

Description of *Limnophyes tyrrheneus* sp. n. from pozzines of the mountain lake Ninu in Corsica [Diptera, Chironomidae, Orthoclaadiinae]

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Keywords: Chironomidae, Orthoclaadiinae, *Limnophyes tyrrheneus* sp. n., pozzines, Corsica, conservation.

A description of the male imago and pupal exuviae of *Limnophyes tyrrheneus* sp. n. is given with comments on its ecology and geographical distribution.

Description de *Limnophyes tyrrheneus* sp. n. des pozzines du lac de montagne Ninu en Corse (Diptera, Chironomidae, Orthoclaadiinae)

Mots-Clés : Chironomidae, Orthoclaadiinae, *Limnophyes tyrrheneus* sp. n., pozzines, Corse, conservation.

L'auteur donne une description de l'imago mâle et de l'exuvie nymphale de *Limnophyes tyrrheneus* sp. n., ainsi qu'un commentaire sur la systématique, l'écologie et la distribution géographique de cette espèce.

1. Introduction

Recent extensive investigations in high mountain, lowland permanent and temporary springs, streams, lakes, pozzines and pools located in Corsica allowed me to collect a large material of Diptera Chironomidae which includes two male adult pharates, one male pupal exuviae and three larvae belonging to a new species in the genus *Limnophyes* Eaton. The new species has already been reported by MOUBAYED-BREIL & ASHE (2012) as *Limnophyes* sp. 3 from the wetland area of the Lake Ninu in Corsica. In this paper a description of the male adult and the pupal exuviae of *Limnophyes tyrrheneus* sp. n. is given on the basis of male adult pharates collected in some pozzines (acidic mountain peat bogs and pools) located in the basin of the Ninu mountain lake (elevation : 1700-1900 m). Terminology and measurements follow SÆTHER (1980, 1990), LANGTON & PINDER (2007) for male imago, SÆTHER (1980) and LANGTON (1991) for pupal exuviae.

2. Description of *Limnophyes tyrrheneus* sp. n.

Study material

Holotype: 1 pharate adult male, pozzines at the Ninu Lake (altitude 1745 m), located 7 km East of “Col of Vergio” Central Corsica, 30.IV.2012, site number 25 in MOUBAYED-BREIL & ASHE (2012).

Paratypes: 1 pharate adult male + 1 male pupal exuviae + 3 larvae, same locality and same date as holotype.

Holotype, presently in the author’s collection, will be deposited in the collections of the National Museum of Ireland, Dublin. Paratypes are deposited in the author’s collection.

Type material was preserved in 70% alcohol, cleared in 90% lactic acid and later mounted on two slides in polyvinyl lactophenol solution.

Male imago

(n = 2, pharate adult male)

(Figures 1-7)

Limnophyes sp. 3 (from Corsica): Moubayed-Breil & Ashe (2012).

Etymology: The species name *tyrrheneus* refers to the Tyrrhenian Province which includes Corsica, Sardinia, Sicily, Elbo and the Tyrrhenian area of continental France, Italy and Spain.

Total length: 2.25-2.30 mm. Wing length : 1.15-1.25 mm. Coloration light brown to dark brown, dark colour of wing is related to dense granulation, last tarsus of each leg blackish.

Head. Antenna 715-725 μ m long, 12-segmented, ultimate flagellomere 315-325 μ m long, AR 0.80-0.85. Temporal setae 4 including 2 inner verticals, 0 outer verticals and 2 postorbitals. Clypeus with 15-16 setae. Palp 5-segmented, segments 2 and 3 swollen, segments 4 and 5 uniformly elongated; lengths (μ m) of segments: 25, 20, 25, 45, 55.

Thorax (Fig. 1). Lanceolate setae on humeral pits 0; dorsal pit absent; humeral pit (Figs 1-3) very shallow and characteristic, consisting of a large discontinuous oval rim which is chitinised only in one side. Thoracic setae: 5 anteprenotals (2 median and 3 laterals), 7-8 acrostichals, 0 lanceolate humerals, 7 prealars, 11-12 dorsocentrals, 6-7 pre-episternal. Scutellum with 4 setae.

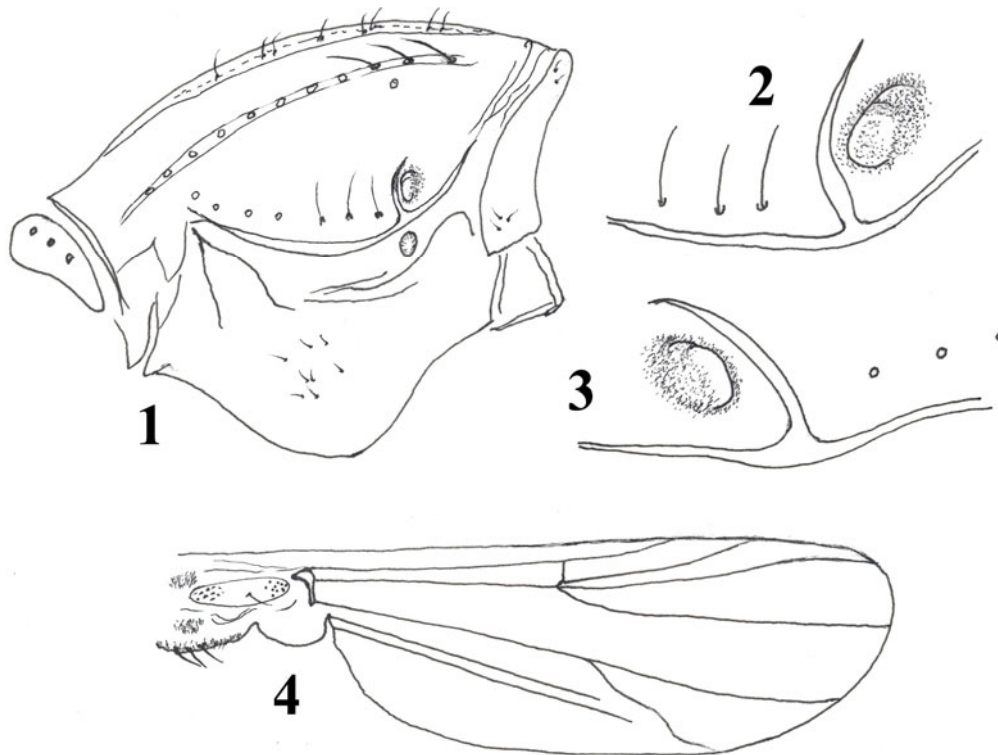
Wing (Fig. 4). Membrane densely covered with fine punctuation; all veins are bare; vein Cu1 strongly curved twice. Brachiolum with a single seta. Anal lobe relatively well developed and distinctly protruding. Squama with 3-4 setae.

Legs. Spur of front tibia 49 μ m long, spurs of middle tibia 27 and 21 μ m long, spurs of hind tibia 44 and 38 μ m long; hind comb with 9 setae. Length (μ m) and proportions of legs:

	fe	ti	ta1	ta2	ta3	ta4	ta5	LR	BV	SV	BR
PI	325	505	265	155	118	70	72	0.53	2.64	3.13	1.4
PII	485	448	210	123	95	63	72	0.47	3.24	4.44	1.8
PIII	465	515	252	160	122	76	78	0.49	2.83	3.89	2.6

“LR = Length of tarsomere ta1 divided by length of tibia (ti); BV = Combined length of femur (fe), tibia and ta1 divided by combined length of tarsomeres ta2-ta5; SV = Ratio of femur plus tibia to tarsomere ta1; BR = Ratio of longest seta of ta1 divided by minimum width of ta1, measured one third from apex.”

Hypopygium in dorsal and ventral views as in Figs 5-7. Anal point not projecting, rounded, broad-based, faintly to indistinctly notched in holotype specimen and bearing 9-11 setae. Phallapodeme and transversal sternapodeme as in Fig. 5. Virga consisting of 2 distinctly sclerotized spines which are fused at base: one stronger and tapering of 35 μm long, one smaller (reduced) of about 10 μm long. Gonocoxite 155-160 μm long, inferior volsella consisting of 2 lobes: one dorsal, triangle-shaped, one ventral much weaker but more extended longitudinally along the inner margin. Gonostylus (Figs 5 and 7) 67-75 μm long with pointed apex; crista dorsalis sharply pointed apically; megaseta 14-17 μm long.



Figures 1-4. Male imago of *Limnophyes tyrrheneus* sp. n.: thorax in lateral view (1); humeral area of holotype (2) and paratype (3); wing (4).

Figures 1-4. Imago mâle de *Limnophyes tyrrheneus* sp. n. : thorax en vue latérale (1) ; aire humérale de l'holotype (2) et du paratype (3) ; aile (4).

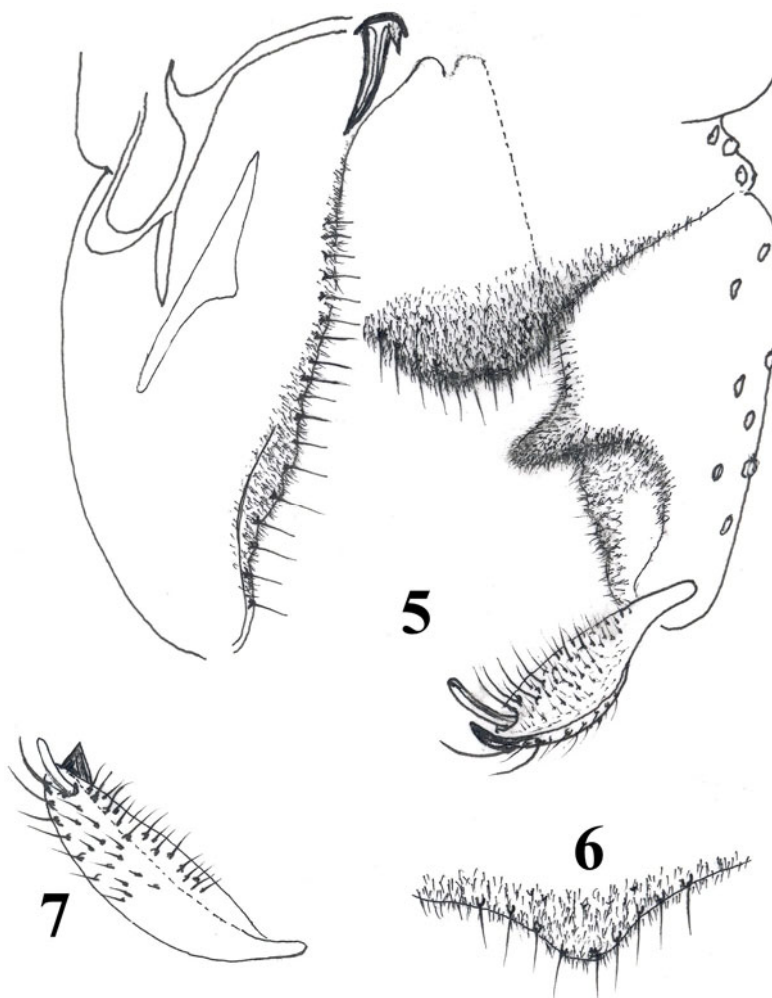
Male pupa

(n = 3)

(Figures 8-11)

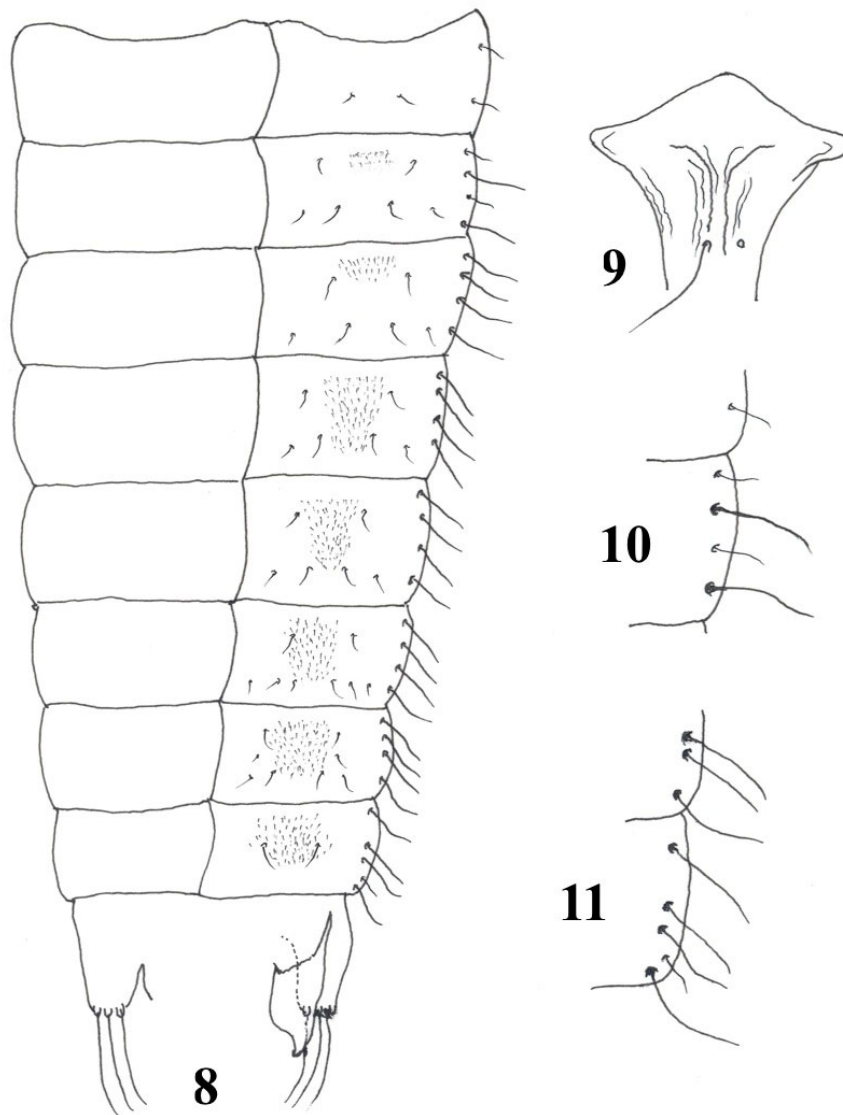
Total length 2.30-2.35 mm. Pupal exuviae almost entirely transparent, wing sheath and cephalothorax with slight yellowish to brownish tinge, genital sac brownish.

Cephalothorax. Frontal apotome (Fig. 8) with 2 thin setae 65-70 μm long; median anteprenotals 70 and 55 μm long, lateral anteprenotal 60 μm long; precorneals close together, 75, 65 and 55 μm long; dorsocentrals 25-70 μm long, inserted on median area of cephalothorax, Dc1, Dc2 and Dc3 close together in one longitudinal row, Dc3 and Dc4 are 30-50 μm distant.



Figures 5-7. Male imago of *Limmophyes tyrrheneus* sp. n.: hypopygium of holotype (5), ventral (left) and dorsal (right); anal point of paratype (6); different aspect of gonostylus (7).

Figures 5-7. Imago mâle de *Limmophyes tyrrheneus* sp. n. : hypopyge de l'holotype (5), vue ventrale (à gauche), vue dorsale (à droite) ; pointe anale du paratype (6) ; aspect différent du gonostyle (7).



Figures 8-11. Male pupal exuviae of *Limnophyes tyrrheneus* sp. n.: abdomen, chaetotaxy pattern of sternites I-VIII (8); frontal apotome (9); lateral setation of segments I-II (10) and VII-VIII (11).

Figures 8-11. Imago mâle de *Limnophyes tyrrheneus* sp. n. : abdomen, chétotaxie des sternites I-VIII (8) ; frontal apotome (9) ; distribution des soies latérales sur les segments I-II (10) et VII-VIII (11).

Abdomen. Armament of tergites and sternites as in Fig. 9. Tergite and sternite I bare. Tergites II-VIII densely covered with spinulae and spinous points becoming progressively more elongated at the posterior margin of each tergite. Posterior row of long spines uniformly sub-

qual in size; longest spines 45-55 μm long, shortest spines 15-25 μm long. Anal tergite with dense patch of points. Conjunctives of tergites II-VI densely covered with projecting points. Paratergites armed with small spinulae. Sternites II-III with scattered anterior patch of spinulae, which become more extensive on sternites IV-VIII. Lateral setae (LS) on segments I-VIII: 2, 4, 4, 4, 4, 5. Presence of thin LS on segments I (2), II (2) and VIII (1) as it is shown in Figs 9, 10 and 11; remaining LS on segments III-VIII are much thicker and typical for the genus. Anal segment (IX) 205-210 μm long. Genital sac 225-230 μm long, overreaching tip of anal segment. Anal macrosetae 150-160 μm long.

3. Taxonomic remarks

Absence of lanceolate setae on thorax and shape pattern of the humeral pit which consists of a faint shallow oval and partly chitinised rim, represent the most relevant distinguishing features to separate *L. tyrrheneus* sp. n. from other related species. According to recently published papers on taxonomy and phylogeny of the male imagines and pupae of the genus *Limnophyes* Eaton (SÆTHER 1975, CRANSTON 1979, CRANSTON et al. 1989, SÆTHER 1990, WANG & SÆTHER 1993, LANGTON & MOUBAYED 2001, LANGTON & PINDER 2007) the male adult of *L. tyrrheneus* sp. n. shows some morphological resemblances with some other close Palaearctic species (i.e. *L. asquamatus* Andersen, 1937 and *L. inanispatina* Langton & Moubayed, 2001). In *L. tyrrheneus* sp. n. the main differentiating characters in the male are: absence of lanceolate setae on thorax and humeral pit; shape pattern of humeral pit consisting of discontinuous rim and bearing two shallow rings; vein Cu1 distinctly and strongly curved twice; virga with two fused spines (one very long and tapering, one very small); shape pattern of inferior volsella which consists of two lobes, one dorsal triangle-shaped and one ventral extended longitudinally; in the pupal exuviae: distribution pattern of dorsocentral setae on cephalothorax; armament pattern of sternites II-VIII; lateral setation pattern of segments II and VIII; the presence of very thin LS on segments II and VIII represents a relevant distinguishing character for the new species.

4. Ecology and distribution

Larvae and pupae of the new species have been collected in the early spring 2012 (end of April), in wet meadows where aerated soil is permanently flooded all the year. Aquatic plants occurring in these pozzines include numerous endemic species belonging to the following genera: *Carex* spp., *Potamogeton* spp., *Juncus* spp., etc. Adaptation and survival of larvae to the severe environmental conditions of high altitude is to be expected for immature stages and adults of this new species.

L. tyrrheneus sp. n. is only known from the type locality (Photos 1 and 2) at Ninu Lake basin (altitude 1745 m) where geographical isolation of the high mountain chain is believed to favour evolution and speciation. It is apparently a very rare species probably restricted to high mountain acidic peat bogs (pozzines), which deserve greater consideration and preservation. The new species is likely to be more widespread at least in the Tyrrhenian Province and can be expected from peat bogs located in high to middle altitude elsewhere in the W-Mediterranean which also includes western Italy, south eastern France and some of the Tyrrhenian islands (i.e. Sardinia, Sicily).



Pozzines of the lake Ninu, 30-IV-2012 (photo Cédrik Poutissou).

Pozzines du lac Ninu, le 30-04-2012 (cliché Cédrik Poutissou).

About 35 aquatic, semi-aquatic and semi-terrestrial chironomid species have been recorded so far from the littoral zone and ripicolous microhabitats of pozzines in the Ninu Lake wetland area (MOUBAYED-BREIL & ASHE 2012). Associated species encountered in the same habitats include *Zavrelimyia barbatipes* (Kieffer, 1911), *Bryophaenocladus aestivus* (Brundin, 1947), *B. nidorum* (Edwards, 1929), *B. subvernalis* (Edwards, 1929), *Chaetocladius algericus* Moubayed, 1989, *C. laminatus* Brundin, 1947, *C. melaleucus* (Meigen, 1818), *C. perennis* (Meigen, 1830), *C. suecicus* (Kieffer, 1916), *Krenosmittia boreoalpina* (Goetghebuer, 1944), *K. camptophleps* (Edwards, 1929), *Limnophyes bidumus* Sæther, 1990, *L. gelasinus* Sæther, 1990, *L. pentaplastus* (Kieffer, 1921), *Micropsectra junci* (Meigen, 1818), *M. lindrothi* Goetghebuer, 1931, *M. notescens* (Walker, 1856), *M. roseiventris* (Kieffer, 1909), etc.

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