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## DESCRIPTIONS OF FOUR NEW SPECIES OF TIPULIDAE FROM THE ALPES-MARITIMES IN SOUTHERN FRANCE (DIPTERA, TIPULIDAE)

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*Key-words:* new species; ice-age refugium; France; Alpes-Maritimes; *Tipula*; *Lunatipula*; *Emodotipula*; *Pterelachisus*; *Yamatotipula*

### Summary

*Tipula (Emodotipula) gomina* sp.n., *Tipula (Lunatipula) vesubiana* sp.n., *Tipula (Pterelachisus) cayollensis* sp.n., *Tipula (Yamatotipula ?) roya* sp.n. are described after specimens collected in the Département des Alpes-Maritimes in France. The concentration of many still undescribed species in this small area shows how much this ice-age refugium located at the meeting point of the Alpine chain and the Mediterranean Sea has remained undercollected.

### Résumé

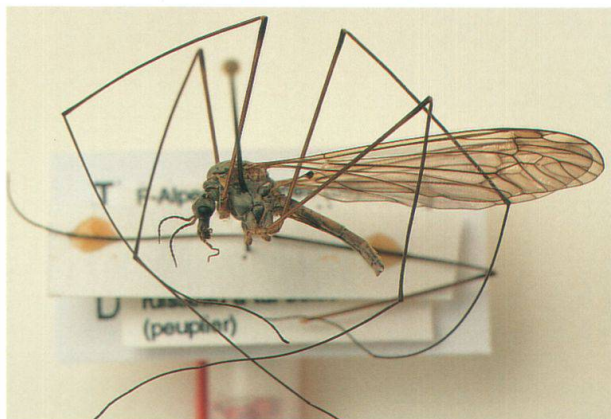
*Tipula (Emodotipula) gomina* sp.n., *Tipula (Lunatipula) vesubiana* sp.n., *Tipula (Pterelachisus) cayollensis* sp.n., *Tipula (Yamatotipula ?) roya* sp.n. sont décrites d'après des spécimens collectés dans le Département des Alpes-Maritimes en France. La concentration, sur ce petit territoire, de plusieurs espèces encore non décrites montre à quel point le refuge glaciaire situé au point de contact de la chaîne alpine et de la mer Méditerranée est encore resté trop peu prospecté.

### INTRODUCTION

Until now the Tipulidae fauna of the Southern Alps in France had not been collected actively. Therefore we organised three short trips to this region, the first in June 1994 with Jean-Paul Haenni, the second in July 1995 with Willy Geiger and the third in October 1995 with my son Robin Dufour and my nephew Colin Dufour. Further specimens were brought to study by Pjotr Oosterbroek who visited this region in late August and early September 1995 and by Jacques Brunhes. Altogether 725 specimens belonging to 63 species collected in 73 localities have been studied. This list is published extensively in this volume (DUFOUR, 2003) and follows other surveys in the Pyrenees and in the Massif Central. Among this material, four new species have been recognised and are described in the present publication. The terms employed in the descriptions are in accordance with MCALPINE, 1981.



## DESCRIPTIONS

***Tipula (Emodotipula) gomina* sp.n.**  
(Figs 1, 2 A-C)

**Figure 1:** Habitus of *Tipula (Emodotipula) gomina* sp.n. Holotype (hypopygium removed).

*Type material*

Holotype ♂: F-Alpes-Maritimes (06); Entraunes 1km N; 1440m; ruisseau à tuf boisé, peuplier; station 43b; 16.6.1994; Haenni J.-P. & Dufour C. leg; Muséum d'histoire naturelle de Neuchâtel; dry

*Description*

**Male** (Fig. 1). Head, rostrum and nasus grey; narrow dark brown occipital band running to frontal tubercle, a brownish shining region on side of rostrum near base of palpi of same colour. Antennae 13 segmented, dark except brownish scape and pedicel.

Thorax grey, lateral praescutal stripes grey surrounded by a narrow dark brown margin, median stripes separate, grey, with thin dark brown margins on outer and inner side. A continuous median dark brown stripe on scutum, scutellum and mediotergite. Lateral mark on scutum faint with brown margin on inner side only. Dense pale pilosity as in *T. saginata* Bergroth, 1891. Coxae grey; trochanter and femora brown, the latter black on apical 9th only; tibiae entirely dark; tarsomeres dark; tibial spurs 1,1,2; no secondary tooth on claw.

Wing with faint pattern; fork of vein m1 and m2 petiolated; neala with bristles.

Abdomen: tergite 1 grey, 2-4 reddish-brown with apical and lateral pale margins; tergites 5-9 mostly dark; sternites 1-5 reddish-brown; sternites 6-8 dark.

Hypopygium (Fig.2 A-C): tergite 9 with a remarkable row of very long stiff hairs on posterior margin and a sclerotized lateral process, outer gonostylus short, curved, swollen medially with a clearly sclerotized tip, inner gonostylus distinctive, sternite 9 devoid of any setae or hairs, bearing a fleshy, white, poorly developed proximal appendage and a pair of swellings on either side on the genital opening.

Body length 14 mm; wing length 20 mm.

*Female*: unknown

*Biotope*

The habitat of *T. gomina* sp.n. is a mountain stream with large deposits of tufa (Fig. 3). It flows through a stripe of damp and steep forest with dominant *Fraxinus* and *Populus tremula*.

Other species collected in the same biotope include six species of *Tipula* (*Lunatipula*): *bullata* Loew, 1873; *falcata* Riedel, 1913; *fascingulata* Mannheims, 1966, *handschini* Mannheims, 1967; *lunata* Linnaeus, 1758 and *T. (Schummelia) zonaria* Goetghebuer, 1921.

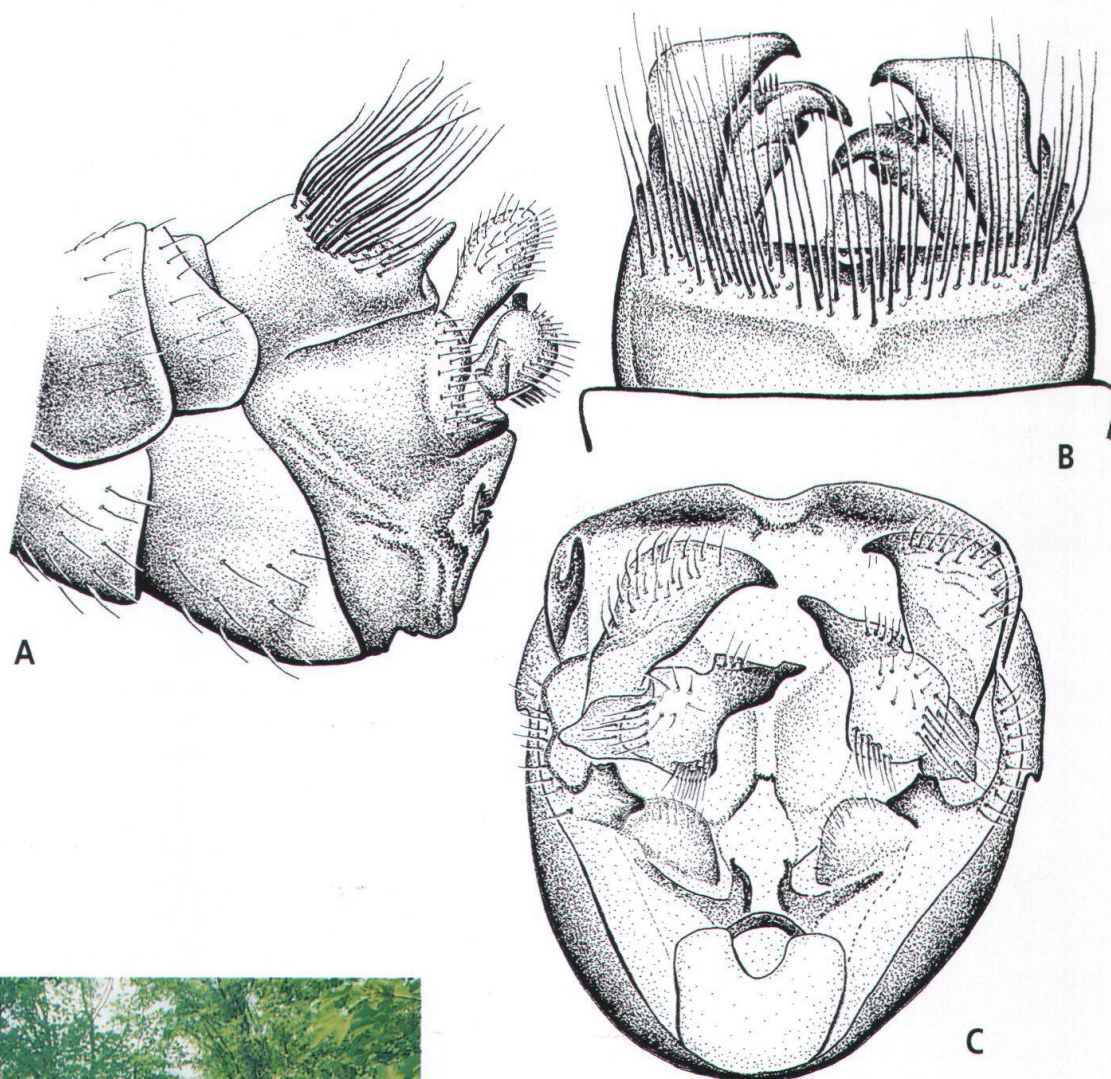
*Etymology*

Name referring to the setae on tergite 9 which are as combed with gomina (hair gel). Name used in apposition.

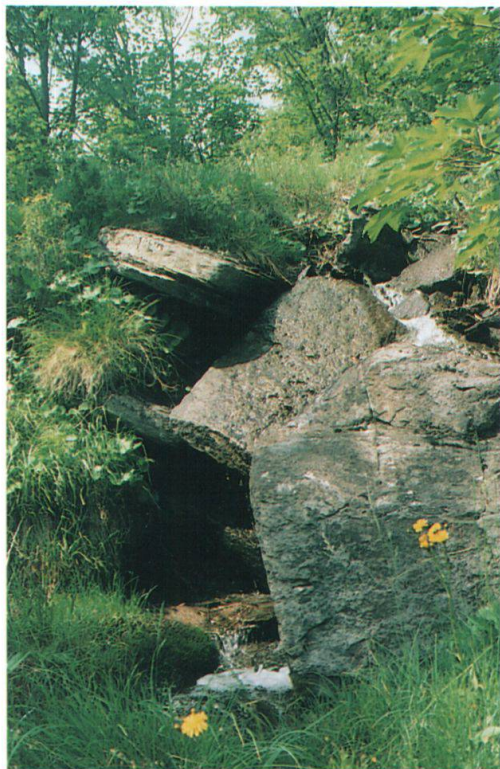
*Discussion*

*Tipula (Emodotipula) gomina* is not easy to relate to the other three *Emodotipula* species of the West Palaearctic. It doesn't show any clear relationship with





**Figure 2:** *Tipula (Emodotipula) gomina* sp.n.; male: A: hypopygium left view; B: hypopygium upper view, C: hypopygium hind view.



**Figure 3:** Type-locality of *Tipula (Emodotipula) gomina* sp.n.



the closely related *T. saginata* Bergroth, 1891 and *T. obscuriventris* Strobl, 1900 (DUFOUR, 1991) neither with *Tipula* (*Emodotipula*) *leo* described from the Sierra Nevada in Spain and collected since by H. de Jong in Morocco; 1 ♂, 1 ♀, Rif Mountains, ZMAN, (P. OOSTERBROEK, comm. pers.). The ninth tergite of *gomina* shows resemblance to the asiatic *T. multibarbata* Alexander, 1935 and *T. multisetosa* Alexander, 1935 which also have lateral processes and long hairs (for illustrations, see SAVTSHENKO, 1964). But otherwise the hypopygia of these two asiatic species are quite different: they bear developed hairs medially and laterally on sternite 8, whereas *gomina* has none. *Tipula* (*Emodotipula*) *leo* has long lateral processes on tergite 9, but no setae and no long hairs. *T. saginata* Bergroth, 1891 and *T. obscuriventris* have neither long lateral processes on tergite 9, nor long hairs. The latter two species are easily identified by the presence on sternite 9 of a large fleshy proximal appendage. This appendage is present although very much reduced in *gomina* and lacking in all other species mentioned. *Tipula* (*Emodotipula*) *leo* bears on sternite 9 a pair of rounded swellings on either side of the genital opening similar to those found in *gomina* (for illustrations, see DUFOUR, 1991). Similar swellings are also present in *saginata* and *obscuriventris* but they are mostly hidden by the large fleshy proximal appendage. The outer gonostylus of *Tipula* (*Emodotipula*) *gomina* which is curved and strongly swollen in the middle offers an easy and reliable character to separate this species from the other mentioned here.

#### Distribution

Known only from type locality.

#### *Tipula* (*Lunatipula*) *vesubiana* sp.n. (Figs 4, 5A-H)



Figure 4: Habitus of *Tipula* (*Lunatipula*) *vesubiana* sp.n. Paratype from Dalmas de Tende

#### Type material

Holotype ♂: F-Alpes-Maritimes (06); Isola 4.5 km NE; 1400m; Refuge de Chastellar; forêt de Mélèze moussue, torrent; station 6; 12.7.1995; Dufour C. & Geiger W. leg; Muséum d'histoire naturelle de Neuchâtel; dry

Paratypes: 2 ♀ idem holotype; dry/alcohol

F-Alpes-Maritimes (06); Boréon Val ?; 1 ♂; 18.7.1960; J. Lucas leg; Zoologisch Museum Amsterdam; dry

F-Alpes-Maritimes (06); Cayolle, Col de, Ref. de la Cantonnière; 1800m; Larix; 1 ♂; .8.1995; Oosterbroek P. & Hartveld C. leg; Zoologisch Museum Amsterdam; dry

F-Alpes-Maritimes (06); Dalmas de Tende 4.5km W; 1250m; noisetiers; 1 ♂; 28.8.1995; Oosterbroek P. & Hartveld C. leg; Zoologisch Museum Amsterdam; dry

F-Alpes-Maritimes (06); Tende, rte du col; 1000m; forêt de feuillus, rivière; 1 ♂; 30.8.1995; Oosterbroek P. & Hartveld C. leg; Zoologisch Museum Amsterdam; dry

F-Alpes-Maritimes (06); Turini Col, L'Authion; 2000m; ruines du fort; prés; 1 ♀; 29.8.1995; Oosterbroek P. & Hartveld C. leg; Zoologisch Museum Amsterdam; dry

*Other material*

Italia, Cuneo, Terme di Valdieri, 1400m, 1 ♂; 1.8.1969, leg Dr. Wagener, Zoologische Forschungsinstitut und Museum "Alexander Koenig" (P. OOSTERBROEK, comm. pers.)

*Description*

*Male* (Fig.4). Head: rostrum and nasus yellowish brown; occiput more greyish; no conspicuous occipital stripe; palpi brown. Antennae 13 segmented, dark except scape and pedicel brownish.

Thorax mostly grey; praescutal and scutal stripes only faintly darker than thorax ground colour; pilosity thin and golden. Coxae, trochanter, femora, tibiae and tarsi yellowish brown; tibial spurs 1,2,2; a secondary tooth on claw present. Wing mostly uniform, with a milky stripe extending from base of stigma to cell M4 across discal cell; cubital vein slightly infuscate along cubital cell; neala with bristles.

Abdomen: mostly yellowish; tergite 1 and 2 lighter than the following.

Hypopygium (Fig.5 A-G): tergite 9 with 4 strong spines inside margin on either side of the broadly v-shaped median posterior extensions. Outer gonostylus elongate, not clubbed. Inner gonostylus strongly sclerotized; its bill made quadrangular by a dorsal crest. Sternite 9 with a dense brush of setae curved inwards, among which 2 or 3 are spine-like. Lateral appendages of adminiculum conspicuous, trifurcate and sclerotized.

Body length 14-15 mm; wing length 18-19 mm.

*Female* (Fig. 5 H): general colour as in male. Antenna: pedicel lighter than scape and flagellum; segments 4-6 lighter apically. Abdomen: tergites thinly bordered with white apically; more widely laterally.

Hypovalvae: in lateral view, outer margin of hypovalvae horizontal not extended upward and not hiding base of inner crests. In ventral view, apical part of hypovalvae curved inwards.

Body length 17 mm; wing length 18 mm

*Biotope*

This species was collected in a vast range of biotopes from deciduous forests near Col de Tende at 1000m up to 2000m near the Col de l'Authion at tree limit. Intermediate habitats include *Corylus* as well as *Larix* forests.

Other species collected in the same biotopes include *Nephrotoma submaculosa* Edwards, 1928; *Tipula* (*Lunatipula*) *bulbata* Loew, 1873; *falcata* Riedel, 1913; *livida* Van der Wulp, 1858 and *T. (Schummelia) zonaria* Goetghebuer, 1921.

One further locality is known on the Italian slopes of the Alps, 1400m, in the province of Cuneo.

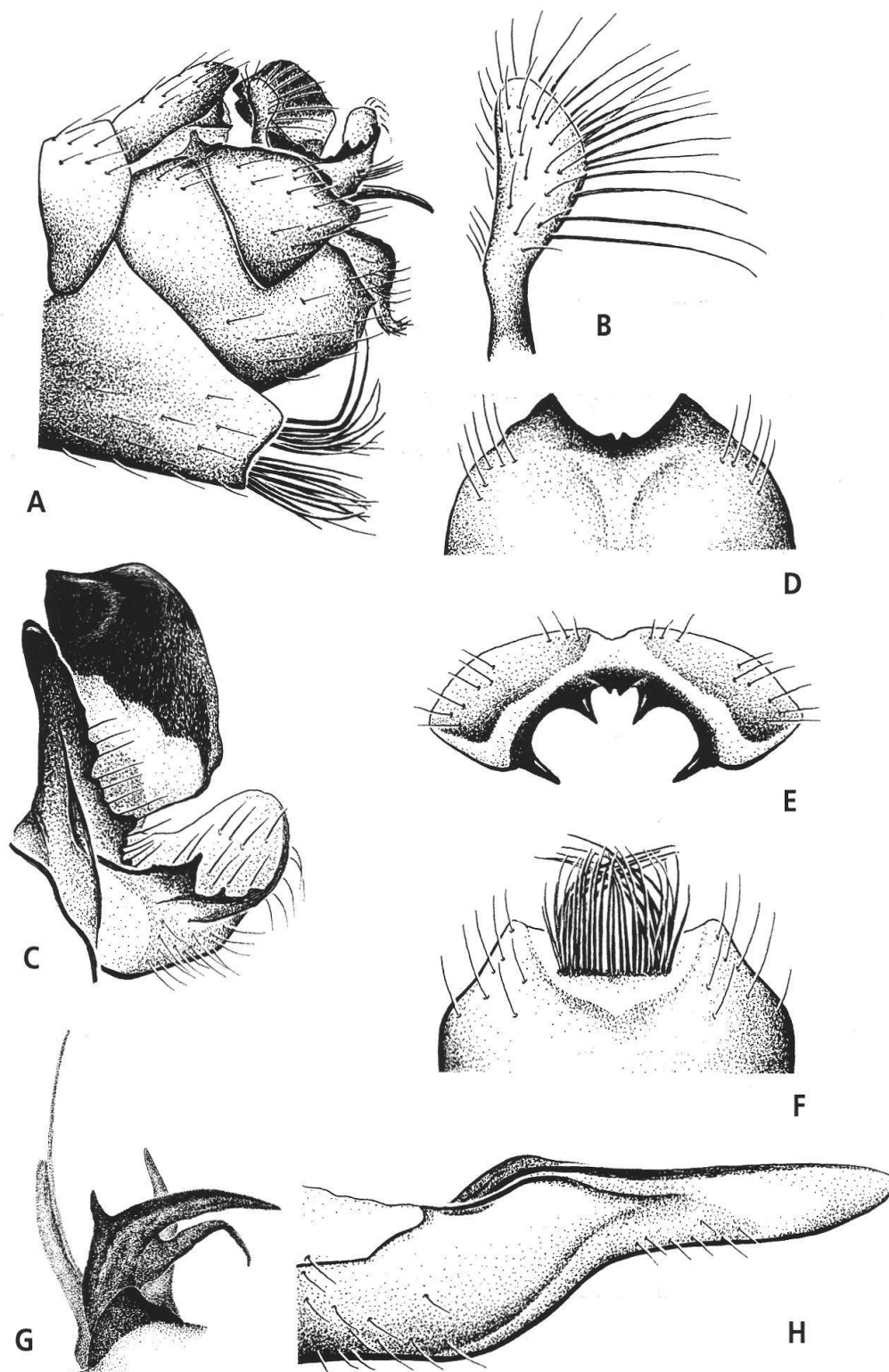
*Etymology*

Named after the Vesubie Valley north of Nice. Name used as an adjective.

*Systematical remark*

*Tipula* (*Lunatipula*) *vesubiana* sp.n. is very similar to *Tipula* (*Lunatipula*) *limitata* Schummel, 1833 (male and female genitalia illustrated in THEOWALD, 1973 Fig. 285) from which it can be separated by genitalia characters only. Differences between males of *vesubiana* and *limitata* include: tergite 9 with four strong lateral spines inside margin in *vesubiana* (Fig. 5E), these absent in *limitata*; outer gonostylus elongate in *vesubiana* (Fig. 5B), clubbed in *limitata*; inner gonostylus roughly rectangular, due to shape of dorsal crest in *vesubiana* (Fig. 5C), roughly triangular in *limitata*; lateral appendage of adminiculum trifurcate in *vesubiana* (Fig. 5G), reduced to a small conical spine,



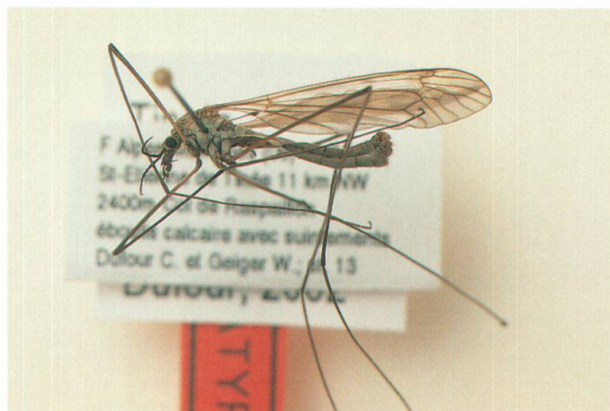


**Figure 5:** *Tipula* (*Lunatipula*) *vesubiana* sp.n.; male: **A**: hypopygium left view; **B**: outer gonostylus outside; **C**: inner gonostylus outside; **D**: tergite 9 upper; **E**: tergite 9 behind; **F**: sternite 8 below; **G**: adminiculum left. Female: **H**: hypovalvae left.

flanked medially by a discrete unsclerotized lobe in *limitata*.

Females of *vesubiana* (Fig. 5H) lack a clearly dorsally extended margin of hypovalvae covering the side of tergite 10 (when valves of ovipositor are set together), which is a good identification character for *limitata*.

***Tipula (Pterelachisus) cayollensis* sp.n.  
(Figs 6, 7A-E)**



**Figure 6:** Habitus of *Tipula (Pterelachisus) cayollensis* sp.n. Paratype from Col de Raspaillon.

*Type material*

Holotype ♂: F-Alpes-Maritimes (06); St-Etienne de Tinée 11 km NW; 2400m; Col de Raspaillon; éboulis calcaire avec suintements; station 13; 13.7.1995; Dufour C. & Geiger W. leg; Muséum d'histoire naturelle de Neuchâtel; dry

Paratypes: 1 ♂ idem holotype;

F-Alpes-de-Haute-Provence (04); Cayolle, Col de la 1,3km N; 2240m; versant N, sous refuge; pâturage sur calcaire/silice; station 45; 1 ♂; 16.6.1994; Haenni J.-P. & Dufour C. leg; Muséum d'histoire naturelle de Neuchâtel; dry

*Description*

**Male** (Fig. 6). Head, rostrum and nasus grey; 13 antennal segments; scape, pedicel and flagellum dark grey; flagellar segments short (length of segments 3+4=1.3 length of scape); eyes small, widely separated below (space 3-4 times wider than scape).

Thorax grey bearing 3 brown praescutal stripes; the lateral very faint, the central distinct, lightened proximally except for a narrow central line (trifurca). Wings with distinct hyaline markings; neala without bristles. Coxa and trochanter grey; base of femora lighter than tibiae and tarsomeres; claws with a secondary tooth.

Abdomen mostly grey, faint lateral markings on sides of tergites 2-3.

Hypopygium (Fig. 7 A-E): posterior extension of tergite 9 most characteristic, central spine shorter than mediocentral. Outer gonostylus rather wide before tip. Inner gonostylus very similar to that of *T. padana* Dufour, 1981. Posterior extension of sternite 8 with long thin hairs.

Body length 13 mm; wing length 15-16 mm.

*Female*: unknown

*Biotope*

The biotopes of this alpine species are located in limestone screes above tree limit (Fig.8). The very sparse vegetation is concentrated where some water keeps the finest soil slightly damp.

Other species collected in the same biotopes include *T. (Savtshenkia) subnodicornis* Zetterstedt, 1838; *T. (Yamatotipula) lateralis* Meigen, 1804 and in the neighbourhood *T. (Vestiplex) excisa* Schummel 1833 and *pallidicosta* Pierre, 1924.

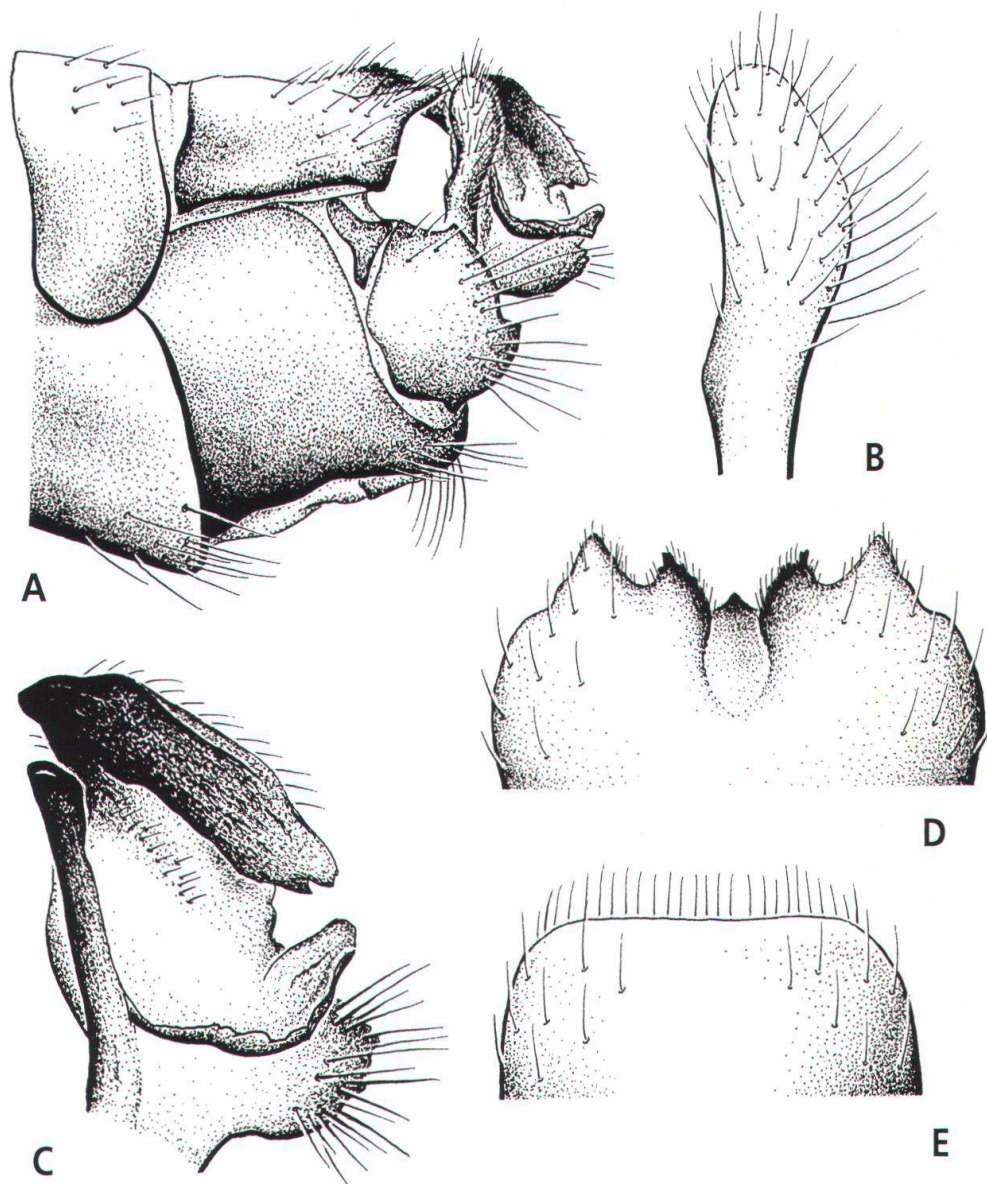
*Etymology*

Named after the Cayolle Pass, locality where this species was first collected. Name used as an adjective.

*Discussion*

*Tipula (Pterelachisus) cayollensis* sp.n. is very closely related to *Tipula (Pt.) austriaca* Pokorny, 1887 and *Tipula (Pt.) padana* Dufour, 1981 and close examina-





**Figure 7:** *Tipula (Pterelachisus) cayollensis* sp.n.; male: **A:** hypopygium left view; **B:** outer gonostylus outside; **C:** inner gonostylus outside; **D:** tergite 9 upper; **E:** sternite 8 below.

tion of its genitalia is required for a reliable identification. It shares with both species a very similarly built inner dististylus, a sparse pilosity of sternite 8, but it differs from them by the shape of tergite 9, the central spine of which is smaller than the mediocentral. This character is also present in *T. pabulina* Meigen, 1818, but in this species the hind part of inner dististylus is

quite differently shaped and sternite 8 bears a dense brush of golden setae. Additionally the new species can be separated from *austriaca* by the 13 antennal segments (14, rarely 15 in *austriaca*), and the very faint lateral praescutal stripes (distinct in *austriaca*); from *padana* by the very faint lateral praescutal stripes; the clearly spotted wing (faintly spotted in *padana*);



grey trochanters (brown as base of femora in *padana*) and the lack of distinct lateral markings on abdominal segments 2-5.



**Figure 8:** Type locality of *Tipula (Pterelachisus) cayollensis* sp.n.

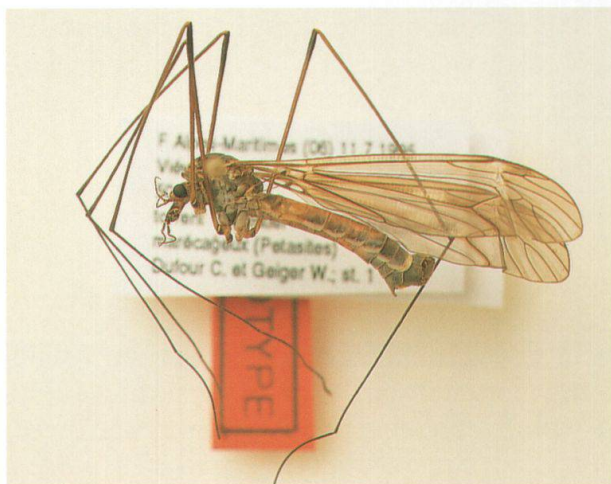
***Tipula (Yamatotipula ?) roya* sp.n.**  
(Figs 9, 10 A-F)

*Type material*

Holotype ♂: F-Alpes-Maritimes (06); Viévol 0.8 km W; 500m; torrent forestier avec suintements marécageux (*Petasites*); station 1; 11.7.1995; Dufour C. & Geiger W. leg; Muséum d'histoire naturelle de Neuchâtel; dry

Paratypes: 2♂ idem holotype; 1♂ idem Zoologisch Museum Amsterdam

3♂: F-Alpes-Maritimes (06); Saorge 5 km WNW; 723m; Vallon de Cayros; torrent forestier; station 2; 11.7.1995; Dufour C. & Geiger W. leg; Muséum d'histoire naturelle de Neuchâtel; dry



**Figure 9:** Habitus of *Tipula (Yamatotipula ?) roya* sp.n. Holotype.

*Description*

*Male* (Fig. 9). Head: rostrum, palpi and long nasus grey brown; gena lighter, more rufous brown; occiput grey brown without a distinct occipital stripe. Antennae 13 segmented, short (length of segments 3+4=length of scape), reddish brown at base progressively darker towards tip.

Thorax: grey, lateral praescutal stripes grey bordered with a broad dark brown margin, the median praescutal stripes grey, mostly separate and fused apically only, with narrow dark brown margin on outer and inner side. Scutum, scutellum and mediotergite dark grey. A long, golden pilosity on side of praescutum, between praescutal stripes, on side of scutum, on scutellum and mediotergite, as well as on sternopleurite; pleurae grey; coxae grey, trochanter reddish brown with apical black marking, femora brown with dark band on last apical tenth, tibiae brown darkened only at tip; tibial spurs 1,2,2; tarsomeres dark brown; a secondary tooth on claw present. Wing slightly infusate with faint pattern; a distinct white mark above cubital vein before m-cu and a white stripe from base of light brown stigma to discal cell; rs only 1.65 as long as m-cu; neala without bristles.



Abdomen: tergite 1 dull brown dorsally with a broad light grey lateral margin, tergites 2-5 reddish brown with narrow apical and broad lateral light grey margins, tergites 6-7 mostly dull brown, tergite 8 mostly light with a lobed angle; sternites 1-4 reddish brown; sternite 5 dull brown apically; 6-8 dull brown.

Hypopygium (Fig. 10 A-E): tergite 9 with long, flattened posterior extensions devoid of spines, outer gonostylus long, narrowed apically; inner dististylus divided in three part: from inside to outside, a broad bill-shaped lobe densely haired medially, a branched lobe bearing finger or spine-like extensions, a strong lateral spine (the hind part of inner dististylus is devoid of a posterior extension); closed foramen for outer gonostylus and inner gonostylus; genital bridge complete (Sp1-Sp2 sensu NEUMANN, 1958); sternite 8 with conical median extension; a sparse brush of pale hairs on side of sternite 9; lateral appendages of adminiculum curved, clubbed and swollen apically.

Body length 17-20 mm; wing length 23-26 mm.

*Female*: unknown

#### *Biotope*

This conspicuous species was collected along two streams flowing through a deciduous forest in mountainous surroundings. In Viévol, it was found near drippings causing a very wet patch of soil with *Petasites*. The Cayros locality is to be found just at the entrance of the Parc national du Mercantour.

Accompanying species include *Nephrotoma cornicina* (Linnaeus, 1758); *Tipula* (*Lunatipula*) *bullata* Loew, 1873; *falcata* Riedel, 1913; *helvola* Loew, 1873; *lunata* Linnaeus, 1758; *T. (Schummelia) zonaria* Goetghebuer, 1921 and *variicornis* Schummel, 1833.

#### *Etymology*

Named after the Roya Valley, the type locality south of Tenda Pass. Name used in apposition.

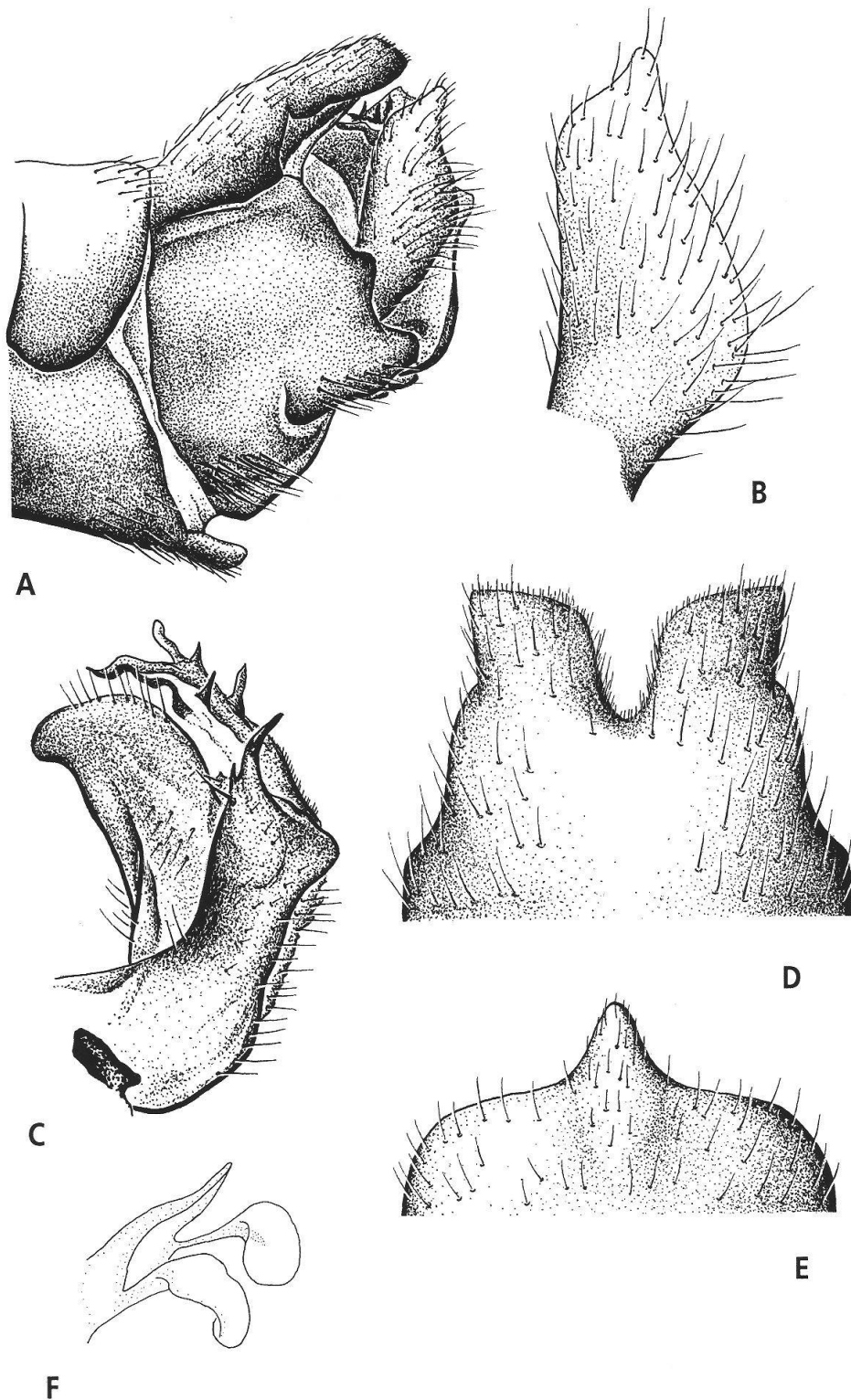
#### *Discussion*

This remarkable species is by no doubt very closely related with *Tipula riedeli* Mannheims, 1952 as shown by general structure of hypopygium. The most striking differences shown by the new species are the presence of an appendage on sternite 8 and the lack of a thumb-like extension on hind part of inner gonostylus.

The systematical position of *Tipula riedeli* has remained unclear for MANNHEIMS (1952) who could not place it in any particular subgenus although he mentions the *Tipula (Acutipula) fulvipennis*-like habitus and the *Tipula (Acutipula) vittata*-like tergite 9. SAVTSHENKO (1964) brings no further opinion. OOSTERBROEK & THEOWALD (1992) have placed *Tipula riedeli* in the subgenus *Yamatotipula*.

In the opinion of HERMAN DE JONG (comm. pers.) *riedeli* and the new species should be placed in *Yamatotipula* on the basis of the similarity of the inner gonostylus of *riedeli* and *Tipula nova* Walker, 1848 (and the species of *Yamatotipula* allied to *nova* in the *nova*, *aino* and *protrusa* groups sensu SAVTSHENKO, 1961). However *Tipula riedeli* and *Tipula roya* show a number of plesiomorphies not encountered in typical *Yamatotipula*, which makes their systematical position somewhat uncertain. DE JONG lists the following characters:

- foramen for inner and outer gonostyli closed in *riedeli* and *roya*; interrupted near dorsal margin in *nova* and allies;
- a complete genital bridge with Sp1 and Sp2 connected in *riedeli* and *roya*
- a sclerotized ventromedial area between gonostyli



**Figure 10:** *Tipula (Yamatotipula ?) roya* sp.n.; male: A: hypopygium left view; B: outer gonostylus outside; C: inner gonostylus outside; D: tergite 9 upper; E: sternite 8 below, F: aedeagal guide and appendages.



- tergite 9 and sternite 9 separated in *riedeli* and *roya*, fused in *nova* and allies, and in *Yamatotipula*
- shape of tergite 9 (the unarmed *nova*-like tergite 9 is interpreted as a synapomorphy for the *nova*, *aino* and *protrusa* groups).

We can add to this list that on wing *rs* is rather short (only 1.65 as long as *m-cu*). In *Yamatotipula* *Rs* is normally long (twice as long as *m-cu*) as checked on specimens of *Tipula* (*Yamatotipula*) *lateralis* Meigen, 1804; *montium* Egger, 1863; *marginella* Theowald, 1980; and on illustrations by SAVTSHENKO for *Tipula nova* Walker, 1848 and *latemarginata* Alexander, 1921.

Before further investigations and until the females of *roya* are discovered and studied we will keep to OOSTERBROEK & THEOWALD (1992) and place, although with

some doubt, *Tipula riedeli* and *Tipula roya* in the subgenus *Yamatotipula*.

#### ACKNOWLEDGMENTS

I would like to thank here very warmly my colleagues in Amsterdam: Pjotr Oosterbroek for his comment on this manuscript as well as for his skilful collecting and Herman de Jong for his most valuable advice concerning the systematical position of *Tipula roya* sp.n. Secondly I would like to thank Sigitas Podénas who draw the beautiful illustrations of the new species. My gratitude goes also to Willy Geiger, Jean-Paul Haenni and to Robin and Colin Dufour who all helped with the collecting and accompanied me during the trips.

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