

# The oriental mud-dauber wasp *Chalybion bengalense* (Dahlbom) introduced in Italy (Hymenoptera, Sphecidae)

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## Zusammenfassung

Maurizio Mei, Giorgio Pezzi, Remo De Togni, Umberto Devincenzo: **Die orientalische Mörtelwespe *Chalybion bengalense* (Dahlbom) eingeführt in Italien (Hymenoptera, Sphecidae).** Der erste Nachweis der orientalischen Mörtelwespe *Chalybion bengalense* (Dahlbom, 1845) in Italien und Europa wird vorgestellt und diskutiert. Die Art ist inzwischen in der Region Veneto im Nordosten Italiens etabliert.

## Summary

The first evidence of the introduction of the oriental mud-dauber wasp *Chalybion bengalense* (Dahlbom, 1845) in Italy and Europe is presented and discussed. The species is by now established in Verona and Rovigo provinces (Veneto region, Northeastern Italy).

## Introduction

The mud dauber wasp *Chalybion bengalense* (Dahlbom, 1845) is perhaps the most widespread species of the genus. It has been recorded from the Eastern coasts of Africa, the Sinai Peninsula, Oman and Iraq, eastward through India, China, Japan, Indonesia and the Philippines, to New Guinea and Australia (Hensen 1988; Pulawski 2012). Throughout this range, the species is also known from most islands and archipels in the Indian and the Pacific oceans. Very recently, moreover, *C. bengalense* has been found also in Florida, U.S.A. (Halbert 2009). Like the other species of the genus whose habits are known (see Bohart & Menke 1976, for a review), this wasp nests in preexistent cavities, very often vacated nests of other mud-dauber wasps and bees, and hunts spiders to provision the cells (Dutt 1912; Friederichs 1918; Bohart & Menke 1976; Sundhendrakumar & Narendran 1989).

In the present note we discuss the first record of *C. bengalense* from Europe, providing evidence of the introduction and the establishment of this sphecid in Italy.

## Examined material

1 ♀, Verona, Legnago, Porto nord, left bank of the river Adige, (45°12'09.76"N 11°18'02.40"E), 08.07.2008, R. De Togni leg.; 2 ♂♂, Verona, Legnago, Vigo, (45°10'18.25"N 11°20'02.37"E), 16.07.2008, R. De Togni leg.; 1 ♂ 1 ♀, Verona, Legnago nord, (45°12'03.44"N 11°17'40.83"E), 17.06.2009, R. De Togni leg.; 1 ♂ 1 ♀, Verona, Legnago, Vigo, right bank of the river Adige, (45°10'18.25"N 11°20'02.37"E), 19.06.2009, R. De Togni leg.; 4 ♂♂ 3 ♀♀, Verona, Legnago, S. Pietro, Peschiere, (45°11'49.11"N 11°15' 46.29"E), 10-15.07.2011, reared from nest, R. De Togni leg.; 1 ♀, Verona, Cerea (45°11'37.52"N 11°12'30.75"E), 11.07.2011, R. De Togni leg.; 1 ♂, Verona,

Oppeano, Ca' degli Oppi, (45°17'41.78"N 11°08'03.53"E), 30.VII.2011, A. Sette leg.; 1 ♂, Rovigo, Giacciano con Baruchella, (45°3'52.40"N 11°27'17.02"E), VI.2011, on flowers of *Ziziphus ziziphus* Miller, U. Devincenzo leg. Some of these specimens are in the collections of M. Mei, G. Pezzi and G. Pagliano (Turin), the others, together with the mud nest, will be deposited in the Museo Civico di Storia Naturale of Verona.

**Notes.** Most of the specimens were collected while feeding on flowers of Jujube (*Ziziphus ziziphus*), in full sun and in the hottest hours of the day, but always in close proximity of buildings. The species has never been observed in open countryside. In the site of Giacciano con Baruchella, several *C. bengalense* were observed feeding on the same Jujube tree and, in several occasions, individuals were seen entering buildings in the town. Furthermore, several specimens were observed flying around potted shrubs of boxwood (*Buxus sempervirens* Linné) in the cemetery of Sanguinetto (45°11'20.35"N 11°08'52.21"E), near the town of Cerea, about 12 km west of Legnago. It is most likely that a specimen published by Sanna (2010), found in the town of Bovolone (Verona) (45°15'31.04"N 11°07'11.38"E), 16 km NW of Legnago, belongs to this species as well. A pair from Legnago and some morphological details are figured (figs. 1-2).

The studied nest was made in a old, vacated mud-nest of a species of *Sceliphron* Klug, 1801, very likely of *Sceliphron caementarium* (Drury, 1773), another invasive sphecid that is by now the most common mud-dauber species at low altitude in the Adige and Po plains and in most of Northern Italy (pers. obs.). The nest was found inside a room once used as a stable, attached behind a cupboard. From the same nest emerged also 6 ♂♂ and 2 ♀♀ of the ichneumonid *Acroricnus seductor* (Scopoli, 1786) (see below).



Fig. 1: *Chalybion bengalense* (Dahlbom), ♂ and ♀ from Legnago (Verona, Italy).

## Discussion

*C. bengalense* is the fourth exotic mud-dauber wasp to become established in Europe over the last few decades (Bitsch 2010; Pulawski 2012), the three other belonging to the related genus *Sceliphron*: *S. caementarium*, *S. curvatum* (Smith, 1870) and *S. deforme* (Smith, 1856). These wasps show a considerable dispersal potential and a tendency to invasiveness. They live often in association with human settlements, and their nests, often constructed on human artifacts, are very easily transported also over considerable distances (see, for example: Harris 1992; Cetkovic et al. 2011; Schmid-Egger, 2005). *C. bengalense* in particular, is known to use almost every suitable natural or artificial cavities for its nests that consist often in only a few cells (Dutt 1912; Sundhendrakumar & Narendran 1989), and this certainly increases the chances of accidental introduction through human activities.

All the above mentioned records are from localities scattered over a distance of about 40 km in the plain of the Adige river, between the cities of Verona and Rovi-

go (Veneto region, Northeastern Italy). In this area the species has been collected and observed more or less regularly at least through the last four years, and can be considered by now well established. It will be interesting to observe the dynamics of this population and see if and when the species will expand in the future in other areas.

The ichneumonid parasitoid *Acroricnus seductor* reared from the nest collected from Legnago, is a common West Palaearctic species and a well known parasite of *Sceliphron spirifex* (Linné, 1758) and *S. destillatorium* (Illiger, 1807) (Frilli 1966; Yu et al. 2005). It has been also recorded from nests of *Sceliphron caementarium* in Italy and possibly France (Campadelli et al. 1999; Carrière 2003). Up to now, the only known parasitoids of *Chalybion* spp. are species in the families Leucospididae and Eulophidae (Hymenoptera, Chalcidoidea) and only the eulophid *Melittobia assemi* Dahms, 1984 as been recorded as parasite of *C. bengalense* (Noyes, 2011). In the observed nest, 8 out of 16 cells were occupied by *Acroricnus*, whose adults emerged in the same period

as the *Chalybion* adults. We think there is the possibility that *Chalybion* was the actual host of the ichneumonid, but as by the present evidence we cannot rule out with certainty a parasitism on *Sceliphron*, we defer to future research the study of this problem.

Six species of *Chalybion* s. str., including *C. bengalense*, are known so far to occur in Europe (Bitsch 2010; Pulawski 2012); we do not take into account here an odd record of *C. zimmermanni* Dahlbom, 1843, an american species collected once in Belgium (Bitsch et al. 1997). Two of these species, *C. flebile* (Lepeletier, 1845) and *C. omissum* (Kohl, 1889), were already recorded also from Italy, where they have a rather marginal distribution. *C. flebile* is known from the islands of Sardinia and Sicily while *C. omissum* is present only in the Friuli region (Negrisolò & Pagliano, 2005), at the very north east of the country, not far from the area where *C. bengalense* have been discovered.

### Key to the species of *Chalybion* (Dahlbom) s. str. occurring in Europe

See also Hensen, 1988. The male of *C. klapperichi* is still unknown.

- 1. Females (12 antennal segments) . . . . . **2**
  - Males (13 antennal segments) . . . . . **7**
- 2. Fourth metasomal sternite with a large patch of micro-pubesence covering at least its posterior half . . . . . **3**
  - Fourth metasomal sternite without micro-pubesence or with only a small patch on anterior half . . . . . **6**
- 3. Propodeal dorsum longitudinally striate on posterior half. Afghanistan, Greece . . . . . **klapperichi** (Balthasar)
  - Propodeal dorsum transversely striate on all its length . . . . . **4**
- 4. Clypeus with three broad apical lobes of nearly equal width (further lateral lobes absent); anterior part of the metapleuron weakly punctured, shiny, contrasting with the coarsely sculptured mesopleuron, posterior part striate. Rhodes, Turkey to Kazakhstan . . . . . **walteri** (Khol)
  - Outer lobes of clypeus present, though sometimes small; median lobe often narrower than submedian ones; sculpture of the anterior part of metapleuron nearly as strong as that of mesopleuron . . . . . **5**

- 5. Petiolus nearly as long as hind basitarsus; lateral lobes of clypeus as strong as the submedian; claws of hind legs without inner subbasal tooth. Greece, Turkey . . . . . **minos** (De Beaumont)
  - Petiolus much shorter than hind basitarsus; median lobe of clypeus much narrower than submedian ones; claws of the hind legs with inner subbasal tooth. Italy and Balcans to Israel . . . . . **omissum** (Kohl)
- 6. Metapleuron transversely striate; clypeus longer than shortest interocular distance across clypeus, the median lobe as wide as submedian; fourth sternite without patch of micro-pubesence. Mediterranean region to Arabia and Pakistan . . . . . **fleBILE** (Lepeletier)
  - Metapleuron not striate; clypeus shorter than shortest interocular distance across clypeus, the median lobe usually distinctly narrower than submedian (Fig. 2a); fourth sternite with a small patch of micro-pubesence on its anterior half. East Africa, Oriental Region to New Guinea, Australia, Italy . . . . . **bengalense** (Dahlbom)
- 7. Eighth metasomal sternite with narrow apical process; flagellum without placoids on fourth and fifth segment . . . . . **8**
  - Eighth metasomal sternite more or less triangular; placoids also on fourth and fifth segment. . . . . **90**
- 8. Petiolus much shorter than hind basitarsus; flagellum with placoids on eighth and ninth segment only. Italy and Balcans to Israel . . . . . **omissum** (Kohl)
  - Petiolus nearly as long as hind basitarsus; flagellum with placoids also on sixth and seventh segment . . . . . **9**
- 9. Metapleuron strongly transversely striate; mesopleuron very densely punctate; placoids on sixth to ninth segment. Greece, Turkey . . . . . **minos** (De Beaumont)
  - Metapleuron not striate; mesopleuron less densely punctate, with well defined smooth interspaces; placoids on fifth (or sixth) to ninth segment . (Fig. 2b, c, d) East Africa, Oriental Region to New Guinea, Australia, Italy . . . . . **bengalense** (Dahlbom)
- 10. Clypeus with three small pointed teeth, as long as shortest interocular width across clypeus. Mediterranean region to Arabia and Pakistan . . . . . **fleBILE** (Lepeletier)
  - Clypeus with three broad and rounded teeth, shorter than interocular width across clypeus. Rhodes, Turkey to Kazakhstan . . . . . **walteri** (Khol)

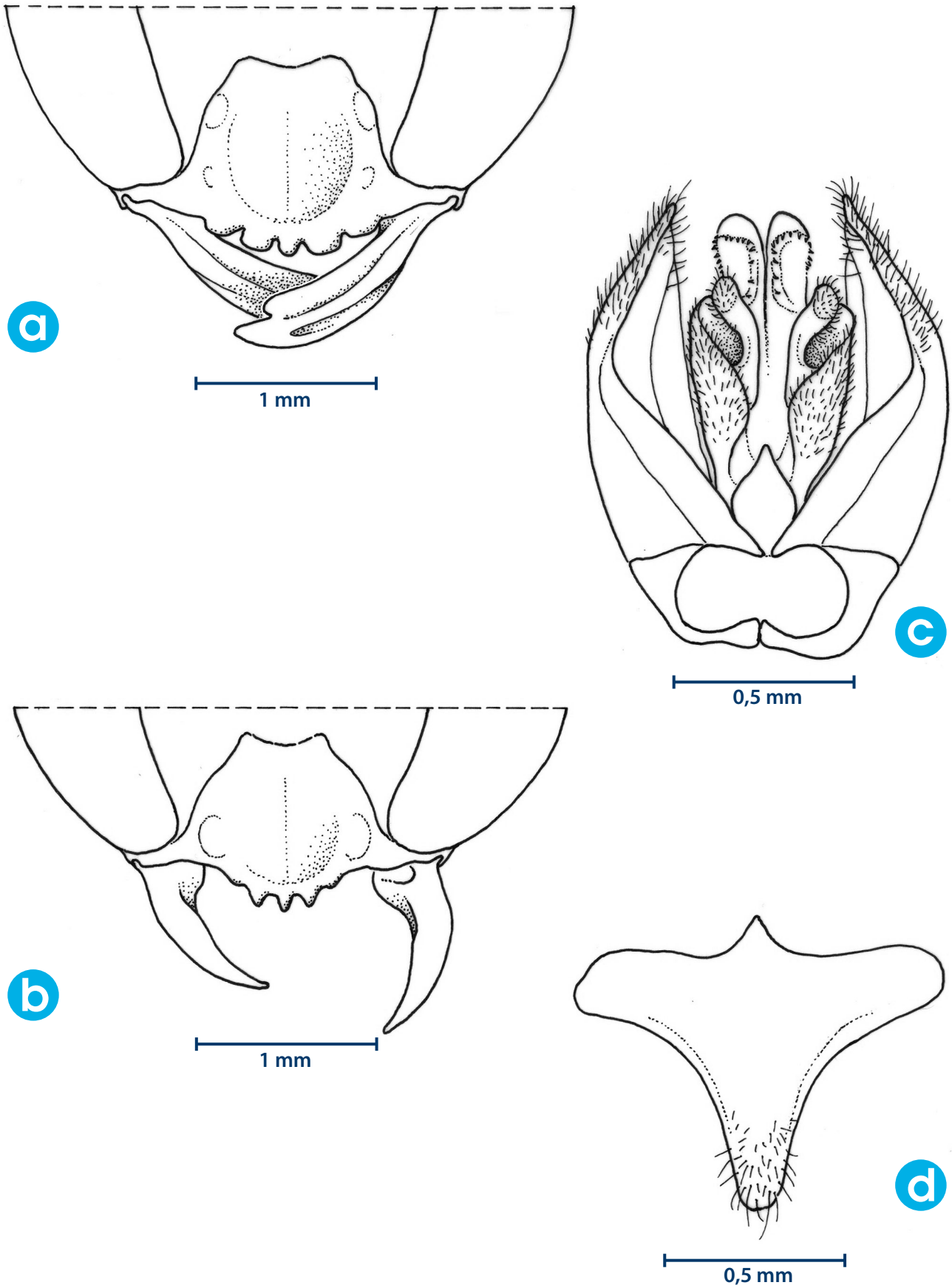


Fig. 2: *Chalybion bengalense* (Dahlbom). ♀ from Legnago (Verona, Italy) a: clypeus. ♂ from Oppeano (Verona, Italy) b: clypeus; c: genitalia, ventral view; d: eighth sternite.

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