The Craneflies of Sardinia (Diptera: Tipulidae)*

Pjotr OOSTERBROEK
Sixhavvenweg 25, 1021 HG Amsterdam, The Netherlands. E-mail: POosterbroek@chello.nl

ABSTRACT

A review is presented of the 31 Tipulidae species known from Sardinia. The paper includes records from the literature, collections and recent collecting. The Tipulidae of Sardinia can be divided into two groups of about equal size: one group of species endemic or subendemic to geographic Italy, and another group with species that are more widespread. About 10% of the species are strictly endemic of the island, while 23% are endemic to Sardinia and Corsica.

Key words: Tipulidae, craneflies, Sardinia, Italy, endemism.

INTRODUCTION

Tipulidae are medium- to large-sized, slender-bodied nematocerous Diptera, and include some of the largest forms among the Nematocera (body length up to 60 mm, wing length up to 40 mm). Adults are distinguished by elongate maxillary palps; rostrum well developed and often with nasus; ocelli absent; thorax with transverse V-shaped mesonotal suture; 2 anal veins reaching wing margin; legs long and slender. The larvae are elongate cylindrical with a tough cuticle (“leatherjackets”). Their body consists of 3 thoracic and 8 abdominal segments. The larvae are rarely aquatic and are usually found in semi-aquatic or terrestrial environments. The life cycle consists of a usually brief egg stage (1–2 weeks), 4 larval stages, and a short pupal stage (1–2 weeks) before emergence of the short-lived adult. Summer as well as winter diapause of certain stages has been noted. Species under temperate conditions produce one or two generations a year, but depending on the species and the environmental conditions, the entire cycle may be as short as 10 weeks or as long as 6 years. The larvae feed on a variety of material such as decaying plant and animal matter, mosses and algae. A few species, especially in Tipula (Tipula Linnaeus, 1758) and Nephrotoma Meigen, 1803, are destructive feeders on pasture grasses, seedlings and crops and may cause severe commercial losses. Some aquatic species in Tipula (Arctotipula Alexander, 1934) and Prionocera Loew, 1844 are apparently facultatively carnivorous. Adults do not appear to feed to any extent but can be observed taking liquids at flowers or from wet substrates and surfaces.

The family comprises about 4,250 described species and subspecies, the majority of which were described by Charles P. Alexander. Western European and Russian workers described most Palaearctic spe-
cies. From Europe some 500 species are known in 10 genera (Oosterbroek 2010). The largest of these is the genus *Tipula*, with 16 subgenera in Europe. The Italian Tipulidae fauna is relatively well known (Oosterbroek 2007). At present 184 species and subspecies are known (Oosterbroek 2010).

The first review of the Tipulidae of Italy (Mannheims & Theowald 1951) includes 15 species from Sardinia, one of which (*Tipula (Vamatotipula) lateralis* Meigen, 1804) turned out to be a misidentification. More than twenty years later, the number was increased to 26 (Theowald et al. 1982; Theowald & Oosterbroek 1984). Since then, individual species have been recorded or described by Oosterbroek (1985: *Nephrotoma crocata crocata* (1985: Oosterbroek 1984). Since then, individual species and subspecies are known (Oosterbroek 2010).

The present study is based on some 430 records. More than half of these are from F. Hartig who was very active on the island from 1972 to 1977. During these years he collected 26 of the 31 species, whereas his 1971 overview of his Italian cranefly material did not yet include a single record from Sardinia. Another 74 records are from 1981 when H. Malicky collected 19 species and 66 records are from 2004 and 2006 when CNBFVR workers collected 19 species.

**MATERIAL AND METHODS**

This paper deals with all Tipulidae known from the island of Sardinia. Localities of collection refer to the old provinces of Sardinia (Cagliari, Nuoro, Oristano, Sassari) and are listed alphabetically. However, the current provinces of CNBFVR records are listed in the Abbreviations. This paper includes:

- all data from the 2004 and 2006 samplings by Centro Nazionale per lo Studio e la Conservazione della Biodiversità Forestale "Bosco Fontana" of Verona (Italy) (CNBFVR) (cf. Cerretti et al. 2009; Bardiani 2011);
- all the data from the material present in the large cranefly collections of the Museum Alexander Koenig, Bonn, Germany (MAKB) and the Zoological Museum, University of Amsterdam, The Netherlands (ZMAN). Most of these records were already briefly published by Oosterbroek (2007), but are here reported with all label data.
- all the records from the literature, as far as known to the author.

Nomenclature and classification follow the Catalogue of the Palaearctic Diptera (Oosterbroek & Theowald 1992), as is also the case for the most recent overview of all Tipulidae of the World, including their distributions and recent citations (Oosterbroek 2010). Chorotypes are listed according to Vigna Taglianti et al. (1999), while Italian distribution is based chiefly on Oosterbroek (2007). Under "Citations" only those literature records are mentioned which include more details than only the presence or number of localities in Sardinia, unless it is the first record for the island; for literature records of which the material is preserved, the full data as well as the depository abbreviations are given.

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**ABBREVIATIONS**

**Sampling sites of CNBFVR field campaigns.**

- **A01** = Medio Campidano prov., Arbuz, Piscinas, 0 m, 32S 452927 4376897;
- **C01** = Carbonia-Iglesias prov., Iglesias, Case Marganai, 725 m, 32S 463890 4355925;
- **C07** = Carbonia-Iglesias prov., Domusnovas, dint. Planargia-Scoveri, 625 m, 32S 465523 4362921;
- **C10** = Medio Campidano prov., Villacidro, dint. P.ta piscina Argiolis, selerbatioi, 282 m, 32S 472049 4360081;
- **C12** = Medio Campidano prov., Villacidro, Can.li s’Otti, versante destro, 520 m, 32S 471690 4359611;
- **C19** = Medio Campidano prov., Villacidro, Rio Cannisoni, 375 m, 32S 468713 4362692;
- **C31** = Carbonia-Iglesias prov., Domusnovas, Lago Siuru, 322 m, 32S 467069 4357916;
- **C58** = Medio Campidano prov., Villacidro, dint. P.ta piscina Argiolis, rigagnolo, 282 m, 32S 472049 4360081;
- **C70** = Carbonia-Iglesias prov., Iglesias, dint. Case Marganai, 660 m, 32S 463341 4356196;
- **C76** = Medio Campidano prov., Villacidro, paese, 223 m, 32S 477968 4367537;
- **C77** = Carbonia-Iglesias prov., Iglesias, Marganai, dint. Case Marganai, 650 m;
- **C81** = Carbonia-Iglesias prov., Domusnovas, Valle Oridda, 643 m, 32S 465399 4362770;
- **C82** = Carbonia-Iglesias prov., Iglesias, M.ti Marganai, Tinilliioni, 480 m, 32S 463010 4355249;
- **S1** = Carbonia-Iglesias prov., Iglesias, dint. Colonia Beneck, 636 m, 32S 462391 4355441;
- **S2** = Carbonia-Iglesias prov., Domusnovas, sa Duchessa, 371 m, 32S 464990 4355834;
- **S3** = Carbonia-Iglesias prov., Domusnovas, Valle Oridda, 592 m, 32S 466973 4362228;
- **SAR1** = Carbonia-Iglesias prov., Iglesias, Marganai, plot CONECOFOR, 700 m, 32S 462853 4355582.

**Collectors.**

- **BC** = B. Conradi; **BO** = B.G. Osella; **CJ** = C.A.W. Jeekel; **DA** = D. Avesani; **DB** = D. Birtele; **DW** = D. Whitmore;
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EB = E.E. Bergroth; EG = E. Gatti; FH = F. Hartig; FM = F. Mason; GC = G. Chessa; GN = G. Nardi; HM = H. Malicky; HN = H. Noack; JD = J. Dils-Faes; LB = L. Botosaneanu; L1 = collector unknown; MB = M. Bardiani; MT = M. Tisato; MZ = M. Zapparoli; PCe = P. Cerretti; PCo = P. Cornacchia; RP = R. Prota; WH = W. Hogenes.

DEPOSITIONS. CNBFVR = Centro Nazionale per lo Studio e la Conservazione della biodiversità Forestale “Bosco Fontana” di Verona (Marmirol, Italy); IEAS = Istituto di Entomologia Agraria (Sassari, Italy); MAKB = Museum Alexander Koenig (Bonn, Germany); MNB = Museum für Naturkunde (Berlin, Germany); MSNB = Museo di Scienze Naturali dell’Alto Adige (Bolzano, Italy); OOLL = Oberösterreichischen Landesmuseum (Linz, Austria); RPSI = collection R. Prota c/o Istituto di Entomologia Agraria dell’Università (Sassari, Italy); ZMAN = Zoologisches Museum, University of Amsterdam (Amsterdam, The Netherlands).

OTHER ABBREVIATIONS AND RECURRENT TERMS USED IN SPECIES LIST.

al = at light; cn = car net; dint. = surroundings of; ex = specimen; Fiune = River; Lago = Lake; mt = Malaise trap; nt = hand net; paece = town; presso = near; prov. = province; radura = clearing; Rio = stream; strada per = road to; Torrente = torrent; Valle = Valley.

SPECIES LIST

1. Dolichopeza (Dolichopeza) fuscipes Bergroth, 1889


CHOROTYPE. 3.01 MED. Mediterraneo-Mediterranean but restrict- ed, known from Algeria, Tunisia, Mallorca, Corsica, Sardinia, southern Italy, Sicily, Greece (including the islands Kefallonia, Kriti, Kythira, Samos, Samothraki and Zakynthos).

ITALIAN DISTRIBUTION. In Italy known from six localities only, namely two in Calabria, two in Sardinia and two in Sicily.

ECOLOGY. The biology of the species is not known but most likely it is more or less the same as in the other species of Dolichopeza Curtis, 1825. The members of this genus are usually found at damp shady places along bodies of water such as small streams, ditches, ponds, etc. The larvae develop in moist to wet cushions of mosses and liverworts.

Recorded for Sardinia in May and June; the actual period of flight is probably much longer, into October. NOTES. The species is indicated for Sardinia for the first time by Theowald & Oosterbroek (1984: 266; species list) but this is a printing error, referring to Corsica (as given on pages 247–248).

2. Nephrotoma appendiculata appendiculata (Pierre, 1919)


COLLECTION RECORDS. Cagliari prov.: Musei, 120 m, 30.III.1972, FH, 4 ex (ZMAN); 31.III.1972, FH, 1 ex (ZMAN); 1.IV.1972, FH, 1 ex (ZMAN); 2.IV.1972, FH, 1 ex (ZMAN); 4.IV.1972, FH, 1 ex (ZMAN); 7.IV.1972, FH, 1 ex (ZMAN); 5.IV.1975, FH, 1 ex (ZMAN). Nuovo prov.: Aritzo, 1200 m, 4.V.1975, FH, 15 ex (ZMAN); near Belvì, 700 m, 3.V.1975, FH, 3 ex (ZMAN); 8.V.1975, FH, 3 ex (ZMAN); 13.V.1975, FH, 1 ex (ZMAN); 16.V.1975, FH, 1 ex (ZMAN); 27.V.1977, FH, 3 ex (ZMAN); 12.V.1977, FH, 3 ex (ZMAN); 17.V.1977, FH, 2 ex (ZMAN); Bruno Spina, 1400 m, 24.V.1979, FH, 1 ex (ZMAN); north of Desulo, Rio Aratu, 970 m, 40 02N/09 15E, 29.V.1981, HM, 3 ex (ZMAN); 9 km south of Fonni, Barbaria Ollolai, 11.VI.1992, WH, 1 ex (ZMAN); Ortueri, 450 m, 40 00N/09 02E, 18.V.1998, JD, 2 ex (ZMAN); Seulo, 400 m, 39 54N/09 11E, 17.V.1998, JD, 2 ex (ZMAN); Tonara, 27.V.1977, FH, 7 ex (ZMAN). Oristano prov.: Nughedu Santa Vittoria, 12.IV.1977, FH, 4 ex (ZMAN). Prov. not traced: M.R. Govosolea, 750 m, 12.V.1975, FH, 2 ex (ZMAN).


CHOROTYPE. 1.12 EUM. Europeo-Mediterranean for the species, including the British Isles, south Fennoscandia, the Caucasus, Turkey and Iran. For the subspecies see Italian distribution.

ITALIAN DISTRIBUTION. The presence of the nomino-
typical subspecies in Sardinia is remarkable because it is entirely surrounded by the subspecies *N. a. pertenu-
na* Oosterbroek, 1978. This last subspecies is found in Northwest Africa, the Iberian Peninsula, along the French Mediterranean coast, in Corsica, the Italian mainland and Sicily. The nomenclatural subspecies is widespread in the rest of Europe, including the British Isles and South Fennoscandia, and reaches as far east as Turkey and Iran.

**Ecology.** Found in more open and semi-dry habitats, usually near shrubs or along the edges of woods, rarely within woods; also frequent and in large numbers in disturbed habitats as a kind of pioneer species. The larvae live in the soil and feed on the roots and young petioles of grasses (including cultivated ones) and other plants; damage by full grown larvae has been reported for oats, rye, sugarbeets, flax, cabbage and coniferous seedlings (Oosterbroek 1978).

Period of flight from the end of March until mid June.


**Collection records.** Cagliari prov.: 2 km north of Domus de Maria, 38 58N/08 52E, 70 m, 23–24.V.1981, HM, 2 ex (ZMAN). *Nuoro prov.*: Aritzo, 1200 m, 2.VII.1977, FH, 1 ex (ZMAN); near Belvì, 700 m, 19.VI.1977, FH, 1 ex (ZMAN); Desulo–Tonara, 800 m, 7.VII.1977, FH, 1 ex (ZMAN); Monte Istiddi, 700 m, 12.VII.1977, FH, 1 ex (ZMAN); S’Arcu de Tascussi, 1350 m, 15.VII.1977, FH, 1 ex (ZMAN). *Sassari prov.*: below Satzu, 240 m, 40 44N/09 30E, 9.VI.1981, HM, 4 ex (ZMAN).

**CNBFVFR records.** Cagliari prov.: C82: 7.VI.2004, DB PCe GN MT DW, 1 ex.

**Chorotype.** The chorotype of the above subspecies is: 3900.20 SARD. Endemic. That of the species s.l. is: 1.01. OLA. Holartic.

**Italian distribution.** Endemic to Sardinia.

**Ecology.** The biology of the subspecies is not known. Most likely it is more or less the same as in *N. c. cornicina* (Linnaeus, 1758) which is found in a large variety of habitats, ranging from open fields and alpine meadows to moist forests. The larvae live in the soil and feed on the roots and young petioles of grasses (including cultivated ones) and other plants; damage by full grown larvae has been reported for beets and one year old spruce-firs (Oosterbroek 1978).

Period of flight from end of June until early August.

4. *Nephrotoma crocata crocata* (Linnaeus, 1758)


**Literature records.** Sardinia (no further details) (Oosterbroek 2009). *Nuoro prov.*: Belvì, 1982 (Oosterbroek 2007; ZMAN).

**Collection records.** Oristano prov.: Fordongianus, 39 59N/08 48E, 50 m, 18.V.1998, JD, 1 ex (ZMAN). *Nuoro prov.*: Seulo, 39 54N/09 11E, 400 m, 17.V.1998, JD, 1 ex (ZMAN).

**Chorotype.** 1.05 SIE. Sibero-European except Iceland, islands in the Arctic Ocean and Turkey, in the east not south of the line Chita–Yakutsk.

**Italian distribution.** Widespread, known from almost all Italian regions (Oosterbroek 2007).

**Ecology.** *Nephrotoma c. crocata* is found in a variety of habitats, ranging from dry (e.g., sandy paths in heathland) to more humid (e.g., sandy or gravelly river banks; fen woods) and is frequently found in gardens. The larvae live in the soil and feed on the roots of grasses, agricultural crops and forest seedlings, but usually without causing severe damage because of the low larval density (Oosterbroek 1979).

Recorded for Sardinia in May only; the actual period of flight is probably much longer, from the end of March until the end of October.

5. *Nephrotoma flavipalpis* (Meigen, 1830)


**Literature records.** Sardinia (no locality details; number of records: 4) (Theowald et al. 1982: 324). Sardinia (no further details) (Oosterbroek & Starý 1995: 12). *Nuoro prov.*: Tonara, Sa

Collection records. Cagliari prov.: 2 km north of Domus de Maria, 70 m, 38 58N/08 52E, 23–24.V.1981, HM, 2 ex (ZMAN); north of Domus de Maria, 80 m, 38 58N/08 52E, 23.X.1981, HM, 1 ex (ZMAN); above San Vito, Fiume Flumendosa, 80 m, 39 29N/09 30E, 26.V.1981, HM, 2 ex (ZMAN).

Nuoro prov.: Aritzo, 800 m, 28.VIII.1974, FH, 1 ex (ZMAN); near Belvi, 700 m, 6.VI.1975, FH, 1 ex (ZMAN); Fermata di Fontanamela, 6.X.1977, FH, 1 ex (ZMAN); Fonnì, 40 07N/09 12E, 650 m, 24.V.1998, JD, 2 ex (ZMAN); north of Mamoïada, Rio Sa Pruna, 40 15N/09 17E, 500 m, 30.V.1981, HM, 1 ex (ZMAN); Rio Taloro, 3 km S water reservoir, 670 m, 40 06N/09 30E, 6–7.VI.1981, HM, 1 ex (ZMAN); Rio Taloro, 670 m, 40 06N/09 13E, 21.X.1981, HM, 1 ex (ZMAN). Oristano prov.: Allai, Rio Mannu, 9.V.1977, FH, 1 ex (ZMAN). Sassari prov.: east of Badde Suelzu, 40 44N/09 20E, 570 m, 31.V.1981, HM, 2 ex (ZMAN); below Sartu, 40 44N/09 30E, 240 m, 9.VI.1981, HM, 1 ex (ZMAN).

CnBFVr records. Cagliari prov.: C10: 8.IX.2006, GC, al, 1 ex; 12.IX.2006, MB DA DB GN, nt, 1 ex; C31: 20–23.V.2006, MB DB PCo DW, mt, 1 ex. The chorotype of the above subspecies is: 3900.20 SARD. Endemic. That of the species s.l. is: 1.11. TUE. Turano-European.

Ecology. Nephrotoma flavipalpis is found in woodlands, gardens, along hedgerows, usually near water; the species is also frequently collected indoors. Its tendency to fly over puddles of water is treated in detail by Stubbs (1970). The larvae feed on decaying plant material in humus rich soils. Period of flight is from early May until the end of October.

6. Nephrotoma guestfalica hartigiana Oosterbroek, 1982


Collection records. Cagliari prov.: 2 km north of Domus de Maria, 38 58N/08 52E, 70 m, 23–24.V.1981, HM, 4 ex (ZMAN); below San Nicolò Gerrei, 39 29N/09 19E, 300 m, 26.V.1981, HM, 1 ex (ZMAN); above San Vito, Fiume Flumendosa, 39 29N/09 30E, 80 m, 26.V.1981, HM, 1 ex (ZMAN). Nuoro prov.: north of Escalapiano, Rio Flumineddu, 39 40N/09 23E, 240 m, 27.V.1981, HM, 1 ex (ZMAN); south of Gadoni, Fiume Flumendosa, 40 05N/09 11E, 29.V.1981, HM, 2 ex (ZMAN); north of Mamoïada, Rio Sa Pruna, 500 m, 40 15N/09 17E, 30.V.1981, HM, 2 ex (ZMAN); tributary of Rio San Girolamo, 550 m, 39 50N/09 24E, 27.V.1981, HM, 1 ex (ZMAN). Oristano prov.: above Fordongianus, Fiume Tirso, 40 00N/08 51E, 30 m, 4.VI.1981, HM, 1 ex (ZMAN); north of Santu Lussurgiu, 40 10N/08 39E, 700 m, 4.VI.1981, HM, 1 ex (ZMAN).

Chorotype. The chorotype of the above subspecies is: 3900.20 SARD. Endemic. That of the species s.l. is: 1.11. TUE. Turano-European. Italian distribution. Endemic to Sardinia. The species was erroneously listed from Corsica as well by Oosterbroek (2007).

Ecology. The biology of the subspecies is not known. Most likely it is more or less the same as in N. g. guestfalica (Westhoff, 1880) which is usually found in woods and gardens, especially near water and at exposed riverine sediments; closer to the sea it is found in dunevalleys with heath and willows or in reeds bordering saline ditches. The larvae live in the soil and feed on decomposing plant material. Period of flight is in May and June.

7. Nephrotoma saccai (Mannheims, 1951)


Literature records. Sardinia (no further details) (Oosterbroek 2009).

CnBFVr records. Cagliari prov.: C77: 9.VI.2004, DB PCe GN MT DW, cn, 1 ex.
CHOROTYPE. 3900.18 TYRR. Apart from Italy it is only known from four localities near Colobrières in the French department of Var (De Jong 1998; Dufour 2003).

ITALIAN DISTRIBUTION. Species with a limited but somewhat disjunct distribution. In Italy it is known from 15 localities in Campania (4), Basilicata (1), Calabria (3), Sicily (6) and Sardinia (1).

ECOLOGY. Very little is known about the biology of this species. It has been collected in olive groves and deciduous forests. Like the other species of *Nephrotoma* Meigen, 1803, the larvae are assumed to live in the soil and to feed on decomposing plant material. The period of flight is from early April to early July.

NOTES. The species was described after one male without locality or date, collected by G. Saccà. With the original description, Mannheims (1951, as *Pales saccata*) stated that the holotype male maybe originat-ed from Rome; however, the species has not been collected in Latium since (cf. Oosterbroek 1997, 2007).

8. *Nephrotoma submaculosa* Edwards, 1928


COLLECTION RECORDS. *Cagliari prov.:* above San Vito, Fiume Flumendosa, 39 29N/09 29E, 80 m, 26.V.1981, HM, 1 ex (ZMAN). *Nuoro prov.:* Seulo, 39 54N/09 11E, 400 m, 17.V.1998, JD, 1 ex (ZMAN).

CNBFVR RECORDS. *Cagliari prov.:* S3: 16–30.V.2006, GC, mt, 1 ex.

CHOROTYPE. 1.12 EUM. Europeo-Mediterranean including the British Isles and south Fennoscandia, in the east as far as the Baltic states and Romania, across the Mediterranean known only from Morocco.

ITALIAN DISTRIBUTION. Widespread, known from 13 out of the 20 Italian regions, including Sicily.

ECOLOGY. *Nephrotoma submaculosa* is found in a variety of habitats, ranging from moist forests to gardens, exposed riverine sediments and dunes. The larvae live in the soil and feed on decomposing plant material.

In Sardinia collected in May only but the period most probably is from mid April into June.

9. *Tipula (Acutipula) corsica* Pierre, 1921


COLLECTION RECORDS. *Nuoro prov.:* north of Desulo, 40 02N/09 15E, 1080 m, 29.V.1981, HM, in shade along small stream in forest, 7 ex (ZMAN); Fonni, 40 07N/09 12E, 650 m, 24.V.1998, JD, 1 ex (ZMAN); southwest of Gairo Scalo, 39 51N/09 27E, 750 m, 27.V.1981, HM, along small stream in stony environment, 1 ex (ZMAN). *Sassari prov.:* 10 km north of Pattada, Rio Bunne, 40 37N/09 06E, 400 m, 2.VI.1981, HM, along small stream in meadow, somewhat polluted, 6 ex (ZMAN).

CHOROTYPE. 3900.19 SACO. Endemic to Sardinia and Corsica.

ITALIAN DISTRIBUTION. Known from Sardinia only.

ECOLOGY. Very little is known about the biology of the species. It belongs to the *T. (A.) maxima* group. The larvae of this group develop in moist sand or mud at the water edge at springs and along streams, small rivers, lakes, etc., usually at shady places in deciduous forests. Adults are usually found near the larval habitat but they are good and swift flyers and are frequently found far from their breeding sites.

In Sardinia collected only between 24 May and 7 June, but the many more records from Corsica cover the period 30 April to 21 July.

NOTES. The species was described by Pierre (1921) on the basis of the characteristic wing pattern (see Ver-molen 1983: fig. 2; De Jong 1993: fig. 13). However, a few specimens from Corsica and Sardinia possess the wing-pattern of *T. (A.) doriae* Pierre, 1926, but on other characteristics belong to *T. (A.) corsica* (Oosterbroek, 1985; see also De Jong 1993: 442, 449).

10. *Tipula (Acutipula) doriae* Pierre, 1926


LITERATURE RECORDS. Sardinia (no locality details; number of records: 8) (Theowald et al. 1982: 320). Sardinia (no further
Grande Kabylie mountains in Algeria. Corsica, Giglio Island (Tuscany), Sardinia and the Tipula De Geer, 1776 (11). fulvipennis ger, from the end of May until the end of October.

Collection records. Cagliari prov.: 2 km north of Domus de Maria, 38 58N/08 52E, 70 m, 23–24.V.1981, HM, along small stream out of maquis, 1 ex (ZMAN); north of Domus de Maria, 38 58N/08 52E, 80 m, 23.X.1981, HM, 3 ex (ZMAN).

Nuoro prov.: Arizzo, 800 m, 2.IX.1974, FH, 1 ex (ZMAN); 9.IX.1974, FH, 1 ex (ZMAN); Barbagia, Belvi, Ortuabis – Bruncu Triotu, 750 m, 6.X.1975, FH, 1 ex (ZMAN); near Belvi, 700 m, 13.VII.1975, FH, 1 ex (ZMAN); near Belvi, 1000 m, 1.VII–10.VIII.1938, HN, 15 ex (Mannheims 1968: 296; MAKB; ZMAN). Cagliari prov.: Aritzo, 800 m, 2.IX.1974, FH, 1 ex (ZMAN); 9.IX.1974, FH, 1 ex (ZMAN); Barbagia, Belvi, Ortuabis – Bruncu Triotu, 750 m, 6.X.1975, FH, 1 ex (ZMAN); near Belvi, 700 m, 13.VII.1975, FH, 1 ex (ZMAN); 25.VII.1976, FH, 4 ex (ZMAN); 16.X.1988, LB, 1 ex (ZMAN); Chiesa di Santa Maria e susu, 5.VII.1977, FH, 1 ex (ZMAN); Desulo, 800 m, 26.VIII.1974, FH, 1 ex (ZMAN); Fermata di Fontanamelà, 6.X.1977, FH, 1 ex (ZMAN); Monte Isiddi, 700 m, 12.VIII.1977, FH, 1 ex (ZMAN); S’Arcu de Tas-cussi, 1350 m, 12.VII.1977, FH, 1 ex (ZMAN); 15.VII.1977, FH, 1 ex (ZMAN). Prov. not traced: Ouzo, 1200 m, 25.VI.1977, FH, 1 ex (ZMAN).

Chorotype. 1.05 SIE. Sibero-European except Iceland, in the Arctic Ocean only Novaya Zemlya, east of the Urals only in the south of Russia and in Kazakhstan and Mongolia.

Italian distribution. Widespread, known from 15 out of the 20 Italian regions, including Sicily.

Ecology. Tipula (A.) fulvipennis is usually found in humid deciduous forests. The larvae develop under moss or in sand, silt and humus in wet places of forest soils, predominantly near water. Adults are usually found near the larval habitat but they are good and swift flyers and are frequently found far from their breeding sites.

The period of flight is from June to October.

– Tipula (Acutipula) maxima Poda, 1761

Notes. Tipula (A.) maxima is widespread in Italy including Sicily, but as far as known does not occur in Sardinia. The record and photo by Pisano et al. (2003) from Monti del Gennargentu refers to either T. (A.) corsica or T. (A.) doriae, species very similar to T. (A.) maxima.

12. Tipula (Lunatipula) livida sardolivida Mannheims & Theowald, 1968


Collection records. Nuoro prov.: Aritzo, 800 m, 22.VIII.1974, FH, 1 ex (ZMAN); 8.IX.1976, FH, 1 ex (ZMAN); near Belvi, 700 m, 10.VII.1975, FH, 1 ex (ZMAN); 5.VIII.1975, FH, 1 ex (ZMAN); 7.VIII.1975, FH, 1 ex (ZMAN); 17.VIII.1975, FH, 1 ex (ZMAN); Bruncu Spina, 1400 m, 7.VIII.1974, FH, 1 ex (ZMAN); 25.VII.1976, FH, 4 ex (ZMAN); 16.X.1988, LB, 1 ex (ZMAN); Chiesa di Santa Maria e susu, 5.VII.1977, FH, 1 ex (ZMAN); Desulo, 800 m, 26.VIII.1974, FH, 1 ex (ZMAN); Fermata di Fontanamelà, 6.X.1977, FH, 1 ex (ZMAN); Monte Isiddi, 700 m, 12.VIII.1977, FH, 1 ex (ZMAN); S’Arcu de Tas-cussi, 1350 m, 12.VII.1977, FH, 1 ex (ZMAN); 15.VII.1977, FH, 1 ex (ZMAN).


Chorotype. 3900.18 TYRR. Known from Mallorca, Corsica, Giglio Island (Tuscany), Sardinia and the Grande Kabylie mountains in Algeria.

Italian distribution. In Italy known from its type-locality (Giglio Island) and Sardinia only.

Ecology. Most likely the same as for the previous species, except that the period of flight is much longer, from the end of May until the end of October.

11. Tipula (Acutipula) fulvipennis De Geer, 1776


Collection records. Nuoro prov.: Aritzo, 800 m, 22.VIII.1974, FH, 1 ex (ZMAN); 8.IX.1976, FH, 1 ex (ZMAN); near Belvi, 700 m, 10.VII.1975, FH, 1 ex (ZMAN); 5.VIII.1975, FH, 1 ex (ZMAN); 7.VIII.1975, FH, 1 ex (ZMAN); 17.VIII.1975, FH, 1 ex (ZMAN); 25.VII.1976, FH, 4 ex (ZMAN); 16.X.1988, LB, 1 ex (ZMAN); Chiesa di Santa Maria e susu, 5.VII.1977, FH, 1 ex (ZMAN); Desulo, 800 m, 26.VIII.1974, FH, 1 ex (ZMAN); Fermata di Fontanamelà, 6.X.1977, FH, 1 ex (ZMAN); Monte Isiddi, 700 m, 12.VIII.1977, FH, 1 ex (ZMAN); S’Arcu de Tas-cussi, 1350 m, 12.VII.1977, FH, 1 ex (ZMAN); 15.VII.1977, FH, 1 ex (ZMAN). Prov. not traced: Ouzo, 1200 m, 25.VI.1977, FH, 1 ex (ZMAN).

Chorotype. 1.05 SIE. Sibero-European except Iceland, in the Arctic Ocean only Novaya Zemlya, east of the Urals only in the south of Russia and in Kazakhstan and Mongolia.
CAGLIARI prov.: Domus de Maria, 12.V.1975, FH, 1 ex (ZMAN); 2 km north of Domus de Maria, 70 m, 38 58N/08 52E, 23–24.V.1981, HM, along small stream out of maquis, 14 ex (ZMAN); Domusnovas, 180 m, 14.VI.1974, FH, 1 ex (ZMAN); Gutturu Sparta, 27.V.1974, FH, 11 ex (ZMAN); Portixeddu, 6.IV.1972, FH, dunes, 1 ex (ZMAN); Punta Cuccurdoni Mannu, 500 m, 9.V.1972, FH, 1 ex (ZMAN); Rio Gutturu Mannu, 100 m, 21.V.1974, FH, 2 ex (ZMAN); above San Vito, Fiume Flumendosa, 80 m, 39 29N/09 30E, 26.V.1981, HM, along small river with broad stony shores, 4 ex (ZMAN); south of Siliqua, 39 12N/08 48E, 250 m, 25.V.1981, HM, along small stream in maquis, 3 ex (ZMAN); Valle Gutturureddu, 300 m, 22.V.1974, FH, 1 ex (ZMAN). Nuoro prov.: Belvi, 700 m, 12.VIII.1977, FH, 2 ex (OOLL); near Belvi, 700 m, 2.V.1975, FH, 1 ex (ZMAN); 17.V.1977, FH, 2 ex (OOLL); 24.V.1977, FH, 2 ex (OOLL); 7.VII.1977, FH, 4 ex (OOLL); Bruncu Spina, 1750 m, 20.VII.1975, FH, 2 ex (ZMAN); 8.VII.1977, FH, 4 ex (OOLL); Desulo – Tonara, 800 m, 7.VII.1977, FH, 2 ex (OOLL); north of Escalaplano, Rio Flumineddu, 39 40N/09 23E, 240 m, 27.V.1981, HM, 1 ex (ZMAN); Castelsardo, 300 m, 22.V.1974, FH, 1 ex (ZMAN). COLLEcTIONS reCordS. Cagliari prov.: Outzu, 1200 m, 25.VI.1977, FH, 10 ex (OOLL). CnBFVR reCords. Cagliari prov.: C07: 20.V.2006, DW MB PCo, nt, 1 ex; C12: 21.V.2006, DW MB DB PCo, al, 9 ex; C31: 20–23.V.2006, MB DB PCo DW, mt, 1 ex; 23.V.2006, MB DB PCo DW, nt, 1 ex; C70: 8.VI.2004, DB Pce GN MT DW, cn, 2 ex; C82: 7.VI.2004, DB Pce GN MT DW, 1 ex; C70: 7.VI.2004, DB Pce GN MT DW, al, 11 ex; C77: 9.VI.2004, DB Pce GN MT DW, cn, 2 ex; SAR1: 15–30.VI.2004, GC, mt, 1 ex; S1: 16–30.VI.2006, GC, mt, 2 ex; S2: 16–30.VI.2006, GC, mt, 2 ex; 30.V–13.VI.2006, GC, mt, 2 ex; 13–27.VI.2006, GC, mt, 1 ex; S3: 16–30.VI.2006, GC, mt, 1 ex.

Chorotype. The chorotype of the subspecies is: 3900.19 SACO. Endemic to Sardinia and Corsica. That of the species s.l. is: 2.01. EUR. European.

ITALIAN DISTRIBUTION. Known from Sardinia only.

Ecology. One of the more common craneflies of Sardinia (50 records). All records from Malicky are along small streams. Otherwise, very little is known about the biology of the subspecies but most likely it is more or less the same as in *T. (L.) l. livida* (Van der Wulp, 1859). This last species is found in a large variety of habitats, ranging from more open habitats (marshes, meadows, dunes, heath) to olive groves, and coniferous, mixed as well as deciduous forests, usually near water. The larvae feed on decaying plant material, predominantly in forest soils under leaf litter, detritus and mosses; they have also been reported from very soft dead wood of *Fagus* (Oosterbroek & De Jong 2001).

The period of flight is from May until August.

13. *Tipula (Lunatipula) macciana* Edwards, 1928


COLLECTION RECORDS. Cagliari prov.: Cagliari, 0 m, 18.III.1972, FH, 1 ex (ZMAN); 27.III.1972, FH, 1 ex (ZMAN); Domus de Maria, 12.IV.1975, FH, 3 ex (ZMAN); Domusnovas, Tinè, 24.V.1974, FH, 1 ex (ZMAN); Musci, 120 m, 30.III.1972, FH, 4 ex (ZMAN); 2.IV.1972, FH, 1 ex (ZMAN); 3.IV.1972, FH, 2 ex (ZMAN); 6.IV.1972, FH, 1 ex (ZMAN); 7.IV.1972, FH, 2 ex (ZMAN); Portixeddu, 6.IV.1972, FH, dunes, 1 ex (ZMAN); Punta Cuccurdoni Mannu, 500 m, 9.V.1972, FH, 1 ex (ZMAN); Rio Gutturu Mannu, Tontana, 300 m, 22.V.1974, FH, 3 ex (ZMAN). Nuoro prov.: Arizzu, 1200 m: 4.V.1975, FH, 2 ex (ZMAN); near Belvi, 700 m, 3.V.1975, FH, 7 ex (ZMAN); Bruncu Spina, 1700 m, 16.V.1975, FH, 1 ex (ZMAN); Bruncu Spina, 1750 m, 14.VI.1975, FH, 6 ex (ZMAN); 8.VII.1977, FH, 45 ex (OOLL); Bruncu Spina, 1400 m, 25.VII.1976, FH, 2 ex (ZMAN); 24.V.1977, FH, 3 ex (OOLL); north of Fonni, Rio Talaro, 820 m, 40 09N/08 52E, 19.V.1981, HM, 1 ex (ZMAN); Tonara, 27.V.1973, FH, 1 ex (ZMAN). Prov. not traced: M.R. Govosolea, 750 m, 12.V.1975, FH, 1 ex (ZMAN).

Chorotype. 3900.19 SACO. Endemic to Sardinia and Corsica.

Italian distribution. Known from Sardinia only.

Ecology. Little is known about the biology of the species. It seems to be adapted to somewhat dry habitats, given that it has been collected on dunes (Portixeddu, 6.IV.1972), and was not collected by Malicky who, studying Trichoptera, collected almost exclusively at water rich localities. The same apparently applies to Corsica (hence its name) where it was very common on dry hillsides among maquis (Edwards 1928).

The period of flight is from mid March until the end of July.

14. Tipula (Lunatipula) parapeliostigma Mannheims & Theowald, 1959


Literature records. Sardinia (no locality details; number of records: 3, months: V–VIII, altitudes: 500–1000 m) (Theowald et al. 1982: 323). Sardinia (no further details) (Oosterbroek & Starý 1995: 13). The period of flight is from mid March until the end of July.

15. Tipula (Lunatipula) sacerdotula Riedel, 1918


Chorotype. 3900.19 SACO. Endemic to Sardinia and Corsica.

Italian distribution. Known from Sardinia only.

Ecology. Almost nothing is known about the biology of the species. In two instances it was collected along a small stream, indicating that it might prefer less dry habitats.

The period of flight is from the end of May until the end of July.

— Tipula (Lunatipula) recticornis Schummel, 1833

Notes. See T. (L.) macciana.


**CHOROTYPE.** 3900.01 ITAL. Restricted to southern Switzerland, Corsica and Italy except Sicily.

**ITALIAN DISTRIBUTION.** Known from 25 localities, distributed over the regions Piedmont (6), Trentino-Alto Adige (3), Emilia-Romagna (2), Abruzzi (7), Molise (4) and Sardinia (3).

**ECOLOGY.** *Tipula (P.) l. agilis* is found in marshes and very wet plains. The larvae of the nominotypical subspecies develop in mud, silt or under mosses and leaf fallings at springs, slopes of lakes and rivers, bogs, woody swamps, swampy riversides, marshy meadows, etc. (Podeniene 2001, 2003); this most probably also applies to *T. (P.) l. agilis*, except that it prefers open habitats (Dufour 1986). Adults are usually found near the larval breeding sites. Collected in Sardinia in October only, elsewhere it occurs from early September to early November. **NOTES.** Females of *T. (P.) l. agilis* are able to fly and possess slightly longer wings than those of *T. (P.) l. luteipennis*, whereas females of the latter, in spite of being fully winged, are proved to lack flight muscles and therefore are quite unable to fly (Dufour & Brunhes 1984; Dufour 1986).

17. *Tipula (Savtshenkia) breviantennata* Lackschewitz, 1933


**LITERATURE RECORDS.** Sardinia (no further details) (Oosterbroek & Starý 1995: 14). *Nuoro prov.*: Arizio, 800 m, 10.XI.1974, FH, 1 ex (Theowald et al. 1982: 321; ZMAN); near Belvi, 700 m, 2.VI.1975, FH, 1 ex; 24.X.1975, FH, 1 ex (Theowald et al. 1982: 321; Theowald & Oosterbroek 1984: 251; ZMAN).

**CHOROTYPE.** 3.02 WME. West Mediterranean including southern Switzerland but not known from the Balearic Islands, Tunisia and Sicily.

**ITALIAN DISTRIBUTION.** In Italy known from eight localities only, distributed over Piedmont (1), Emilia-Romagna (1), Tuscany (2), Latiun (2) and Sardinia (2).

**ECOLOGY.** Unknown. Considered a mountain species by Theowald (1980, as *T. atlas* Pierre, 1924), but in Sardinia collected at 700 and 800 m and in Switzerland not above 600 m (Dufour 1986). As far as is known the larvae of the subgenus *Savtshenkia* Alexander, 1965 develop in and under mosses. The general period of flight is from May to October but in the south of its distribution range the species can also be found later in the year, as is the case for Sardinia.

18. *Tipula (Savtshenkia) cyrnosardensis* Theowald, Dufour & Oosterbroek, 1982


**COLLECTION RECORDS.** *Nuoro prov.*: north of Fonni, Rio Taloro, 820 m, 40°9′/09°16′E, 20.X.1981, HM, 3 ex (ZMAN).

**CHOROTYPE.** 3900.19 SACO. Endemic to Sardinia and Corsica.

**ITALIAN DISTRIBUTION.** Known from Sardinia only.

**ECOLOGY.** Apparently a forest species, collected in Sardinia and Corsica in *Quercus ilex* forests, in Corsica also in a *Quercus-Castanea* forest, in a mixed forest,
and in Pinus laricio forests; in all four types of forests along streams. The larvae are supposed to develop in and under mosses. Period of flight from early September to early November.

19. *Tipula (Savtshenkia) hartigiana* Theowald, Dufour & Oosterbroek, 1982

*Tipula (Savtshenkia) hartigiana* spec. nov.: Theowald et al. 1982: 327–328.


**Literature records.** Sardinia (no further details) (Oosterbroek & Starý 1995: 14). **Nuoro prov.:** Aritzo (Theowald & Oosterbroek 1984: 252); near Belvi, 700 m, 22.II.1976, FH, 2 ex (holotype, paratype) (Theowald et al. 1982: 328; Theowald & Oosterbroek 1984: 252; ZMAN); Gennargentu, Bruncu Spina, 1400 m, 15.VII.1976, JH, 1 ex (paratype gynandromorph) (Theowald et al. 1982: 328; Theowald & Oosterbroek 1984: 252; ZMAN).

**Chorotype.** 3900.19 SACO. Endemic to Sardinia and Corsica.

**Italian distribution.** Known from Sardinia only.

**Ecology.** There is no information on the habitat preferences for Sardinia. In Corsica the species was collected between 1,300 and 2,200 m in *Alnus* shrubs and at dripping rocks with *Narthecium*. The larvae are supposed to develop in and under mosses. The dates of collecting of this species are far apart; in Sardinia: 22 February and 15 July, in Corsica: 21 September, 14 and 15 October.

20. *Tipula (Savtshenkia) jeekeli* Mannheims & Theowald, 1959


**Chorotype.** 3900.20 SARD. Endemic. **Italian distribution.** Endemic to Sardinia.

**Ecology.** Unknown. The larvae are supposed to develop in and under mosses. The species is known from the type material only which was collected in the second half of October.

21. *Tipula (Savtshenkia) omega* De Jong, 1994

*Tipula (Savtshenkia) omega* sp. n.: De Jong 1994: 315–317.


**Collection records.** **Nuoro prov.:** near Belvi, 700 m, 20–21.X.1975, 700 m, FH, 2 ex (ZMAN); Fermata di Fontanamela, 6.X.1977, FH, 1 ex (ZMAN); Monte Istiddi, 700 m, 21.X.1977, FH, 1 ex (ZMAN).

**CNBFVR.** Cagliari prov.: S2: 3–17.X.2006, GC, mt, 2 ex; 17–31.X.2006, GC, mt, 10 ex.

**Chorotype.** 2.04 SEU. South European, but in the west limited to Galicia and Mallorca, southern France and Corsica, Sardinia and Sicily; more widespread in Greece including Lesvos, Naxos and Rodos; also recorded from Cyprus.

**Italian distribution.** Besides Sardinia also known from four localities in Sicily; not known from the Italian mainland.

**Ecology.** Predominantly found at wet places in coniferous as well as deciduous forests and at higher altitudes in shrubs. In Sicily it was collected in coniferous as well as deciduous forests, near water or at wet places. The larvae are supposed to develop in and under mosses. Period of flight from the end of September to early November.

22. *Tipula (Savtshenkia) rufina rufina* Meigen, 1818


Chorotype. 1.12 EUM. Europeo-Mediterranean, including the Canary Islands, the British Isles and Iceland, in the east as far as the Caucasus, Turkey, NW Iran and Tajikistan, in the south not recorded from Libya and Egypt.

Italian distribution. In Italy known from five localities only, one in each of the following regions: Lombardy, Trentino-Alto Adige, Latium, Basilicata, Sardinia.

Ecology. Larvae have been found in wet mosses in and along small streams (Theowald 1967) and in wet mosses at the foot of a Quercus tree in a garden (ZMAN). The species can be found in a large variety of habitats, such as wet deciduous forests (e.g., on mountain slopes), dry coniferous forests (e.g., on the dunes), marshlands (e.g., at higher altitudes); adults are also sometimes found indoors.

In temperate Europe the species is on the wing from April to October, records from Mediterranean countries cover all year, except January.

23. Tipula (Savtshenkia) sardosignata Mannheims & Theowald, 1959


Collection records. Nuoro prov.: Barbagia, Belvì, Ortuabus – Bruncu Trotu, 5.X.1977, 800 m, FH, 1 ex (ZMAN); near Belvì, 700 m, 6.XII.1974, FH, 1 ex (ZMAN); 10.X.1977, FH, 2 ex (ZMAN); north of Fonni, Rio Tàloro, 820 m, 40 09N/09 16E, 20.X.1981, HM, 3 ex (ZMAN).


Ecology. There is no information on the habitat preferences for Sardinia. In Corsica it has been collected along streams in a Quercus ilex and a mixed forest, and in wet Pinus laricio forests; in south-east France along a small stream and along a temporary stream in maquis. The larvae are supposed to develop in and under mosses.

Period of flight from the second half of September into December.

24. Tipula (Savtshenkia) serrulifera Alexander, 1942


Collection records. Nuoro prov.: Aritizzo, 1100 m, 4.X.1975, FH, 1 ex (ZMAN); Barbagia, Belvì, Ortuabus – Bruncu Trotu, 750 m, 6.X.1975, FH, Quercetum ilex, 1 ex (ZMAN); near Belvì, 600 m, 29.IX.1977, FH, 1 ex (ZMAN); Bruncu Spina, 16.X.1988, LB, 1 ex (ZMAN); Fermata di Fontanamela, 6.X.1977, FH, 4 ex (ZMAN); Punta Marcusa, 1200 m, 15.IX.1977, FH, 1 ex (ZMAN); 25.IX.1977, FH, 10 ex (ZMAN).

Chorotype. 2.04 SEU. South European including Great Britain, Germany, the SE of European Russia, Georgia, Armenia, Azerbaijan and Turkey (Arvini).

Italian distribution. Besides Sardinia also known from one locality in Piedmont and two in Sicily.

Ecology. Found in forests and at higher altitudes also in shrub or marshland vegetation. In Sicily along a river and a lake in deciduous forests, in Sardinia and Corsica in Quercus ilex forests, in Corsica also in Alnus shrubs and at dripping rocks with Narthecium, in Andorra along small rivers in pine forests. The larvae are supposed to develop in and under mosses.

The period of flight is from the end of July until mid October.

25. Tipula (Tipula) italica errans Theowald, 1984

Tipula (Tipula) italica Lackschewitz: Mannheims & Theowald 1959: 18.


Tipula (Tipula) italica errans nov. subspec.: Theowald 1984: 45.


Collection records. Cagliari prov.: Cagliari, 0 m, 30.IX.1972, FH, 8 ex (ZMAN); Castello di Acquafredda, 120 m, 12.X.1972, FH, 9 ex (ZMAN); Nuoro prov.: Atzara, 550 m, 5.VI.1977, FH, 1 ex (ZMAN); near Belvì, 600 m, 29.IX.1977, FH, 1 ex (ZMAN); Fermata di Fontanamela, 6.X.1977, 700 m, FH, 2 ex (ZMAN). Sassari prov.: Tempio [Pausania], 30.IX–6.X.1975, CJ, 16 ex (paratypes) (Theowald 1984: 45; ZMAN).

Collection records. Cagliari prov.: Castello di Acquafredda, 120 m, 12.X.1972, FH, 1 ex (ZMAN). Nuoro prov.: Atzara, 550 m, 5.VI.1977, FH, 1 ex (ZMAN); near Belvì, 600 m, 29.IX.1977, FH, 1 ex (ZMAN); Fermata di Fontanamela, 6.X.1977, 700 m, FH, 2 ex (ZMAN). Sassari prov.: Tempio [Pausania], 20.IX.1968, L; 1 ex (ZMAN).

Chorotype. 1.10 TUE. Not extending to the limits of the Turano-European chorotype, in the west as far as Corsica, Sardinia and Sicily only, in the east including Georgia, Armenia, Azerbaijan and Iran (Talis Mts.).

Italian distribution. Besides Sardinia also known from three localities in Sicily: not known from the Italian mainland.

Ecology. Not known in detail for this subspecies but most likely the ecology is more or less the same as in the other members of the subgenus *Tipula*. These have larvae that live in the soil just underneath the surface and feed on decaying vegetation as well as on crowns, roots and stems of plants. Because of the high larval density, damage to cereal crops, grasslands, crowns, roots and stems of plants. Because of the high larval density, damage to cereal crops, grasslands, golfcourses, lawns, etc. can be very serious, leading to severe commercial losses. The species involved in temperate Europe are *T. (T.) oleracea* Linnaeus, 1758, and *T. (T.) paludosa* Meigen, 1830 (reviews on biology, damage and related topics in Umble & Rao 2005; Peck et al. 2006; Rao et al. 2006). Of cultural interest, especially in Italy, is *T. (T.) italic* *italica* Lackschewitz, 1930, as discussed by Loi (1972). As can be expected, adults are usually found in open habitats, including open deciduous forests. This subspecies, as well as the nominotypical subspecies of the Italian mainland, apparently have two generations a year, in spring and in autumn. In both cases there are many more autumn than spring records.

**26. Tipula (Tipula) mediterranea** Lackschewitz, 1930

*Tipula (Tipula) mediterranea* Lackschewitz: Mannheims & Theowald 1959: 18.


**Nuoro prov.** Tonara, Sa Codina, 19.X.1957, CJ, 2 ex (Mannheims & Theowald 1959: 18; ZMAN). Sassari prov.: Alghero, 27.IX.1957, CJ, 1 ex (Mannheims & Theowald 1959: 18; ZMAN); Tempio Pausania, 6.X.1957, CJ, 2 ex (Mannheims & Theowald 1959: 18; ZMAN).

Collection records. Cagliari prov.: Cagliari, 0 m, 30.IX.1972, FH, 8 ex (ZMAN); Castello di Acquafredda, 120 m, 12.X.1972, FH, 8 ex (ZMAN); Domusnovas, Tiny, 180 m, 14.V.1974, FH, 1 ex (ZMAN); 29.X.1974, FH, 1 ex (ZMAN); Musci, 120 m, 8.III.1977, FH, 1 ex (ZMAN); 12.IV.1974, FH, 1 ex (ZMAN); 13.IX.1972, FH, 1 ex (ZMAN); 27.IX.1972, FH, 1 ex (ZMAN); 29.X.1972, FH, 2 ex (ZMAN); 10.X.1972, FH, 1 ex (ZMAN); 21.X.1972, FH, 1 ex (ZMAN); 22.IX.1973, FH, 1 ex (ZMAN); 11.XI.1973, FH, 1 ex (ZMAN); 20.V.1974, FH, 1 ex (ZMAN); 18.I.1975, FH, 1 ex (ZMAN); 19.I.1975, FH, 2 ex (ZMAN); Musci, 4.X.1974, FH, 1 ex (ZMAN); San Giovanni, 50 m, 39 05N/08 31E, 15.V.1998, JD, 1 ex (ZMAN). Nuoro prov.: Arizzo, 800 m, 8.IX.1974, FH, 1 ex (ZMAN); Barbajà, Belvì, Ortaubì – Brunci Truot, 800 m, 16.IX.1977, FH, 2 ex (ZMAN); Belvì, Nàzù, 800 m, 30.VIII.1974, FH, 1 ex (ZMAN); near Belvì, 700 m, 6.XII.1975, FH, 1 ex (ZMAN); 22.II.1976, FH, 1 ex (ZMAN); 19.I.1976, FH, 1 ex (ZMAN); 23.V.1977, FH, 1 ex (ZMAN); 7.VI.1977, FH, 2 ex (ZMAN); Fermata di Fontanamela, 6.X.1977, FH, 6 ex (ZMAN); north of Fonni, Rio Talòro, 820 m, 40 09N/09 16E, 20.X.1981, HM, 1 ex (ZMAN); Gadoni, 500 m, 5.5.1974, FH, 2 ex (ZMAN); Gennargentu, Cant. Pirra, 800 m, 25.V.1977, FH, 2 ex (ZMAN); [Meana Sardo,] Ortaubì, Scala Martina, 800 m, 14.IX.1977, FH, 1 ex (ZMAN); Rio Tinya, parte centrale [= central part], 29.XI.1972, FH, 3 ex (ZMAN). Oristano prov.: Tadasuni, 12.IV.1977, FH, 7 ex (ZMAN). Sassari prov.: east of Badde Suelu, 40 44N/09 20E, 570 m, 31.V.1981, HM, along small stream in maquis, 1 ex (ZMAN); 10 km southeast of Budusò, Fiume Tirso, 40 34N/09 20E, 810 m, 30.V.1981, HM, along small swampy stream, 2 ex (ZMAN); 10 km north of Pattada, Rio Bunne, 40 37N/09 06E, 400 m, 2.6.V.1981, HM, along small stream in meadow, somewhat polluted, 1 ex (ZMAN). Prov. not traced: M.R. Govosolea, 750 m, 12.V.1975, FH, 1 ex (ZMAN).

Chorotype. 3.02 WME. West Mediterranean extended to the Canary Islands, Austria, Slovenia, Montenegro and Macedonia.

Italian distribution. Apart from Sardinia, known from 16 other localities, distributed over the regions as follows: Liguria (1), Emilia-Romagna (1), Tuscany (1), Latium (4), Basilicata (1), Calabria (2) and Sicily (6).

Ecology. One of the more common craneflies of Sardinia (41 records). The general ecology of members of the subgenus *Tipula* is outlined under *T. (T.) italic* *errans*.

The species is found in all kinds of open habitats as...
well is in open forests and orchards, usually near water. In Sardinia it has been recorded in all months of the year except July, with distinct peaks in May and September-October.

27. *Tipula (Tipula) oleracea* Linnaeus, 1758


**Collection records.** *Cagliari prov.*: Muravera, 26.IV.1972, FH, 1 ex (ZMAN); Musei, 120 m, 18.II.1972, FH, 1 ex (ZMAN); 27.II.1972, FH, 1 ex (ZMAN); 1.III.1972, FH, 1 ex (ZMAN); 2.III.1972, FH, 1 ex (ZMAN); 3.III.1972, FH, 1 ex (ZMAN); 7.III.1972, FH, 11 ex (ZMAN); 8.III.1972, FH, 1 ex (ZMAN); 13.III.1972, FH, 8 ex (ZMAN); 16.III.1972, FH, 3 ex (ZMAN); 21.III.1972, FH, 1 ex (ZMAN); 23.III.1972, FH, 1 ex (ZMAN); 30.III.1972, FH, 4 ex (ZMAN); 2.IV.1972, FH, 1 ex (ZMAN); 4.IV.1972, FH, 1 ex (ZMAN); 8.IV.1972, FH, 19 ex (ZMAN); 19.IV.1972, 120 m, FH, 1 ex (ZMAN); 20.IV.1972, FH, 2 ex (ZMAN); 20.V.1972, FH, 1 ex (ZMAN); 29.V.1972, FH, 1 ex (ZMAN); 28.IX.1972, FH, 4 ex (ZMAN); 1.X.1972, FH, 2 ex (ZMAN); 3.X.1972, FH, 2 ex (ZMAN); 4.X.1972, FH, 1 ex (ZMAN); 8.X.1972, FH, 2 ex (ZMAN); 11.X.1972, FH, 2 ex (ZMAN); 14.X.1972, FH, 2 ex (ZMAN); 9.XI.1972, FH, 1 ex (ZMAN); 23.X.1974, FH, 1 ex (ZMAN); 15.I.1975, FH, 1 ex (ZMAN); 18.I.1975, FH, 1 ex (ZMAN); 19.I.1975, FH, 1 ex (ZMAN); 21.I.1975, FH, 1 ex (ZMAN); 2.II.1975, FH, 1 ex (ZMAN); 8.II.1975, FH, 1 ex (ZMAN). **Prov. not traced:** Sardegna merid. (= southern Sardinia), 18.III.1972, FH, 3 ex (ZMAN); 19.III.1972, FH, 1 ex (ZMAN); 21.III.1972, FH, 2 ex (ZMAN); 24.III.1972, FH, 1 ex (ZMAN); 25.III.1972, FH, 1 ex (ZMAN).

**Chorotype.** 1.12 EUM. Europeo-Mediterranean including the Canary Islands, the British Isles and Norway, across the Mediterranean only known from Morocco, Algeria and Tunisia; introduced in Canada, USA and Ecuador.

**Italian distribution.** Widespread, known from 13 out of the 20 Italian regions, including Sicily.

**Ecology.** One of the more common craneflies of Sardinia (42 records). The general ecology of members of the subgenus *Tipula* is outlined under *T. (T.) italica errans*.

The species is found in all kinds of open habitats, usually near water, and also in coniferous and, more frequently, deciduous forests, ranging from dry to rather wet. As in the rest of Europe, there are two periods of flight, in Sardinia from mid January to the end of May and from the end of September to early November.

28. *Tipula (Tipula) plumbea* Fabricius, 1782


**Collection records.** *Cagliari prov.*: 2 km north of Domus de Maria, 38 58N/08 52E, 80 m, 23.X.1981, HM, 1 ex (ZMAN); Musei, 120 m, 18.X.1973, FH, 1 ex (ZMAN); 14.XI.1973, FH, 2 ex (ZMAN); 25.XI.1973, FH, 1 ex (ZMAN); 7.XI.1974, FH, 1 ex (ZMAN). **Nuoro prov.** 4 km north of Asuni, Fiume Noudda, 39 54N/08 56E, 80 m, 22.X.1981, HM, 5 ex (ZMAN); north of Fonni, Rio Talaro, 40 09N/09 16E, 800 m, 20.X.1981, HM, 7 ex (ZMAN); Rio Talaro, 40 06N/09 13E, 670 m, 21.X.1981, HM, 4 ex (ZMAN).

**CNCBVR records.** *Cagliari prov.*: C76: 12.IX.2006, GN, al, 1 ex.

**Chorotype.** 3900.18 TYRR. Known from Italy and southern France only.

**Italian distribution.** Besides Sardinia also known from one locality in Tuscany and one in Apulia.

**Ecology.** The general ecology of members of the subgenus *Tipula* is outlined under *T. (T.) italica errans*. Detailed information on the habitat preferences of *T. (T.) plumbea* is not available. The period of flight is in October and November.

29. *Tipula (Tipula) subcunctans* Alexander, 1921


COLLECTION RECORDS. Cagliari prov.: Castello di Acquafreda, 120 m, 12.X.1972, FH, 1 ex (ZMAN). Nuovo prov.: near Belvi, 700 m, 6.XII.1974, FH, 1 ex (ZMAN); Bruncu Spina, 16.X.1988, LB, 9 ex (ZMAN); Rio Tiny, parte centrale [= central part], 29.XI.1972, FH, 1 ex (ZMAN).

CHOROLOGY. 1.05 SIE. Sibero-European except Iceland, islands in the Arctic Ocean and Turkey, in the east including Sakhalin, Mongolia, Japan and northern China.

ITALIAN DISTRIBUTION. Represented well on Sardinia (7 localities) and Sicily (13) but known from mainland Italy from a few records only: Piedmont (1), Trentino-Alto Adige (3), Tuscany (1), Abruzzi (2), Molise (1). ECOLOGY. The general ecology of members of the subgenus Tipula is outlined under T. (T.) italic a errans. T. (T.) subcunctans is found near water, along small streams or otherwise rather wet places, usually in open environments but also in deciduous forests. The species is on the wing from the end of September to early December.

30. Tipula (Vestiplex) pallidicosta pallidicosta Pierre, 1924


CHOROLOGY. 2.01 EUR. European including Turkey, excluding the British Isles, Russia and most of the Iberian Peninsula.

ITALIAN DISTRIBUTION. Widespread, known from 14 out of the 20 Italian regions; not known from Sicily. ECOLOGY. A species of higher altitudes, usually above 1,500 m, in open coniferous, mixed or deciduous forests, and at higher altitudes alpine meadows and marshes. Larvae live in the soil on decomposing plant material.

The species is on the wing from the end of May until August.

31. Tipula (Yamatotipula) afriberia italia Theowald, Dufour & Oosterbroek, 1982

Tipula (Yamatotipula) lateralis Meinigen: Mannheims & Theowald 1959: 18.

Tipula (Yamatotipula) montium Egger: Mannheims & Theowald 1959: 18.

Tipula (Yamatotipula) montiumitalia subsp. nov.: Theowald et al. 1982: 320, 325.


COLLECTION RECORDS. Cagliari prov.: 2 km north of Domus de Maria, 38 58N/08 52E, 70 m, 23–24.V.1981, HM, along broad stream in meadow, and along small stream out of maquis, 31 ex (ZMAN); north of Domus de Maria, 80 m, 38 58N/08 52E, 23.X.1981, HM, 123 ex (ZMAN); Domusnovas, Tiny, 27.IX.1974, FH, 1 ex (ZMAN); Gutturu Spota, 27.V.1974, FH, 3 ex (ZMAN); Rio Gutturu Mannu, 100 m, 31.V.1974, FH, 1 ex (ZMAN); north of crossing Sádali – Seulo, 800 m, 39 51N/09 16E, 28.V.1981, HM, 1 ex (ZMAN); below San Nicolò Gerrei, 300 m, 39 29N/09 19E, 26.V.1981, HM, 4 ex (ZMAN); above San Vito, Fiume Flumendosa, 80 m, 39 29N/09 30E, 26.V.1981, HM, along small river with broad stony shores, 23 ex (ZMAN); south of Siliqua, 250 m, 39 12N/08 48E, 25.V.1981, HM, along small stream in maquis, 1 ex (ZMAN); Teulada, Montes, 650 m, 17.X.1973, FH, 1 ex (ZMAN). Nuovo prov.: Arizto, 800 m, 11.IX.1974, FH, 1 ex (ZMAN); above Arizto, 1000 m, 1.VII–10.VIII.1938, HN, 1 ex (MAKB); Barbaga, Belvi, Ortusubis – Bruncu Trotu, 750 m, 14.VIII.1977, FH, 1 ex (ZMAN); Barbaga, Belvi, Ortusubis – Bruncu Trotu, 800 m, 16.IX.1977, FH, 2 ex (ZMAN); north of Belvi, 560 m, 39 59N/09 11E, 28.V.1981, HM, along small polluted stream between gardens, 2 ex (ZMAN); Bruncu Spina, 16.X.1988, LB, 4 ex (ZMAN); north of Desulo, Rio Aratu, 970 m, 40 02N/09 15E, 29.V.1981, HM, 1 ex (ZMAN); north of Escalaplano, Rio Flumineddu, 240 m, 39 40N/09 23E, 27.V.1981, HM, 1 ex (ZMAN); Fermata di Fontanamela, 6.X.1977, FH, 2 ex (ZMAN); Fonni, 1000 m, 40 07N/09 12E, 12.V.1998, JD, 1 ex (ZMAN); north of Fonni, Rio Taloro, 820 m.
m, 40°09’N/09°16’E, 29.V.1981, HM, 1 ex (ZMAN); south of Gadoni, Fiume Flumendosa, 400 m, 39°53’N/09°11’E, 28.V.1981, HM, 6 ex (ZMAN); north of Mamoiada, Rio Sa Pruna, 500–510 m, 40°15’N/09°17’E, 30.V.1981, HM, along very polluted river, 2 ex (ZMAN); [Meana Sardo,] Ortuabis, Scala Martina, 800 m, 14.IX.1977, FH, 1 ex (ZMAN); Rio San Girolamo, 550 m, 39°50’N/09°24’E, 27.V.1981, HM, 1 ex (ZMAN); Rio Taloro, 670 m, 40°06’N/09°13’E, 21.X.1981, HM, 9 ex (ZMAN); Rio Tiny, parte centrale [= central part], 22.XI.1972, FH, 1 ex (ZMAN); 29.XI.1972, FH, 1 ex (ZMAN); Tertenia, 100 m, 39°41’N/09°35’E, 12.V.1998, JD, 1 ex (ZMAN); east of Ussassai, Rio San Girolamo, 530 m, 39°50’N/09°24’E, 25.XI.1981, HM, 1 ex (ZMAN). **Oristano prov.**:

Allai, Rio Mannu, 9.V.1977, FH, 1 ex (ZMAN); south of Allai, tributary of Fiume Tirso, 30 m, 39°57’N/08°53’E, 5.VI.1981, HM, 1 ex (ZMAN); above Fordongianus, Fiume Tirso, 40°00’N/08°51’E, 30 m, 4.VI.1981, HM, 3 ex (ZMAN). **Sassari prov.**:

east of Badde Suelzu, 570 m, 40°44’N/09°20’E, 31.V.1981, HM, along small stream in maquis, 20 ex (ZMAN); 19.X.1981, HM, along small stream in maquis, 5 ex; Island of Caprera, Casa di Garibaldi, 18.VI.1989, BO, 1 ex (ZMAN); Sas Baddes, 430 m, 40°25’N/08°51’E, 2.VI.1981, HM, along very polluted small stream in open country, 4 ex (ZMAN). **CNBFVR records. Cagliari prov.:** A01: 21.IX.2004, DB PCe EG FM DW, dune, nt, 1 ex; 26.III.2006, DW MB DB PCo, dune, nt, 1 ex; C19: 24–25.III.2006, DW MB DB PCo, nt, 7 ex; C58: 10–11.XI.2006, MB GN DW MZ, al, 1 ex; S3: 2–16.V.2006, GC, mt, 1 ex.

**CHOROTYPE. 2.04 SEU.** South European but only as far east as south-eastern Switzerland and Slovenia. **Italian distribution.** Besides Sardinia known from 40 localities, distributed over Piedmont, Liguria, Emilia-Romagna, Tuscany, Marches, Abruzzi, Calabria and Sicily. **Ecology.** One of the most common craneflies of Sardinia (44 records). Found along streams and rivers, in open environments but also in shrubs and not too dense deciduous forests. The larvae develop in wet soils along the water side, feeding on decomposing plant material. On the wing from the end of March until the end of November, with the large majority of records in May and October.

-- **Tipula (Yamatotipula) lateralis** Meigen, 1804

**Notes.** See *T. (Y.) ariefberia italia.*

-- **Tipula (Yamatotipula) montium** Egger, 1863

**Notes.** See *T. (Y.) ariefberia italia.*

**CONCLUSIONS**

The Tipulidae of Sardinia can be divided into two groups:

1. 16 species (52%) widespread in the (West) Mediterranean, Europe or even the Palaearctic (chorotypes 1.05 (3 species), 1.10 (1), 1.12 (5), 2.01 (1), 2.04 (3), 3.01 (1), 3.02(2))

2. 15 species or subspecies (48%) endemic or sub-endemic to geographic Italy (chorotypes 3900). An important group here are the 7 species (23%) endemic to Corsica and Sardinia. Another three (10%) are known only from Sardinia and four have a Tyrrenian distribution. Among the last group it is of interest that three of them show a distributional connection with southern France.

A remarkable aspect is the apparent absence in Sardinia of members of the genera *Ctenophora* Meigen, 1803, *Dictenidia* Brulle, 1833 or *Tanyptera* Latreille, 1804. They are special as their larvae develop in decaying wood of deciduous trees. Of these genera, 14 species occur in Europe (Oosterbroek et al. 2006), eight are known from mainland Italy, three from Corsica and one from Sicily (Oosterbroek 2007).

The number of species recorded from the four former Sardinian provinces is Nuoro 28, Cagliari 19, Sassari 17 and Oristano 7.

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della fauna italiana, 63. Calderini, Bologna.


