

**NEW SPECIES OF *TIPULA*, SUBGENUS *LUNATIPULA*,
FROM ISRAEL AND TURKEY (DIPTERA: TIPULIDAE)**

PIOTR OOSTERBROEK

*Institute for Systematics and Population Biology, Department of Entomology,
Plantage Middenlaan 64, 1018 DH Amsterdam, The Netherlands*

ABSTRACT

Six new species of *Tipula*, subgenus *Lunatipula*, are described from Israel and Turkey. The new species from Israel are *detruncata*, *fini*, *substernalis* and *meronensis*. The first two species are members of the *angelica* complex. *T. (L.) substernalis* is the sister species of *sternalis*. *T. (L.) meronensis* belong to the *Icybele* complex. Within this complex two new species from Turkey are described: *cirratula* and *turgida*. An annotated summary is presented for the Tipulidae species which are extending from the Turkish province Hatay in the north to Israel in the south.

KEY WORDS: Tipulidae, *Lunatipula*, new species, Israel, Turkey.

INTRODUCTION

Through the kind cooperation of Dr. Amnon Freidberg of the Tel Aviv University, unidentified Tipulidae specimens from Israel could be studied. This material included four species of *Tipula*, subgenus *Lunatipula*, new to science: *detruncata*, *fini*, *substernalis* and *meronensis*.

T. (L.) detruncata and *fini* belong to the *angelica* complex, all species of which are discussed below. The new species *substernalis* and *meronensis* are members of the *livida* group. The first is the sister species of *sternalis* Theischinger, 1977, from the Van region in eastern Turkey. The second belongs to the *kybele* complex. All species of this complex are discussed, including the description of two additional new species from Turkey: *cirratula* and *turgida*.

The descriptions given below mainly deal with the characters of the copulatory organs because the new species differ from their close relatives merely in the characters of these organs. The terminology follows De Jong (1993, 1994a, b).

An annotated summary of the species known from the region of the Turkish province Hatay in the north to Israel in the south, is given at the end of the paper.

Material examined refers to specimens preserved dry, unless otherwise stated. Types and other material studied originated from the following museums: Natural History Museum, London (NHML), Naturhistorisches Museum, Wien (NMW), Oberosterreichisches Landesmuseum, Linz (OOL), National Collection of Insects, Department of Zoology, Tel Aviv University (TAU), Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn (ZFMK), Zoologisch Museum, Amsterdam (ZMA) and Zoologische Staatssammlung, Munchen (ZSM).

***Tipula (Lunatipula) angelica* complex**

The *angelica* complex includes a group of six closely related species within the *acuminata* group of the subgenus *Lunatipula*. The members of this complex are *angelica* Theowald, 1957; *angela* Mannheims, 1963; *berytia* Mannheims, 1963; *leeuweni* Theischinger, 1982; and the two species, *detruncata* and *fini*, described here as new to science. All six species are endemic to Syria, Lebanon and/or Israel. Study of type material revealed that *kaplani* Theowald and Oosterbroek, 1987 is a junior synonym of *angela* Mannheims, 1963. Furthermore, material mentioned in Theowald and Oosterbroek (1987) under the name *leeuweni* turned out to belong to *berytia*.

***Tipula (Lunatipula) angela* Mannheims, 1963**
(Figs. 1, 8)

Tipula (Lunatipula) kaplani Theowald and Oosterbroek, 1987, **n. syn.**

DESCRIPTION: **Male.** Lateral extension of tergite 9 (Fig. 1) bluntly rounded with distinct excavations basally at the mesal side. Sclerotized elevations at the posterior inner margin of the excavations small. Tergite 9 with an elongate cleft. Outer gonostylus apically broadened. Posterior part of inner gonostylus very elongate, as in *detruncata* (Fig. 13) and *fini*.

Female (from a female with the same labels as the holotype). Wing large, about as long as abdomen. Hypogynial valve (Fig. 8) elongate, almost reaching tip of cercus; part of hypogynial valve which is lying inside sternite 8 strongly arched and very broad cranially. Sternite 8 abbreviated, not narrowly continued at lateral side of hypogynial valve.

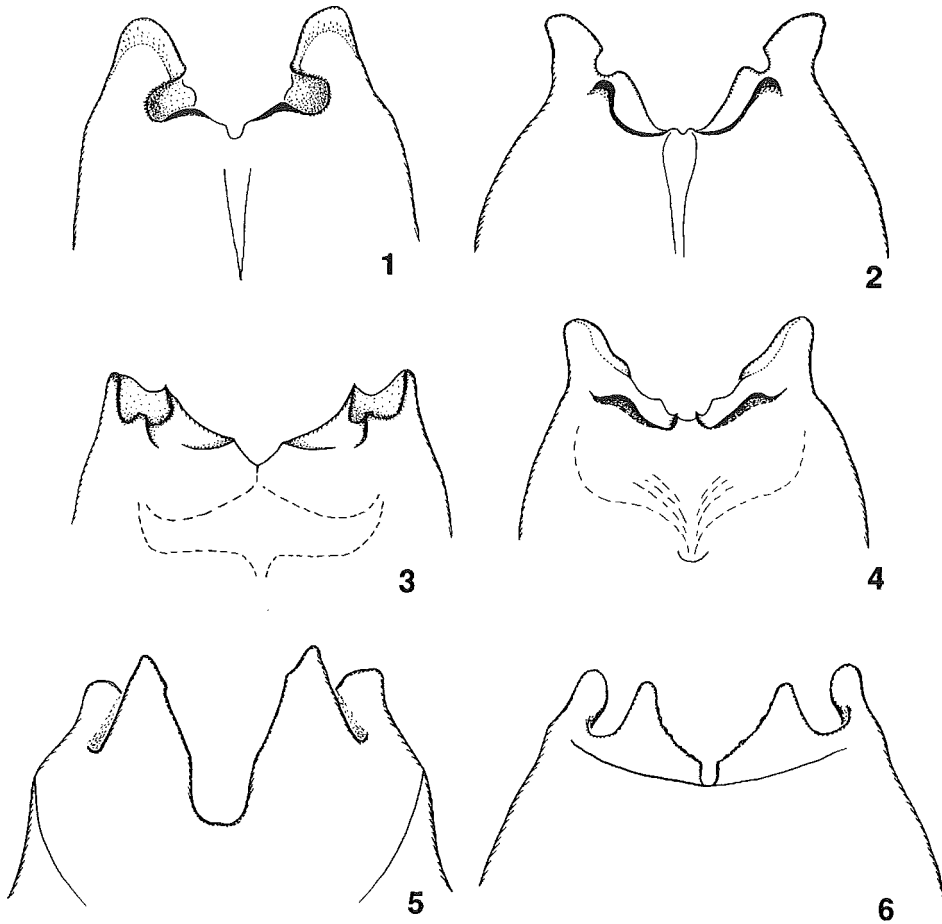
DISTRIBUTION: Known from Becharré in Lebanon and various localities in Israel (see below).

SYNONYMY: Re-examination of type material showed that the species *kaplani*, described by Theowald and Oosterbroek (1987: Figs. 3a, d, g) as closely related to *angela*, is in fact identical with *angela*. The species named "*angela* Mannheims" in Theowald and Oosterbroek (1987: Figs. 3b, e, h) represents a different species, described here as *fini*.

MATERIAL EXAMINED: Holotype ♂, LEBANON: Nord-Libanon, Becharré, 1400 m, 8–10.vi.1931, Zerny (NMW) (the second type specimen of *angela*, a paratype male from Place of Sacrifice, Karmel, belongs to *fini*). Holotype ♂ of *kaplani*, ISRAEL: Hagosherim, 27.v.1980 (TAU). Paratypes of *kaplani*, ISRAEL: Har [Mt.] Meron (1♂, TAU); Peqi'in (1♂, TAU); Mezudat Nimrod [Qal'at Nimrud] (1♂, TAU); Har [Mt.] Hermon (2♂ TAU, 1♂ ZMA; among these males there is one from "Israel, Mt. Hermon, 1500 m, 25.v.1977, A. Freidberg", whereas the original description mentions a female paratype labeled as such). In addition, specimens were examined from the following localities in Israel: Ein el Asad, Hagosherim, Har [Mt.] Hermon, Har [Mt.] Meron, Nuhallal, Peqi'in, Qal'at Nimrud, Rihaniya, Zomet Koah, Golan: Yehudiyya, Qusbiya.

***Tipula (Lunatipula) angelica* Theowald, 1957**
(Figs. 2, 7, 10)

DESCRIPTION: **Male.** Lateral extension of tergite 9 (Fig. 2) with small excavations at the mesal



Figs. 1–6. Male tergite 9, dorsal view. 1. *Tipula (Lunatipula) angela*. 2. *T. (L.) angelica*. 3. *T. (L.) detruncata*. 4. *T. (L.) fini*. 5. *T. (L.) berytia*. 6. *T. (L.) leeuweni*.

side. Sclerotized elevations almost continuous and distinctly broadened laterally. Tergite 9 with an elongate cleft. Outer gonostylus apically broadened. Posterior part of inner gonostylus (Fig. 10) divided into two as in *berytia* (Fig. 11) and *leeuweni* (Fig. 12).

Female. Wing short, reaching as far as abdominal segment 7. Hypogynial valve (Fig. 7) short and broad, dorsal margin interrupted before the tip; part of hypogynial valve which is lying inside sternite 8 abbreviated. Sternite 8 with a narrow continuation at lateral side of hypogynial valve.

DISTRIBUTION: *T. (L.) angelica* is the only species of Tipulidae known from Jordan (mouth of river Jordan). It is also known from Syria (10 km N Aleppo and Zebdani) and has been frequently collected in Israel (see below).

MATERIAL EXAMINED: SYRIA: 1♂, 1♀, collected in copula, Anti-Libanon [= Jebel esh Sharqi], Zebdani (ZSM; the male was erroneously designated as holotype by Mannheims (1963); see Theowald, 1980: 515). ISRAEL: numerous specimens from the following localities: Metulla, Har [Mt.] Meron, Meron, Rihaniya, Nahal Amud, Karé Deshe, Gonen, Biq'at Bet Zayda [Btecha], Deganya A, Haifa, Muhraga [Karmel], Yaqfir, Park Canada, Ma'ale Adummim, Nahr es Zarka, Golan: Panyas, Qazrin, Hushniyya, Qusbiya; additional localities are mentioned in Theowald and Oosterbroek, 1987.

Tipula (Lunatipula) berytia Mannheims, 1963
(Figs. 5, 11)

DESCRIPTION: **Male.** Central part of the male tergite 9 consisting of two large, triangularly shaped outgrowths which partly cover the lateral extensions and are separated by a broad median incision (Fig. 5). Hind part of the inner gonostylus divided into two, as in *leeuweni* and *angelica*, but in *berytia* (Fig. 11) the smaller division is elongate and situated ventrally and in the same plane as the larger upper division.

Female. Unknown.

DISTRIBUTION: Known from Lebanon (Beirut) and Israel (see below).

MATERIAL EXAMINED: Holotype ♂ *berytia*, LEBANON: Beirut, Syria [= Lebanon], Miss A.H. Jessup, 98. 117 (NHML). Paratype, 1♂, ISRAEL: Tivon, 15.ii.'56, Div. plant. prot. qar. agr. Israel (alcohol, ZFMK). In addition, specimens were examined from the following localities in Israel: Montfort, Har Meron [Jermak], Nahal Amud, Kefar Hasidim, Qiryat Tiv'on, Har Karmel, Petah Tiqwa.

Tipula (Lunatipula) leeuweni Theischinger, 1982
(Figs. 6, 12)

DESCRIPTION: **Male.** Triangular outgrowths of the central part of tergite 9 (Fig. 6) smaller than in *berytia* and not covering the lateral extensions. Hind part of the inner gonostylus divided into two, as in *berytia* and *angelica*, but in *leeuweni* (Fig. 12) the smaller division is more irregularly shaped and situated somewhat behind the larger upper division.

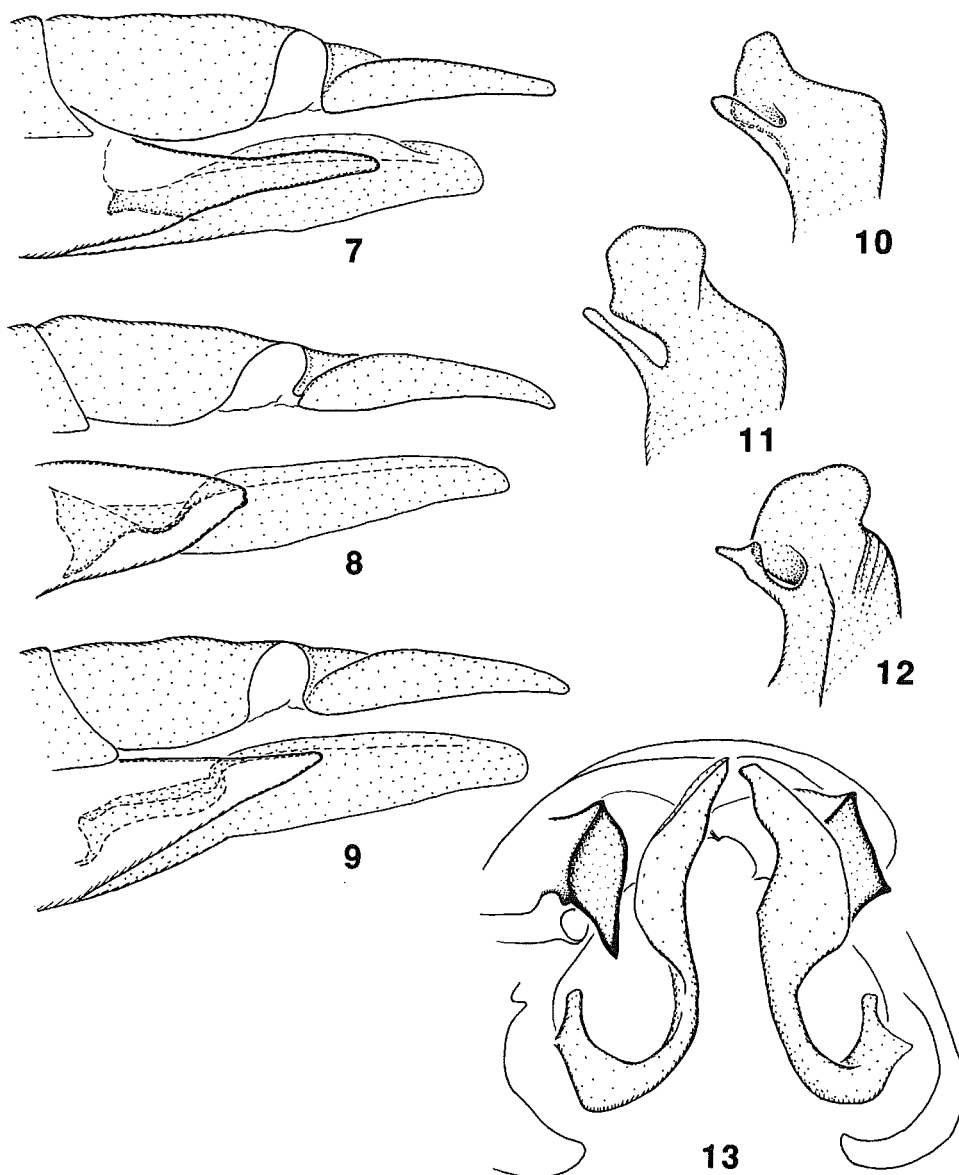
Female. Unknown.

DISTRIBUTION: *T. (L.) leeuweni* is known from the male holotype from Panyas (Golan) only. Re-examination of the specimens from Israel, mentioned in Theowald and Oosterbroek (1987) under the name *leeuweni*, revealed that this material belongs to *berytia*.

MATERIAL EXAMINED: Holotype ♂, ISRAEL (Golan): Syrien, karst spring, 7 km N of Baniyas [= Panyas (Golan)], 6.iii.1979, leg. Kinzelbach (alcohol, ZSM).

Tipula (Lunatipula) detruncata Oosterbroek n. sp.
(Figs. 3, 13)

DESCRIPTION: **Male.** Of the same size and coloration as *angela*. Differentiating characters are found in the hypopygium. Lateral extension of tergite 9 (Figs. 3, 13) apically abbreviated with



Figs. 7–13. Ovipositor, lateral view. 7. *Tipula (Lunatipula) angelica*. 8. *T. (L.) angela*. 9. *T. (L.) fini*. 10–12. Posterior part of inner gonostylus, rear view. 10. *T. (L.) angelica*. 11. *T. (L.) berytia*. 12. *T. (L.) leeuweni*. 13. *T. (L.) detruncata*, dorsal part of hypopygium, rear view.

a concave central area surrounded by darkly sclerotized margins. Dorsal part of tergite 9 with a large transverse depression (Fig. 3). Outer gonostylus small, apically not broadened. Posterior part of inner gonostylus (Fig. 13) very elongate as in *angela* and *fini*, but with a distinct blunt-ending outgrowth basally, which is lacking in the other two species.

Female. Unknown.

DISTRIBUTION: Israel: Har [Mt.] Meron.

MATERIAL EXAMINED: Holotype ♂, ISRAEL: Har Meron, 900 m, 11.vi.1991, A. Freidberg (TAU).

ETYMOLOGY: Named *detruncata* after the abbreviated lateral extensions of tergite 9.

***Tipula (Lunatipula) fini* Oosterbroek n. sp.**

(Figs. 4, 9)

DESCRIPTION: **Male.** Differing from *angela* mainly in the shape of tergite 9. In *fini* (Fig. 4) the lateral extensions are broadly triangular, without mesal excavations and with distinct sclerotized elevations lying in front. Tergite 9 with a transverse depression which is broader and less deep than in *detruncata*. Outer gonostylus apically not broadened. Posterior part of inner gonostylus of the same shape as in *detruncata* (Fig. 13), apical half, however, less broad in *fini*.

Female (from paratype females from Place of Sacrifice). Wing large, about as long as abdomen. Hypogynial valve (Fig. 9) elongate, almost reaching tip of cercus; part of hypogynial valve which is lying inside sternite 8 straight. Sternite 8 continued at lateral side of hypogynial valve, but not to the same extent as in *angelica* (Fig. 7).

DISTRIBUTION: Israel.

MATERIAL EXAMINED: Holotype ♂, ISRAEL: Migdal Zedek, 24.iii.1983, Nussbaum (TAU). Paratypes, 1 ♂, Karmel, 22.iv.1973, A. Freidberg (ZMA); 1 ♂, Har Karmel near Haifa, 16.iv.1980, J. Lucas (ZMA); 1 ♂, Nahal Oren, 14.iv.1973, D. Furth (TAU); 2 ♂, 2 ♀, Place of Sacrifice, Karmel, 1–9.iv.1930 (NHML); 2 ♂, Nahal Ezyona, 26.iii.1974, D. Furth (1 ♂ TAU, 1 ♂ ZMA); 1 ♂, Jerusalem, 15.iv.1953, Hebr. Univ., J. Wahrman (TAU); 1 ♂, Wadi Ruaz, Beth Hakerem, Jerusalem, 14.iv.1951, O. Theodor (TAU); 1 ♀, Wadi Kabala, Jerusalem, 29.iii.1923, P.A. Buxton (ZFMK).

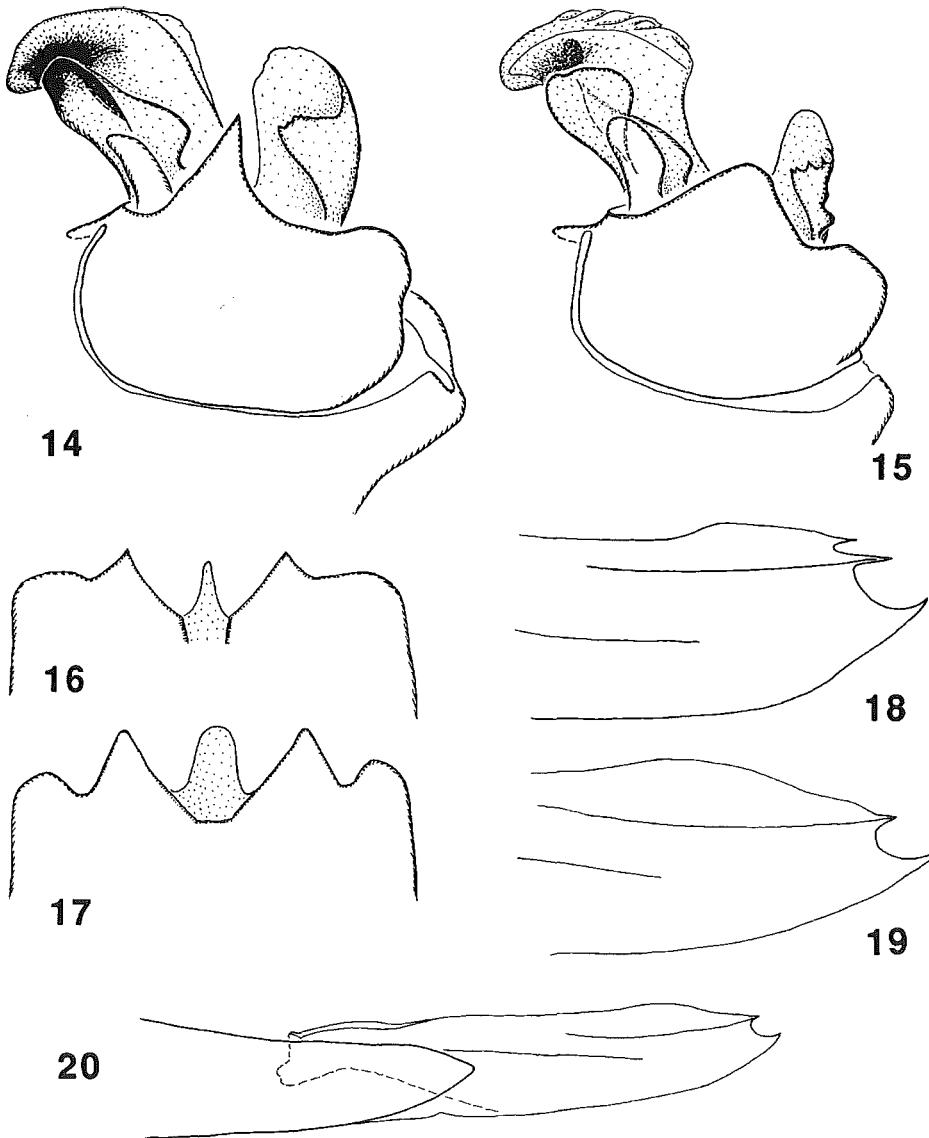
ETYMOLOGY: The species is named *fini*, as a noun in apposition, in honor of Mrs Fini Kaplan.

***Tipula (Lunatipula) substernalis* Oosterbroek n. sp.**

(Figs. 14, 16, 18)

DESCRIPTION: Males of the species *sternalis* and *substernalis* can be easily discriminated from all other species of the subgenus *Lunatipula* by the shape of sternite 8. The sternite bears no appendages or spines, but is distinctly swollen and the posterior half is divided into two by a large median cleft (Theischinger, 1977: Figs. 20a, b). Males of *substernalis* and *sternalis* differ in details of the hypopygium and females in details of the hypogynial valves.

Male. In the male of *substernalis* the posterolateral corners of tergite 9 are not protruding



Figs. 14–20. *Tipula (Lunatipula) substernalis*. 14. Gonocoxite, outer and inner dististyles, lateral view. 16. Tergite 9, dorsal view. 18. Apical half of hypogynial valve, lateral view. 15, 17, 19, 20. *Tipula (Lunatipula) sternalis*. 15. Gonocoxite, outer and inner dististyles, lateral view. 17. Tergite 9, dorsal view. 19. Apical half of hypogynial valve, lateral view. 20. Sternite 8 and hypogynial valve, lateral view.

(Fig. 16; distinctly so in *sternalis*, Fig. 17), the hind margin is interrupted in front of the median projection (continuous in *sternalis*) and the median projection of tergite 9 is narrow (broad in *sternalis*). Upper corner of the gonocoxite distinctly acute in *substernalis* (Fig. 14; evenly rounded in *sternalis*, Fig. 15). Anterior part of inner gonostylus heavily sclerotized, upper margin slightly irregular; lateral flange of anterolateral part small in *substernalis* (anterior part less sclerotized, dorsal margin much more irregular; lateral flange distinctly developed in *sternalis*); posterior part of inner gonostylus large and upper margin slightly irregular in *substernalis* (posterior part small and dorsal margin distinctly irregular in *substernalis*).

Female. Hypogynial valve of *substernalis* apically ending in three acute tips (Fig. 18; ending in two tips in *sternalis*, Figs. 19, 20).

DISTRIBUTION: Israel.

MATERIAL EXAMINED: Holotype ♂ *substernalis*, ISRAEL: Carmel [Karmel], 27.v.1974, A. Freidberg (TAU). Paratypes, 2♂, 1♀, same data as holotype (TAU); 3♀, Nahal Kelah [Karmel], 10.v.1982, Nussbaum (TAU); 1♂, Zomet Ha'Amaqim (Jalame), 18–22.v.1993, A. Freidberg (TAU); 4♂, Zomet Ha'Amaqim (Jalame), 26–30.v.1993, A. Freidberg (2♂ TAU, 2♂ ZMA); 1♂, Har [Mt.] Meron, 1100 m, 10.vi.1987, A. Freidberg (TAU); 1♂, 1♀, Meron, 10.vi.1982, A. Freidberg (ZMA); 1♀, Nahal Amud, 6.VI.1973, D. Furth (ZMA); 1♀, Yehudiyya [Golan], 20.iii.1984, I. Nussbaum (TAU); 1♂, Wadi Kabala [Jerusalem], 4.vi.1953 (TAU).

Holotype ♂ *sternalis*, TURKEY, 1965, Van-See, vii, H. Noack leg./ T. (Lunat.) *sternalis* Mannheims det. 1968/ Holotypus *Tipula* (*Lunatipula*) *sternalis* (♂) Theischinger 1977 (ZFMK). Paratypes, 2♂, 1♀, same data as holotype (1♂ ZFMK, 1♂, 1♀ ZMA); 1♂, 2♀, same data as holotype but with date 16.viii. (1♀ ZFMK, 1♂, 1♀ OÖL); additional material of *sternalis*, 7♂, 1♀, same data as holotype but ♀ with date 16.viii. (ZFMK, ZMA).

ETYMOLOGY: Named *substernalis*, the sister species of *sternalis*.

Tipula (*Lunatipula*) *kybele* complex

Within the *Tipula* (*Lunatipula*) *livida* group, the species of the *kybele* complex are characterized by the small size of the posterior part of the inner gonostylus and the absence of the median projection of tergite 9 (as present, for example, in *sternalis* and *substernalis*, Figs. 16, 17). To date three taxa have been recognized, viz. *kybele kybele* Mannheims, 1968; *kybele russula* Theischinger, 1977; and *trapeza* Theischinger, 1982. With respect to *kybele*, Mannheims (1968) mentioned and illustrated variability in the shape of the anterior part of the inner gonostylus. His figures were drawn from specimens of the typical *kybele* (Mannheims, 1968: Fig. 272, left) and from material that was described later as *kybele russula* by Theischinger (1977).

Mannheims (1968) knew *kybele* from Israel, Lebanon, Syria and Turkey (Hatay, Antalya). In their review of the Turkish Tipulidae, Theowald and Oosterbroek (1990) added the Turkish provinces Konya, İçel, Nigde, Mus, Bitlis, Siirt and Hakkari. Examination of the available material has now shown that *kybele* is restricted to Israel, Lebanon, Syria, and the Turkish province Hatay. The specimens from the other Turkish provinces belong to *russula* and to two new species, viz. *cirratula* and *turgida*. A third new species, *meronensis*, is described here from Israel.

The taxa of the *kybele* complex differ from each other merely in the details of the male and female copulatory organs. The species *cirratula* possesses very characteristic hypogynial valves (Figs. 46–48) and *turgida* is characterized by the spherical outgrowths of the gonocoxites (Figs. 49, 51). The remaining four taxa are very similar and differ only in details of the hypopygium. Because of sympatry between *kybele* and *meronensis*, these four taxa are assigned equal rank and treated as species. The distributions of the six species of the *kybele* complex are given in Fig. 54.

***Tipula (Lunatipula) kybele* Mannheims, 1968**
(Figs. 21–25)

DESCRIPTION: Male. Posterior corners of tergite 9 (Fig. 23) simple; lateral margins of ventral shell incurved. Anterior part of inner gonostylus distinctly strengthened along the dorsal inner side; posterior end of dorsal crest adjacent to small posterior part of inner gonostylus; antero-lateral part of inner gonostylus elongate with a clear elevation at its base (Figs. 21, 22). Fragmentum not protruding beyond gonocoxite (Fig. 21); setae of fragmentum straight. Aedeagal guide (Fig. 25) terminating in two slender and acute outgrowths; lateral shell consisting of a large dorsal part and a triangular, posteriorly directed ventral part. Mid-posterior margin of sternite 8 (Figs. 21, 24) with long setae forming a pencil-shaped brush, almost reaching setae of fragmentum.

Female. Ovipositor as in *trapeza*; hypogynial valve apically ending in two acute tips (Fig. 29).

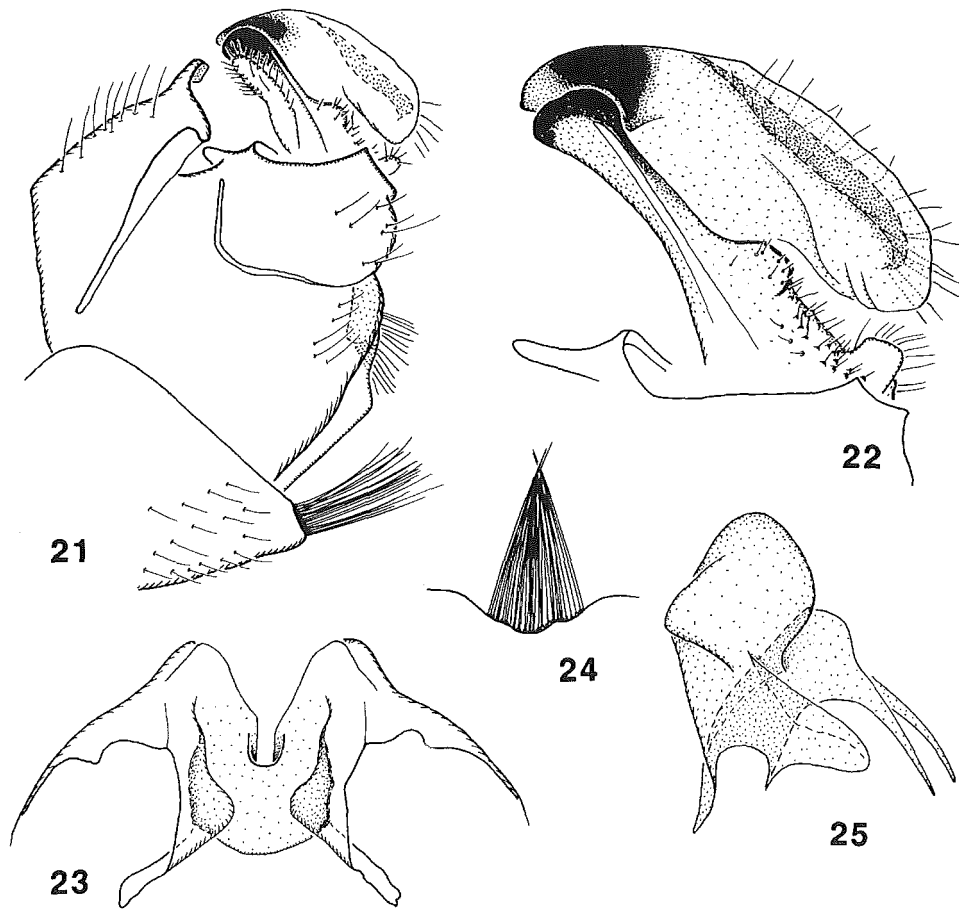
DISTRIBUTION (Fig. 54). Material was examined from Turkey (province Hatay), Syria (Djebel Akrad), Lebanon (Becharré) and various localities in Israel (see below).

MATERIAL EXAMINED: Holotype ♂, TURKEY: 1962, Kumerloeve u. Mittendorf/ Soguk Oluk, 1050 m, ob. Iskenderun, Amanus Dagi, 22.v./ *Tipula (Lunat.) kybele* sp. n./ Holotypus (ZFMK). Paratypes, ISRAEL: 1 ♀, Jerusalem, 20.v.29, S. Tapuschi, Palestine (ZFMK); 1 ♂, Mishmar HaYardén, Upper Galilee, 29.iv.30, Ph. Jolles (ZFMK; according to Mannheims, 1968, the above two paratypes are preserved in the NHML, but according to J. Chainey, in litt. 26.iv.1995, they do not belong to the NHML collection). LEBANON: 1 ♀, 1 ♂, Nord-Libanon, Becharré, 1400 m, 8–10.vi.31, Zerny (NMW). TURKEY: 36 ♂, 8 ♀, same data as holotype (ZFMK; of this series also 1 ♂, 1 ♀, in NHML, not examined). Additional specimens originated from the following localities in Israel: 'En Te'o, Mishmar HaYardén, Karé Deshe, Tiberias, Hammat Gader, Haré Gilbo'a, Zomet Ko'ah, Yaqqir, Jerusalem, Golan: Panyas, Qazrin, Ma'ale Gamla.

NOTE: Specimens from Antalya, included in the original type series of *kybele* as paratypes, are included in the type series of *russula*.

***Tipula (Lunatipula) russula* Theischinger, 1977, n. stat.**
(Figs. 26–28)

DESCRIPTION: Male. Posterior corners of tergite 9 similar to *kybele* (Fig. 27). Anterior part of inner gonostylus (Fig. 26) very weakly strengthened along the dorsal inner side; posterior end

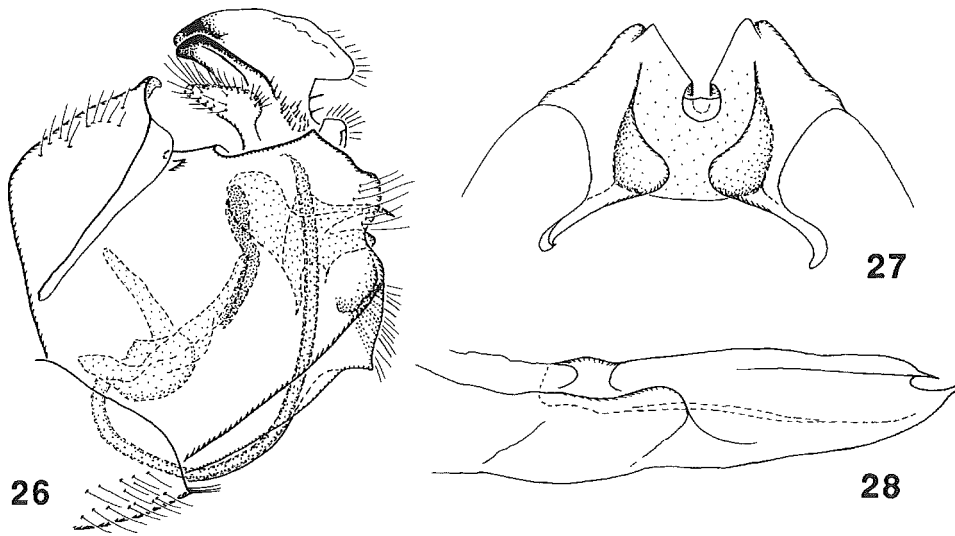


Figs. 21–25. *Tipula (Lunatipula) kybele*. 21. Hypopygium, lateral view. 22. Inner gonostylus, outside lateral view. 23. Tergite 9, ventral view. 24. Mid-posterior margin of sternite 8. 25. Aedeagal guide, lateral view.

of dorsal crest not adjacent to small posterior part of inner gonostylus; anterolateral part of inner gonostylus shorter than in *kybele* and without elevation at its base. Fragmentum and aedeagal guide as in *kybele*. Mid-posterior margin of sternite 8 (Fig. 26) bare or with a concentration of a few weak setae that are only slightly stronger than the setae covering the sternite.

Female. Ovipositor as in *trapeza*; hypogynial valve apically ending in two acute tips (Figs. 28, 29).

DISTRIBUTION (Fig. 54). Turkey: provinces Mugla (N Incirköy), Antalya (Antalya), Burdur (11 km E Burdur), Isparta (25 km N Gelendost) and Konya (Aksehir, Sultan Dag.).



Figs. 26–28. *Tipula (Lunatipula) russula*. 26. Hypopygium, lateral view. 27. Tergite 9, ventral view. 28. Sternite 8 and hypogynial valve, lateral view.

MATERIAL EXAMINED: Holotype ♂, TURKEY: 1962, Antalya, 14.5, Roer leg./ *Tipula (Lunat.) russula* sp. n. Mannheims det. 1962/ Holotypus *Tipula (Lunatipula) kybele russula* Theischinger 1977 (ZFMK; originally included in the type series of *kybele*). Paratypes, 1 ♂, 3 ♀, same data as holotype (2 ♀ ZFMK, 1 ♂, 1 ♀ ZMA; these paratypes also belong to the original type series of *kybele*), 2 ♂, Anatolien, Aksehir, ca. 1000 m, 1–31.viii.64, Herbert Noack (ZFMK).

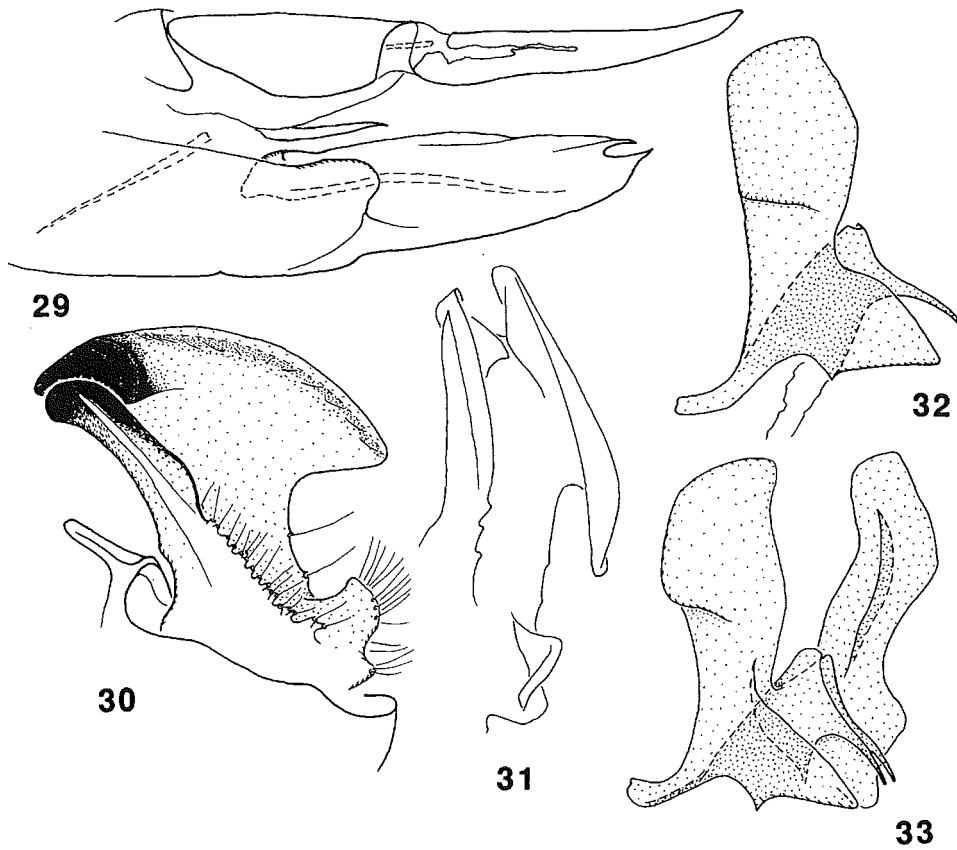
Tipula (Lunatipula) trapeza Theischinger, 1982

(Figs. 29–33)

DESCRIPTION: **Male.** Posterior corners of tergite 9 as in *cirratula* (Fig. 44), with pointed tips and incurved lateral margins of ventral shell. Anterior part of inner gonostylus (Figs. 30, 31) not or weakly strengthened along the dorsal inner side; posterior end of dorsal crest not adjacent to small posterior part of inner gonostylus; anterolateral part of inner gonostylus short and without elevation at its base. Fragmentum slightly protruding beyond gonocoxite (in Theischinger (1982), the fragmentum is figured as distinctly protruding but this illustration was made from material preserved in alcohol); setae of fragmentum straight. Lateral shell of aedeagal guide (Figs. 32, 33) very high, the posteriorly directed ventral part with a triangular apex. Setae at mid-posterior margin of sternite 8 of moderate length, forming a broad brush (Theischinger, 1982: Figs. 13a, b).

Female. Ovipositor (Fig. 29) with the cercus elongate and apically somewhat upcurved; hypogynial valve broad, ending in two acute tips separated by a rounded incision.

DISTRIBUTION (Fig. 54). Northern Turkey.



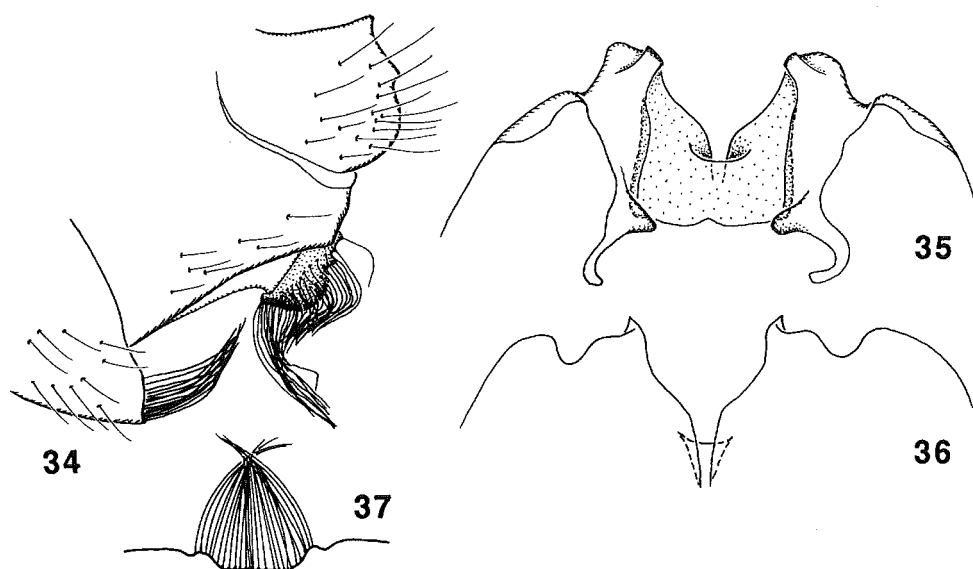
Figs. 29–33. *Tipula (Lunatipula) trapeza*. 29. Ovipositor, lateral view. 30. Inner gonostylus, outside lateral view. 31. Inner gonostylus, dorsal view. 32. Aedeagal guide, lateral view. 33. Aedeagal guide, oblique rear view.

MATERIAL EXAMINED: Holotype ♂, TURKEY: Anatolien, Afyon, SSW Bayat, 1300 m, 38.57 N/ 30.54 E, 9.vii.1978, Aspöck, Rausch, Ressler, ARR 78/14 (alcohol, ZMA); additional specimens from Turkey: 1 ♂, Gümüsane, Tersundagi Gecidi, 2000 m, 24.vii.1987, H. & Th. v. Oorschot, W. de Prins and F. Coenen, st 418 (ZMA); 8 ♂, 13 ♀, Cankiri, 15 km S Sabanözü, 950 m, 7–8.vii.1988, S. Wagener (ZFMK, ZMA).

Tipula (Lunatipula) meronensis Oosterbroek **n. sp.**

(Figs. 34–37)

DESCRIPTION: **Male.** Posterior corners of tergite 9 (Fig. 35) apically with downcurved rectangular prolongations; lateral margins of ventral shell mostly parallel, incurved at the cranial



Figs. 34–37. *Tipula (Lunatipula) meronensis*. 34. Hypopygium, lateral view. 35. Tergite 9, ventral view. 36. Tergite 9, dorsal view. 37. Mid-posterior margin of sternite 8.

side only. Inner gonostylus as in *kybele*. Fragmentum distinctly protruding beyond gonocoxite (Fig. 34); setae at upper part of fragmentum downcurved, those at lower part lengthened. Aedeagal guide as in *kybele*. Mid-posterior margin of sternite 8 with long setae forming a broadly based brush, reaching setae of fragmentum (Figs. 34, 37).

Female. Unknown.

DISTRIBUTION (Fig. 54). Israel: Har [Mt.] Meron.

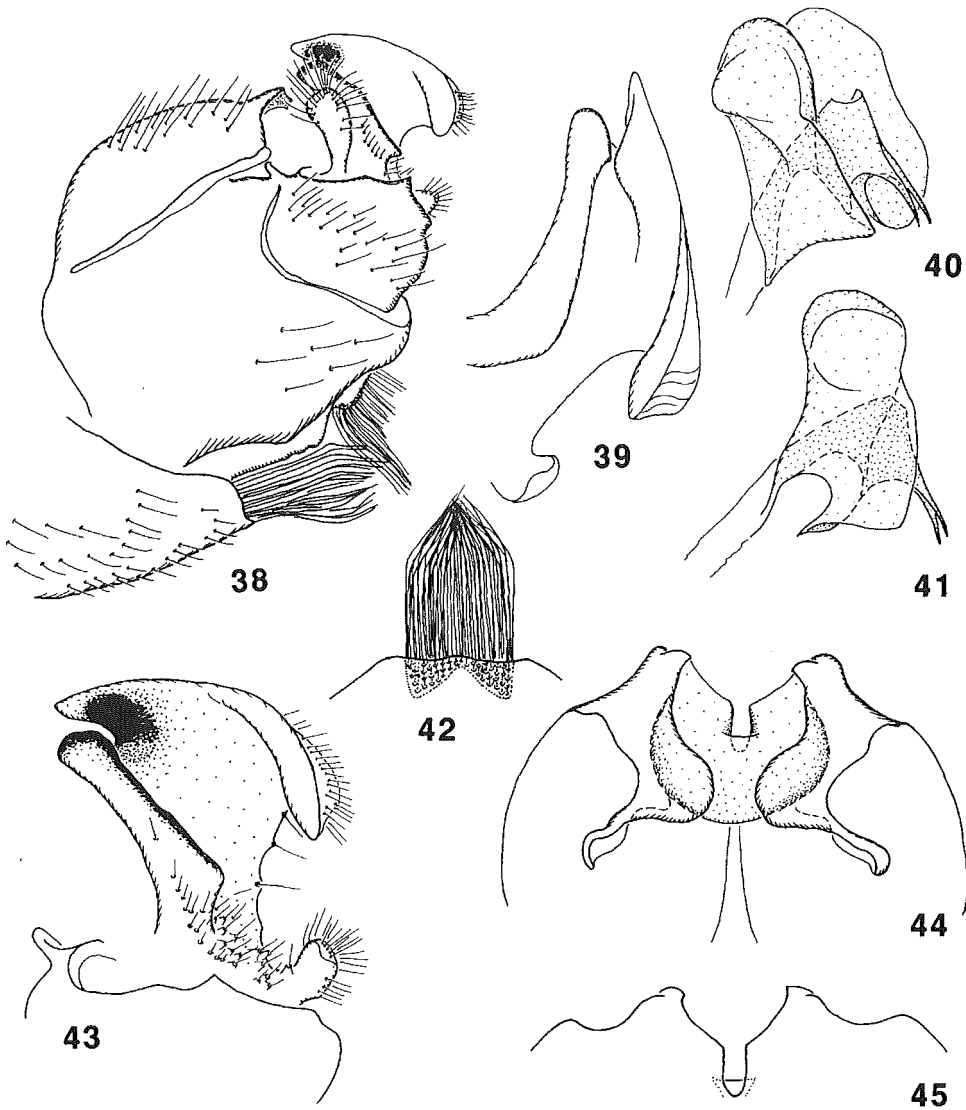
MATERIAL EXAMINED: Holotype ♂, ISRAEL: Har Meron, 900 m, 11.vi.1991, A. Freidberg (TAU). Paratypes, 1 ♂, Meron, 13.vi.1971, leg. Kugler (TAU); 5 ♂, Israel, Har [Mt.] Meron, 1100 m, 10.vi.1987, A. Freidberg (3 ♂ TAU, 2 ♂ ZMA).

ETYMOLOGY: Named after the type locality, Har Meron.

***Tipula (Lunatipula) cirratula* Oosterbroek n. sp.**

(Figs. 38–48)

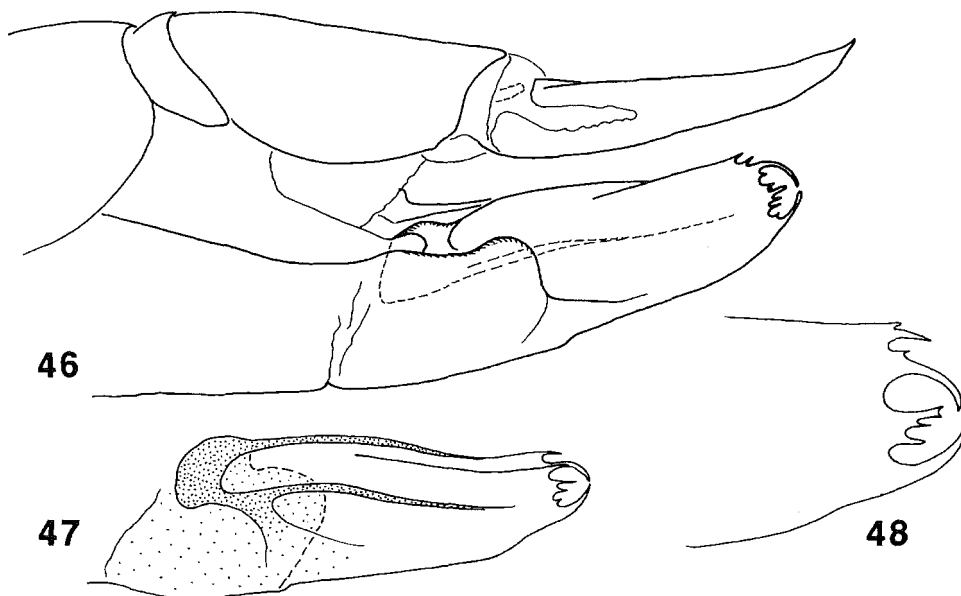
DESCRIPTION: Male. Posterior corners of tergite 9 with pointed downcurved tips (Figs. 44, 45); lateral margins of ventral shell incurved. Anterior part of inner gonostylus distinctly strengthened along the posterior part of the dorsal inner side (Figs. 39, 43); posterior end of dorsal crest not adjacent to small posterior part of inner gonostylus; anterolateral part of inner gonostylus elongate but without elevation at its base (Figs. 38, 43). Fragmentum protruding beyond gonocoxite (Fig. 38); setae of fragmentum straight. Ventral part of lateral shell of



Figs. 38–45. *Tipula (Lunatipula) cirratula*. 38. Hypopygium, lateral view. 39. Inner gonostylus, dorsal view. 40. Aedeagal guide, oblique rear view. 41. Aedeagal guide, lateral view. 42. Mid-posterior margin of sternite 8. 43. Inner gonostylus, outside lateral view. 44. Tergite 9, ventral view. 45. Tergite 9, dorsal view.

aedeagal guide (Figs. 40, 41) broadly connected to dorsal part. Mid-posterior margin of sternite 8 with long setae forming a broad brush, reaching setae of fragmentum (Figs. 38, 42).

Female. Ovipositor (Figs. 46–48) with cercus elongate and apically somewhat upcurved; hypogynial valve broad, ending in up to eight acute tips, two of which are longer and strongly curved.



Figs. 46–48. *Tipula (Lunatipula) cirratula*. 46. Ovipositor, lateral view. 47. Hypogynial valve, lateral view. 48. Apex of hypogynial valve, lateral view.

DISTRIBUTION (Fig. 54). Turkey: provinces Bingöl, Bitlis, Siirt, Van and Hakkari.

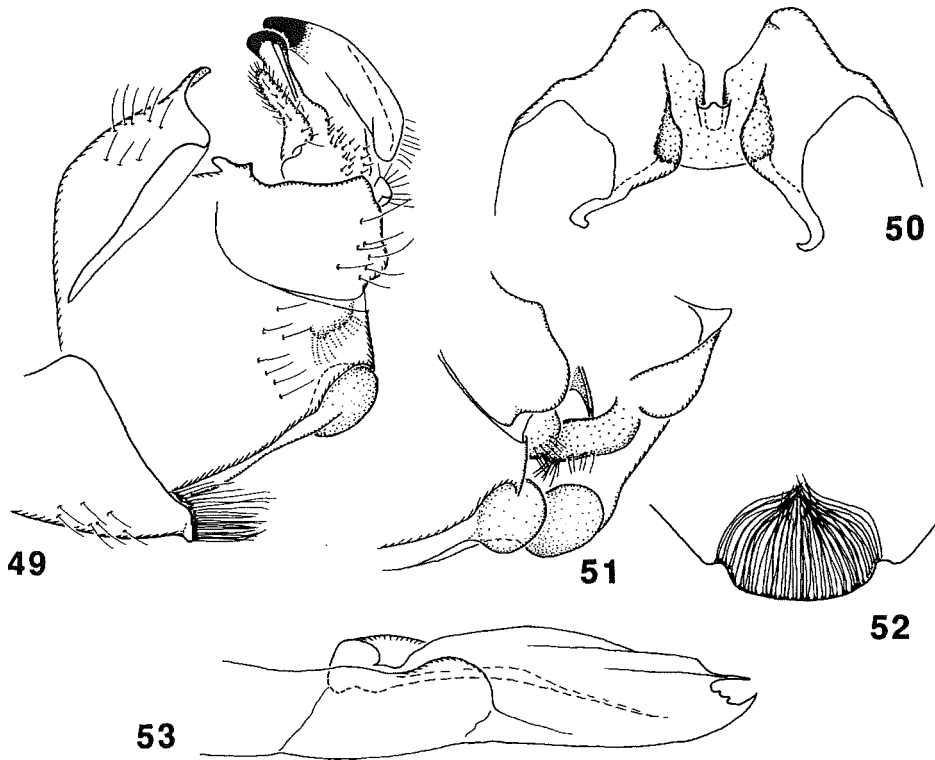
MATERIAL EXAMINED: Holotype ♂, TURKEY: Van-See, vii.1965, H. Noack leg. (ZMA). Paratypes, 6♂, 2♀, same data as holotype (6♂, 1♀ ZFMK, 1♀ ZMA); 4♂, 3♀, Van Gölü o. Tatvan, 10.vii.1968, Mittendorf, 10. Orient Expedition Dr. Kumerloeve (3♂, 2♀ ZFMK, 1♂, 1♀ ZMA); 1♂, 55 km östl. Tatvan, 1900 m, 27.vi.1977, leg. Holzschuh u. Ressler, RH 77/34 (alcohol, ZMA); 4♂, 4♀, 50 km westl. Mus, 1600 m, 28.vi–4.vii.1977, leg. Holzschuh u. Ressler, RH 77/35 (alcohol, ZMA); 1♂, Siirt, 20 km SW of Sirnak, 1000 m, 8.vi.1984, H. v. Oorschot, H. v. d. Brink, st 178 (ZMA); 1♀, Hakkari, 10 km SE of Uludere, 1000 m, 9.vi.1984, H. v. Oorschot, H. v. d. Brink, st 180 (ZMA); 2♀, Siirt, Birinitepsi Gecidi, 24 km NW Sirnak, 1600 m, 9.vi.1985, H. v. Oorschot, H. v. d. Brink, st 243 (ZMA).

ETYMOLOGY: The name refers to the shape of the hypogynial valve.

***Tipula (Lunatipula) turgida* Oosterbroek n. sp.**

(Figs. 49–53)

DESCRIPTION: **Male.** Posterior corners of tergite 9 (Fig. 50) with rounded tips, slightly pointed ventrally; lateral margins of ventral shell incurved. Anterior part of inner gonostylus (Fig. 49) weakly strengthened along the dorsal inner side; posterior end of dorsal crest adjacent to small posterior part of inner gonostylus; anterolateral part of inner gonostylus elongate with a clear



Figs. 49–53. *Tipula (Lunatipula) turgida*. 49. Hypopygium, lateral view. 50. Tergite 9, ventral view. 51. Gonocoxites and fragmenta, oblique rear view. 52. Mid-posterior margin of sternite 8. 53. Sternite 8 and hypogynial valve, lateral view.

elevation at its base. Fragmentum small, fragmentum and its setae not protruding beyond gonocoxite (Fig. 49). Aedeagal guide as in *kybele*. Gonocoxite with two sphaerical outgrowths situated below fragmenta (Figs. 49, 51). Mid-posterior margin of sternite 8 provided with setae of moderate length forming a broadly based brush (Fig. 52).

Female. Ovipositor as in *trapeza*, incision between the two tips of the hypogynial valve sometimes with traces of smaller tips (Fig. 53).

DISTRIBUTION (Fig. 54). Turkey: provinces Içel and Nigde.

MATERIAL EXAMINED: Holotype ♂, TURKEY: Nigde, Aladag, 16 km SE of Camardi, 1600–1800 m, 6–11.viii.1983, H. v. Oorschot, H. v. d. Brink and H. Wiering, st 136, op licht (ZMA). Paratypes, 1 ♂, Asia Minor, 1–2.vi.1979, Namrun, Holzschuh C. and Ressler F. leg. (alcohol, ZMA); 1 ♂, Asia Minor, 16–19.vi.1979, Namrun, Holzschuh C. and Ressler F. leg. (alcohol, ZMA); 3 ♂, 16 ♀, same data as holotype (1 ♂, 2 ♀ ZFMK, 2 ♂, 14 ♀ ZMA).

ETYMOLOGY: The name refers to the small bulbous outgrowth at the upper mid-posterior part of the gonocoxite.

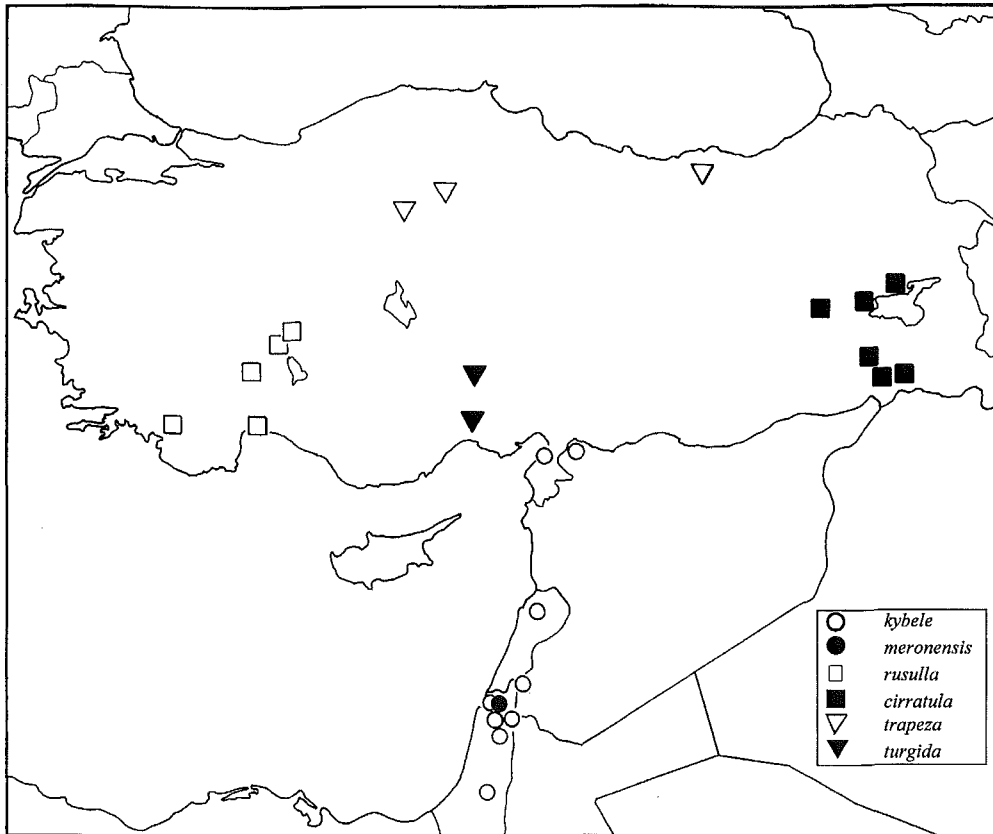


Fig. 54. Distribution of the species of the *Tipula (Lunatipula) kybele* complex. *T. (L.) kybele* is known from more localities in Israel than indicated on the map.

SPECIES SUMMARY

In their review of the Tipulidae known from the Turkish province Hatay in the north to Israel in the south, Theowald and Oosterbroek (1987) mentioned 26 species. An additional species, *Tipula (Yamatotipula) submontium*, was listed in Oosterbroek and Theowald (1992). Of these 27 species, one is placed in synonymy (*kaplani*), one is described above as new (*substernalis*), and two could not be confirmed for the region. With inclusion of the species described here as new, once again 27 species are known to occur in the region. In the list of these species given below (Table 1), species numbers in bold refer to the remarks, species endemic to the region are indicated by an asterisk (*), and the number of localities from which species are known in Israel is given between brackets. Information on the distribution of the non-endemic species can be found in Oosterbroek and Theowald (1992).

TABLE 1
List of the Tipulidae species of Israel and adjacent areas

Tipulidae species	Israel	Lebanon	Syria	Hatay
1. <i>Nephrotoma beckeri</i> (Mannheims, 1951)	+ (16)	+		+
2. <i>N. cornicina</i> (Linnaeus, 1758)	+ (1)	+		
3. <i>N. minuscula</i> (Mannheims, 1951)	+ (26)	+	+	+
4. <i>N. scalaris</i> (Meigen, 1818)	+ (16)	+	+	+
5. <i>Tipula (Acutipula) latifurca</i> Vermoolen, 1983		+		
6. <i>T. (A.) libanica</i> Vermoolen, 1983	+ (1)	+		
7. <i>T. (Lunatipula) angela</i> Mannheims, 1963*	+ (11)	+		
8. <i>T. (L.) angelica</i> Mannheims, 1963*	+ (40)		+	
9. <i>T. (L.) berytia</i> Mannheims, 1963*	+ (8)	+		
10. <i>T. (L.) cedrophila</i> Mannheims, 1963	+ (5)	+		
11. <i>T. (L.) detruncata</i> n. sp.*	+ (1)			
12. <i>T. (L.) fini</i> n. sp.*	+ (8)			
13. <i>T. (L.) freidbergi</i> Theowald and Oosterbroek, 1987*	+ (7)			
14. <i>T. (L.) helvola</i> Loew, 1873	+ (1)			
15. <i>T. (L.) kinzelbachi</i> Theischinger, 1982*			+	
16. <i>T. (L.) kybele</i> Mannheims, 1963*	+ (12)	+	+	+
17. <i>T. (L.) leeuweni</i> Theischinger, 1982*	+ (1)			
18. <i>T. (L.) meronensis</i> n. sp.*	+ (1)			
19. <i>T. (L.) peliostigma peliostigma</i> Schummel, 1833	+ (3)			
20. <i>T. (L.) pseudopeliostigma</i> Mannheims, 1965*	+ (7)	+		
21. <i>T. (L.) substernalis</i> n. sp.*	+ (9)			
22. <i>T. (L.) verrucosa sinedente</i> Theischinger, 1982	+ (4)			
23. <i>T. (Savtshenkia) ornata</i> Theowald and Oosterbroek, 1987	+ (1)			
24. <i>T. (S.) rufina rufina</i> Meigen, 1818	+ (2)	+		
25. <i>T. (Tipula) orientalis</i> Lackschewitz, 1930	+ (26)	+	+	
26. <i>T. (Vestiplex) relicta</i> Dia and Theowald, 1982*	+ (2)	+		
27. <i>T. (Yamatotipula) lateralis</i> Meigen, 1818	+ (21)	+	+	

REMARKS

2. Known in Israel from HaTanur (Nahal Iyyon) only (Theowald and Oosterbroek, 1987).
5. Given species rank by De Jong (1994a).
6. Known in Israel from Tel Dan only (Theowald and Oosterbroek, 1987).
8. Also known from Jordan, but not from Lebanon as given in Oosterbroek and Theowald (1992).
10. Recorded by Theowald and Oosterbroek (1987) for Israel from Har [Mt.] Hermon only. Additional material from this locality was examined, as well as from Har [Mt.] Shalhavit, Giv'at Koah, Lifta (Jerusalem) and Petaḥ Tiqwa.
14. Recorded by Theowald and Oosterbroek (1987) for Israel from Har [Mt.] Meron only. Additional material from this locality was examined (1100 m, 10.vi.1987, A. Freidberg).
23. Described from Israel (Bar'am), now also known from Cyprus (De Jong, 1994b).
24. In Israel known from two localities only: Panyas and north of Nahal Amud.
26. Recorded by Theowald and Oosterbroek (1987) in Israel from Har [Mt.] Meron only. Additional material was examined from Nahal Bezet (23.x.1986, A. Freidberg cs).
27. The species of the *T. (Y.) lateralis* group are discussed by Oosterbroek (1994). The records from Syria in Theowald and Oosterbroek (1987, 1990) and Oosterbroek and Theowald (1992) for two members of this group, *iranensis* Theowald, 1978, and *submontium* Theowald and Oosterbroek, 1981, are to be omitted.

ACKNOWLEDGMENTS

I am especially grateful to A. Freidberg for the opportunity to study material preserved in the Department of Zoology of the Tel Aviv University and for his support during this study. I would like to thank H. de Jong (Amsterdam) for his help in preparing the manuscript. I also thank J. Chainey (London), R. Contreras-Lichtenberg (Vienna), F. Gusenleitner (Linz), W. Schacht (München), H. Schumann (Berlin) and H. Ulrich (Bonn), who kindly provided on loan material under their care.

REFERENCES

- Jong, H. de.** 1993. The phylogeny of the *Nephrotoma flavescens* species group (Diptera: Tipulidae). *Tijdschrift voor Entomologie* 136:235–256.
- Jong, H. de.** 1994a. The phylogeny of the *Tipula (Acutipula) maxima* species group, with notes on its distribution (Diptera: Tipulidae). *Entomologica Scandinavica* 24:433–457.
- Jong, H. de.** 1994b. The phylogeny of the subgenus *Tipula (Savtshenkia)* (Diptera: Tipulidae) with special reference to the western Mediterranean Fauna. *Tijdschrift voor Entomologie* 137:271–323.
- Mannheims, B.** 1963. 15. Tipulidae. *Die Fliegen der Palaearktischen Region* 3(5)1, Lief. 238:137–176.
- Mannheims, B.** 1968. 15. Tipulidae. *Die Fliegen der Palaearktischen Region* 3(5)1, Lief. 275:289–320.
- Oosterbroek, P. and Theowald, Br.** 1992. Family Tipulidae. In: Catalogue of Palaearctic Diptera. Vol. 1. Edit. Á. Soós, L. Papp and P. Oosterbroek. Pp. 56–178.
- Theowald, Br.** 1957. Die Entwicklungsstadien der Tipulidae (Diptera, Nematocera) insbesondere der west-palaearktischen Arten. *Tijdschrift voor Entomologie* 100:195–308.
- Theowald, Br.** 1980. 15. Tipulidae. *Die Fliegen der Palaearktischen Region* 3(5)1, Lief. 324:437–538.
- Theowald, Br. and Oosterbroek, P.** 1987. The zoogeography of the western Palaearctic Tipulidae. VIII. The Tipulidae of Israel and adjacent regions. *Israel Journal of Entomology* 20:71–83.
- Theowald, Br. and Oosterbroek, P.** 1990. Zur Zoogeographie der westpaläarktischen Tipuliden. IX. Die Tipuliden des Vorderen Orients. *Tijdschrift voor Entomologie* 133:83–95.
- Theischinger, G.** 1977. Neue Taxa von *Lumatipula* Edwards aus der mediterranen Subregion der Palaearktis (Diptera, Tipulidae, *Tipula* Linnaeus). *Beaufortia* 26:1–38.
- Theischinger, G.** 1982. Neue Taxa von *Lumatipula* Edwards aus der mediterranen Subregion der Palaearktis (Diptera, Tipulidae, *Tipula* Linnaeus). 4. Fortsetzung. *Beaufortia* 32:79–96.