Chrysis monticola Linsenmaier, 1999 (Hymenoptera, Chrysididae), a new species for the European fauna

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Abstract - Chrysis monticola Linsenmaier, 1999, previously known for northern Africa, was collected in different sites in Algarve and Baixo Alentejo in Portugal. A list of the known species of the C. aestiva group is given and Chrysis amurensis Semenov, 1967 is transferred from the C. aestiva group to the C. splendidula group.

Key words: Chrysididae, Chrysis monticola, Chrysis aestiva group, Portugal.

INTRODUCTION

In recent years, from 2000 to 2015, there has been an increasing number of entomologists collecting and studying Hymenoptera in Portugal. The main recorders have been Alain Livory, Roselyne Coulomb and David Baldock; all the other colleagues are mentioned in the acknowledgements. Thanks to this teamwork, about 1200 species of Hymenoptera and 70 species of Chrysididae have been recorded in Portugal, raising the number of known Portuguese species and subspecies to 162 (Mingo, 1994; Kuhlmann, 1996; Tussac & Zumeta, 2004; Oliveira, 2009; Rosa & Soon, 2012; pers. data). The new chrysidid records for Portugal will be discussed in a separate paper, but one species is worthy to be mentioned apart, because it has not been found previously from Europe and it is one of the most outstanding species in the West Palearctic. Chrysis monticola Linsenmaier, 1999 was recently described for northern Africa (Morocco and Algeria); Alain Livory and Roselyne Coulomb collected some specimens for the first time in Europe from 2009 to 2012. After this discovery, the number of chrysidid European species is raised from 483 (Mitroiu et al., 2015) to 484.

MATERIALS AND METHODS

The terminology follows Kimsey & Bohart (1991), and the classification of species and species groups follow Fauna Europaea (Rosa & Soon, 2012), Linsenmaier (1959, 1999). Abbreviations used in the text are as follows:

F1, F2, etc. = flagellum 1, flagellum 2;
1/w = length versus width;
MOD = midocellus diameter;
OOL = oculo-ocellar line;
POL = postocellar line;
S2 = second metasomal sternite;
T1 = first metasomal tergite;
T3 = third metasomal tergite;
TFC = transverse frontal carina.

Photographs of the specimens were taken with a Nikon D80 camera connected to a Togal SCZ stereomicroscope and stacked with Combine ZP software. The white calibration of the camera was applied to reduce the blue effect of the neon light of the Togal microscope.

RESULTS

Examined material

Chrysis monticola Linsenmaier was collected in Portugal in Algarve and Baixo Alentejo by A. Livory and R. Coulomb (Fig. 1). Algarve: 1♀, Carrapateira, 7.vii.2009 (Fig. 2A) (P. Rosa collection); 1♂, Odeceixe (Aljezur), 2004; Oliveira, 2009; Rosa & Soon, 2012; pers. data).

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Description of *Chrysis monticola* Linsenmaier, 1999

Female: 7-8 mm (6-7 mm in the original description) (Fig. 3A).

**Colouration:** head metallic blue, frons and vertex in ocellar area greenish; pronotum, scutellum, metanotum mesopleuron, metapleuron and partially propodeum metallic red to golden-red; metasoma metallic red, T1 anteriorly metallic blue to greenish; antennae blackish, with very feeble blue metallic reflections on pedicellus and base of F1. **Head:** malar spaces more subparallel than in Linsenmaier line drawing (Linsenmaier, 1999: 170, fig. 224) and about 1.1 MOD long (Fig. 3B); subantennal space a little longer than 1 MOD; OOL: 2.3 MOD; POL: 2.2 MOD; TFC distinctly M-like; scapal basin micropunctate, with long whitish hairs; apical teeth shorter and smaller, with subequal intervals.

**Meso soma:** with large punctures and smooth intervals (Fig. 3C), propodeal tooth narrow and pointing downward. **Metasoma:** apical teeth elongated (Fig. 3D) and spini form, the median pair close together and the lateral well developed and pointed; pit row with relatively large and deep pits, the two median pits larger, laterally partially fused; black spots on S2 large (Linsenmaier, 1999: 170, fig. 227).

Male: 7-8 mm (Fig. 4). Differs from female by colouration: the red and golden parts of mesosoma are greenish, contrasting with the rest of head and mesonotum. In both sexes there are two greenish to bluish rounded spots laterally on pronotum. Malar spaces evidently convergent and about 1.1 MOD long; TFC distinctly M-like; scapal basin micropunctated, with long whitish hairs; apical teeth shorter and smaller, with subequal intervals.

Variation and species group placement

The European female (Fig. 2A) differs from the northern African female by narrower apical teeth and larger black spots on S2. The male (Fig. 2B) differs by pale femur and enlarged black spots on S2. Despite these small differences, the genital capsule match the genitalia of the allotype from Morocco and therefore we consider the discrepancies as intraspecific variations between different populations. Future molecular systematic analysis will possibly confirm this interpretation.

The Algerian paratype housed in the Linsenmaier collection is truly a little different, as already noticed by Linsenmaier (1999). In particular, the very reduced black spots on S2 are remarkably different. However, this variation could be related to the different environmental conditions, whereas the genital capsule matches the genital capsule of the Moroccan allotype.

Linsenmaier (1999) noticed that *C. monticola* could be included in the *C. viridula* group. We maintain the placement of *C. monticola* in the *C. aestiva* group for its general habitus, the shape of the genital capsule and other diagnostic characteristics of the species group despite its unusual and unique body colouration.
Fig. 3 - *Chrysis monticola* Linsenmaier, 1999, holotype female. A) general habitus, dorsal view; B) head, frontal view; C) head and mesosoma dorsal view; D) metasoma, dorsal view.

Fig. 4 - *Chrysis monticola* Linsenmaier, 1999, allotype male. A) general habitus, dorsal view; B) genital capsule; C) head and mesosoma dorsal view; D) metasoma, dorsal view.
Distribution

*Chrysis monticola* Linsenmaier, 1999 is known from northern Africa (Morocco and Algeria) and Portugal. Based on the known records, *C. monticola* is a eurythermic and euryzonal species living in high mountains (it was collected at 1900 m) and deserts (Tamanrasset).

Phenology

*Chrysis monticola* in Portugal was recorded only in July, although field research was carried out throughout the season between March and the end of September. It is likely that July is the optimal period of flight of *C. monticola* in Portugal. In northern Africa, it has been recorded in the High Atlas and Anti-Atlas mountains in Morocco (Tizi-n-Test, Timahdite, Ijoukak, Ait Saoun) from June to July, and in Algeria (Tamanrasset) at the end of March.

Biology and habitat

*Chrysis monticola* Linsenmaier was collected in three localities from North to South of the coast between Cabo de Sines and Cabo de Sao Vicente, in the Parque Natural do Sudoeste Alentejano e Costa Vicentina, the largest protected coastal area in Europe, more than 100 km long. The landscapes consist of rocky capes, steep or broken cliffs, interspersed with immense dunes or estuaries. These habitats conceal many endemic plants and the fauna is extremely rich. One specimen was collected on the cliffs of Zambujeira do Mar in Alentejo (Fig. 5), in a habitat of dunes and scrubland. Most of the specimens were collected further south, on the banks of the Ceixe estuary at Odeceixe, together with many other rare Hymenoptera species. Here the dunes perched on cliffs offer a diversified network of scrubland and mobile sands that is extremely attractive to aculeate Hymenoptera. Lastly, one specimen was collected at the extreme south of Algarve, in the immense stretch of dunes of Carrapateira (Fig. 6) with its enormous clumps of *Eryngium maritimum*. The specimens were collected on the ground or on flowers but possible hosts were not observed. The only citation (Linsenmaier, 1959) in this species group for Mediterranean species is *Pseudoanthidium lituratum* (Panzer) (Megachilidae), as a possible host for *Chrysis interjecta* du Buysson.

Fig. 5 - Habitat of *Chrysis monticola* in Zambujeira do Mar 17th July 2012. Roselyne Coulomb hunting on Helichrysum flowers (Photo Alain Livory).

Fig. 6 - Habitat of *Chrysis monticola* in Carrapateira 9th July 2009 (Photo Alain Livory).
Diagnosis of the C. aestiva group

*Chrysis monticola* Linsenmaier, 1999 belongs to the *C. aestiva* group. The *C. aestiva* group was originally established by Linsenmaier (1959) and it is characterised by: rather long F1 (l/w in male: 2.2-2.8, in female: 2.4-2.8), face usually microridged medially, in some species basomedially polished in female; TFC partial, with an M-like form, usually strongest medially; malar space long, in male about 1.2 MOD, in female about 2 MOD (less than the measures given in Kimsey & Bohart, 1991); propodeal angle short, stout, blunt, straight or gently incurved behind; last tergite not saddled, pit row margin of T3 with four short teeth, usually the median developed, but usually simple, without large pits; apical margin of T3 with four short teeth, usually the median pair a little longer and closer together, lateral pair weak or absent; S2 with two large black spots, sometimes fused or nearly so.

Members of the *Chrysis aestiva* group are found in the western Palearctic region (15 species and 8 subspecies), and in the Afrotropical region (2 species). They are most-western Palearctic region (15 species and 8 subspecies), or nearly so.

Before this study, only two species of the *C. aestiva* group were known from the Iberian Peninsula: *Chrysis interjecta* du Buysson and *C. mixta* Dahlbom (Mingo, 1994).


The distributional range of *C. mixta* is SW European, being distributed only in southern Portugal, Spain, southern France and northwestern Italy (Linsenmaier, 1959; Rosa & Soon, 2012). Other citations outside this range are referable to other similar species (e.g. *Chrysis maderi* Linsenmaier, 1959).

*Chrysis monticola* Linsenmaier is easily recognizable within this species group, and more generally, within the European chrysidid fauna by its unique body colouration combined with diagnostic characteristics of the group. A similarly coloured European species is *Chrysis judaica* du Buysson (scutellaris group), known only from Cyprus, whereas in northern Africa and Middle East other species share a similar colour pattern, but belong to different species groups (e.g. *C. moriceana* du Buysson – scutellaris group; *C. convexianalis* Linsenmaier – facialis group).

Key to Iberian species of the *Chrysis aestiva* group

1. T3 apical margin with two small, triangular teeth, sometimes blunted or like simple undulations ... *C. mixta*

- T3 apical margin with four triangular teeth, always distinct in both sexes. ..................................................... 2

2. Female with mesosoma bicoloured blue with pronotum, scutellum, metanotum and mesopleuron contrasting red; malar spaces subparallel; T3 with long and triangular teeth, the two median teeth extended distinctly further posteriorly than lateral teeth. Male with greenish to golden green pronotum, scutellum, metanotum and mesopleuron contrasting with the rest of blue mesosoma; shortest distance between the compound eyes narrower than eye width ................................................................. *C. monticola*

- Female with green to greenish mesosoma, darker bluish to blackish on the mesoscutum; malar spaces convergent; T3 with apical teeth almost aligned along the apical margin. Male with green mesosoma; shortest distance between the compound eyes distinctly larger than eye width ................................................................. *C. interjecta*

DISCUSSION AND CONCLUSIONS

*Chrysis monticola* Linsenmaier was recently described by Linsenmaier (1999) from northern Africa based on a type series of seven specimens. Until now, no other specimens have been found from the main European collections. Therefore, we cannot evaluate if this species has
recently dispersed to Portugal from northern Africa or if its original distributional range has been wider in west Mediterranean countries and is now limited to the west Iberian Peninsula and North Africa. It is very likely that *C. monticola* could be also distributed along the coast of Andalucia, Spain.

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**REFERENCES**


