

Tipula (Lunatipula) graeca n. sp. and other species related to *T. (L.) heros* (Diptera: Tipulidae)

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Abstract: *Tipula (Lunatipula) graeca* is described. The species is closely related to *heros* Egger. Two subspecies of *graeca* are recognized, the nominal subspecies from mainland Greece and the Pelopónnisos, and the subspecies *dufouri* from the Pelopónnisos and the islands of Kérkira, Keffalinia, and Kíthira. The affinities of the species *pachyprocta* Loew, *savitschenkoi* Simova, *decolor* Mannheims, and *vermooleni* Theischinger are discussed. The name *leandros* Erhan-Dincă, 1976, is considered a new synonym of *heros*.

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Introduction

With the description of *Tipula heros* in 1863, Egger already mentioned the very clear characters by which this species could be separated from other species of *Tipula*. Because of these characters (colouration of the antennae, structure of the male hypopygium, female wing-pattern), *heros* has always been treated as a distinct and easily recognizable species and apparently for this reason it was not noticed before that two species are involved. Examination of a fair amount of specimens showed that *heros* is distributed from Ticino in Switzerland to southwest Roumania and central Greece. The new species is distributed in Greece and named *graeca*. Of this species two subspecies are recognized, the nominal subspecies occurring in mainland Greece and the Pelopónnisos, and the subspecies *dufouri*, from the Pelopónnisos and the islands of Kérkira, Keffalinia, and Kíthira (fig. 11), named after Dr. C. Dufour (Neuchâtel) who encouraged us to have a closer look at *heros*.

The differences between *heros*, *graeca graeca*, and *graeca dufouri* are confined to the hypopygium. Therefore, characters of the hypopygium are mentioned only. For a full description of *heros* the reader is referred to Riedel (1913) and Mannheims (1963).

Specimens were studied from the following institutes: Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, GFR (Dr. B. Mannheims collection) (MKB); Oberösterreichisches Landesmuseum, Linz, Austria (Dr. G. Theischinger collection) (OÖL); British Museum (Natural History), London, England (BMNH); Zoölogisch Museum, Amsterdam, The Netherlands (ZMA). Material was furthermore kindly received from Dr. E. Erhan-Dincă (Roumania), Dr. J. Martinovský (Czechoslovakia), and Dr. C. Dufour.

Names of localities are given according to the 1987 edition of The Times Atlas of the World. Localities marked with an asterisk (*) could not be traced.

Material examined

Tipula (Lunatipula) graeca graeca spec. nov., subspec. nov. Holotype ♂ from Greece, labelled: "Mt. Pendéli [= mount Pendelikón] (GR) Athen 25-iv-1980 leg. H. Teunissen" (ZMA, dry). Paratypes: 2 ♂, labelled as the holotype (ZMA, dry); 8 ♂ 1 ♀, Greece, Delphi, 13.v.1978, Theischinger (OÖL, alcohol); 4 ♂ 8 ♀, Greece, Oíti mountains, 700-1500 m, 21-29.v.1952, Mannheims (MKB, dry).

Additional material was examined from the following localities in Greece: lake Vegorritis (20 km E Florina), Diakopion (5 km WNW Ámfissa), Trigona* (10 km W Mitsoron), Akhaia (38° 10' / 22° 05'), Athos, Parnassós

(high plain above Arákhova), Eptálofon (38°36' / 22°29'), Pendaíy (38°35' / 22°04'), Makrúmítsa (Tsarangádhá, 20 km E Vólós), Eptálofon-Arákhova (10 km N Delphí), lake Tríkhonís (15 km E Agríníon), 25 km SE Kozáni, below Kumaíoi*, Delphí, lake Stímfalás, Kalávrita.

Tipula (Lunatipula) graeca dufouri spec. nov., subsp. nov. Holotype ♂ from Greece, labelled: "Éllas Kefallínia Drongáratí 13-v-1980 W. H. Gravestein" (ZMA, dry). Paratypes: 1 ♂, Greece, Paroí, W Spárti, 3.v.1988, den Hollander (ZMA, dry); 1 ♂ 1 ♀, Greece, Párga, Morfí lake, 10-11.v. 1972, Stubbs (BMNH, dry); 2 ♂, Greece, Akrokorínth, 11.iv.1978, Speta (OÖL, alcohol); 1 ♂ 1 ♀, Greece, Kíthira, W Arlemenas, 120 m, 36°14' / 23°02', 8.v.1976, Malícky (OÖL, alcohol); 14 ♂ 2 ♀, Greece, Kérkira, 15.iii-28.iv.1961, Niethammer (MKB, dry); 9 ♂ 1 ♀, Greece, Kérkira, 1961, Niethammer (MKB, dry); 1 ♂, Greece, Kérkira, Or. Pandokrátór, 900 m, 16-30.v.1971, v. Aartsen (ZMA, dry). All material known to us is included in the type-series.

Tipula (Lunatipula) heros Egger, 1863. Presumed holo- or lectotype ♂ from north Yugoslavia, with six labels reading: "Croatian Fiume" [= Rijeka] "Schiner 1869" "heros det. Schiner" "Typ" "Tip. heros Egg ♂ det. M. P. Riedel" "Tipula (Lunat.) heros Egg. Mannheims det. 1955". This specimen, preserved in the Naturhistorisches Museum, Vienna, is considered the holotype by Mannheims (1963, 1964). The label "Schiner 69" however could indicate that it was collected after 1863.

A male preserved in the MKB, collected in 1853, bears four labels reading; "Mann Fiume 8.53" "heros Alte Sammlung" "Tip. heros Egg ♂ det. M. P. Riedel" "Tipula (Lunat.) heros Egg. Mannheims det. 1947". This specimen might belong to the original type-series. However, both Schiner (1864) and Riedel (1913) studied specimens from Fiume collected by Mann in 1853 but did not refer to it as type-material.

The original description does not provide information about the type-material besides mentioning as type-locality: "Österreich, Küstenland". Whether "Fiume" or Rijeka can be considered to be located in this region is questionable. According to the Stieler's Hand-Atlas of 1864, as well as the Andrees Allgemeiner Handatlas of 1906, "Küstenland" refers to Istria and the borderland of Italy and Yugoslavia north of Istria and does not include Rijeka.

Other material of *heros* was examined from the following countries and localities: SWITZERLAND: Somazzo (near Mendrisio); YUGOSLAVIA: Rijeka (see remark above), Rabac (near Pula), Durmitor massif above Savnik, Krúševica (SE Hercegovina), near Ohrid, 20 km N Píleyp; ROUMANIA: mount Milean (Gorj district, Motrului; type-material of *leandros*, see below), Băile Herculane; GREECE: lake Vegorítis (20 km E Florína), Kaloneríon*, Ólimbos, Pentálofos*, Eleuterochorion (10 km S Grevená), Oíti mountains.

Tipula (Lunatipula) leandros Erhan-Dincă, 1976. Two slides containing parts of one of the two syntypes after which *leandros* was described were examined. One slide with one wing and one antenna reads, written with pencil:

"T. leandros v. Motrului leg Tăbăcaru". The other slide containing hypopygial parts (appendages of sternite 9, sternite 8, adminiculum, left and right inner and outer dististyles, tergite 9, aedeagus) reads, written with pencil: "T. leandros n.sp. v Motrului amonte Mileanul leg I Tăbăc. 2 vi.1960" (Museum Bucurest, Roumania).

Tipula (Lunatipula) pachyprocta Loew, 1873. Holotype ♂ with five labels reading: "Schmidt Laibach" [= Ljubljana] "Pachyprocta Lw." "6916" "Tipula (Lunat.) pachyprocta Loew Mannheims det. 1949" "Holotypus pachyprocta Lw. design. Mannhs 1949" (Museum Berlin, GDR).

Other material: YUGOSLAVIA: 2 ♂, Durmitor Massiv above Savnik, 1000-1200 m, 12-vi-1979 (ZMA, alcohol).

Descriptions

Both subspecies of *graeca* differ from *heros* in the following characters of the hypopygium. Inner dististyle (figs. 8, 9) with a distinct anterior beak (small in *heros*, fig. 10), and a well developed dorsal crest (posteriorly only in *heros*, fig. 10); hind part of dististyle usually without hooklet (fig. 9), in some males of *g. graeca* with a small hooklet (fig. 8) (*heros* always with a distinct hooklet, fig. 10). Dorsolateral arms of adminiculum (fig. 7) with a small outgrowth basally (basal outgrowth large in *heros*, fig. 3); medial arm slightly curved (in *heros* distinctly curved, fig. 3). Membranous part of sternite 9 in the middle distinctly protruding below appendages of sternite 9 and provided with a sclerotized plate (figs. 1, 7) (not protruding and not sclerotized in *heros*, fig. 2).

The subspecies *dufourii* differs from the nominal subspecies and from *heros* in the following characters. Dorsal margin of tergite 9 evenly rounded (fig. 6) (dorsal margin somewhat protruding in *g. graeca* (fig. 5) and *heros* (fig. 2)). Midventral part of inner dististyle (fig. 9) simple, without a lineated swelling, lineation also not present on anterior part of lateral shell (in *g. graeca* (fig. 8) and *heros* (fig. 10) dististyle mid-ventrally with a ventrally directed and lineated swelling and lineation also present on anterior part of lateral shell). Strong bristles at the caudal, midventral part of sternite 8 with straight smaller bristles at their base (fig. 1) (smaller bristles distinctly curved and crossing each other in *g. graeca* (fig. 4) and *heros*).



1

2



4



3



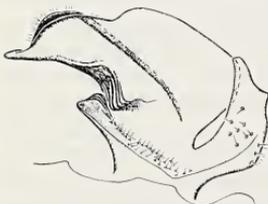
5



6



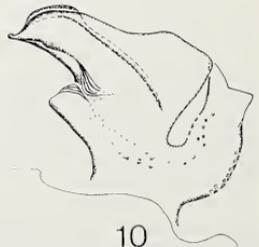
7



8



9



10

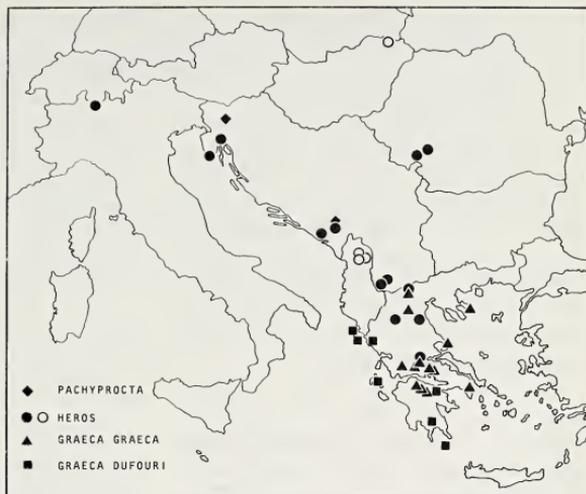


Fig. 11. Distribution of *T. pachyprocta* (also known from "Croatia"), *T. heros* (○ refers to data from the literature), *T. g. graeca*, and *T. g. dufouri*.

Distribution and period of flight

Fig. 11 shows that *heros* and *graeca* are largely sympatric in mainland Greece. Specimens from lake Vegorritis and the Óiti mountains bear identical labels which might indicate that their habitat preferences are not very different. Both subspecies of *graeca* occur in the north of the Pelopónnisos but are not known to be sympatric.

Altitudes for both species range up to 1500 to 1600 m. The periods of flight show a distinct shift towards Spring from north to south. In the northern part of its distribution range *heros* is known from the end of May until August, in the south from early May to the middle of July. *T. g. graeca* is collected from the end of April to the end of June, and *g. dufouri* from the middle of April to the end of May.

In the literature *heros* is mentioned for north Hungary by Thalhammer (1900: Sátoraljaújhely) but the species is not recorded for Hungary by Mannheims (1966b), Simova-Tošič et.

al. (1978, 1981, 1983, 1984) list *heros* from all Yugoslavian republics except Slovenia. From Albania only females are known (Mannheims, 1966a). They probably belong to *heros* as they are from the northern part of the country.

Related species and synonymy

T. (L.) heros and *graeca* are without doubt sisterspecies, differing only in details of their hypopygia. No autapomorphous characters are available for the subspecies *g. graeca*. This could indicate that this subspecies is paraphyletic and that *g. dufouri* forms a sistergroup with part of *g. graeca* only. In which region of Greece the two subspecies became separated can not be inferred from what is known about their distributions (fig. 11).

The species *heros* and *graeca* belong to the *acuminata* group. This group is represented in Spain and southern France by three species, in the Balkan by about 15 species and in Turkey, the Caucasus, Iran, Syria, Lebanon and Israel

Figs. 1-10. Hypopygium of *Tipula heros*, *g. graeca*, and *g. dufouri*. 1, *T. g. dufouri*, hypopygium, rear view; 2, *T. heros*, hypopygium, side view; 3, *T. heros*, adminiculum, side view; 4, *T. g. graeca*, mid-ventral bristles of sternite 8, rear view; 5, *T. g. graeca*, tergite 9, side view; 6, *T. g. dufouri*, tergite 9, side view; 7, *T. g. graeca*, adminiculum and appendage of sternite 9, side view; 8, *T. g. graeca*, inner dististyle, outside view; 9, *T. g. dufouri*, inner dististyle, outside view; 10, *T. heros*, inner dististyle, outside view.

by some 30 species. Examination of most species of this group showed that *heros* and *gracea* form a monophyletic group with *pachyprocta* Loew, 1873. This species, known from Yugoslavia only is among others characterized by the largely bifid appendages of sternite 9 (see Mannheims, 1963: fig. 107). Theischinger (1987) considered *pachyprocta* to be closely related to his new species *vermooleni* from Kos, but in our opinion the latter forms a species-group with *savtschenkoi* Simova, 1960, from south Yugoslavia and Bulgaria, and *decolor* Mannheims, 1963, from west Roumania and northwest Turkey.

Mannheims (1963, 1964) supposed *macrocauda* Pierre, 1926, to be synonymous with *heros*. Type-material of *macrocauda*, described after one ♂ from "Saripazar" (probably in Macedonia), is apparently lost (Mannheims, l.c.). The original description and figures strongly indicate that *macrocauda* is indeed synonymous with *heros*, having the membranous part of sternite 9 not protruding beyond the appendages of sternite 9 (fig. 2).

Examination of type-material of *leandros* Erhan-Dincă, 1976, revealed that *leandros* is also synonymous with *heros*. The differences listed by Erhan-Dincă (l.c.) are mainly due to distortion of the hypopygial parts by preserving them in slides.

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