

Evidence of the introduction into Europe of the Nearctic mud-dauber wasp *Chalybion californicum* (de Saussure) (Hymenoptera, Sphecidae)

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Abstract: The first evidence of the introduction of the Nearctic mud-dauber wasp *Chalybion californicum* (de Saussure, 1867) into Europe is presented and discussed. The species is by now possibly established in southern Croatia.

Key words: Hymenoptera, Sphecidae, *Chalybion californicum*, first record, Europe, Croatia.

Primeros registros para Europa del esfécido neártico *Chalybion californicum* (de Saussure)

Resumen: Se presenta y discute la primera evidencia de la introducción de la especie neártica *Chalybion californicum* (Saussure, 1867) (Hymenoptera, Sphecidae) en Europa. Es probable que actualmente la especie esté establecida en el sur de Croacia.

Palabras clave: Hymenoptera, Sphecidae, *Chalybion californicum*, primer registro, Europa, Croacia.

Introduction

The mud-dauber wasp *Chalybion californicum* (de Saussure, 1867) is native to North America, where it is known from most of the United States, southern Canada and northern Mexico (Bohart & Menke, 1963; Hensen, 1988; Pulawski, 2016). From its original range, it has also been introduced into the Hawaii and Bermuda islands and Peru (Hensen, 1988; Pulawski, 2016).

In the present note we discuss the first records of *C. californicum* from Europe, providing evidence of the introduction and the possible establishment of this sphecid in Croatia.

Examined material (fig. 1-4)

1 ♂: CROATIA, Orebič, 42.9757 N, 17.1624 E, 19.VI.2011, leg. R. Blažek (in the collection of I. Boščik) (pictures of this male are available at: <http://www.entomologiitaliani.net/public/forum/phpBB3/viewtopic.php?f=11&t=65730>).

1 ♀: CROATIA, Dalmatia, Makarska, Veprik, 5.IX.2013, leg. J. Halada (in the collection of M. Mei).

Discussion

C. californicum could be the fifth exotic mud-dauber wasp to become established in Europe over the last few decades (Bitsch *et al.*, 1997; Bitsch, 2010; Pulawski, 2016a, 2016b; Mei *et al.*, 2012), the other four being *Chalybion bengalense* (Dahlbom, 1845), *Sceliphron caementarium* (Drury, 1773), *S. curvatum* (Smith, 1870) and *S. deforme* (Smith, 1856) (we are not taking into account here an odd record of *Chalybion zimmermanni* Dahlbom, 1843, an American species collected once in Belgium (Bitsch *et al.*, 1997)).

The species of the genus *Chalybion* Dahlbom, 1843 whose habits are known nest in preexistent cavities, very often vacated nests of other mud-dauber wasps and bees, and hunt spiders to provision the cells (see Bohart & Menke, 1976, for a review).

The nesting biology of *Chalybion californicum* has been described in detail by Rau (1928; but see also Kurczewski, 2004). This wasp usually takes hold of the nests of the yellow legged mud dauber, *S. caementarium*, acting as a true parasite. The female *Chalybion* carries water to the sealed *Sceliphron* nest, in order to soften the mud walls and to cut an opening into the cells. Through this opening, the female will remove all of the spider prey, as well as the *Sceliphron* egg. As soon as the cell has been emptied, the female refills it with fresh, paralysed spiders and, after laying an egg on one of these, closes the opening again with mud taken from the cell walls, often mixed with other convenient material at hand, such as spider webs, pollen, sawdust or lime (Rau, 1928). After resealing the cells, the female daubs pellets of mud on the nest, giving its surface a characteristic, irregular look (Muma & Jeffers, 1945).

Unlike *S. caementarium*, *C. californicum* shows some preference to hunt its prey on the ground, sometimes under stones. The black widow, *Latrodectus mactans* (Fabricius, 1775) has been listed among its usual spider prey. (Rau, 1935a, 1935b; Muma & Jeffers, 1945; Horner & Klein, 1979; Landes *et al.*, 1987; Dean *et al.*, 1988).

S. caementarium, the host of *C. californicum* in America, shows a considerable dispersal potential and a tendency to invasiveness. Its nests, often constructed on human artifacts, are besides very easily transported over considerable distances (see, for example: Harris, 1992; Schmid-Egger, 2005; Bogusch & Macek, 2005). In the second half of the 20th century, *S. caementarium* has been indeed inadvertently introduced, from its native Nearctic range, into many parts of the world, including central and southern Europe (Bohart & Menke, 1963; van der Vecht & van Breugel, 1968; Schmid-Egger, 2005; Bitsch, 2010; Pulawski, 2016b).

In the Balkan Peninsula, *S. caementarium* has been recorded so far from Slovenia (Gogala, 2011) and Croatia (Gusenleitner, 2002; Józán, 2009). The transport of nests of *S. caementarium* could also result in the introduction of the inquiline *C. californicum* (Hensen, 1988). The recorded localities of *S. caementarium* known so far from Croatia are mostly in Istria and around the Kvarner Gulf, in the north of the country (Gusenleitner, 2002; Józán, 2009). Of course, this may depend on insufficient research and the actual presence of the species also in the south cannot be ruled out. Both collecting sites of *C. californicum* presented in this note are indeed in southern Croatia and are separated by only about 40 km as the crow flies. This would suggest an introduction, possibly through *S. caementarium* nests colonised by the *Chalybion*, that took place directly in that area from some American location. The capture of a male and a female, in different years, would seem to indicate the existence of a stable population. Of course, further investigation will be needed to verify the present state of the species in southern Croatia and its effective acclimatisation and spread.

Chalybion californicum can be distinguished in both sexes from the other six species of *Chalybion* s. str. known to occur in Europe (Mei *et al.*, 2012), and in particular from *C. minos* (De Beaumont, 1965), *C. klapperichi* (Balthasar, 1957), *C. flebile* (Lepelletier, 1845) and *C. omisum* (Kohl, 1889), the four species recorded so far from the Balkan Peninsula, by the tarsi with plantulae (fig. 4), metapleuron with an angular carina between mid- and hind coxae, black pubescence on head and thorax and metanotal flange broadly produced over the propodeum (the latter is a unique apomorphy of the species; Hensen, 1988). The female (fig. 1) is also characterised by the lack of an inner, subapical tooth on the mandible and by the presence of a large depression covered by a dense patch of black micropubescence on the fourth sternite (a smaller, and sparser patch is often present also on the third sternite). The male clypeus (fig. 2) has three sharp teeth, the middle one being smaller than the lateral ones. The male genitalia are as in fig. 3. Furthermore, in both sexes the body is relatively stocky and of a very dark blue colour, the wings being almost black (fig. 1) (the wings of the other six *Chalybion* species are hyaline or more or less infumated, but never so dark).

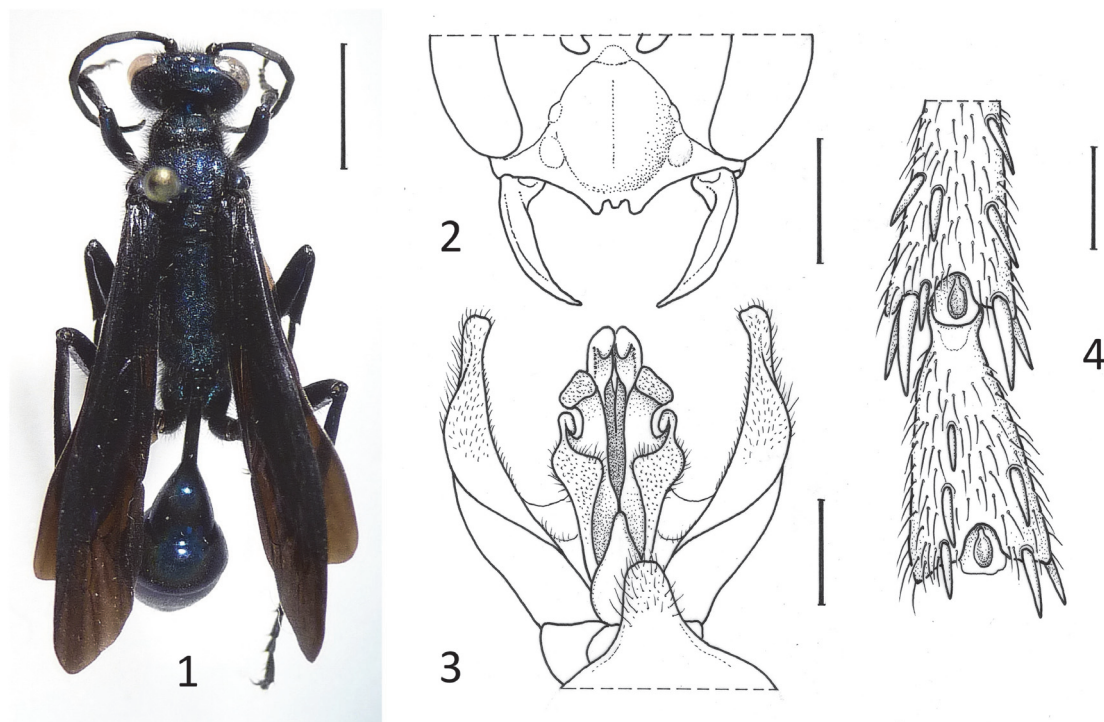


Fig. 1-4: *Chalybion californicum* (de Saussure). **1:** Habitus of female from Makarska (Croatia); scale bar, 5.0 mm. **2:** Male from Orebič (Croatia) - clypeus; scale bar, 1.0 mm. **3:** Male from Orebič (Croatia) - genitalia and eighth sternite, ventral view; scale bar, 0.5 mm. **4:** Male from Orebič (Croatia) - detail of III and IV hind tarsomeres in ventral view, showing plantulae; scale bar, 0.3 mm. **1:** Hábitus de la hembra de Makarska (Croacia); barra de escala, 5'0 mm. **2:** Macho de Orebič (Croacia) - clipeo; barra de escala, 1'0 mm. **3:** Macho de Orebič (Croacia) - genitalia y octavo esternito, en vista ventral; barra de escala, 0'5 mm. **4:** Macho de Orebič (Croacia) - detalle de los tarsómeros posteriores III y IV, en vista ventral, mostrando las plantulae; barra de escala, 0'3 mm.

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