Revision of the hoverflies of *Cheilosia longula* (Zetterstedt, 1838) group from the Iberian Peninsula (Diptera: Syrphidae)

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INTRODUCTION

Cheilosia Meigen, 1822 is a mostly-Palaearctic genus with 400+ species of dark-coloured hoverflies. There are 56 species of *Cheilosia* reported from the Iberian Region, including the Balearic Islands. The *Cheilosia longula* group *sensu* Claußen and Ståhls (2007) has six species sharing bare eyes, connected antennal sockets, bare face, and tibiae pale at least basally and apically. Three species of this group are reported at present from the Iberian Peninsula, *Cheilosia longula* (Zetterstedt, 1838), *Cheilosia scutellata* (Fallén, 1817) and *Cheilosia soror* (Zetterstedt, 1843).

The aims of this study were: 1) to better understand the distribution of the *C. longula* group in the Iberian Region, 2) to assess the intraspecific variability found in *Cheilosia soror*.

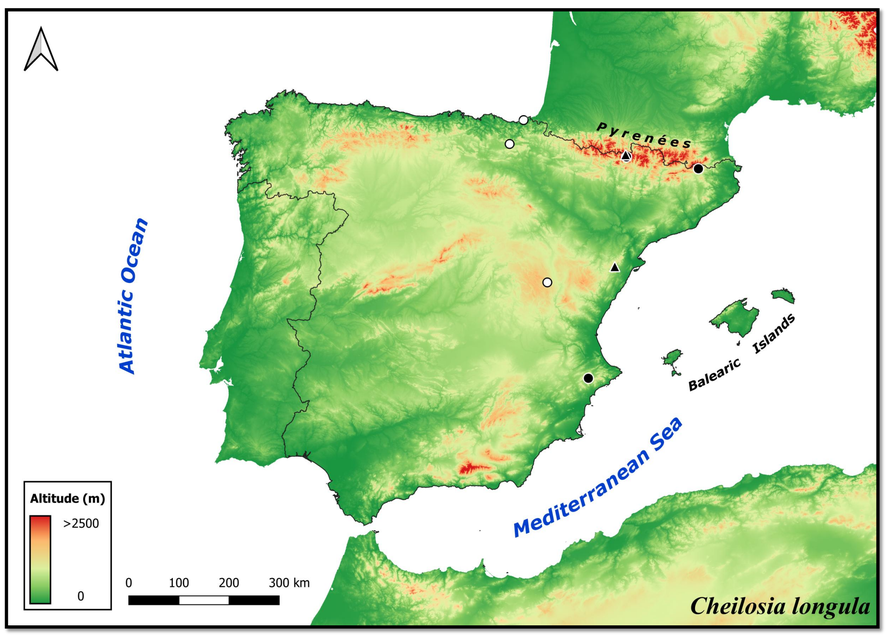
MATERIAL AND METHODS

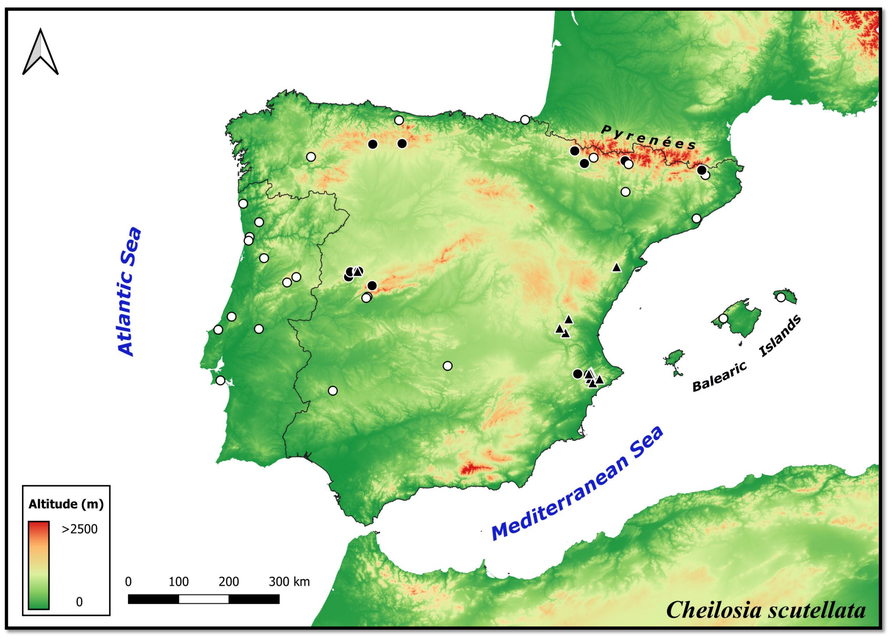
Over 440 specimens of the *C. longula* group were examined, including 207 specimens caught recently (2019-2021) with hand net in different localities of South-Eastern Spain (Alicante and Valencia provinces). Examined material is deposited at the CEUA-CIBIO collection (University of Alicante) and the MNCN collection (Museo Nacional de Ciencias Naturales, Madrid). Bibliographic species records were also included by following the information in the checklists of Ricarte & Marcos-García (2017) and Van Eck (2011, 2016). Distribution maps of published and unpublished records were made using QGis software.

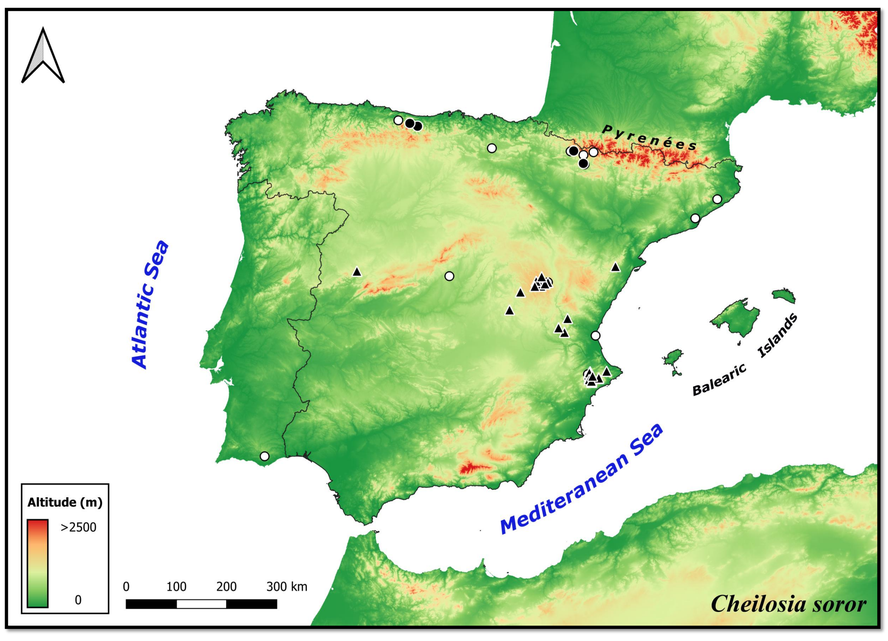
To assess the intraspecific variability of *C. soror,* 97 specimens were analysed. Variability in 15 morphological characters was assessed, including the colour of different body parts, length of arista, basoflagellomere size, and, in males, shape of different parts of genitalia (structures of hypandrium and epandrium).

RESULTS AND DISCUSSION

Distribution maps







Published record: revised

New record

Published record: not revised

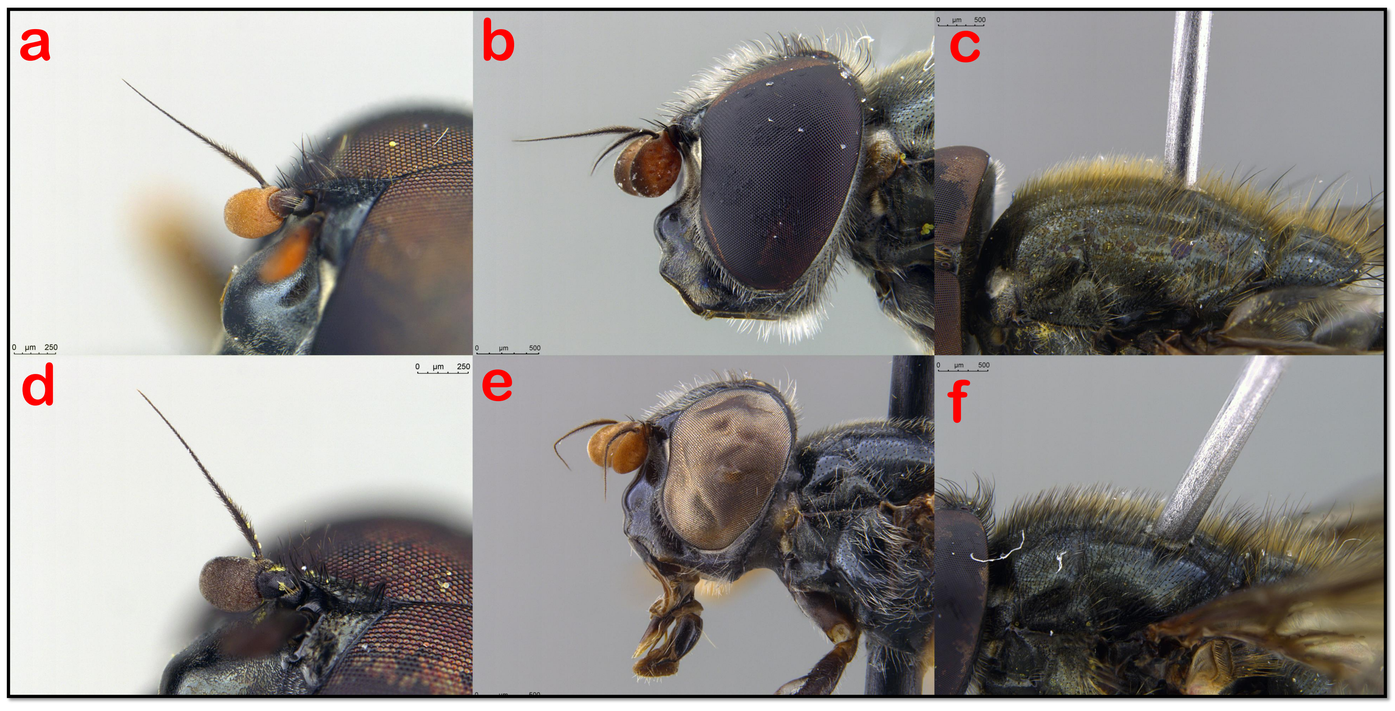
Species distribution and preferred environments

Within the *C. longula* group, *C. longula* appears to be scarcer than the other two species in the Iberian Peninsula. For example, *C. longula* has not been recorded in the South-East of Spain from 1993-2005, despite some localities in this region have been intensively surveyed. However, *C. soror* has proven to be common in many locations of Spain; the single record from Portugal is possibly due to low sampling effort in this part of the Peninsula. *Cheilosia scutellata* is also widely distributed in the Iberian Region. The only species of the *C. longula* group reported from the Balearic Islands is *C. scutellata* (**maps**).

Due to the fungivorous trophic regime of their larvae, the species of the *C. longula* group are frequently associated with water sources and/or humid and shady habitats, facts that have been confirmed in some of the samplings conducted along the course of this research. In relation with flower visitation by adults, umbellifers such as *Thapsia villosa* appear to be one of the preferred plants by species of the *C. longula* group in South-Eastern Spain (**1**).

Intraspecific variability of *Cheilosia soror*

Males of *C. soror* showed even more variability than females in all studied morphological characters. The following three resulted to be the most variable characters: basoflagellomere colour, ranging from orange (**a**) to black (**d**); shape of face in profile, normally with well-differentiated central knob and mouth edge (**b**), sometimes not so (**e**); and colour of the mesonotum pile, from completely yellow (**c**) to almost entirely black (**f**).



CONCLUSIONS

✓ The distribution of the three species of *C. longula* group has been substantially expanded in the Iberian Region (13 new localities in total of the following Spanish provinces: Alicante, Castellón, Cuenca, Girona, Huesca, Salamanca, Teruel and Valencia), enabling, for example, a future assessment of their conservation status in this region.

✓ *Cheilosia soror* has resulted to be a species with a high intraspecific variability in various morphological characters. Whether this variability involves one or more taxa within the current concept of *C. soror*, this is to be tested with molecular analysis (COI 5') in the near future.

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