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VESPA ORIENTALIS (*Hymenoptera Vespidae*), THE FIRST RECORD IN MARCHE REGION

SUMMARY

The presence of *Vespa orientalis* Linnaeus, 1771 (Hymenoptera Vespidae) was reported for the first time on the eastern side of the Italian peninsula, in Ancona (Marche Region). After an initial sighting by a beekeeper, sampling was carried out directly in the apiary and the identity of the insects captured was subsequently confirmed in the laboratory.

Key words: first record, beekiping, Ancona

RIASSUNTO

Vespa orientalis *(Hymenoptera Vespidae), prima segnalazione nella Regione Marche.* Viene segnalata per la prima volta nel versante orientale della Penisola italiana, ad Ancona (Regione Marche) la presenza di *Vespa orientalis* Linnaeus, 1771 (Hymenoptera Vespidae). Dopo un primo avvistamento da parte di un apicoltore, sono stati effettuati dei campionamenti direttamente in apiario e l'identità degli insetti catturati è stata successivamente confermata in laboratorio.

Parole chiave: prima segnalazione, apicoltura, Ancona

Introduction

The oriental hornet *Vespa orientalis* Linnaeus, 1771 (Hymenoptera Vespidae), is a eusocial wasp generally characterized by nesting in closed underground or aerial spaces (Archer, 2012). This species is known for its role as a generalist predator, making it a significant threat to various insects and in particular to honey bees. *V. orientalis* is a common and widespread

species of hornet native to the south-eastern Mediterranean, north-eastern and eastern Africa, the Middle East, Central Asia (Carpenter & Kojima, 1997; Cetkovic, 2003; Archer, 2012) up to the Indian subregion (Archer, 1998; Cetkovic, 2003). In the last decades, it has been introduced in several new countries, although it has not always become established (Hernandez *et al.*, 2013; Rafi *et al.*, 2017; Temreshev, 2018; Sanchez *et al.,* 2019; Rios *et al.*, 2020; Gereys *et al.*, 2021; Zachi & Ruicanescu, 2021; Ceccolini 2021).

In Italy, *V. orientalis* was naturally present in the southern regions, such as Sicily, Calabria and Campania (Archer, 1998; etkovi , 2003) until recent years, when it has been observed expanding northwards along the Italian western regions, through Lazio (Bressi *et al.*, 2019), Toscana and Liguria (Gereys *et al.,* 2021). This species reached, through the Balkans, Trieste, in the north-eastern end of Italy (Bressi *et al.,* 2019; Graziani & Cianferoni, 2021).

To date, the oriental hornet has never been observed in Central Italy, east of the Apennine chain. Therefore, the first recorded presence of this hornet specie in Ancona, an area that could be a well-suited for its establishment, point out significant attention for the future.

Materials And Methods

The insects were captured in the apiary located within Cittadella city park (43°36'45"N; 13°30'37"E, 102 a.s.l.,) (Fig. 1) in Ancona, Marche Region, Italy, using an entomological net. The samples were successively identified at the laboratory of the Dipartimento di Scienze Agrarie, Alimentari ed Ambientali of Università Politecnica delle Marche, Ancona, Italy, to ascertain the species.

Results

Vespa orientalis was observed and isolated in the apiary within the Cittadella city park of Ancona, which is located approximately 500 meters from the tourist and commercial port of Ancona (Fig. 1).

The first presence was recorded on September 18th, 2023, at 10 am. Four female workers were observed by the beekeeper hunting in front and behind the apiary; the weather was sunny, and the temperature was 26 °C. Three days later, on September 21st, 2023, at 9.30 am, with cloudy weather and 23 °C, after approximately one hour of waiting, a female that was hunting in front of the hive was observed and captured. The last sampling was done on October 11th, 2023 (Fig. 2). In this occasion, taking into

Fig. 1 — Aerial photograph of Ancona indicating the position of the apiary where the records occurred. The proximity to the touristic and commercial port is highlighted (after Google Earth, 2023, modified).

consideration that *V. orientalis*, in contrast with other hornets, shows a peak of activity in the middle of the day (ISHAY *et al.*, 1967), to ensure a successful catch, the sampling was done at 12.00 and two hunting females were captured. The weather was sunny, and the temperature was 27 °C.

The constant presence of *V. orientalis* in the apiary indicates the existence of at least one nest in the surrounding area of the hive. Unfortunately, these observations do not provide sufficient information to determine the presence of more nests around.

This first record in Ancona, the only one east of the Apennine chain, is of significant importance due to this ecological characteristic of this territory. In fact, it could potentially be a new establishment area for *V. orientalis*, especially if the climatic trends of recent years, characterized by high summer temperatures, very favorable to this species, will be confirmed in the coming years. Moreover, Ancona is a commercial and touristic hub, from which the hornet could potentially move north and/or south by anthropic actions and/or active spreading (BUTIKOFER *et al.,* 2018; BRESSI *et al.,* 2019; FAJARDO & SANCHEZ, 2020; CIANFERONI *et al.,* 2021; ZACHI & RUICANESCU, 2021).

There are two hypotheses regarding how this wasp could have reached Ancona. The first hypothesis involves a natural active spreading from the

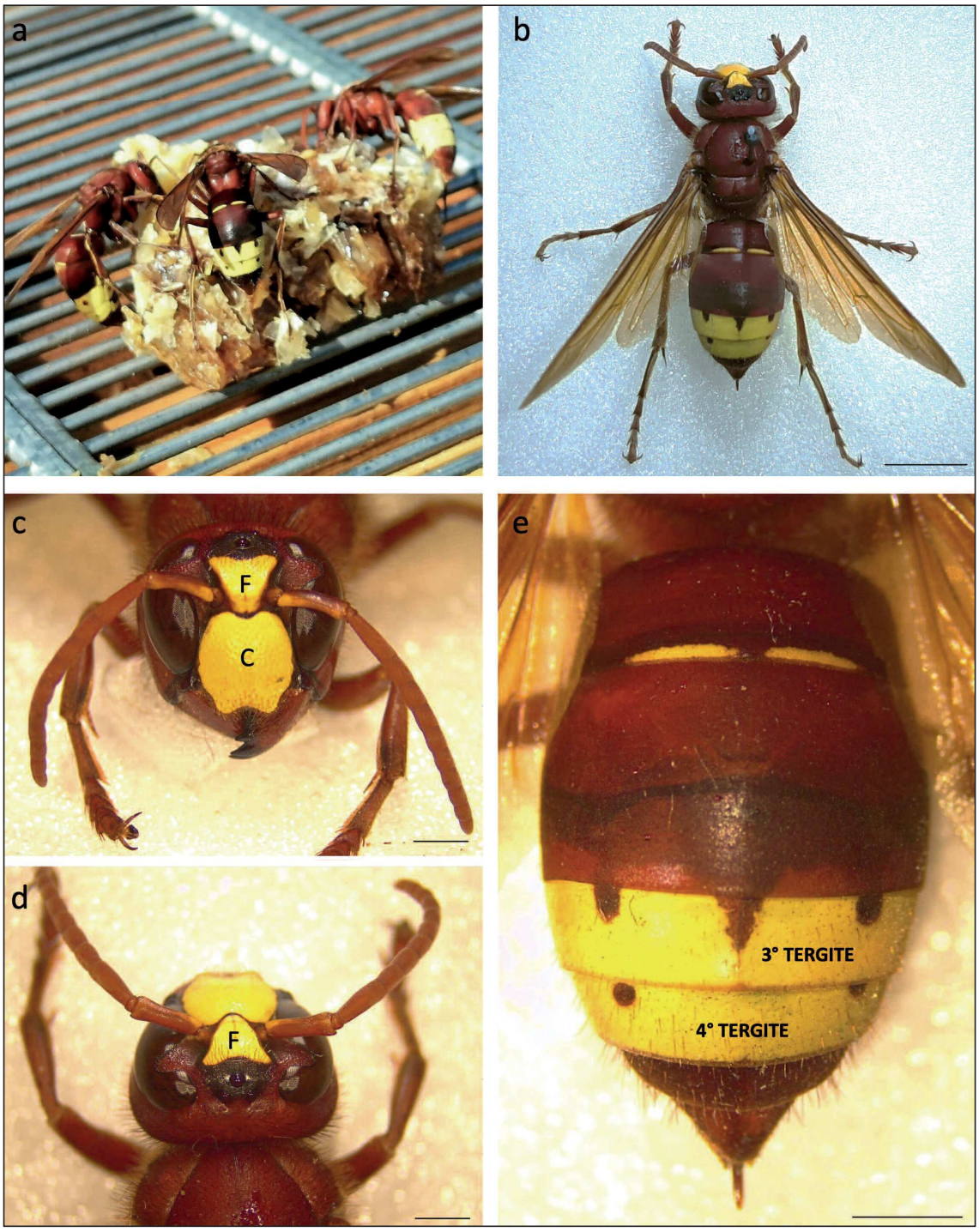

Fig. 2 — *Vespa orientalis* recorded in Ancona, Italy. *a)* workers eating honey in an apiary in Ischia (ph. Raffaella Scotti); *b)* worker female collected in Ancona, Italy, 11 October 2023, it is visible the reddish body with yellow parts on the head and abdomen. *c)* frontal view of the head in which are visible the yellows clypeus and front; *d)* dorsal view of the head in which is visible the yellow front; *e)* dorsal view of the abdomen in which are visible the 3rd and 4th abdominal segments yellow colored. On the 3rd tergite the reddish color forms an arrowhead in the central dorsal area and two symmetrical drop-like spots are present laterally. On the 4th tergite are present two small reddish circular spots in line with the drops-like ones of the 3rd tergite. Scale bar: b = 50 mm; c, d = 10 mm; e = 20 mm.

western side of the Italian Peninsula, where it is well established and widely distributed (e.g. Lazio, Toscana). The second hypothesis suggest a potential introduction by human activities. Of the two hypotheses, the second one is considered more reliable. In fact, there have been no other records that would suggest a potential natural passage from the west, furthermore the climatic conditions of the Apennines Mountains, despite the increase in temperature, are not optimal for the development of oriental hornet colonies (PLOTKIN *et al.,* 2010; TAHA, 2014). Most likely, the proximity to the tourist and commercial harbor of Ancona could be the easier way of its introduction. In fact, several reports have recently been recorded from large harbor areas of some cities, like Genoa, Trieste and Marseille (BRESSI *et al.,* 2019; GEREYS *et al.,* 2021).

V. orientalis is probably undergoing active spread. Its establishment and expansion will rapidly continue through the surrounding area of Ancona and new records may probably occur as early as next spring. In fact, the oriental hornet could be found in this area due to the abundance of shelters, food (FARINHA-MARQUES *et al.,* 2011; BRESSI *et al.,* 2019), and the absence of predators (BRESSI *et al.,* 2019). The city of Ancona has several natural parks with several abandoned historic buildings immersed and surrounded by natural environments. These areas host both apiaries and wild eusocial insect nests. Moreover, the feeding of the colony could also be favored by the presence of waste and food remains (BRESSI *et al.,* 2019), resources that the hornets could easily find, especially in the harbor area.

While *V. orientalis* is not considered an exotic species in Italy, it is mandatory to monitor and control its movements due to the risks it causes to various aspects, including wild eusocial bees, beekeeping (GLAIIM, 2009; GEREYS *et al.,* 2021), agriculture (ABDEL-GHANY *et al.,* 2009; GRAZIANI & CIANFERONI, 2021), and even also human health (GRAZIANI & CIANFERONI, 2021). For these reasons in the following season the species will be monitored by the beekeepers of Ancona and the surrounding areas with the coordination of the Polytechnic University of Marche. In addition, further research to verify the presence of nests in Ancona will be carried out.

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