

First records of two insect orders (Embiidina et Isoptera) from Macedonia

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ABSTRACT: During two tours taken to Macedonia (FYROM) in May and June of 2014, *Haploembia solieri* (Rambur, 1842) was collected at two, while *Reticulitermes* sp. at one lowland site in SE Macedonia. These are the first records of webspinners (Embiidina) and termites (Isoptera) from the country, and the more inland occurrences of these orders in the Balkans. Morphological features of the specimens and their habitats are presented on figures. Occurrence of the termitovore European blind snake, *Xerotyphlops vermicularis* (Merrem, 1820), is also noted from the locality where both webspinners and termites were found.

Introduction

Recently, several new country records of webspinners (Embiidina) and termites (Isoptera) were published from the Mediterranean part of Balkan areas (MURÁNYI 2013a, 2013b). In these papers, all data of both orders came from areas that are not far from the sea, but it was also concluded that these insects are rather poorly known in the Balkans. Actually, both were missing from the landlocked Balkan countries (HELLER 2013).

During two collecting tours taken in May and June, 2014, to Balkan countries for collecting aquatic insects, we found small colonies of webspinners at two localities in south-eastern Macedonia (FYROM), and also termites at one of these sites.

Herein we report these new observations, with some notes on the distribution and ecology of the species found, and give figures on their taxonomical characters. The localities are shown on the map of southeastern Macedonia (Fig. 1).

Material and methods

Specimens were collected by singling from beneath stones. Juvenile Embiidina were kept in jars between moss and stones for a few months to obtain adults. They are stored in 70% ethanol and deposited in the Collection of Lesser Insect Orders, Department of Zoology, Hungarian Natural History Museum (HNHM).

Drawings were made with a drawing tube on a Nikon SMZ800 microscope.

Distributional data were discussed after MURÁNYI (2013a, 2013b), that based on FONTANA (2002), HARZ & KALTENBACH (1976), HELLER (2013), ROSS (1966) and STEFANI (1955). Nomenclature follows ROSS (1966) regarding Embiidina, while HARZ & KALTENBACH (1976) was used in case of Isoptera; full list of synonymies can be found in those works.

Results

EMBIIDINA

Haploembia solieri (Rambur, 1842) – **Macedonia**, Southeastern Region, Valandovsko Polje, Čalakli, open macchia W of the village, N41°18.181', E22°37.334', 125 m, 05.05.2014 (/6),

leg. T. Kovács, D. Murányi: 5 juveniles; 3 females matured in captivity more than a month later; Kožuf Mts, Novo Konsko, grassland and forest edge W of the village, N41°09.484', E22°25.466', 210 m, 25.06.2014 (/5), leg. P. Juhász, T. Kovács, D. Murányi: 1 juvenile.

Remarks: All the specimens that we were able to rear to mature adults are females. Their specific identity can be determined on the basis of two ventral papillae on hind basitarsus (Fig. 6), prothorax paler than head (Fig. 2), mandible not carinated and only slightly elevated basolaterally (Figs 3–5).

The species is widespread in the Mediterranean Europe and known from all coastal areas of the Balkans, but this is the first record from a landlocked country in the peninsula. In the Balkans it was always found in dry, warm habitats less than 50 kilometres far from the sea, and always on lowland, while the second species of the Balkanian webspinners, *H. palau* Stefani, 1955 lives in high elevations (MURÁNYI 2013a). However, the new southeastern Macedonian localities are of typical Mediterranean climate, home to several termophilous taxa not known elsewhere in the country (MURÁNYI et al. 2014). Though the ground vegetation were still green during early May after the unusually rainy April (Figs 11, 13), the grass became dry at the end of June (Fig. 15).

Haploembia solieri was introduced to several southwestern states of the USA, and also regarded non-native in the Macaronesian Isles (ROSS 1966). It is exclusively parthenogenetic in both regions, and also on the Tyrrhenian Isles (FONTANA 2002, ROSS 1966, STEFANI & CONTINI 1961). The Macedonian populations are at the edge of their inland distribution, and possibly are also parthenogenetic. We found very small colonies (up to three specimens) or even solitary individuals at both localities. They were present only beneath every tenth or fifteenth stones (Fig. 12), and we were not able to found a single male.

Isoptera

***Reticulitermes* sp. – Macedonia**, Southeastern Region, Kožuf Mts, Novo Konsko, grassland and forest edge W of the village, N41°09.484', E22°25.466', 210 m, 25.06.2014 (/5), leg. P. Juhász, T. Kovács, D. Murányi: 5 workers.

Remarks: There are two accepted species of *Reticulitermes* Holmgren, 1913 reported from the Balkans: *R. clypeatus* Lash, 1952 and *R. lucifugus* (Rossi, 1792). Since the work of CLÉMENT et al. (2001), the name *R. balkanensis* is in use for the Balkanian *Reticulitermes* populations, but that name is still a *nomen nudum* (MURÁNYI 2013a). The few worker specimens we found in Macedonia are clearly a species of *Reticulitermes* on the basis of their size, proximally narrowed pronotum (Fig. 7), presence of vestigial fontanelle (Fig. 8), and arrangement of mandibular teeth (Fig. 10). Weakly projecting postclypeus (Fig. 9) would suggest their identity as *R. lucifugus*, but at present we avoid the specific identification, as the genus is in need of comparative morphological revision.

Small colonies of *Reticulitermes* are rather frequent in low and dry habitats all over the coastal areas of the Balkans, but they occasionally were found also in wet habitats, and in mountains above 1000 meters and more than 100 kilometers far from the sea (MURÁNYI 2013a). Thought the discovery of the present, small population is not a surprise, this is the first record from a landlocked country in the peninsula. The new southeastern Macedonian localiy is a typical termite habitat of Mediterranean climate (Figs 13, 15), where we also found

the European blind snake, *Xerotyphlops vermicularis* (Merrem, 1820) (Fig. 14). Termites are favourite food of this snake species, which is usually found in areas inhabited also by termites (GRILLITSCH et al. 1999). In the Balkans, it is found more frequently in coastal areas, but was also known from Macedonia (DUBOIS 2013).

We found only a few small colonies at the Macedonian locality, and no males or females were caught despite our light trapping efforts in June.

Acknowledgements: Thanks are due to our friend Péter JUHÁSZ (Hortobágy National Park Directorate, Debrecen) who took part in the second collecting tour. The tours were supported by János OLÁH (Sakertour, Debrecen) who should receive special thanks.

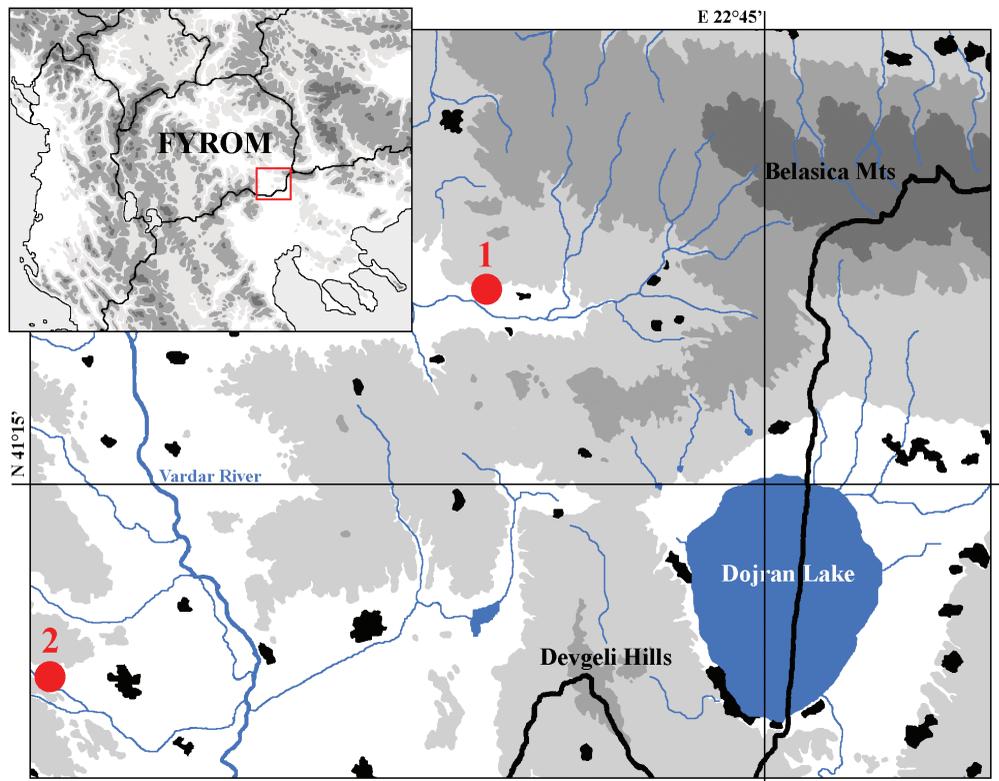
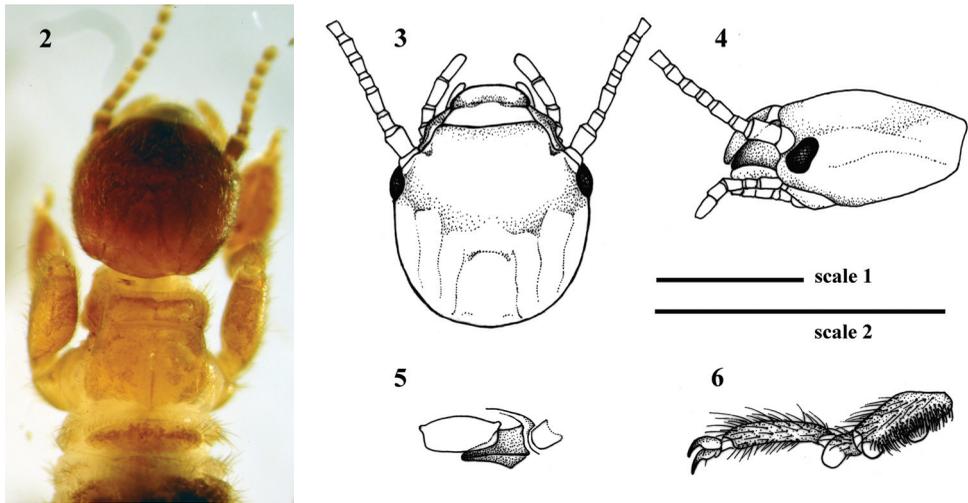
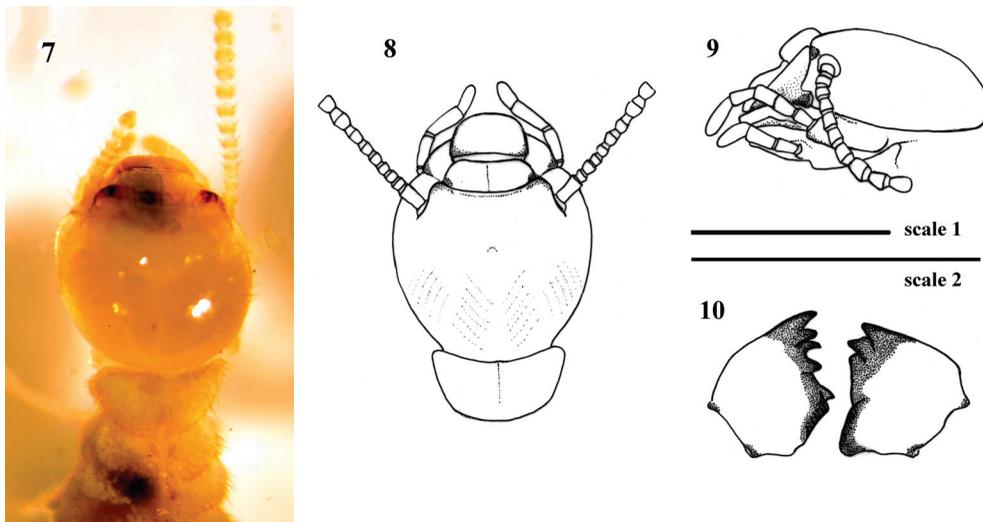


Fig. 1. Collecting sites in southeast Macedonia: 1 = open macchia W of Čalakli;
2 = grassland and forest edge W of Novo Konsko



Figs 2–6. *Haploembia solieri* (Rambur, 1842) female from Macedonia, Čalaki: 2 = colour pattern of head and prothorax, dorsal view; 3 = head, dorsal view; 4 = head, lateral view; 5 = labrum and left mandible, apical view; 6 = metatarsus, lateral view – scale 1 for Figs 3–5; scale 2 for Fig. 6; Fig. 2 not to scale



Figs 7–10. *Reticulitermes* sp. worker from Macedonia, Novo Konsko: 7 = colouration of head and thorax, dorsal view; 8 = head, dorsal view; 9 = head, lateral view; 10 = mandibles, dorsal view – scale 1 for Figs 8–9, scale 2 for Fig. 10; Fig. 7 not to scale



Figs 11–15. Habitats of Embiidina and Isoptera in Macedonia: 11 = open macchia W of Čalakli; 12 = limestone pieces at Čalakli, colonies of *Haploembia solieri* (Rambur, 1842) lived beneath; 13 = grassland and forest edge W of Novo Konsko in May 2014; 14 = *Xerotiphlops vermicularis* (Merrem, 1820) specimen found at Novo Konsko; 15 = grassland and forest edge W of Novo Konsko in June 2014

References

- CLÉMENT, J.-L., BAGNÈRES, A.-G., UVA, P., WILFERT, L., QUINTANA, A., REINHARDT, J. & DRONNET, S. (2001): Biosystematics of Reticulitermes termites in Europe: morphological, chemical and molecular data. – *Insectes Sociaux*, 48: 202–215.
- DUBOIS, A. (2013): Family Typhlopidae. – *Fauna Europea* version 2.6.2, <http://www.faunaeur.org>
- FONTANA, P. (2002): Contribution to the knowledge of Mediterranean Embiidina with description of a new species of the genus *Embia* Latreille, 1825 from Sardinia (Italy) (Insecta Embiidina). – *Atti della Academia roveretana degli Agiati*, Serie VIII, 2B: 39–50.
- GRILLITSCH, H., WEISCH, P. & TIEDEMANN, F. (1999): *Typhlops vermicularis* Merrem, 1820 in the Dalmatian island of Dugi Otok (Croatia) (Squamata: Serpentes: Typhlopidae). – *Herpetozoa*, 12(3/4): 161–162.
- HARZ, K. & KALTENBACH, A. (1976): Die Orthopteren Europas III. The Orthoptera of Europe III. – Dr. W. Junk B. V., The Hague, 434 pp.

- HELLER, K.-G. (2013): Orthopteroid orders. – Fauna Europea version 2.6.2, <http://www.faunaeur.org>
- HOLMGREN, N. (1913): Termitenstudien 4. Versuch einer systematischen monographie der termiten der Orientalischen Region. – Kungliga Svenska Vetenskaps-Akademiens Handlingar, 50(2): 1–276.
- LASH, J. W. (1952): A new species of *Reticulitermes* (Isoptera) from Jerusalem, Palestine. – American Museum Novitates, 1575: 1–7.
- MERREM, B. (1820): Versuch eines Systems der Amphibien I (Tentamen Systematis Amphibiorum). – J. C. Kriegeri, Marburg, 191 pp.
- MURÁNYI, D. (2013a): Data to three insect orders (Embiidina, Dermaptera, Isoptera) from the Balkans. – Opuscula Zoologica Budapest, 44(suppl. 1): 167–186.
- MURÁNYI, D. (2013b): Further contribution to the earwig and termite (Insecta: Dermaptera et Isoptera) fauna of Albania and Macedonia. – Folia historico-naturalia Musei Matraensis, 37: 43–46.
- MURÁNYI, D., KOVÁCS, T. & ORCI, K. M. (2014): New country records and further data to the stonefly (Plecoptera) fauna of southeast Macedonia. – Ecologica Montenegrina, 1(2): 64–77.
- RAMBUR, M.P. (1842): Histoire Naturelle des Insectes Névroptères. – Roret, Paris, 534 pp.
- ROSS, E. S. (1966): The Embioptera of Europe and the Mediterranean region. – Bulletin of the British Museum (Natural History) Entomology, 17(7): 273–326.
- ROSSI, P. (1792): Mantissa Insectorum, exhibens species nuper in Etruria. – Pisis, Polloni, 154 pp.
- STEFANI, R. (1955): Revisione del genere *Haploembia* Verh. E descrizione di una nuova specie (*Haploembia palaui* n. sp.) (Embioptera, Oligotomidae). – Bollettino della Società Entomologica Italiana, 8(7–8): 110–120.
- STEFANI, R. & CONTINI, C. (1961): Caratteri morfologici distintivi nelle forme anfigonica e partenogenetica di *Haploembia solieri* Ramb. – Memorie della Società Entomologica Italiana, 40: 36–43.

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