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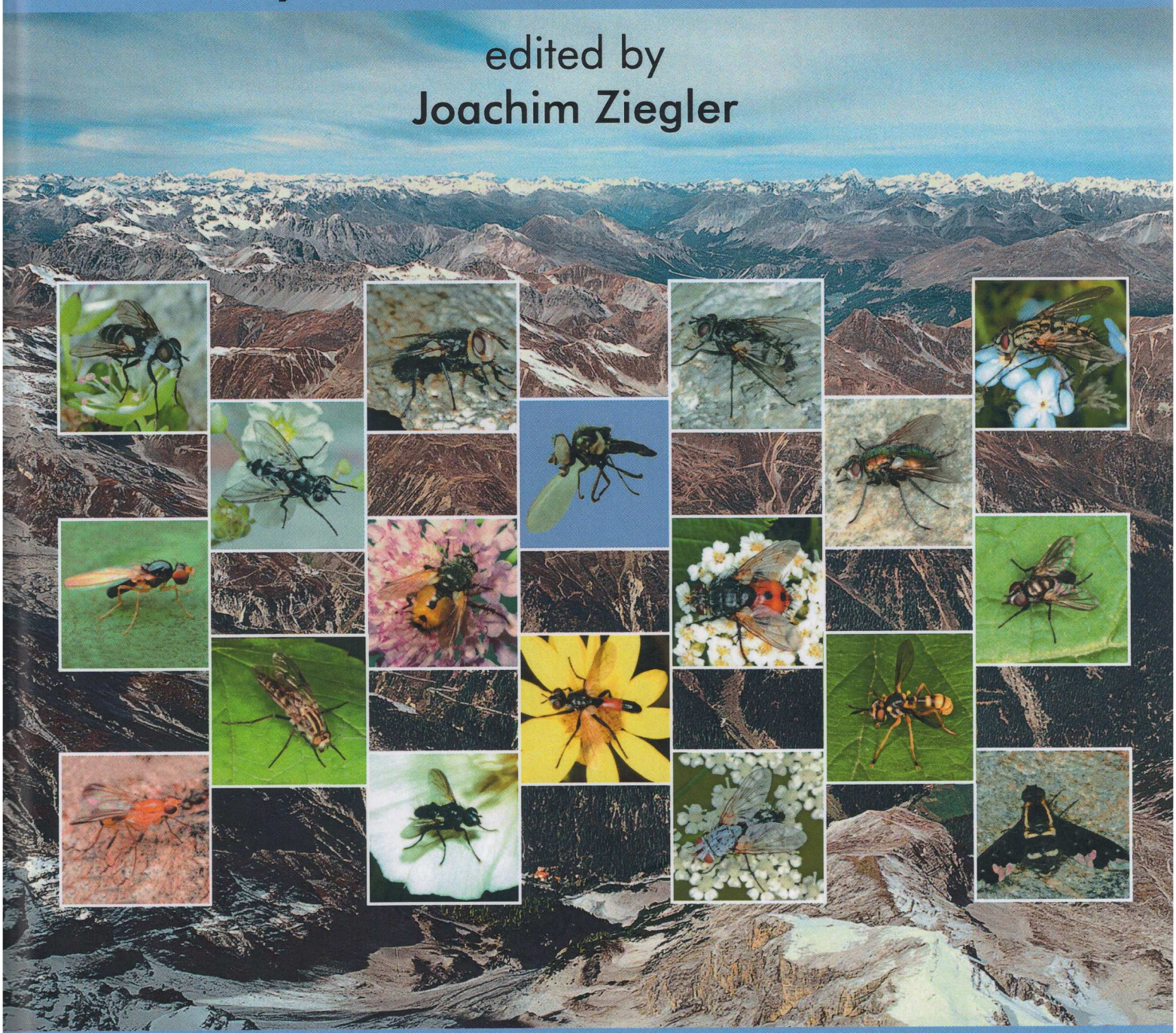

Herausgegeben von Andreas Stark und Frank Menzel

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3.3.05 Ceratopogonidae

Biting midges of the genus *Forcipomyia* Meigen (Diptera, Ceratopogonidae)

Shahin Navai and Ryszard Szadziewski

Abstract

In this study 633 specimens of 19 species from 7 subgenera of the genus *Forcipomyia* (Diptera: Ceratopogonidae) were identified microscopically. The specimens were collected using Malaise traps in the Stilfserjoch National Park (Parco Nazionale dello Stelvio), Italy, from an altitude of 940 to 2,315 m during May to October 2005. The species are diagnosed and illustrated. The present study has expanded the current knowledge of the biodiversity in mainland Italy – 5 subgenera and 15 species are recorded for the first time for Italy and all 19 collected species are new for South Tyrol. A key for determination of Italian species and subgenera of *Forcipomyia* is also provided.

Introduction

Adults of the genus *Forcipomyia* are important pollinators of a number of commercial and wild plants, herbs, shrubs and trees. In Latin-America, Africa, Indonesia and the Philippines, members of the genus are the primary pollinators of cacao – the source of chocolate – some palms, mango and rubber trees (Borkent et al. 2009). Within the genus females of the subgenus *Lasiohelea* feed on warm-blooded vertebrates like female adults of other genera of biting midges: *Austroconops* Wirth & Lee, *Culicoides* Latreille, and *Leptoconops* Skuse. Moreover, females feed on cold-blooded vertebrates like amphibians and reptiles (Thompson 1969).

The adult females of the genus *Forcipomyia* are in general parasites of larger insects or arachnids and feed on their haemolymph. They were reported as parasites of Opilionida, Araneae, Odonata, Hemiptera, Phasmatodea, Orthoptera, Neuroptera, Coleoptera, Diptera, Hymenoptera and Lepidoptera (Kawahara et al. 2006; Borkent & Spinelli 2007 and Salvato et al. 2008). However, records of feeding in the field are not common and for most species of *Forcipomyia* hosts are unknown. The larvae of the genus *Forcipomyia* are found in semiaquatic or terrestrial moist habitats like algae, mosses, under rotting tree bark, decaying leaves and fungi, vegetable or in the dung of herbivorous animals (Saunders 1924).

Forcipomyia Meigen, 1818 is a relatively well studied genus of biting midges, which in the recent World fauna comprises 1,153 species (Borkent 2015), and in the European fauna 144 species (Szadziewski et al. 2015). The genus in mainland Italy has received weak attention; only 8 species have been recorded and their biology is poorly understood (Boorman 1995, Szadziewski et al. 2015). They are: *F.* (*F.*) *armandi* Harant, Huttel & Huttel, *F.* (*F.*) *brevipennis* (Macquart) (= *coprophila* Kieffer), *F.* (*F.*) *nigra* (Winnertz), *F.* (*F.*) *pulchrithorax* Edwards, *F.* (*F.*) *venetiana* (Kieffer), *F.* (*Microhelea*) *fuliginosa* (Meigen), *F.* (*Panhelea*) *aristolochiae* (Rondani) and *F.* (*Pterobosca*) *paludis* Macfie.

Adults of both sexes can be easily distinguished among other biting midges by the terminal flagellomere bearing a nipple like prolongation and slender paratergite without setae. The body usually hairy, legs armed with long empodium, the sensillae coeloconica on the first flagellomeres are absent. Male tibiae are always without lanceolate scales, the parameres are symmetrical.

Materials and methods

The material studied includes adults only. Biting midges were collected by C. LANGE and J. ZIEGLER in the Stilfserjoch National Park (Parco Nazionale dello Stelvio), Italian Alps, using Malaise traps and preserved in 70 % ethanol. Traps operated between May and October 2005 in various altitudinal zones: submontane 940 m, montane 1,220 m, oreal 1,630 m, subalpine 2,030 m, and alpine 2,315 m. The locations of the traps are representative of all the essential habitats of the South Tyrol section of the National Park. A complete review of the study area, vegetation and climate was given by ZIEGLER (2008).

The specimens examined in this study are mounted on slides by the senior author in phenol-balsam (50:50), as proposed by WIRTH & MARSTON (1968). Colours used refer to slide mounted specimens viewed under transmitted light microscopy. All measurements and other data are based on slide mounted specimens examined, measured and drawn using a Zeiss Axioskop compound microscope with attached camera lucida. When possible 5 specimens of each sex were measured: mean value (minimum value – maximum value, n = number of measurements). The terminology used here follows BORKENT et al. (2009), KACZOROWSKA (2000), WIRTH & NAVAI (1978) and WIRTH (1952).

The following special terms are used in the description. Palpal ratio (PR) is the length of the third papal segment divided by its greatest width. Antennal ratio (AR) is the combined length of the 5 distal flagellomeres in female, 4 distal in male divided by the combined length of the remaining proximal flagellomeres, respectively 1–8 in female or 1–9 in male. Wing length is measured from the basal arculus, wing width is taken at the widest point. Costal ratio (CR) is the costal length – measured from the basal arculus to the tip of the second radial cell – divided by the wing length. The tarsal ratio (TR) is the length of the first tarsomere divided by the length of the second tarsomere of the fore TR(I), middle TR(II) and hind leg TR(III).

In the genus *Forcipomyia* females are difficult to identify and their association with males sometimes needs immature stages and rearing. Due to the lack of immature stages in this study we were not able to identify some females. In most species matching sexes were identified by overall size, colour, the shape of third palpal segment and location of the sensory pit.

Material is deposited in the Diptera Collection of the Museum of Natural History, Leibniz-Institute for Evolution and Biodiversity Science, Berlin (ZMHB) and one specimen deposited in the collection of Department of Invertebrate Zoology and Parasitology, University of Gdansk (CEI UG).

The following species list is in the order of the trap sites, from the lowest, submontane locality (Schmelz) to the highest, alpine study site (Glurnser Alm). The lowest and the highest altitudinal belts from which material of the "Diptera Stelviana" project is available are given in square brackets. Precise data on the Malaise trap sites are given by ZIEGLER (2008). Symbols that follow the species name give relevant faunistic information. Two asterisks ** indicate that the species in question is newly recorded from Italy and the species is also new for the South Tyrol. Species with one asterisk * are new records from South Tyrol. Two asterisks in brackets (**) indicate that the species is not included in the Italian Checklist of BOORMAN (1995) but known from Italy. Additional information is included in the section "Review of species".

Results

Species list and collecting data (subgenera and species in alphabetical order)

Forcipomyia* (*Euprojoannisia*) *alacris* (WINNERTZ, 1852)*: Trafoi 11.–27.VI. 1♂ [oreal].

Forcipomyia* (*Euprojoannisia*) *phlebotomoides* BANGERTER, 1933*: Schmelz 19.IX.–3.X. 1♂. Gomagoi, 31.V.–11.VI. 1♂, 11.–27.VI. 6♂♂. Trafoi 11.–27.VI. 4♂♂ 1♀. Glurnser Alm 13.–25.VII. 1♂ [submontane-alpine].

Forcipomyia* (*Euprojoannisia*) *titillans* (Winnertz, 1852)*: Gomagoi, 31.V.–11.VI. 9♂♂ 1♀, 11.–27.VI. 3♂♂ 16♀♀, 8.–15.VIII. 1♂, 19.IX.– 3.X. 2♀♀. Trafoi 11.–27.VI. 2♂♂ 5♀♀ [montane-oreal].

Forcipomyia* (*Forcipomyia*) *altaica* Remm, 1972*: Gomagoi, 31.V.–11.VI. 1♂, 11.–27.VI. 1♂. Trafoi 11.–27.VI. 2♂♂ [montane-oreal].

Forcipomyia* (*Forcipomyia*) *bipunctata* (Linnaeus, 1767)*: Schmelz 11.–27.VI. 4♂♂, 8.–15.VIII. 3♂♂, 5.–19.IX. 2♂♂, 19.IX.–3.X. 5♂♂. Gomagoi 31.V.–11.VI. 5♂♂ 3♀♀, 11.–27.VI. 13♂♂, 8.–15. VIII. 5♂♂. Trafoi 21.–31.V. 3♂♂; 11.–27.VI. 1♂ [submontane-oreal].

***Forcipomyia* (*Forcipomyia*) *brevipennis* (Macquart, 1826)** (**): Schmelz, 19.IX.–3.X.1♂ [submontane].

Forcipomyia* (*Forcipomyia*) *ciliata* (Winnertz, 1852)*: Schmelz 11.–27.VI. 2♂♂ 2♀♀, 8.–15.VIII. 2♀♀. Gomagoi 11.–27.VI. 13♀♀. Trafoi 30.VIII.– 5.IX. 1♂, 5.–19.IX. 1♂ [submontane-oreal].

Forcipomyia* (*Forcipomyia*) *costata* (Zetterstedt, 1838)*: Schmelz 8.–15.VIII. 1♂, 5.–19.IX. 1♀, 19.IX.–3.X. 2♀♀. Gomagoi 11.–27.VI. 4♀♀. Trafoi 21.–31.V. 3♂♂ 1♀, 11.–27.VI. 2♂♂ 2♀♀, 1.–8. VIII. 1♀ [submontane-oreal].

***Forcipomyia* (*Forcipomyia*) *nigra* (Winnertz, 1852)** (**): Gomagoi 5.–19.IX. 1♀. Trafoi 21.–31.V. 1♂ 2♀♀, 11.–27.VI. 1♀ [montane-oreal].

Forcipomyia* (*Forcipomyia*) *pulchrithorax* Edwards, 1924: Schmelz 11.–27.VI. 2♂♂, 5.–19.IX. 5♀♀, 19.IX.–3.X. 2♂♂. Gomagoi 31.V.–11.VI. 1♂. Trafoi 11.–27.VI. 4♀♀, 1.–8.VIII. 2♀♀ [submontane-oreal].

Forcipomyia* (*Forcipomyia*) *radicicola* Edwards, 1924*: Trafoi 21.–31.V. 1♂, 31.V.11.VI. 3♂♂ 1♀, 11.–27.VI. 2♂♂ 13♀♀ [oreal].

Forcipomyia* (*Forcipomyia*) *sahariensis* Kieffer, 1923*: Schmelz, 5.–19.IX. 1♀. Trafoi 11.–27.VI. 2♂♂ [submontane-oreal].

Forcipomyia* (*Lasiohelea*) *sibirica* (Bujanova, 1962)*: Schmelz 11.–27.VI. 1♂ 2♀♀ [submontane].

Forcipomyia* (*Microhelea*) *fuliginosa* (Meigen, 1818): Gomagoi 11.–27.VI. 1♂ 10♀♀. Trafoi 11.–27. VI. 1♂ [montane-oreal].

Forcipomyia* (*Synthyridomyia*) *knockensis* Goetghebuer, 1938*: Schmelz 11.–27.VI. 1♂. Gomagoi 11.–27.VI. 1♂ 5♀♀ [submontane-montane].

Forcipomyia* (*Synthridomyia*) *murina* (Winnertz, 1852)*: Schmelz 11.–27.VI. 2♂♂ 4♀♀, 5.–19.IX. 1♂ 14♀♀. Trafoi 31.V.–11.VI. 2♀♀ [submontane-oreal].

Forcipomyia* (*Thyridomyia*) *blascoi* Delécolle & Rieb, 1993*: Schmelz 5.–19.IX. 1♀, 19.IX.–3.X. 1♂ 1♀. Gomagoi, 8.–15.VIII. 1♀. Trafoi 31.V.–11.VI. 1♀, 11.–27.VI. 2♂♂ 5♀♀ [submontane-oreal].

Forcipomyia* (*Thyridomyia*) *monilicornis* (Coquillett, 1905)*: Schmelz 21.–31.V. 5♂♂ 23♀♀, 8.–15.VIII. 11♀♀, 5.–19.IX. 5♂♂ 11♀♀, 19.IX.–3.X. 3♂♂ 11♀♀, 3.–14.X. 2♀♀. Gomagoi 21.–31.V. 7♀♀, 31.V.–11.VI. 35♂♂ 60♀♀, 11.–27.VI. 69♂♂ 85♀♀, 8.–15.VIII. 1♂ 10♀♀, 1.–5.IX. 1♀, 5.–19. IX. 1♀, 19.IX.–3.X. 1♂. Trafoi 21.–31.V. 1♂ 1♀, 31.V.–11.VI. 1♀, 11.–27.VI. 9♂♂ 34♀♀, 1.–8.VIII. 2♀♀ [submontane-oreal].

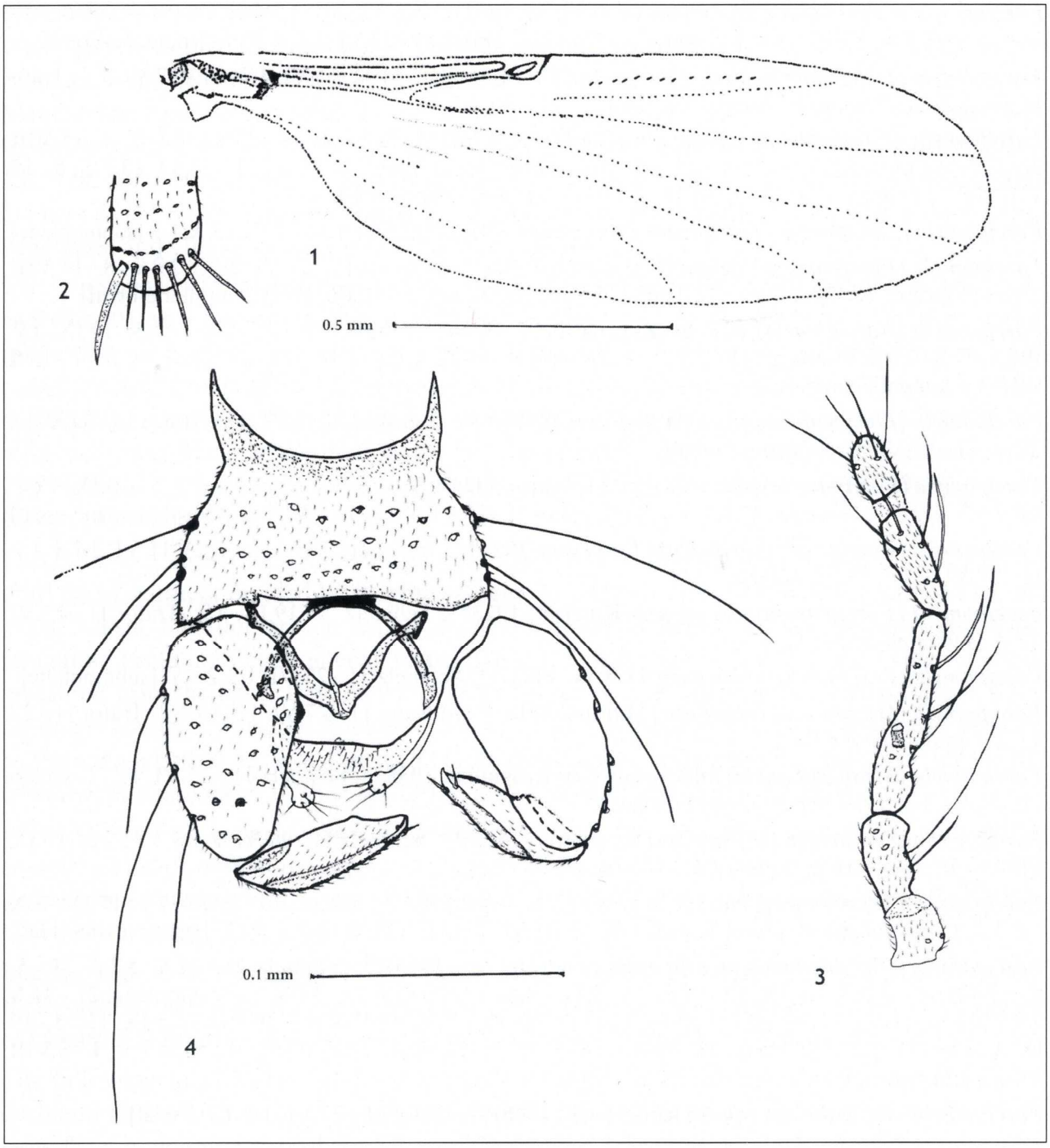
Forcipomyia* (*Trichohelea*) *eques* (Johannsen, 1908)*: Trafoi 11.–27.VI. 1♂ 1♀ [oreal].

Review of species (in alphabetical order)

***Forcipomyia* (*Euprojoannisia*) *alacris* (Winnertz, 1852)** (Figs 1–4)

A medium-sized dark species.

Male. Head appendages and antennal plum brown. Eyes bare, frontal sclerite with central sclerotization. Sensilla chaetica present on flagellomeres 1–12. Distal flagellomeres 10–13 with many sharp sensilla trichoidea and few sensilla basiconica. Third palpal segment elongated, sensory pit well sclerotized (Fig. 3); PR 5 (N = 1). Mesonotum and postscutellum dark brown, scutellum and pleura brown. Wing (Fig. 1) covered with long brown macrotrichia, first radial cell reduced. Wing length 1.29 mm (N = 1), CR 0.38 (N = 1). Halter brown. TR(I) 1.8 (N = 1), TR(II) 1.4 (N = 1), TR(III) 1.6 (N = 1). Tibial comb with 6 long spines (N = 1) (Fig. 2). First five abdominal segments light brown, distal segments dark brown and genitalia slightly darker. Genitalia (Fig. 4). Sternite IX short. Gonocoxite elongated, longer than sternite. Gonostylus shorter than gonocoxite, with short setae, narrowed at apex. Parameres and aedeagus well sclerotized.



Figs 1–4: *Forcipomyia* (*Euprojoannisia*) *alacris* (WINNERTZ, 1852), male. – **1**: wing; – **2**: comb on hind tibia; – **3**: palpus; – **4**: genitalia.

Specimen examined. 1♂ (ZMHB). South Tyrol: Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 27.VI.2005.

West Palaearctic species common in Europe. This is the first record from Italy.

Forcipomyia (*Forcipomyia*) *altaica* REMM, 1972 (Figs 5–9)

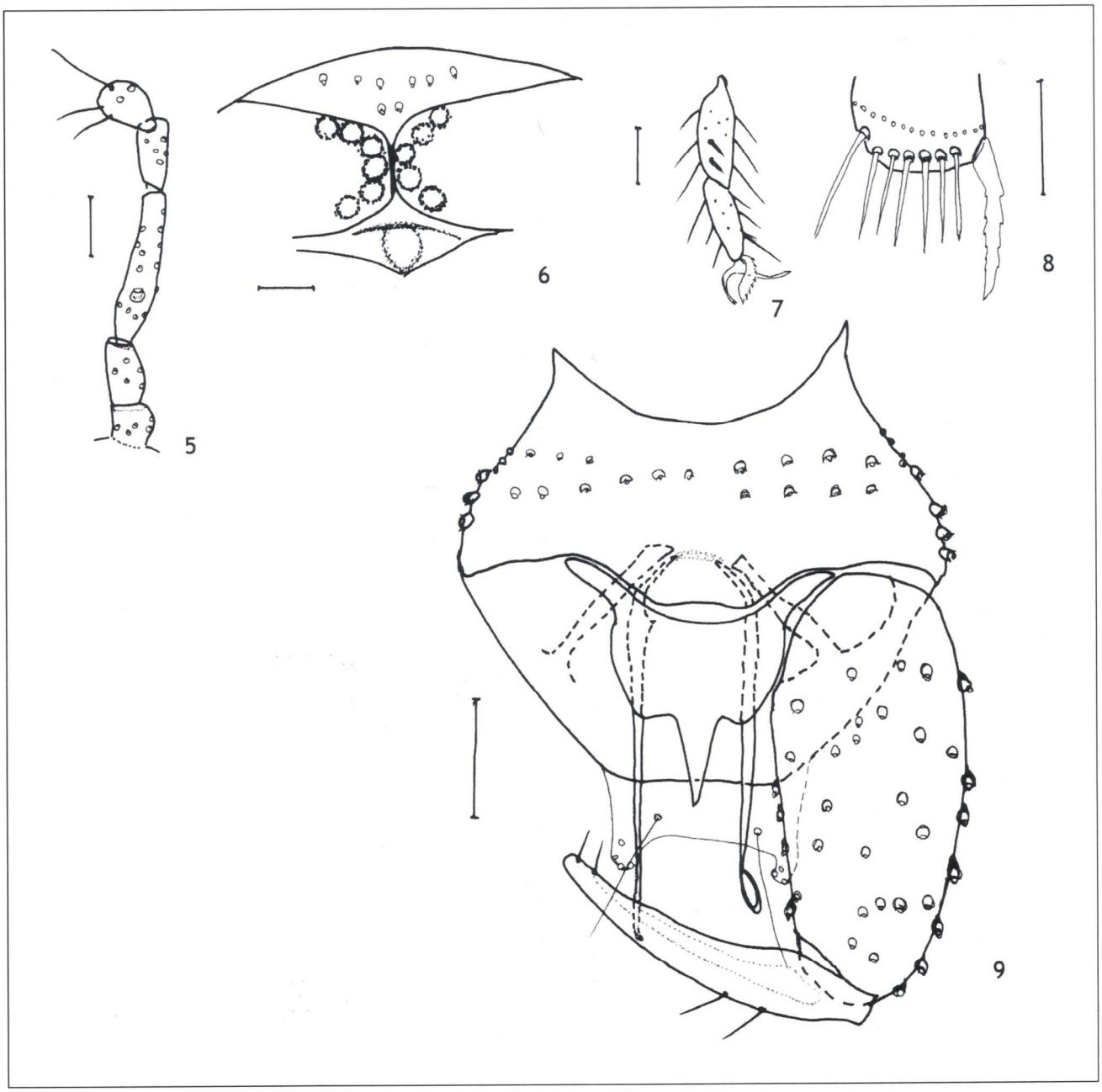
A large black species, body covered with long black hairs.

Male. Head almost black. Eyes bare, frontal sclerite as in Fig. 6. Last flagellomere without sensilla chaetica. Antennal ratio (AR) 1.22 (1.11–1.28, N = 4). Palpus (Fig. 5), third segment slender, sensory pit shallow. PR 4.3 (4.0–5.0, N = 4). Mesonotum, scutellum and postscutellum black. Wing without pattern, covered with long macrotrichia. Costal margin and radial cells dark, first radial cell reduced, second radial cell 4 times longer than its width. Wing length 1.86 mm

(1.65–2.00, N = 4). Costal ratio (CR) 0.43 (0.41–0.45, N = 4). Halter dark brown to blackish. Legs dark brown to blackish without pattern and scales, covered with long blackish hairs. TR(I) 1.2 (1.0–1.4, N = 4), TR(II) 1.0 (0.9–1.1, N = 3), TR(III) 1.1 (1.0–1.2, N = 4). Tibial comb (Fig. 8) with 8 (N = 4) long spines. Claws slender and bifid (Fig. 7). Abdomen black, covered with long blackish hairs. Genitalia (Fig. 9). Sternite IX more than 2.3 times as wide as long, with two rows of strong and long hairs, caudomedian margin not bilobate mesad. Gonocoxite more than twice as long as broad. Gonostylus 0.8 as long as gonocoxite, rather straight and slightly tapering towards tip, covered with fine hairs, 2 setae present at midlength and 2 at tip. Aedeagus shield-shaped, basal arms long, about 1.5 times as broad as long, posterior half produced into one median and two submedian processes. Parameres long, slender, s-wavy on distal portion, pointed at the tip, at the base conected.

Specimens examined. 4♂♂ (ZMHB). South Tyrol: Sulden Valley near Gomagoi, 1,220 m, 46°34'33.8" N 10°32'51.2" E; 11.VI.2005, 1♂; 27.VI.2005, 1♂. Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 27.VI.2005, 2♂♂.

West Palaearctic boreo-montane species. This is the first record from Italy.



Figs 5–9: *Forcipomyia* (*Forcipomyia*) *altaica* Remm, 1972. – **5**: male palpus; – **6**: male frontal sclerite; – **7**: last two segments of metatarsus; – **8**: comb on hind tibia; – **9**: male genitalia. Scale bars = 0.05 mm.

***Forcipomyia* (*Forcipomyia*) *bipunctata* (LINNAEUS, 1767)**

A medium-sized brown to dark brown species. In female all tibiae with narrow scales.

Female. Head dark brown, appendages brown. Eyes bare, frontal sclerite with light central sclerotization. Third palpal segment elongated, swollen on basal half, sensory pit not deep containing numerous capitate sensilla. Mesonotum, scutellum and postscutellum dark brown, pleura light brown. Wing length 1.47 mm (N = 1), CR 0.46 (N = 1). TR (III) 0.88 (N = 1). Tibial comb with 9–11 (N = 1) long spines. Halter straw colored. Empodium well developed; all tibiae with narrow scales. Abdomen dark brown, 2 ovoid spermathecae present.

Male. Head appendages brown. Eyes bare, frontal sclerite with light central sclerotization. Terminal flagellomere without sensilla chaetica. Plum reaching flagellomere 10, sensilla chaetica on flagellomeres 11–12 present at the bottom ring. Flagellomeres 11–13 with many sharp sensilla trichodea and few peg-like sensilla basiconica. Third palpal segment elongate, swollen on basal half, sensory pit not deep containing numerous capitate sensilla. PR 3.11 (3–3.3, N = 4). Mesonotum, scutellum and postscutellum dark brown, pleura light brown. Wing covered with long dark macrotrichia. Small light spot in front of costal vein. Wing length 1.40 mm (1.33–1.47, N = 4). CR 0.45 (0.42–0.56, N = 4). Halter straw colored. Empodium well developed, claws long and curved. TR(I) 1.2 (1.1–1.2, N = 4), TR(II) 0.9 (N = 4), TR(III) 0.9 (N = 3). Tibial comb with 8 (N = 3) spines. Abdomen same color as thorax, last three segments and genitalia slightly darker. Sternite IX as long as broad. Gonocoxite elongated. Gonostylus shorter than gonocoxite, gradually narrowed, pointed and slightly curved at tip. Proximal half of gonostylus bearing some short setae. Aedeagus with low basal arch well sclerotized, aedeagal body weakly sclerotized, sometimes difficult to discern. Parameres long and slender, pointed at the tip, widely separated at base, with or without visible connection.

Specimens examined. 3♀♀, 41♂♂ (ZMHB). South Tyrol: Sulden Valley near Schmelz, 940 m, 46°36'42.1" N 10°34'35.6" E; 27.VI.2005, 4♂♂; 15.VIII.2005, 3♂♂; 19.IX.2005, 2♂♂; 03.X.2005, 5♂♂. Sulden Valley near Gomagoi, 1,220 m, 46°34'33.8" N 10°32'51.2" E; 11.VI.2005, 3♀♀, 5♂♂; 27.VI.2005, 13♂♂; 15.VIII.2005, 5♂♂. Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30`17.2" E; 31.V.2005, 3♂♂; 27.VI.2005, 1♂.

Holarctic species common in Europe. This is the first record from Italy.

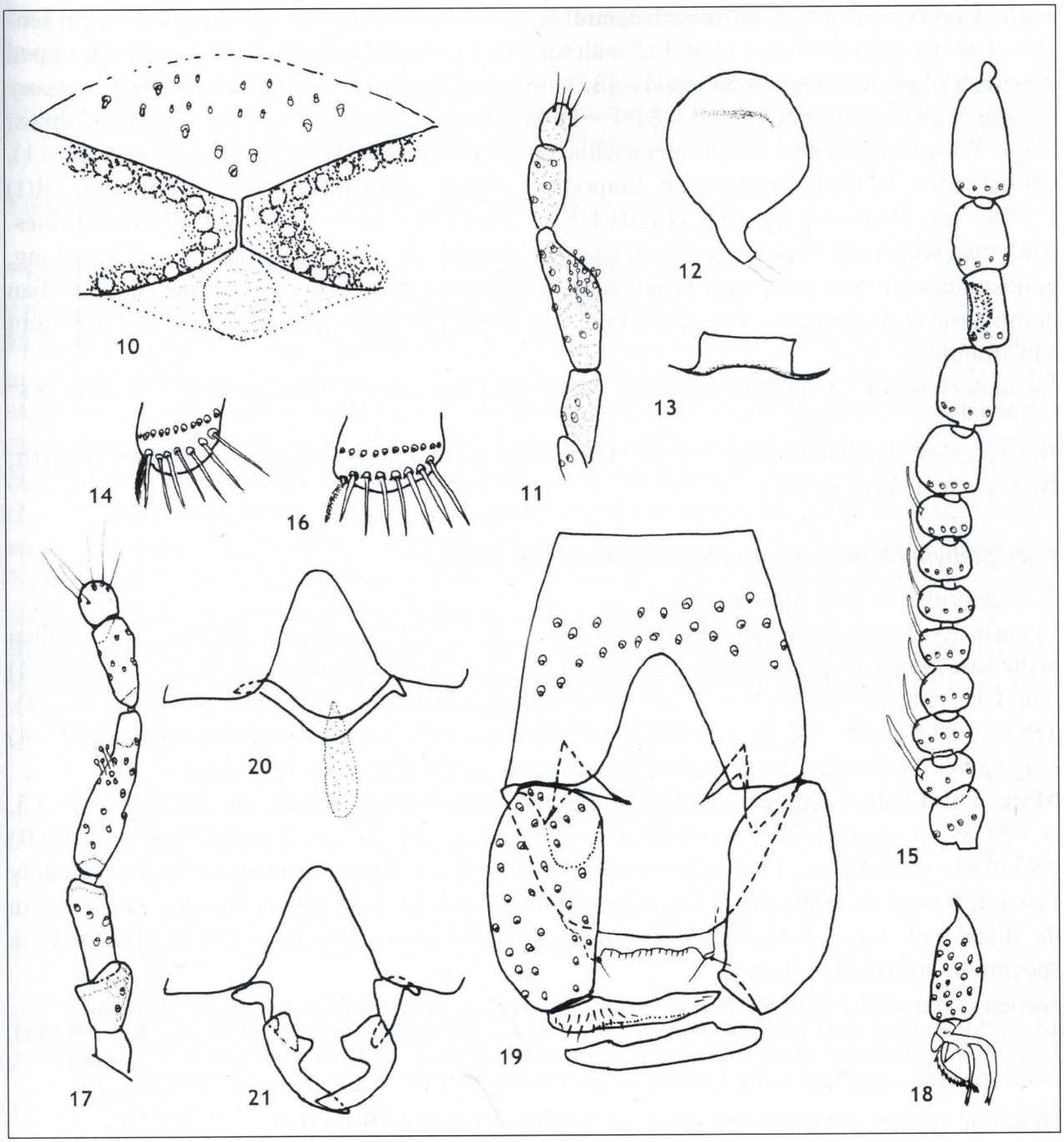
***Forcipomyia* (*Thyridomyia*) *blascoi* DELÉCOLLE & RIEB, 1993** (Figs 10–21)

A small dark brown species.

Female. Frontal sclerite as in Fig. 10. Flagellomeres 4–10 subspherical (Fig. 15), terminal flagellomere longer than preceding one. AR 1.06 (0.94–1.13, N = 3). Mandible and maxilla armed with fine teeth. Third palpal segment (Fig. 11) subcylindrical, slightly swollen in middle with few capitate sensilla on surface. PR 2.6 (2.5–2.7, N = 3). Scutum and scutelum dark brown, halter dark . Wing length 1.02 mm (0.95–1.08, N = 3). CR 0.48 (0.47–0.51, N = 3). TR(I) 2.6 (N = 2), TR(II) 2.4 (2.1–2.8, N = 3), TR(III) 2.4 (2.3–2.5, N = 3). Tibial comb (Fig. 14) with 7 long spines. Abdomen brown. One dark well sclerotized retort-shaped spermatheca present with slightly curved neck (Fig. 12). Subgenital plate as in Fig. 13.

Male. Same color as female. Frontal sclerite as in female. Last flagellomere without sensilla chaetica. AR 0.98 (0.95–1.02, N = 2). Third palpal segment without sensory pit (Fig. 17), some capitate sensilla present. PR 4.07 (3.9–4.25, N = 2). Wing length 1.30 mm (1.25–1.35, N = 2), CR 0.48 (0.48, N = 2). TR(I) 2.4 (2.4–2.5, N = 2), TR(II) 1.9 (1.9–2.0, N = 2), TR(III) 2.2 (2.2–2.2, N = 2). Tibial comb with 7 spines (Fig. 16). Empodium well developed, claws bifid (Fig. 18). Genitalia complicated (Figs. 19–21), median part of aedegus (Fig. 20) hyaline and difficult to observe, parameres heavily sclerotized (Fig. 21).

Specimens examined. 10♀♀, 3♂♂ (ZMHB); 1♂ (IZUG). South Tyrol: Sulden Valley near Schmelz, 940 m, 46°36'42.1" N 10°34'35.6" E; 19.IX.2005, 1♀; 03.X.2005, 1♀ and 1♂. Sulden Valley near Gomagoi, 1,220 m, 46°34'33.8" N 10°32'51.2" E; 15.VIII.2005, 1♀. Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 11.VI.2005, 1♀; 27.VI.2005, 5♀♀, 2♂♂.



Figs 10 – 21: *Forcipomyia* (*Thyridomyia*) *blascoi* Delécolle & Rieb, 1993. – **10**: female frontal sclerite; – **11**: female palpus; – **12**: spermatheca; – **13**: female genital plate; – **14**: comb on hind tibia of female; – **15**: female flagellum; – **16**: comb on hind tibia of male; – **17**: male palpus; – **18**: hind tarsus last segment; – **19 – 21**: male genitalia (– **20**: aedeagus; – **21**: parameres).

South European species recorded from Spain and Andorra. This is the first record from Italy.

Discussion. This species is close to *F. tenuichela* Dow & Wirth, 1972 since in both sexes 3rd palpal segment has trace of sensory organ without pit. Female genital sclerotizations are clearly different. Sternite IX in male genitalia with broad deep V-shaped caudomedian excavation is different from that in *F. tenuichela*. Delécolle & Rieb (1993) in the original description of the species did not mention parameres. Present studies show however, that parameres and aedeagus can be recognized separately as shown in Figs 20 and 21.

Forcipomyia (*Forcipomyia*) *brevipennis* (Macquart, 1826)

A black large species with light brown tarsi and halter.

Male. Eyes bare, frontal sclerite with central sclerotization. Terminal flagellomere without sensilla chaetica. Flagellomeres 11 and 12 with sensilla chaetica at bottom ring. Many sharp-tipped sensilla trichodea on flagellomeres 11–13. Third palpal segment swollen on basal half, sensory pit deep with narrow opening. PR 4.6 (N = 1). Mesonotum, scutellum and postscutellum almost black. Wing covered with long macrotrichia, costal vein darker. Wing length 1.75 mm (N = 1). CR 0.42 (N = 1). Halter light brown. Empodium well developed, claws long and curved. TR(I) 1.2 (N = 1), TR(II) 1.1 (N = 1), TR(III) 1.1 (N = 1). Tibial comb with 9 (N = 1) long spines. Abdomen with long black hairs. Genitalia black, sternite IX as long as broad. Gonocoxite long, gonostylus stout with setae over proximal half. Aedeagus triangular with distinct caudomedian point; basal arch not deep, arms short. Parameres broadly fused on basal third, distal part stout and straight.

Specimen examined. 1♂ (ZMHB). South Tyrol: Sulden Valley near Schmelz, 940 m, 46°36'42.1" N 10°34'35.6" E; 3.X.2005.

Holarctic species common in Europe. From Italy recorded by KIEFFER (1919) and HARANT, HUTTEL & HUTTEL (1952).

Forcipomyia (*Forcipomyia*) *ciliata* (WINNERTZ, 1852)

A large brown to dark brown species.

Female. Eyes bare. Antennal ratio 0.69 (0.59–0.79, N = 4). Third palpal segment well swollen at the base with a deep sensory pit. PR 2.5 (2.3–2.7, N = 4). Wing length 1.32 (1.17–1.76, N = 4) mm. CR 0.44 (0.41–0.47, N = 4). All tibiae with slender scales. TR(I) 0.95 (0.84–1.1, N = 4). TR(II) 0.87 (0.0.75–1.0, N = 4). TR(III) 0.94 (0.75–1.03, N = 4). Tibial comb with 8 (N = 4) long spines. Two well sclerotized ovoid spermathecae present, neck very short.

Male. Third palpal segment swollen at the base with distinct sensory pit. PR 3.3 (3.2–3.5, N = 3). Wing length 1.72 (1.62–1.85, N = 3) mm. CR 0.45 (N = 3). TR(I) 1.1 (N = 3). TR(II) 0.93 (0.91–0.95, N = 3). TR(III) 0.97 (0.91–1.0, N = 3). Genitalia: Parameres U-shaped, broadly fused at bases. Aedeagus triangular, distal third elongated. Gonostylus abruptly narrowed in the distal half. Tarsi of the female lectotype in all legs are slightly paler (ZMB 6166) than in specimens collected in Italy.

Specimens examined. Lectotype female, ZMB 6166, mounted on a micro-slide on insect pin (ZMHB) and 17♀♀, 4♂♂ (ZMHB) from South Tyrol: Sulden Valley near Schmelz, 940 m, 46°36'42.1" N 10°34'35.6" E; 27.VI.2005, 2♀♀, 2♂♂; 15.VIII.2005, 2♀♀. Sulden Valley near Gomagoi, 1,220 m, 46°34'33.8" N 10°32'51.2" E; 27.VI.2005, 13♀♀. Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 5.IX.2005, 1Y; 19.IX.2005, 1♂.

Holarctic species common in Europe. This is the first record from Italy.

Forcipomyia (*Forcipomyia*) *costata* (ZETTERSTEDT, 1838) (Figs 22–28)

A dark brown to black species with long dark hairs all over the body. First radial cell in both sexes reduced. Knob of halter light brown.

Female. Frontal sclerite as in Figure 22. Antennal ratio 1.06 (0.97–1.17, N = 4). Third palpal segment (Fig. 23) well swollen on proximal half, two third of the length with a deep sensory pit. PR 1.98 (1.9–2.0, N = 5). Wing length 1.41 mm (1.13–1.70, N = 5), width 0.60 mm (0.54–0.70, N = 5). Costal ratio 0.45 (0.43–0.49, N = 5). TR(I) 0.96 (0.89–1.11, N = 5). TR(II) 0.75 (0.60–0.87, N = 5). TR(III) 0.78 (0.68–0.87, N = 5). Tibial comb with 7 (N = 5) long spines. Abdomen: Tow well sclerotized subequal spermathecae present, neck short (Fig. 24). Subgenital plate as in Fig. 25.

Male. Antennal ratio 1.11 (0.96–1.26, N = 3). Third palpal segment with deep sensory pit (Fig. 26). PR 4.0 (3.3–4.6, N = 3). Wing length 2.00 mm (1.80–2.25, N = 3), width 0.66 mm (0.66–0.70, N = 2). Costal ratio 0.44 (0.41–0.46, N = 3). TR(I) 0.95 (0.95–0.96, N = 3). TR(II)

0.68 (0.65–0.73, N = 3). TR(III) 0.82 (0.78–0.87, N = 3). Tibial comb (Fig. 27) with 9 (N = 3) long spines. Genitalia as in Fig. 28.

Specimens examined. 11♀♀, 6♂♂ (ZMHB). South Tyrol: Sulden Valley near Schmelz, 940 m, 46°36′42.1 N 10°34'35.6" E; 15.VIII.2005, 1♂; 19.IX.2005, 1♀; 3.X.2005, 2♀♀. Sulden Valley near Gomagoi, 1,220 m, 46°34'33.8" N 10°32'51.2" E; 27.VI.2005, 4♀♀. Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 31.V.2005, 1♀, 3♂♂; 27.VI.2005, 2♀♀, 2♂♂; 8.VIII.2005, 1♀.

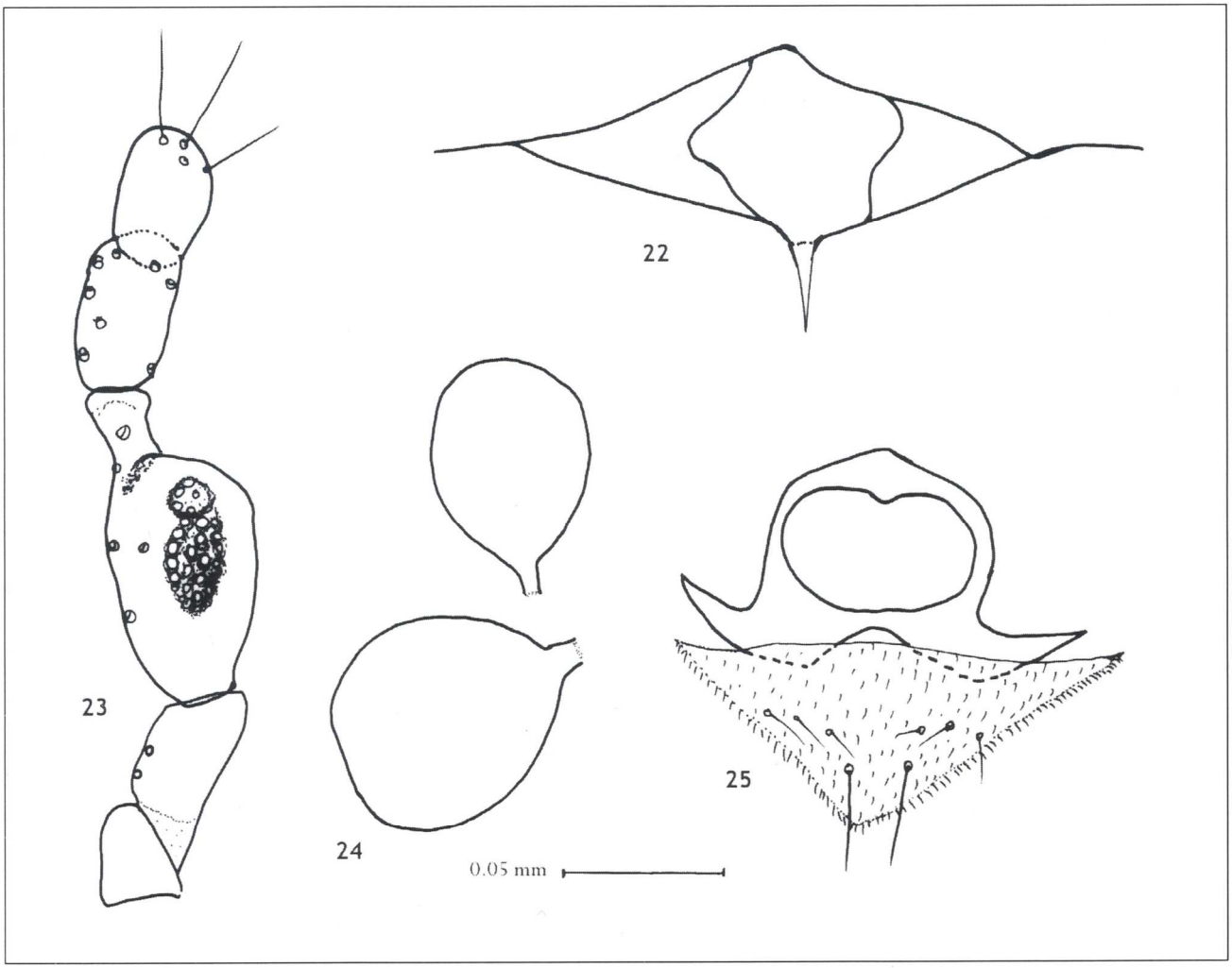
European species. This is the first record from Italy.

Forcipomyia (*Trichohelea*) *eques* (Johannsen, 1908) (Figs 29–34)

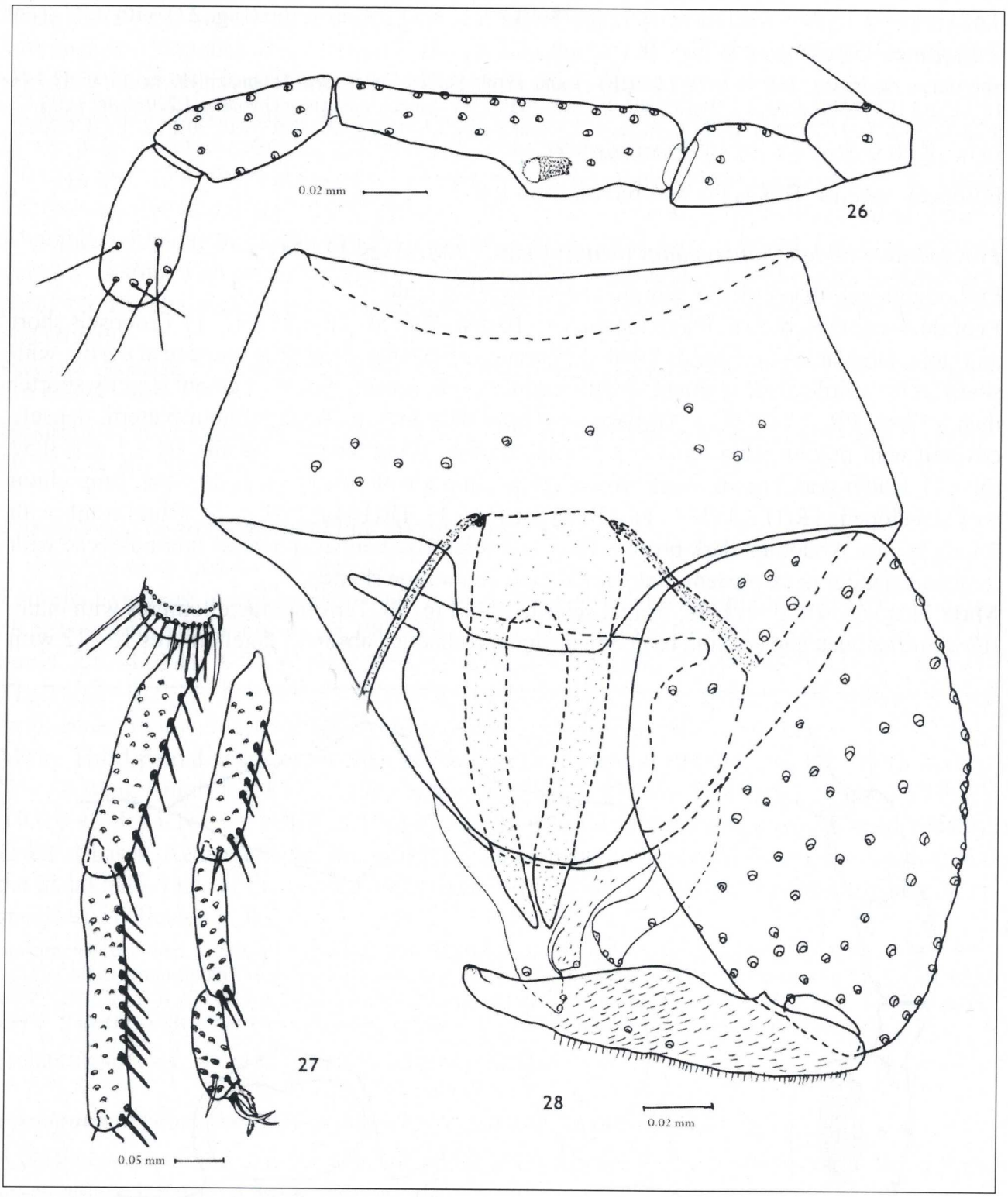
Empodium well developed in female and vestigial in male.

Female. Head dark brown. Flagellomeres 3–10 disk-shaped. AR 1.25 (N = 1). Proboscis short and stout, labellar lobes expanded with different sensilla hairs. Mandible rounded at the tip, with sharp teeth. Third palpal segment slightly swollen with sensory pit, 4th segment slightly shorter than 3rd one. PR 2.1 (N = 1). All parts of thorax dark brown. Wing without pattern, densely covered with macrotrichia, thicker of costal margin. Wing length 1.04 mm (N = 1. CR 0.52 (N = 1). Halter dark brown. Legs brown, claws simple with fine spine at the base. Empodium well developed. TR(I) 2.4 (N = 1). TR(II) 2.1 (N = 1). TR(III) 2.2 (N = 1). Tibial comb with 7 long spines. Abdomen dark brown. Two well sclerotized equal spherical spermathecae with long and slender neck present. Subgenital plate horseshoe shaped.

Male. Head brown. Eyes bare, frontal sclerite as in Fig. 30. Terminal flagellomeres with many sensilla trichodea and sensilla basiconica; sensilla chaetica absent. Flagellomeres 10–12 with

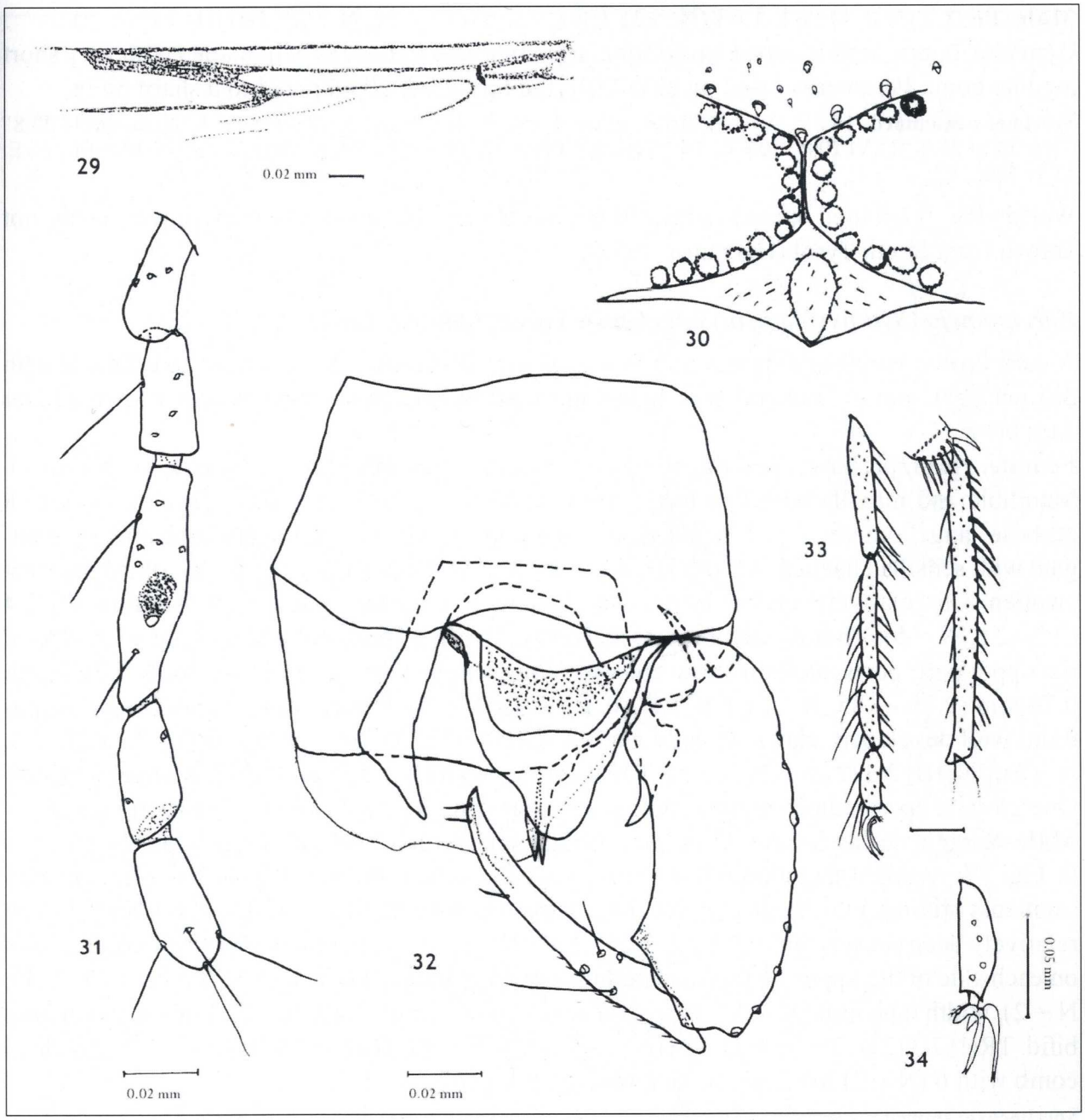


Figs 22–25: *Forcipomyia* (*Forcipomyia*) *costata* (Zetterstedt, 1838), female. – **22**: frontal sclerite; – **23**: palpus; – **24**: spermathecae; – **25**: genital plate.



Figs 26–28: *Forcipomyia* (*Forcipomyia*) *costata* (ZETTERSTEDT, 1838), male. – **26**: palpus; – **27**: comb on hind tibia and tarsus; – **28**: genitalia.

sensilla chaetica, few sensilla basiconica and many sensilla trichodea. Flagellomeres 1–9 with sensilla chaetica and few sensilla trichodea, sensilla basiconica present on some segments. Palpus (Fig. 31). Third palpal segment slightly swollen in middle, sensory pit relatively deep with narrow opening. PR 3 (N = 1). Mesonotum and postscutellum dark brown, scutellum light brown. Wing without pattern, densely covered with macrotrichia, macrotrichia of costal margin thicker. First radial cell narrow, second radial cell distinct (Fig. 29). Costal margin and radial cells slightly darker. Wing length 1.39 mm (N = 1). CR 0.48 (N = 1). Halter straw in color, stem dark brown at base. Legs light brown without pattern. Empodium vestigial on all legs. TR(I)



Figs 29 – 34: *Forcipomyia* (*Trichohelea*) *eques* (JOHANNSEN, 1908), male. – **29**: radial cells; – **30**: frontal sclerite; – **31**: palpus; – **32**: genitalia; – **33**: comb on hind tibia and tarsus; – **34**: last tarsal segment and claws.

2.0 (N = 1). TR(II) 1.9 (N = 1). TR(III) 2.2 (N = 1). Metathoracic tarsus and tibial comb as in Fig. 33. Tibial comb with 6 long spines. Claws long with prominent basal tooth and bifid as in Fig. 34. Abdomen light brown, some parts of genitalia darker. Genitalia as in Fig. 32.

Specimens examined. 1♀, 1♂ (ZMHB). South Tyrol: Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 27.VI.2005.

Holarctic species. This is the first record from Italy.

Forcipomyia (*Microhelea*) *fuliginosa* (MEIGEN, 1818)

Dark brown to black species, halter light brown, stem dark.

Female. Mandible with fine teeth. AR = 0.60 (N = 2).

Third palpal segment strongly inflated to the tip, sensory organ deep with small distal opening. PR 2.3 (2.0–2.6,N = 2). WL 1.68 (1.66–1.71, N = 2) mm. CR 0.40 (N = 2). TR(III) 0.87 (0.84–0.90, N = 2). Two ovoid spermathecae, slightly unequal.

Male. PR 3.3 (N = 1). WL 1.63 (N = 2). CR 0.43 (0.42–0.44, N = 2). TR(III) 1 (N = 2). Genitalia. Ninth sternite broad, posterior margin bilobed. Aedeagus bell-shaped with very short median point. Parameres fused on basal half, the fork gradually tapered to a sharp point.

Specimens examined. 10♀♀, 2♂♂ (ZMHB). South Tyrol: Sulden Valley near Gomagoi, 1,220 m, 46°34'33.8" N 10°32'51.2" E; 27.VI.2005, 10♀♀, 1♂. Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 27.VI.2005, 1♂.

Worldwide distributed species. From Italy reported by BOORMAN (1995), but previously not known from South Tyrol (HELLRIGL 1996).

***Forcipomyia* (*Synthyridomyia*) *knockensis* GOETGHEBUER, 1938** (Figs 35–43)

A dark brown species, empodium in both sex well developed. Mesonotum dark brown with distinct light spot on humeral area, scutellum light brown, postscutellum dark brown. Halter dark brown.

Female. Head, proboscis and flagellum dark brown. Eyes bare. Frontal sclerite as in Fig. 35. Mandible and maxilla with fine teeth. Antenna (Fig. 43), pedicel darker, flagellomeres 1–8 globose, flagellomeres 9–12 longer than preceding, terminal flagellomere subconically elongate with sensilla chaetica. AR 0.96 (0.90–1.03, N = 5). Palpus (Fig. 36) brown, third segment swollen with relatively deep sensory pit at midlength, segments 4 and 5 almost fused. PR 2.4 (2.2–2.6, N = 5). Thorax dark brown, mesonotum with a straw colored spot on each side of the upper part; postscutellum straw colored. Wing length 1.78 mm (1.64–1.86, N = 5), width 0.79 mm (0.75–0.85, N = 5). CR 0.47 (0.46–0.48, N = 5). Halter brown. Legs brown, empodium well developed, claws strongly curved. TR(I) 2.3 (2.0–2.4, N = 5). TR(II) 2.2 (2.0–2.6, N = 5). TR(III) 2.3 (2.2–2.5, N = 5). Tibial comb with 6 (N = 5) long spines. Abdomen brown. One globose spermatheca present, neck very short (Fig. 37). Subgenital plate as in Fig. 38.

Male. Same color as female. Eyes bare, frontal sclerite as in Fig. 40. Flagellomeres 1–13 as in Fig. 41, terminal flagellomere without sensilla chaetica. Palpus (Fig. 39); fourth and fifth segments missing in both specimens; third palpal segment slightly swollen at midlength, with relatively deep sensory pit. PR 3.27 (3.25–3.30, N = 2). Mesonotum with a straw colored spot on each side of the upper part; postscutellum straw colored. Wing length 1.33 mm (1.18–1.49, N = 2), width 0.66 mm (N = 2). Halter brown. CR 0.47 (0.46–0.49, N = 2). Legs brown, claws bifid. TR(I) 2.3 (2.0–2.5, N = 2), TR(II) 1.8 (1.6–2.0, N = 2), TR(III) 2.0 (1.8–2.2, N = 2). Tibial comb with 6 (N = 2) long spines. Genitalia as in Fig. 42.

Specimens examined. 5♀♀, 2♂♂ (ZMHB). South Tyrol: Sulden Valley near Schmelz, 940 m, 46°36'42.1" N 10°34'35.6" E; 27.VI.2005, 1♂. Sulden Valley near Gomagoi, 1,220 m, 46°34'33.8" N 10°32'51.2" E; 27.VI.2005, 5♀♀, 1♂.

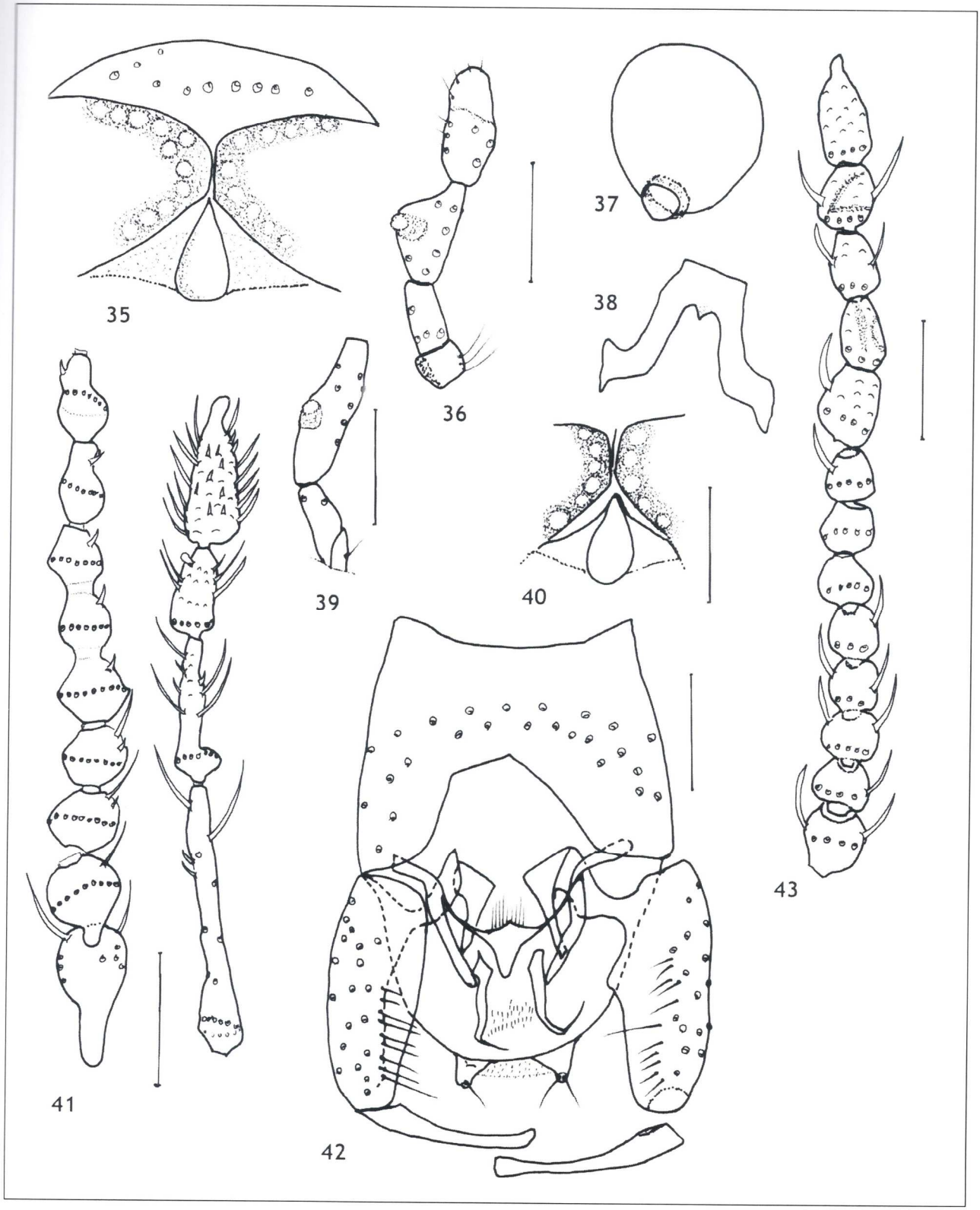
Palaearctic species. This is the first record from Italy.

***Forcipomyia* (*Thyridomyia*) *monilicornis* (COQUILLETT, 1905)** (Figs 44–46)

A small brown to dark brown species, mesonotum and postscutellum darker. Eyes bare. Empodium in both sexes well developed. First radial cell reduced, halter light brown to brown.

Female. Flagellomeres 1–8 subspherical and the last 4 flagellomeres slightly elongated. AR 1.20 (1.10–1.26, N = 5). Mandible with about 40 fine teeth, maxilla with about 22 teeth. Third palpal segment swollen in the middle with a large shallow pit, segments 4 and 5 in few specimens among 260 slides examined not well separated. PR 2.36 (2.00–2.60, N = 5). Wing length 0.99 mm (0.95–1.05, N = 5), CR 0.49 (0.48–0.51, N = 5). TR(III) 2.21 (2.10–2.30, N = 5). Tibial comb with 7 (N = 5) long spines. One dark spermatheca with relatively long curved strongly sclerotized neck present.

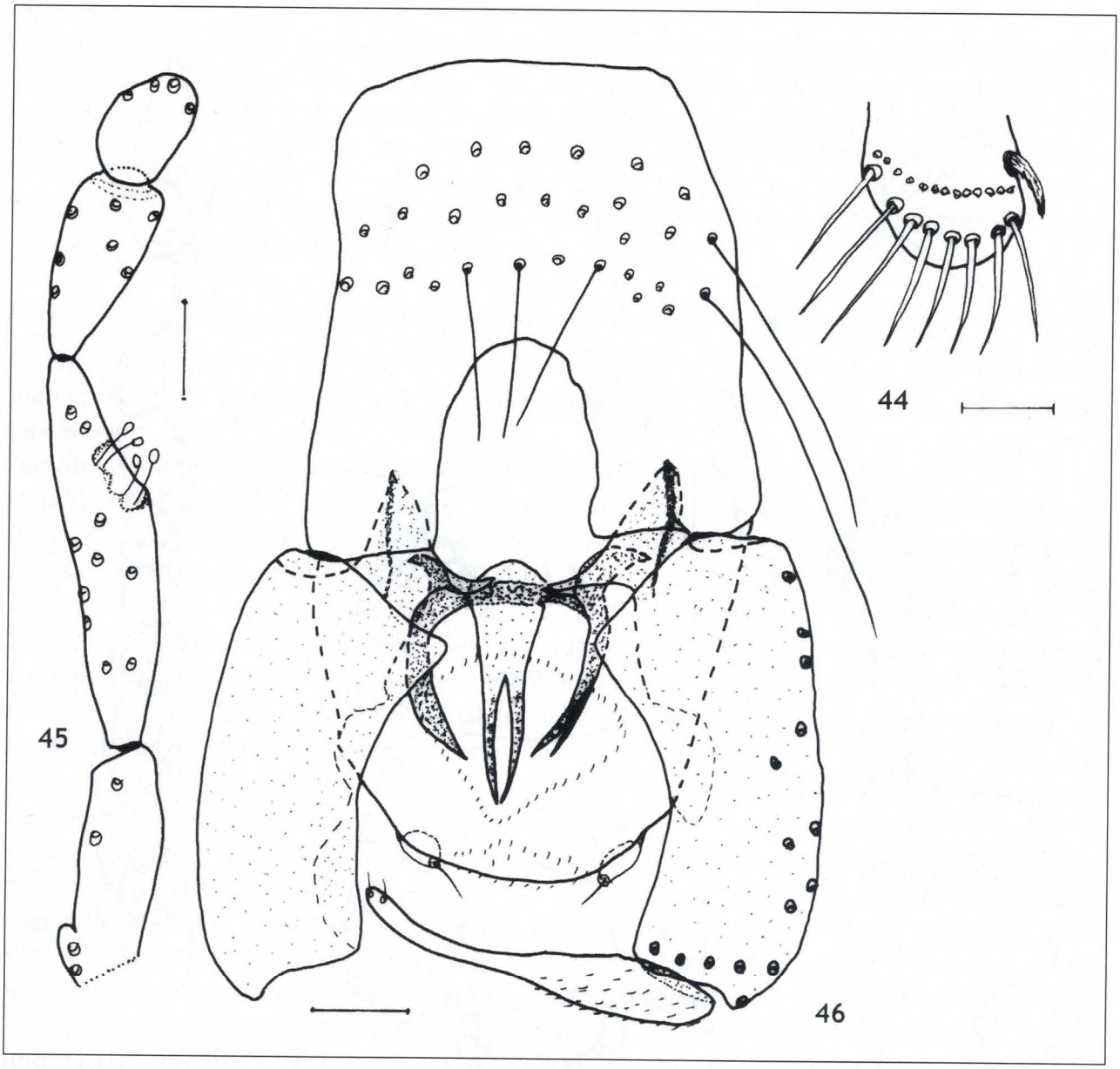
Male. Terminal flagellomere covered with sensilla trichodea, without sensilla chaetica. Third palpal segment slightly swollen in the middle (Fig. 45). PR 3.33 (3.00–3.75, N = 5). Wing length 1.16 mm (1.12–1.24, N = 5). CR 0.46 (0.45–0.47, N = 5). TR(I) 2.46 (2.10–2.62,



Figs 35–43: *Forcipomyia* (*Synthyridomyia*) *knockensis* GOETGHEBUER, 1938. – **35**: female frontal sclerite; – **36**: female palpus; – **37**: spermatheca; – **38**: female genital sclerotization; – **39**: male palpus; – **40**: male frontal sclerite; – **41**: male flagellum; – **42**: male genitalia; – **43**: female flagellum. Scale bars = 0.05 mm.

N = 5). TR(II) 2 (1.80–2.38, N = 5). TR(III) 2.29 (2.1–2.4, N = 5). Tibial comb (Fig. 44) with 7–8 (N = 5) long spines. Abdomen dark brown, genitalia as in Fig. 46.

Specimens examined. 260♀♀, 129♂♂ (ZMHB). South Tyrol: Sulden Valley near Schmelz, 940 m, 46°36'42.1" N 10°34'35.6" E; 31.V.2005, 23♀♀, 5♂♂; 15.VIII.2005, 11♀♀; 19.IX.2005, 11♀♀, 5♂♂; 3.X.2005, 11♀♀, 3♂♂; 14.X.2005, 2♀♀. Sulden Valley near Gomagoi, 1,220 m, 46°34'33.8" N 10°32'51.2" E; 31.V.2005, 7♀♀; 11.VI.2005, 60♀♀, 35♂♂; 27.VI.2005, 85♀♀, 69♂♂; 15.VIII.2005, 10♀♀, 1♂; 5.IX.2005, 1♀; 19.IX.2005, 1♀; 3.X.2005, 1♂.



Figs 44–46: *Forcipomyia* (*Thyridomyia*) *monilicornis* (COQUILLETT, 1905), male. – **44**: comb on hind tibia; – **45**: palpus; – **46**: genitalia. Scale bars = 0.05 mm.

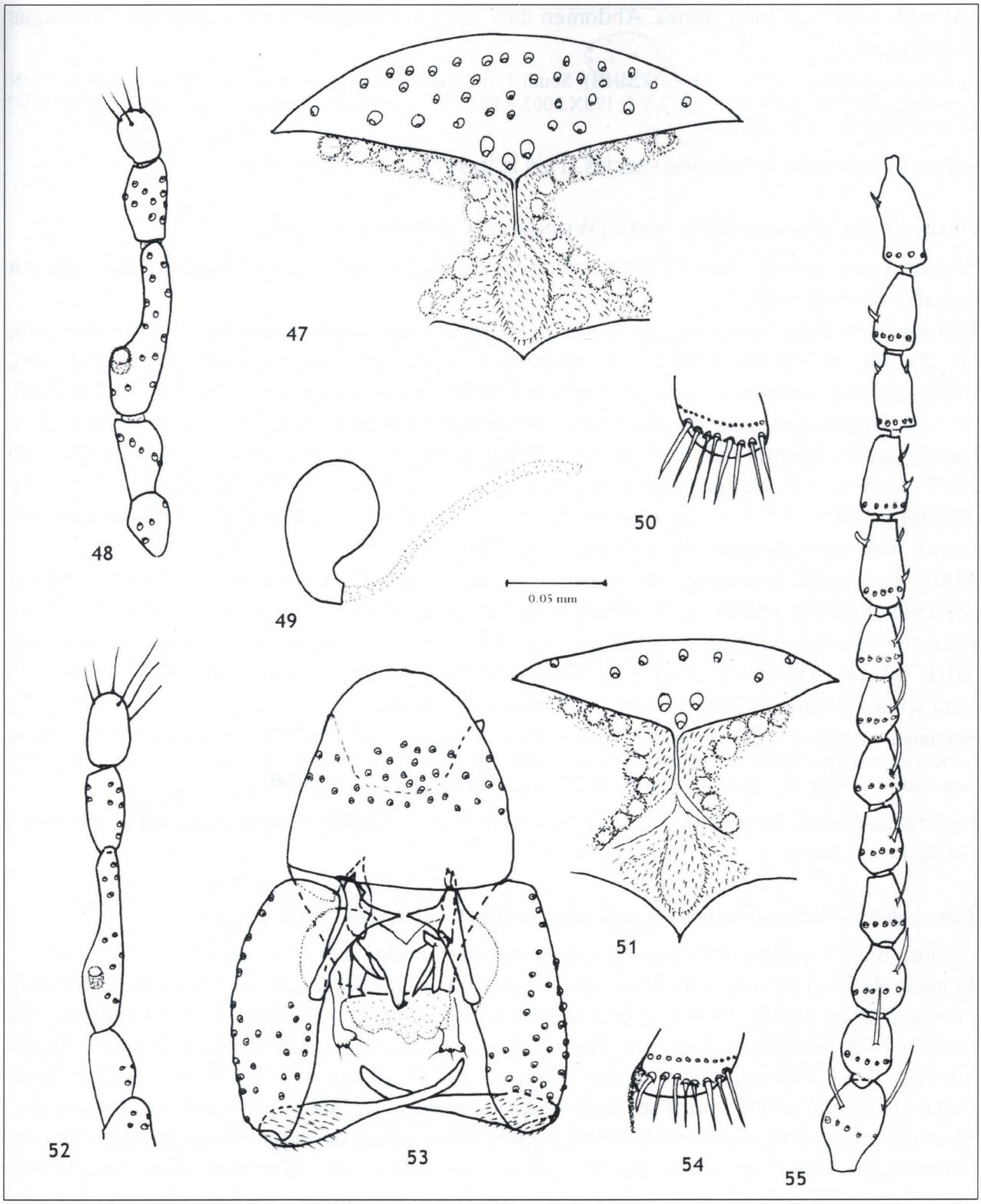
Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 31.V.2005, 1♀, 1♂; 11.VI.2005, 1♀, 27.VI.2005, 34♀♀, 9♂♂; 8.VIII.2005, 2♀♀.

Holarctic species. First record for Italy.

Forcipomyia (*Synthridomyia*) *murina* (WINNERTZ, 1852) (Figs 47–55)

A medium size dark brown species. Eyes in the middle pubescent.

Female. Eyes in the middle pubescent (Fig. 47). Flagellum as in Fig. 55, flagellomeres 1–13 with sensilla trichodea. Distal five flagellomeres with sensilla basiconica. AR 0.83 (0.76–0.88, N = 5). Palpus (Fig. 48) brown, third segment slightly swollen in lower half with weakly sclerotized sensory pit. PR 3.01 (2.81–3.30, N = 5). Mandible and maxilla with many fine teeth. Mesonotum and postscutellum dark brown, scutellum and pleura light brown. Wing covered with macrotrichia. Wing length 1.09 mm (1.06–1.13, N = 5). CR 0.40 (0.38–0.43, N = 5). Legs brown to dark brown. TR(I) 2.3 (1.9–2.6, N = 5). TR(II) 2.3 (2.1–2.5, N = 5). TR(III) 1.8 (1.6–2.1, N = 5). Tibial comb (Fig. 50) with 8 (N = 5) long spines. One spermatheca present with distinct neck (Fig. 49), in some specimens the hyaline duct is visible.



Figs 47–55: *Forcipomyia* (*Synthyridomyia*) *murina* (WINNERTZ, 1852). – **47**: female frontal sclerite; – **48**: female palpus; – **49**: spermatheca; – **50**: comb on hind tibia of female; – **51**: male frontal sclerite; – **52**: male palpus; – **53**: male genitalia; – **54**: comb on male hind tibia; – **55**: female flagellum.

Male. Eyes in the middle pubescent. Frontal sclerite as in Fig. 51. Palpus (Fig. 52) light brown, third segment slightly swollen in lower half with lightly sclerotized sensory pit. PR 4.36 (4.1–4.8, N = 3). Mesonotum, scutellum and postscutellum same color as in female. Wing length 1.16 mm (1.05–1.27, N = 3), CR 0.38 (N = 3). Halters straw colored. TR(I) 2.4 (2.3–2.6, N = 3), TR(II) 2.3 (2.1–2.6, N = 3), TR(III) 1.9 (1.7–2.1, N = 3). Tibial comb (Fig.

54) with 8 (N = 3) long spines. Abdomen dark brown. Genitalia with complicated aedeagus as in Figure 53.

Specimens examined. 20♀♀, 3♂♂ (ZMHB). South Tyrol: Sulden Valley near Schmelz, 940 m, 46°36'42.1" N 10°34'35.6" E; 27.VI.2005, 4♀♀ and 2♂♂; 19.IX.2005, 14♀♀, 1♂. Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 11.VI.2005, 2♀♀.

Almost worldwide distributed species. This is the first record from Italy.

***Forcipomyia* (*Forcipomyia*) *nigra* (WINNERTZ, 1852)** (Figs 56–64)

A dark, hairy species. In both sexes wing covered with long narrow black scales, dense on costal and radial veins.

Female. Eyes bare, frontal sclerite as in Fig. 56. Flagellum (Fig. 64), length 0.75 mm (0.66–0.8, N = 3). AR 0.74 (0.68–0.80, N = 3). Maxilla and mandible without teeth. Palpus (Fig. 63), third segment slightly swollen on basal half with shallow sensory pit. PR 3.53 (3.38–3.66, N = 3). Mesonotum, postscutellum and scutellum dark brown. Wing covered with long, dark narrow scales. Second radial cell distinct. Wing length 1.51 mm (1.36–1.64, N = 3). CR 0.40 (0.37–0.45, N = 3). Halter dark brown. TR(I) 1.5 (1.2–1.6, N = 3). TR(II) 1.0 (0.9–1.0, N = 3). TR(III) 1.0 (0.9–1.1, N = 3). Tibial comb (Fig. 57) with 8 (N = 3) long spines. Abdomen dark brown with two subequal spermathecae (Fig. 58).

Male. Same color as female with usual differences. Frontal sclerite as in Fig. 60. Third palpal segment slightly swollen on basal half with lightly sclerotized shallow sensory pit (Fig. 61). PR 6 (N = 1). Wing length 1.52 mm (N = 1). CR 0.4 (N = 1). Halter dark brown as in female. TR(I) 1.3 (N = 1). TR(II) 1.0 (N = 1). TR(III) 0.9 (N = 1). Tibial comb (Fig. 59) with 8 (N = 1) long spines. Abdomen dark brown. Genitalia as in Fig. 62.

Specimens examined. Lectotype female (ZMB 6165), micro-slide on insect pin (ZMHB) and 4♀♀, 1♂ (ZMHB). South Tyrol: Sulden Valley near Gomagoi, 1220 m, 46°34'33.8" N 10°32'51.2" E; 19.IX.2005, 1♀. Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 31.V.2005, 2♀♀, 1♂; 27.VI.2005, 1♀.

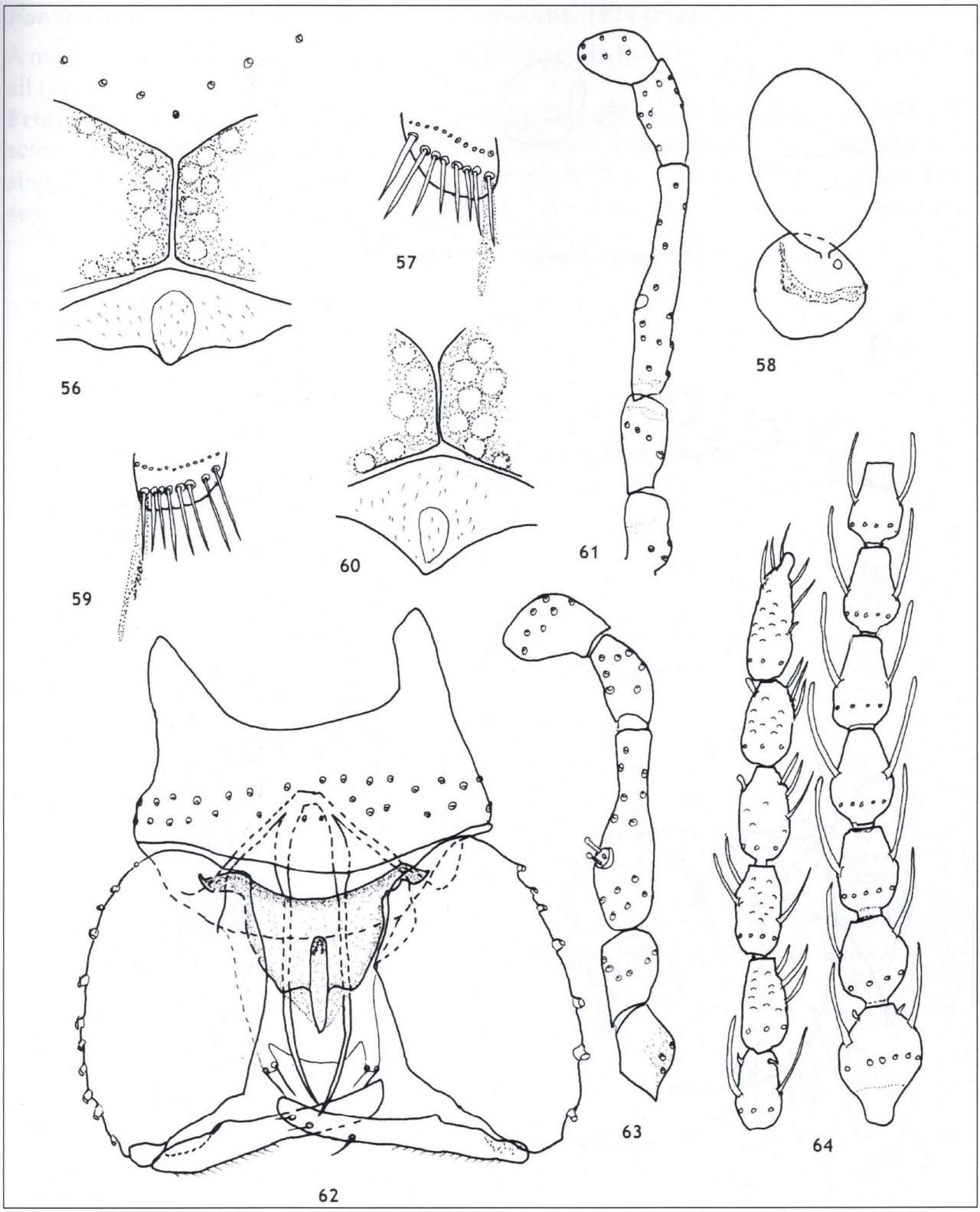
Holarctic species. From Italy reported by HARANT et al. (1952), but not included in the list of BOORMAN (1995).

***Forcipomyia* (*Euprojoannisia*) *phlebotomoides* BANGERTER, 1933** (Figs 65–72)

A small brown to dark brown species. Empodium in both sexes developed.

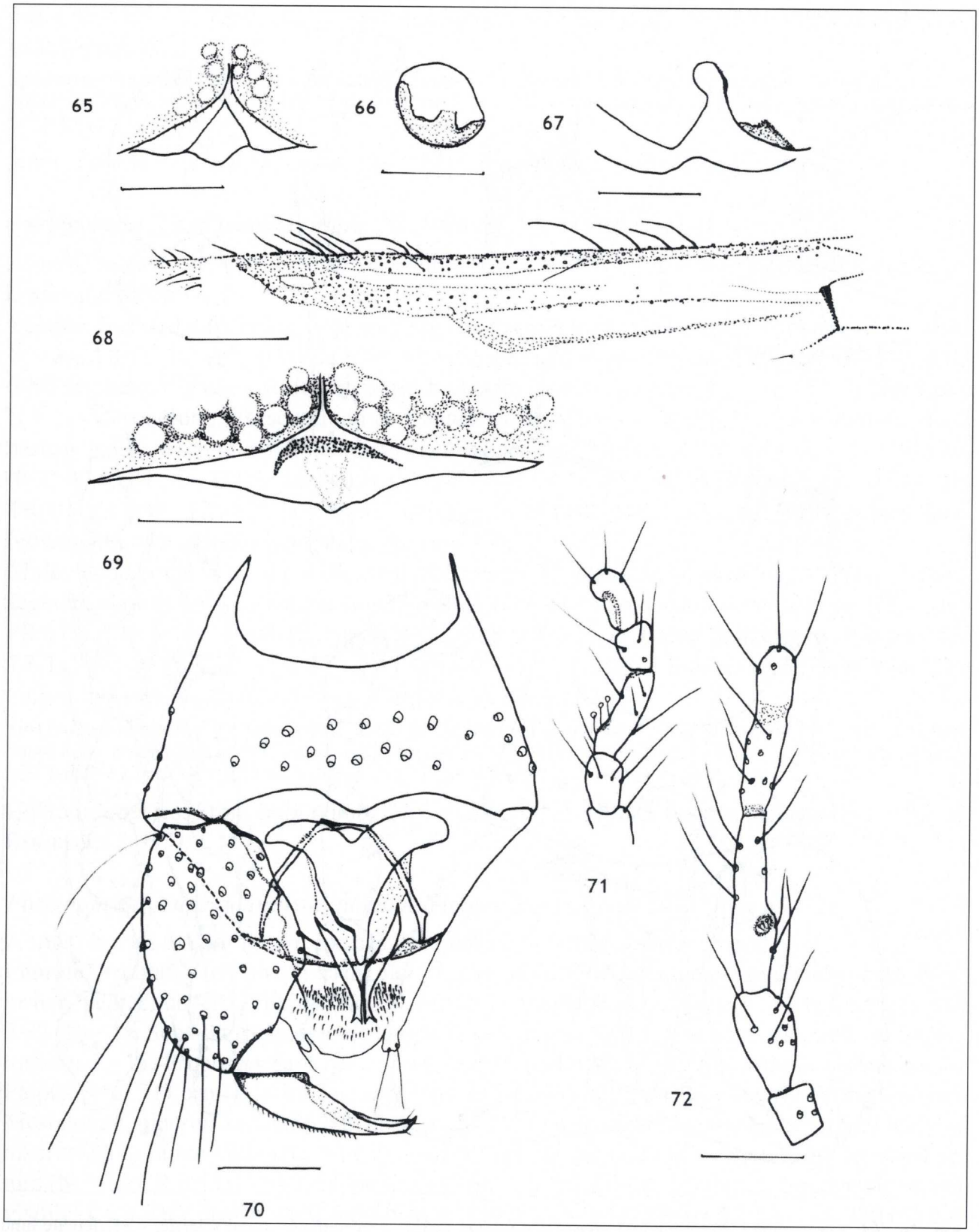
Female. Frontal sclerite with triangular projection (Fig. 65). Antennae relatively short, dark brown, pedicel darker. Proximal flagellomeres 1–8 subspherical, distal 9–13 cylindrical. AR 0.82 (N = 1). Sensilla trichodea visible on flagellomeres 3–13, sensilla basiconica on flagellomeres 7–13. Proboscis dark brown and short. Mandible and maxilla without distinct teeth. Palpus (Fig. 71) brown, third segment long and narrow with shallow lightly sclerotized pit. Mesonotum, pleuron and scutellum dark brown. Wing pale without marking, covered with long macrotrichia, radial cells area slightly darker. First radial cell obliterated. Wing length 0.86 mm (N = 1). CR 0.45 (N = 1). Halter brown and covered with microtrichia, 2 macrotrichia are visible. Legs dark brown, tarsi light brown. TR(I) 2 (N = 1). TR(II) 2.2 (N = 1). TR(III) 2.4 (N = 1). Tibial comb with 8 (N = 1) long spines. Abdomen dark brown. One spherical spermatheca (Fig. 66), darkly sclerotized with short neck. Distal margin of ninth sternite as Fig. 67.

Male. Head dark brown. Frontal sclerite (Fig. 69) with triangular projection and dark arched sclerotized mark. Antenna brown, flagellomeres 2–10 with dense, long, dark brown sensilla chaetica. Sensilla chaetica on flagellomeres 1, 11, 12 not very long. Last two flagellomeres covered with sensilla trichodea and few basiconica. Terminal flagellomere without sensilla chaetica. AR 0.96 (0.95–0.97, N = 3). Palpus (Fig. 72) light brown, third segment with small shallow pit. Pleuron and scutellum dark brown, mesonotum slightly darker. Wing pale without



Figs 56–64: *Forcipomyia* (*Forcipomyia*) *nigra* (Winnertz, 1852). – **56**: female frontal sclerite; – **57**: female hind tibial comb; – **58**: spermathecae; – **59**: comb on hind tibia of male; – **60**: male frontal sclerite; – **61**: male palpus; – **62**: male genitalia; – **63**: female palpus; – **64**: female flagellum.

markings, covered with long macrotrichia, no macrotrichia in basal radial cell. Radial cell area slightly darker; first radial cell reduced (Fig. 68). Wing length 1.29 mm (1.26–1.36, N = 3). CR 0.41 (0.40–0.42, N = 3). Halter brown to dark brown. Legs dark brown. TR(I) 1.6 (1.4–1.7, N = 3). TR(II) 1.2 (1.1–1.6, N = 3). TR(III) 1.3 (1.3–1.4, N = 3). Tibial comb with 6–7 (N = 8) long spines. Abdomen dark brown, genitalia (Fig. 70) darker than abdomen.



Figs 65–72: *Forcipomyia* (*Euprojoannisia*) *phlebotomoides* BANGERTER, 1933. – **65**: female frontal sclerite; – **66**: spermatheca; – **67**: female 9th sternum transfer; – **68**: male costal and radial part of the wing; – **69**: male frontal sclerite; – **70**: male genitalia; – **71**: female palpus; – **72**: male palpus. Scale bars = 0.05 mm.

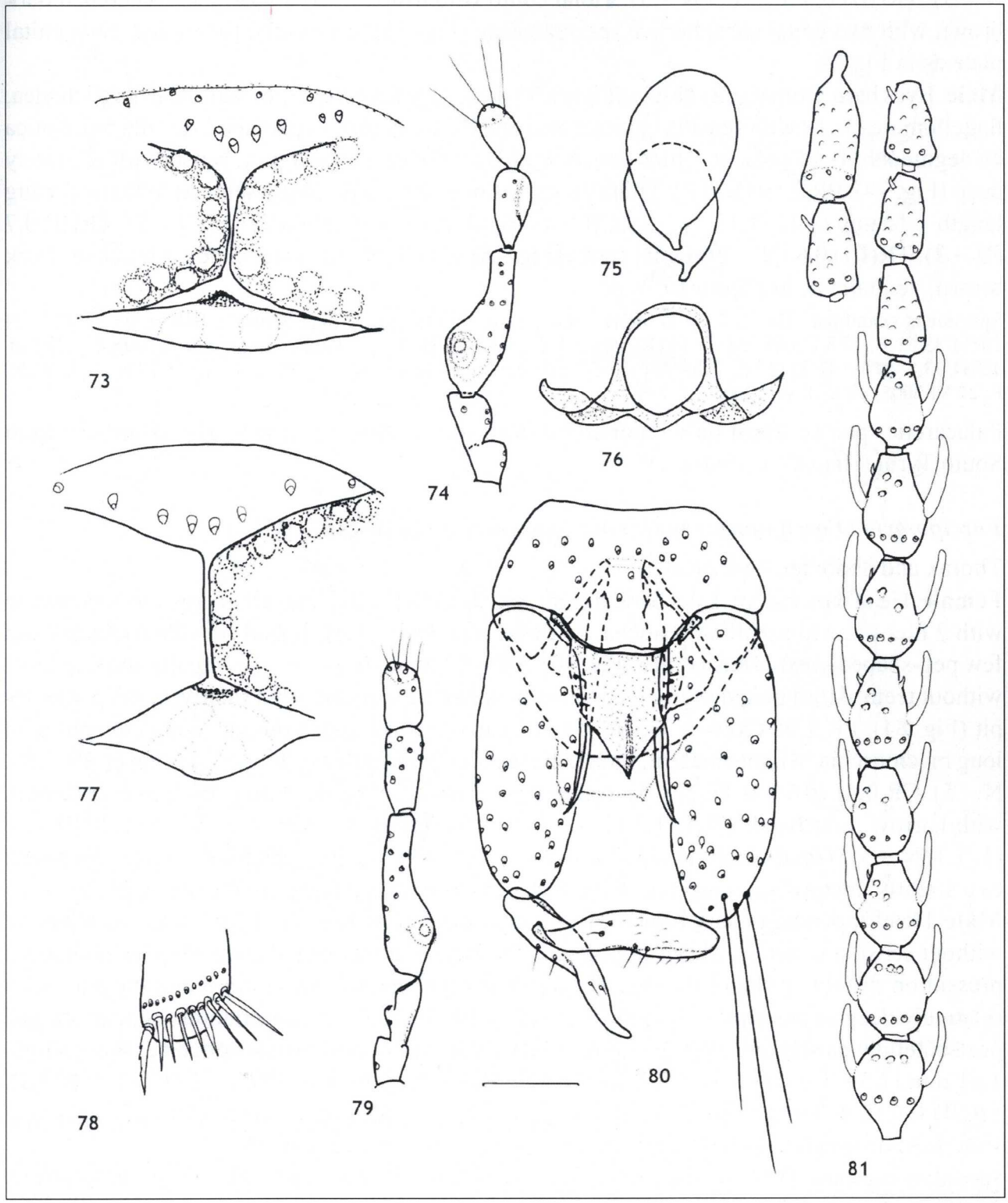
Specimens examined. 1♀, 13♂♂ (ZMHB). South Tyrol: Sulden Valley near Schmelz, 940 m, 46°36′42.1 N 10°34′35.6" E; 3.X.2005, 1♂. Sulden Valley near Gomagoi, 1,220 m, 46°34'33.8" N 10°32'51.2" E; 11.VI.2005, 1♂; 27.VI.2005, 6♂♂. Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 27.VI.2005, 1♀, 4♂♂. Glurnser Alm, 2,315 m, 46°32'07.1" N 10°27'50.4" E, 25.VII.2005, 1♂.

West Palaearctic species. This is the first record from Italy.

***Forcipomyia* (*Forcipomyia*) *pulchrithorax* EDWARDS, 1924** (Figs 73–81)

A medium-sized species. Mesonotum with light stripes. In female lanceolate scales present on all tibiae.

Female. Head: Dark brown, all appendages straw colored to light brown. Eyes bare, frontal sclerite as in Fig. 73. Maxilla and mandible without teeth. Flagellomeres elongated, distal five slightly longer (Fig. 81). Sensilla chaetica present on all flagellomeres. Many sharp-tipped sensilla trichodea present on flagellomeres 9–13. Peg-shaped sensilla basiconica present on



Figs 73–81: *Forcipomyia* (*Forcipomyia*) *pulchrithorax* EDWARDS, 1924. – **73**: female frontal sclerite; – **74**: female palpus; – **75**: spermathecae; – **76**: female genital plate; – **77**: male frontal sclerite; – **78**: comb on hind tibia of male; – **79**: male palpus; – **80**: male genitalia; – **81**: female flagellum. Scale bare = 0.05 mm.

flagellomeres 1–12. AR 0.67 (0.64–0.72, N = 3). Third palpal segment swollen in basal part with relatively deep sensory pit (Fig. 74). PR 2.2 (N = 3). Mesonotum yellowish with three dark brown stripes; in some specimens anteroanepisternum yellowish, or anteroanepisternum and anepimeron yellowish and katepisternum brown. Wing covered with long macrotrichia. Second radial cell present, a light spot in front of it. Wing length 1.11 mm (0.98–1.30, N = 3). CR 0.43 (0.41–0.45, N = 3). Halter straw colored. Legs light brown, hind femur and tibia darker. Lanceolate scales present on all tibiae. TR(I) 1.1 (1.0–1.1, N = 3). TR(II) 0.8 (0.7–0.8, N = 3). TR(III) 0.8 (0.7–0.9 N = 3). Tibial comb with 6–7 (N = 3) long spines. Abdomen dark brown with two equal subspherical spermathecae (Fig. 75), necks slightly curved. Subgenital plate as in Fig. 76.

Male. Eyes bare, frontal sclerite as in Figure 77. Last flagellomeres with many sensilla trichodea, flagellomeres 1–12 with sensilla chaetica and sensilla trichodea. Peg-shaped sensilla basiconica on segments 11–13 present. Third palpal segment swollen in basal part, sensory pit relatively deep (Fig. 79). PR 2.69 (N = 2). Thorax same color as in female. Wing same as in female, wing length 1.12 mm (1.11–1.13, N = 2). CR 0.41 (0.40–0.43, N = 2). TR(I) 0.9 (N = 2). TR(II) 0.7 (N = 2). TR(III) 0.8 (N = 2). Tibial comb (Fig. 78) with 8 (N = 2) long spines. Abdomen: Dark brown, genitalia as in Figure 80.

Specimens examined. 11♀♀, 5♂♂ (ZMHB). South Tyrol: Sulden Valley near Schmelz, 940 m, 46°36'42.1" N 10°34'35.6" E; 27.VI.2005, 2♂♂; 19.IX.2005, 5♀♀ ; 03.X.2005, 2♂♂. Sulden Valley near Gomagoi, 1,220 m, 46°34'33.8" N 10°32'51..2" E; 11.VI.2005, 1♂. Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 27.VI.2005, 4♀♀; 8.VIII.2005, 2♀♀.

Palaearctic species. From Italy reported by BOORMAN (1995), but previously not known from South Tyrol (HELLRIGL 1996).

Forcipomyia (*Forcipomyia*) *radicicola* EDWARDS, 1924 (Figs 82–90)

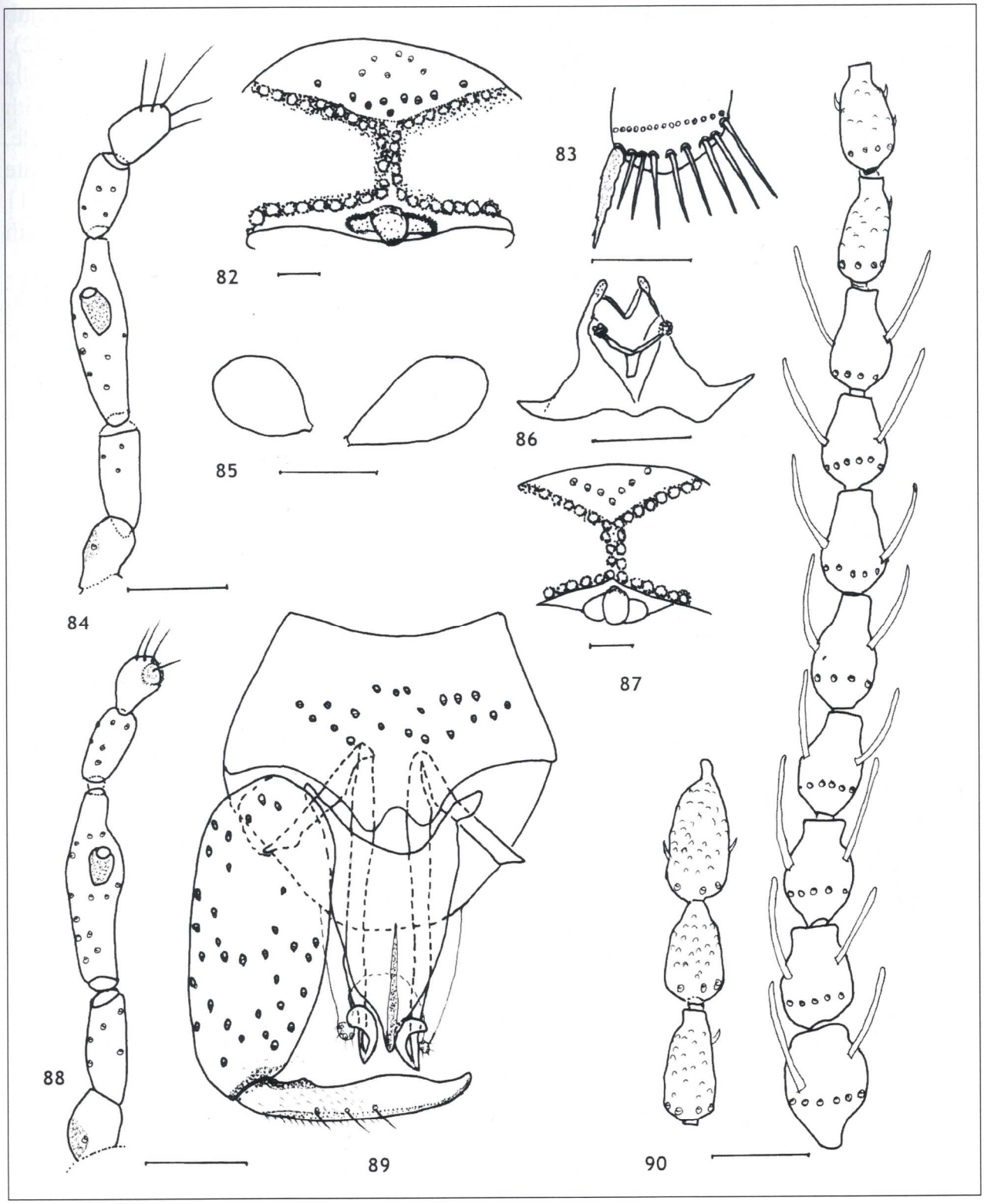
Thorax and abdomen dark brown.

Female. Head dark brown. Eyes bare, frontal sclerite as in Fig. 82. Flagellomeres 1 to 8 elongated with 2 blunt-tipped sensilla trichodea, on distal five many sharp-tipped sensilla trichodea and few peg-shaped sensilla basiconica (Fig. 90). AR 0.62 (0.60–0.63, N = 4). Maxilla and mandible without teeth. Third palpal segment swollen in upper middle part, with relatively deep sensory pit (Fig. 84). PR 2.95 (2.66–3.33, N = 5). All parts of thorax dark brown. Wing covered with long macrotrichia, without pattern. First radial cell obliterated. Wing length 1.48 mm (1.38–1.60, N = 5). CR 0.41 (0.39–0.43, N = 5). Halter light brown. Legs dark brown, both ends of femora with narrow light band. TR(I) 1.3 (1.2–1.4, N = 5). TR(II) 1.1 (0.9–1.3, N = 5). TR(III) 1.1 (1–1.1, N = 5). Tibial comb (Fig. 83) with 8–9 (N = 5) long spines. Abdomen dark brown with two slightly unequal spermathecae (Fig. 85), neck very short. Subgenital plate as in Fig. 86.

Male. Head appendages dark brown. Eyes bare, frontal sclerite as in Fig. 87. Last flagellomere without sensilla chaetica. Sharp-tipped sensilla trichodea and peg-shaped sensilla basiconica present on distal two flagellomeres. Third palpal segment swollen in upper middle part, with relatively deep sensory pit (Fig. 88). PR 3.45 (3.30–3.63, N = 4). Mesonotum, scutellum and postscutellum dark brown. Wing without pattern, covered with long macrotrichiae. Wing length 1.61 mm (1.59–1.65, N = 3). CR 0.39 (N = 3). Halter light brown. TR(I) 1.1 (1.1–1.2, N = 3). TR(II) 0.9 (0.9–0.9, N = 4). TR(III) 1.0 (0. 9–1.0, N = 4). Tibial comb with 8 (N = 4) long spines. Abdomen black, covered with long hairs. Genitalia as in Fig. 89.

Specimens examined. 14♀♀, 6♂♂ (ZMHB). South Tyrol: Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 31.V.2005, 1♂; 11.VI.2005, 1♀, 3♂♂; 27.VI.2005, 13♀♀, 2♂♂.

Palaearctic species. This is the first record from Italy.



Figs 82 – 90: *Forcipomyia* (*Forcipomyia*) *radicicola* EDWARDS, 1924. – **82**: female frontal sclerite; – **83**: comb on hind tibia of female; – **84**: female palpus; – **85**: spermathecae; – **86**: female genital plate; – **87**: male frontal sclerite; – **88**: male palpus; – **89**: male genitalia; – **90**: female flagellum. Scale bars = 0.05 mm.

Forcipomyia (*Forcipomyia*) *sahariensis* KIEFFER, 1923 (Figs 91–95)

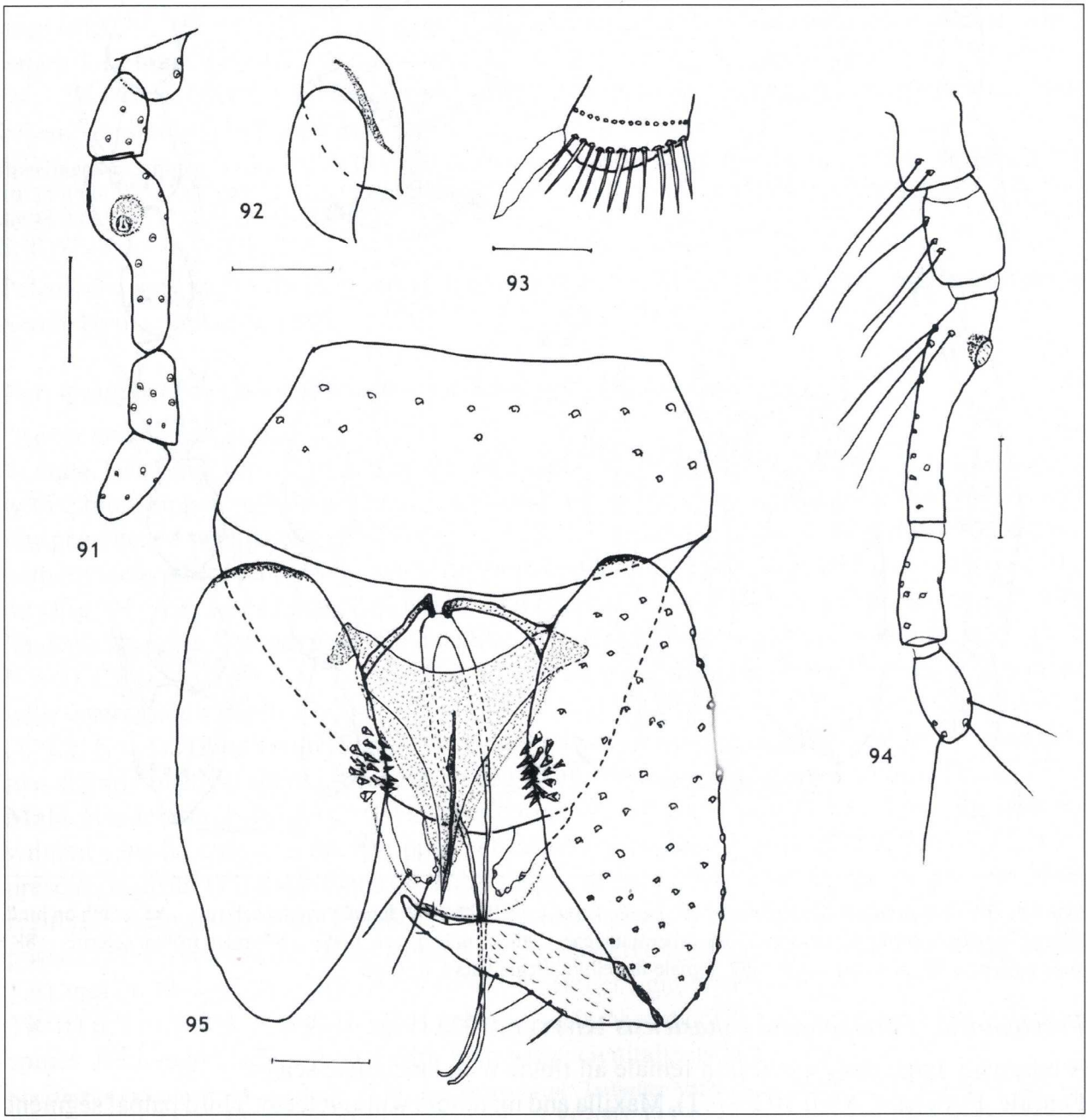
A relatively large dark species. In female all tibiae with lanceolate scales.

Female. Eyes bare. AR 0.79 (N = 1). Maxilla and mandible without teeth. Third palpal segment slightly swollen in basal half, with shallow sensory pit (Fig. 91). PR 2.50 (N = 1). Mesonotum, postscutellum and scutellum dark brown, halters straw colored. Wing covered with long macrotrichia, radial cell area slightly darker. Wing length 1.28 mm (N = 1). CR 0.41 (N = 1). All tibiae

with lanceolate scales. TR(I) 1.3 (N = 1). TR(II) 0.9 (N = 1). TR(III) 1.0 (N = 1). Tibial comb with 9 (N = 1) long spines. Abdomen dark brown. Two ovoid spermathecae present (Fig. 92).
Male. Same color as female with usual differences. Terminal flagellomere covered with sensilla trichodea, sensilla chaetica present. Third palpal segment slightly swollen on basal half, with sclerotized shallow sensory pit (Fig. 94). PR 3.91 (3.91–3.92, N = 2). Thorax as in female. Wing length 1.81 mm (1.74–1.89, N = 2). CR 0.44 (0.44–0.45, N = 2). Tibiae without lanceolate scales. TR(I) 1.0 (0.9–1.1, N = 2). TR(II) 0.8 (N = 2). TR(III) 0.8 (N = 2). Tibial comb with 11 (N = 2) long spines (Fig. 93). Abdomen dark brown. Genitalia as in Fig. 95. Gonocoxite with strong ventral spines.

Specimens examined. 1 ♀, 2 ♂ ♂ (ZMHB). South Tyrol: Sulden Valley near Schmelz, 940 m, 46°36'42.1" N 10°34'35.6" E; 19.IX.2005, 1 ♀. Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 27.VI.2005, 2 ♂ ♂.

Palaearctic species. This is the first record from Italy.



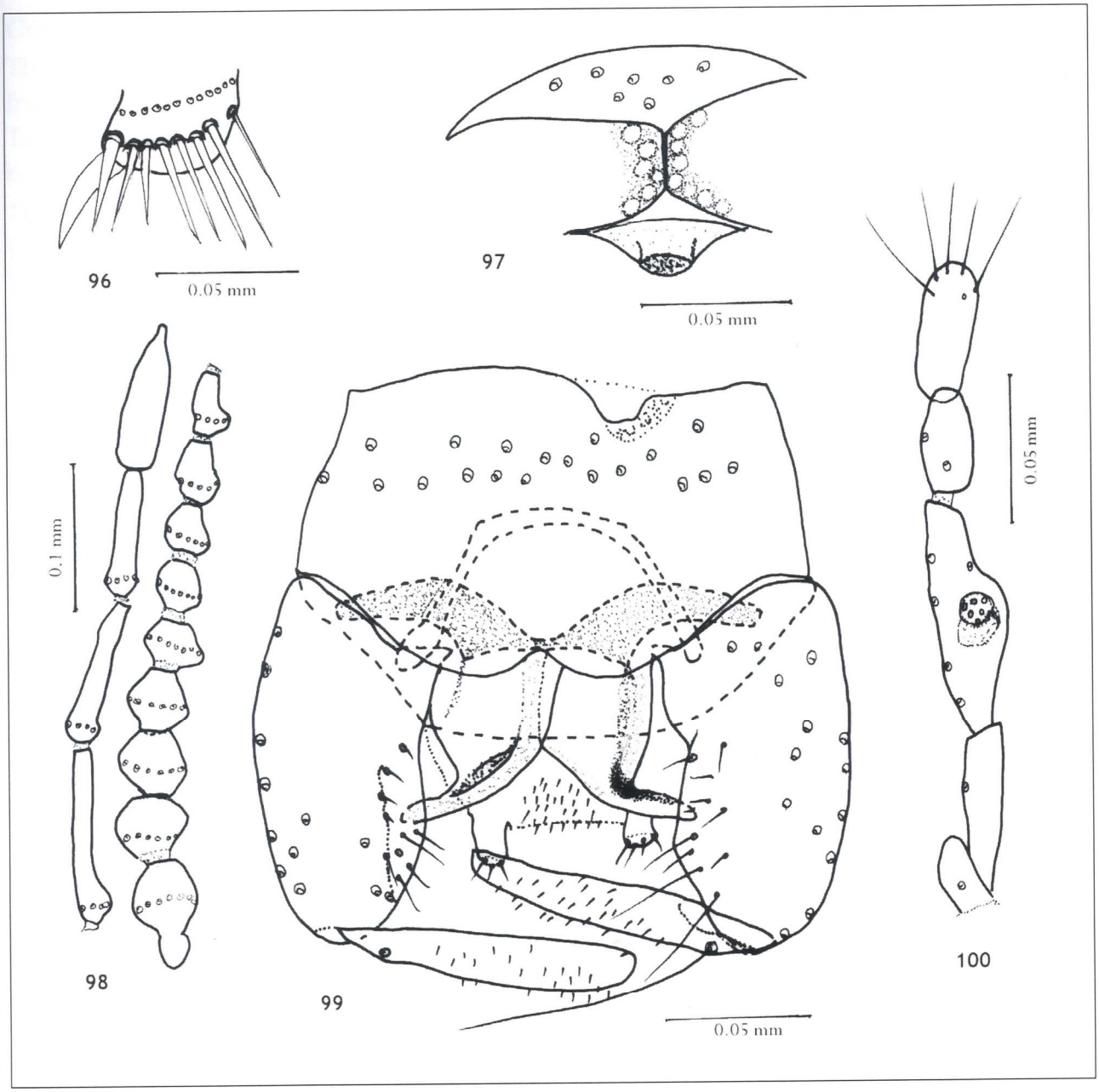
Figs 91 – 95: *Forcipomyia* (*Forcipomyia*) *sahariensis* KIEFFER, 1923. – **91**: female palpus; – **92**: spermathecae; – **93**: comb on hind tibia of female; – **94**: male palpus; – **95**: male genitalia. Scale bars = 0.05 mm.

***Forcipomyia* (*Lasiohelea*) *sibirica* (BUJANOVA, 1962)** (Figs 96–100)

A medium-sized dark pigmented species. First radial cell reduced, second radial cell distinct.

Female. Eyes bare. Flagellomeres 1–13 with sensilla chaetica, terminal flagellomere with apical papilla ending in 2–3 tiny teeth. AR 0.92 (N = 2). Mandible and maxilla with fine teeth. Third palpal segment slightly swollen in the middle with sensory pit. PR 2.7 (2.1–3.3, N = 2). Thorax dark brown. Wing pale without marking, covered with macrotrichia, radial cells area slightly darker. Wing length 0.88 mm (N = 2). CR 0.53 (N = 2). Halter brown. Legs brown. TR(I) 2.0 (N = 2). TR(II) 2.0 (N = 2). TR(III) 2.2 (2.1–2.3, N = 2). Tibial comb with 6 long spines. Abdomen dark brown. One spherical spermatheca darkly sclerotized with wide opening present. Subgenital plate arch-shaped with lateral arms.

Male. Eyes bare. Frontal sclerite as in Fig. 97. Flagellomeres 1–13 as in Fig. 98. Terminal flagellomere with many sensilla trichodea, without sensilla chaetica. AR 1.0 (N = 1). Third palpal segment at midlength swollen, sensory pit moderately deep (Fig. 100). PR 2.91 (N = 1).



Figs 96–100: *Forcipomyia* (*Lasiohelea*) *sibirica* (BUJANOVA, 1962), male. – **96**: comb on hind tibia; – **97**: frontal sclerite; – **98**: flagellum; – **99**: genitalia; – **100**: palpus.

Wing narrow, first radial cell absent, second radial cell long, wing length 1.14 mm (N = 1). CR 0.57 (N = 1). Tarsal claw bifid. TR(I) 1.9 (N = 1). TR(II) 1.8 (N = 1). TR(III) 1.91 (N = 1). Tibial comb with 8 long spines (Fig. 96). Abdomen brown. Genitalia as in Fig. 99.

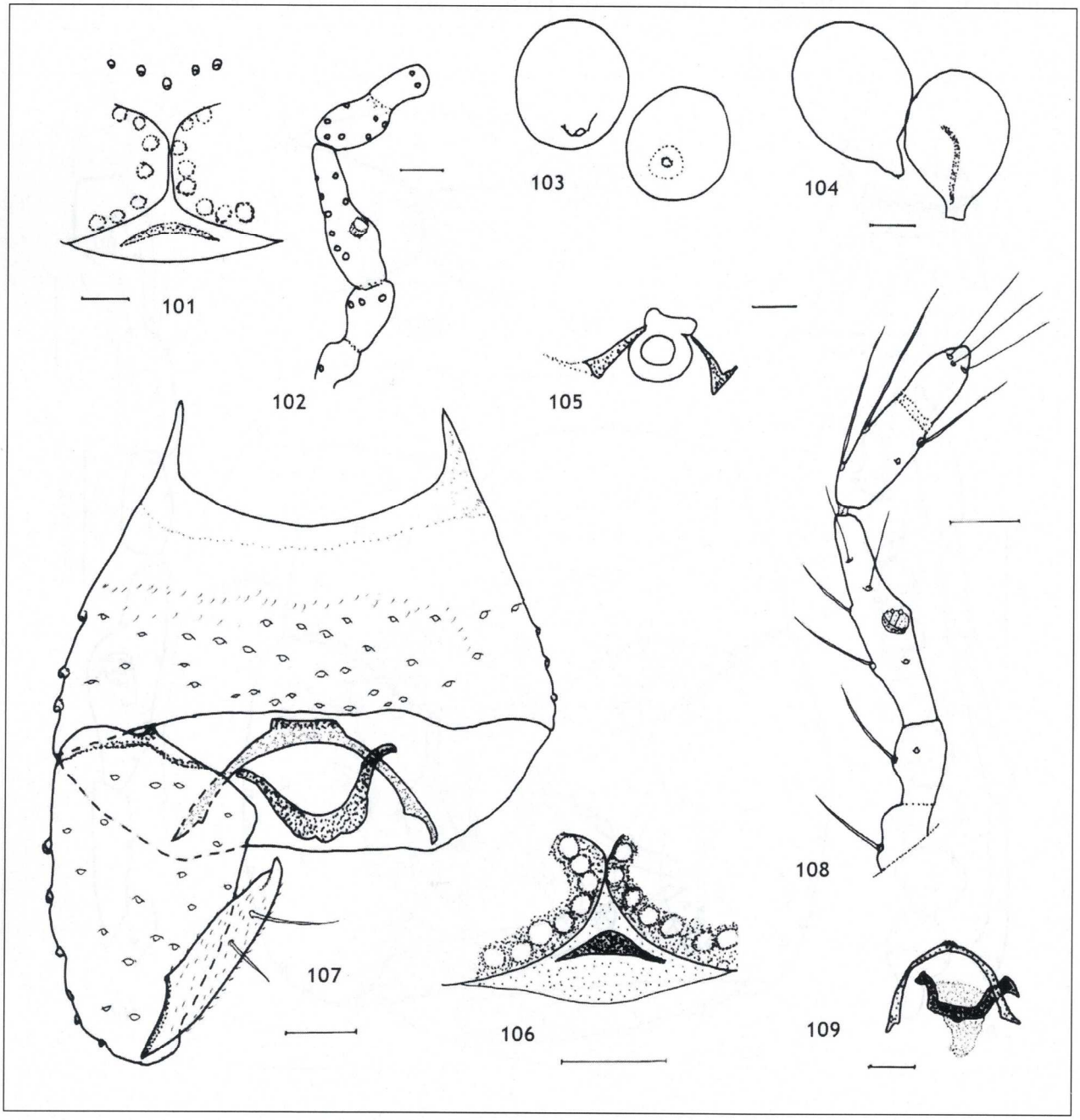
Specimens examined. 2♀♀, 1♂ (ZMHB). South Tyrol: Sulden Valley near Schmelz, 940 m, 46°36'42.1" N 10°34'35.6" E; 27.VI.2005.

Palaearctic species. From Italy reported from the first time.

***Forcipomyia* (*Euprojoannisia*) *titillans* (WINNERTZ, 1852)** (Figs 101–109)

A brown to dark brown species, halters and legs light brown.

Female. Frontal sclerite as in Fig. 101. Antennal ratio (AR) 0.92 (0.84–1.04, N = 3). Third palpal segment slightly swollen in the middle with shallow sensory pit (Fig. 102). PR 3.14 (3–3.33, N = 3). Mandible with about 35 fine sclerotized teeth. Wing with both radial cells developed,



Figs 101 – 109: *Forcipomyia* (*Euprojoannisia*) *titillans* (WINNERTZ, 1852). – **101**: female frontal sclerite; – **102**: female palpus; – **103** and **104**: spermathecae; – **105**: female genital plate; – **106**: male frontal sclerite; – **107**: male genitalia; – **108**: male palpus; – **109**: aedeagus and parameres. Scale bars figs 101–105, 107–109 = 0.02 mm; Fig. 106 = 0.05 mm.

first radial cell very narrow. Wing length 1.30 mm (1.10–1.51, N = 3), CR 0.44 (0.44–0.46, N = 2). Halters light brown. TR(I) 1.8 (1.7–1.8, N = 3). TR(II) 1.5 (1.3–1.8, N = 3). TR(III) 1.6 (1.4–1.7, N = 3). Tibial comb with 6 (N = 3) long spines. Two equal, ovoid spermathecae, darkly sclerotized with short neck (Fig. 103, 104). Subgenital plate as in Fig. 105.

Male. Frontal sclerite as in Fig. 106. Third palpal segment slightly swollen in the middle with shallow sensory pit (Fig. 108). PR 4.98 (4.80–5.16, N = 2). First radial cell reduced. Wing length 1.04 mm (1.03–1.06, N = 2). CR = 0.42 (N = 2). TR(I) 1.7 (N = 2). TR(II) 1.5 (1.5–1.6, N = 2). TR(III) 1.4 (1.3–1.4, N = 2). Tibial comb with 6 (N = 2) long spines. Genitalia as in Fig. 107 and 109. Adeagus with darkly sclerotized basal arch, the hyaline projection visible in some specimens (Fig. 109).

Specimens examined. 24♀♀, 15♂♂ (ZMHB). South Tyrol: Sulden Valley near Gomagoi, 1,220 m, 46°34'33.8" N 10°32'51.2" E; 11.VI.2005, 1♀, 9♂♂; 27.VI.2005, 16♀♀, 3♂♂; 15.VIII.2005, 1♂; 3.X.2005, 2♀♀. Tartscher Valley near Trafoi, 1,630 m, 46°32'33.9" N 10°30'17.2" E; 27.VI.2005, 5♀♀, 2♂♂.

Holarctic species. This is the first record from Italy.

Concluding remarks

The species and number of specimens of the genus *Forcipomyia* (Diptera: Ceratopogonidae) from the Stilfser Joch National Park (Italy) at different altitudes and dates are summarized in Tables 1 and 2. The majority of the specimens in this study were collected from an altitude between 940 m (Sulden Valley) and 1,630 m (Tartscher Tal).

The dominant species in this area was *Forcipomyia* (*Thyridomyia*) *monilicornis* (COQUILLETT, 1905) with 380 specimens collected from May to October and its peak of activity was in June. The question is: how many generations of *F. monilicornis* are involved during this period?

Table 1. Distribution of species of the genus *Forcipomyia* in different altitude during 2005

Subgenus	Species	Σ	940 m	1,220 m	1,630 m	2,030 m	2,315 m
			♂♂/♀♀	♂♂/♀♀	♂♂/♀♀	♂♂/♀♀	♂♂/♀♀
Euprojoannisia	*alacris*	1	–	–	1/0	–	–
Euprojoannisia	*phlebotomoides*	14	1/0	7/0	4/1	–	1/0
Euprojoannisia	*titillans*	39	–	13/19	2/5	–	–
Forcipomyia	*altaica*	4	–	2/0	2/0	–	–
Forcipomyia	*bipunctata*	44	14/0	23/3	4/0	–	–
Forcipomyia	*brevipennis*	1	1/0	–	–	–	–
Forcipomyia	*ciliata*	21	2/4	0/13	2/0	–	–
Forcipomyia	*costata*	17	1/3	0/4	5/4	–	–
Forcipomyia	*nigra*	5	–	0/1	1/3	–	–
Forcipomyia	*pulchrithorax*	16	4/5	1/0	0/6	–	–
Forcipomyia	*radicicola*	20	–	–	6/14	–	–
Forcipomyia	*sahariensis*	3	0/1	–	2/0	–	–
Lasiohelea	*sibirica*	3	1/2	–	–	–	–
Microhelea	*fuliginosa*	12	–	1/10	1/0	–	–
Synthyridomyia	*knockensis*	7	1/0	1/5	–	–	–
Synthyridomyia	*murina*	23	3/18	–	0/2	–	–
Thyridomyia	*blascoi*	12	1/2	0/1	2/6	–	–
Thyridomyia	*monilicornis*	389	13/58	106/164	10/38	–	–
Trichohelea	*eques*	2	–	–	1/1	–	–
7	**19**	**633**	**42/93**	**154/220**	**43/80**	–	**1/0**

Table 2. Records of species of the genus *Forcipomyia* in different months during 2005

			May	June	July	August	September	October
Subgenus	**Species**	Σ ♂♂/♀♀	–	–	–	–	–	–
Euprojoannisia	*alacris*	1/0	–	1	–	–	–	–
Euprojoannisia	*phlebotomoides*	13/1	–	12	1	–	–	1
Euprojoannisia	*titillans*	15/24	–	36	–	1	–	2
Forcipomyia	*altaica*	4/0	–	4	–	–	–	–
Forcipomyia	*bipunctata*	41/3	3	26	–	8	2	5
Forcipomyia	*brevipennis*	1/0	–	–	–	–	–	1
Forcipomyia	*ciliata*	4/17	–	17	–	2	2	–
Forcipomyia	*costata*	6/11	14	9	–	1	1	2
Forcipomyia	*nigra*	1/4	–	4	–	–	1	–
Forcipomyia	*pulchrithorax*	5/11	–	7	–	2	7	–
Forcipomyia	*radicicola*	6/14	1	19	–	–	–	–
Forcipomyia	*sahariensis*	2/1	–	2	–	–	1	–
Lasiohelea	*sibirica*	1/2	–	3	–	–	–	–
Microhelea	*fuliginosa*	2/10	–	12	–	–	–	–
Synthyridomyia	*knockensis*	2/5	–	7	–	–	–	–
Synthyridomyia	*murina*	3/20	–	8	–	–	15	–
Thyridomyia	*blascoi*	3/9	–	8	–	1	1	2
Thyridomyia	*monilicornis*	129/260	37	293	–	24	18	17
Trichohelea	*eques*	1/1	–	2	–	–	–	–
Total		**240/393**	**45**	**420**	**1**	**39**	**48**	**30**

For almost all species, except two, the peak of activity was in June. Most species were collected from Trafoi at 1,630 meters, only *Forcipomyia* (*Euprojoannisia*) *phlebotomoides* BANGERTER, 1933 was collected from all altitudes including the Glurnser Alm at 2,315 meters.

In conclusion, this study has expanded the current knowledge of the genus *Forcipomyia* in the South Tyrol and has brought to light the presence of other five subgenera and fifteen species for the first time from Mainland Italy. All 19 recorded species are new for South Tyrol (HELLRIGL 1996).

Keys for Italian subgenera and species of the genus *Forcipomyia*

Females

1 Distal 6 flagellomeres elongated, empodium broad and pad-like..... subgenus ***Pterobosca*** **MACFIE** (1 sp.): *F. (P.) paludis* (MACFIE, 1936)

• Only distal 5 flagellomeres elongated, empodium not pad like. **2**

2 Flagellomeres 3–10 compressed disk-shaped, AR 1.25 or more. ..... subgenus ***Trichohelea*** **GOETGHEBUER** (1 sp.): *F. (T.) eques* (JOHANNSEN, 1908)

• Flagellomeres 3–10 not compressed. **3**

3 Spermathecae with very long strongly sclerotized ducts..... subgenus ***Panhelea*** **REMM** (1 sp.): *F. (Pa.) aristolochiae* (RONDANI, 1860)

• Spermathecae without or with short sclerotized ducts. 4
4 Costa long, one spermatheca with broad opening. ..... subgenus ***Lasiohelea*** **Kieffer** (1 sp.): *F. (L.) sibirica* (Bujanova, 1962)
• Costa short, one or two spermathecae with narrow opening. 5
5 Last two palpal segments fused, joint immovable (Fig. 102). ..... subgenus ***Euprojoannisia*** **Bréthes** (3 spp.):
– One spherical spermatheca with short neck (Fig. 66). ..... *F. (E.) phlebotomoides* Bangerter, 1933
– One pyriform spermatheca. ..... *F. (E.) alacris* (Winnertz, 1852
– Two equal ovoid spermathecae (Figs 103–104) ..... *F. (E.) titillans* (Winnertz, 1852)
• Last two palpal segments not fused. 6
6 Third palpal segment with deep sensory pit. Peglike sensory spines at sensory pore present. ..... subgenus ***Microhelea*** **Kieffer** (1 sp.): *F. (M) fuliginosa* (Meigen, 1818)
• Third palpal segment with or without moderately deep sensory pit. Peglike sensory spines at sensory pore absent.. 7
7 One spermatheca. ..... subgenera ***Thyridomyia*** **Saunders** (2 spp.) and ***Synthyridomyia*** **Saunders** (2 spp.) 8
8 Eyes pubescent in the middle, spermatheca retort-shaped, long hyaline duct visible (Fig. 49). ..... *F. (S.) murina* (Winnertz, 1852)
• Eyes bare
– Sensory pit of third palpal segment absent ..... *F. (Th.) blascoi* Delécolle & Rieb, 1993
– Sensory pit of third palpal segment distinct, deep ..... *F. (S.) knockensis* Goetgebuer, 1938
– Sensory pit of third palpal segment indistinct, shallow ..... *F. (Th.) monilicornis* (Coquillet, 1905)
9 Fourth and fifth palpal segments not fused, tibiae with or without scales, flagellomeres 3–10 flask-shaped ..... subgenus ***Forcipomyia*** **Meigen** (11 spp.)
– Some or all tibiae with lanceolate scales. ..... *F. (F.) altaica* Remm, 1972
F. (F.) bipunctata (Linnaeus, 1767)
F. (F.) ciliata (Winnertz, 1852)
F. (F.) pulchrithorax Edwards, 1924 (Figs 73–76, 81)
F. (F.) sahariensis Kieffer, 1923 (Figs 91–93)
– Tibiae without lanceolate scales. ..... *F. (F.) brevipennis* (Macquart, 1826)
F. (F.) costata (Zetterstedt, 1838) (Figs 22–25)
F. (F.) nigra (Winnertz, 1852) (Figs 56–58, 63, 64)
F. (F.) radicicola Edwards, 1924 (Figs 82–86, 90)
F. (F.) venetiana (Kieffer, 1919)

Males

1 Costal ratio (CR) 0.5 or more. ..... subgenus ***Lasiohelea*** **Kieffer** (1 sp.): *F. (L.) sibirica* (Bujanova, 1962) (Figs 96–100)
• Costal ratio less than 0.5. 2
2 Empodium vestigial (Fig. 34), parameres U-shaped (Fig. 32). ..... subgenus ***Trichohelea*** **Goetghebuer** (1 sp.): *F. (T.) eques* (Johannsen, 1908) (Figs 29–34).
• Empodium developed. 3

3 Fourth and fifth palpal segments fused, joint immovable (Fig. 3), TR(III) less than 1.6. ..... subgenus ***Euprojoannisia*** **BRÉTHES** (3 spp.):
F. (E.) alacris (WINNERTZ, 1852) (Figs 1–4)
F. (E.) phlebotomides BANGERTER, 1933 (Figs 65–72)
F. (E.) titillans (WINNERTZ, 1852) (Figs 106–109)

• Fourth and fifth palpal segments not fused (Fig. 45). When partly fused, TR(III) higher than 2.0. ..... **4**

4 Gonocoxal apodemes short, triangular (Fig. 19). ..... subgenus ***Thyridomyia*** **SAUNDERS** (2 spp.):
F. (Th.) blascoi DELÉCOLLE & RIEB, 1993 (Figs 16–21)
F. (Th.) monilicornis (Coquillett, 1905) (Figs 44–46)

• Gonocoxal apodemes long (Fig. 42). **5**

5 Submedian processes of parameres fused at bases (Fig. 28). **6**

• Submedian processes of parameres separated (Fig. 42). **8**

6 TR(III) higher than 2.3. ..... subgenus ***Pterobosca*** **MACFIE** (1 sp.):
F. (P.) paludis (MACFIE, 1936)

• TR(III) 0.5–1.3 ..... **7**

7 TR(III) about 0.5, base of fused submedian processes of parameres distinct narrow. ..... subgenus ***Microhelea*** **KIEFFER** (1 sp.):
F. (M.) fuliginosa (MEIGEN, 1818)

• TR(III) 0.5–1.3. Base of fused submedian processes of parameres broad. ..... (Fig. 28) ..... subgenus ***Forcipomyia*** **MEIGEN** (11 spp.):
F. (F.) altaica REMM, 1972 (Figs 5–9)
F. (F.) armandi HARANT, HUTTEL & HUTTEL, 1952
F. (F.) bipunctata (LINNAEUS, 1767)
F. (F.) brevipennis (MACQUART, 1826)
F. (F.) ciliata (WINNERTZ, 1852)
F. (F.) costata (ZETTERSTEDT, 1838) (Figs 26–28)
F. (F.) nigra (WINNERTZ, 1852) (Figs 59–62)
F. (F.) pulchrithorax EDWARDS, 1924 (Figs 77–80)
F. (F.) radicicola EDWARDS, 1924 (Figs 87–89)
F. (F.) sahariensis KIEFFER, 1923 (Figs 94, 95)
F. (F.) venetiana (KIEFFER, 1919)

8 Lateral processes of parameres separated from submedian processes, well developed, fragile, V-shaped. ..... subgenus ***Panhelea*** **REMM** (1 sp.):
F. (Pa.) aristolochiae (RONDANI, 1860)

• Lateral processes of parameres fused with submedian processes, massive, directed upwards (Fig. 42). ..... subgenus ***Synthyridomyia*** **SAUNDERS** (2 spp.):
F. (S.) knockensis GOETGHEBUER, 1938 (Figs 39–42)
F. (S.) murina (WINNERTZ, 1852) (Figs 51–54)

Erratum. The female of the *F. phlebotomoides* description (p. 80) and record (p. 82) concern a species which belong to the subgenus *Thyridomyia* or *Synthyridomyia.*

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Riassunto. In questo studio sono stati identificati al microscopio 633 esemplari di 19 specie appartenenti a 7 sottogeneri del genere *Forcipomyia* (Diptera: Ceratopogonidae). Gli esemplari sono stati raccolti con trappole Malaise nel Parco Nazionale dello Stelvio, Italia, ad altitudini tra 940 e 2.315 m tra maggio e ottobre 2005. Le specie sono diagnosticate e illustrate. Le presenti ricerche ampliano le conoscenze sulla biodiversità di questi ditteri in Italia continentale: 5 sottogeneri e 15 specie sono segnalate per la prima volta per l'Italia, mentre tutte e 19 le specie rappresentano prime segnalazioni per l'Alto Adige. È inoltre fornita una chiave di determinazione delle specie e dei sottogeneri italiani di *Forcipomyia*.

Zusammenfassung. Aus der Gattung *Forcipomyia* (Diptera: Ceratopogonidae) wurden in dieser Studie 633 Exemplare von 19 Arten und 7 Untergattungen unter dem Mikroskop bestimmt. Die Mücken wurden mit Malaise-Fallen gesammelt, die von Mai bis Oktober 2005 im italienischen Stilfserjoch Nationalpark (Parco Nazionale dello Stelvio) in Höhenstufen von 940 bis 2.315 m aufgestellt waren. Die gefundenen Arten wurden diagnostiziert und illustriert. Durch die Studie konnte die Kenntnis der Biodiversität der Gnitzen in Festlandsitalien erweitert werden – 5 Untergattungen und 15 Arten werden erstmals für Italien gemeldet und alle 19 gesammelten Arten sind neu für Südtirol. Ein Bestimmungsschlüssel für die italienischen Untergattungen und Arten der Gattung *Forcipomyia* wird gegeben.

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Das Signet im Titelbild zeigt die Frontalansicht eines Männchens von *Campsicnemus magius* (Loew). Diese halophile Langbeinfliege (Dolichopodidae) kommt in den Binnensalzstellen um Halle (Saale) vor. Sie wurde von Loew nach Tieren aus Sizilien (Syrakus) im Jahre 1845 in der Stettiner entomologischen Zeitung **6**: 392–394 als *Medeterus magius* beschrieben. Hinsichtlich der Farbgebung und der Gestaltung der Beine weisen die Männchen dieser Spezies die prächtigste und komplizierteste Abwandlung im Vergleich aller einheimischen *Campsicnemus*-Arten auf. Sie versinnbildlicht also in besonderer Weise die Schönheit der Zweiflügler und ist deshalb als Signet der Zeitschrift **Studia dipterologica** sowie der **Supplemente** ausgewählt worden.

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A dipterological perspective on a changing alpine landscape

Results from a survey of the biodiversity
of Diptera (Insecta) in
the Stilfserjoch National Park (Italy)

Volume 2

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