ZooNotes 86: 1-4 (2016)
www.zoonotes.bio.uni-plovdiv.bg
ISSN 1313-9916

Dinarda dentata (Gravenhorst, 1806) (Coleoptera: Staphylinidae: Aleocharinae) new to Bulgaria and an additional site for *Lomechusoides strumosus* (Fabricius, 1793) in Bulgaria

TOM HARRISON

56 Falstaff Avenue, Earley, Reading, Berkshire, RG6 5TG, United Kingdom, coleopterist@gmail.com

Abstract. First record of the myrmecophilous species *Dinarda dentata* (Gravenhorst, 1806) is reported for Bulgaria. A second site for *Lomechusoides strumosus* (Fabricius, 1793) and a correction to a previous record is provided.

Key words: myrmecophiles, Staphylinidae, *Dinarda*, *Lomechusoides*, Bulgaria.

Introduction

The genus *Dinarda* belongs to the subtribe Dinardina (tribe Oxypodini) whose members are known to be obligate myrmecophiles. Wasmann (1914) showed that there were four closely related species in central Europe, namely *dentata, maerkeli, hagensii* and *pygmaea*. Hölldobler & Wilson (1990) provide a useful summary of the groups known biology: the larvae are found in the kitchen middens of hosts and feed on dead ants and debris. Adult *Dinarda* are able to "steal" food from ants by tapping the ant's labrum, which elicits the regurgitation of liquefied food. The ant may then mount an attack on the beetle which is able to calm the ant by producing an abdominal secretion. Both adults and larvae possess these "calming" glands but lack the "adoption" glands found in the Lomechusini.

To date two species of *Dinarda* are known from Bulgaria, namely *D. maerkeli* Kiesenwetter, 1843 (Ilieff & Lapeva 1997, Lapeva-Gjonova 2013) and *D. hagensii* Wasmann, 1889 (Zerche 1988); and a further, as yet unidentified species of *Dinarda* from a *Formica sanguinea* nest (Hlaváč *et al.* 2007). Below I present the first records of *Dinarda dentata* (Gravenhorst 1806) for Bulgaria.

Dinarda dentata:

Materials and Methods

The nests of *Formica* ants were searched for by looking under good-sized slabs of stone; myrmecophilous beetles were collected by hand from directly below such capping stones. Where beetles were observed disappearing into the soil of the subterranean part of the nest the soil was sieved and this too yielded beetles. It was found that if beetles did escape, replacing the capping stone and leaving the nest for half an hour would significantly increase the chance that specimens would again appear just below the stones. Voucher specimens of ants were collected (and retained) from each nest that yielded beetle specimens.

Accepted: 09 February 2016
Published: 06 March 2016
Университетско издателство "Паисий Хилендарски"
Plovdiv University Press "Paisii Hilendarski"

The specimens were preserved dry; the *Dinarda* were identified by examining external morphology and by carrying out a detailed examination of genitalia (this included measurement of dimensions). The specimens were also compared with British material in the author's personal collection. The determinations were made with reference to Zerche (1989); the four common Central European species can be distinguished on size, shape of pronotum, the form of the spermatheca and the dimensions of the aedeagus. Further, *D. maerkeli* lacks microsculpture on the five visible tergites whereas in the case of *D. dentata* and *D. hagensii* it is clearly visible. To distinguish *D. dentata* from *D. hagensii* is less straightforward and requires careful examination of the genitalia.

The ants were identified using Collingwood (1958) and Brian (1977).

Results

A male and a female specimen of *Dinarda dentata* were collected from separate sites and these represent the first records of this taxon from Bulgaria. In each case voucher specimens of the host ant were also collected and were determined as belonging to the species *Formica sanguinea* (Latreille, 1798). The details of these records are given below:

Dinarda dentata (Gravenhorst, 1806), 1 male;

Stara Planina Mt., Etropole district, near Boikovets village, near Ravni Del, N42.823722 E23.857222, 1320 m alt, 23 April 2015, from a nest of *Formica sanguinea* (Latreille, 1798), leg. T.Harrison.

Dinarda dentata (Gravenhorst, 1806); 1 female;

Stara Planina Mt., Etropole district, near Boikovets, Maniakov Kamak, N42.855472 E23.870444, 1448 m alt, 24 April 2015, from nests of *Formica sanguinea* (Latreille 1798), leg. T.Harrison.

Dinarda dentata has a wide distribution in Europe and is known from Western Siberia, Asia Minor and the Caucuses (Hlaváč et al. 2011); it is likely to be widely distributed in Bulgaria. It is a myrmecophile specific to the host ant, *Formica sanguinea* but it has, on rare occasions, been found with *Formica fusca* Linnaeus, 1758; *F. rufibarbis* Fabricius, 1793; *F. cinerea* Mayr, 1853; *F. aquilionia* Yarrow, 1955 and *F. exsecta* Nylander, 1846 (Päivinen et al. 2003) and it is anticipated that in Bulgaria it will be found in many *F. sanguinea* nests, particularly if they are examined in early Spring and mid Autumn.

Lomechusoides strumosus:

Materials and Methods

The author previously reported the first Bulgarian record of a specimen of *Lomechusoides strumosus* (Fabricius, 1793) from a *Formica* nest at a site in the Stara Planina mountains; but samples of the host ant were not collected (Harrison & Lapeva-Gjonova, 2014). On a return visit to this site on 23 April 2015 the original nest was rediscovered; made possible by the large dimensions of the nest and its distinctive appearance. Pieces of wood and soil were removed from the nest and sieving this material yielded myrmecophilous beetles. These were collected together with voucher specimens of worker ants.

On the following day a second site, 3.5 kilometres distant from the first, was visited and several *Formica* nests were found under stones in a small pasture surrounded by montane beechwoods. Myrmecophilous beetles were collected by hand from directly under the stones containing nests, and sieving soil taken from the nests yielded additional specimens. Again voucher specimens of worker ants were collected.

Specimens belonging to the genus *Lomechusoides* were identified on the basis of external morphology alone, using Schilow (1981), Hlaváč (2005) and Jászay & Hlaváč (2013), while specimens of the ants collected were identified using Collingwood (1958) and Brian (1977).

Results

The specimens collected included three males and three females of *Lomechusoides strumosus* and in every case were found to be associated with the ant, *Formica sanguinea* . Unfortunately, the designated location given for the site of the first Bulgarian record of *L. strumosus* in Harrison & Lapeva-Gjonova (2014), was incorrect even though the coordinates provided were correct. The location name "Maniakov Kamik Peak" should be replaced with "near Ravni Del". A corrected and updated record is given below:

Lomechusoides strumosus (Fabricius, 1793),
1 male on 10 October 2014 (original record)
1 female on 23 April 2015 (subsequent record)

Stara Planina Mt., Etropole district, near Boikovets village, near Ravni Del, N42.823722 E23.857222, 1320 m alt, from a nest of *Formica sanguinea* (Latreille, 1798), leg T.Harrison.

The site visited on 24 April 2015 happened to be the actual location known as Maniakov Kamak and the relevant record for this site is given below:

Lomechusoides strumosus (Fabricius, 1793),
3 males and 2 females on 24 April 2015

Stara Planina Mt., Etropole district. near Boikovets village, Maniakov Kamak, N42.855472 E23.870444, 1448 m alt, 24 April 2015 from nests of *Formica sanguinea* (Latreille, 1798), leg T. Harrison.

Acknowledgments. I would like to thank Kevin and Mariana Edmonds for their generous hospitality which enabled me to study some of the myrmecophilous beetles of Bulgaria. I am also indebted to Albena Lapeva-Gjonova for much helpful advice and encouragement in the preparation of this note.

References

Brian, M. V. (1977) *Ants*. The New Naturalist. Collins. London. 223 pp.

Collingwood, C.A. (1958) A key to the species of ants (Hymenoptera, Formicidae) found in Britain. *Transactions of the Society for British Entomology*, 13 (Part 5): 69-96.

Harrison, T. & Lapeva-Gjonova, A. (2014) Two Lomechusini (Coleoptera: Staphylinidae: Aleocharinae) species new to Bulgaria. *ZooNotes*, 66: 1-2.

Hlaváč, P. (2005) Revision of the myrmecophilous genus *Lomechusa* (Coleoptera: Staphylinidae: Aleocharinae). *Sociobiology*, 46: 203-250.

Hlaváč, P., Bekchiev, R., Růžička,J. and Lackner,T. (2007) Contribution to the knowledge of myrmecophilous beetles (Coleoptera) of Bulgaria, *Acta Societatis Zoologicae Bohemicae*, 71: 127-132.

Hlaváč, P., Newton, A.F. & Maruyama, M. (2011) World catalogue of the species of the tribe Lomechusini (Staphylinidae: Aleocharinae). *Zootaxa*, 3075: 1-151.

Hölldobler, B. & Wilson, E.O. (1990) *The Ants*. Harvard University Press. Cambridge, Mass, USA: 496-498.

Ilieff, O. & Lapeva, A. (1997) Rove beetles (Coleoptera,Staphylinidae) from nests of the meadow ant *Formica pratensis* (Hymenoptera, Formicidae). *Acta Zoologica Bulgarica*, 49: 102-104.

Jászay, T, & Hlaváč, P. (2013) A taxonomic revision of the myrmecophilous genus *Lomechusoides* Tottenham, 1939 (Coleoptera: Staphylinidae: Aleocharinae) Part 1. Redescription of the genus, definition of species groups and the revision of the *amurensis* Wasmann 1897 species group. *Zootaxa*, 3683(1): 065-081.

Lapeva-Gjonova, A. (2013) *Ant-associated beetle fauna in Bulgaria: a review and new data.* Psyche, vol. 2013, Article ID 242037, 14 pp.

Päivinen, J., Ahlroth, P., Kaitala, V., Kotiaho, J.S., Suhonen, J. & Virola, T. (2003) Species richness and regional distribution of myrmecophilous beetles. *Oecologia*, 134 (no. 4): 587-595.

Schilow, W. F. (1981) Die *Lomechusa*-Arten der Sowjetunion und angrenzender Gebiete (Coleoptera, Staphylinidae, Aleocharinae). *Reichenbachia*, 19(36): 213-223.

Wasmann, E. (1914) *Modern Biology and the Theory of Evolution*. London Forgotten Books (2013): 206-207.

Zerche, L. (1988) Myrmecobionte Aleocharinae bei *Formica exsecta* (Nylander) aus Bulgarien (Coleoptera, Staphylinidae). *Entomologische Nachrichten und Berichte*. 32: 271-272.

Zerche, L. (1989) in Lohse, G.A. & Lucht, W.H. Die Käfer Mitteleuropas. 1. *Supplementband miit Katalogteil, Goecke & Evers, Krefeld*: 12: 220-222.