

First records of *Lasius sabularum* (BONDROIT, 1918) in Poland (Hymenoptera: Formicidae)

Marek L. BOROWIEC



Abstract

The ant *Lasius sabularum* (BONDROIT, 1918), a temporary social parasite, was recently collected from two sites in Dolny Śląsk, southwest Poland. One nest was found at the base of a common hornbeam tree in a long-abandoned quarry on the western slope of the Ślęza massif and another collection was made from under a stone in a stand of low-growing oak trees west of Kunów. Intriguingly, the latter contained workers of both *L. sabularum* and *L. umbratus* (NYLANDER, 1846) but the nature of this association is unknown. This is the first report of *L. sabularum* from Poland, bringing the total count of native ant species to 97. A summary of the known distribution and biology of the species is given and future prospects for Polish ant faunistics are briefly discussed.

Key words: Ants, Formicidae, *Lasius*, *Chthonolasius*, Poland, new record, social parasitism, mixed nests, plesiobiosis.

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M.Sc. Marek L. Borowiec, Department of Biodiversity and Evolutionary Taxonomy, Zoological Institute of the University of Wrocław, Przybyszewskiego 63/77, 51-148 Wrocław, Poland. Present address: Department of Entomology, University of California, Davis, One Shields Avenue, Davis, CA 95616, USA. E-mail: mlborowiec@ucdavis.edu

Introduction

The temporary social parasite *Lasius sabularum* (BONDROIT, 1918) is a rarely encountered member of the subgenus *Chthonolasius* RUZSKY (see BOER 2005, SEIFERT 2007). Although infrequently collected, it is apparently widely distributed, hitherto reported from Spain (COLLINGWOOD 1991), France (BONDROIT 1918, CASEVITZ-WEULERSSE & GALKOWSKI 2009), the British Isles (COLLINGWOOD 1991), Belgium (DEKONINCK & VANKERKHOVEN 2001, BOER & al. 2003), the Netherlands (BOER & al. 2003, BOER 2005), Germany (SEIFERT 1988, 2007), Austria (GLASER 2001, STEINER & al. 2002), Italy (GLASER 2008), Czech Republic (SEIFERT 1988, WERNER & WIEZIK 2007), Slovakia (SEIFERT 1988, BEZDEČKA 1996), Slovenia (BRAČKO 2000, 2007), Romania (SEIFERT 1988, MARKÓ & al. 2006), and Finland (PAUKKUNEN & al. 2009).

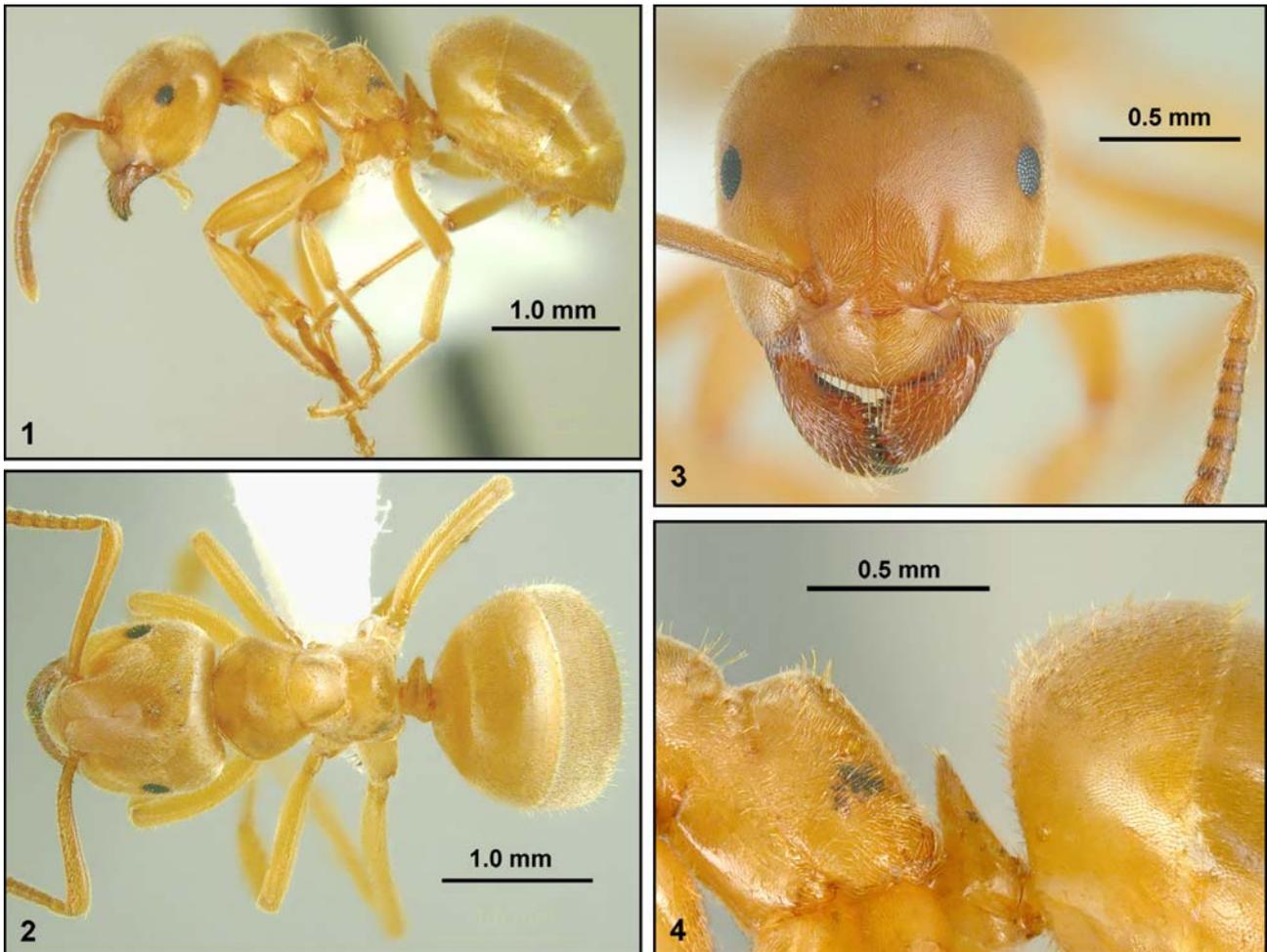
What little is known about the biology of *L. sabularum* has been well summarized by SEIFERT (1988, 2007). He characterizes the species as being one of the least thermophilous members of the subgenus. *Lasius sabularum* has been found in a variety of habitats, such as woodlands, parks, gardens, often in association with human habitations where it can nest in the mortar of walls and under stones (SEIFERT 2007), coastal sand dunes (BOER & al. 2003, BOER 2005), calcareous grasslands (BOER & al. 2006, DEKONINCK & al. 2007) and a *Sphagnum* bog (COLLINGWOOD 1991). It is generally recognized that *L. sabularum* is much less abundant than *L. umbratus* (NYLANDER, 1846), the most common Central European species of the parasitic subgenus *Chthonolasius* (see SEIFERT 1988, 2007, BOER 2005). The presence of alates in nests of *L. sabularum* has been observed from the beginning of July to late October. They can also be found in colonies during spring,

suggesting that alates overwinter if fall weather does not allow mating flight. It has been speculated that mated gynes postpone colony foundation for cold days (DEKONINCK & al. 2004). This strategy is employed by winter-active gynes of *L. mixtus*, which after mating wait in concealment until the temperature drops and then wander around searching for suitable hosts (DEKONINCK & al. 2004, SEIFERT 2007). Suggested hosts of *L. sabularum* include *L. platythorax* SEIFERT, 1991 (see DEKONINCK & al. 2004), *L. niger* (LINNAEUS, 1758), *L. alienus* (FÖRSTER, 1850), and *L. flavus* (FABRICIUS, 1782) (see BOER 2005) but no direct evidence for hosts has ever been provided.

In this paper I report the first findings of *L. sabularum* in Poland. It was discovered almost simultaneously on two sites in Dolny Śląsk (Lower Silesia). In one of the locations it was found in association with *L. umbratus*.

Methods

Determination of specimens was made using the keys in SEIFERT (1988, 2007) and was later confirmed by Bernhard Seifert. Voucher specimens were deposited in the author's private collection, the collection of Lech Borowiec, the Department of Biodiversity and Evolutionary Taxonomy, Wrocław, the Museum and Institute of Zoology collection at the Polish Academy of Sciences, Warsaw, and in the Senckenberg Museum of Natural History collection in Görlitz. Several of the references cited here were obtained from the Antbase website (AGOSTI & JOHNSON 2010). Color photographs were prepared using a Nikon SMZ 1500 stereomicroscope with a Nikon Coolpix 4500 digital photo camera and processed using CombineZP freeware and Adobe Photoshop.



Figs. 1 - 4: *Lasius sabularum* (BONDROIT, 1918), worker from "Białe Krowy" abandoned quarry. (1) Body in lateral view; (2) body in dorsal view; (3) head in full-face view; (4) lateral view focusing on petiole and gaster.

Results

Lasius sabularum (BONDROIT, 1918) (Figs. 1 - 4)

Poland: Dolny Śląsk, 1 km SE Biała "Białe Krowy" quarry XS13 (50° 52' 31" N, 16° 40' 11" E), 210 m a.s.l., hand coll., leg. L. & M.L. Borowiec, samples #68-1 and #81, 12.VI.2010 & 27.VI.2010, ca. 60 workers pinned and in alcohol.

The site is located near Biała village in Dolny Śląsk (Lower Silesia) at the base of the East slope of the Ślęza massif in a long-abandoned quartzite quarry dubbed "Białe Krowy". The former excavation sites are overgrown with mixed deciduous woodland composed of many tree species. A single nest of *L. sabularum* was found after removing a stone from between the roots of a common hornbeam tree near the edge of the woodland. Other *Lasius* species recorded from the site were *L. flavus*, *L. emarginatus* (OLIVIER, 1792) and *L. platythorax*.

Poland: Dolny Śląsk, 0.5 km W Kunów, near abandoned quarry XS24 (50° 53' 53" N, 16° 47' 10" E), 195 m a.s.l., hand coll., leg. L. Borowiec, 5.VI.2010, 6 workers; additional material with the same data as above except leg. L. & M.L. Borowiec, sample #140-1, 14.VIII.2010, 9 workers.

This site is on a hill near an abandoned amphibolite and gabbro quarry, 8.6 km northeast of the other site and just

west of Kunów village. The ants were found under a stone approximately 50 cm in diameter, located ca. 1.2 m from a medium sized *Quercus robur* in a stand of several other trees. The patch of trees bordered abandoned excavation sites and was surrounded by a xerothermous, partly ruderal meadow and a woodland. Upon removal of the stone many *Chthonolasius* workers were observed, suggesting proximity of a nest. However, there was no immediate indication that more than one species was present. After review under a stereomicroscope most specimens were identified as *L. umbratus* but a few workers proved to be *L. sabularum*. On repeated excursions to the site no more ants were found in the cavity where the stone was (now removed), but nine workers of *L. sabularum* and three of *L. umbratus* were obtained by excavating further into the ground. I was unable to discover the nest because the substrate was too difficult to penetrate into very deep. *Lasius flavus*, *L. platythorax*, and *L. niger* were other *Lasius* species observed on the site.

Discussion

The presence of *Lasius sabularum* in Poland is not surprising since it has been reported from many sites in Germany, including Görlitz, a town at the Polish-German border (SEIFERT 1988, 2007). The habitat where the species was found in Poland, open woodland areas, conforms to the existing

data on habitat preferences (see introduction). This record gives no definitive data on hosts for *L. sabularum*, but other *Lasius* species, *L. flavus*, *L. emarginatus*, *L. platythorax*, *L. niger* and *L. flavus*, were recorded on the sites. Additionally, in the site west of Kunów, *Lasius sabularum* was collected from under a single stone together with *L. umbratus*. There are at least four explanations for this association. Either the nests are in close proximity (plesio-biosis), the gynes of both species simultaneously parasitized the same host nest (allopleometrosis), one of the species mated with males of *L. sabularum* and *L. umbratus* and produced worker progeny with phenotypes of both species, or one of these species is capable of hyperparasitism on other *Chthonolasius*. The hybridization hypothesis, however, can be rejected with low error probability. Upon multi-character morphometric analysis, ants from Kunów fall well within typical morphological clusters, corresponding to either *L. sabularum* or *L. umbratus*, suggesting no interbreeding (B. Seifert, pers. comm.).

With this paper the total number of ant species recorded from Poland is raised to 97 native species (104 including invasive and tramp species). Although the myrmecofauna of Poland is relatively well studied (CZECHOWSKI & al. 2002), new species continue to be reported from its territory (RADCHENKO & al. 2003, 2004, 2005, BOROWIEC 2007). Furthermore, as compared to Germany, there are still many gaps in our knowledge of most species' distributions within the country (CZECHOWSKI & al. 2002, SEIFERT 2007). Several common and widespread species have never been recorded from some regions, like Dolny Śląsk (CZECHOWSKI & al. 2002). Judging from the distribution of many species in Central Europe (SEIFERT 2007) it is very likely that additional species may be present in the country. Further collecting efforts are needed to improve the knowledge of ant faunistics in Poland.

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Zusammenfassung

Die Ameisenart *Lasius sabularum* (BONDROIT, 1918), ein temporärer Sozialparasit, wurde vor kurzem an zwei Stellen in Dolny Śląsk, Südwest-Polen, gesammelt. Ein Nest wurde bei einer Hainbuche in einem seit langem stillgelegten Steinbruch am Westhang des Ślęża Massivs gefunden, der andere Fund gelang unter einem Stein in einem Bestand niedrigwüchsiger Eichen westlich von Kunów. Ein faszinierender Aspekt des letzteren Fundes war, dass sowohl Arbeiterinnen von *L. sabularum* als auch *L. umbratus* (NYLANDER, 1846) enthalten waren, wobei der biologische Zusammenhang dieser Beziehung ungeklärt bleibt. *Lasius sabularum* wird hier erstmals für Polen gemeldet, wodurch die Zahl der heimischen Ameisenarten auf 97 steigt. Die

bekanntere Verbreitung und die Biologie der Art werden zusammengefasst und die Perspektiven der polnischen Ameisenfaunistik werden kurz diskutiert.

References

- AGOSTI, D. & JOHNSON, N.H. (Eds.) 2010: Antbase. – <http://antbase.org>, retrieved August 2010.
- BEZDEČKA, P. 1996: The ants of Slovakia (Hymenoptera: Formicidae). – Entomofauna Carpathica 8: 108-114.
- BOER, P. 2005: De breedschubmier *Lasius* (*Chthonolasius*) *sabularum* en de steppemier *L. (C.) distinguendus* (Hymenoptera: Formicidae) in Nederland. – Entomologische Berichten 65: 8-13.
- BOER, P., DEKONINCK, W., VAN LOON, A.J. & VANKERKHOVEN, F. 2003: List van mieren (Hymenoptera: Formicidae) van België en Nederland, hun Nederlandse namen en hun voorkomen. – Entomologische Berichten 63: 54-58.
- BOER, P., DEKONINCK, W. & VAN NOORDWIJK, T. 2006: De mierenfauna van enkele kalkgraslanden van Thier de Lanaye en de herontdekking van *Lasius distinguendus* in België. – Bulletin de la Société royale belge d'Entomologie 144: 115-122.
- BONDROIT, J. 1918: Les fourmis de France et de Belgique. – Annales de la Société Entomologique de France 87: 1-174.
- BOROWIEC, M.L. 2007: *Camponotus truncatus* (SPINOLA, 1808) (Hymenoptera: Formicidae) – ant species new to Poland. – Polish Journal of Entomology 76: 41-45.
- BRAČKO, G. 2000: Review of the ant fauna (Hymenoptera: Formicidae) of Slovenia. – Acta Biologica Slovenica 43: 37-54.
- BRAČKO, G. 2007: Checklist of the ants of Slovenia. – Natura Sloveniae 9: 15-24.
- CASEVITZ-WEULERSSE, J. & GALKOWSKI, C. 2009: Liste actualisée des fourmis de France (Hymenoptera, Formicidae). – Bulletin de la Société Entomologique de France 114: 475-510.
- COLLINGWOOD, C.A. 1991: Especies raras de hormigas del género *Lasius* en España. – Boletín de la Asociación Española de Entomología 15: 215-221.
- CZECHOWSKI, W., RADCHENKO, A. & CZECHOWSKA, W. 2002: The ants (Hymenoptera, Formicidae) of Poland. – Muzeum i Instytut Zoologii PAS, Warszawa, 200 + 1 pp.
- DEKONINCK, W., BOER, P. & MAELFAIT, J.-P. 2004: *Lasius platythorax* SEIFERT, 1991 as a host of several *Chthonolasius* species, with remarks on the colony foundation of the parasites (Hymenoptera: Formicidae). – Myrmecologische Nachrichten 6: 5-8.
- DEKONINCK, W., DE KONINCK, H., BAUGNÉE, J.-Y. & MAELFAIT, J.-P. 2007: Ant biodiversity conservation in Belgian calcareous grasslands: active management is vital (Hymenoptera: Formicidae). – Belgian Journal of Zoology 137: 137-146.
- DEKONINCK, W. & VANKERKHOVEN, F. 2001: Eight new species for the Belgian ant fauna and other remarkable recent records (Hymenoptera, Formicidae). – Bulletin de la Société royale belge d'Entomologie 137: 36-43.
- GLASER, F. 2001: Die Ameisenfauna Nordtirols – eine vorläufige Checkliste (Hymenoptera: Formicidae). – Berichte des naturwissenschaftlich-medizinischen Vereins in Innsbruck 88: 237-280.
- GLASER, F. 2008: Die Ameisenfauna (Hymenoptera, Formicidae) des Schlerengebiets (Italien, Südtirol). – Gredleriana 8: 467-496.
- MARKÓ, B., SIPOS, B., CSÖSZ, S., KISS, K., BOROS, I. & GALLÉ, L. 2006: A comprehensive list of the ants of Romania (Hymenoptera: Formicidae). – Myrmecologische Nachrichten 9: 65-76.
- PAUKKUNEN, J., SODERMAN, G., LEINONEN, R., POYRY, J., RAEKUNNAS, M., TERAS, I., VIITASAARI, M. & VIKBERG, V. 2009: Havaintoja Suomelle uusista, havinneista, uhanalaisista ja silmälläpidettävistä myrky- ja sahapistiaislajeista. – Sahlbergia 15: 2-20.

- RADCHENKO, A., CZECHOWSKA, W., CZECHOWSKI, W., ANTONOVA, V. & STANKIEWICZ, A. 2005: *Myrmica lacustris* RUZSKY (Hymenoptera: Formicidae), a new ant species for Poland. – *Fragmenta Faunistica* 48: 167-174.
- RADCHENKO, A., ELMES, G.W., CZECHOWSKA, W., STANKIEWICZ, A., CZECHOWSKI, W. & SIELEZNIEW, M. 2003: First records of *Myrmica vandeli* BONDROIT and *M. tulinae* ELMES, RADCHENKO et ACTAÇ (Hymenoptera: Formicidae) for Poland, with a key for the *scabrinodis*- and *sabuleti*-complexes. – *Fragmenta Faunistica* 46: 47-57.
- RADCHENKO, A., STANKIEWICZ, A. & SIELEZNIEW, M. 2004: First record of *Myrmica salina* RUZSKY (Hymenoptera: Formicidae) for Poland. – *Fragmenta Faunistica* 47: 55-58.
- SEIFERT, B. 1988: A revision of the European species of the ant subgenus *Chthonolasius* (Insecta, Hymenoptera, Formicidae). – *Entomologische Abhandlungen. Staatliches Museum für Tierkunde Dresden* 51: 143-180.
- SEIFERT, B. 2007: Die Ameisen Mittel- und Nordeuropas. – Lutra Verlags- und Vertriebsgesellschaft, Görlitz/Tauer, 368 pp.
- STEINER, F.M., SCHÖDL, S. & SCHLICK-STEINER, B.C. 2002: Liste der Ameisen Österreichs (Hymenoptera: Formicidae), Stand Oktober 2002. – *Beiträge zur Entomofaunistik* 3: 17-25.
- WERNER, P. & WIEZIK, M. 2007: Vespoidea: Formicidae (mravenovití). In: BOGUSCH, P., STRAKA, J., KMENT, P. (Eds.): Annotated checklist of the Aculeata (Hymenoptera) of the Czech Republic and Slovakia. – *Acta Entomologica Musei Nationalis Pragae, Supplement* 11: 133-164.