New records and review of the occurrence of the oriental hornet Vespa orientalis Linnaeus, 1771 in the islands of Greece (Hymenoptera: Vespidae: Vespinae)

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A review of the oriental hornet *Vespa orientalis* (Hymenoptera: Vespidae: Vespinae) Linnaeus, 1771 distribution in the islands of Greece

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ABSTRACT

Records of *Vespa orientalis* Linnaeus, 1771 for 28 islands of Greece are given: in 18 islands (Agistri, Euboea, Folegandros, Kalamos, Kalymnos, Karpathos, Kos, Leros, Lefkada, Naxos, Nisyros, Paros, Patmos, Pserimos, Telendos, Tilos, Tinos, Sifnos), these occurrences are the first record of the species for them. The total number of Greek islands in which *V. orientalis* is known becomes 33.

KEY WORDS: distribution, faunistics, Greek islands, wasp.

Introduction

The genus *Vespa* Linnaeus, 1758 consists of 22 species of large eusocial wasps, most of which with a distribution restricted to Asia (Carpenter & Kojima 1997; Archer 2012; Perrard et al. 2013). In Europe only two species are native (Gusenleitner 2013), but during the recent years two alien species have been added in the continent (see Castro 2019; Laurino et al. 2019).

In Greece, the genus is represented by two species native in Europe: *Vespa crabro* Linnaeus, 1758 and *V. orientalis* Linnaeus, 1771 (Gusenleitner 2013). The latter species is originally distributed from southern Europe and northern Africa (up to the Horn of Africa in the south), across the Middle East to India, Nepal, central Asia and western China (Carpenter & Kojima, 1997; Ćetković, 2004; Archer, 2012). In the recent years it has been introduced in several countries—for a summary on the current non-native distribution see Zachi & Ruicănescu (2021), Gereyes et al. (2021), Werenkraut et al. (2021) and Ceccolini (2021). A complete review of the distribution of *V. orientalis* in Greece was published by Ćetković (2004) who reported all known records from both literature sources and material examined by himself: in this work the occurrence of this hornet was reported from 15 islands, as well as from the mainland. This number appears to be a consequence of undersampling and seems to be quite inadequate to represent the real distribution of the species in the Greek islands, considering that this country has some thousands of islands of which about one hundred extend over areas of at least 5 km² (https://www.statistics.gr).

Herein, new records of *V. orientalis* from several Greek islands are reported and an updated list of the islands of Greece in which the species is known is provided.

Materials and Methods

The examined material originates from the web platform iNaturalist (www.inaturalist.org).

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Specimens of *Vespa orientalis* can easily be identified by photos because of the habitus of the species, which is well recognizable by its entirely largely reddish-brown colour with yellow markings on the face and the presence of a yellow band across the gaster (Archer 2012; Smith-Pardo et al. 2020).

For each site, the following information is given: locality, geographical coordinates, date, number of specimens, photo authority. For each locality, geographical coordinates are in decimal degrees (datum WGS84). Number of decimals varies according to the accuracy of the data. Uncertainty (abbreviated as un.) of the data (in metres) was indicated according to the point-radius method (Wieczorek et al. 2004). Each record was identified or confirmed by the author.

**Material examined**

**Ionian Islands:**


*Corfu:* Old Fortress, 39.623417° N 19.929603° E (un. = 251 m), 3.X.2020, 1 ex., photo by “Sotiria Mb”.

*Kalamas:* near Kalamas, 38.631022° N 20.941387° E (un. = 5 m), 11.VII.2019, 1 ex., photo by “tikitu”.


**Zakynthos:** Laperda Beach, 37.856068° N 20.746983° E (un. not recorded), 2.VIII.2020, 1 ex., photo by “Véra Sz.;” Stasi Leoforiou, 37.718478° N 20.858282° E (un. = 190 m), 26.IX.2021, 1 ex., photo by Royce Cumming.

**Saronic Islands:**

*Agistri:* Dragonera Beach, 37.696955° N 23.33197° E (un. = 5 m), 7.VIII.2019, 1 ex., photo by Jonathan Riedel.

**Euboea and surrounding islands**


**Aegean Islands:**

**Dodecanese**


*Karpathos:* 35.575949° N 27.14014° E (un. = 526 m), 15.VII.2021, 1 ex. (Fig. 2), photo by Benoît Segerer.

*Kos:* Tigaki, 36.883858° N 27.179944° E (un. = 977 m), 15.XII.2019, 1 ex., photo by Harrys Reisis; Igrotopos - Akti Psalidiou, 36.885837° N 27.340292° E (un. not recorded), 5.X.2019, 1 ex., photo by Almut Martens; near Agios Fokas Beach,
36.859731° N 27.34821° E (un. = 2 m), 7.VII.2020, 1 ex., photo by “mnauky”; near Chapel St John Perigialiti, 36.832264° N 27.06107° E (un. = 8 m), 23.IX.2019, 1 ex., photo by “manroth”; Kardámaina, 36.774457°N 27.133121° E (un. = 35 m), 16.VIII.2019, 1 ex., photo by “anlias”; Kefalos, 36.744239° N 26.967029° E (un. = 77 m), 1.V.2021, 1 ex., photo by “expatp”.

**FIG. 1:** Specimen of *Vespa orientalis* from Karpathos Island (photo by Benoît Segerer).

Milos: Agathia Beach, 36.72726° N 24.34143° E (un. = 4 m), 27.VIII.2018, 1 ex., photo by “g-natural”.


Nisyros: Emporios, 36.603213° N 27.177195° E (un. not recorded), 23.VIII.2019, 1 ex. (Fig. 3), photo by Giorgos Nikolakakis; near Stefanos Crater, 36.579618° N 27.167563° E (un. not recorded), 28.IX.2018, 1 ex., photo by Almut Martens.


**FIG. 2:** Specimen of *Vespa orientalis* from Nisyros Island (photo by Giorgos Nikolakakis).


Patmos: northern part of the island, 37.36662° N 26.575962° E (un. = 5 m), 17.VIII.2021, 1 ex., photo by “elisaredavid”.

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Serifos: Moni Taxiarchon, 37.19182° N 24.509175° E (un. = 10 m), 4.IX.2021, 1 ex., photo by “naturaliste”.

Sifnos: Exambela, 36.974124° N 24.731714° E (un. = 172 m), 22.X.2010, 2 adults and 1 larva (Fig. 1), photo by Kim Moore.

FIG. 3: Adults and larva of Vespa orientalis from Sifnos Island (photo by Kim Moore).

Telendos: Telendos village, 36.99817° N 26.92092° E (un. = 10 m), 12.IX.2018, 1 ex., photo by “libertyruth”.

The Cyclades

Tilos: Livadia, 36.415111° N 27.384746° E (un. = 10 m), 3.IX.2016, 1 ex., photo by Magne Flåten.


Cretan islands

Crete: Kissamos, 35.48424° N 23.57867° E (un. = 92 m), 11.IX.2021, 1 ex., photo by “lasmalla”; near Maléme airport, 35.528938° N 23.825171° E (un. = 31 m), 8.IX.2018, 1 ex., photo by John Cree; near Gouverneto Monastery, 35.57216° N 24.133874° E (un. = 977 m), 2.XII.2020, at least 3 exx., photo by “fotis-samaritakis”;


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23.688736° E (un. = 23 m), 20.IX.2021, 1 ex., photo by Julian Kokott; Elafonisi (island), 35.268862° N 23.533225° E (un. = 5 m), 27.IX.2019, 1 ex., photo by “elenor”; Epar. Od. Kastelliou – Kefaliou, 35.358031° N 23.562308° E (un. = 95 m), 13.IX.2021, 1 ex., photo by “lasmalla”.

Gavdos: 34.839272° N 24.089732° E (un. = 6450 m), 5.VII.2020, 1 ex., photo by Alexandros Quartarone.

The list of the Greek islands in which *V. orientalis* is known is reported in Table 1.

### TABLE 1. List of the islands (in alphabetical order) in which *Vespa orientalis* is known. Islands marked with an asterisk are reported for the first time in the present work. Only references with original data are quoted.

<table>
<thead>
<tr>
<th>Island</th>
<th>References</th>
</tr>
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<tr>
<td>Agistri*</td>
<td>Present work</td>
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<td>Cephalonia</td>
<td>Giordani Soika 1953; Ćetković 2004; Present work</td>
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<tr>
<td>Chios</td>
<td>Alfken et al. 1934</td>
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<td>Corfu</td>
<td>Giordani Soika 1953; Present work</td>
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<tr>
<td>Crete</td>
<td>Giordani Soika 1953; Blüthgen &amp; Gusenleitner 1970; Ćetković 2004; Present work</td>
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<td>Euboea*</td>
<td>Present work</td>
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<tr>
<td>Folegandros*</td>
<td>Present work</td>
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<tr>
<td>Gavdos</td>
<td>Ćetković 2004; Present work</td>
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<tr>
<td>Ikaria</td>
<td>Alfken et al. 1934; Giordani Soika 1953</td>
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<tr>
<td>Kalamos*</td>
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<td>Kalymnos*</td>
<td>Present work</td>
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<td>Karpathos*</td>
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<tr>
<td>Kos*</td>
<td>Present work</td>
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<tr>
<td>Leros*</td>
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<td>Lesbos</td>
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<td>Lefkada*</td>
<td>Present work</td>
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<tr>
<td>Milos</td>
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<td>Patmos*</td>
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<td>Pserimos*</td>
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<td>Atanassov 1942; Ćetković 2004</td>
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<td>Tilos*</td>
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<td>Tinos*</td>
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<td>Samos</td>
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<td>Present work</td>
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<tr>
<td>Siros</td>
<td>Giordani Soika 1953</td>
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<td>Zakynthos</td>
<td>Giordani Soika 1953; Present work</td>
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Conclusions

With the present work, the occurrence of *Vespa orientalis* in 28 Greek islands is documented. This includes first records for 18 islands. Currently, also considering references sources, the number of islands of Greece in which *V. orientalis* is documented is 33, as summarized in Fig. 4 and Table 1. Therefore, the knowledge of *V. orientalis* distribution in insular Greece is now more than doubled (from 15 to 33 islands). Further research might show even more widespread presence of this highly successful overseas colonizer.

Acknowledgements

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**CECCOLINI: Distribution of Vespa orientalis in Greek islands**

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**ΠΕΡΙΛΗΨΗ**

Στην παρούσα εργασία δίνονται καταγραφές της παρουσίας του είδους *Vespa orientalis* Linnaeus, 1771 από 28 νησιά της Ελλάδας, στα 18 από τα οποία (Αγκίστρι, Εύβοια, Φολέγανδρος, Κάλαμος, Κάλυμνος, Κάρπαθος, Κως, Λέρος, Λευκάδα, Νάξος, Νίσυρος, Πάρος, Πάτμος, Τελένδος, Ψήρημος, Τήνος, Σίφνος), τα περιστατικά αυτά αποτελούν πρώτες καταγραφές για την τοποθεσία. Ο συνολικός αριθμός των ελληνικών νησιών στα οποία είναι πλέον καταγεγραμμένη η παρουσία του *V. orientalis* ανέρχεται στα 33.