

First records of *Forcipomyia paludis* (Diptera: Ceratopogonidae), a midge parasitising dragonfly adults (Odonata: Libellulidae), for the Balearic Islands, Spain

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Abstract. Photographs of odonates parasitised by *Forcipomyia* (*Pterobosca*) *paludis* taken 2007 and 2014 in the Parc Natural de s'Albufera de Mallorca, Spain, document the first records of this ceratopogonid for the Balearic Islands.

Key words. Odonata, *Forcipomyia paludis*, Mallorca, Balearic Islands, Spain

Introduction

Females of *Forcipomyia* (*Pterobosca*) *paludis* (Macfie, 1936), a biting midge only 1.8 mm in size, suck haemolymph from the veins of odonate wings (cf. WILDERMUTH & MARTENS 2007). It is the only ceratopogonid species known to parasitise dragonfly adults in Europe and more than 65 species of odonates have so far been recorded as hosts (MARTENS et al. 2008, 2013).

Study sites and methods

On the 09-ix-2007 and 18-vii-2014 respectively ERN and RM photographed several odonates in the Parc Natural de s'Albufera de Mallorca, Balearic Islands, Spain (39°47'57.10"N, 3°06'51.43"E). Subsequent analysis of the images revealed infestation by *F. paludis* in six specimens.

Results

On 09-ix-2007, one individual of *F. paludis* sucking haemolymph was clinging to the wing of a female *Crocothemis erythraea* (Fig. 1). Another picture of the same female from another angle, taken less than two minutes later, revealed one more biting midge not clearly visible in the first picture. On 18-vii-2014, altogether seven individuals of *F. paludis* were found as attached to the wings of a male *Orthetrum coerulescens* (Fig. 2). On the same day four further individuals of *Orthetrum cancellatum* infested by *F. paludis* were photographed by RM: Two males with one and two midges respectively and two females with one midge each.

Discussion

These are the first records of *F. paludis* for Mallorca and the Balearic Islands, being the second western Mediterranean island besides Sardinia from which the species has been recorded so far (DELL'ANNA et al. 1995). While numerous records of *F. paludis* are known from France (MARTENS et al. 2008), very little information is available from Spain. However, at least a photograph without further locality information taken in the Extremadura given by SÁNCHEZ et al. (2009: 51, 121) indicates that this midge species is also present in the continental mainland of Spain.

Photography of dragonflies and subsequent analysis of pictures generally turned out a very useful and effective tool for recording parasitising *Forcipomyia* species

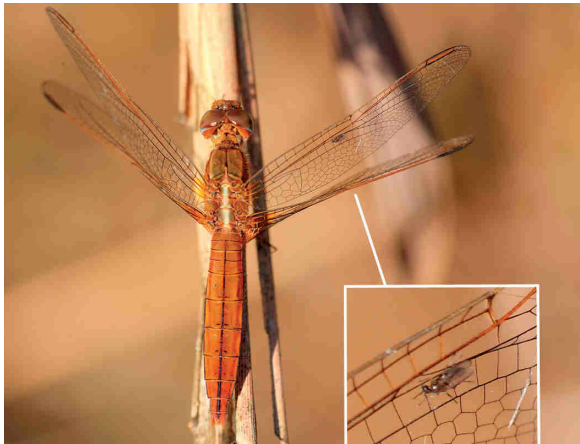


Fig. 1. Biting midge *Forcipomyia paludis* on the right forewing of a female *Crocothemis erythraea*. Parc Natural de s'Albufera de Mallorca, Spain (09-ix-2007). Photo: ERN



Fig 2. Seven biting midges *Forcipomyia paludis* on the wings of a male *Orthetrum coerulescens* while eating a male *Ischnura elegans*. Parc Natural de s'Albufera de Mallorca, Spain (18-vii-2014). Photo: RM

(MARTENS et al. 2013; WILDERMUTH 2013). In several cases such photos resulted in first national records (cf. CLAEREBOUT 2013; MANGER & MARTENS 2013). Possible future records of *Forcipomyia* sucking on wings of odonates from the eastern Mediterranean should be supported by random samples of specimens picked from the wings preserved in ethanol.

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