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Contribution to the knowledge of the fauna and taxonomy of Mediterranean Beach Flies (Diptera, Tethinidae)

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New faunal and taxonomic data are presented for Mediterranean Tethinidae. Records of tethinid species from Cyprus are reported for the first time, and some morphological observations concerning *Tethina longirostris* (Loew, 1865) are discussed. The male of *Tethina karatasensis* Munari, 1981 is described and the terminalia are figured for the first time. After study of the type material it is concluded that *Tethina quadricephala* Freidberg & Beschovski, 1996 is a **new synonym** of *Tethina intermedia* Collin, 1966.

Key-words: Tethinidae, Mediterranean, faunistics, taxonomy, new synonym

INTRODUCTION

The Beach Flies (Tethinidae) are a small family of Acalyptrate flies having worldwide distribution. The family is particularly species-rich in the Mediterranean basin (Mathis & Munari 1996, Munari 1996a, 2002, Munari & Ebejer 2001). These flies mainly occur in seashore ecosystems, often associated with stranded, decaying wrack heaps. Some species are also found inland, associated with saline environments, in particular continental salt lakes and alkaline hot springs. Exceptions are some species of the Pelomyiinae which are found in meadows on mountain passes, forests, and desert oases. In general, most tethinids are true halophilous, often strictly thalassophilous and psammophilous flies. In nature, sites where tethinids occur usually are characterized by a surfeit of individuals and a relative paucity of species (except for some localities along the Mediterranean coast).

In addition to the faunal part, this paper deals also with the taxonomy and variability of some problematic Mediterranean species. The male of *Tethina karatasensis* Munari, 1981 is described and illustrated for the first time, remarks about the variability of *T. longirostris* (Loew, 1865) are given, and the status of *T. quadricephala* Freidberg & Beschovski, 1996 and *T. intermedia* Collin, 1966 is discussed. We take the opportunity to publish here the first records of Tethinidae for Cyprus and to give new data for the fauna of Malta and Sardinia.

MATERIAL AND METHODS

The present work is based on the study of more than 670 specimens of Tethinidae from the Mediterranean basin, mainly from Malta, Sardinia and Cyprus. Where not otherwise mentioned, all specimens are deposited in the entomological collections of the Muséum d'histoire naturelle, Geneva, with some duplicates kept

in the private collection of the senior author. A few specimens originate from the entomological collection of the Department of Zoology, University of Tel Aviv (TAU), and the Museo di Storia Naturale, Venice (MCV). Most specimens are double mounted by minuten pins on plastozote, and a few are instead glued on the tip of triangular cardpoints. Illustrations of adult habitus and heads were made by using a digital camera fixed on the right sided eyepiece of a dissecting stereomicroscope. After capturing and processing the images by a PC software, they were ink-jet printed and subsequently drawn and inked on tracing paper. Terminalia were drawn by using a compound microscope provided with a grid. In the text, species are listed in alphabetical order under each subfamily as well as the localities of capture under each species. Terminology of anatomical structures chiefly follows J.F. McAlpine (1981), except for the first antennal flagellomere for which the term «postpedicel» (sensu Stuckenberg 1999) is used.

Flies from the Mediterranean islands were captured by the following collectors: B. Merz, J. C. Deeming, M. J. Ebejer and P. Gatt (together) [Cyprus]; B. Merz [Malta]; B. Merz and M. Eggenberger [Sardinia].

TAXONOMIC ACCOUNT

Subfamily Pelomyiinae Foster, 1976

Pelomyiella mallochi (Sturtevant, 1923)

Material examined. **Sardinia:** Cuglieri reg., Sinis peninsula, Capo Mannu, 40.01.59 N/8.24.06 E; 0 m, St. 16, 22.vi.2002, 4 ♀♀.

Distribution. Nearctic: Canada, Greenland, USA. Neotropical: Mexico. Palaearctic: Austria, Belgium, Bulgaria, Czech Republic, Denmark, England, France, Germany, Greece, Hungary, Italy (new to Sardinia), Mongolia, Netherlands, Poland, Romania, Russia, Slovakia, Sweden, Tibet, Turkey, Ukraine, former Yugoslavia.

Remarks. The record from Sardinia confirms the presence of this species in Italy. The only citation known so far dates back to Hendel's (1934) record from «Triest» (NE Italy). The specimens were collected in a saltmarsh near the beach with only some *Chenopodiaceae* growing.

Subfamily Tethininae Hendel, 1916

Tethina albosetulosa (Strobl, 1900)

Material examined. **Cyprus:** Akamas peninsula, Lara beach, 34.58 N/32.19 E, dunes/meadow, 0 m, St. 28, 28.iv.2002, 39 ♂♂ 2 ♀♀; Akrotiri peninsula, Lady Mile Beach, 34.36 N/33.00 E, sand dunes/beach, 0 m, St. 34, 30.iv.2002, 1 ♂; Lemasos, Pegasus beach hotel, 34.42 N/33.06 E, garden/beach, 0 m, 29.iv.2002, 5 ♂♂; Mazotos Beach, 34.47 N/33.28 E, ruderal/beach, 0 m, St. 19, 26.iv.2002, 45 ♂♂ 5 ♀♀; 10 km W Pissouri, Petra tou Romiou, 34.41 N/32.35 E, beach, 0 m, St. 4, 23.iv.2002, 3 ♂♂; 6 km E Zygi, Pentaschoinos delta, 34.45 N/33.23 E, beach, 0 m, St. 10, 24.iv.2002,

2 ♂♂. **Malta:** Ghadira Beach, 35.58 N/14.21 E, 0 m, 5.v.2001, 8 ♂♂ 1 ♀; Ghajn Tuffieha Bay, 35.56 N/14.21 E, 0m, 1.v.2001, 4 ♂♂ 2 ♀♀; Gnejna Bay, 4.v.2002, 1 ♂; Gozo, Ramla Bay, 36.04 N/14.17 E, 0 m, 5.v.2001, 14 ♂♂ 11 ♀♀; Gozo, Ramla dunes, 3.v.2002, 1 ♂ 2 ♀♀; Mgiebah, 35.58 N/14.23 E, 0m, 5.v.2001, 22 ♂♂ 13 ♀♀. **Sardinia:** Baunei reg., Santa Maria Navarrese, 39.59.13 N/9.41.18 E, 0 m, St. 10, 18.vi.2002, 1 ♂; Bosa reg., Bosa Marina, 40.17.15 N/8.29.04 E, 0 m, St. 13, 20.vi.2002, 1 ♂ 4 ♀♀; Dorgali reg., Cala Luna (S of Cala Gonone), 40.13.27 N/9.37.36 E, 0 m, St. 9, 17.vi.2002, 4 ♂♂ 1 ♀.

Distribution. Afrotropical: Senegal. Palaearctic: Austria, Azores, Belgium, Bulgaria, Canary Islands, Cyprus (new), Denmark, Egypt, England, France, Germany, Greece, Israel, Italy (new to Sardinia), Lebanon, Malta, Portugal, Rumania, Spain, Tunisia, Turkey.

Remarks. Like other *Tethina* species, dwarf and normal sized individuals of *T. albosetulosa* often are present in the same population. This is a very common, strictly thalassophilous species favouring sandy beaches. All specimens cited above were collected on sandy beaches, confirming previous observations. New to Cyprus and Sardinia.

***Tethina czernyi* (Hendel, 1934) (Figs 1-2)**

Material examined. **Cyprus:** Mazotos Beach, 34.47 N/33.28 E, ruderal/beach, 0 m, St. 19, 26.iv.2002, 6 ♂♂.

Distribution . Palaearctic: Bulgaria, Cyprus (new), Egypt (Sinai), France, Germany, Hungary, Israel, Italy, Mongolia, Poland, Spain, Tadjikistan, Tunisia, Turkey, Turkmenistan, Uzbekistan.

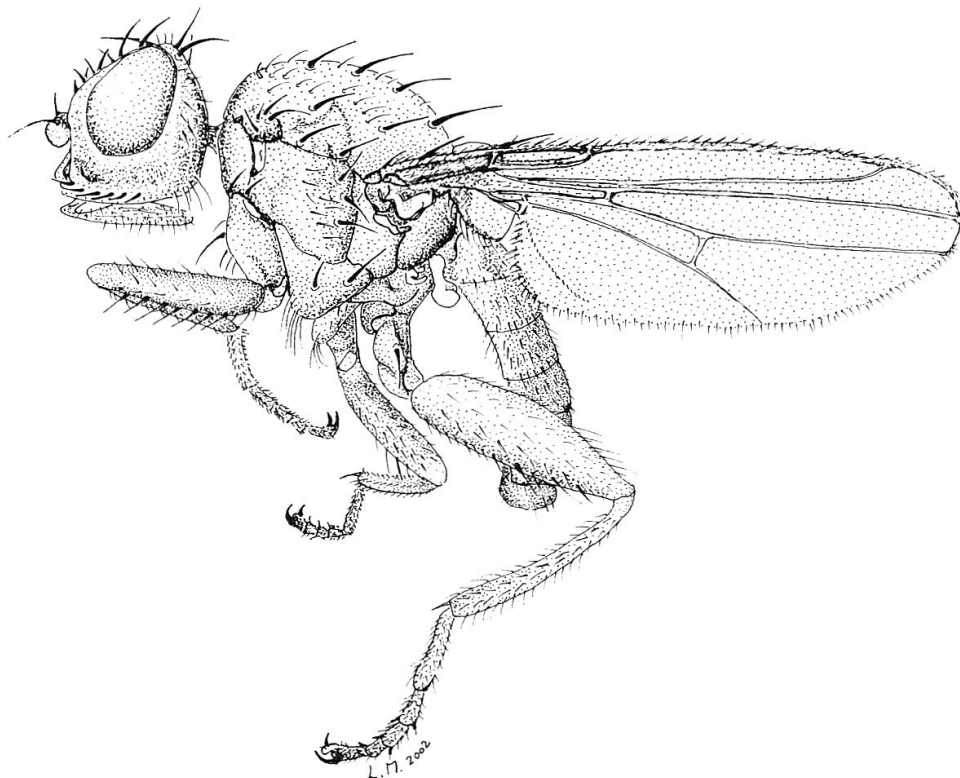


Fig. 1. *Tethina czernyi* (Hendel, 1934), habitus of male.

Remarks. This uncommon species was swept on a small sandy beach bordered by ruderal and maquis vegetation. It may be confused with large specimens of *T. longirostris* (Loew, 1865) because of the stylet-shaped labella, which is slightly longer than the buccal cavity length, the facial prognathism, and the reduced number of acrostichal setulae. However, it can be easily separated from the latter species by the following combination of characters: gena generally homogeneously microtrichose, except for anterior third showing tenuous, often indistinct, shining patch only seldom extending posteriorly beyond anterior portion of gena; gena distinctly higher than in *T. longirostris*; parafacial wider than half of postpedicel width; head in profile subquadrate (fig. 2), showing facial prognathism noticeably less accentuated, although ventral face with nose-shaped, roundish, protruding carina; grey colour of body and legs distinctly lighter; hind tibia yellowish to brownish yellow, not strongly infuscated (usually predominantly dark brown to blackish in *T. longirostris*); external terminalia of male very distinctive, with very large surstylus. It should be noted that the surstylus in this species exhibits noticeable variability with regard to the lateral outline, ranging from distinctly subrectangular/subtrapezoidal to roughly subtriangular, therefore with ventral and dorsal edges parallel to slightly convergent towards apex, respectively. New to Cyprus.

***Tethina flavigenis* (Hendel, 1934)**

Material examined. **Sardinia:** Cuglieri reg., Sinis peninsula, Capo Mannu, 40.01.59 N/8.24.06 E; 0 m, St. 16, 22.vi.2002, 2 ♀♀.

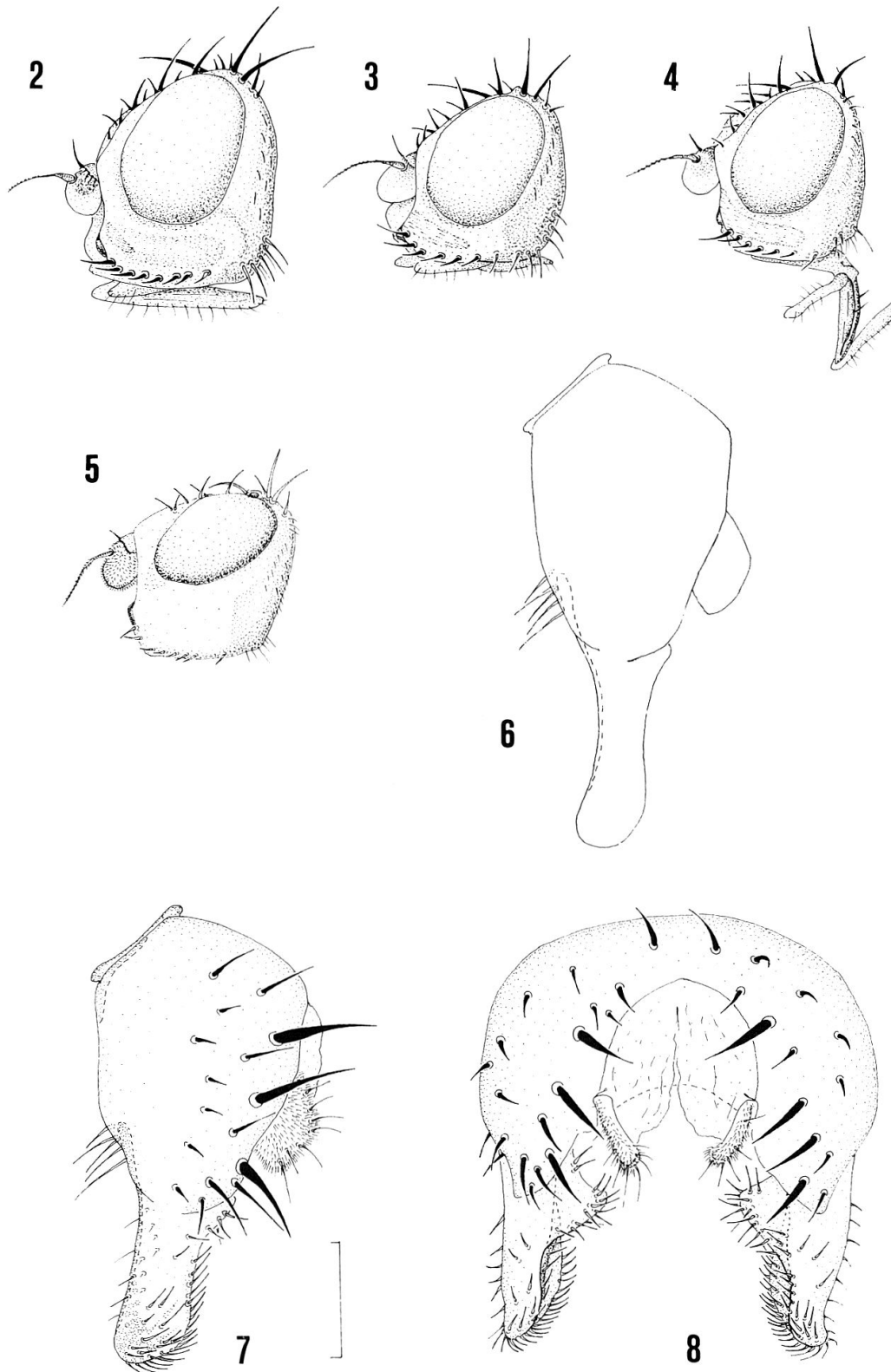
Distribution. Palaearctic: Bulgaria, Denmark, England, France, Germany, Greece, Italy (new to Sardinia), Netherlands, Romania, Spain, Tunisia.

Remarks. This species often occurs on bare salty soil near the sea or in the proximity of river mouths. New to Sardinia. The specimens from Sardinia were collected together with *P. mallochi* in a saltmarsh on bare soil with only few Chenopodiaceae growing.

***Tethina grisea* (Fallén, 1823)**

Material examined. **Cyprus:** Akamas peninsula, Lara beach, 34.58 N/32.19 E, dunes/meadow, 0 m, St. 28, 28.iv.2002, 7 ♂♂ 3 ♀♀; Akrotiri peninsula, Lady Mile Beach, 34.36 N/33.00 E, sand dunes/beach, 0 m, St. 3, 22.iv.2002, 1 ♂; ibidem, sand dunes/beach, St. 34, 30.iv.2002, 1 ♂; ibidem, sand dunes/saltmarsh, St. 36, 1.v.2002, 1 ♀; Lemasos, Pegasus beach hotel, 34.42 N/33.06 E, garden/beach, 0 m, St. 29, 29.iv.2002, 10 ♂♂; ibidem, beach, 0 m, St. 38, 1.v.2002, 3 ♂♂; Mazotos Beach, 34.47 N/33.28 E, ruderal/beach, 0 m, St. 19, 26.iv.2002, 21 ♂♂ 3 ♀♀; 10 km W Pissouri, Petra tou Romiou, 34.41 N/32.35 E, beach, 0 m, St. 4, 23.iv.2002, 4 ♂♂ 2 ♀♀. **Malta:** Gozo, Ramla Bay, 36.04 N/14.17 E, 0 m, 5.v.2001, 1 ♂; Gozo, Ramla dunes, 3.v.2002, 1 ♂; Ghajn Tuffieha Bay, 35.56 N/14.21 E, 0 m, 1.v.2001, 1 ♂ 1 ♀; Gnejna Bay, 0 m, 4.v.2002, 1 ♂; Mgiebah, 35.58 N/14.23 E, 0 m, 5.v.2001, 13 ♂♂ 7 ♀♀.

Distribution. Palaearctic: Azores, Belgium, Bulgaria, Canary Islands, Cyprus (new), Denmark, England, Finland, France, Germany, Greece (Crete), Israel, Italy, Malta, Netherlands, Norway, Spain (including Balearic Islands), Sweden, Tunisia, Turkey, Turkmenistan, Ukraine.



Figs. 2-8. (2-5) Lateral profile of male head. - 2. *Tethina czernyi* (Hendel, 1934). - 3. *T. longirostris* (Loew, 1865) (slightly magnified). - 4. *T. ochracea* (Hendel, 1913). - 5. *T. intermedia* Collin, 1966 (holotype). (6-8) *T. intermedia* Collin, 1966, external terminalia of male (scale bar = 0.1 mm). - 6. specimen from Egypt (paratype of *T. quadricephala* Freidberg and Beschovski, 1996, syn. nov.) (lateral view; setulae largely omitted). - 7. topotypic specimen from La Marsa, Tunisia (lateral view). - 8. same in posterior view.

Remarks. A common species, which can be found in Malta throughout the year. It is strictly coastal, where it can be very numerous on wrack and on heaps of *Posidonia oceanica* (L.) Del. (Munari & Ebejer 2001). Most specimens from Cyprus were collected on wet seaweed which was regularly flooded by strong waves. New to Cyprus.

***Tethina intermedia* Collin, 1966 (Figs 5-8)**

Tethina quadricephala Freidberg & Beschovski, 1996, **syn. nov.**

Distribution. Palaearctic: Canary Islands, Egypt, Israel, Tunisia, Ukraine.

Remarks. After examining the male holotype (deposited in MCV) and two topotypic specimens of *T. intermedia* Collin, 1966 from the Tunisian beach of La Marsa, as well as two paratypes of *T. quadricephala* Freidberg & Beschovski, 1996, from Egypt (label reads: Israel, Nahal Yam, 3.ii.1973, A. Freidberg) (deposited in TAU) we have come to the conclusion that the latter species is a junior synonym of Collin's species. Based on the description and illustrations alone of *T. quadricephala* given by Freidberg and Beschovski (1996) the senior author had suspected a close resemblance of the two species in a previous paper (Munari 2002). The study of the above-mentioned types confirms this synonymy.

Tethina «quadricephala» is possibly a geographical race inhabiting salty biotopes of the East Mediterranean area. It differs slightly from Collin's species by the following characters: scutellar spot brown, markedly darker than the vanishing yellowish spot in the specimens of *T. intermedia*, and therefore strongly contrasting with the rest of scutellum and scutum. The latter is pale grey, slightly darker than the whitish yellow scutum of *T. intermedia*; surstylus of male terminalia slightly, though distinctly, narrower and more slender in lateral view (figs 6-7), having shorter, spinelike, subapical setae on ventral surface. On the other hand, all of the remaining characters, including the lateral profile of the head (fig. 5) as well as the morphological and chaetotactic features of the external terminalia of male in posterior view (fig. 8), are identical in both taxa. All of the examined specimens show the buccal palpus shorter and thinner than in congeners, though not so remarkably vestigial as figured by Freidberg & Beschovski (1996: 99, fig. 8).

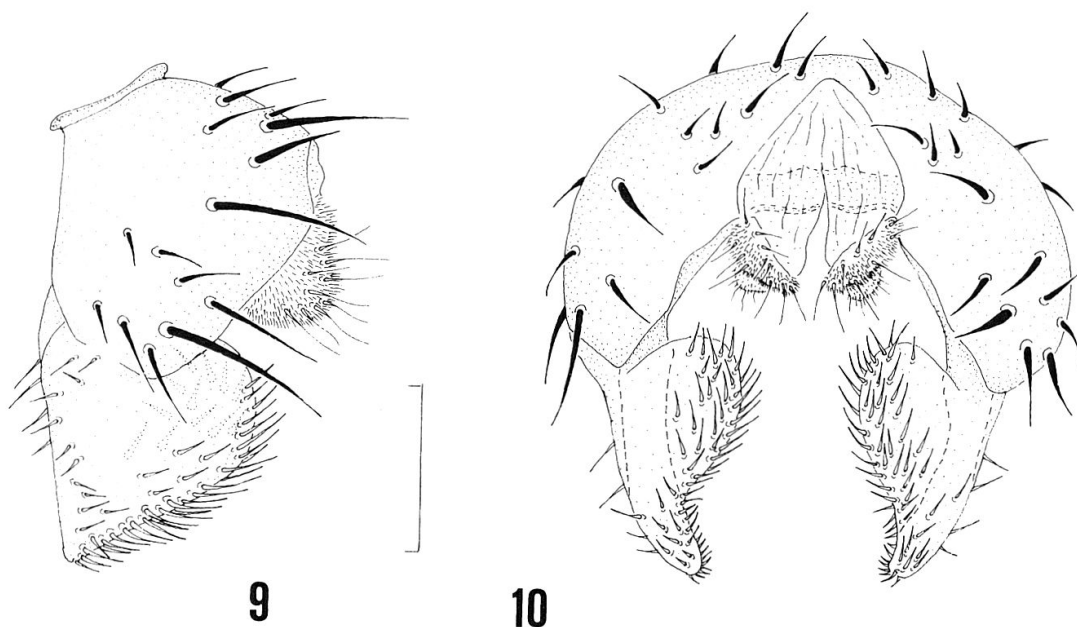
***Tethina karatasensis* Munari, 1981 (Figs 9-10)**

Material examined. **Turkey:** Antalya Prov., Side (= Selimye), 0 m, 2.v.2000, Merz and Senay, 1 ♀; Aydıncık, Rt. 400, 100 km SW Silifke, 12.v.2000, A. Freidberg, H. Ackerman, L. Friedman, 5 ♂♂ 5 ♀♀.

Distribution. Palaearctic: Turkey.

Remarks. This species was described in 1981 on the basis of a single female from Karatas, Turkey. Since then no additional specimen was available for study until the junior author and A. Freidberg were successful in capturing new material, including a few male specimens. This allows us to describe the male for the first time.

Diagnosis: The species clearly belongs to the *T. alboguttata*-group (milky wing cross veins, dark scutellar spot, lobate surstylus of male terminalia, strong pseudacanthophorites on the female cerci, the latter small and stumpy). It differs from the congeners of the species-group mainly by the following combination of characters: ventral face distinctly protruding; frontal setae weak and unpigmented, often difficult to see; acrostichal setulae conspicuous, more or less numerous, arranged in 2-4 very irregular rows; scutellar spot large, roundish, dark brown; ventro-apical spur of male mid tibia strong and distinctly curved; hind femur of male moderately to strongly inflated, depending on specimen size; abdomen generally yellowish, sometimes dark grey, with tergites 3-5 each with distinct, rusty brown, lateral spot distinctly contrasting with mid portion of grey transversal band on proximal surface of tergites; lateral outline of surstylus of male terminalia (fig. 9) very broad, about as wide as epandrium, roughly equilateral triangle shaped, with posterior lobe strongly developed; cercus of male terminalia bearing small, hairy, dorsal lobe (figs 9-10).



Figs. 9-10 (Scale bar = 0.1 mm). *Tethina karatasensis* Munari, 1981, external terminalia of male. - 9. lateral view. - 10. posterior view.

Description of male: Size, external morphology, colour, and chaetotaxy quite similar to female (see Munari 1981; Freidberg & Beschovki 1996). It differs mainly in dimorphic characters such as thick hind femur and stronger and curved ventro-apical spur of mid tibia. External terminalia of male (fig. 9-10) small with epandrium bearing few long setae posteriad; surstylus very broad, lobate, subtriangular, distinctly pointed at apex (lateral view), bearing several long setae on outer surface and on posterior edge, mainly on wide lobe; anal cercus rather hairy, bearing small dorsal lobe.

Tethina litocola Munari & Ebejer, 2001

Material examined. **Cyprus:** Akrotiri peninsula, Lady Mile Beach, 34.36 N/ 33.00 E, sand dunes/beach, 0 m, St. 3, 22.iv.2002, 1 ♂ 5 ♀♀; ibidem, sand dunes/beach, St. 34, 30.iv.2002, 2 ♂♂ 12 ♀♀; ibidem, sand dunes/saltmarsh, St. 36, 1.v.2002, 2 ♂♂ 2 ♀♀.

Distribution. Palaearctic: Cyprus (new), Tunisia.

Remarks. As is usual in species of the *T. alboguttata*-group (Freidberg & Beschovski 1996), the specimens from Cyprus were all collected at least 50 m away from the shore line, on the slopes of the first two rows of sand dunes, where they were swept at the edge between bare sand and vegetation.

The examined specimens from Cyprus probably belong to a geographical race from the East Mediterranean basin. The Cyprus population differs from the type material of Tunisia by the following characters: head subquadrate, with ventral face less protruding, as a consequence labella slightly shorter; mesonotal setae darker, brown to black; acrostichal setulae inconspicuous, markedly thin and short, but always present in scarce numbers on anterior half of scutum (these setulae are mostly absent in the type material); at least fore and hind femora dark grey microtrichose, hind femur usually strongly infuscated, brown to blackish. All of the remaining characters perfectly agree with the type specimens. New to Cyprus.

Tethina longirostris (Loew, 1865) ? complex (Fig. 3)

Material examined. **Cyprus:** Akrotiri peninsula, Akrotiri, 34.36 N/32.58 E, saltmarsh/garigue, 0 m, St. 2, 22.iv.2002, 6 ♂♂; ibidem, St. 37, garigue/pines, 1.v.2002, 1 ♂ 1 ♀; Akrotiri peninsula, 3 km S Kolossi, 34.37 N/32.57 E, marshland, 0 m, St. 32, 30.iv.2002, 2 ♂♂ 1 ♀; Akrotiri peninsula, Lady Mile Beach, 34.36 N/ 33.00 E, sand dunes/beach, 0 m, St. 3, 22.iv.2002, 41 ♂♂ 1 ♀; ibidem, sand dunes/beach, St. 34, 30.iv.2002, 39 ♂♂; ibidem, sand dunes/saltmarsh, St. 36, 1.v.2002, 24 ♂♂; Mazotos Beach, 34.47 N/33.28 E, ruderal/beach, 0 m, St. 19, 26.iv.2002, 6 ♂♂. **Malta:** Ghajn Tuffieha Bay, 35.56 N/14.21 E, 0 m, 1.v.2001, 1 ♂ 1 ♀; Gozo, Ramla dunes, 3.v.2002, 3 ♂♂ 2 ♀♀; Gozo, Zebbug, salt pans, 3.v.2002, 10 ♂♂ 1 ♀; Salina Bay, 35.57 N/14.25 E, 0 m, 2.v.2001, 2 ♀♀; Marsaxlokk Beach, 35.50 N/14.33 E, 0 m, 4.v.2001, 3 ♀♀; Mgiebah, 35.58 N/14.23 E, 0 m, 5.v.2001, 3 ♂♂ 2 ♀♀.

Distribution. Palaearctic: Algeria, Cyprus (new), Egypt, Germany, Greece (Crete), Israel, Italy, Malta, Spain, Tunisia.

Remarks. Different from other species of the genus, this species was not exclusively collected at the sea shore but some specimens were swept on inland sand dunes covered partly with dense vegetation, and on a sandy footpath.

The examined specimens range in size from very small (dwarf individuals) to large (giant individuals) and are characterized mainly by the following features: carina of ventral face vertically from beneath anterior margin of postpedicel (head strongly prognathous, fig. 3) to beneath middle of postpedicel (head moderately prognathous, slightly subquadrate); labella distinctly longer than buccal cavity length, in most specimens very long, always markedly straight and very narrow, stylet-shaped; mesonotum generally thinly grey microtrichose, often showing non-homogeneous covering; few larger specimens distinctly densely and homogeneously golden brownish microtrichose; as a rule acrostichal setulae markedly impoverished in numbers and strength, generally thin and short, often insignificant (mostly in dwarf specimens), arranged in two very irregular rows; conversely, they are well developed in some giant specimens and even arranged in 3-4 irregular rows on anterior third of scutum in a few specimens from Tunisia (material previously identified); intra-alar setulae arranged in 1, seldom 2, rows on anterior sides of scutum; femora dark grey to blackish; fore and mid tibiae yellowish to light brownish,

hind tibia usually strongly infuscated, very often blackish, on the distal two-thirds; male terminalia with epandrium variable in size, generally small; lateral outline of surstylus strikingly variable in size and shape, from rather elongated (sometimes narrow and curved upwards, roughly sabre-shaped but with rounded apex, other times with dorsal and ventral edges moderately sinuous and with largely rounded apex) to distinctly subtriangular with slightly pointed apex (typical form), at times noticeably short and stumpy in some dwarf forms as well as in a few larger specimens. It is interesting to note that some specimens with golden brownish mesonotum show indistinct dark spots surrounding the bases of the scutal setae. This is the most important character distinguishing *T. subpunctata* Beschovski, 1994, from *T. longirostris* (Loew, 1865). A study of the types is needed to show whether they belong to the same variable species or are indeed two distinct species.

If we consider the morphology of the lateral outline of the surstylus alone, it would be virtually possible to describe at least 3-4 new species among the specimens of the same population. Sometimes specimens with different types of surstyli are present in a single collection sample, that is among syntopic and synchronic individuals exhibiting quite similar external features and coloration, except for the body size which is rather variable. In other words, either we have a puzzling complex of species characterized by dwarf and giant specimens showing males with strong genitalic morphodiversity or we have a highly polymorphic species with unusual variability in the morphology of the male terminalia in addition to diversity in body size. This observation was already stressed by Munari (1996b) after studying some specimens from Tunisia. On that occasion it was also pointed out that most of the Tunisian specimens showed 3-4 rows of acrostichal setulae, whereas in the material discussed here these setulae are almost exclusively arranged in two irregular rows. At the present state of knowledge we prefer the more conservative assumption that *T. longirostris* (Loew, 1865) is a very variable species in size and terminalia morphology, although we realize well that a complex of closely related species cannot be entirely excluded a priori. New to Cyprus.

Tethina melitensis Munari & Ebejer, 2001

Material examined. **Malta:** Ghadira Beach, 35.58N/14.21 E, 0 m, 5.v.2001, 8 ♂♂ 13 ♀♀; Gozo, Ramla Bay, 36.04 N/14.17E, 0 m, 5.v.2001, 12 ♂♂ 8 ♀♀ 1 sex ?; Gozo, Ramla dunes, 3.v.2002, 15 ♂♂ 9 ♀♀; Mgiebah, 35.58 N/14.23 E, 0 m, 5.v.2001, 1 ♂.

Distribution. Palaearctic: Malta.

Remarks. Most specimens were collected in similar habitats as *T. litocola*: on sand dunes at some distance from the sea shore, while sweeping over bare sand and the edge between sand and vegetation.

Study of this material has revealed that the colour of the specimens is more variable than described in the original description (Munari & Ebejer 2001). Most specimens have noticeably paler femora than the type series, the fore and mid femora being more yellowish, often light grey microtrichose, only the hind femur is generally rather infuscated on its distal half. Some specimens have a quite yellow mid femur whereas some others also have an indistinct scutellar spot. Further, in the new examined material all of the specimens have sparse, inconspicuous acrostichal setulae on the anterior half of scutum, in contrast to the type series where they are usually absent. In the previously published «revised key to *Tethina* species

of the *alboguttata*-group» (Munari & Ebejer 2001), the first couplet has therefore to be changed as follows:

1. At least hind femur extensively to partially dark grey or blackish (except for rare specimens having hind femur yellowish, at most light greyish microtrichose. In this case examination of male terminalia is needed) 2
- All femora yellowish, or at most fore and hind femora partially light greyish, never strongly infuscated 7

***Tethina munarii* Carles-Tolrá, 1993**

Material examined. **Malta:** Gnejna Bay, 0 m, 4.v.2002, 1 ♀.

Distribution. Palaearctic: Italy, Malta (new), Spain (including Balearic Islands).

Remarks. A very rare species recently described from Spain (Carles-Tolrá, 1993) and subsequently recorded from Sicily (Pantelleria and Linosa Islands) (Munari 2002). The single specimen was collected along the sea shore on bare sand. New to Malta.

Our concept of this species is based primarily on structures of the male terminalia and secondarily on some external features that seem to be consistent and diagnostic. Specimens of *T. munarii* from central Mediterranean are distinguished from related congeners by the following combination of external characters: thorax and legs dark grey to blackish; abdomen slightly lighter, brownish; dorsal surface of head yellowish on anterior part only (anterior half of frons), otherwise blackish with ocellar triangle dark grey; ventral face slightly, though distinctly, protrudent; labella not elongated beyond posterior margin of buccal cavity, thus as long as subcranial cavity length; acrostichal setulae arranged in 3-4 irregular rows; at least fore and hind tibiae blackish.

Tethina munarii from central Mediterranean is similar to *T. longirostris*, but differs from it chiefly by the following external characters: posterior half of frons distinctly blackish; labella not stylet-shaped, rather stumpy, never prolonged beyond the posterior margin of the subcranial cavity; acrostichal setulae generally more numerous.

***Tethina nigrofemorata* Beschovski, 1997**

Material examined. **Cyprus:** Akamas peninsula, Agios Georgios, 34.55 N/32.20 E, beach/stream, 0 m, St. 27, 28.iv.2002, 1 ♀; Kourion dunes near Episkopi, 34.40 N/32.53 E, sand dunes, 0 m, St. 30, 30.iv.2002, 1 ♂; Mazotos Beach, 34.47 N/33.28 E, ruderal/beach, 0 m, St. 19, 26.iv.2002, 1 ♂. **Malta:** Ghadira Beach, 35.58 N/14.21 E, 0 m, 5.v.2001, 1 ♂; Gozo, Ramla dunes, 3.v.2002, 2 ♂♂; Marsaxlokk Beach, 35.50 N/14.33 E, 0 m, 4.v.2001, 2 ♂♂ 1 ♀.

Distribution. Palaearctic: Canary Islands, Cyprus (new), France, Greece (Crete), Israel, Malta (new), Spain, Tunisia.

Remarks. Most specimens were collected on a sandy beach at the sea shore, whereas a few other specimens were captured on sand dunes far away from the tidal zone. The specimens from Cyprus and Malta have the surstylus of the male terminalia narrower and longer than illustrated by Beschovski (1997, fig 6). The variability of the surstylus in this species had already been recorded from material from Crete and Canary Islands (Munari 1999; Munari & Baez, 2000). New to Cyprus and Malta.

***Tethina ochracea* (Hendel, 1913) (Fig. 4)**

Material examined. **Cyprus:** Akrotiri peninsula, Akrotiri, 34.36 N/32.58 E, saltmarsh/garigue, 0 m, St. 2, 22.iv.2002, 2 ♂♂; Akrotiri peninsula, Lady Mile Beach, 34.36 N/ 33.00 E, sand dunes/beach, 0 m, St. 3, 22.iv.2002, 2 ♂♂; ibidem, sand dunes/beach, 0 m, St. 34, 30.iv.2002, 4 ♂♂ 1 ♀; ibidem, sand dunes/saltmarsh, St. 36, 1.v.2002, 2 ♂♂; Lemasos, Mazotos Beach, 34.47 N/33.28 E, ruderal/beach, 0 m, St. 19, 26.iv.2002, 11 ♂♂; Pegasus beach hotel, 34.42 N/33.06 E, garden/beach, 0 m, St. 29, 29.iv.2002, 2 ♂♂; ibidem, beach, 0 m, St. 38, 1.v.2002, 7 ♂♂; 6 km E Zygi, Pentaschoinos delta, 34.45 N/33.23 E, beach, 0 m, St. 10, 24.iv.2002, 1 ♀ (cf.). **Malta:** Ghadira Beach, 35.58 N/14.21 E, 0 m, 4-5.v.2001, 30 ♂♂ 5 ♀♀; Gnejna Bay, 0 m, 4.v.2002, 3 ♂♂; Gozo, Ramla Bay, 36.04 N/14.17 E, 0 m, 5.v.2001, 4 ♂♂; Marsaxlokk Beach, 35.50 N/14.33 E, 0 m, 4.v.2001, 14 ♂♂ 2 ♀♀; Mgiebah, 35.58 N/14.23 E, 0 m, 5.v.2001, 8 ♂♂ 3 ♀♀.

Distribution. Afrotropical: Cape Verde Islands, Senegal, Seychelles (Aldabra), South Africa. Australasian/Oceanian: Australia. Oriental: Taiwan. Nearctic: Bermuda, USA. Neotropical: Chile, Mexico. Palaearctic: Algeria, Azores, Bulgaria, Canary Islands, Cyprus (new), Egypt, France, Greece, Israel, Italy, Madeira, Malta, Spain, Tunisia, Turkey.

Remarks. A very common, subcosmopolitan species often almost indistinguishable from *T. strobliana* (Mercier, 1923) as based on external morphology because specimens with intermediate characters occur regularly. This is particularly true when both species occur together. On the other hand the male terminalia of the two species are very distinctive and this allows them to be separated easily. Therefore, identifications based on females with transitional characters are usually unreliable. Figure 4 shows the characteristic profile of the head in a typical specimen of *T. ochracea* (Hendel, 1913). New to Cyprus.

***Tethina strobliana* (Mercier, 1923)**

Material examined. **Malta:** Fiddien, 130 m, 5.v.2002, 2 ♂♂ 2 ♀♀; Ghadira Beach, 35.58 N/14.21 E, 0 m, 4.v.2001, 1 ♀; Gozo, Mgarr-ix-Xini, 36.01 N/14.17 E, 0 m, 5.v.2001, 1 ♂; Marsaxlokk Beach, 35.50 N/14.33 E, 0 m, 4.v.2001, 3 ♂♂ 3 ♀♀ (2 ♀♀ cf.); Mgiebah, 35.58 N/14.23 E, 0 m, 5.v.2001, 1 ♂ 1 ♀ (cf.); Salina Bay, 35.57 N/14.25 E, 0 m, 2.v.2001, 2 ♂♂; ibidem, 7.v.2002, 5 ♂♂. **Sardinia:** Baunei reg., Santa Maria Navarrese, 39.59.13 N/9.41.18 E, 0 m, St. 10, 18.vi.2002, 2 ♀♀ (cf.); Dorgali reg., Cala Luna (S of Cala Gonone), 40.13.27 N/9.37.36 E, 0 m, St. 9, 17.vi.2002, 2 ♀♀ (cf.).

Distribution. Palaearctic: ? Azores, Belgium, Bulgaria, Denmark, England, France, Germany, Greece (Crete), Hungary, Israel, Italy, Kazakhstan, Malta, Poland, Russia (Sea of Azov), Spain, Tadjikistan, Tunisia, Turkmenistan, Ukraine, Uzbekistan.

Remarks. The specimens from Malta have the surstylus of the male terminalia quite similar to that figured by Beschovski (1994, fig. 6.2) and Beschovski & Nartshuk (1997, figs 2 and 4), that is, rather stumpy and with lateral profile somewhat sinuous. Also, as it can be noticed above, the identity of the specimens of Sardinia is somewhat doubtful. These females, if compared with typical specimens, have the gena slightly narrower and the ventral face with a rather sharp, nose-shaped carina. Positive identification will be possible only by the study of males from the same localities. As far as the habitat of *T. strobliana* is concerned, Munari & Ebejer (2001) state: «In Malta, this species appears to be widespread and it has been found inland as well as on rocky and sandy coasts. It has been observed feeding on various flowers, notably *Chrysanthemum coronarium*». This unusual biology is confirmed here. The specimens from Fiddien were collected on wet grassland in a creek in the middle of the island of Malta.

Due to strong similarity with *T. ochracea* (see «Remarks» under the latter species), all old literature citations need to be verified by authentic specimens in order to ascertain the exact distribution of the species.

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REFERENCES

- Beschovski, V. L. 1994. Contribution to the study of the West Palaearctic Tethinidae (Diptera). — *Acta Zoologica Bulgarica* 47: 16-29.
- Beschovski, V. L. 1997. Contribution to the study of the Tethinidae species from the East Mediterranean Region, with description of two new species (Insecta: Diptera: Tethinidae). — *Reichenbachia* 32(23): 143-149.
- Beschovski, V. L. & Nartshuk, E.P. 1997. The Tethinidae species in the collection of the Zoological Institute in St. Petersburg (Insecta: Diptera: Tethinidae). — *Reichenbachia* 32(22): 129-141.
- Carles-Tolrà, M. 1993. Two new species of Psilidae and Tethinidae from Spain (Diptera). — *Bollettino della Società Entomologica Italiana* 124(3): 250-253.
- Collin, J. E. 1966. A revision of the Palaearctic species of *Tethina* and *Rhinoessa*. — *Bollettino del Museo civico di Storia naturale di Venezia* 16: 19-32.
- Freidberg, A. & Beschovski, V. L. 1996. A new species group within *Tethina* Haliday (Diptera: Tethinidae) with descriptions of six new Mediterranean species. — *Israel Journal of Entomology* 30: 91-113.
- Hendel, F. 1934. Revision der Tethiniden (Dipt. Muscid. acal.). — *Tijdschrift voor Entomologie* 77: 37-54.
- Mathis, W. N. & Munari, L. 1996. World Catalog of the family Tethinidae (Diptera). — *Smithsonian Contributions to Zoology* 584: i-iv + 1-27. Washington D. C.
- McAlpine, J. F. 1981. 2. Morphology and Terminology - Adults (pp. 9-63). — In: McAlpine, J.F. (ed.), *Manual of Nearctic Diptera*, Volume 1. Research Branch Agriculture Canada, Monograph 27, pages vi + 1-674. Ottawa.
- Munari, L. 1981. Tre nuove *Tethina* Haliday raccolte dal Prof. A. Giordani Soika in Asia Minore e Senegal (Diptera, Tethinidae). — *Bollettino del Museo civico di Storia naturale di Venezia* 31(1980): 139-144.

- Munari, L. 1996a. Osservazioni e riflessioni sulla biogeografia dei Tethinidae (Diptera) e su alcuni fenomeni microevolutivi nelle specie di *Tethina* Haliday, 1838 del bacino del Mediterraneo. — Bollettino del Museo civico di Storia naturale di Venezia 46(1995): 153-164.
- Munari, L. 1996b. Tethinidae (Diptera) in the Museum of Zoology, Lund University. — Stobaeana 6: 1-11.
- Munari, L. 1999. The Tethinidae of Crete: a faunal contribution, with descriptions of two new species (Diptera, Acalyptratae). — Studia dipterologica 6(2): 365-372.
- Munari, L. 2002. Beach Flies (Diptera: Tethinidae) of the Palaearctic Region: an Annotated Checklist, including World Distribution. — Società Veneziana di Scienze Naturali – Lavori 27: 17-25.
- Munari, L. & Baez, M. 2000. The Tethinidae of Macaronesia: a faunal revision, with descriptions of two new species (Diptera). — Bollettino del Museo civico di Storia naturale di Venezia 50(1999): 3-30.
- Munari, L. & Ebejer, M. J. 2001. Three new species of *Tethina* Haliday, 1838 from Malta and Tunisia, with a revised key to the *alboguttata*-group. (Diptera, Tethinidae). — Bollettino del Museo civico di Storia naturale di Venezia 51(2000): 131-145.
- Stuckenberg, B. R. 1999. Antennal evolution in the Brachycera (Diptera), with a reassessment of terminology relating to the flagellum. — Studia dipterologica 6(1): 33-48.

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