

TWO NEW SPECIES OF BITING MIDGES FROM FRANCE AND ALGERIA (DIPTERA: CERATOPOGONIDAE)

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Abstract.— Two new species of biting midges are described and illustrated from West Palaearctic. They are: *Forcipomyia (F.) pyrenaica* sp. nov. from France (Pyrenees-Orientales) and *Monohalea mediterranea* sp. nov. from France (Pyrenees-Orientales) and North Algeria (Sahara).



Key words.— *Forcipomyia pyrenaica* sp. nov., *Monohalea mediterranea* sp. nov., West Palaearctic, Europe, North Africa

INTRODUCTION

Biting midges are a relatively well-studied family of nematoceros flies. From Europe after more than two centuries of studies almost 600 valid species of biting midges have been reported. France with 241 species is among the best studied countries in Europe. Similar number of species (256) is recorded from Germany, however with many doubtful species (Szadziewski and Dominiak 2016).

The purpose of this paper is to describe two new species of biting midges based on males in the genus *Forcipomyia* Meigen from France and *Monohalea* Kieffer from France and Algeria.

MATERIAL AND METHODS

The male specimens described in this paper are mounted on slides and deposited in the collection of the Museum of Amber Inclusions, University of Gdańsk,

Poland. All photographs were taken using a LAS Montage multifocus attached to a Leica DM6000.

DESCRIPTIONS

Subfamily Forcipomyiinae

Genus *Forcipomyia* Meigen, 1818

Subgenus *Forcipomyia* Meigen, 1818

Forcipomyia (F.) pyrenaica sp. nov.
(Figs 1–3)

Diagnosis. The new species can be easily distinguished by having very low tarsal ratio of hind leg TR(3) 0.45, palpomere 3 enlarged on proximal $\frac{1}{3}$, parameres separated, stout on proximal $\frac{2}{3}$ and filamentous on distal $\frac{1}{3}$, aedeagus with triangular median projection and distinct lateral shoulders. Female unknown.

Description. Male. Body dark brown with pale parts of legs and abdomen (Fig. 2a). Head dark brown. Eyes bare, touching at distance of 6 ommatidia. Frons with distinct tubercle bearing stout, black spine-like seta (with a barb) in submedian position (Fig. 1c). Flagellum with 13 flagellomeres (Fig. 1a), length 1.10 mm, AR 1.11, distal flagellomeres 10–13 elongated, plume on flagellomeres 2–10 well developed, flagellomere 10 about 2.45 times longer than flagellomere 11. Palpus 5-segmented (Fig. 1b); palpomere 3 with distinct sensory pit on enlarged basal $\frac{1}{3}$, length 0.14 mm, PR 4.0; palpomere 4 about 1.4 times longer than palpomere 5.

Thorax including scutellum dark brown (Fig. 2a). Wing with two darker patches at anterior margin, on

first radial cells and on radial fork (Fig. 2b); length 1.55 mm, CR 0.45; first radial cell slit-like, second one small; wing membrane with scale-like slender macrotrichia. Legs pale brownish, femur of hind leg brown (Fig. 2a), tarsomeres 4 distinctly longer than tarsomere 5, claws long, empodium well developed, TR (1) 0.63, TR(2) 0.36, TR(3) 0.45.

Abdomen dark brown with pale caudal margins of tergites (Fig. 2a). Genitalia dark brown with pale gonostyli (Fig. 3a). Caudal margin of sternite 9 slightly convex with broad and shallow median incision. Gonocoxite without modified setae, gonostylus almost straight. Aedeagus shield-shaped, well sclerotized with well developed long triangular median projection and

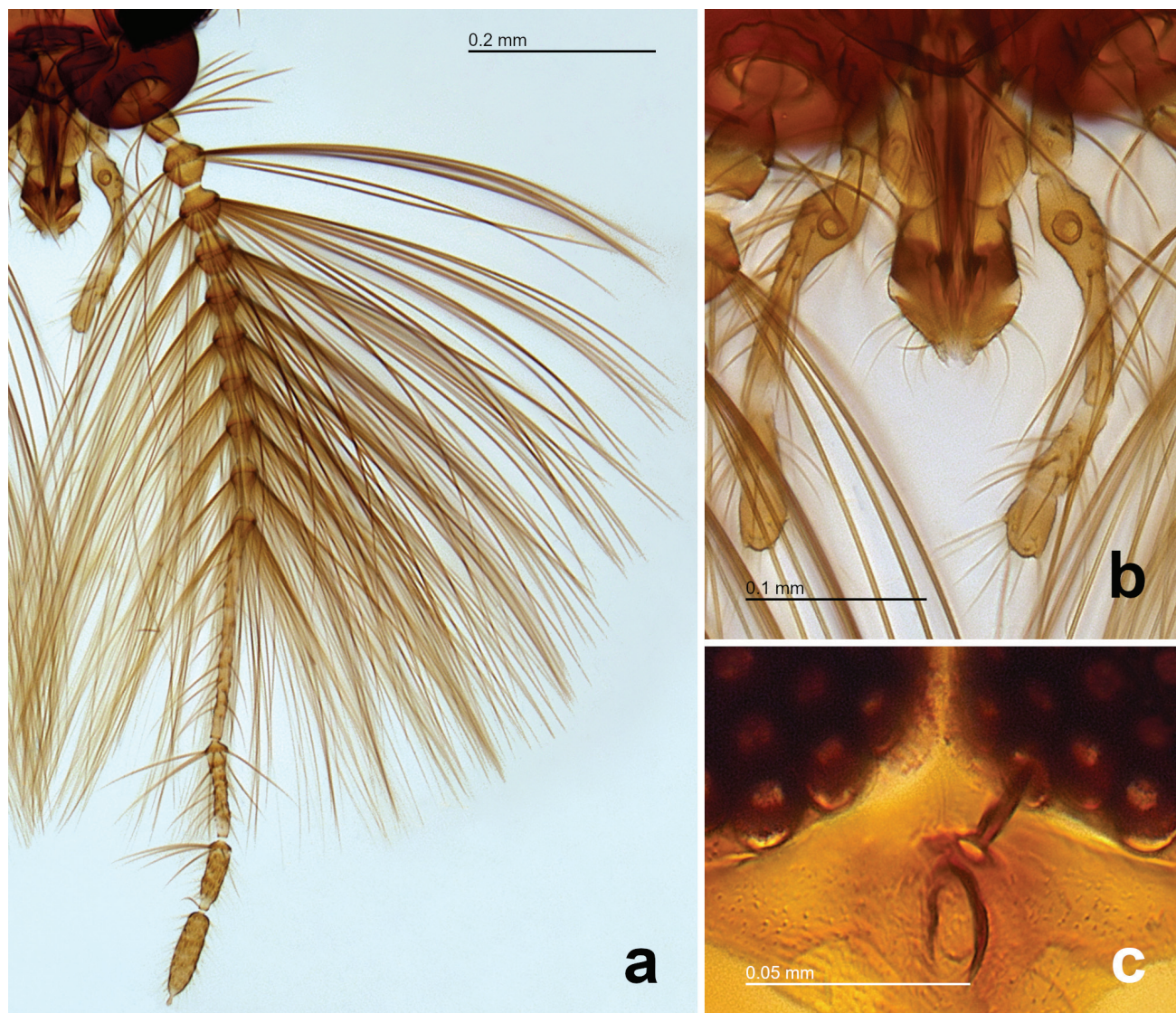


Figure 1. *Forcipomyia (F.) pyrenaica* sp. nov., male; a – flagellum, b – palpus, c – frons with spine-like seta.

distinct lateral shoulders (Fig. 3b). Parameres separated, stout, rod-like on proximal $\frac{2}{3}$ and narrow, filamentous on distal $\frac{1}{3}$ (Fig. 3c).

Female unknown.

Material examined. *Forcipomyia (F.) pyrenaica* sp. nov., holotype male, France, Pyrenees-Orientales, RNN foret de la Massane, Malaise trap, about 600 m a.s.l., 9.09.2008, P. Withers. The holotype is deposited

in the Museum of Amber Inclusions, University of Gdańsk, in the Collection of Extant Invertebrates.

Etymology. The specific name refers to the Pyrenees mountains (Latin Pyrenaei) where the species was collected.

Discussion. The new species is a typical member of the subgenus *Forcipomyia* s. str. (Alwin and Szadziewski 2013). The subgenus including almost 350

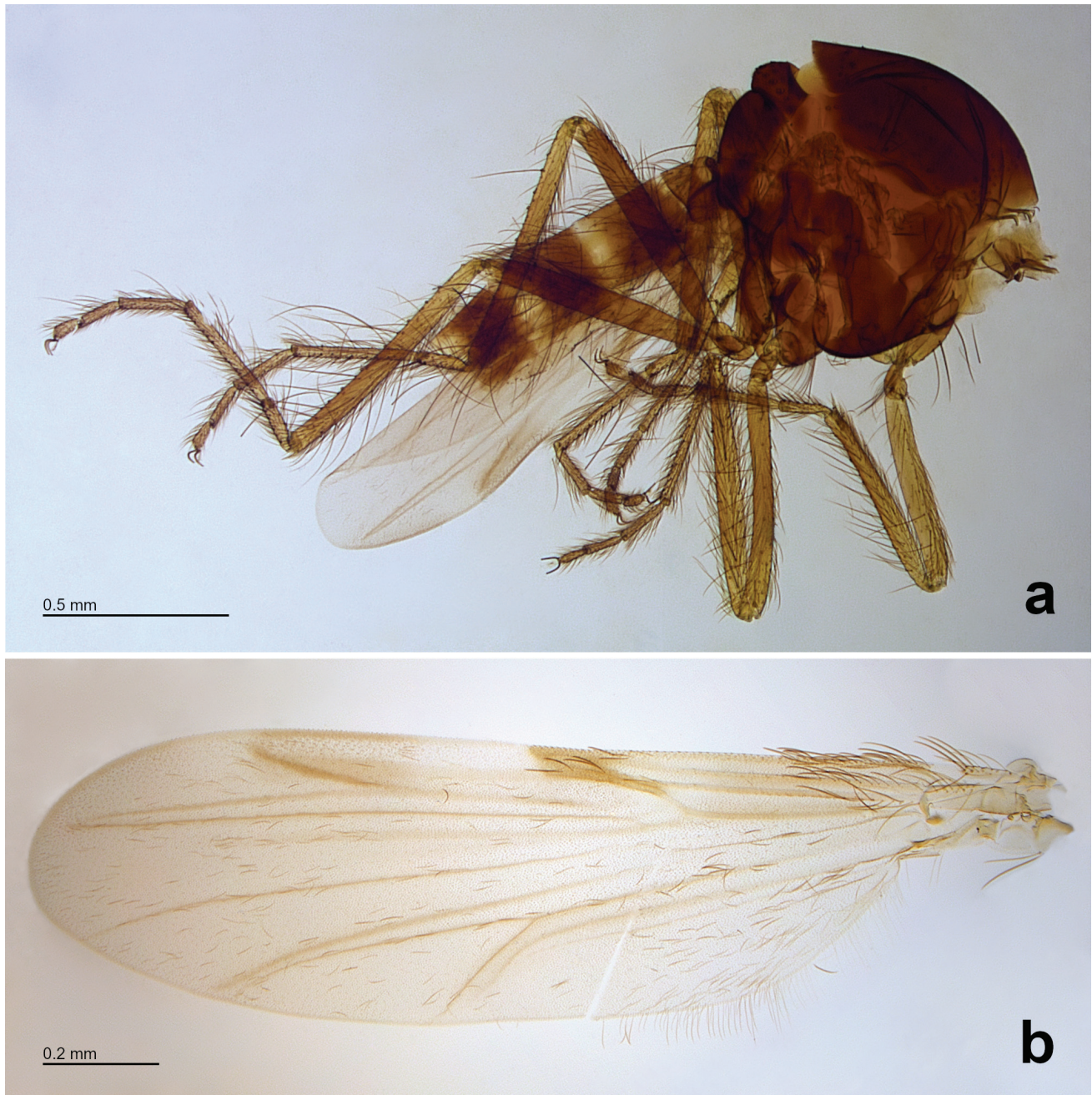


Figure 2. *Forcipomyia (F.) pyrenaica* sp. nov., male; a – total habitus, without head and genitalia, b – wing.

extant species is distributed worldwide (Borkent 2016). The low hind tarsal ratio (less than 0.5) is known among a few species of *Forcipomyia* s. str. outside of Europe. European species of the subgenus have higher hind TR, usually about 0.8–1.2 (Goetghebuer 1934, Remm 1962, 1980, Szadziewski 1983, Navai and Szadziewski 2016).

In the holotype the tubercle of the frons in sub-

median position has stout black spine-like seta with a distinct barb (Fig. 1c). In all, known for us, adults of biting midges this tubercle is devoid of setae and we treat this character as a developmental aberration. Similar setae (forked, with serrations, barbs or spurs) are known in immature stages (larvae and pupae) of *Forcipomyia* (Lewańczyk *et al.* 2009).

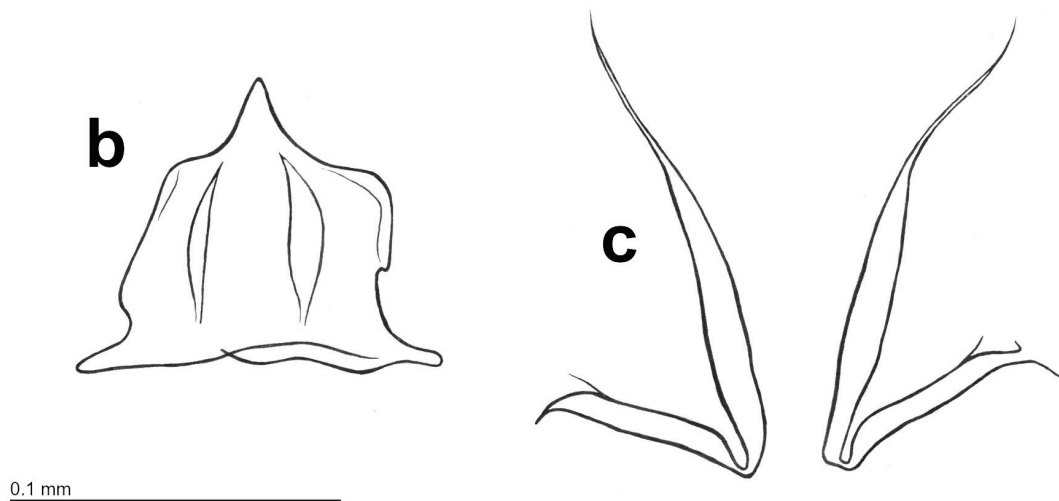
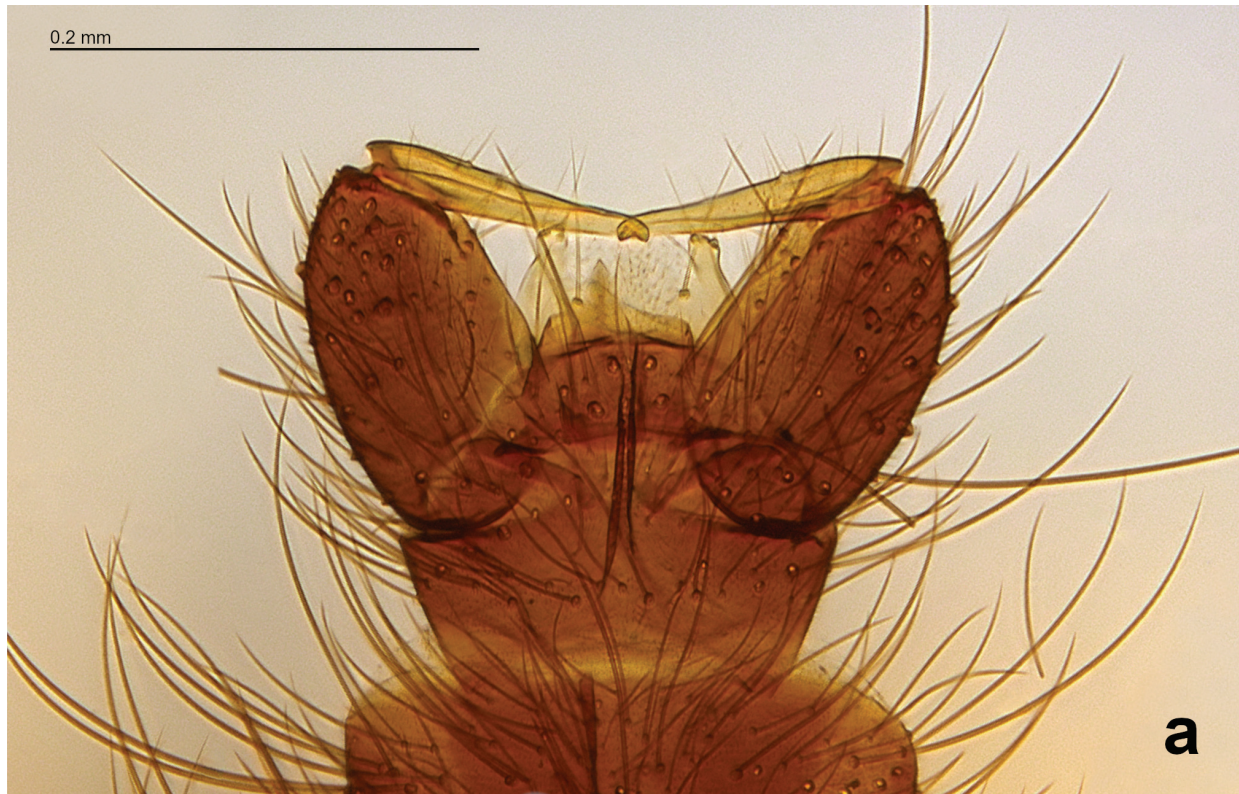


Figure 3. *Forcipomyia (F.) pyrenaica* sp. nov., male genitalia; a – ventral aspect, b – aedeagus, c – parameres.

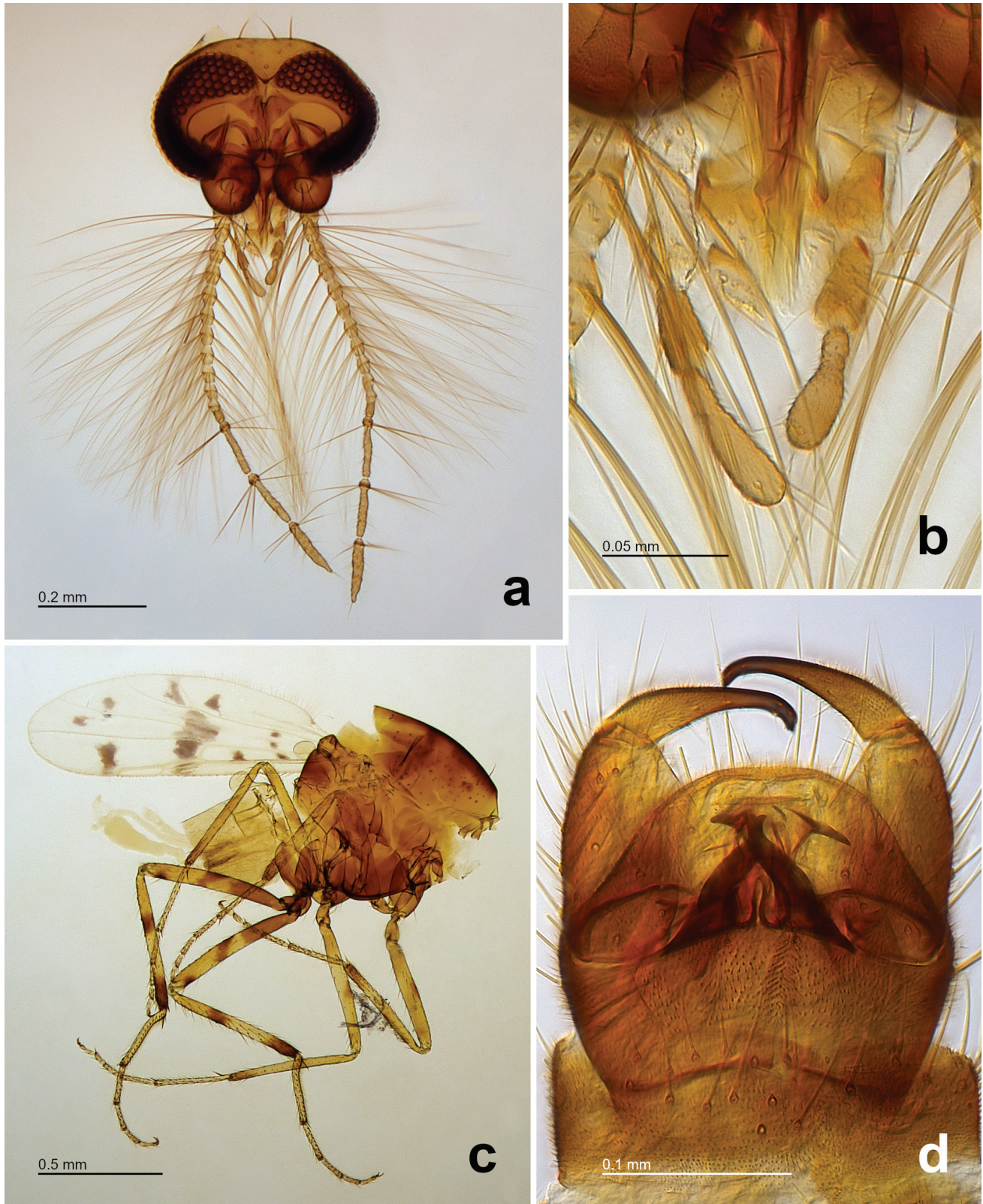


Figure 4. *Monohelea mediterranea* sp. nov., male; a – head of paratype, dorsal aspect, b – palpi of paratype, c – total habitus of paratype, without head and genitalia, d – genitalia of holotype, ventral view.

Subfamily *Ceratopogoninae*Genus *Monohelea* Kieffer, 1917*Monohelea mediterranea* sp. nov.
(Figs 4–6)

Diagnosis. The species is distinct in having second radial cell without dark spot, dark spot below first radial cell rectangular and uniformly dark, without pale spot or spots, legs with brown and pale rings and stripes, gonocoxite in male genitalia without ventral tubercle and apex of paramere T-shaped. Female unknown.

Description. Male. Body yellowish brown (Fig. 4c).

Eyes bare, broadly separated by vertex and frons (Fig. 4a). Flagellum with well developed plume (Fig. 4a), length 0.80–0.83 mm, AR 0.93–0.95. Palpus 5-segmented (Fig. 4b); third palpal segment with small sensory pit, length 48–53 μm , PR 2.11–2.30.

Thorax brownish with indistinct ornamentation in slide mounted specimen, paratergite narrow, scutellum yellowish with 4 marginal bristles. Wing length 1.22–1.30 mm, CR 0.70–0.71. Both first radial cells well developed, macrotrichia restricted to few at wing tip. Wing pattern as in Fig. 5; second radial cell without dark spot; dark spot below first radial cell rectangular, uniformly dark, without pale spot or spots.

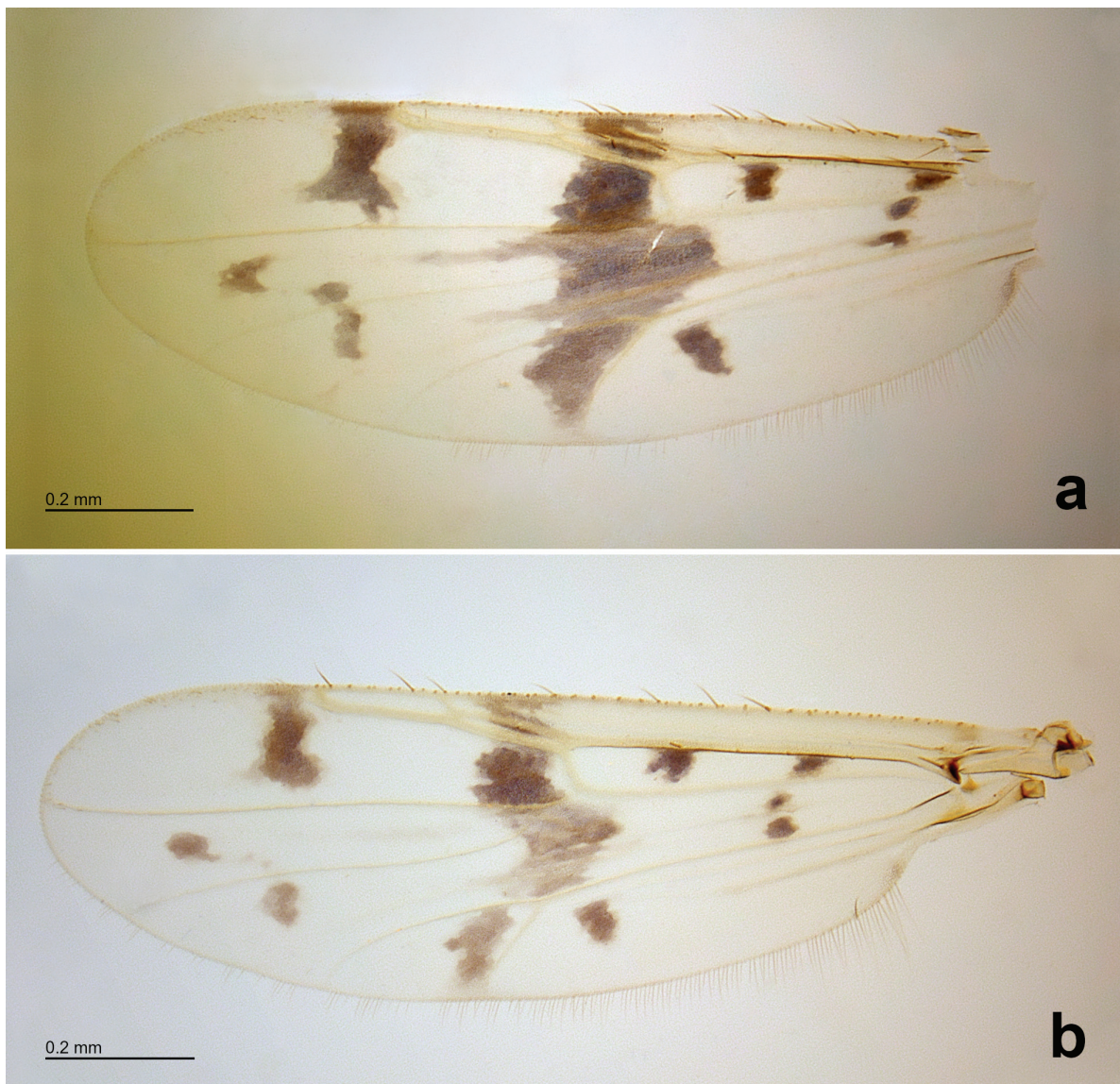


Figure 5. *Monohelea mediterranea* sp. nov., wing of male; a – holotype, b – paratype.

Fore and hind legs somewhat thickened, mid legs slender. Legs brownish, femora without spines; coxae brown; trochanter of fore leg yellow, of mid and hind legs brown; femur of hind leg yellowish with distinctly brown proximal portion, narrow brown ring at middle and ventral subapical dark spot; fore and mid femora with similar colour patterns, however paler and indistinct; hind tibia with distinct brown ring at mid length and apex, fore and mid tibiae paler, with less developed brownish patterns as in hind tibia; tarsomere 1 of fore leg straight, with 1 subapical and 1 apical spine; tarsomere 1 of mid leg straight, with 2 subbasal and 2 apical spines; tarsomere 1 of hind leg strongly bent at base, with one row of palisade setae and strong subbasal spine; tibial spur of hind leg short, tibial comb composed of 9 spines; tarsomeres 4 cylindrical; claws small, equal; TR(1) 1.85–1.92, TR(2) 2.00–2.17, TR(3) 1.67–1.71.

Genitalia brown (Fig. 4d). Gonocoxite stout, mesal margin without lobe or tubercle (Fig. 6a). Gonostylus with slightly curved, pointed dark tip. Aedeagus with sclerotized basal loop, a pair of pointed, oblique lateral sclerites (Fig. 6b). Parameres separated, with wing-like basal apodeme and T-shaped apex (Fig. 6c).

Female. Unknown.

Material examined. Holotype male, North Algeria, Sahara, 30 km north of Biskra, 27 April 1981, collected by entomological net, R. Szadziewski; paratype male, France, Pyrenees-Orientales, RNN foret de la Massane, Malaise trap, 15.07.2009, P. Withers. The holotype and paratype are deposited in the Collection of Extant

Invertebrates the Museum of Amber Inclusions, University of Gdańsk.

Etymology. The specific name refers to the Mediterranean region where the species was collected.

Discussion. The new species is very similar to *Monohalea andersoni* Wirth & Grogan, 1981 from North America (Wirth and Grogan 1981). The latter species however, is smaller (wing length 0.9 mm), has darker legs, the aedeagus is longer and apices of parameres abruptly expanded in a cap-like lobe bent ventrally. The aedeagus and parameres of *M. mediterranea* sp. nov. are also somewhat similar to those of *M. pallida* Clastrier & Delécolle, 1990 from tropical Africa (Clastrier and Delécolle 1990). However, the latter species has pale legs and second radial cell with dark spot.

Monohalea is a worldwide distributed genus, which includes 88 recent species (Borkent 2016). Three species are currently known from western Palaearctic. In addition to the new species described above they are *M. estonica* Remm, 1965 (North and Central Europe) and *M. hissarica* Remm, 1980 (Tajikstan in Central Asia, only female). The latter two species have dark spot in the second radial cell which in *M. mediterranea* sp. nov. is totally pale (Fig. 5). The European *Monohalea estonica* Remm reported from Russia, Estonia, Poland, Czechia, N. France (Dominiak and Michalczyk 2009) differs also in having gonocoxites with a tubercle on mesal margin and simple pointed apices of parameres (Remm 1965, Delécolle and Rieb 1995).

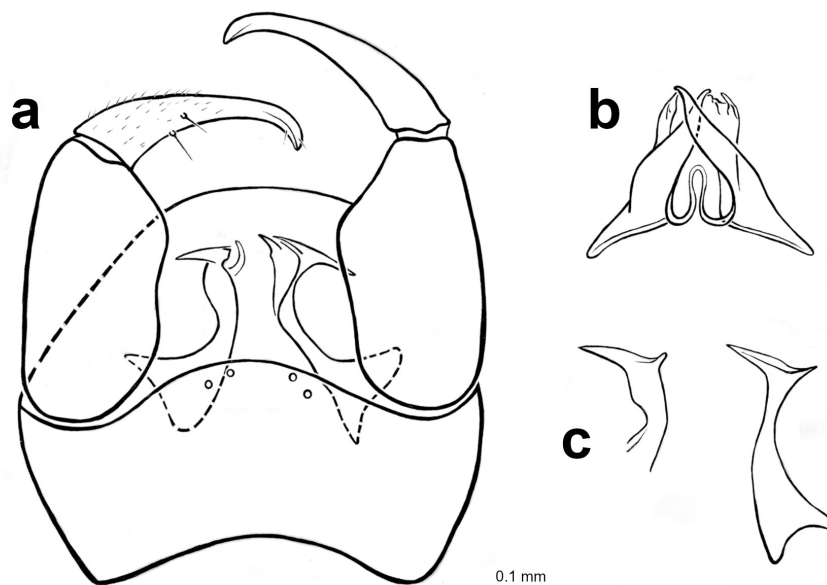


Figure 6. *Monohalea mediterranea* sp. nov., male genitalia; a – ventral aspect of holotype, b – aedeagus of holotype, c – parameres of paratype.

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