

Rediscovery of the parasitic ant *Myrmica karavajevi* (ARNOLDI, 1930) in Belgium (Formicidae, Hymenoptera)

François VANKERKHOVEN¹, Zoë VANSTRAELEN² & Wouter DEKONINCK³

¹ Mierenwerkgroep Polyergus, Wolvenstraat 9, B-3290 Diest. (e-mail: francois.vankerkhoven@formicidae.be).

² Westerwennel 15, 3600 Genk (e-mail: zoe.kriebelbeestjes@skynet.be).

³ Royal Belgian Institute of Natural Sciences, Department Entomology, Vautierstraat 29, B-1000 Brussels (e-mail: wouter.dekoninck@natuurwetenschappen.be).

Abstract

Myrmica karavajevi ARNOLDI, 1930 is a social parasitic ant species that was observed for the first time in Belgium in 1951 in the Hautes Fagnes region. Despite several investigations carried out during the last two decades with an intensive search for common but also very rare ants (DEKONINCK & VANKERKHOVEN, 2001; DEKONINCK *et al.*, 2003) this species was never found again in Belgium. A recently started inventory to investigate the diversity of invertebrates in the "North-South-connection", resulted in the rediscovery of *Myrmica karavajevi* in Houthalen.

Keywords: Formicidae, faunistics, *Myrmica karavajevi*, Belgian record, Limburg.

Samenvatting

De sociaalparasitaire mier, *Myrmica karavajevi* ARNOLDI, 1930 werd voor het eerst in België waargenomen in 1951 in de Hoge Venen. Ondanks meerdere inventarisaties de laatste paar decennia in België, waarbij intensief naar algemene maar ook zeldzame mieren werd gezocht, werd deze soort niet meer waargenomen. Tijdens een recente studie naar de diversiteit van ongewervelden op het "traject Noord-Zuid" werd *Myrmica karavajevi* gevonden te Houthalen.

Introduction

In 1951 Albert RAINIER and Joseph VAN BOVEN discovered a dealate gyne of a *Myrmica* species in a nest of *Myrmica scabrinodis* NYLANDER, 1846 in the Hautes Fagnes region (name of the exact site: Baraque Michel, 31 May 1951). After comparing this specimen with other known socially parasitic *Myrmica* species, VAN BOVEN described this gyne as a new species: *Myrmica faniensis* (VAN BOVEN, 1970) referring to its type locality. After evaluation by KUTTER (1973) and SEIFERT (1994) *Myrmica faniensis* VAN BOVEN, 1970 was respectively catalogued as *Sifolinia karawajewi* and designated as a synonym of *Symbiomyrma karavajevi* ARNOLDI, 1930, later both catalogued as synonym of *Myrmica karavajevi* by RADCHENCKO and ELMES (2003). The Hautes Fagnes is a region in the east of Belgium with an altitude above 600 m (Baraque Michel, 674 m) where the marshes, bogs and fens are drained by an annual rainfall of 1600 mm.

Several unique records of rare ant species stem from this region (BONDROIT, 1910 ; VAN BOVEN, 1949). Despite several investigations carried out during the last two decades in Belgium with an intensive search for common but also very rare ants (DEKONINCK & VANKERKHOVEN, 2001; DEKONINCK *et al.*, 2003) this species was never found again. *M. karavajevi* has a wide distribution area. This workerless social parasite can be found from England in the west of Europe to Ukraine in the east and from Finland in the north to Spain in the south (RADCHENKO & ELMES, 2010). Nevertheless, it is an ant rarely discovered despite intensive searching. Here we report on the second observation of this species 60 years after its first record in Belgium.

Material and methods

Description of the study area

Before 2004 the sampled site was mainly a



Fig. 1. Panoramic view of the sampling place NZ16. ©Peter Berx.

heathland with purple moor grass (*Molinia caerulea* L. (MOENCH)). At this very moment parts of the site are rather humid habitat, dominated by grasses and Neat Feather-moss (*Pseudoscleropodium purum* (HEDW.) M. FLEISCH. ex BROTH. (1925)) with scattered trees and shrubs as Scots Pine (*Pinus sylvestris* L.), Pedunculate Oak (*Quercus robur* L.), Silver Birch (*Betula pendula* ROTH) and Black Cherry (*Prunus serotina* EHRH.) (Fig. 1). The study area is separated by a road from a military training field (known as the Pampa Range) of 955 ha in the north. The Pampa Range is one of the most valuable nature reserves of Belgium with a great diversity of habitats: dry and wet heathland, country dunes, bogs and fens.

Sampling

A series of pitfall traps were used during an inventory project financed by the community of Houthalen-Helchteren to obtain information of the invertebrate fauna along a planned road from Hasselt (Belgium) to Eindhoven (the Netherlands), named North-South-connection. For the sampling fifty-one sets of pitfall traps were installed, each set consisting of 4 pitfalls, labeled NZ01 – NZ51. The 4 pitfalls of the same set were placed at an intermediary distance of 5 m. The study started on July 28 2011 and will end in July 2012. The traps were emptied in intervals of 3 weeks and ants, spiders, beetles and other invertebrates were sorted out by Z. VANSTRAELEN.

Identification

We used the key of RADCHENKO and ELMES for identifying parasitic *Myrmica* females (RADCHENKO & ELMES, 2010).

The following morphometric characters were measured:

HW: maximum head width behind the

eyes;

HL: maximum head length in median line;

SL: maximum scapus length;

FR: minimum distance between frontal carinae;

AL: diagonal length of the alitrunk, measured from posteroventral corner of the propodeum to the most distal point of the pronotum, excluding the neck. ...

All measurements were made with an Olympus SZX12 stereomicroscope equipped with a 1.2 x PF front lens at magnifications of 96-216 times.

Results

One specimen of *M. karavajevi* (a dealate gyne) was found in a pitfall sample together with several workers of *M. scabrinodis*. This gyne is obviously much smaller than gynes of all other known *Myrmica* species in Belgium.

The only scapus (one is missing on the specimen we collected) is lightly curved without a lobe or carina. The postpetiolar node has a ventrally forward projecting tooth (cf Fig. 2).



Fig. 2. Habitus of a dealate gyne of *Myrmica karavajevi* – specimen found in Germany: Oberes Ahrtal © Photographed by April Nobile, www.antweb.org

The values (all in μm) of the morphometric analysis match well with the indications of RADCHENKO and ELMES (2003): HW: 761, HL: 818, SL: 752, FR: 324, AL: 1200. The frontal index FI (FR / HW) is 0.425.

Discussion and possibilities to rediscover *M. karavajevi* in Belgium

After an absence of sixty years in Belgium it was a surprise to discover a specimen of *M. karavajevi* (dealate queen) in a pitfall sample (NZ16, dated as 22 August 2011) together with several workers of *M. scabrinodis*. The sample was part of a series of pitfall traps used in an project ordered by the community of Houthalen-Helchteren to obtain information of the invertebrate fauna along a planned road from Hasselt (Belgium) to Eindhoven (the Netherlands), named North-South-connection. This workerless social parasite is nowhere common in its European range, and is labelled as vulnerable on the IUCN Red list of threatened species (<http://www.iucnredlist.org/>).

The host specificity of *Myrmica karavajevi* is not very restricted. So far this parasitic ant was found in the nests of *Myrmica scabrinodis* (probably the most common host), *Myrmica gallienii* BONDROIT, 1920, *Myrmica lonae* FINZI, 1926, *Myrmica rugulosa* NYLANDER, 1849 and *Myrmica sabuleti* MEINERT, 1861 (RADCHENKO & ELMES, 2010). The first three of these hosts prefer to live in relatively wet habitat as found especially in the Hautes Fagnes. Of five German samples of *M. karavajevi* (at that time called *Symbiomyrma karavajevi*), investigated by SEIFERT (SEIFERT, 1994) three were sampled in raised bogs with a dominance of *M. scabrinodis* nests. The habitat of the fourth sample was a mesophilic fallow where *M. karavajevi* was found in two colonies of *M. scabrinodis*, while the fifth record was from a *M. rugulosa* nest in a sandy dry grassland. All these host species (except *M. gallienii*) are very common species in Belgium. So maybe other records in similar (or different) habitats with high nest densities of these host species are not to be excluded. Moreover RADCHENKO and ELMES (2010) mentioned that this parasite can continuously be found for several years in the same colonies. Hence, it is plausible that a big and vital population has settled in the discussed study site and its surroundings. This opens the opportunity that more specimens of this very rare parasitic *Myrmica* ant may be observed at the locality mentioned here.

Acknowledgments

We want to thank the municipality of Houthalen-Helchteren that offered us the opportunity to investigate the biodiversity along the planned project. We also want to thank our colleagues of the Lieteberg-group for their collaboration, especially Dirk EERDEKENS who took care of installing and emptying the pitfall traps and Peter BERX, our project manager, for his practical information and for providing the picture of the habitat. We also wish to thank F.M. STEINER and B.C. SCHLICK-STEINER for their comments on the first version of the manuscript.

References

- BONDROIT J., 1910. - Compte rendu d'une excursion aux environs de Hockai. *Annales de la Société royale belge d'Entomologie*, 54: 231-232.
- DEKONINCK W. & VANKERKHOVEN F., 2001. - Checklist of the Belgian ant-fauna (Formicidae, Hymenoptera). *Bulletin de l'Institut Royal des Sciences naturelles de Belgique, Entomologie*, 71: 263-266.
- DEKONINCK W., VANKERKHOVEN F. & MAELFAIT J.P., 2003. - *Verspreidingsatlas en voorlopige Rode Lijst van de mieren van Vlaanderen*. Rapport van het Instituut voor Natuurbehoud 2003.07. Brussel, 191 pp.
- KUTTER, H., 1973. - Über die morphologischen Beziehungen der Gattung *Myrmica* zu ihren Satellitengenera *Sifolinia* Em., *Symbiomyrma* Arnoldi und *Sommimyrmica* Menozzi (Hymenoptera, Formicidae). *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 46 (3-4): 253-268.
- RADCHENKO A.G. & ELMES G.W., 2003. - A taxonomic revision of the socially parasitic *Myrmica* ants (Hymenoptera: Formicidae) of the Palaearctic region. *Annales Zoologici* 53(2) : 217-243.
- RADCHENKO A.G. & ELMES G.W., 2010. - *Myrmica* ants (Hymenoptera: Formicidae) of the Old World. *Fauna Mondii*, Vol. 3, 789 pp.
- SEIFERT B., 1988. - A Taxonomic Revision of the *Myrmica* Species of Europe, Asia Minor, and Caucasia (Hymenoptera, Formicidae). *Abhandlungen und Berichte des Naturkundemuseums Görlitz*, 63[3]: 1-75.
- SEIFERT B., 1994. - Die freilebenden Ameisenarten Deutschlands (Hymenoptera: Formicidae) und Angaben zu deren Taxonomie und Verbreitung. *Abhandlungen und Berichte des Naturkundemuseums Görlitz*, 67[3]: 1-44.
- VAN BOVEN J.K.A., 1949. Notes sur la faune des Hautes-Fagnes en Belgique. *Bulletin de la Société royale Belge d'Entomologie*, 85(5-6): 135-143
- VAN BOVEN J.K.A., 1970. - *Myrmica faniensis*, une nouvelle espèce parasite (Hymenoptera, Formicidae). *Bulletin et Annales de la Société royale belge d'Entomologie*, 106: 127-132.