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First Record of The South European Rare Parasitic Ant Species *Camponotus universitatis* Forel (Hymenoptera, Formicidae) in Asia[1*]

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ABSTRACT

Camponotus universitatis was the only known inquiline parasitic species of the genus *Camponotus* until *C. ruseni*, a putative parasitic species, was recently described by Karaman in 2012. *C. universitatis* has been recorded so far only from the southern Europe (Spain, France, Italy, Switzerland, Albania and Bulgaria) by a few studies. Despite the Bulgarian record of the *C. universitatis* is from the Strandzha Mountains which lies very close to the Turkish boundary, the species has not yet been recorded from Turkey up to date. In this study, we recorded *C. universitatis* from Konya-Akşehir-Engili Village (Central Anatolia) representing the first record of the species in Asia.

Key words: Formicidae, *Camponotus universitatis*, social parasite, Turkey.

INTRODUCTION

Camponotus is the largest genus of Formicidae which comprise about 1100 extant species, 500 subspecies and 34 fossil species, constituting more than %10 of all ant species known (Bolton, 2012; Karaman and Aktaç, 2013). The parasite species of the genus are represented with one inquiline parasite, *C. universitatis* Forel and a putative parasite, *C. ruseni* Karaman. *C. ruseni* has been recently described from the Anatolian part of Turkey-Kütahya (Karaman, 2012) but biology of the species is poorly known. Worker of the real parasitic species, *C. universitatis*, was described by Forel (1890) from France, and later Tinaut *et al*. (1992) described queen and male from the Iberian Peninsula and gave some information on biology of the species. Although it has been more than 120 years from Forel's description, *C. universitatis* has only been recorded from the Southern Europe: France (Espadaler, 1981; Forel, 1890,1904), Switzerland (Forel, 1904; Kutter, 1936), Italy (Rigato and Toni, 2011; Würmli, 1969), Albania (Andoni, 1977), Spain (Espadaler, 1981; Tinaut*, et al.*, 1992) and Bulgaria (Lapeva-Gjonova and Kiran, 2012). The locality of the Bulgarian record is very close to Turkish boundary but the species has not yet been recorded from the Turkish Thrace and Anatolian part of Turkey.

Here, we recorded *C. universitatis* from the Anatolian part of Turkey (Asia) representing the first record of the species outside Europe.

1* This study was presented in 5th Central European Workshop of Myrmecology at Innsbruck, Austria in 2013

MATERIALS AND METHODS

6 workers, Turkey-Sultan Mountains-Konya-Akşehir-Engili Village-1.5 km SW (38˚ 18′ 11″ N, 31˚ 26′ 48″ E), 1466 m asl., 27 June 2011, leg. K. Kiran and V. Aksoy. 8 workers of *C. aethiops* were collected from the same nest with *C. universitatis*.

The materials are deposited in the collection of Biology Department of the Trakya University, Edirne, Turkey (TU).

Illustrations were prepared using Nikon D70s DSLR camera with 105 mm macro lens and 2x teleconverter, and Combine-Z (2008) free software.

Morphometric measurements and indices for *C. universitatis* are given below:

Measurements: HL: head length, from the anterior point of the median lobe of the clypeus to the midpoint of the occipital margin; HW: head width, maximum width behind the posterior margin of the eye; EL: maximum diameter of the eye; SL: scape length, excluding the basal condyle; CL: maximum length of the clypeus, including the posterior lobes; CW: maximum width of the clypeus between the tentorial pits; ML: mesosoma length, diagonal length of the mesosoma laterally from the anterodorsal margin of the mesosoma to the posterior margin of the lobe of the metapleural lobe; MH: mesosoma height, from the upper level of the mesonotum to the lower margin of the mesopleuron; HFL: maximum length of the hind femorae; HFW: maximum width of the hind femorae; HTL: maximum length of the hind tibiae.

Indices: CI (cephalic): HL/HWx100; SI_1 (scape 1): SL/HLx100; SI_2 (scape 2): SL/HWx100; CLI (clypeal): CW/CLx100; HFI (hind femorae): FFW/FFLx100; MI (mesosoma): ML/MHx100; HTI (tibiae): HTL/HWx100.

RESULTS AND DISCUSSION

Turkey, with highly variable topography and habitat types, as well as its climate and geographical position, has a role to serve as a junction point for three biodiversity hotspots - the Caucasus, Irano-Anatolian, and Mediterranean (Şekercioğlu *et al.*, 2011), allowing for a high degree of ant diversity to occur in the country. A total of 313 ant taxa have been recorded from Turkey so far (Karaman, 2012; Karaman and Aktaç, 2013; Kiran and Karaman, 2012). *Camponotus* is the most speciose genus with 44 taxa (40 species and 4 subspecies) (Karaman, 2012; Karaman and Aktaç, 2013). *C. aethiops*, the host species of the unique parasitic species *C. universitatis,* is the most prevalent species of the genus which has a wide distributional range throughout the country. However, *C. universitatis* has not been recorded so far either from the Turkish Thrace or from the Anatolian part of Turkey (Asia), although its Bulgarian record is very close to the Turkish boundary (Lapeva-Gjonova and Kiran, 2012).

C. universitatis was recorded from the Sultan Mountains-Konya-Akşehir-Engili Village which is the part of the Western Anatolian Mountain chain that connects the South European Mountains with the Taurus Mountains and served as a refugium in the glacial period (Çıplak, 2003). This locality is very close to the type locality of *C. ruseni* recorded from the Murat Mountain-Kütahya-Gediz-Murat Dağı Hamamı, a

region also the part of the Western Anatolian Mountain chain (Fig. 1). Both *C. ruseni* and *C. universitatis* were collected in a very old and arid *Pinus nigra* Arnold forest from 1462 m and 1466 m asl, respectively. *C. universitatis* could have expanded its distribution from Europe to Asia by passing the Straits formed almost 5.000-7.500 years ago. Hölldobler and Wilson mentioned in their book "The Ants" that the permanent parasitic species (especially the inquilines) occurred in Europe mostly in mountainous and arid regions (Hölldobler and Wilson, 1990). The South European Mountain Belt (Pyrenees, Alps, Transylvanians, Carpathians, Western Anatolian Mountains, Taurus Mountains and Caucasus) lying from west to east direction is a suitable geography for such habitats to exist (Hölldobler and Wilson, 1990; Çıplak, 2003). The distribution of *C. universitatis* coincides with the orientation of the South European Mountain Belt and substantiates the hypothesis of Hölldobler and Wilson.

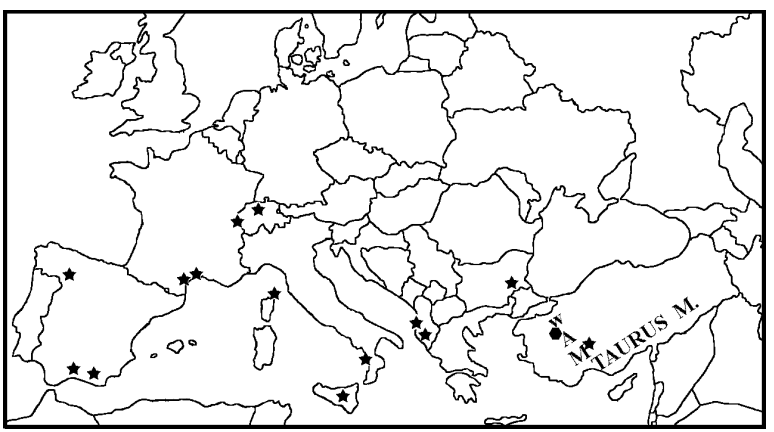

Fig. 1. The map showing the distributions of *C. universitatis* and *C. ruseni*. ★ represents localities for *C. universitatis* and ● localities for *C. ruseni*; WAM: Western Anatolian Mountain chain; Taurus M.: Taurus Mountains.

According to Rigato and Toni (2011) the distribution of *C. universitatis*, should follow the distribution of its host species *C. aethiops* although the species has a scattered distribution. Accordingly, we expect to find more nests of *C. universitatis* from the Anatolia and also from the Turkish Thrace.

Our *C. universitatis* material is differentiated from the Spanish specimen (1 worker) identified by A. Tinaut by a more slender body; 6 toothed mandibles; more thicker upper half of the petiole in profile view (Fig. 2); bare occipital corners (Fig. 3); sparse erect hairs on ventral surface of the head and femorae; without pubescence on extensor surface of femorae and yellowish-brown body colour. The Spanish *C. universitatis* specimens are more robust (Table 1) but the indices (Table 2) are almost same with the Turkish specimens of the species.

C. universitatis workers differs from *C. ruseni* workers by 6 toothed mandibles; absence of metanotal groove; convex to straight propodeal dorsum; absence of short erect hairs on the eyes; erect hairs on antennae, extensor surface of femorae and tibiae and its males differ from *C. ruseni* males by their narrower head and 12 segmented antennae.

Table 1. Measurements (mm) for *C. universitatis* workers (n = number of workers).

	Turkey (n=6)		Spain (n=1)
	Mean±SD	Range	
HL	1.156±0.031	1.098-1.183	1.427
HW	0.892±0.032	0.892-0.915	1.146
EL	0.368±0.005	0.365-0.378	0.427
SL	1.244±0.043	1.171-1.293	-
CL	0.337±0.030	0.281-0.366	0.463
CW	0.535±0.020	0.500-0.549	0.659
ML	1.724±0.050	1.634-1.781	2.122
MH	0.876±0.037	0.805-0.902	1.073
HFW	0.262±0.007	0.256-0.268	0.256
HFL	1.342±0.037	1.268-1.366	1.317
HTL	1.482±0.036	1.415-1.512	-

Table 2. Indices for *C. universitatis* workers (n = number of workers).

	Turkey (n=6)		Spain (n=1)
	Mean±SD	Range	
CI	130±0.9	128-133	125
SI	107±0.8	104-110	-
SI2	139±0.9	135-141	-
CLI	159±4.6	143-178	142
MI	197±1.9	189-203	198
HFI	19.6±0.2	19-20	19
HTI	166±1.2	163-171	-

Figs. 2-3. *C. universitatis* 2. Alitrunk, petiole and gaster (in profile) 3. Head (frontal view).

The number of *Camponotus* taxa in Turkey increased from 44 to 45 and Turkish ant taxa increased from 313 to 314 with the present record of *C. universitatis.*

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