

First Records of *Temnothorax flavicornis* (Emery, 1870) (Hymenoptera: Formicidae) in Bulgaria and Turkey

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Abstract: The ant species *Temnothorax flavicornis* (Emery, 1870) was recently found in Bulgaria and Turkey. The Bulgarian samples were collected from two sites in the southern part of the country. Three localities of the species were detected in the European part of Turkey and in western Anatolia. These are the first reports of *T. flavicornis* from Bulgaria and Turkey, which indicates the expansion of the geographical range eastwards.

Keywords: *Temnothorax flavicornis*, ants, Formicidae, Bulgaria, Turkey, distribution

Introduction

The extremely species-rich genus *Temnothorax* includes 379 valid *species* with 46 subspecies and 7 fossil species (BOLTON 2014). *Temnothorax flavicornis* (Emery, 1870) is the only species of this genus with a geographical range restricted to Western Palaearctic. It is characterised by 11-segmented antennae in workers and gynes and 12-segmented antennae in males. Therefore, it was grouped by RUZSKY (1904) together with the species of the genus *Leptothorax* (subgenus *Mychothorax*) and later placed in the subgenus *Leptothorax* by EMERY (1916). BOLTON (2003) transferred this species to the revalidated genus *Temnothorax*.

In addition to the 11-segmented antennae, workers are characterised by the well-developed sculpture of the head and thorax. The first funiculus segment is 2-2.5 times longer than wide, ending with a 3-segmented club. The metanotal groove is clearly visible, the propodeal spines are long, and the petiolus is lower. The colour of *T. flavicornis* is light yellow, with a darker back half of the first gastral tergite (KUTTER 1977).

This species was described from Italy and also reported from France (GALKOWSKI 2011), southern

Switzerland (KUTTER 1977), Montenegro (MÜLLER 1923), Croatia (BRAČKO 2006), Slovenia (BRAČKO 2003), Serbia (PETROV 2000), Republic of Macedonia (KARAMAN 2009, BRAČKO *et al.* 2014) and Greece (BOROWIEC, SALATA 2012). The nests of *T. flavicornis* were found in soil, under stones, in empty acorns in deciduous forests and shrubbery (BUSCHINGER 1999) as well as around the roots of *Artemisia caerulescens* (BRAČKO 2003).

In this article, we report the first records of *Temnothorax flavicornis* in Bulgaria and Turkey.

Material and Methods

The specimens used in this study were collected during faunistic surveys of ants conducted across Bulgaria and Turkey. The specimens of *Temnothorax flavicornis* from Bulgaria were found in two collecting sites, both in the southern part of the country. The samples from Turkey were collected from two sites in the European part of Turkey and another one in the western Anatolia (Fig. 1). The identification was made following the keys in BERNARD (1967), KUTTER (1977) and SEIFERT (2007). Photographs were pre-



Fig. 1. Sampling sites of *T. flavicornis* in Bulgaria and Turkey



Fig. 2. Worker of *T. flavicornis*: a. head (dorsal view), b. whole body (lateral view)

pared as Extended Focus (Z-stack) Images (EFIs). The EFI photographs were taken using a Nikon D70s digital SLR camera with a 105 mm macro lens and 2x teleconverter, using CombineZ free software.

Results and Discussion

Temnothorax flavicornis (Emery, 1870) (Figs. 2-4)

Material examined. Bulgaria: Maleshevska Mountain, above Gorna Breznitsa Village (Kresna

district), N41°45'16" E23°06'33", 530 m, 27.03.2012, 8 workers, a nest under a stone, leg. A. Lapeva-Gjonova; Rhodope Mountains, above Brestovitsa Village (Plovdiv district), N42°02'53" E24°35'23", 625 m, 17.04.2012, 15 workers, a nest under a stone, leg. A. Lapeva-Gjonova; Turkey: Bursa, Orhangazi, Hamzalı Village, N40°31' E29°15', 250 m, 31.07.1998, 1 female, 1 male, 3 workers, *Pinus brutia* Ten. forest, a nest in soil covered by moss, leg. K. Kiran; Kırklareli, Pınarhisar, Poyralı Village, N41°39'00" E27°36'21", 300 m,



Fig. 3. Queen of *T. flavicornis*: a. head (dorsal view), b. whole body (lateral view)

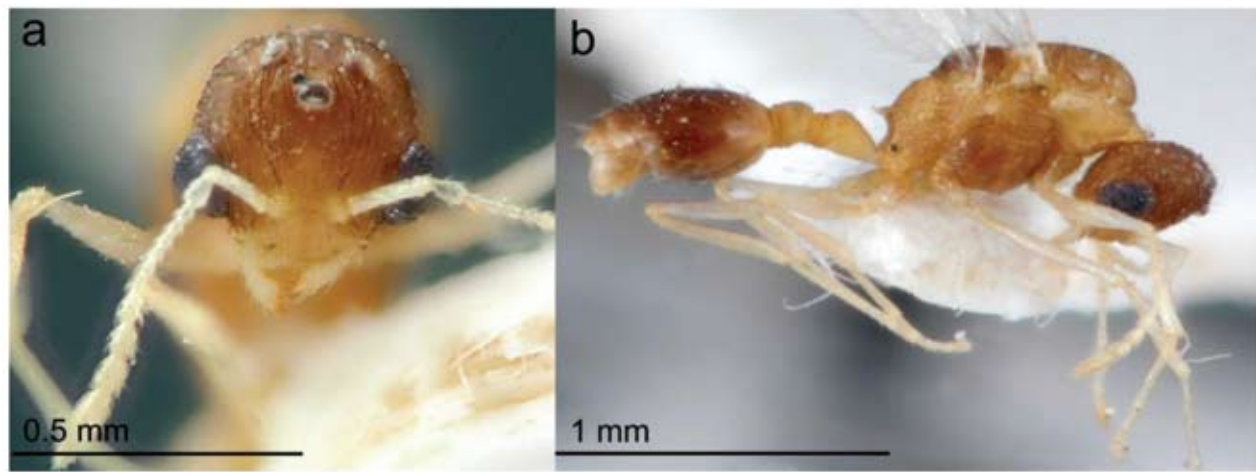


Fig. 4. Male of *T. flavicornis*: a. head (dorsal view), b. whole body (lateral view)

11.05.2003, 1 worker, leg. K. Kiran; Kırklareli, Vize, Kızılağaç Village, N41°41'02" E27°52'51", 141 m, 24.05.2011, 2 workers, leg. A. Lapeva-Gjonova.

The detection of this species in Bulgaria as well as in the European part of Turkey and western Anatolia is not unexpected in view of its previous records in other Balkan countries (MÜLLER 1923, PETROV 2000, BRAČKO 2003, 2006, KARAMAN 2009,

BOROWIEC, SALATA 2012, BRAČKO *et al.* 2014). The new records increase the number of *Temnothorax* species known from Bulgaria to 22, and from Turkey to 31 (LAPEVA-GJONOVA *et al.* 2010, KIRAN, KARAMAN 2012, CSÖSZ *et al.* 2013, BRAČKO *et al.* 2014).

The present records expand the known distribution of *T. flavicornis* eastwards. Its known geographical range currently extends from France to the western part of Turkey.

References

- BERNARD F. 1967. Faune de l'Europe et du Bassin Méditerranéen 3. Les fourmis (Hymenoptera Formicidae) d'Europe occidentale et septentrionale (1968). Paris: Masson. 411 p.
- BOLTON B. 2003. Synopsis and classification of Formicidae. *Memiors of the American Entomological Institute*, **71**: 1-370.
- BOLTON B. 2014. An online catalog of the ants of the world. Available from <http://antcat.org>. (accessed December 2014).
- BOROWIEC L., S. SALATA, 2012. Ants of Greece – checklist, comments and new faunistic data (Hymenoptera: Formicidae). – *Genus*, **23** (4): 461-563.
- BRAČKO G. 2003. New species for the ant fauna of Slovenia (Hymenoptera: Formicidae). – *Natura Sloveniae*, **5** (1): 17-25.
- BRAČKO G. 2006. Review of the ant fauna (Hymenoptera: Formicidae) of Croatia. – *Acta Entomologica Slovenica*, **14** (2): 131-156.

- BRAČKO G., H. C. WAGNER, A. SCHULZ, E. GIOAHIN, J. MATIČIĆ and A. TRATNIK. 2014. New investigation and a revised checklist of the ants (Hymenoptera: Formicidae) of the Republic of Macedonia. – *North-western Journal of Zoology*, **10** (1): 10-24.
- BUSCHINGER A. 1999. Bemerkenswerte Ameisenfunde aus Südtirol (Hymenoptera: Formicidae). – *Myrmecologische Nachrichten*, **3**: 1-8.
- CSÓSZ S., B. SEIFERT, B. MÜLLER, A. TRINDL, A. SCHULZ and J. HEINZE. 2013. Cryptic diversity in the Mediterranean *Temnothorax lichtensteini* species complex (Hymenoptera: Formicidae). – *Organisms Diversity & Evolution*, 1-14.
- EMERY C. 1916. Fauna Entomologica Italiana. I. Hymenoptera. – Formicidae. – *Bullettino della Società Entomologica Italiana*, **47**: 79-275.
- GALKOWSKI C. 2011. Une liste des fourmis (Hymenoptera; Formicidae) récoltées dans la région de Grasse, avec la mention d'une nouvelle espèce de la faune de France. – *Bulletin de la Société Linneenne de Provence*, **62**: 1-4.
- KARAMAN M. G. 2009. An introduction to the ant fauna of Macedonia (Balkan Peninsula), a check list (Hymenoptera, Formicidae). – *Natura Montenegrina, Podgorica*, **8** (3): 151-162.
- KIRAN K., C. KARAMAN. 2012. First annotated checklist of the ant fauna of Turkey (Hymenoptera: Formicidae). – *Zootaxa*, **3548**: 1-38.
- KUTTER H. 1977. Hymenoptera. Formicidae. *Insecta Helvetica*, Fauna Bd. 6: 1-298.
- LAPEVA-GJONOVA A., V. ANTONOVA, A. G. RADCHENKO and M. ATANASOVA. 2010. Catalogue of the ants (Hymenoptera, Formicidae) of Bulgaria. – *ZooKeys*, **62**: 1-124.
- MÜLLER G. 1923. Le formiche della Venezia Giulia e della Dalmazia. – *Bolletino della Società Adriatica di Scienze Naturali in Trieste*, **28**: 11-180.
- PETROV I. Z. 2000. Checklist of the myrmecofauna (Formicidae, Hymenoptera) of Yugoslavia. – *Archives of Biological Science, Belgrade*, **52** (4): 243-249.
- RUZSKY M. 1904. On the ants from Arkhangelsk province. – *Zapiski Imperatorskago Russkago Geograficheskago Obshchestva po Obshchei Geografii*, **41**: 287-294. (In Russian)
- SEIFERT B. 2007. Die Ameisen Mittel- und Nordeuropas. Tauer: lutra – Verlags- und Vertriebsgesellschaft. 368 pp.

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