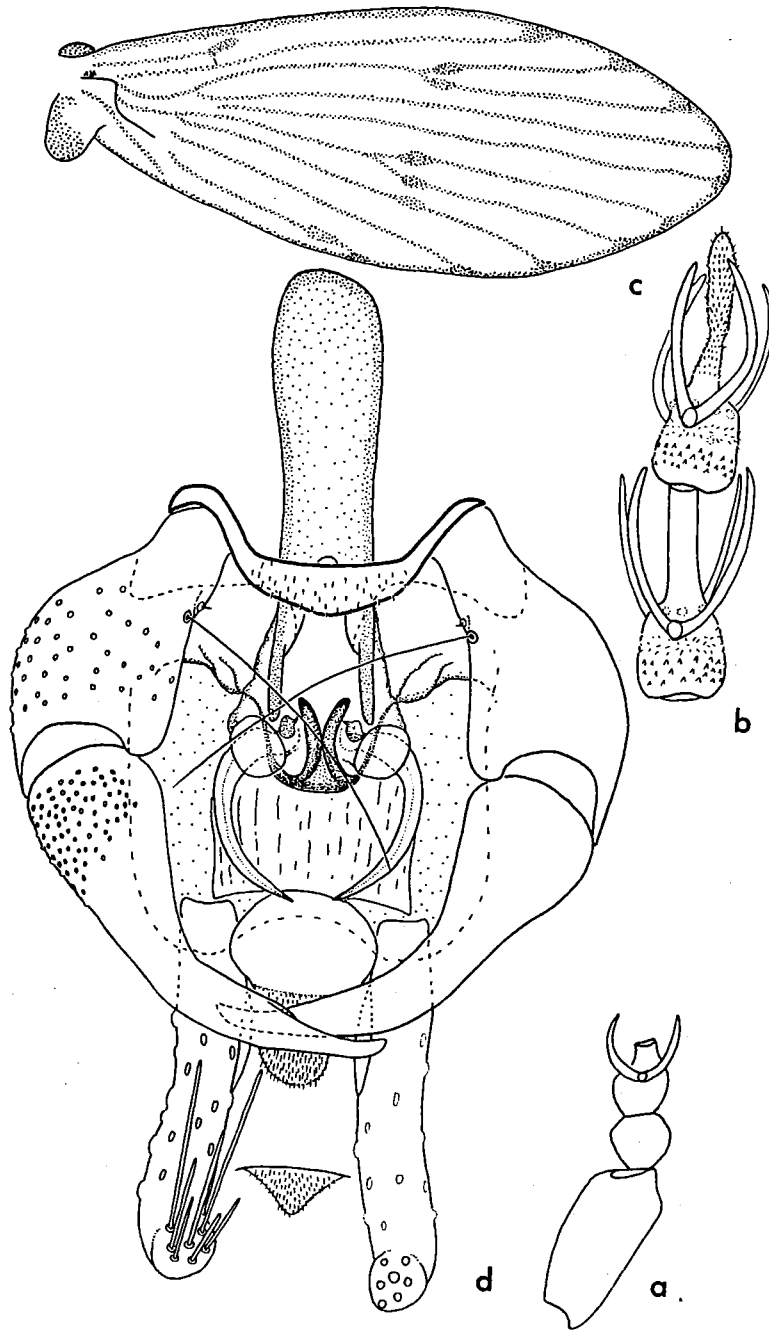


Fig. 2. *Telmatoscopus sarai* (Salamanna). a. ♂, scape, pedicel, and 1st flagellar segment; b. ♂, tip of antenna; c. ♂, wing; d. ♂, genitalia, ventral view.

facet diameters. Scape cylindrical, 1.5 times longer than wide, pedicel elongate spheric, as long as scape. Flagellar segments cylindrical, distal segments 9-16 missing. Relative

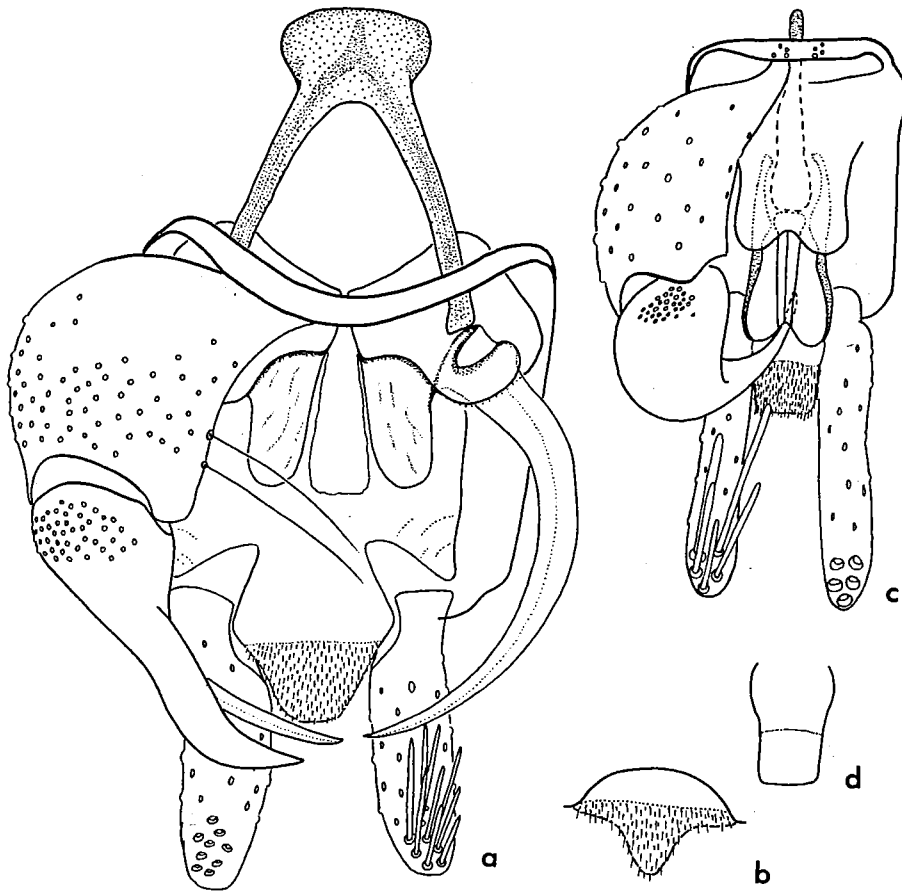


Fig. 3. *Panimerus freidbergi* n. sp. a. ♂, genitalia, ventral view; b. ♂, anal valve. *Pericoma kugleri* n.sp. c. ♂, genitalia, ventral view; d. ♂, subgenital valve.

length of palpus segments: 18-25-30-37. Thorax not distinctive.

Wing: Length 2.2 mm. Medial angle 148° . Apical angle: 107° . Genitalia (Fig. 3c) with a rectangular 9th tergite with rounded edges. Cercopodia elongate cylindrical, slightly bent, distally with 5 simple tenacula. Subgenital valve (Fig. 3d) distally comparatively wide, with two edges. Ventral bridge wide, in its central part with insertion points of 8 setae. Basistyles bent, twice as wide as long, dististyles basally subspherical with tip strongly bent mediodorsad. Subgenital plate with a distal semicircular incision. Aedeagus also with a distal semicircular incision, plate-like and comparatively wide.

The new species is a member of the subgenus *Leptopericoma* Vaillant 1978, and a member of the *P. trifasciata*-group, whose dististyles are basally globular and the tips are immediately and strongly curved mediad. Concerning the shape of the genitalia, most probably *Pericoma bosniaca* Krek, 1967 from Yugoslavia, and *P. maroccana* Vaillant, 1955 from North Africa are the closest relatives. But the shape of the aedeagus readily distinguishes *P. kugleri* from these species. Another very distinctive

feature of the new species is the very small medial angle of the wing, which is about 160° in the above mentioned species.

MATERIAL EXAMINED: Holotype ♂, Israel, Dan. 26.VI.1967, Kugler (Tel Aviv University).

Pericoma spec.

MATERIAL EXAMINED: Upper Nahal Amud, 17.XI.1981, Kaplan (1♀); Dan, 26.VI.1967, Kugler (1♀).

Females of *Pericoma* species are presently indistinguishable. Possibly, the specimen from Dan represents the female of *Pericoma kugleri* n.sp., with which it has been taken.

LARVAE

A large quantity of larvae has been collected during the Inland Water Ecological Service Program of the Hebrew University, indicating that there are additional species and genera in Israel. There are at least two undescribed species of the genus *Berdeniella* Vaillant, and representatives of the genera *Clytocerus* Eaton, *Mormia* Enderlein, *Satchelliella* Vaillant, and *Peripsychoda* Enderlein.

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