

The identity of *Tipula (Emodotipula) saginata* Bergroth and *T. (E.) obscuriventris* Strobl, and the description of *Tipula (E.) leo* sp. n. from the Sierra Nevada in Spain (Diptera, Tipulidae)

Autor(en): **Dufour, C.**

Objektyp: **Article**

Zeitschrift: **Mitteilungen der Schweizerischen Entomologischen Gesellschaft = Bulletin de la Société Entomologique Suisse = Journal of the Swiss Entomological Society**

Band (Jahr): **64 (1991)**

Heft 1-2

PDF erstellt am: **13.09.2024**

Persistenter Link: <https://doi.org/10.5169/seals-402433>

Nutzungsbedingungen

Die ETH-Bibliothek ist Anbieterin der digitalisierten Zeitschriften. Sie besitzt keine Urheberrechte an den Inhalten der Zeitschriften. Die Rechte liegen in der Regel bei den Herausgebern.

Die auf der Plattform e-periodica veröffentlichten Dokumente stehen für nicht-kommerzielle Zwecke in Lehre und Forschung sowie für die private Nutzung frei zur Verfügung. Einzelne Dateien oder Ausdrucke aus diesem Angebot können zusammen mit diesen Nutzungsbedingungen und den korrekten Herkunftsbezeichnungen weitergegeben werden.

Das Veröffentlichen von Bildern in Print- und Online-Publikationen ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. Die systematische Speicherung von Teilen des elektronischen Angebots auf anderen Servern bedarf ebenfalls des schriftlichen Einverständnisses der Rechteinhaber.

Haftungsausschluss

Alle Angaben erfolgen ohne Gewähr für Vollständigkeit oder Richtigkeit. Es wird keine Haftung übernommen für Schäden durch die Verwendung von Informationen aus diesem Online-Angebot oder durch das Fehlen von Informationen. Dies gilt auch für Inhalte Dritter, die über dieses Angebot zugänglich sind.

The identity of *Tipula (Emodotipula) saginata* BERGROTH and
T. (E.) obscuriventris STROBL, and the description of *Tipula (E.) leo*
sp. n. from the Sierra Nevada in Spain (Diptera, Tipulidae)

C. DUFOUR

Musée d'histoire naturelle, Terreaux 14, CH-2000 Neuchâtel

Tipula (Emodotipula) leo sp. n. is described after a male and a female caught along a stream running in a steep deciduous forest of the foothills of Sierra Nevada. The new species differs markedly from both other western palaeartic species of the subgenus *Emodotipula* which are revised and for which neotypes are designated.

INTRODUCTION

In LINDNER, THEOWALD (1980) considers with some reserve *Tipula (E.) saginata* BERGROTH as the only representative of the subgenus *Emodotipula* in western palaeartic region, with the range "Europa".

This author also mentions the variety *obscuriventris* described by STROBL (1900) from the Pyrenees on the basis of its dark colouration. In order to work out the taxonomic status of *obscuriventris*, all the material deposited in the Zoological Museum of Amsterdam has been checked. This has proved not only that specimens recently collected in southern Spain belong to a totally new species, but also that *T. (E.) obscuriventris* is itself a valid species, distributed from the Pyrenees to eastern Europe and the USSR. On the contrary, *T. (E.) saginata* turned out to be strictly alpine, found in Switzerland and northern Italy.

STUDIED SPECIES

Tipula (E.) saginata BERGROTH, 1891
(fig. 1 A–E, fig. 2 A–B, fig. 3 F–H)

This species was described by BERGROTH in 1891 on the basis of a female sent by Prof. G. HUGUENIN in Zurich and collected in Weissenburg (Canton Bern). THEOWALD (1980) indicates that the type is not in Helsinki, where BERGROTH's collection is deposited, but that it could be in Zurich. There are indeed 4 ♂♂ and 14 ♀♀ in the ETH collection, but no specimen labelled as type. Among these, all ♂♂ and 12 ♀♀ correspond fully with the illustration of genitalia given by THEOWALD for *saginata* on the basis of specimens from the Italian Alps (Aosta, Val Ferret), while 2 ♀♀ (checked by Prof. W. SAUTER in Zurich) belong to *T. (E.) obscuriventris* STROBL (see below).

BERGROTH's description does not include any illustration but in spite of the close resemblance between both species, the following characters enable to establish that the name *saginata* refers to the most common species of the Weissen-

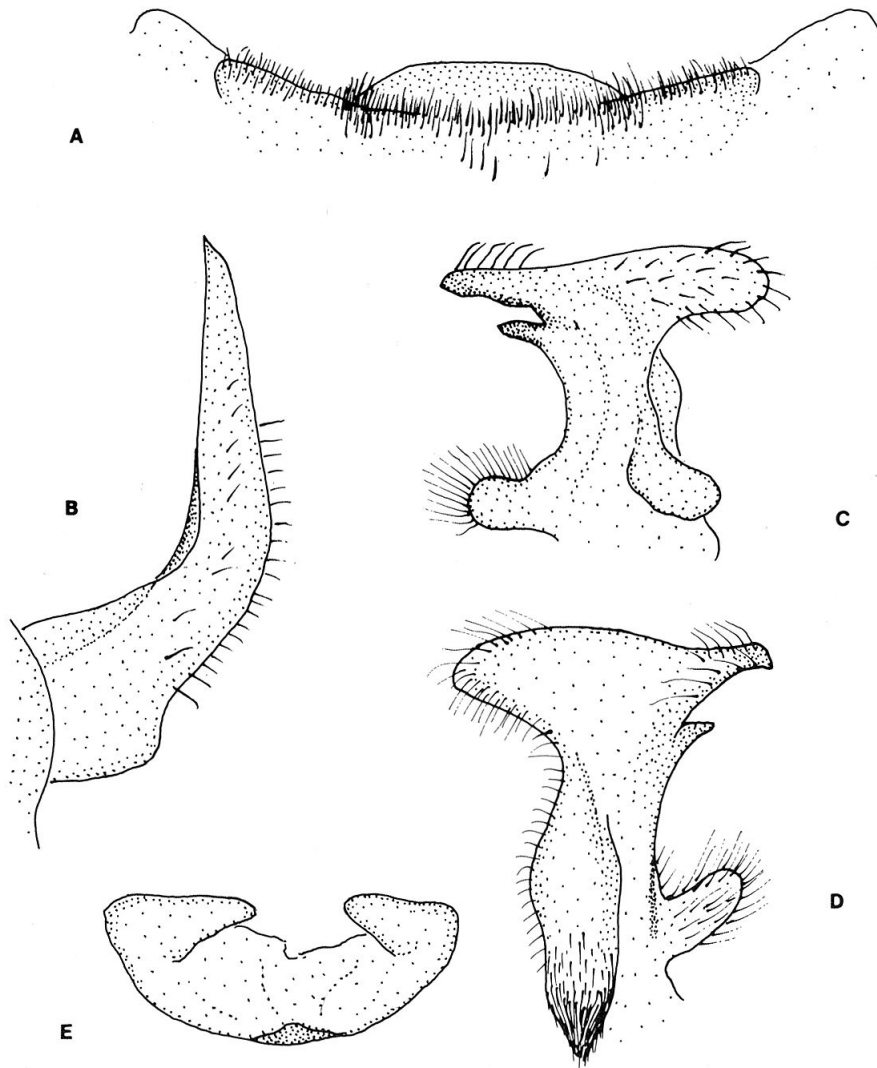


Fig. 1. A–E: *Tipula (Emodotipula) saginata* BERGROTH ♂; A, posterior extension of tergite 9; B, left od outside; C, left id outside; D, left id inner side; E, proximal appendage of sternite 9.

burg series: brownish colour of rostrum and palpi “. . . rostro in testaceum vergente, palpis fuscis, apice testaceis, . . .” (these are dark grey in alpine specimens of *obscuriventris*); presence of a lateral process near tip of hypoalvae “. . . apice utrinque prope basin lamellarum inferiorum in processum auriculiformem ferrugineum prominente . . .”.

Discriminating characters

The genitalia of ♂ (fig. 1) are easily recognized by the shape of tergite 9 which bears a continuous and regular row of dark setae on posterior margin; shape of id; od rather straight on anterior margin and narrow. The soft proximal appendage of sternite 9 shows no discriminating character.

The females of *Emodotipula* are recognized by very short cerci (as illustrated for *T. leo* sp. n. in fig. 8). The hypoalvae of *saginata* (fig. 2 A,B) bear strong lateral processes most easily seen in ventral view on prepared specimens. The tip of sternum 9 is broad (fig. 3 F–H).

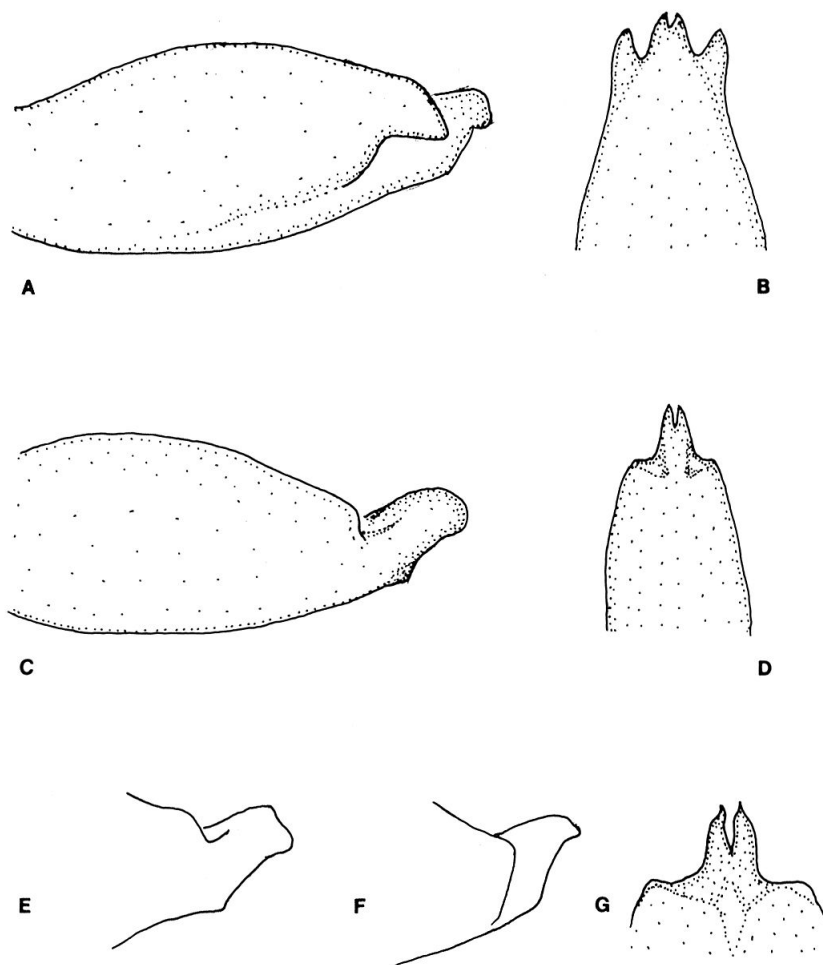


Fig. 2. A–B: *Tipula (Emodotipula) saginata* BERGROTH ♀; A, hypovalvae lateral view; B, hypovalvae ventral view;
 C–D: *T. (E.) obscuriventris* STROBL ♀ from Switzerland (Iséables); C, hypovalvae lateral view, usual type; D, hypovalvae ventral view, usual type;
 E: *T. (E.) obscuriventris* STROBL ♀ from L'Aquila (Abruzzo);
 F–G: *T. (E.) obscuriventris* STROBL ♀ from Switzerland (Les Giettes) (Valais, Vérossaz), unusual type.

Distribution

T. (E.) saginata is known with certainty only from the Alps (fig. 6) between northern Italy and eastern Switzerland. Other published data under the name of *saginata* are likely to refer to *obscuriventris* (fig. 5).

Neotype designation

Considering that the type of *T. saginata* is lost as indicated above, that BERGROTH did not examine the other specimens deposited in Zurich, and in order to avoid any further confusion (made possible by the fact that *obscuriventris* is also present among the specimens of *Emodotipula* collected in the type locality), we designate as neotype a specimen from Weissenburg. *Neotype*: 1 ♂, Weissenburg (BE)/Coll. HUGUENIN (ETH Zürich).

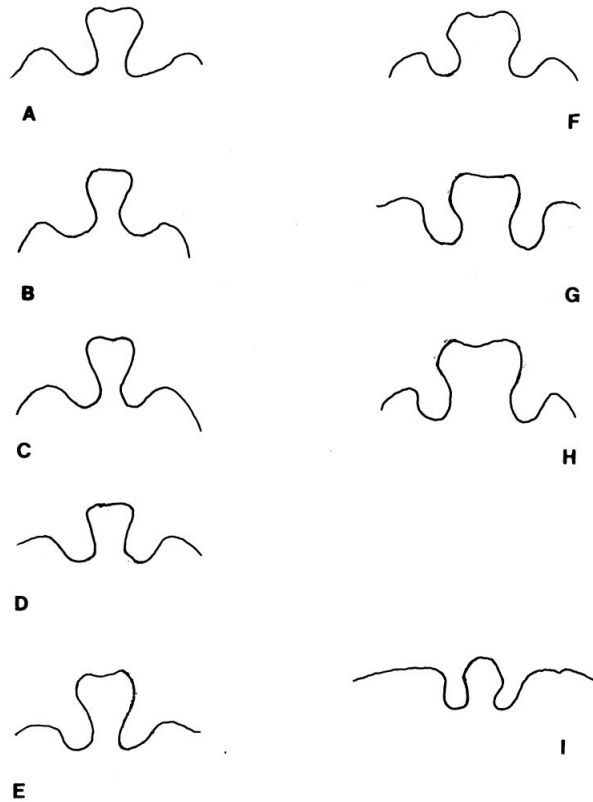


Fig. 3. A–E: *Tipula (Emodotipula) obscuriventris* STROBL ♀, tip of sternum 9; A, H. Pyrenees; B, Atl. Pyrenees; C, Switzerland, Iséables; D, L'Aquila (Abruzzo); E, Bulgaria; F–H: *T. (E.) saginata* BERGROTH ♀, tip of sternum 9; F, Italy, Val Ferret; G, Switzerland, Weissenburg; H, Switzerland, Churwalden; I: *T. (E.) obscuriventris* STROBL ♀, Vérossaz, Switzerland, tip of sternum 9, unusual type.

Other material examined: Switzerland: 3 ♂, 12 ♀♀, Weissenburg (BE/Coll. HUGUENIN (ETH Zürich)); 1 ♂, Churwalden (GR), 31.5.1882/Coll. HUGUENIN (ETH); 1 ♀, Churwalden (GR), 30.5.1882/Coll. HUGUENIN (ETH); 1 ♀, Pianvesto b. Soglio (GR), 25.7.1907/Coll. ESCHER-KÜNDIG (ETH); 1 ♂, Sion (VS), 6.5.1892/Coll. HUGUENIN (ETH); 1 ♂, St-Léonard (VS), 2.5.1888/Coll. HUGUENIN (ETH); 1 ♂, Parc National rég. Val S-charl, Pt. 1608, 13.6.1980, C. DUFOUR leg. (Musée d'histoire naturelle de Neuchâtel, MHNN); 1 ♂, Ramosch (Strada, GR), 827/192, Pt. 1113, 13.6.1986, C. DUFOUR leg. (MHNN); 1 ♂, 1 ♀, Maderanertal (UR), Lägni 870–1050 m, 25.6.1983, T.F., L. REZBANYAI leg. (Natur-Museum Luzern); 1 ♂, Binn, Im Feld (VS), 29.5.1955 (14–15 h.), E. HANDSCHIN leg. (Naturhistorisches Museum Basel, NMB); Italy: 1 ♂, 1 ♀, Val Ferret, La Vachey, 1600–1700 m, 1.8.1962/Italia Aosta exc. Amsterdam (Zoological Museum Amsterdam, ZMA).

Tipula (E.) obscuriventris STROBL, 1900
(fig. 2 C–G, fig. 3 A–E, I, fig. 4 A–E, fig. 9 A–B)

Tipula (E.) saginata var. *obscuriventris* was described in 1900 by STROBL on the basis of a single female from Sierra Aiscurre (Mte. Aitzgorri, 50 km SW San Sebastian). According to STROBL, *obscuriventris* is a darker form of *saginata* especially on thorax and abdomen (segments 3–4 with only slight lateral reddish marks) and wings are more strongly marked but with same pattern as *saginata*.

The study of genitalia of a series of specimens from many parts of Europe has revealed evident discriminating characters showing that *T. obscuriventris* must be given species rank and has a large distribution. The first point agrees with the opinion of TJEDER who labelled the Pyrenees specimens as *T. (E.) obscuriventris*.

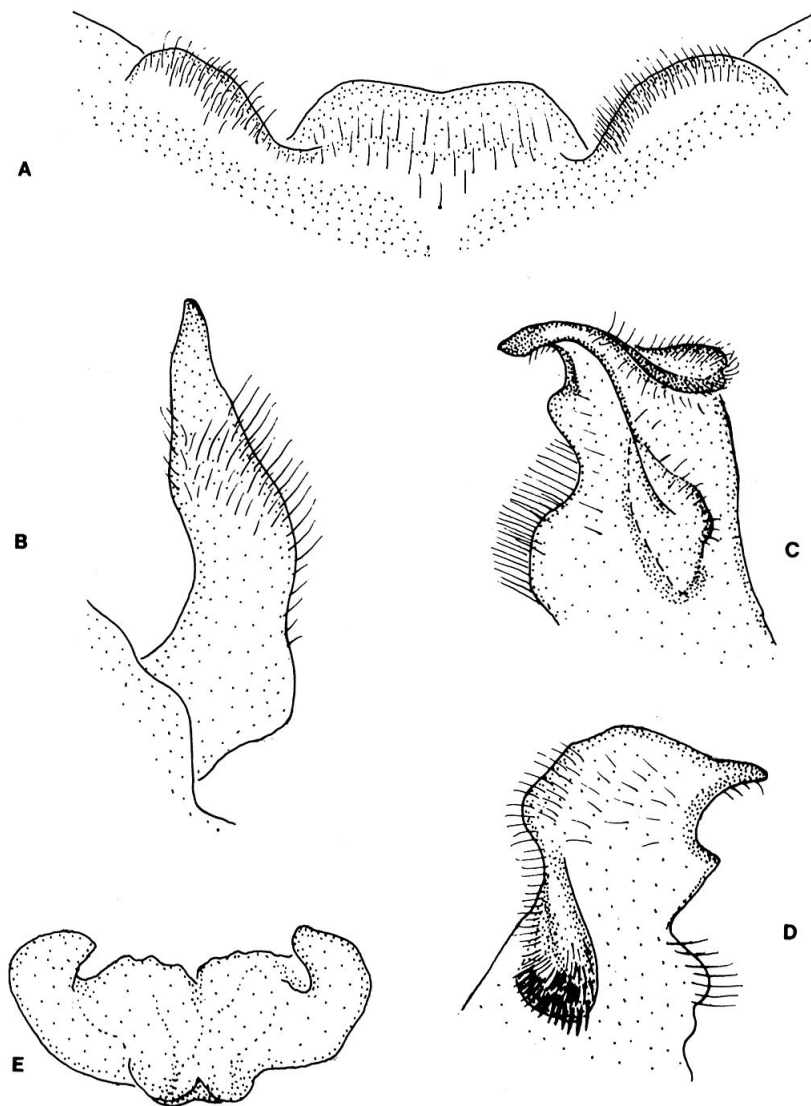


Fig. 4. A–E: *Tipula (Emodotipula) obscuriventris* STROBL ♂ from Isérables, Switzerland; A, posterior extension of tergite 9; B, left od outside; C, left id outside; D, left id inner side; E, proximal appendage of sternite 9.

Discriminating characters

T. obscuriventris shows a great deal of variation in colour of thorax, abdomen and wing, all characters which are not reliable. Grey colour of gena between eye and base of rostrum (also grey) can help separating *obscuriventris* and *saginata* where gena is lighter than vertex and rostrum more brownish. The genitalia of male (fig. 4) are recognized by shape of tergite 9 which is devoid in its central part of a continuous and dense row of dark setae; shape of id and rather short od with curved anterior margin.

The female bears no lateral processes on hypovalvae (fig. 2 C–D) as best seen in ventral view on prepared genitalia. The tip of sternum 9 is narrow at base (fig. 3 A–E).

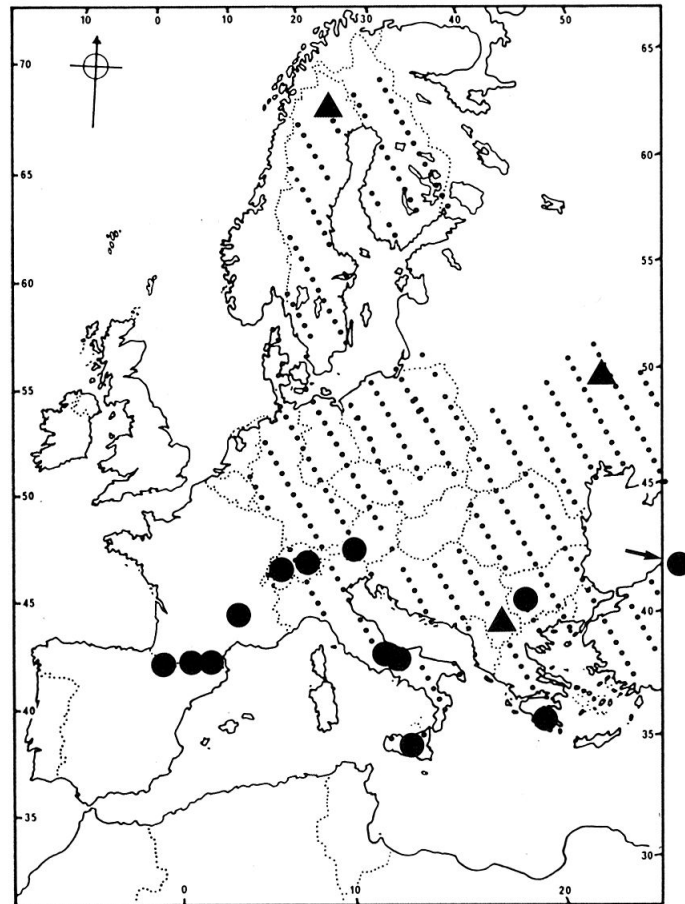


Fig. 5. Distribution of *T. (E.) obscuriventris* STROBL in Europe. Material examined (●); published data with illustrations (▲); countries listed by OOSTERBROEK & THEOWALD, in print (...).

Distribution (fig. 5)

Together with Dr. Pjotr OOSTERBROEK in Amsterdam, we have seen specimens of *obscuriventris* from regions situated between the Spanish Pyrenees, Sicily, Bulgaria and NE Turkey, including Andorra, French Pyrenees, Massif Central, Switzerland (where it is sympatric with *saginata* BERGROTH), and Italy (Abruzzo). Furthermore the following illustrations refer to *obscuriventris*: SAVTSHENKO (1966), Ukraine; SIMOVA (1977), Macedonia; TJEDER (1979), Swedish Lapland.

Particular cases

a) The specimens from Abruzzo (1 ♂, 2 ♀♀) show slight differences: wings with additional mark between distal end of discal cell and fork of veins m1 and m2; lighter body colour and tip of hypovalvae as in fig. 2 E. They are labelled as *Tipula (E.) abruzzina* TJEDER, 1976 (1 ♀ holotype, 1 ♂ 1 ♀ paratypes), an unpublished name. These specimens belong to *obscuriventris* of which *abruzzina* can at most be considered as subspecies. This should only be stated with a larger material.

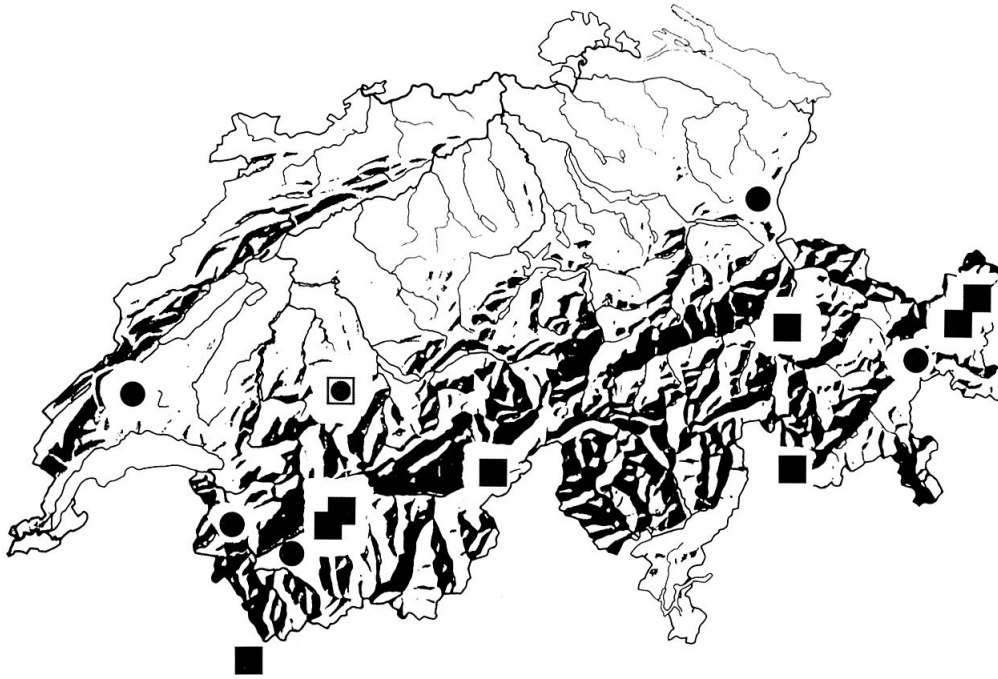


Fig. 6. Distribution of *Tipula (Emodotipula) saginata* BERGROTH (■) and *T. (E.) obscuriventris* STROBL (●) in the Alps.

b) 1 ♂ from Ordesa (Spain) is labelled *T. (E.) libonotica* TJEDER, 1976 Paratype (unpublished name) but it is in fact *obscuriventris* as labelled in 1979 by TJEDER himself.

c) 5 ♀♀ from Switzerland (Vérossaz, Valais) show unusual hypovalvae with slight lateral extensions, somewhat intermediate between *obscuriventris* and *saginata* (fig. 2 F–G). Sternum 9 shows a very small tip (fig. 3 I). Gena is greyish. These females belong probably to *obscuriventris* or possibly to a hybrid-form. In the same locality, 2 typical females of *obscuriventris* have also been collected, but unfortunately no males.

Neotype designation

MORGE (1974, 1976) does not mention a specimen of *saginata* var. *obscuriventris* to be preserved in the STROBL collection in Admont (Austria). P.H. HUBL (in litt.), Prior in Admont, could not trace it either although in STROBL's hand-written catalogue a "♀ aus Spanien" is reported. The type material (1 ♀ from Sierra Aiscurre) is therefore apparently lost. Because of the confusion with *saginata* a neotype of *obscuriventris* is designated here from the Spanish Pyrenees. *Neotype*: 1 ♂, Huesca, Ordesa, 1400–1600 m, 26.7.–2.8.1963, J. LOURENS leg./Paratype of *Tipula (Emodotipula) libonotica* BO TJEDER, 1976 (unpublished name)/*Tipula (Emodotipula) obscuriventris* STROBL, det. TJEDER, 1979 (ZMA).

Other material examined. Spain: 1 ♀, idem neotype/*T. (E.) obscuriventris* STROBL, det. TJEDER, 1979 (ZMA); Andorra: 1 ♂, Las Forcals, 2400 m, 15.7.1958, DE LAEVER leg. (ZMA); France: 1 ♂, Pyr. Centr. Cauterets, 1700–2000 m, 30.6.1960, F. BINK leg. (ZMA); 1 ♀, H. Pyr. Gavarnie, 1650–1830 m, 12.6.1955, K. VOOUS leg. (ZMA); 1 ♂, idem, 1500–1800 m, 9.–11.6.1955, K. VOOUS leg. (ZMA); 1 ♂, H. Pyr. Gavarnie, Dal van La Crabère, 1900–2300 m, 14.6.1955, K. VOOUS leg. (ZMA); 1 ♂, H. Pyr., Gavarnie, Vallée des Espécières, 1650–1850 m, 3.7.1975, A. C. & W. N. ELLIS (ZMA);

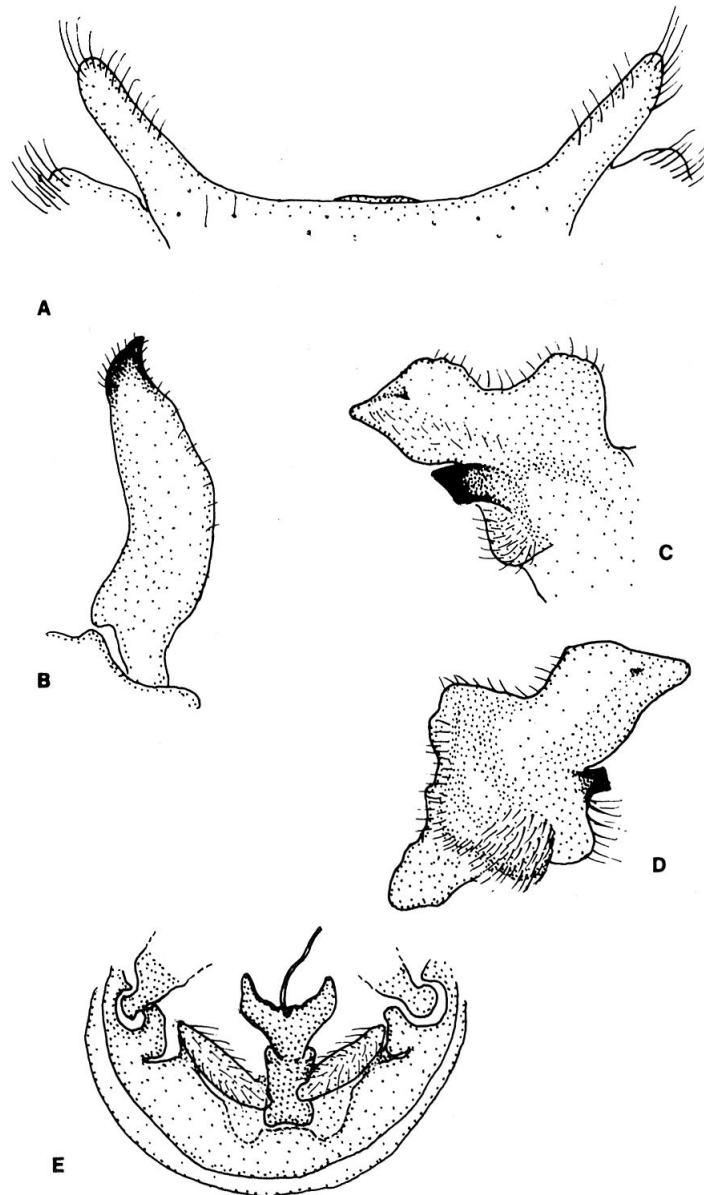


Fig. 7. A–E: *Tipula (Emodotipula) leo* sp. n. ♂; A, posterior extension of tergite 9; B, left od outside; C, left id outside; D, left id inner side; E, hind view of hypopygium showing sternite 8, sternite 9 with distal appendages, adminiculum and base of id.

leg. (ZMA); 1 ♂, Pyr. Centr., Cauterets, 1700–2000 m, 30.6.1960, F. BINK leg. (ZMA); 1 ♀, Pyr. Atl., Gorge Taillon (N. Roncesvalles), (ZMA); 1 ♂, 1 ♀, Pyr. Or., Lac Lanous, 2200 m, 11.7.1983, BRUNHES leg. (MHNN); 1 ♂, F-Puy-de-Dôme, Livradois, le Bouy, 29.4.1984, J. BRUNHES leg. (MHNN); 1 ♀, F-Puy-de-Dôme, Besse, 9.6.1989, J. BRUNHES leg. (MHNN); Switzerland: 2 ♀, Weissenburg (BE), Coll. HUGUENIN (ETH, Zurich); 3 ♂, 2 ♀, Iséables (VS), 20.6.1979, C. DUFOUR leg. (Musée cantonal de zoologie de Lausanne MZL); 1 ♂, Eclépens (VD), Venoge, 9.5.1978, C. DUFOUR leg. (MZL); 1 ♀, les Giettes (VS) (Vérossaz), 1200 m, 16.6.1982, C. DUFOUR leg. (MHNN); 6 ♀♀, Vérossaz (VS), 1220 m, 3.6.1990, C. DUFOUR leg. (MHNN); 1 ♂, Säntis (AR), Platte, 29.5.1949, 1280 m, E. HANDSCHIN leg. (NMB); 1 ♀, Zernez, 18.6.1953, 1717 m, Strauch, E. HANDSCHIN leg. (NMB); Italy: 1 ♀, L'Aquila, Assergi, Valle de Vasto, 900–1000 m, 29.7.1960, BR. THEOWALD leg./Holotypus ♀ *Tipula (Emodotipula) abruzzina* BO TJEDER, 1976 (this is an unpublished name) (ZMA); 1 ♂, 1 ♀, idem/Paratypes, idem; 1 ♂, Marche, sources of the Nera, 900 m, 1.8.1978, MALICKY leg. (ZMA, alcohol); 1 ♀, Marche, 5 km E Visso, 1.8.1980, MALICKY leg. (ZMA,

alcohol); 1 ♀, Sicily, Monti Nebrodi, M Sera del Re, 1650 m, 25.6.1986, BORCHARD & GERECKE leg. (ZMA, alcohol); Austria: 1 ♀, Karawanken, Loibl-Pass, Northslope, 800 m, 18.6.1977, MALICKY leg. (ZMA, alcohol); Greece: 3 ♂♂, 3 ♀♀, Péloponnèse, Lakonia, Taiyetos Oros, 7 km WSW Paliopanyia, 1200 m ?, torrent, gros blocs moussus (*Platanus*), 12.6.1990, st. 21a, J.-P. HAENNI & C. DUFOUR leg. (MHNN); Bulgaria: 1 ♂, 2 ♀, Witoscha Nordhang, 1200 m (42°40'N/23°19'E), 24.6.1980, H. MALICKY leg. (ZMA); Turkey (NE): 1 ♀, Rizes Cat, 1200 m, 1.8.1967, STEINER leg. (ZMA, dry).

Tipula (E.) leo sp. n.
(fig. 7 A–E, fig. 8 A–C)

Type material. Holotype ♂: Espagne-Granada, Sierra Nevada, 28.IX.1989, C. DUFOUR & J.-P. HAENNI leg. /4,5 km SE Güejar-Sierra, Convento Alhambra, 1500 m, bord ruisseau, ravin boisé abrupt, St. 15 (Musée d'histoire naturelle de Neuchâtel); paratype: 1 ♀, idem holotype (Musée d'histoire naturelle de Neuchâtel).

Description ♂: Head, rostrum and nasus olivaceous brown; narrow dark brown occipital band running to frontal tubercule, a dark brown stripe on side of rostrum near base of palpi of same colour. Antennae 13 segmented, dark except scape and pedicel yellowish.

Thorax: olivaceous brown, lateral praescutal stripes with conspicuous dark brown margin, the median stripes well separated by thorax ground colour with thinner dark margin on outer side only. A continuous median brown stripe on scutum, scutellum and mediotergite. 2 distinct lateral marks on scutum identical in colour to lateral praescutal stripes. Pilosity scarcer than in *T. saginata*. Coxae and trochanter grey; femora light brown, black on apical 9th only; tibia slightly

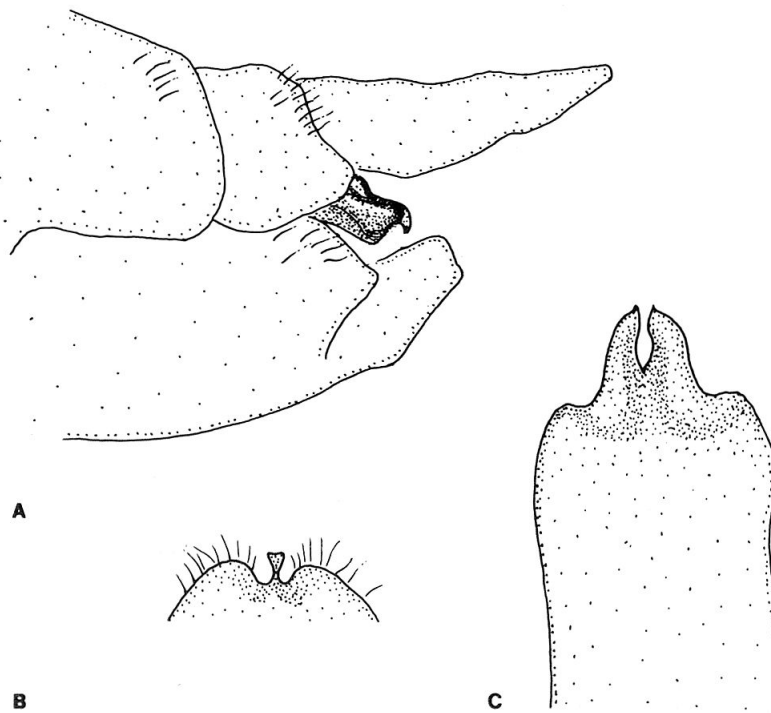


Fig. 8. A–C: *Tipula (Emodotipula) leo* sp. n. ♀; A, hypovalvae, lateral view; B, tip of sternum 9; C, hypovalvae, ventral view.

darker, with black apical tip; tarsi dark brown; tibial spurs 1,1,2; no secondary tooth on claw. Wing with contrasted pattern; fork of veins m1 and m2 touching discal cell; neala with bristles.

Abdomen: large dorsal mark on tergite 1, narrower on following segments, sides of tergites 1–5 yellowish-brown, with only thin dark margin; tergites 6–9 mostly dark; sternites 1–5 yellowish-brown; sternites 6–8 dark.

Hypopygium (fig. 7): very long lateral processes on tergite 9, curved od with sclerotized tip, very distinctive id, no fleshy proximal appendage on sternite 9, but clearly developed distal appendage on sternite 9 near base of adminiculum.

♂. Body length 13 mm; with length 19 mm.

Description ♀. As ♂ in colour pattern; genitalia (fig. 8): cerci short; hypovalvae without lateral processes; tip of sternum 9 very small and narrow at base.

♀. Body length 16 mm, wing length 20 mm.

Biotope: The new species was collected along a fast running stream about 1 m wide, in the shelter of a deciduous forest. The female was caught laying eggs in flight, just above the water surface.

Distribution: Sierra Nevada

Etymology: This beautiful species is dedicated to Dr. THEOWALD VAN LEEUWEN (lion in Dutch) who always inspired the author by transmitting his knowledge and joy to study Tipulidae.

Systematical remark: the hypopygial differences between *saginata* and *obscuriventris* are less striking than between these two species and *leo*. Therefore the first two species mentioned must be considered sister species. The lateral process on the hypovalvae of *saginata* is apparently an autapomorphous character for this species because such a process is not found in *submarmoratipennis* ALEXANDER, *leo* or *obscuriventris*.

NOTE ON THE ANATOMY OF FEMALE OF THE SUBGENUS *EMODOTIPULA*

TJEDER (1979) has described in females of *Emodotipula* a pair of soft, pale sac-like structures on the intersegmental membrane between tergites 9 and 10, named by him sacculi laterales and suspected to emit a sex pheromone. A second pair of sacculi laterales was present between tergites 8 and 9 in some newly emerged females.

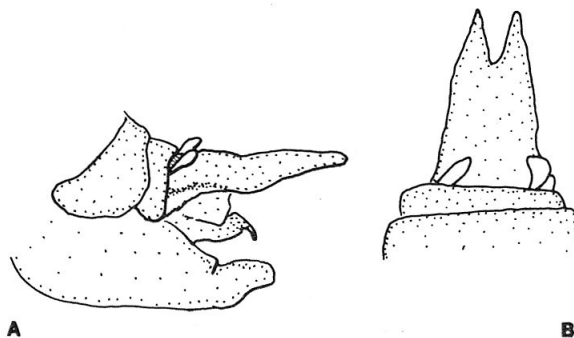


Fig. 9. Sacculi laterales between tergite 9 and 10 of females of subgenus *Emodotipula* (*Tipula obscuriventris* STROBL ♀ from Isérables, Valais).

The specimens illustrated by TJEDER belong to *T. obscuriventris* STROBL (1 ♀, Pyrenees) and according to this author to an undescribed species for a female from Swedish Lapland. However we believe that the figure given by TJEDER of the latter also refers to *obscuriventris*. This species shows some variation in the hypovalvae and males are needed for a further decision.

We have observed sacculi laterales in all females examined of *Tipula obscuriventris* (fig. 9) though they might be quite un conspicuous in some dry specimens. They are present as well in all females of *Tipula saginata* BERGROTH as well as in the only known female of *Tipula leo* sp. n. Furthermore the eastern palaeartic *Tipula (E.) submarmoratipennis* ALEXANDER from Kashmir (India) also possesses these sacculi, as checked lately on one dry specimen deposited in the British Museum (London).

ACKNOWLEDGMENTS

I would like to thank Dr. M. BRANCUCCI (Basel), Dr. M. SARTORI (Lausanne) and Prof. W. SAUTER (Zurich) for sending loan material. I am also most grateful to Dr. P. OOSTERBROEK (Amsterdam) for his valuable and critical advices, for making rare or little known literature available and for checking and improving the manuscript.

RÉSUMÉ

L'identité de *Tipula (Emodotipula) saginata* BERGROTH et *T. (E.) obscuriventris* STROBL, et la description de *Tipula (E.) leo* sp. n. de la Sierra Nevada en Espagne (Diptera, Tipulidae). – *Tipula (Emodotipula) leo* sp. n. est décrite d'après un mâle et une femelle capturés le long d'un ruisseau à cours rapide coulant à l'ombre d'une forêt caducifoliée des contreforts de la Sierra Nevada. La nouvelle espèce diffère largement des deux autres espèces du sous-genre *Emodotipula* présentes dans la région paléarctique occidentale qui font l'objet d'une révision et pour lesquelles des néotypes sont désignés.

REFERENCES

- BERGROTH, E. 1891. Beitrag zur Tipuliden-Fauna der Schweiz. – *Mitt. natf. Ges. Bern 1891*: 137–138.
- MORGE, G. 1974. Das Naturhistorische Museum des Stiftes Admont, Diptera collectionis P. Gabriel Strobl. 5. Die «Typen-Sammlung». – *Beitr. ent. 24 (Sonderheft)*: 161–431.
- MORGE, G. 1976. Diptera Collectionis P. Gabriel Strobl. 8. Verzeichnis der Dipteren-Arten der Kollektion Strobl. – *Beitr. ent. 26*: 339–439.
- OOSTERBROEK, P. & THEOWALD, Br. in print. Family Tipulidae. In: SOOS, A. & PAPP, L. (ed.) *Catalogue of palaeartic Diptera, vol. 1. Akademiai Kiado (Budapest) & Elsevier (Amsterdam)*.
- SAVTSHENKO, E. N. 1964. Tipulidae. In *Fauna URSS (n. s.) 89 (Diptera II)*: 1–504.
- SAVTSHENKO, E. N. 1966. Tipulidae. In *Fauna Ukraini 14 Insecta Diptera 1*: 1–552.
- SIMOVA, D. 1977. Tipulidae (Diptera). In *Faune de Macédoine III*: 1–198. Skopje.
- STROBL, G. 1900. Spanische Dipteren. XII Theil. XXII. Tipulinae. – *Wien. Ent. Ztg. 19*: 207.
- THEOWALD, Br. 1980. 15. Tipulidae. – In LINDNER, E. (Ed.) *Fliegen paläarkt. Region 324*: 437–538, Stuttgart.
- TJEDER, B. 1979. Presence of abdominal sacculi laterales in females of the subgenus *Emodotipula* (Diptera, Tipulidae). *Ent. scand. 10*: 241–243.

(received September 23th 1990)