

First record of *Paragus flammeus* Goeldlin de Tiefenau, 1971 (Diptera, Syrphidae) from Portugal

Primera cita de *Paragus flammeus* Goeldlin de Tiefenau, 1971 (Diptera, Syrphidae) para Portugal

The fauna of Syrphidae from Portugal has been studied and reported in several publications (MARCOS-GARCÍA *et al.*, 2002; RICARTE & LYSZKOWSKI, 2009; RICARTE *et al.*, 2009; VAN ECK, 2011, 2016). So far, nine *Paragus* species are known from Portugal, i.e., *P. albifrons* (Fallén, 1817), *P. bicolor* (Fabricius, 1794), *P. bradescui* Stănescu, 1981, *P. haemorrhous* Meigen, 1822, *P. pecchiolii* Rondani, 1857, *P. quadrifasciatus* Meigen, 1822, *P. strigatus* Meigen, 1822, *P. tibialis* (Fallén, 1817), and *P. vanderhooti* Marcos-García, 1986. RICARTE & MARCOS-GARCÍA (2017) state that *Paragus* Latreille, 1804 is the most diverse genus of the subfamily Syrphinae in Spain with 18 species, and they reported four *Paragus* species from Andorra (*P. haemorrhous*, *P. pecchiolii*, *P. quadrifasciatus*, and *P. tibialis*) and another four species from Gibraltar (*P. bicolor*, *P. haemorrhous*, *P. quadrifasciatus*, and *P. tibialis*).

Paragus (Paragus) flammeus Goeldlin de Tiefenau, 1971 is a small hover fly species (5 mm long) distributed in the Western Palaearctic (GOELDLIN DE TIEFENAU, 1976; SPEIGHT, 2018). It was described from Les Dévens (Vaud, Switzerland) based on a large series of males and females (GOELDLIN DE TIEFENAU, 1971), and it has been reported from Central Europe south to central Spain, eastward to Ukraine and Greece, Caucasus Region, and into the republics of Kazakhstan and Tajikistan (SPEIGHT, 2018). Additionally, *P. flammeus* has been cited from Morocco (SPEIGHT, 2018). RICARTE & MARCOS-GARCÍA (2017) list *P. flammeus* from three Spanish provinces, i.e., León, Pontevedra, and Salamanca. Here the first record of *P. flammeus* from Portugal is reported. The male specimen (Fig. 1A) is deposited at the Zoologisches Forschungsmuseum Alexander Koenig (ZFMK), Bonn (Germany), with the following data labels: “PORTUGAL // Amarante // 2.5.1990 // leg. A. Roth” “ZFMK-DIP-00070589” (Fig. 1B). Another male is also here reported as the first record for the Spanish province of Lugo. This second male has the following information:



Fig. 1. *Paragus (Paragus) flammeus* Goeldlin de Tiefenau, 1971, male from Portugal: A) habitus, dorsal view. Scale = 1 mm; B) labels; C) male genitalia, lateral view.

Fig. 1. *Paragus (Paragus) flammeus* Goeldlin de Tiefenau, 1971, macho capturado en Portugal: A) *habitus*, vista dorsal. Escala = 1 mm; B) etiquetas; C) genitalia masculina, vista lateral.

“Spain/Galicia // Sierra de Ancares // Portelo, 1100m // 02.06.1996, Stuke leg.” “ZFMK-DIP-00067278”. The Sierra de Ancares is located between the two Spanish provinces of León and Lugo, and the village of O Portelo (Lugo) is situated at the border (42°44’20.65”N 6°58’05.98”W).

All photographs were taken with a Canon EOS 7D camera mounted on a P-51 Cam-Lift (Dun Inc., VA, USA) and with the help of Adobe Lightroom (version 5.6), and then stacked using the Zerene Stacker 1.04 (Richland, Washington, USA) software. The male genitalia were detached from the pinned specimen after 12 hours in a relaxing chamber. The genitalia were cleared in a 10% KOH solution for 10 minutes at 56 °C, washed with distilled water for 10 minutes, followed for another wash

with 96% ethanol for 10 minutes. Then, male genitalia were preserved in a microvial with glycerin.

Paragus (Paragus) flammeus is very similar to *Paragus (Paragus) bicolor* but they differ by the presence of fasciae of silverfish pollinosity on abdominal tergites 3 and 4 in *P. bicolor* (absent in *P. flammeus*; see Fig. 1A), females with a characteristic annular bulge on tergite 7 in *P. bicolor* (absent in *P. flammeus*), and by the male genitalia (Fig. 1C) (GOELDLIN DE TIEFENAU, 1971, 1976; MARCOS-GARCÍA, 1985; VAN VEEN, 2010). In *P. flammeus* (male genitalia in lateral view), the postgonites are broader in the dorsal part, each lateral lobe of the aedeagus is more than twice as high as long and has two little processes pointed ventrally, the posterior tip of the aedeagus can be seen between these two processes, and the lingula reaches the level of the more basal process. In *P. bicolor*, the postgonites are not broadened dorsally, each lateral lobe of the aedeagus (male genitalia in lateral view) is as high as long, with only a small process pointed ventrally, and the longer lingula does not reach the level of the process.

SPEIGHT (2018) mentions the thermophilous forest fringes and dry/semi-arid, unimproved grasslands as the preferred environs for *P. flammeus*, and he states that the species can be found from end of May to the end of August. The new record from Portugal is from the beginning of May, broadening the known phenology of the species.

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XIMO MENGUAL

Zoologisches Forschungsmuseum Alexander Koenig, Leibniz-Institut für Biodiversität der Tiere, Adenauerallee 160, D-53113 Bonn, Germany. x.mengual@leibniz-zfmk.de