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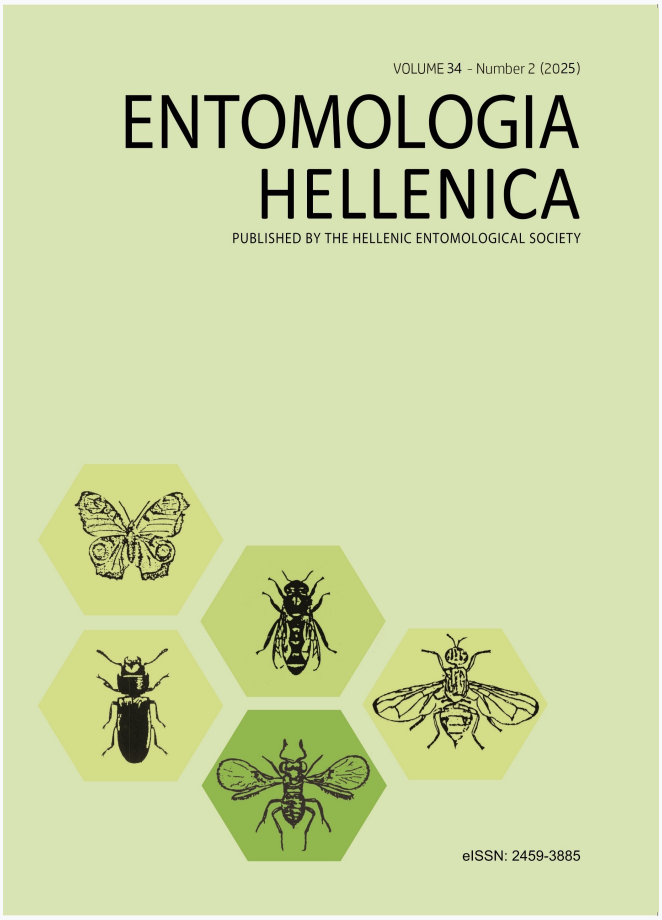

First record for Camponotus vagus (Hymenoptera: Formicidae) in Crete, Greece

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First record for *Camponotus vagus* (Hymenoptera: Formicidae) in Crete, Greece

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ABSTRACT

Camponotus vagus (Scopoli, 1763) is a lignicolous ant species widespread in Europe and Greece, including some large Mediterranean islands. Herein, the first record for the species in the island of Crete is presented.

KEY WORDS: *Camponotus vagus*, Crete, distribution, Formicidae

Introduction

Camponotus vagus (Scopoli, 1763) is a south European – West-Siberian species (Seifert 2018) present in large Mediterranean islands e.g. Sicily (Schifani 2022), Corsica (Blatrix et al. 2018) and Sardinia (Schifani et al. 2021). The species is widespread in continental Greece and is also present in the Ionian Islands and Euboea (Borowiec & Salata 2012, Borowiec & Salata 2022). Colonies nest in dead wood, mostly in the lowlands, in a variety of forests including olive plantations (Seifert 2018, Borowiec & Salata 2022).

It belongs to the subgenus *Camponotus* sensu stricto, composed of large species with an alobed clypeus, without a central carina, and the profile of the mesosoma not truncated (Forel, 1914). The other two European species of the subgenus, *Camponotus herculeanus* (Linnaeus, 1758) and *Camponotus ligniperda* (Latreille, 1802) inhabit colder habitats, being restricted in southern Europe to high mountains (Seifert 2018, Borowiec & Salata 2022). Morphologically, *C. vagus* is distinguished by its blackish mesosoma and profuse pilosity while in *C. herculeanus* and *C. ligniperda* the mesosoma is reddish and chaetotaxy is sparser (Seifert 2018).

Material and methods

One dead major worker (Fig. 1) being carried by *Aphaenogaster simonellii* Emery, 1894 foragers was collected near the entrance to the Samaria Gorge, Crete, 11/7/2019, 35.308N 23.916E, 1250 m.a.s.l., shrubby vegetation, but not far from pine forests. F. García leg.

The identification of the specimen was performed following the identification keys by Seifert (2018) and Borowiec & Salata (2022).

The biometric measurements and indexes were measured with an ocular micrometer at a maximum magnification of 60×. CL: cephalic length in frontal view, from the anterior border of the clypeus to the occipital border; CW: maximum cephalic width in frontal view; CS: cephalic size, mean of CL and CW; SL: maximum scape length; PoOc: postocular distance, in frontal view from the posterior border of the eyes to the occipital border; ML: mesosoma length, in lateral view from the anterior point of the pronotum to the posterior border of the metapleural gland; MW: maximum mesosoma width in dorsal view, across the pronotum; EYE: mean of the longest and shorter diameters of eye; HTL: length of the posterior tibia; GHL: length of the longest hair on the anterior part

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Table 1. Biometric and chaetotaxy indexes in European *C. vagus* workers and in the worker from Crete. CS in mm.

Sample	***C. vagus Europe***	***C. vagus Crete***
n=	44 from 15 nests	1
CS	2.678 ± 0,416 (1.765; 3.400)	2.847
$CL/CW_{2.6mm}$	1.026 ± 0.022 (0.996; 1.092)	1.001
$PoOc/CL_{2.6mm}$	0.244 ± 0.011 (0.222; 0.268)	0,238
$SL/CS_{2.6mm}$	0.965 ± 0.024 (0.915; 1.017)	1.009
$CS/ML_{2.6mm}$	0.712 ± 0.013 (0.684; 0.737)	0,709
$CS/MW_{2.6mm}$	1.413 ± 0.027 (1.367; 1.495)	1.420
$MW/ML_{2.6mm}$	0.504 ± 0.011 (0.473; 0.531)	0,499
$EYE/CS_{2.6mm}$	0.196 ± 0.003 (0.188; 0.205)	0,188
$FL/CW_{2.6mm}$	0.347 ± 0.008 (0.329; 0.365)	0,342
$HTL/CS_{2.6mm}$	1.104 ± 0.028 (1.042; 1.163)	1.137
$GHL/CS_{2.6mm}$	0.202 ± 0.016 (0.171; 0.247)	0,223
$nOcc_{2.6mm}$	6.362 ± 2.743 (1.632; 11.429)	4.281
$nPn_{2.6mm}$	16.912 ± 2.648 (9.504; 22.649)	13.961
$nPe_{2.6mm}$	6.871 ± 1.569 (3.755; 10.654)	7.529
sqPDG	7.469 ± 0.572 (6.242; 8.679)	5.682

of the first gaster terguite; nOcc: unilateral number of hairs projecting from the occipital margin of the head; nPn: unilateral number of hairs on the pronotum; nPe: unilateral number of hairs protruding from the dorsal profile of the petiole; sqPDG: square root of the distance between the pubescence hairs on the first gaster tergite.

Seifert's (2008) method for the removal of the allometric variance was applied to the data, since *Camponotus* is a highly polymorphic genus (Seifert, 2008). With CS in mm, the functions applied to a CS of 2.6 mm were:

$nOcc_{2.6mm}$ = (nOcc/(4.3505*CS-4.9144)) *6.397

$nPn_{2.6mm}$ = (nPn/(7.3197*CS-2.6264)) *16.405

$nPe_{2.6mm}$ = (nPe/(3.5328*CS-2.4128)) *6.772

$CL/CW_{2.6mm}$ = (HL/HW/ (-0.1466*CS+1.4093))*1.028

$SL/CS_{2.6mm}$ = (SL/CS/ (-0.241*CS+1.5876))*0.961

$CS/ML_{2.6mm}$ = (CS/ML/ (0.0831*CS+0.4991))*0.715

$CS/MW_{2.6mm}$ = (CS/MW/ (0.0865*CS+1.1902))*1.4151

$MW/ML_{2.6mm}$ = (MW/ML/ (0.0279*CS+0.4325))*0.505.

$EYE/CS_{2.6mm}$ = (EYE/CS/ (-0.0343*CS+0.287))*0.197

$HTL/CS_{2.6mm}$ = (HTL/CS/ (-0.2391*CS+1.7284))*1.107

$GHL/CS_{2.6mm}$ = (GHL/CS/ (-0.0452*CS+0.3212))*0.204.

Using these 14 biometrical indexes and chaetotaxy counts, a Principal Component Analysis (PCA) was performed. Comparative samples of *C. vagus* were also included in the analysis originating from Spain, Slovakia and Montenegro, while specimens of *C. herculeanus* and *C. ligniperda* used were collected from the Pyrenees and Slovakia.

Results and Discussion

The Cretan worker matches the concept of *C. vagus* in the morphology of its clypeus, colour, biometry and chaetotaxy (Fig. 1; Table 1). The PCA plot (Fig. 2) differentiates the three European species of *Camponotus* s. str., and places the Cretan sample well inside other European *C. vagus*. This is the first record of *C. vagus* for Crete (Salata et al. 2020; Borowiec & Salata 2022).

Given the extensive samplings undertaken in Crete, our good knowledge of its myrmecofauna and the remarks by Salata et al. (2020) about the lack of suitable habitat in the island for *C. vagus*, it seems odd that such a big and characteristic species could be overlooked. However, it must be taken into account the high diversity of habitats in the island, including its high altitude mountains and deep and humid valleys. Moreover, a mitochondrial sequence to be published elsewhere (Menchetti et al., in prep.) shows it is probably a relict. Therefore, the Cretan population could account for a low number of colonies, could be restricted geographically or could inhabit quite inaccessible places. More work is needed to assess the distribution, ecology and conservation status of the species on the island.

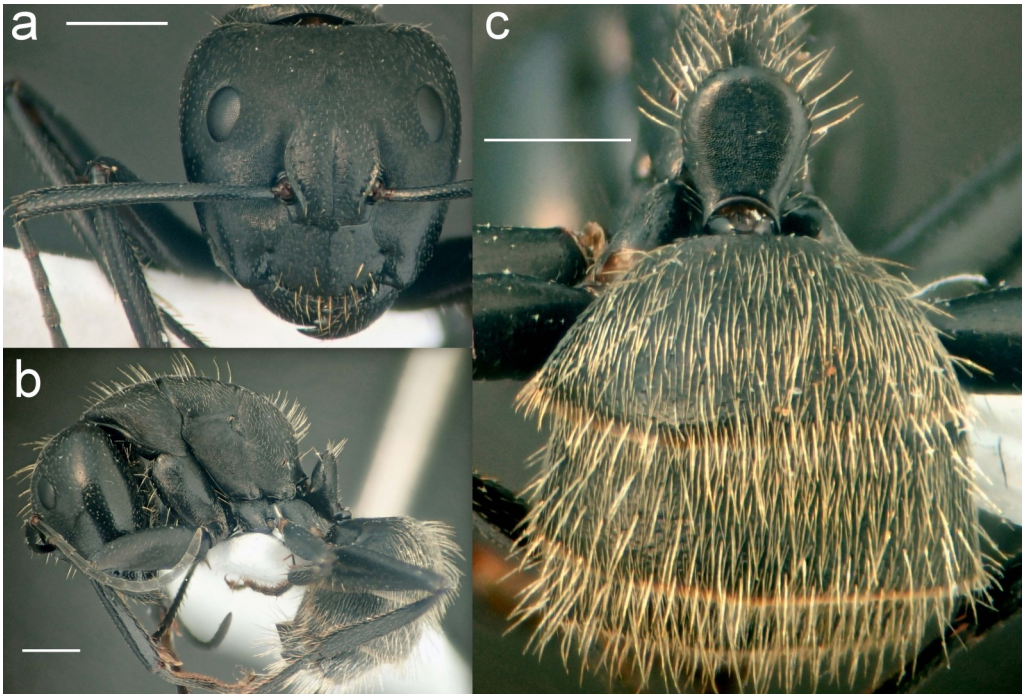

FIG. 1: Worker of *Camponotus vagus* (Scopoli, 1763) from Crete. a) head in full face view; b) habitus in lateral view; c) gaster in dorsal view. Scales: 1 mm.

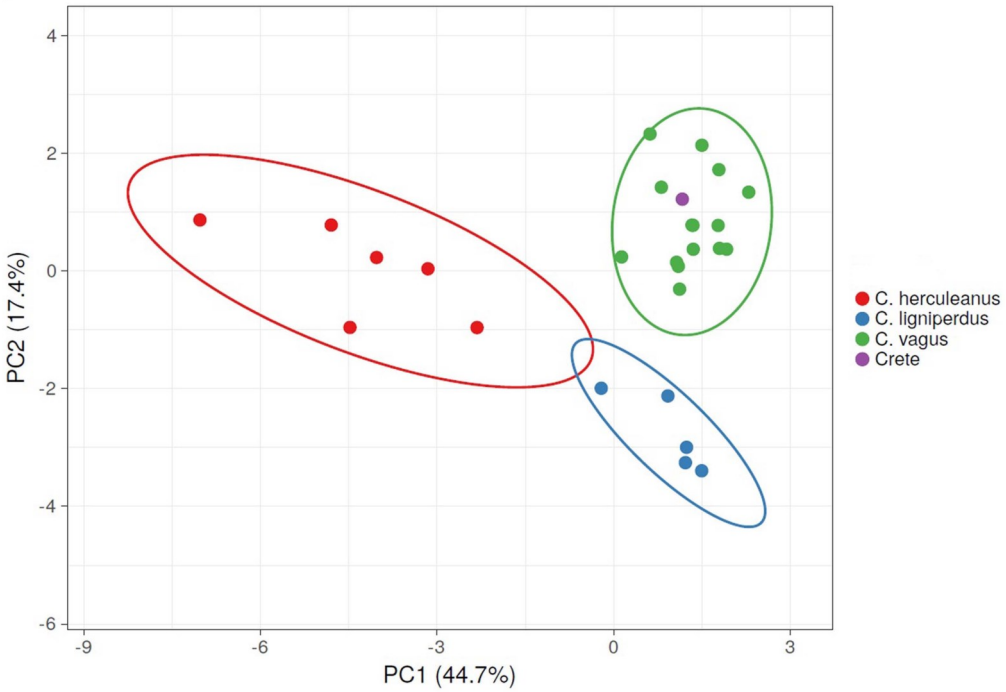

FIG. 2: Scatter plot of the principal components analysis for the three European species belonging to subgenus *Camponotus s. str*. plus the Cretan sample, made using nest means for 14 biometric and chaetotaxy indexes.

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Πρώτη αναφορά του *Camponotus vagus* (Hymenoptera: Formicidae) για την Κρήτη, Ελλάδα

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ΠΕΡΙΛΗΨΗ

Το *Camponotus vagus* (Scopoli, 1763) είναι ένα σαπροξυλικό είδος μυρμηγκιού ευρέως διαδεδομένο στην Ευρώπη και την Ελλάδα, συμπεριλαμβανομένων ορισμένων μεγάλων νησιών της Μεσογείου. Στο παρόν άρθρο παρουσιάζεται η πρώτη καταγραφή του είδους στο νησί της Κρήτης.

ΛΕΞΕΙΣ ΚΛΕΙΔΙΑ: *Camponotus vagus*, Crete, distribution, Formicidae

