



## A review of the soldier flies (Diptera: Stratiomyidae) of Sardinia\*

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### Abstract

All published records on Stratiomyidae from Sardinia were critically evaluated and extensive, recently collected material (more than 500 specimens) was identified. The present review of the soldier flies from Sardinia includes 27 species. *Nemotelus niloticus* Olivier, 1811 is newly recorded from Europe and Italy, and *Lasiopa pseudovillosa* Rozkošný, 1983 and *Zabrachia tenella* (Jaenicke, 1866) are newly recorded from Sardinia. *Nemotelus brachystomus* Loew, 1846 and *N. leucorhynchus* Costa, 1884 are proposed as new synonyms of *N. notatus* Zetterstedt, 1842. *Beris hyaliniventris* Costa, 1857, the types of which could not be found, is removed from synonymy with *Chorisops tibialis* (Meigen, 1820) and declared as species *incertae sedis*. Brief comments are made on the zoogeography of Sardinian soldier flies.

**Key words:** Diptera, Stratiomyidae, Sardinia, new synonyms, new records, faunistics, zoogeography

### Introduction

The first records of Stratiomyidae from Sardinia were published by Achille Costa (1882, 1883, 1884, 1886). He carried out several collecting trips in southern Italy and Sardinia, set up important collections and described numerous new species of insects (cf. Conci & Poggi 1996; Pantaleoni 2005). Unfortunately, his collection was not catalogued and made accessible to subsequent specialists after his death (Pantaleoni 2005). Costa (1882, 1883, 1884, 1886) recorded 15 species of soldier flies from Sardinia, including two new species. Recently (June 2008), the senior author had the opportunity to examine the Costa Diptera collection, which is deposited at Naples in the “Museo Zoologico dell'Università di Napoli Federico II” (cf. Maio *et al.* 1995), and found that no types or other specimens of Stratiomyidae collected in Sardinia have been preserved.

The available additional literature records of soldier flies from Sardinia are present in faunistic lists (Röder 1884; Bezzi 1892; Troiano & Toscano 1997; Mason & Rozkošný 2003; Mason 2005; Mason *et al.* 2006), and two species are also mentioned in Lindner (1938). Rozkošný (1982, 1983) recorded several species from Sardinia based on a list kindly provided by Carlo Contini (Cagliari), and on specimens found in collections deposited in the “Museo Civico di Storia Naturale”, Milan and the Zoological Institute of the Russian Academy of Sciences, St. Petersburg.

All published records were critically evaluated and compared with the extensive, recently collected material. Altogether, 27 species of soldier flies are recorded, with certainty, for Sardinia, three for the first time.

## Material and methods

In 2003–2007 the Centro Nazionale per lo Studio e la Conservazione della Biodiversità Forestale “Bosco Fontana” of Verona carried out annual entomological investigations in SW Sardinia to assess arthropod diversity in the framework of the Conecofor project (the Italian ICP Forests network for the monitoring of forest ecosystems) (cf. Mason *et al.* 2006). In 2007 the opportunity was taken by the first author to organize a collecting trip in the most important coastal salt marshes of Sardinia, during which over 500 specimens of Stratiomyidae were collected by sweep net. All specimens were collected in salt marshes with a high salt concentration: Stagno di [= Marsh of] San Teodoro, Stagno di s'Ena Arrubia, Stagno di Mistras di Oristano, Stagno di Cabras, Stagno di Santa Giusta, Stagno di Putzu Idu, San Giovanni di Sinis, Stagno di Molentargius, Stagno di Cagliari, Laguna di [= Lagoon of] Santa Gilla, Porto Pino, and Stagno di Santa Caterina. All are Sites of Community Importance in the Natura 2000 network of the EU Habitats Directive. Further material was kindly made available by Sardinian colleagues Carlo Contini, Luca Fancello and Carlo Meloni from Cagliari.

The following biometric measurements were made: length of body, length of wing, and head index, the latter being the head length divided by the head height in lateral view (cf. Rozkošný 1982, pl. 3, fig. 11).

Under each species, the headings “Published records” and “Material examined” refer exclusively to Sardinia. When necessary, additional material from outside Sardinia was studied for some species, the label data of which is listed under the heading “Other examined material”. Sardinian localities are arranged alphabetically within each province according to the Touring Club Italiano (2000). However, in 2005 the Sardinian provinces were rearranged and increased in number from four to eight, and we chose to follow this new arrangement also for records previous to 2005, so as to avoid the assignment of same localities to two different provinces. Generic records (“Sardinia”) are listed first. Site coordinates were obtained using a Garmin Vista C GPS (precision of about  $\pm 5$  m). The records published in Mason (2005) were reprinted in the English version of that work (Mason 2006); in the “List of species”, only Mason (2005) is referred to for brevity. The chorotypes used in the zoogeographical analysis were assigned according to Vigna Taglianti *et al.* (1993, 1999) and are based on the distributional areas provided by Rozkošný (1982), Nartshuk (2009) and the literature sources cited below each species. Acronyms of collections were taken from the “Abbreviations for Insect and Spider Collections of the World” (Evenhuis 2008). Species that are not confirmed with certainty from Sardinia are enclosed in square brackets and excluded from the zoogeographical analysis.

The systematics and nomenclature used in the “List of species” principally follow Rozkošný (2004).

Acronyms of specimen depositories:

CCC	Carlo Contini collection (Cagliari, Italy)
CNBFVR	Centro Nazionale per lo Studio e la Conservazione della Biodiversità Forestale “Bosco Fontana” (Verona, Italy)
FMV	Franco Mason collection (Verona, Italy)
FSMU	Faculty of Science, Masaryk University (Brno, Czech Republic)
MZUN	Museo Zoologico dell'Università di Napoli Federico II (Naples, Italy)

## List of species

### *Chloromyia formosa* (Scopoli, 1763)

**Published records.** Sardinia (Bezzi 1892; Mason & Krivosheina 1995; Rozkošný 2004). Cagliari prov.: Cagliari (Costa 1883); Cagliari; Capoterra, sponde [= banks of] Rio Santa Lucia; Geremeas (Mason 2005); Sarrabus (Troiano & Toscano 1997). Nuoro prov.: Sorgono (Rozkošný 1982). Oristano prov.: Tirso [torrent] (Mason 2005). Sassari prov.: Ploaghe (Troiano & Toscano 1997); Porto Conte; Sassari (Mason 2005).

**Material examined.** Cagliari prov.: Geremeas, 2.VI.2003, L. Fancello leg., 3 ♂♂, net (CNBFVR); Carbonia-Iglesias prov.: Iglesias, near Colonia Beneck, N 39°20'51.3" E 8°33'48.7", 636 m, 2-16.V.2006, G. Chessa leg., 2 ♂♂, Malaise trap (CNBFVR).

**Distribution.** Palaearctic species, extending from central Scandinavia to North Africa and eastwards to eastern Siberia (Rozkošný 1982).

### *Chorisops caroli* Troiano, 1995

**Published record.** Olbia-Tempio prov.: Tempio Pausania (Mason & Rozkošný 2003).

**Distribution.** This species was described from Liguria (NW Italy) and later recorded exclusively from Italy in Liguria (Troiano & Toscano 1997; Mason & Rozkošný 2003), Latium (Mason & Mei 2002), Tuscany (Mason 2003, 2005) and Sardinia (see above).

### *Chorisops masoni* Troiano & Toscano, 1995

**Published records.** Sardinia (Rozkošný 2004). Oristano prov.: Busachi, Masi (Mason 2005).

**Material examined.** Oristano prov.: Busachi, Masi, N 40°02'02.0" E 8°53'47.92", 379 m, 15.X.1978, C. Contini leg., 25 ♂♂, 5 ♀♀ (CCC, FMV).

**Remarks.** This species was also recorded from Sardinia by Mason (2005) based on part of the above-listed material.

**Distribution.** Only known from Italy: Lombardy (Mason 2004), Liguria (Troiano & Toscano 1995), Latium (Mason & Rozkošný 2003), Sicily (Troiano & Toscano 1995), and Sardinia (Mason 2005).

### [*Chorisops tibialis* (Meigen, 1820)]

**Published records.** Ogliastra prov.: [in the mountain forest near] Gennargentu (Costa 1882, as *Beris hyaliniventris* Costa, 1857). Sassari prov.: Ploaghe (Costa 1884, as *B. hyaliniventris*).

**Remarks.** *Beris hyaliniventris* Costa, 1857, which was described from Naples (Campania region, southern Italy) and was later recorded also from the above-quoted Sardinian localities, was treated by Woodley (2001), following Rozkošný (1982), as a synonym of *Chorisops tibialis*. However, three other species of *Chorisops* Rondani, 1856 – *C. caroli*, *C. masoni* and *C. tunisiae* (Becker, 1915) – were recently recorded from Sardinia and the Costa types could not be found (Mason, unpublished data). Because the reliable distinguishing characters of these species are represented mainly by structures of the male terminalia, the correct synonymy of *Beris hyaliniventris* remains doubtful, and it is here considered as a species *incertae sedis* of *Chorisops*.

### *Chorisops tunisiae* (Becker, 1915)

**Published record.** Carbonia-Iglesias prov.: Iglesias, Case Marganai, N 39°21'07.3" E 8°34'51.2", 650 m, 23.IX.2004, D. Birtele, P. Cerretti, F. Mason & D. Whitmore leg., 13 ♂♂, 5 ♀♀, on *Hedera helix* L. flowers, net (FMV) (Mason *et al.* 2006, with locality given as "Marganai").

**Material examined.** Carbonia-Iglesias prov.: Iglesias, near colonia Beneck, N 39°20'51.3" E 8°33'48.7"1, 636 m, 19.IX-3.X.2006, G. Chessa leg., 1 ♂, Malaise trap (CNBFVR); Marganai, Tintillonis, N 39°19'13.6" E 8°20'14.8", 480 m, 22.IX.2004, D. Birtele, P. Cerretti, E. Gatti, F. Mason & D. Whitmore leg., 1 ♀, on *Foeniculum vulgare* flowers (CNBFVR); Domusnovas, sa Duchessa, N 39°22'27.2" E 8°35'36.7", 371 m, 17-31.IX.2006, G. Chessa leg., 1 ♀ (FMV); same data but 19.IX-3.X.2005, 4 ♀♀ (FMV); same data

but 3–17.X.2006, 1 ♀, Malaise trap (CNBFVR); Domusnovas, Valle Oridda, N 39°24'32.2" E 8°36'58.9", 592 m, 19.IX.–3.X.2006, G. Chessa leg., 1 ♀, Malaise trap (CNBFVR).

**Remarks.** This species was first recorded from Sardinia by Mason *et al.* (2006) based on part of the above-listed material. The specimens from Case Marganai were collected on sunlit *Hedera helix* flowers and at night on a garden light.

**Distribution.** Recently recorded from Sardinia and Sicily (Mason *et al.* 2006) as new to Italy, previously recorded only from few localities in Portugal, Spain, Morocco, Algeria and Tunisia (Rozkošný 1982).

### *Hermetia illucens* (Linnaeus, 1758)

**Published records.** Sardinia (Mason & Krivosheina 1995; Rozkošný 2004). Cagliari prov.: Cagliari, city; Elmas (Mason 2005). Carbonia-Iglesias prov.: Isola di Sant'Antioco, Rio Trigo (Mason 2005).

**Remark.** Numerous records from Italy were recently summarized by Mason (2005) and Adamo (2008).

**Distribution.** Almost cosmopolitan between 45°N and 40°S, apparently American in origin but spread by commerce (Rozkošný 1983). In the Palaearctic it has been recorded from the Canary Islands, Portugal, Spain, France, Italy, Malta, Croatia, Albania and Turkey, with northernmost localities in southern Switzerland (Üstüner *et al.* 2003; Rozkošný 2004).

### *Lasiopa pseudovillosa* Rozkošný, 1983

**Material examined.** Cagliari prov.: Pula, S.S. [= Strada Statale = Statal Road] Sulcitana, near Pula, 21.VI.1978, C. Meloni leg., 2 ♂♂ (FMV).

**Remarks.** Species new to Sardinia. In Italy known from southern Emilia-Romagna to Calabria, Apulia and Sicily (Rozkošný 1983; Mason 2005).

**Distribution.** A S-European (*sensu* Vigna Taglianti *et al.* 1999) species ranging from the Italian mainland, Sicily and Sardinia. Also recorded from Switzerland, Turkey and Iran (Rozkošný 1983, 2004).

### *Microchrysa polita* (Linnaeus, 1758)

**Published records.** Sardinia (Troiano & Toscano 1997). Sassari prov.: Ploaghe (Costa 1884, as *Chrysomya polita*).

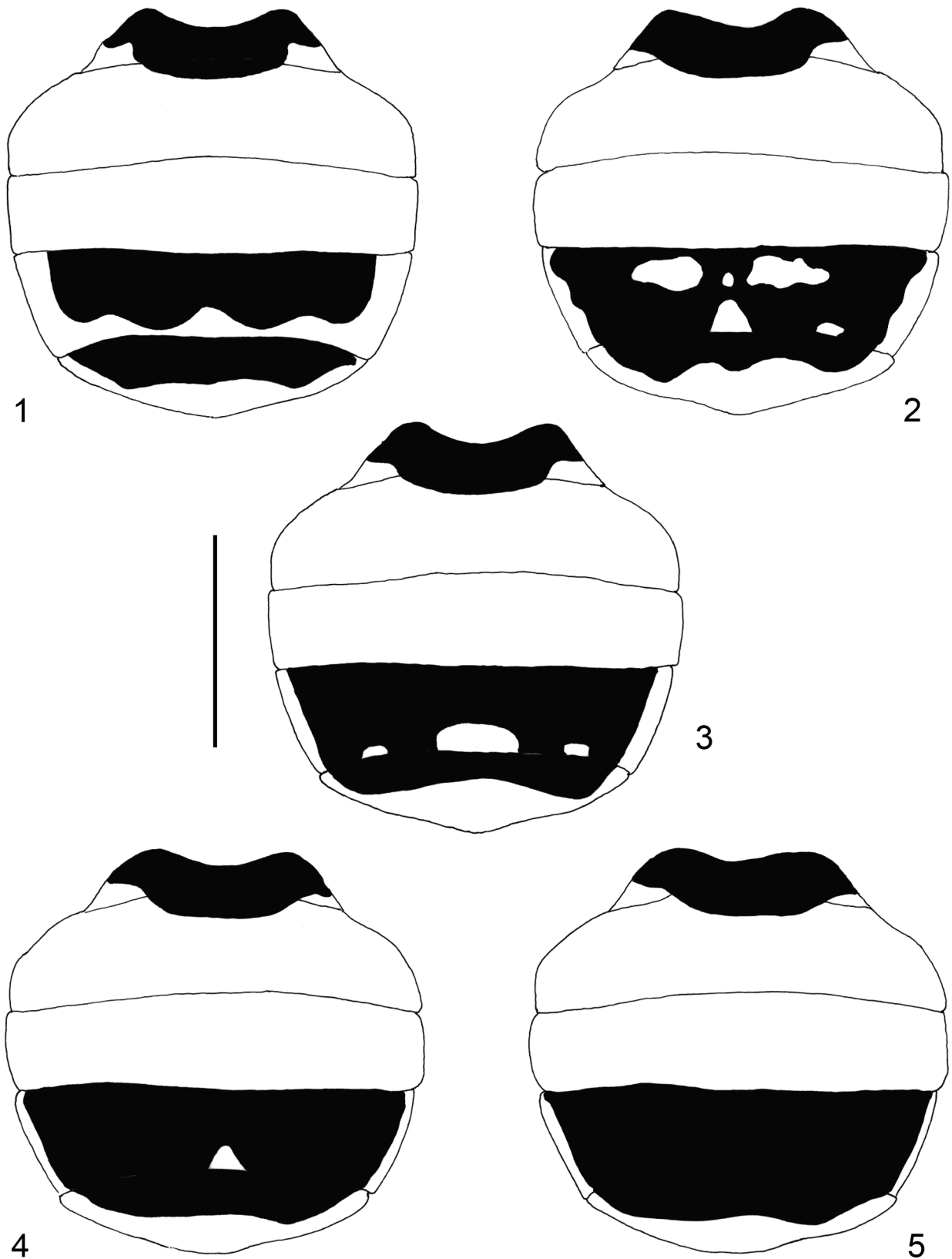
**Distribution.** A Centralasiatic-European (*sensu* Vigna-Taglianti *et al.* 1996) species extending from western Europe through Asia to Mongolia, also introduced into North America (James 1936; McFadden 1972; Rozkošný 2004).

### *Nemotelus anchora* Loew, 1846

**Published records.** Sardinia (Rozkošný 1983). Oristano prov.: Oristano (Lindner 1938; Mason 2005); Sinis, Capo Mannu (Troiano & Toscano 1997). Sassari prov.: Asinara Island (Troiano & Toscano 1997; Nuvoli *et al.* 2007).

**Material examined.** Sardinia, Cagliari prov.: [Cagliari], Stagno di Santa Gilla, 7.V.2001, L. Fancello leg., 1 ♂, 14 ♀♀, net (FMV).

**Distribution.** Known in Italy from Emilia-Romagna (*cf.* Mason 2005), Sicily (Loew 1846; Jaennike 1866; Lindner 1938; Rozkošný 1977) and Sardinia (see above). It has been recorded also from Malta, Israel, Algeria, Tunisia and from several localities in the former USSR (northern Caucasus, Transcaucasus, Central Asia) (Rozkošný 1977, 1983, 2004).



**FIGURES 1–5.** Variability of male abdominal colour pattern in a population of *Nemotelus nigrifrons* Loew (Sardinia, Stagno di Santa Gilla), scale bar: 1 mm.

### *Nemotelus lasiops* Loew, 1846

**Published records.** Cagliari prov.: Assemini, Rio Flumini Mannu; Serdiana; Siliqua (Mason 2005). Oristano prov.: Sinis, Capo Mannu (Troiano & Toscano 1997).

**Material examined.** Cagliari prov.: Cagliari, Stagno di Santa Gilla, saline [= saltworks], 7.V.2001, L. Fancello leg., 3 ♀♀, net (FMV); Serdiana, 1.V.2001, L. Fancello leg., 10 ♂♂, 33 ♀♀ (FMV).

**Remarks.** This species is known in Italy only from Sardinia and Sicily (Troiano & Toscano 1997; Mason 2005).

**Distribution.** A W-Mediterranean species known to occur in Sardinia, Sicily and the coastal areas of North Africa (Rozkošný 1977, 2004).

### *Nemotelus nigrifrons* Loew, 1846

(Figs 1–5)

**Published records.** Cagliari prov.: Cagliari, Stagno di Santa Gilla, saline [= saltworks] (Mason 2005). Carbonia-Iglesias prov.: Gonnesa, Palude Gonnesa (Mason 2005).

**Remarks.** A species resembling *N. pantherinus* (Linnaeus, 1758) in the male terminalia, but well distinguished by the absence of frontal spots (Rozkošný 1977, 1983). Recent records of this species from Sardinia are not surprising given its occurrence in Sicily (Rozkošný 1983; Mason & Krivosheina 1995).

**Distribution.** *Nemotelus nigrifrons* seems to be confined to the Mediterranean area, extending from Spain, Sardinia, Sicily and North Africa (Morocco, Algeria, Tunisia) to Israel (Rozkošný 1977, 2004).

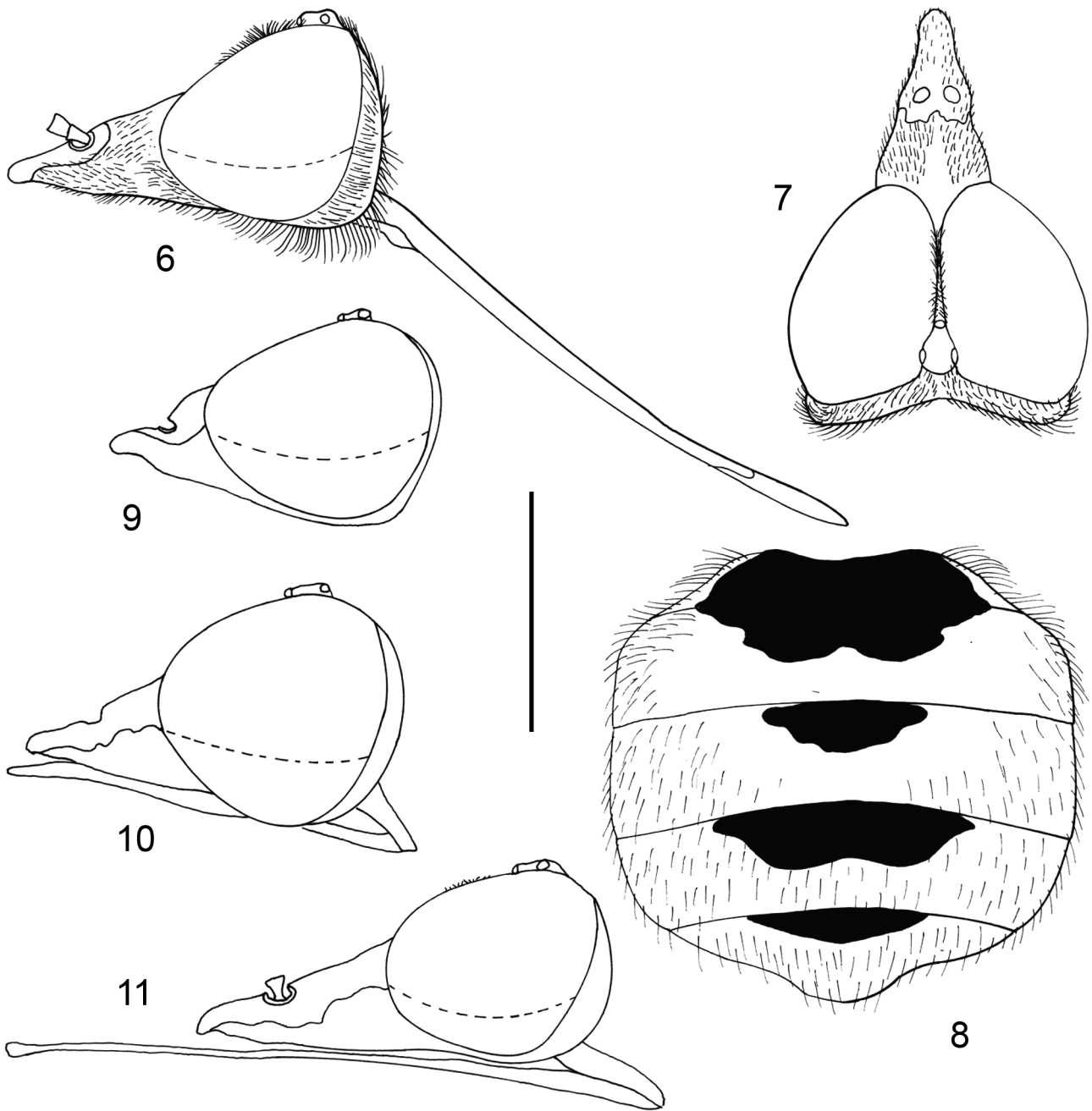
### *Nemotelus niloticus* Olivier, 1811

(Figs 6–20, 21–24, 62–63)

**Material examined.** Carbonia-Iglesias prov.: Isola di Sant'Antioco, Stagno di Santa Caterina, close to "Centro Sperimentale ENEL", N 39°05'18.4" E 8°29'10.5", 24.VI.2007, C. Meloni leg., 88 ♀♀, 47 ♂♂ sweep net, on *Salicornia* sp. (FMV); Sant'Anna Arresi, Stagno di Punta Pino N 38°58'24.0" E 8°36'34.4", 22.VI.2007, F. Mason, D. Birtele & F. Mazzocchi leg., 25 ♂♂, 26 ♀♀, sweep net, on *Salicornia* (FMV).

**Other material examined.** Israel, Neve Zohar, 19.03.1995, net, B. Merz leg. 1 ♂, 1 ♀, (FMV); Tunisia, near Nefta, palme grove, 31.05.1994, net, S. Becvar leg., 2 ♂♂ (FMV); Algeria, Skah, Biskra, 18.04.1949, A. Giordani Soika leg., 1 ♂, 1 ♀ (FMV).

**Remarks.** *Nemotelus niloticus* was treated as a species *incertae sedis* by Rozkošný (1977) in his revision of the West-Palaeartic *Nemotelus* Geoffroy, 1762; the same author illustrated the diagnostic characteristics of *N. albifacies* Becker, 1902, which was later considered as its synonym by Hauser (2008). The specimens recently collected in Sardinia have a yellow spot limited to the area between the apex of the facial projection and the base of the antennae (typical, according to Hauser (2008), of specimens from the Tunisian coast). Records from Sardinia confirm the Mediterranean distribution pattern of the species (Rozkošný 1977, 1983). The Sardinian specimens were collected in a salt marsh with *Salicornia* sp. and *Limonium* sp. vegetation. Specimens of both sexes were attracted in great numbers by white surfaces, e.g. clothes, insect nets or white cars (Mason, pers. obs.; Meloni, pers. comm.). The biometric measurements refer to the population collected on the same day at Stagno di Santa Caterina (see above). Males (n = 21): body = 4.2–5.4 mm, wing = 2.5–3.7 mm, head index = 1.9–2.1; females (n = 26): body = 4.3–5.7, wing = 2.5–3.7, head index = 1.9–2.1 mm. The head index ranges from 1.6–1.7 (males) and 1.9 (females) for specimens from Algeria and Israel, to 2.0–2.3 for males from Tunisia. The Sardinian specimens are characterized by a relatively long facial projection (see Tab. 1).

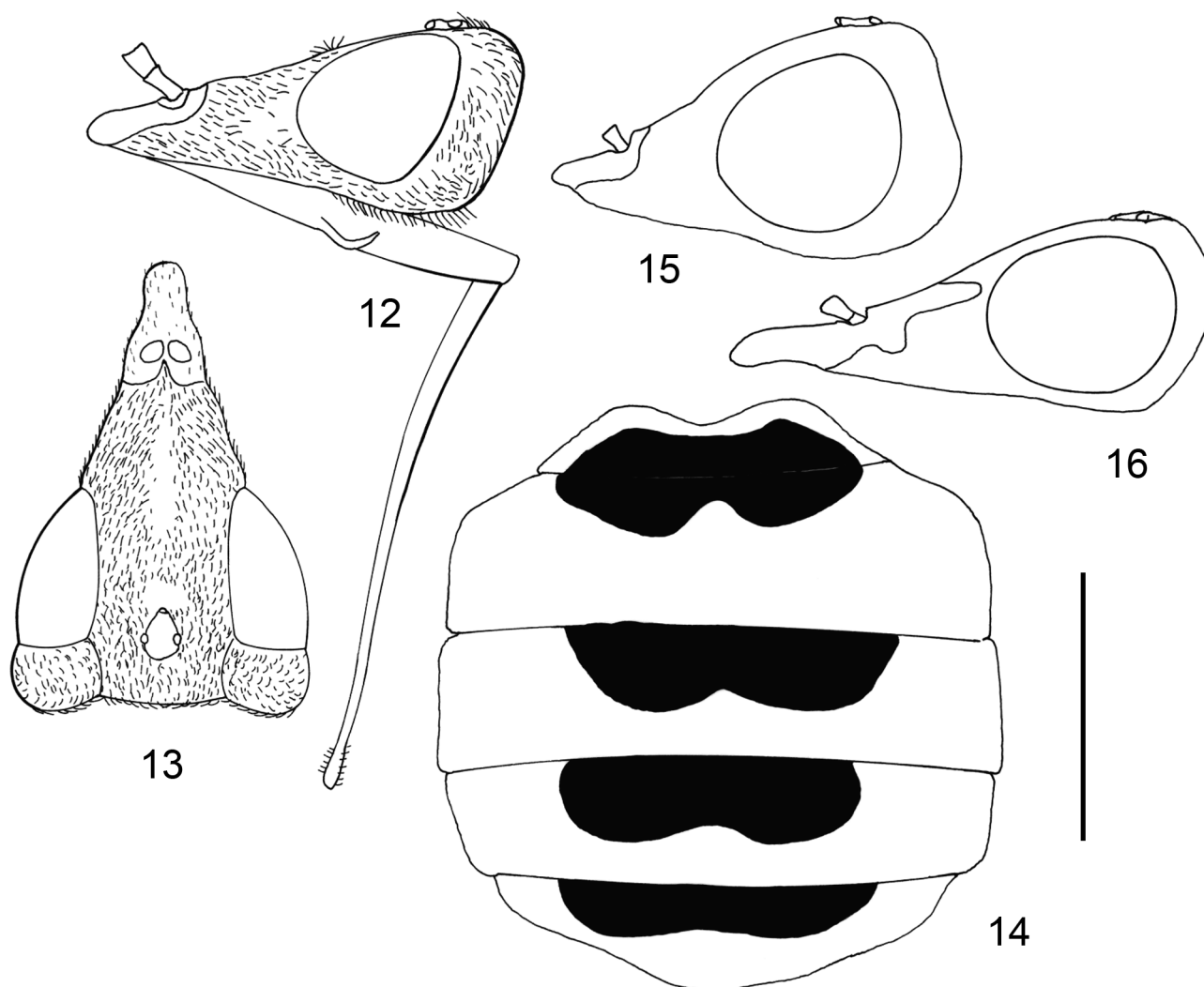


**FIGURES 6–11.** Male of *Nematelus niloticus* Olivier, scale bar: 1 mm. **6.** Head in lateral view (Sardinia, Stagno di Santa Caterina). **7.** Head in dorsal view (same locality). **8.** Abdomen in dorsal view (same locality). **9.** Head in lateral view (Israel, Newe Zohar). **10.** Head in lateral view (Algeria, Skah, Biskra). **11.** Head in lateral view (Tunisia, Nefta).

**TABLE 1.** Head index of *Nemotelus niloticus* specimens from Sardinia (Stagno di Santa Caterina), Israel (Newe Zohar), Tunisia (Nefta) and Algeria (Skah, Biskra) (for label data see “Other material examined”).

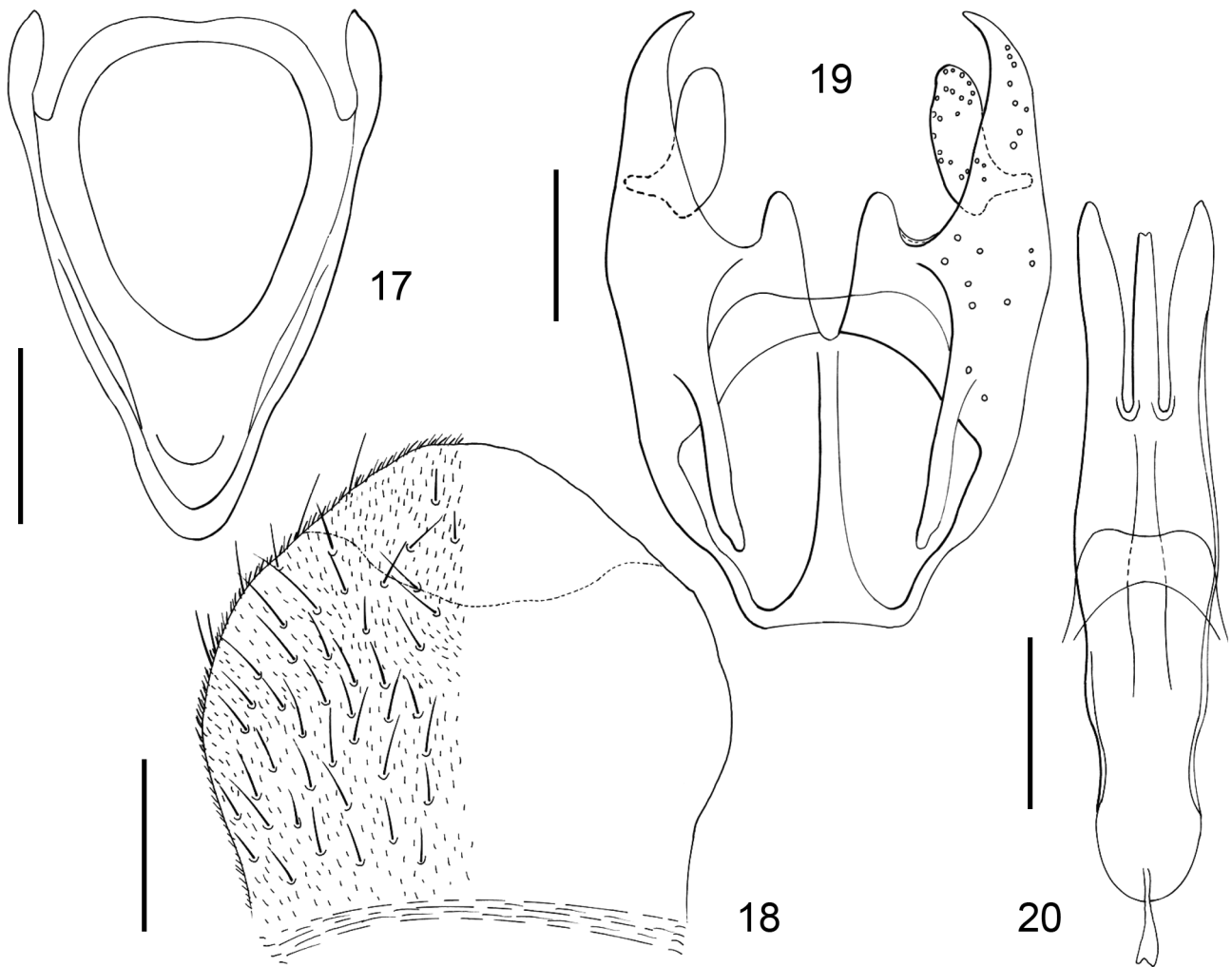
	Sardinia	Israel	Tunisia	Algeria
♂♂	1.9–2.1	1.6	2.0–2.3	1.7
♀♀	1.9–2.1	1.9	-	1.9

**Distribution.** First record for Europe. This species was known from Algeria and Egypt (Rozkošný 1977), and was recently recorded from Libya (Troiano & Toscano 1997), Tunisia (Hauser 2008), Israel (Hauser 2008) and the United Arab Emirates (Hauser 2008).



**FIGURES 12–16.** Female of *Nemotelus niloticus* Olivier, scale bar: 1 mm. **12.** Head in lateral view (Sardinia, Stagno di Santa Caterina). **13.** Head in dorsal view (same locality). **14.** Abdomen in dorsal view (same locality). **15.** Head in lateral view (Israel, Newe Zohar). **16.** Head in lateral view (Tunisia, Nefta).





**FIGURES 17–20.** *Nemotelus niloticus* Olivier (Sardinia, Stagno di Santa Caterina), scale bars: 0.1 mm. **17–18.** Female. **17.** Genital furca. **18.** Subgenital plate. **19–20.** Male. **19.** Genital capsule in dorsal view. **20.** Phallic complex in dorsal view.

***Nemotelus notatus* Zetterstedt, 1842**

(Figs 25–60)

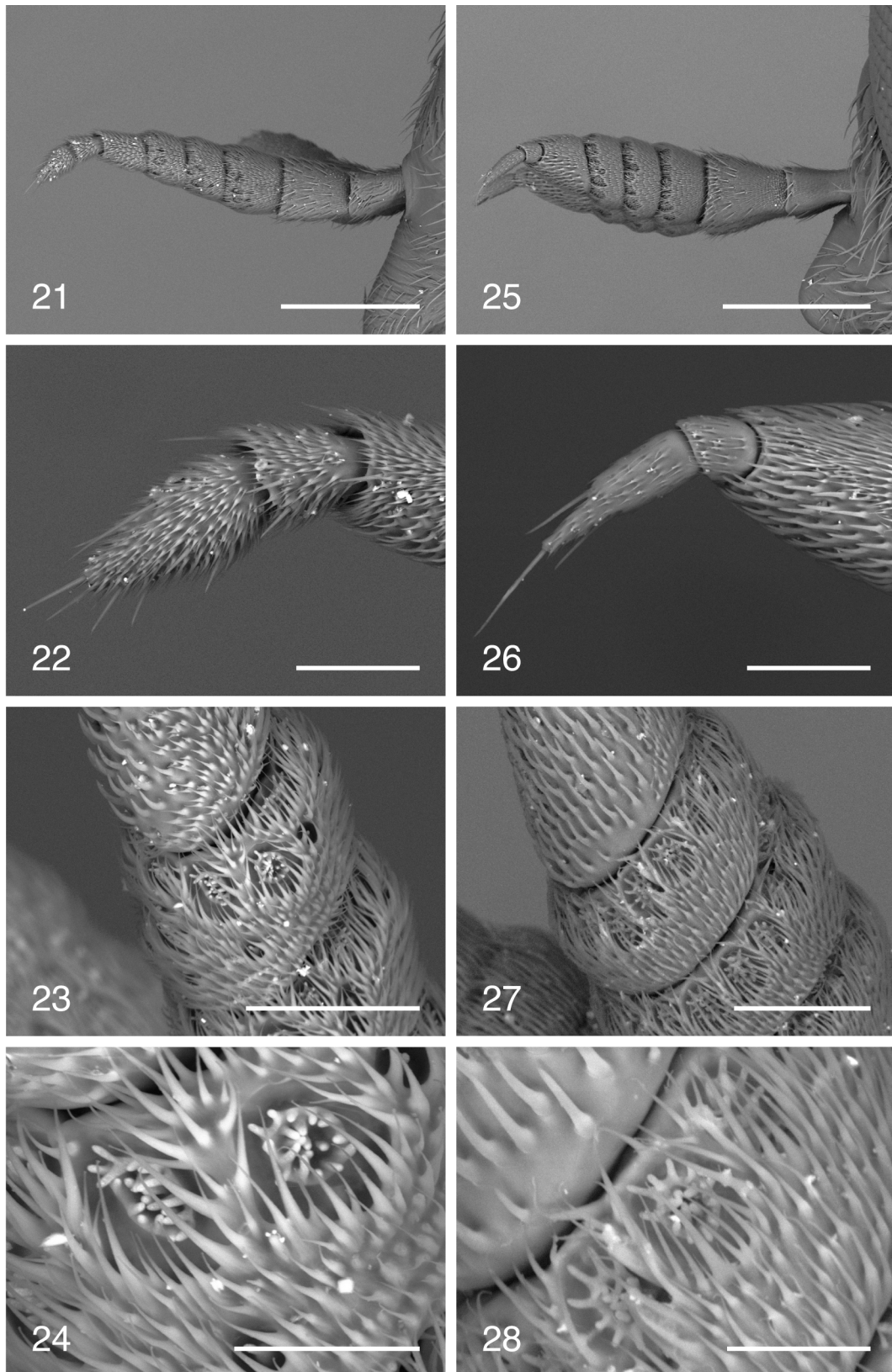
*Nemotelus notatus* Zetterstedt, 1842: 148.

*Nemotelus brachystomus* Loew, 1846: 443 **syn. nov.**

*Nemotelus leuchorhynchus* Costa, 1884: 61 **syn. nov.**

**Published records.** Sardinia (Rozkošný 2004). Cagliari prov.: Cagliari (Costa 1884, as *N. leucorhynchus*); Santa Gilla, Saline di Santa Gilla (Mason 2005, as *N. brachystomus*). Carbonia-Iglesias prov.: Isola di San Pietro, La Caletta (Mason 2005). Sassari prov.: Stintino (Mason 1988).

**Material examined.** Carbonia-Iglesias prov.: Sant’Anna Arresi, Stagno di Punta Pino, N 38°58’24.0” E 8°36’34.4”, 22.VI.2007, F. Mason, D. Birtele & F. Mazzocchi, 1 ♀, sweep net, on *Salicornia* sp. (FMV); Sant’Antioco, Stagno di Santa Caterina, N 39°04’56.1” E 8°29’21.9”, 22.VI.2007, F. Mason, D. Birtele & F. Mazzocchi leg., 10 ♂♂, 7 ♀♀, sweep net, on *Salicornia* sp. (FMV). Oristano prov.: S. Giovanni di Sinis, Stagno di Mistras, N 39°53’15.3” E 8°26’48.8”, 23.VI.2007, F. Mason, D. Birtele & F. Mazzocchi 1 ♂, sweep net, on *Salicornia* sp. (FMV); Cabras, Stagno di Cabras, N 39°55’35.4” E 8°27’53.8”, 23.VI.2007, F. Mason, D. Birtele & F. Mazzocchi leg., 1 ♂, 1 ♀, sweep net, on *Salicornia* sp. (CNBFVR); Arborea, Stagno di Santa Giusta, N 39°52’05.9” E 8°35’22.3”, 25.V.2006, 10 ♂♂ 7 ♀♀, M. Bardiani, D. Birtele, P. Cornacchia & D.



**FIGURES 21–28.** Males of *Nemotelus* spp. from Sardinia. **21–24.** *Nemotelus niloticus* Olivier (Sant’Antioco). **21.** Antenna; scale bar, 0.2 mm. **22.** Fifth and sixth flagellomeres; scale bar: 0.05 mm. **23.** Detail of third flagellomere, scale bar: 0.05 mm. **24.** Third flagellomere, sensory pits, scale bar: 0.02 mm. **25–28.** *Nemotelus notatus* Zetterstedt (Stagno di s’Ena Arrubia). **25.** Antenna; scale-bar: 0.2 mm. **26.** Fifth and sixth flagellomeres; scale bar: 0.05 mm. **27.** Detail of third flagellomere, scale-bar: 0.05 mm. **28.** Sensory pits of third flagellomere, scale bar: 0.02 mm.

Whitmore leg., sweep net, on *Salicornia* sp., (FMV); same data but N 39°51'15.7" E 8°35'55.5", 23.VI.2007, F. Mason, D. Birtele & F. Mazzocchi leg., 10 ♀♀ (FMV); San Vero Millis, Capo Mannu, N 40°02'16.1" E 8°22'30.2", 22.VI.2002, B. Merz & M. Eggenberger leg., 1 ♂, sweep net (FMV); San Vero Milis, Stagno di Putzu Idu, N 38°58'24.0" E 8°36'34.4", 23.VI.2007, F. Mason, D. Birtele & F. Mazzocchi leg. 3 ♂♂, 4 ♀♀, sweep net, on *Salicornia* sp. (FMV); Arborea, Stagno di s'Ena Arrubia, N 39°49'49.5" E 8°33'37.6", 23.VI.2007, F. Mason, D. Birtele & F. Mazzocchi leg., 38 ♂♂, 37 ♀♀, on *Juncus* sp. sweep net (FMV); Sassari prov.: Stintino, Saline [= Saltworks] Tonnara, N 40°54'23.2" E 8°13'59.8", 24.VI.2007, F. Mason, D. Birtele & F. Mazzocchi leg., 5 ♀♀, sweep net, on *Salicornia* sp. (FMV); Olbia, Saline [= Saltworks] di Porto Palo, N 40°54'16.5" E 9°34'23.2", 24.VI.2007, F. Mason, D. Birtele & F. Mazzocchi leg., 1 ♀, sweep net, on *Salicornia* sp. (FMV); Stintino, 30.V.1950, A. Servadei leg., 1 ♂ (FMV); Olbia-Tempio prov.: San Teodoro, Stagno di San Teodoro, N 40°47'04.4" E 9°39'37.8", puparium collected on 24.VI.2007, emerged in laboratory on 2.VII.2007, F. Mason, D. Birtele & F. Mazzocchi leg., salt marsh, 1 ♂ (FMV).

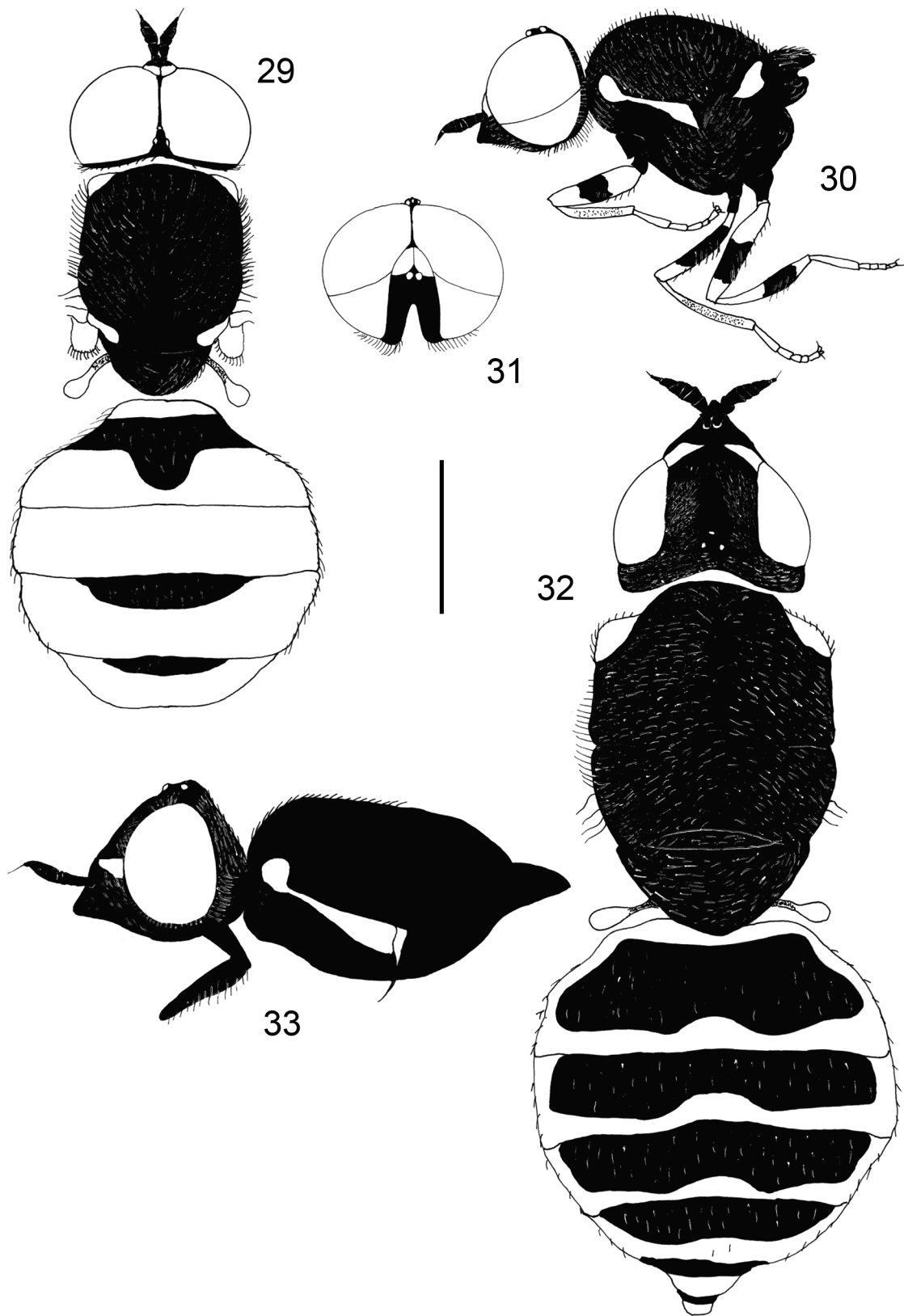
**Other material examined.** France, Bouches du Rhône, plage de Faraman, 10.VII.1986, 1 ♂ (FMV); Italy, Venetia, Venice prov., Alberoni, Giordani-Soika leg., 16.VI.1970, J. I. Maldas leg., net, 1 ♂ (FMV); Italy, Ferrara prov., Comacchio [salt marsh], 15.V.2002, F. Mason leg., 1 ♂ (FMV); Italy, Latium, Latina prov., Parco Nazionale del Circeo, Sabaudia, Pantani dell'Inferno [salt marsh], N 41.20 E 12.5, B. Merz, P. Cerretti & G. Nardi leg., 2.IX.2004, net, 1 ♂, 19 ♀♀ (FMV); Italy, Apulia, Foggia prov., Lesina Lake, saltmarsh, on *Salicornia* sp., 25.VII.1990, F. Mason leg., 1 ♂ (FMV); Italy, Sicily, Trapani prov., Egadi Islands, Favignana Island, 2.V.1991, net, Osella leg., 1 ♂ (FMV).

**Remarks.** The lectotype of *N. notatus*, from Copenhagen (Denmark), and that of *N. brachystomus*, from Dalmatia (Croatia), were designated and compared by Rozkošný (1977), who stated that the terminalia of both sexes of both species were identical. Nevertheless, he believed that the facial projection is usually shorter and the underside of the abdomen mostly lighter in *N. brachystomus* than in *N. notatus*. Rozkošný (1983) considered both species as valid, although he suggested they may be conspecific. During the last two decades we had the opportunity to examine a large number of specimens from the Mediterranean area (*cf.* Rozkošný 1977, 1983; Mason 1988; Hauser 2008), comparing them with populations from northern and western Europe. Also specimens from Italy, including Sardinia, provided further evidence of the chromatic pattern variability of this species, without any relation to their geographic distribution (*cf.* Mason 1988). In particular, the species varies in the colour of the antennae, the length of the facial projection, and in the abdominal pattern of both sexes (although the extreme colour forms are less frequent in females). We suppose that the occurrence of individual forms may depend on the degree of salinity and temperature of water in which the larvae and puparia developed. Extremely pale specimens (Figs 42, 47–48) are known from Egypt, but this is also well known in some other soldier flies with similar large areas of distribution in the Western Palaearctic, e.g., *Stratiomys longicornis* (Scopoli, 1763). We thus conclude that all variants with identical terminalia from Europe, North Africa and the Near East belong to a single species.

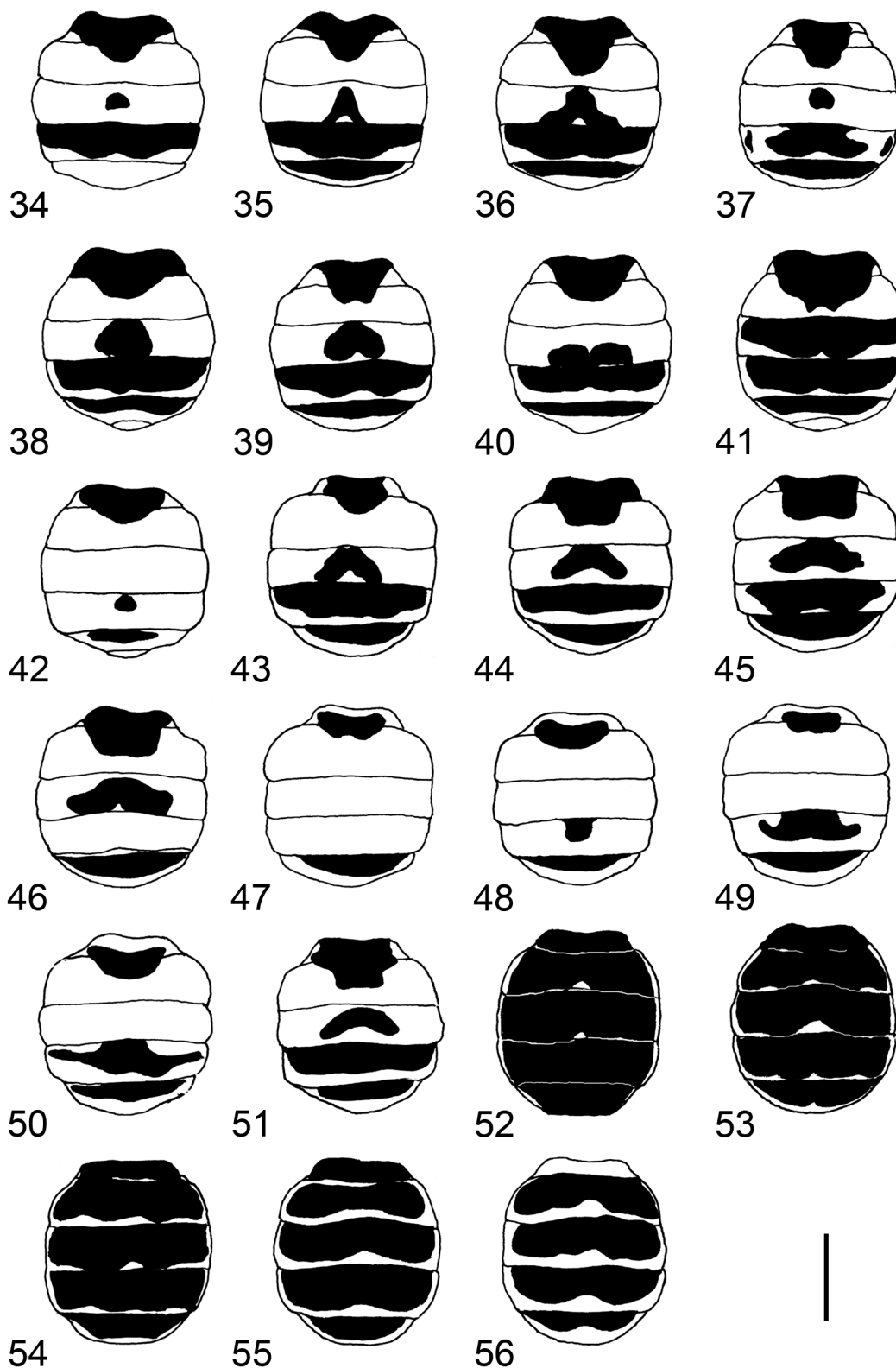
One of the adults was reared from a puparium in the lab, and the larvae can thus be compared with the diagnostic characters published for the larva of *N. notatus* (*cf.* Lenz 1923; Brindle 1964; Rozkošný 1973). The larva of *N. notatus* can be distinguished from the similar larva of *N. uliginosus* (Linnaeus, 1767) by the pattern of the abdominal segments, the shape and the chaetotaxy of the anal segment (*cf.* Stubbs & Drake 2001: 57). The holotype of *N. leuchorhynchus*, originally housed in the "Museo Zoologico dell'Università di Napoli Federico II", is very probably lost. The original description, with the smooth dorsal yellow spot on the facial projection, the brown antennae darkened along the dorsal surface and tip and the black median dorsal part of the fifth abdominal tergite with the ivory-white posterior margins probably refers to dark males of *N. notatus*. This conclusion is also supported by the fact that this species was very abundant in the Stagno di Cagliari on "salsola" [= *Salicornia* sp.] (*cf.* Costa 1884), i.e. in the locality near Cagliari where many specimens of *N. notatus* were recently collected.

The biometric measurements refer to the population collected on the same day at Stagno di s'Ena Arrubia. Males (n = 10): body = 5.1–7.9 mm, wing = 3.3–6.2, head index = 1.1–1.2; females (n = 11): body = 4.5–6.7, wing = 2.9–5.2, head index = 1.1–1.4. Head indices of males originating from different parts of Italy are

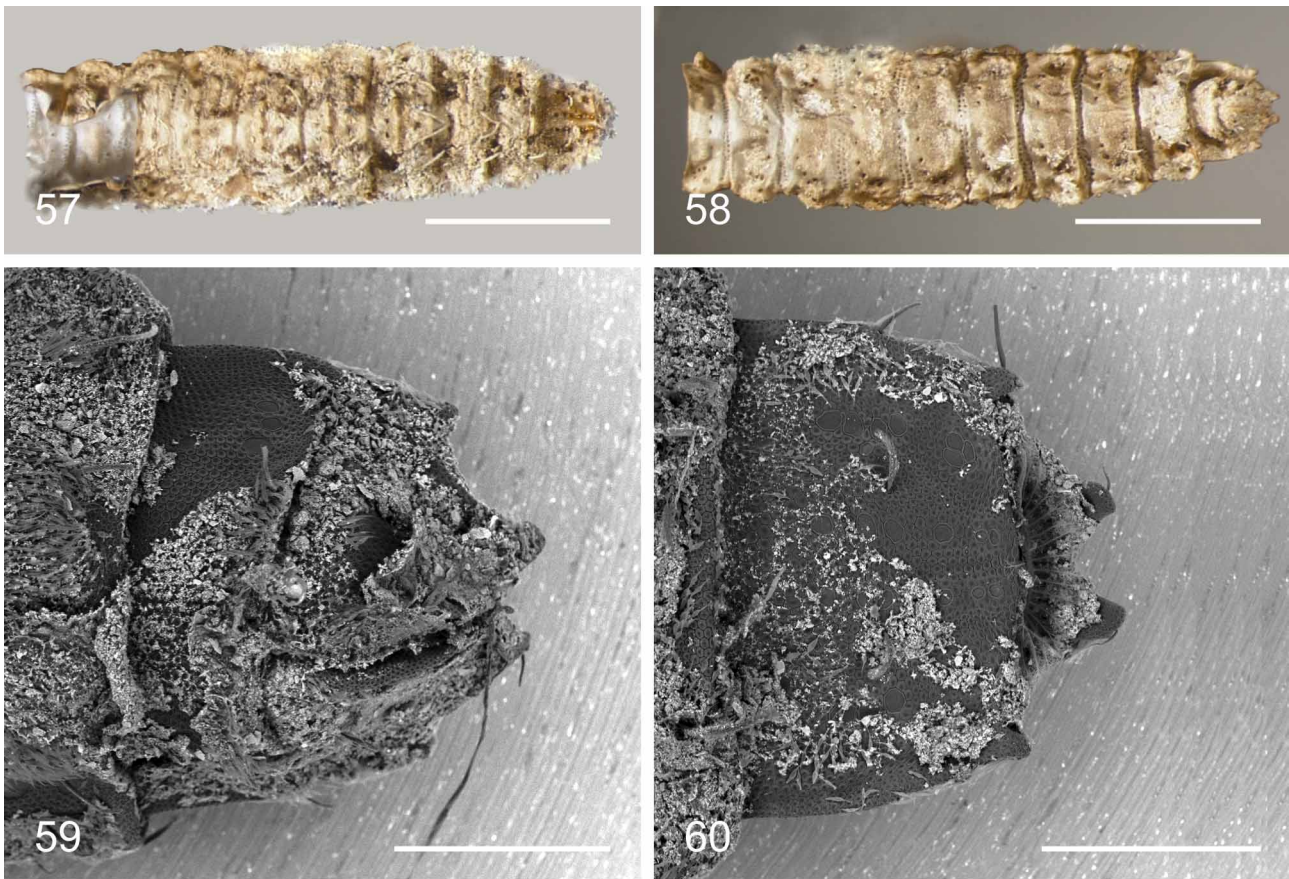
summarized in Tab. 2. According to Rozkošný (1983), the head index of all the populations examined by him ranges between 1.15 and 1.28 in males and between 1.25 and 1.50 in females.



**FIGURES 29–33.** *Nemotelus notatus* Zetterstedt (Sardinia, Stagno di s'Ena Arrubia), scale bar: 1 mm. **29–31.** Male. **29.** Body in dorsal view. **30.** Head and thorax in lateral view. **31.** Head in frontal view. **32–33.** Female. **32.** Body in dorsal view. **33.** Head and thorax in lateral view.



**FIGURES 34–56.** Variability of abdominal pattern in *Nemotelus notatus* Zetterstedt, scale bar: 1 mm [Figs 41–49 and 59–61 adapted from Rozkošný (1977), Figs 45–49 and 61 published originally under *N. brachystomus* Loew]. **34–51.** Males. **34–36.** Denmark. **37.** Spain. **38.** Croatia. **39.** Northern Italy. **40.** Greece. **41.** Croatia. **42.** Egypt. **43–46.** Variants from different parts of Italy. **47–51.** Variants from Sardinia. **52–56.** Females. **52–53.** Denmark. **54.** Croatia. **55–56.** Variants from Sardinia.



**FIGURES 57–60.** *Nemotelus notatus* Zetterstedt, eclosed puparium (Sardinia, Stagno di San Teodoro). **57.** Dorsal view, scale bar: 2 mm. **58.** Ventral view, scale bar: 2 mm. **59.** Anal segment in dorsal view, scale bar: 0.5 mm. **60.** Anal segment in ventral view, scale bar: 0.5 mm.

**TABLE 2.** Male head index of *Nemotelus notatus* specimens from different parts of Italy and France (for label data “Other material examined”).

Locality	N	Head index
NE Italy, Emilia-Romagna, Ferrara prov., Comacchio	1	1.1
Central Italy, Latium, Latina prov., Sabaudia	1	1.1
South Italy, Sicily, Trapani prov., Egadi Islands	1	1.1
Southern France, Bouches du Rhône	1	1.1
NE Italy, Venetia, Venice prov., Alberoni	1	1.3
Southern Italy, Apulia, Foggia prov., Lesina Lake	1	1.2
Sardinia, Stagno s’Ena Arrubia	10	1.1–1.2

**Distribution.** Mainly a coastal element but occurring also around inland salt pools and marshes. Well known from southern Scandinavia and Finland, western Europe to southern-most Spain, the Balearic Islands, southern France, Italy (including Sardinia) and the coasts of the Balkan Peninsula including the Black Sea (Croatia, Albania, Romania, Bulgaria, Greece, Ukraine); also occurs in Egypt, Cyprus, the Near East and North Africa. Inland localities are known in Austria, Hungary, Romania and the southern, central and eastern parts of Russia (Rozkošný 2004).

*Nemotelus pantherinus* (Linnaeus, 1758)

**Published records.** Sardinia (Rozkošný 2004). Oristano prov.: Flumentongiu (Troiano & Toscano 1997).

**Remarks.** Another highly variable species with regard to the length and colour of the facial projection and the extent of the black abdominal pattern in males. The distal black bands on the male abdomen can be largely reduced even within one population (Rozkošný 1977).

**Distribution.** A species occurring in Europe from southern Scandinavia to southern regions including all larger Mediterranean islands; also found in Morocco, eastwards through Turkey and the Near East to Central Asia and Russian Siberia (Rozkošný 2004).

[*Nemotelus pullus* Loew, 1871]

**Published records.** Oristano prov: Pilo near San Lussurgio (Costa 1883).

**Remarks.** This record is very probably based on a misidentification. The true *N. pullus* was described based on the female holotype from Andalusia (Spain) and no additional specimens have been recorded (*cf.* Rozkošný 1983, 2004).

[*Nemotelus uliginosus* (Linnaeus, 1767)]

**Published records.** Cagliari prov.: Cagliari (Costa 1883).

**Remarks.** This record probably represents a misidentification, because *N. uliginosus* is not known to occur in Mediterranean Europe (*cf.* Rozkošný 1983, 2004).

*Odontomyia angulata* (Panzer, 1798)

**Published records.** Cagliari prov: Assemini, Rio Flumini Mannu (Mason 2005); Nurri (Mason 2005). Nuoro prov.: Sorgono (Rozkošný 1982).

**Material examined.** Cagliari prov: Assemini, Rio Flumini Mannu, without further data, 1 ♀ (CNBFVR); Nurri, 18.VII.2003, L. Fancello leg., 3 ♂♂ (FMV). Carbonia-Iglesias prov.: Domusnovas, sa Duchessa, N 39°22'27.2" E 8°35'36.7", 371 m, 12.VII.2008, P. Cerretti, D. Avesani, M. Bardiani, B. Birtele, M. Mei & D. Whitmore leg., 1 ♀, net (CNBFVR); Iglesias, near Colonia Beneck, N 39°20'51.3" E 8°33'48.7"1, 636 m, 13.VII.2006, D. Avesani, M. Bardiani, D. Birtele, P. Cerretti, M. Mei & D. Whitmore leg., 1 ♀, net (FMV); Oristano prov.: Arborea, Sant'Anna, 18.VI.2004, L. Fancello leg., 2 ♂♂, net (FMV).

**Distribution.** A widespread Palaearctic species, extending from Western Europe to the Far East of Russia, and also known from Morocco, Algeria and Egypt (Rozkošný 1982, 2004).

*Odontomyia annulata* (Meigen, 1822)

(Fig. 61)

**Published records.** Sardinia (Röder 1884; Lindner 1938; Mason & Krivosheina 1995; Troiano & Toscano 1997; Rozkošný 2004). Cagliari prov.: Cagliari env. (Costa 1888); Campidano di Cagliari (Costa 1888). Nuoro prov.: Sorgono (Rozkošný 1982).

**Material examined.** Carbonia-Iglesias prov.: Domusnovas, Bega d'Aleni, N 39°24'03.3" E 8°37'36.0", 621 m 17.VII.2006, P. Cerretti, D. Avesani, M. Bardiani, D. Birtele & D. Whitmore leg., 1 ♀ (FMV). Oristano prov.: Sant'Anna, Arborea, 18.VI.2004, L. Fancello leg., 5 ♀♀ (FMV). Olbia-Tempio prov.: Buddusò,

Tazone, N 40°35'11.6" E 9°20'03.9", 19.VI.2007, D. Birtele, F. Mason & F. Mazzocchi leg., 1 ♀, net on *Thapsia* sp. (Fig. 61) (FMV).

**Distribution.** Species known to occur in central and southern Europe from northern Germany to Spain, Sardinia and Sicily, eastwards to Sochi (southern Russia) on the Black Sea coast (Rozkošný 1982, 2004).

### *Odontomyia discolor* Loew, 1846

**Published records.** Sardinia (Mason & Krivosheina 1995; Troiano & Toscano 1997; Rozkošný 2004).

**Distribution.** A species which is known from Spain, Italy (including Sardinia and Sicily) and Greece in Europe, Morocco and Algeria in North Africa, Turkey and southern Russia to western Tien-Shan in Central Asia (Rozkošný 1982, 2004).

### *Odontomyia ornata* (Meigen, 1822)

**Published records.** Sardinia (Bezzi 1892; Mason & Krivosheina 1995; Troiano & Toscano 1997; Rozkošný 2004). Cagliari prov.: Assemini, Rio Flumini Manu; Capoterra (Mason 2005). Oristano prov.: Fordongianus (Costa 1883).

**Material examined.** Oristano prov.: Arborea, Sant'Anna, 10.VI.2004, L. Fancello leg., 1 ♀ (FMV).

**Distribution.** A species widespread in Eurasia (Rozkošný 1982), eastwards to Patara (Turkey), Israel, Syria, Transcaucasia, Transcaspiya, Omsk (SW Siberia) and Irkutsk (central Siberia); it appears to be absent in Norway, Finland, Ireland and Corsica (Rozkošný 1982, 2004).

### *Oplodontha viridula* (Fabricius, 1775)

**Published records.** Sardinia (Bezzi 1892; Troiano & Toscano 1997). Cagliari prov.: Assemini, Foce [= mouth of] Riu Flumenede (Mason 2005). Oristano prov.: Oristano (Costa 1884, as *Odontomyia viridula*).

**Remarks.** Some specimens often differ in the extent of the black abdominal pattern. In extreme cases the dorsal longitudinal mid band may be remarkably expanded, leaving only the narrow lateral margins of the terga pale, or the black patches may be reduced and even separated in the middle. Rarely only the basal black abdominal spot is present (*cf.* Rozkošný 1982).

**Distribution.** A widely distributed Palaearctic species (Rozkošný 1982).

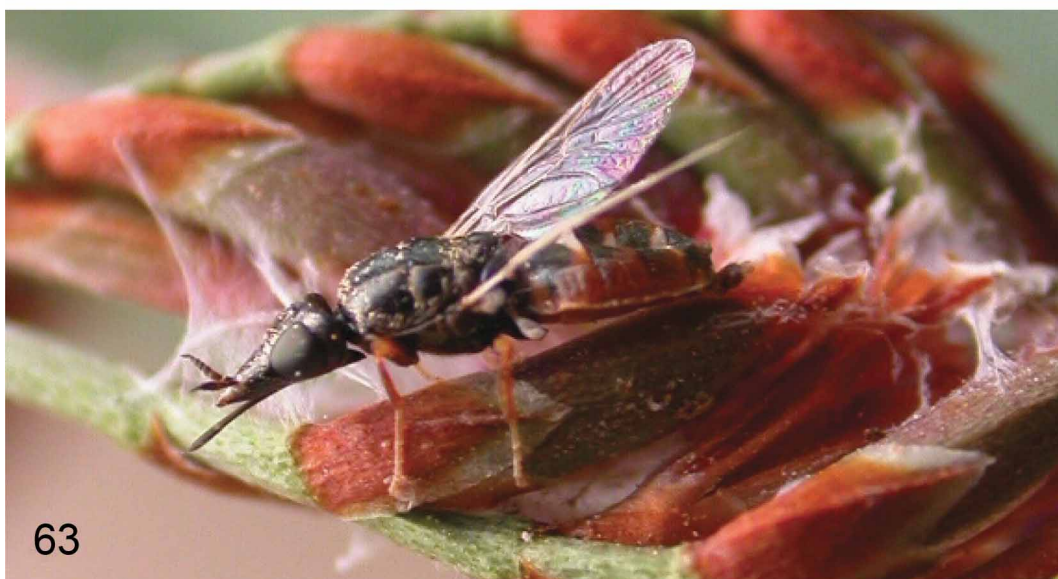
### *Oxycera nigricornis* Olivier, 1811

**Published records.** Sardinia (Bezzi 1892; Mason & Krivosheina 1995; Troiano & Toscano 1997; Rozkošný 2004). Ogliastra prov.: Valle di Correboi (Costa 1884, as *O. formosa* Meigen, 1822). Nuoro prov.: Laconi (Costa 1884, as *O. formosa*).

**Material examined.** Carbonia-Iglesias prov.: Domusnovas, near Grotta San Giovanni, N 39°20'34.3" E 8°37'39.0", 11.VI.2004, P. Cerretti, D. Birtele, G. Nardi, M. Tisato & D. Whitmore leg., 1 ♀, sweep net (FMV); Domusnovas, Lago Siuru, N 39°22'12.3" E 8°37'03.7", 322 m, 20.V.2006, M. Bardiani, D. Birtele, P. Cornacchia & D. Whitmore leg., 1 ♀, Malaise trap (CNBFVR); same locality, 12-17.VII.2006, D. Avesani, M. Bardiani, D. Birtele, P. Cerretti, M. Mei & D. Whitmore, Malaise trap, 1 ♀ (FMV).

**Remarks.** This species had been previously recorded from Sardinia only by Costa (1884) and Bezzi (1892); it was consequently listed from "Sardinia" by other authors (see above). The above, recently examined material confirms the old records.





**FIGURES 61–63.** **61.** *Odontomyia annulata* (Meigen), female feeding on flowers of *Thapsia* sp. (Sardinia, Buddusò) (photo by F. Mason). **62.** *Nemotelus niloticus* Olivier, male on *Salicornia* sp. (Sardinia, Stagno di Santa Caterina) (photo by F. Mason). **63.** *Nemotelus niloticus*, female on *Salicornia* sp. (Sardinia, Stagno di Santa Caterina) (photo by F. Mason).

**Distribution.** A European species ranging from southern-most Scandinavia to the Pyrenees, Sardinia, Sicily and Greece, eastwards to the Ukraine (Rozkošný 2004).

***Oxycera rara* (Scopoli, 1763)**

**Published records.** Sardinia (Troiano & Toscano 1997; Rozkošný 2004). Olbia-Tempio prov.: Tempio (Costa 1883, as *O. pulchella* Meigen, 1822).

**Distribution.** A species ranging from southern England, Wales and northern Germany to Spain, Italy, Slovenia and Romania, but also known from Tunisia (Rozkošný 1983, 2004).

***Oxycera trilineata* (Linnaeus, 1767)**

**Published record.** Nuoro prov.: Siniscola (Costa 1888).

**Remarks.** We did not find any recent material from Sardinia although this species very probably still occurs there.

**Distribution.** A well known and widely distributed Palearctic species (Rozkošný 1983, 2004).

***Pachygaster leachii leachii* Curtis, 1824**

**Published record.** Sardinia (Rozkošný 2004, as *Praomyia leachii*). Olbia-Tempio prov.: Calangianus (Mason 2005, as *P. leachii*).

**Material examined.** Carbonia-Iglesias prov.: Domusnovas, near Grotta San Giovanni, 325 m, N 39°20'34.3" E 8°37'39.0", 12.VI.2004, P. Cerretti, D. Birtele, G. Nardi, M. Tisato & D. Whitmore, sweep net, 1♀ (FMV); Iglesias, near colonia Beneck, N 39° 20' 32.4" E 8° 35' 37.5", 636 m, 13-27.VI.2006, G. Chessa leg., Malaise trap, 1 ♀ (FMV).

**Remarks.** Recently, Krivosheina (2004) described a subspecies, *Pachygaster leachii angustifrons*, from southern Russia (environs of Krasnodar) and Azerbaijan.

**Distribution.** This species occurs throughout most of Europe: from Ireland, southern Wales and England, southern Sweden and the St. Petersburg area in Russia to Portugal, Spain, Italy and Bulgaria, the Ukraine, southern European Russia, Azerbaijan and Georgia.

***Sargus bipunctatus* (Scopoli, 1763)**

**Published records.** Sardinia (Rozkošný 1982; Mason & Krivosheina 1995; Troiano & Toscano 1997; Rozkošný 2004). Carbonia-Iglesias prov: Iglesias, Monti Marganai, near Case Marganai (Mason *et al.* 2006). Olbia-Tempio prov.: Tempio (Costa 1882, as *S. reaumurii* Meigen, 1804).

**Remarks.** The above-quoted generic record from Sardinia is based on a list provided by C. Contini more than 27 years ago (*cf.* Rozkošný 1982).

**Distribution.** A European species ranging from Ireland, Great Britain and Poland to Spain, Sardinia, Sicily, Greece, southern most European Russia and Georgia. The species has also been introduced to the west coast of North America (Rozkošný 1982, 2004).

*Sargus iridatus* (Scopoli, 1763)

**Published record.** Sardinia (Rozkošný 2004). Sassari prov. (Troiano & Toscano 1997).

**Distribution.** A species ranging from Europe to western Siberia and Mongolia (Rozkošný 1983, 2004).

*Stratiomys chamaeleon* (Linnaeus, 1758)

**Published records.** Sardinia (Rozkošný 1982; Mason & Krivosheina 1995; Mason 2005; Rozkošný 2004). Oristano prov.: Oristano (Troiano & Toscano 1997); Simaxis (Costa 1883).

**Remarks.** The generic record published by Rozkošný (1982) is based on a list of Sardinian Stratiomyidae kindly provided by C. Contini; the only recent Sardinian record is that published by Troiano and Toscano (1997).

**Distribution.** This species inhabits most of Eurasia, although it is apparently absent from Ireland, Norway and Finland (Rozkošný 1982, 2004).

*Stratiomys longicornis* (Scopoli, 1763)

**Published records.** Sardinia (Röder 1884; Bezzi 1892; Rozkošný 1982; Mason & Krivosheina 1995; Rozkošný 2004). Cagliari prov.: Assemini, Rio Flumini; Cagliari, Stagno di Molentargius, Sarroch (Mason 2005). Carbonia-Iglesias prov.: Gonnese (Mason 2005). Nuoro prov.: Lula (Troiano & Toscano 1997; Mason 2005). Oristano prov.: Oristano (Costa 1884). Sassari prov.: Asinara Island (Costa 1883; Nuvoli *et al.* 2007); Chilivani (Mason 2005).

**Material examined.** Olbia-Tempio prov.: Olbia, Le Vecchie Saline di [= The old saltworks of] Porto Palo, N 40°54'16.5" E 9°34'23.2", 24.VI.2007, D. Birtele, F. Mason & F. Mazzocchi leg. 3 ♂♂, 2 ♀♀, sweep net, on *Salicornia* sp. (FMV). Oristano prov.: Arborea, Sant'Anna, 18.VI.2004, L. Fancello leg., 1 ♂ 1 ♀, (FMV); Arborea, Stagno di s'Ena Arrubia,, N 39°50'32.4" E 8°33'47.3", 23.VI.2007, D. Birtele, F. Mason & F. Mazzocchi, 3 ♂♂ 1 ♀, on *Salicornia* sp., sweep net (FMV).

**Distribution.** A widely distributed Palaearctic species, extending in Europe from southern Sweden (absent in Ireland, Norway and Finland) to the extreme southern coast of the continent; well known in North Africa (Morocco, Algeria, Tunisia, Egypt), and eastwards through Turkey, the Near East and Middle Asia to Mongolia, China and Korea (Rozkošný 1982).

*Zabrachia tenella* (Jaenicke, 1866)

**Material examined.** Carbonia-Iglesias prov.: Domusnovas, sa Duchessa, 371 m, N 39°22'27.2" E 8°35'36.7", 27.VI.-11.VII.2006, G. Chessa leg., 1 ♀ (FMV); Iglesias, near Colonia Beneck, 636 m, N 39°20'51.3" E 8°33'48.7"1, 5-19.IX.2006, G. Chessa leg., 3 ♀♀, Malaise trap (FMV, FSMU); same data but 11-25.VII.2006, 1 ♀, Malaise trap (FMV, FSMU); same data but 8-22.VIII.2006, 1 ♀, Malaise trap (FMV).

**Remarks.** Recorded in Italy by Stuke (2008) for the first time, from Stelvio National Park (Trentino-Alto Adige region, N Italy). The new records from Sardinia are the southern-most in Europe.

**Distribution.** A species widespread in Europe and Asia, ranging to the Pacific coast and Kurile Islands (see map in Krivosheina & Rozkošný 1990). In Europe it ranges from Ireland, England and Sweden to France and Italy including Sardinia; also recorded from Ukraine, and northern and central European Russia (Rozkošný 2004; Stuke 2008).

**TABLE 3.** Chorotypes of the Stratiomyidae of Sardinia. Abbreviations: ASE = Asiatic-European; CAE = Centralasiatic-European; CAM = Centralasian-Mediterranean; CEM = Centralasiatic-Euro-Mediterranean; COS = Cosmopolitan; END = Italian endemic; EUM = Euro-Mediterranean; EUR = European; MED = Mediterranean; PAL = Palaearctic; SIE = Sibero-European; SEU = S-European; WME = W-Mediterranean.

Species	Chorotype
<i>Chloromyia formosa</i> (Scopoli, 1763)	PAL
<i>Chorisops caroli</i> Troiano, 1995	END
<i>Chorisops masoni</i> Troiano & Toscano, 1995	END
<i>Chorisops tunisiae</i> (Becker, 1915)	WME
<i>Hermetia illucens</i> (Linnaeus, 1758)	COS
<i>Lasiopa pseudovillosa</i> Rozkošný, 1983	SEU
<i>Microchrysa polita</i> (Linnaeus, 1758)	CAE
<i>Nemotelus anchora</i> Loew, 1846	CAM
<i>Nemotelus lasiops</i> Loew, 1846	WME
<i>Nemotelus nigrifrons</i> Loew, 1846	MED
<i>Nemotelus niloticus</i> Olivier, 1811	MED
<i>Nemotelus notatus</i> Zetterstedt, 1842	EUM
<i>Nemotelus pantherinus</i> (Linnaeus, 1758)	CEM
<i>Odontomyia angulata</i> (Panzer, 1798)	PAL
<i>Odontomyia annulata</i> (Meigen, 1822)	EUM
<i>Odontomyia discolor</i> Loew, 1846	CAM
<i>Odontomyia ornata</i> (Meigen, 1822)	SIE
<i>Oplodontha viridula</i> (Fabricius, 1775)	PAL
<i>Oxycera nigricornis</i> Olivier, 1811	EUR
<i>Oxycera rara</i> (Scopoli, 1763)	EUR
<i>Oxycera trilineata</i> (Linnaeus, 1767)	PAL
<i>Pachygaster leachii leachii</i> Curtis, 1824	EUR
<i>Sargus bipunctatus</i> (Scopoli, 1763)	EUR
<i>Sargus iridatus</i> (Scopoli, 1763)	CAE
<i>Stratiomys chamaeleon</i> (Linnaeus, 1758)	ASE
<i>Stratiomys longicornis</i> (Scopoli, 1763)	PAL
<i>Zabrachia tenella</i> (Jaenicke, 1866)	ASE

### Biogeography of Sardinian Stratiomyidae

Table 3 summarizes all the chorotypes of the Stratiomyidae from Sardinia. Five groups of chorotypes are represented: species widespread in the Palaearctic Region (ASE, CAE, CAM, CEM, EUM, PAL), species more or less widespread in Europe (EUR, SEU), species more or less widespread in the Mediterranean (MED, WME), Cosmopolitan species (COS) and Italian endemics (END).

The first component is by far the most numerous (59.25%). The distribution of the Palaearctic species covers much of Europe, North Africa and Palaearctic Asia: *Odontomyia angulata*, *Oplodontha viridula*, and *Stratiomys longicornis* occur eastwards as far as the Pacific Ocean; *Nemotelus pantherinus* and *Oxycera*

*trilineata* extend eastwards as far as eastern Russian Siberia and Mongolia. *Nemotelus notatus*, as defined here (with *N. brachystomus* and *N. leuchorhynchus* as synonyms) has a West-Palaearctic chorotype covering the greater part of Europe, North Africa (Egypt), the eastern and southern parts of European Russia and the Near East. Asiatic-European species can reach as far east as the Russian Maritime Province and/or Japan, but they are absent in North Africa. They seem to be relatively scarce in the Sardinian fauna, totalling only 11.11 %, like the Centralasiatic-European species. True Holarctic stratiomyids were not recorded in Sardinia, but two species widely distributed in the Palaearctic have been introduced into North America: *Chloromyia formosa* and *Microchrysa polita*. The former was introduced to the state of New York, where it has been repeatedly collected since the middle of the last century (James 1941, 1970), while *Microchrysa polita* is widely distributed from British Columbia to California and to Georgia in North America (James 1941; McFadden 1972). A third species, *Sargus bipunctatus*, is known also from a relatively small area on the west coast of the USA (Rozkošný 1982; Woodley 2001), but is originally only from Europe and the Caucasus (cf. Rozkošný 2004).

The European (18.51%) and Mediterranean (14.81%) component have almost the same value and are the second and third most important groups.

The Cosmopolitan component (3.70%) is represented only by *Hermetia illucens*, which is the only allochthonous stratiomyid recorded from Italy (cf. Mason 2005); it is apparently American in origin but has spread worldwide through commerce. In Europe it was first collected in Malta (Linder 1936) and now it seems to have established itself in the Mediterranean area, with northern limits in southern Switzerland, northern Italy and Croatia (Rozkošný 2004).

From a zoogeographical point of view, the most interesting species recorded are certainly *Chorisops caroli* and *C. masoni*, both endemic in Italy.

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