

First record of *Myrmica rugulososcabrinodis* KARAWAJEW, 1929 (Hymenoptera: Formicidae) from Bulgaria

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Abstract

Myrmica rugulososcabrinodis KARAWAJEW, 1929 is recorded for the Bulgarian fauna for the first time. It was found in two parks of Sofia and in the Sandanski region. The taxonomic position of this species is discussed. *Myrmica rugulososcabrinodis* is compared with related species, and data regarding its habitat preferences and distribution are provided.

Key words: ants, Formicidae, *Myrmica rugulososcabrinodis*, Bulgaria, taxonomy, distribution, ecology

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Introduction

The Holarctic genus *Myrmica* contains about 160 described species, more than 120 of which are known from the Palaearctic Region (BOLTON 1995a, b, RADCHENKO & ELMES 1998, 1999, 2001). Ten species of *Myrmica* were recorded for Bulgaria in the latest monographic revision of Bulgarian ants (ATANASSOV & DLUSSKY 1992). Nevertheless, two species of *Myrmica* (*M. hellenica* FINZI, 1926 and *M. salina* RUZSKY, 1905) previously mentioned for this country by SEIFERT (1988), were omitted in that monograph. Additionally, SEIFERT (2000) recorded *M. lonae* FINZI, 1926 from Bulgaria, and one more species, *M. vandeli* BONDROIT, 1920, was found here very recently (STANKIEWICZ & ANTONOVA in press). Here we record the fifteenth species of *Myrmica* known from Bulgaria, *M. rugulososcabrinodis* KARAWAJEW, 1929.

Material and Methods

Two nests of *M. rugulososcabrinodis* (one queen and 57 workers) were found by one of the authors (VA) in two different sites of the city of Sofia (for details see below). Another six workers were collected by P. Bezděčka (Praha) in the Sandanski region on 8-12.VI. 1984. The collected specimens were compared with the syntypes of *Myrmica rugulosa* var. *rugulososcabrinodis* KARAWAJEW, 1929, preserved in the Institute of Zoology of the Ukrainian National Academy of Sciences, Kiev, and with the rich material collected by one of the authors (AR) and by G.W. Elmes (UK) in the Caucasus, Turkey and on the Crimea.

Morphometrics of a sample of specimens were measured (accurate to 0.01 mm) and these were used to calculate various indices for the discrimination of *M. rugulososcabrinodis*:

FI	FW / HW
FLI	FLW / FW
FLW	maximum width between external borders of the frontal lobes
FW	minimum width of frons between the frontal lobes
HW	maximum width of head in dorsal view behind eyes

Results and Discussion

Myrmica rugulososcabrinodis was collected in two parks in Sofia, in the "Severen Park" (northern part of the city), and in the "St. Peter and Pavel Park" (western part of the city), in the course of ecological studies on ants during May and June 2004. The species builds nests in the soil of open mowed meadows with 90 % grass cover in the first site and 40 % grass cover in the latter one (Poaceae: *Festuca pratensis* HUDS. and *Dactylis glomerata* L.; Fabaceae: *Trifolium* sp.), with single trees (*Aesculus hippocastanum* L., *Tilia tomentosa* MOENCH, *Betula pendula* ROTH, *Acer platanoides* L.). The soil in "Severen Park" is an "urbogenic anthroposol" with neutral to low-alkaline chemical reaction (pH 6.9-7.05; PENEV & al. in press). Average altitude of the city of Sofia is 550 m, mean annual temperature is ca. 10.2 °C, and the summer precipitation is about 194 mm (BLUSKOVA & al. 1983).

Unfortunately, we do not have enough ecological data on the site of finding *M. rugulososcabrinodis* by P. Bezděčka in the Sandanski region.

Myrmica rugulosa var. *rugulososcabrinodis* was described by KARAWAJEW (1929) from the Caucasus based on workers and males. The same variety name (*Myrmica rubra* var. *rugulososcabrinodis*) has been used earlier by FOREL (1874), therefore ARNOL'DI (1934) proposed for Karawajew's taxon the replacement name, *M. rugulosa* ssp. *caucasica*, and later (ARNOL'DI 1970) he considered it to be a subspecies of *M. sancta*. *Myrmica caucasica* was raised to species rank by SEIFERT (1988), but shortly afterwards DLUSKY & al. (1990) synonymized it (as well as *M. sancta* KARAWAJEW, 1926 and *M. specioides* BONDROIT, 1918) with *M. bessarabica* NASSONOV, 1889. However, FOREL's (1874) *Myrmica rubra* var. *rugulososcabrinodis* is a nomen nudum and therefore the replacement name *caucasica* ARNOL'DI, 1934 for *rugulososcabrinodis* KARAWAJEW, 1929 is unjustified. Very recently, *M. rugulososcabrinodis* KARAWAJEW, 1929 was revived from synonymy (RADCHENKO & ELMES 2004).

The situation with *M. rugulososcabrinodis* in Bulgaria is slightly puzzled by the record of *M. scabrinodis* var. *ruguloso-scabrinodis* from Sofia (FOREL 1893), but FOREL's name is a nomen nudum. On the other hand, ATANASSOV & DLUSKY (1992) assumed *Myrmica rugulosa* var. *rugulososcabrinodis* KARAWAJEW, 1929 (together with *M. specioides* and *M. sancta*) to be junior synonyms of *M. bessarabica*, while SEIFERT (2002) proposed to consider the latter name as incertae sedis in the genus *Myrmica*, and revived the name *M. specioides* from synonymy. RADCHENKO & ELMES (2004) confirmed Seifert's position, as well as the synonymy of *M. sancta* with *M. specioides*.

Myrmica rugulososcabrinodis belongs to the *M. scabrinodis* species group (RADCHENKO & ELMES 2004) and might be confused with *M. specioides* and *M. hellenica*. The workers of *M. rugulososcabrinodis* differ from those of *M. specioides* by the less curved frontal carinae, thus the frons is distinctly wider (*M. rugulososcabrinodis*: mean FI = 0.40, std = 0.02, n = 56 in the Bulgarian material, and even mean FI = 0.43, std = 0.04, n = 106 in the Caucasian and Turkish populations; *M. specioides*: mean FI = 0.38, std = 0.03, n = 59). A more obvious distinguishing feature of *M. rugulososcabrinodis* is the merely slight extension of the frontal lobes, so that FLI is definitely smaller than in *M. specioides* (*M. rugulososcabrinodis*: mean FLI = 1.20, std = 0.06 in Bulgarian specimens, and even mean FLI = 1.15, std = 0.05 in Caucasian and Turkish populations; *M. specioides*: mean FLI = 1.32, std = 0.05). The antennal scape of *M. rugulososcabrinodis* is distinctly angulated at the base, but has a much reduced lobe compared to *M. specioides* (seen from above), at most it appears as a

narrow longitudinal ridge on the bend. Males of *M. rugulososcabrinodis* and *M. specioides* are hardly distinguishable, but standing hairs on the mid and hind tibiae and tarsi of the first species are somewhat longer and more erect.

Workers of *M. rugulososcabrinodis* resemble *M. hellenica* by the shape of antennal scape and general structure of the frontal carinae and frontal lobes (including FI and FLI). However, these species are more easily separable by the sculpture of the head and by the length of the propodeal spines. The frons of *M. rugulososcabrinodis* is completely longitudinally rugulose, while the posterior third of the frons of *M. hellenica* bears a distinct reticulation; and the propodeal spines of *M. rugulososcabrinodis* are distinctly longer. Queens of *M. hellenica* are quite small (together with *M. rugulosa* NYLANDER, 1849 they are the smallest among all known European non-parasitic species of *Myrmica*), distinctly smaller than those of *M. rugulososcabrinodis* (HW < 1 mm vs. HW > 1 mm). Males of *M. hellenica* well differ from those of *M. rugulososcabrinodis* by much shorter standing hairs on the mid and hind tibiae and tarsi.

Myrmica rugulososcabrinodis hitherto was known from the Crimea, the Caucasus, northern Turkey and Iran (A. Radchenko, unpubl. data). Zoogeographically, this species seems to be a Ponto-Caspian element, and currently the Bulgarian sites are the westernmost of its range.

Ecologically, *M. rugulososcabrinodis* obviously is quite tolerant to different kinds of habitats, but generally it dwells in mountain meadows at an altitude up to 2000 m a.s.l. and builds nests in the soil, often under stones. On the Crimea, the species was found at altitudes of 1000 - 1200 m a.s.l. on a mountain meadow, and in the lowland at about 400 m a.s.l. In Turkey it was collected at 400 - 1700 m a.s.l., and in the Caucasus at 600 - 1700 m a.s.l. Despite the fact, that *M. rugulososcabrinodis* up to now has been recorded in Bulgaria only in city parks in Sofia and in the Sandanski region, we may assume that this species is widespread and may be found also in other regions of Bulgaria as well as in adjacent countries.

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Zusammenfassung

Die Ameisenart *Myrmica rugulososcabrinodis* KARAWAJEW, 1929 wurde in zwei Stadtparks von Sofia sowie in der Region Sandanski gesammelt und wird hiermit zum ersten Mal aus Bulgarien gemeldet. Zusätzlich wird die taxonomische Stellung der Art diskutiert, und Angaben zur geografischen Verbreitung und den ökologischen Ansprüchen werden präsentiert.

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