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Five ant species (Hymenoptera: Formicidae) new to the Greek fauna with notes on ants from Greek Thrace

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Abstract: *Camponotus tergestinus* MÜLLER, *Lasius sabularum* (BONDROIT), *Proformica korbi* (EMERY), *Strongylognathus bulgaricus* PISARSKI, and *Strongylognathus karawajewi* PISARSKI are recorded from Greece for the first time. A list of 81 species and morphospecies collected in Greek Thrace in 2023, including ten taxa new to this region, are given.

Key words: ants, Greece, Thrace, faunistics.

INTRODUCTION

The faunistics and taxonomy of Greek ants have been intensively studied in recent years. Several regional check-lists of species covered some Greek islands: Cephalonia (BOROWIEC & SALATA 2014a), Corfu (BOROWIEC & SALATA 2021a), Crete (SALATA *et al.* 2020), Dodecanese (BOROWIEC *et al.* 2021), Euboea (BOROWIEC & SALATA 2018e), Samos (BOROWIEC & SALATA 2018c), Zakynthos (BOROWIEC & SALATA 2018d), Thasos (BOROWIEC & SALATA 2022a), and continental provinces: Epirus (BOROWIEC & SALATA 2018a), Peloponnese (BOROWIEC & SALATA 2017a), Thrace (BRAČKO *et al.* 2016), Thessaly (BOROWIEC & SALATA 2018b) and Western Greece (BOROWIEC & SALATA 2021b). Additionally, numerous new faunistic records were also given in faunistic and taxonomic papers focused on Greek ants (BOROWIEC & SALATA 2012, 2013, 2014b, 2017b, CSŐSZ *et al.* 2018, SALATA & BOROWIEC 2017, 2018a, 2018b, 2019a, 2019b, 2019c, BOROWIEC *et al.* 2022, DEMETRIOU *et al.* 2023, SALATA *et al.* 2018a, b, 2019, 2023, SCHIFANI *et al.* 2023, SCUPOLA & BOROWIEC 2023). The culmination of this research was the publication of the first volume of the monograph on Greek ants (BOROWIEC & SALATA 2022). As a result of these studies, at least 296 species have been recorded from Greece, and 19 more identified only as morphospecies without a formal name await further research and mostly represent undescribed taxa (our unpublished data). This ranks Greece as the country with the highest number of ant species in Europe (LAPEVA-GJONOVA & ANTONOVA 2022).

However, subsequent explorations of various regions of Greece, including those previously studied, still supplement our knowledge with discoveries of species new to the fauna of Greece. In May 2023, two of the coauthors (Jasper and Jeroen van Delft) explored the area of Thrace, previously studied by an international team (BRAČKO *et al.* 2013). In the recently collected materials, we discovered five species not previously reported from Greece and ten taxa not recorded from Thrace. This brings the total number of identified species in Greece to over 300. In this material we also found two specimens of an interesting *Temnothorax* species new to science, we have also in recent materials from western Thessaly. Its description will be published in a separate paper.

STUDY AREA, MATERIAL AND METHODS

From 14 to 20 May 2023, 31 localities were visited in three Thracian regions (Evros 19, Rodopi 1, Xanthi 11). As a result 81 species and morphospecies have been identified in this material. Five of them, discussed below, were not previously recorded from Greece. Photos were taken using a Nikon SMZ 1500 stereomicroscope, Nikon D5200 photo camera, and Helicon Focus software. Materials of the most interesting species are preserved, pinned or in alcohol, in the Myrmecological Laboratory, Department of Biodiversity and Evolutionary Taxonomy, University of Wrocław.

SPECIES NEW TO GREECE

Camponotus tergestinus MÜLLER, 1921 (Fig. 1, 3)

Material: 1 alate gyne, Evros, 7 km W of Dadia, 41.12107/26.14538, 295 m, 15 V 2023, leg. J. & J. van Delft.

A rare species, recorded from Bulgaria, Croatia, Hungary, Italy, Montenegro, Romania, Serbia, Slovakia, Slovenia and Türkiye. From all these countries only one or two localities are known (IONESCU-HIRSCH *et al.* 2009, JEŠOVNIK *et al.* 2011, WIEZIK & WIEZIKOVÁ 2013, BOROWIEC 2014, BRAČKO 2017). Its presence in Greek Thrace was more or less expected (BOROWIEC & SALATA 2022). Based on published data, *Camponotus tergestinus* is an arbicolous species having a strong association with oaks. In Slovenia two colonies were found, the first nesting on *Quercus pubescens* at a height of 3.2 m, the second on *Quercus cerris* at a height of 2.2 m. Both nests had two entrances each (BRAČKO 2017). In Slovakia a single specimen was found crawling on the bark of a freshly cut trunk of *Quercus cerris* on a temporary log pile. In Thrace a dead alate gyne, transported by a worker of *Aphaenogaster subterranea*, was collected at the edge of an extensive *Quercus*-dominated forest, close to lush grassland with some scattered stones and trees (Fig. 3).

Lasius sabularum (BONDROIT, 1918) (Fig. 2, 4)

Material: 2 workers, Xanthi, 2 km NW of Kottani near Xeropotamos ancient stone bridge, 41.32143/25.07343, 312 m, 19 V 2023, leg. J. & J. van Delft.

Lasius sabularum is known from 20 European countries but appears rare (CZECHOWSKI *et al.* 2012, BOROWIEC 2014, RADCHENKO 2016). Its presence in northern Greece was expected (BOROWIEC & SALATA 2022). This is a temporary parasite of other *Lasius* species. There is no direct evidence of which host species are used, although RADCHENKO (2016) noted *Lasius niger* (LINNAEUS). It usually occurs in woodland margins with open land, light *Pinus-Betula* Taiga forest, old orchards, meadows, semi-dry grassland, and open heath with few bushes and trees. *Lasius sabularum* nests under big stones or in rotten tree trunks (SEIFERT 2018). In Thrace, the species was collected under dead wood in a moist deciduous forest edge with

scattered stones and dead wood (Fig. 4). This locality is situated in a river valley next to the grassland where *Strongylognathus karawajewi* was found.

Proformica korbi (EMERY, 1909) (Figs. 5–6)

Material: 7 workers, Evros, 500 m SW of Therapeio centre, 41.57521/26.18591, 78 m, 17 V 2023, leg. J. & J. van Delft.

Proformica korbi is a very rare species. It was described from western Anatolia (Sultan Dag) and recently confirmed for Anatolia (Konya-Meram-Belenbaşı Pass) by KIRAN & KARAMAN (2021). The only record outside Türkiye comes from Bulgaria: Kocherinovo in the Struma Valley (DLUSSKY 1969). It was recently reported from Iran (KHANDEHROO *et al.* 2015). Still, based on the photograph in this publication, the record is a misidentification with another unidentified species (the specimen on the photo is a medium worker without erect setae on the mesonotum, while in *P. korbi* all workers have several long erect setae on the whole dorsum of the mesosoma). Nothing is known about the habitat preferences of this species. In Thrace, a ground nest was observed in a road verge near shrubby grassland and a forest edge.

Strongylognathus bulgaricus PISARSKI, 1966 (Figs. 7–8)

Material: 22 workers in nest of *Tetramorium hippocratis* AGOSTI & COLLINGWOOD, Evros, 2.5 km NW of Petrota, 41.71133/26.11506, 208 m, 16 V 2023, leg. J. & J. van Delft.

Described by VIEHMAYER (1922) from Bulgaria (Veliko Tarnovo) under the unavailable name *Strongylognathus huberi* subsp. *rehbinderi* var. *bulgarica*. The name was validated by PISARSKI (1966) as *Strongylognathus bulgaricus* and considered a senior synonym of *S. kratochvili* ŠILHAVÝ, 1937. Later, SEIFERT (2018) noted, without comments, that *S. bulgaricus* is not a synonym of *S. kratochvili*, but is a junior synonym of *S. christophi* EMERY, 1889. In the recent review of Bulgarian *Strongylognathus* LAPEVA-GJONOVA & RADCHENKO (2021) noted that the proposed synonymy seems doubtful and argued this decision by comparing the most important morphological differences between these taxa. Thus, confirmed records of *S. bulgaricus* are known only from several sites in Bulgaria (LAPEVA-GJONOVA & RADCHENKO 2021). *Strongylognathus bulgaricus*, like other species of this genus, is a social parasite of *Tetramorium* species, but none of the named hosts have been reported in the literature. In Thrace, it was collected in a nest of *Tetramorium hippocratis* AGOSTI & COLLINGWOOD located under a stone in a dry, nutrient-poor grassland with scattered stones close to forest edges. *Strongylognathus bulgaricus* was present in large numbers under this stone (hundreds), clearly outnumbering its host.

Strongylognathus karawajewi PISARSKI, 1966 (Figs. 9–11)

Material: 3 workers in nest of *Tetramorium hungaricum* RÖSZLER, Xanthi, 2 km NW of Kottani near Xeropotamos ancient stone bridge, 41.32181/25.07327, 306 m, 19 V 2023, leg. J. & J. van Delft.

Strongylognathus karawajewi was described from Crimea (Ukraine) and then reported from Armenia, Bulgaria, Kazakhstan, SW Russia, Tajikistan, Türkiye, and Turkmenistan (BOROWIEC 2014, RADCHENKO 2016, LAPEVA-GJONOVA & RADCHENKO 2021). It is a social parasite in nests of various *Tetramorium* species. So far, *Tetramorium caespitum* (LINNAEUS, 1758), *T. ferox* RUZSKY, 1903, *T. inerme* MAYR, 1877 and *T. sulcinode* SANTSCHI, 1927 have been reported as its hosts. In Thrace, it was collected in a nest of *Tetramorium hungaricum* RÖSZLER located under a stone in a river valley with open grassland with scattered stones and a few shrubs and bramble, between the river and the forest edge where *Lasius sabularum* was found. Only a few specimens of *S. karawajewi* were observed.

LIST OF ANT SPECIES COLLECTED IN THRACE IN MAY 2023

(E – Evros, R – Rodopi, X – Xanthi, species new to Thrace in bold)

1. *Aphaenogaster epirotes* (EMERY, 1895) E
2. *Aphaenogaster subterranea* (LATREILLE, 1798) E, X
3. ***Aphaenogaster subterraneoides* EMERY, 1881 E**
4. *Bothriomyrmex communista* SANTSCHI, 1919 E, X
5. *Camponotus aegaeus* EMERY, 1915 E
6. *Camponotus aethiops* (LATREILLE, 1798) E, X
7. *Camponotus atricolor* (NYLANDER, 1849) E
8. *Camponotus dalmaticus* (NYLANDER, 1849) E, X
9. *Camponotus fallax* (NYLANDER, 1856) X
10. *Camponotus gestroi* EMERY, 1878 E, X
11. *Camponotus lateralis* (OLIVIER, 1792) E, X
12. *Camponotus piceus* (LEACH, 1825) E
13. *Camponotus samius* FOREL, 1889 E, X
14. ***Camponotus tergestinus* MÜLLER, 1921 E**
15. *Camponotus vagus* (SCOPOLI, 1763) E
16. *Cardiocondyla bulgarica* FOREL, 1892 E
17. ***Cardiocondyla dalmatica* SOUDEK, 1925 E**
18. *Cataglyphis nodus* (BRULLÉ, 1833) E, R, X
19. *Cataglyphis viaticoides* (ANDRÉ, 1881) E
20. *Colobopsis truncata* (SPINOLA, 1808) E, X
21. *Crematogaster lorteti* FOREL, 1910 E
22. *Crematogaster schmidti* (MAYR, 1853) E, X
23. *Crematogaster sordidula* (NYLANDER, 1849) E
24. *Dolichoderus quadripunctatus* (LINNAEUS, 1771) E, X
25. *Formica cinerea* MAYR, 1853 X
26. *Formica clara* FOREL, 1886 E, R, X
27. *Formica cunicularia* LATREILLE, 1798 E
28. *Formica gagates* LATREILLE, 1798 E, X
29. *Lasius alienus* (FÖRSTER, 1850) E, X
30. *Lasius brunneus* (LATREILLE, 1798) E
31. ***Lasius emarginatus* (OLIVIER, 1792) E**
32. *Lasius flavus* (FABRICIUS, 1782) E
33. *Lasius fuliginosus* (LATREILLE, 1798) E
34. *Lasius illyricus* ZIMMERMANN, 1935 X
35. *Lasius lasioides* (EMERY, 1869) E, X
36. *Lasius neglectus* VAN LOON, BOOMSMA & ANDRASFALVY, 1990 E
37. *Lasius niger* (LINNAEUS, 1758) E

38. *Lasius platythorax* SEIFERT, 1992 E
39. *Lasius sabularum* (BONDROIT, 1918) X
40. *Lasius turcicus* SANTSCHI, 1921 E, X
41. *Lepisiota frauenfeldi* (MAYR, 1855) E, X
42. *Liometopum microcephalum* (PANZER, 1798) E
43. *Messor atanassovi* ATANASSOV, 1982 R, X
44. *Messor hellenius* AGOSTI & COLLINGWOOD, 1987 E
45. *Messor ibericus* SANTSCHI, 1931 E, X
46. *Messor mcarthuri* STEINER *et al.*, 2018 E, X
47. *Messor oertzeni* FOREL, 1910 E
48. *Messor ponticus* STEINER *et al.*, 2018 E
49. *Messor structor* (LATREILLE, 1798) X
50. *Messor wasmanni* KRAUSSE, 1910 E, R
51. *Myrmecina graminicola* (LATREILLE, 1802) E, X
52. *Pheidole* cf. *pallidula* E, X
53. *Plagiolepis perperamus* SALATA, BOROWIEC & RADCHENKO, 2018 E
54. *Plagiolepis pygmaea* (LATREILLE, 1798) E, X
55. *Plagiolepis taurica* SANTSCHI, 1920 E, X
56. *Ponera coarctata* (LATREILLE, 1802) E
57. *Prenolepis nitens* (MAYR, 1853) E
58. *Proformica korbi* (EMERY, 1909) E
59. *Solenopsis* cf. *lusitanica* E, X
60. *Strongylognathus bulgaricus* PISARSKI, 1966 E
61. *Strongylognathus karawajewi* PISARSKI, 1966 X
62. *Tapinoma* cf. *erraticum*_BALC E, R, X
63. *Temnothorax affinis* (MAYR, 1855) E, X
64. *Temnothorax* sp. nov. of *T. aveli* group E
65. *Temnothorax crasecundus* SEIFERT & Csósz, 2015 E
66. *Temnothorax* cf. *exilis*, *darii* form E, X
67. *Temnothorax helenae* Csósz, HEINZE & MIKÓ, 2015 E
68. *Temnothorax lichtensteini* (BONDROIT, 1918) X
69. *Temnothorax recedens* (NYLANDER, 1856) E, X
70. *Temnothorax semiruber* (ANDRÉ, 1881) E, X
71. *Temnothorax turcicus* (SANTSCHI, 1934) E, X
72. *Temnothorax unifasciatus* (LATREILLE, 1798) E
73. *Temnothorax* cf. *unifasciatus*_yellow club X
74. *Tetramorium caespitum* (LINNAEUS, 1758) E, R, X
75. *Tetramorium chefketi* FOREL, 1911 E, X
76. *Tetramorium ferox* RUZSKY, 1903 E

77. *Tetramorium hippocratis* AGOSTI & COLLINGWOOD, 1987 E
 78. *Tetramorium hungaricum* RÖSZLER, 1935 E, R, X
 79. *Tetramorium immigrans* SANTSCHI, 1927 E, R
 80. *Tetramorium kephalosi* SALATA & BOROWIEC, 2017 E, X
 81. *Tetramorium moravicum* KRATOCHVIL, 1941 E, X

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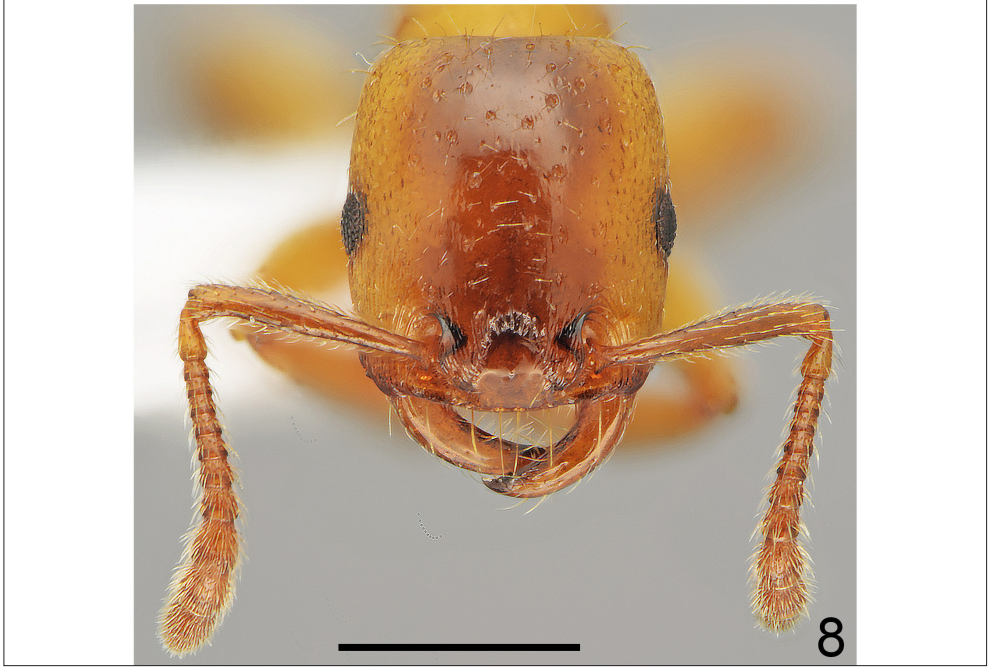
Figs. 1–2. Habitus lateral: *Camponotus tergestinus* MÜLLER, gyne (1, scale bar = 2 mm); *Lasius sabularum* (BONDROIT), worker (2, scale bar = 1 mm) (photos L. Borowiec).



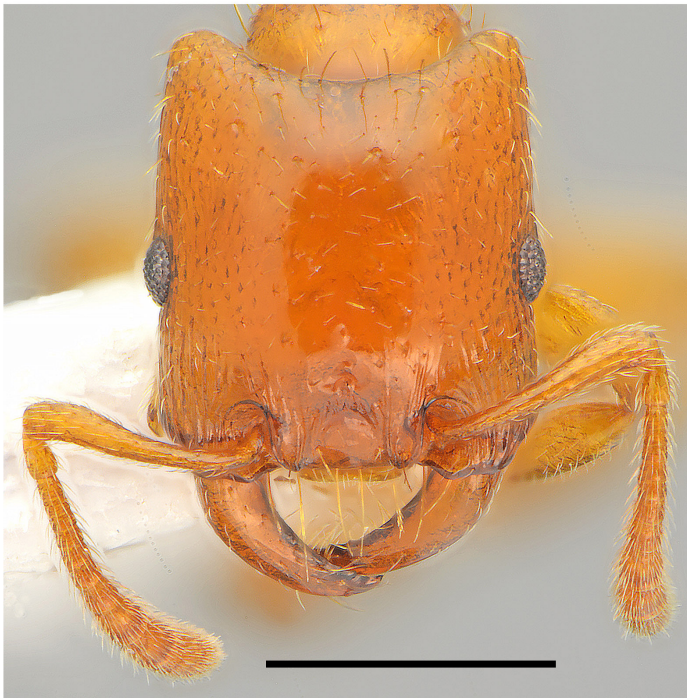
Figs. 3–4. Habitat where ants new to Greece were found. *Camponotus tergestinus* MÜLLER (3); *Lasius sabularum* (BONDROIT) (4) (photos J.P.L. van Delft).



Figs. 5–6. Habitus and head: *Proformica korbi* (EMERY): minor worker lateral (5), major worker lateral (6) (scale bar = 1 mm) (photos L. Borowiec).



Figs. 7–8. Habitus and head: *Strongylognathus bulgaricus* PISARSKI, worker: lateral (7) (scale bar = 1 mm), head (8) (scale bar = 0.5 mm) (photos L. Borowiec).



Figs. 9–10. Habitus and head: *Strongylognathus karawajewi* PISARSKI, worker: lateral (9) (scale bar = 1 mm), head (10) (scale bar = 0.5 mm) (photos L. Borowiec).



Fig. 11. Grassland habitat of *Strongylnathus karawajewi* PISARSKI (photo J.J.C.W. van Delft).

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