

**Tramp species *Hypoponera schauinslandi* (EMERY)
(Hymenoptera: Formicidae) in Poland**

HANNA BABIK

Laboratory of Social and Myrmecophilous Insects, Museum and Institute of Zoology,
Polish Academy of Sciences, Wilcza 64, 00-679 Warsaw, Poland;
e-mail: hbabik@miiz.waw.pl

ABSTRACT. The second record of the tropical tramp species *Hypoponera schauinslandi* (EMERY) is reported from Poland. Single workers were found on the ground and one nest was localized under the bark of a dead trunk in a Warsaw Zoological Garden greenhouse (Warsaw, Mazovian Lowland, Central Poland). Some notes on the biology and distribution of *H. schauinslandi* are given and the potential negative effects of its establishment are discussed.

KEY WORDS: ants, *Hypoponera schauinslandi*, tramp species, greenhouse, synanthropic fauna.

INTRODUCTION

Introduced species are among the main interest of scientists all over the world (VITOUSEK et al. 1997, TORCHIN et al. 2003, MOYLE & MARCHETTI 2006, WARD et al. 2006, PERRINGS et al. 2010). Due to their small size and abundance ants are among those animals which have quite often been accidentally transported to new areas. For example there are over 200 species of non-native ants recorded in the USA, over 100 in New Zealand and all of the approx. 45 species found in Hawaii are introduced species (SUAREZ et al. 2005, WARD et al. 2006, KRUSHELNYCKY et al. 2005 respectively). Among the non-native ants, that manage to establish new colonies, the invasive ones have the most influence, because they are able to widen their range into natural habitat and may have a significant impact on indige-

nous species (see e.g. JOURDAN et al. 2001, CREMER et al. 2006, LESSARD et al. 2009). All others, called simply “tramp ants” (MCGLYNN 1999 after PASSERA 1994), usually do not pose a serious threat to native flora and fauna. However, tramp ants frequently become a nuisance to humans or a hygienic threat (see e. g. HÖLLDOBLER & WILSON 1990, LEE 2002, BOER & VIERBERGEN 2008, WETTERER 2010) as they occur synanthropically and are associated with human activity.

OUTLINE OF DISTRIBUTION AND BIOLOGY OF *H. schauinslandi*

H. schauinslandi (Emery) was first reported from Hawaii in 1899 (SEIFERT 2003), already as an introduced species (KRUSHELNYCKY et al. 2005). It has been reported as a tramp species in many countries of Europe (e.g. Belgium, England, Germany, Switzerland, the Netherlands) and other parts of the world (e.g. Hawaii, Indonesia, Japan, Tanzania; Seifert 2003). It probably originated from a tropical region. It nests outdoors in Europe only to the south of 48°N. In places north of this latitude the colonies are found exclusively in heated buildings, e.g. greenhouses of botanical and zoological gardens with air temperature not lower than 19°C (SEIFERT 2003).

H. schauinslandi is morphologically very similar to its sister species, *H. punctatissima* (ROGER). The two species can be only distinguished by using highly sophisticated measurements (SEIFERT 2003). They are both predominantly hypogeic ants, living in small weakly polygynous colonies up to approx. 200 workers (SEIFERT 2007). Nests are located mostly in and under rotting wood (YAMAUCHI et al. 1996, SEIFERT 2003). The workers feed on small Arthropods, especially Collembola.

There are two distinct morphs of queens (alate and ergatoid) and always ergatoid males (major and minor) which are likely to be found in the colony of *H. schauinslandi* (YAMAUCHI et al. 1996). Mainly between November and February alate fertile females take part in dispersal flights over limited distances (SEIFERT 2003). Mating occurs in the nest and both major and minor males copulate with both alate and ergatoid females (YAMAUCHI et al. 1996). Larvae in this species, similar to some others of the genus *Hypoponera*, can feed independently and may eat each other. “Larvae cannibalism” is thought to be the reason, why workers keep them separated in the nest chambers (PEETERS & HÖLLDOBLER 1992, RÜGER et al. 2008).

H. schauinslandi in Poland

The genus *Hypoponera* SANTSCHI consists of over 120 described species living mainly in the tropical and subtropical parts of the world (CZECHOWSKI et al. 2002). In Central Europe there occur three species of the genus; two of them are introduced (SEIFERT 2003, 2007). For many years only one species, *H. punctatissima*, was reported in Poland (CZECHOWSKI & CZECHOWSKA 1999, RADCHENKO et al. 2004). Quite recently it has been revealed that second representative of the genus, *H. schauinslandi*, was found in Poland (as

is presumed, based on old museum specimens). The first finding originated in a greenhouse of the Botanical Garden in Wrocław, Poland (52°26'N, 21°02'E; Lower Silesia) from before 1945, (SEIFERT 2003). Now, over 60 years later, the species was found for the second time in the aviary of the Warsaw Zoological Garden, Warsaw, Poland (51°12'N, 16°59'E; Mazovian Lowland).

In the aviary, there is a closed space of 300 m² called Free Flight Hall, which is, maintained as an artificial habitat of Asian tropical forest which serves as a living place for exotic birds. The temperature and humidity in this area is kept at a relatively constant high level and many small arthropods are present on the ground. In this place, in addition to other ants, 13 workers of *H. schauinslandi* were collected on 19th August, 2009. Ten individuals were found dwelling on the ground in at least two places which were distant from each other. One nest with brood was located under the bark of a dead tree at the level of approx. 1 m. A repeated inspection on 21th April, 2010 showed that the nest was gone, but the ants were still present since one worker was collected.

In the Free Flight Hall *H. schauinslandi* was accompanied by other ant species, all native, which nested there: *Solenopsis fugax* (LATR.), *Tetramorium caespitum* (L.), *Lasius niger* (L.) and *L. brunneus* (LATR.).

DISCUSSION

As mentioned above, *H. schauinslandi* was only quite recently reliably separated from the often reported in Poland *H. punctatissima* (see CZECHOWSKI et al. 2002). Since it is now known, that it is possible to find both species in Poland, careful measurements were made of the Polish specimens identified as "*H. punctatissima*" kept in the collection of the Museum and Institute of Zoology PAS. The examination of the collection specimens confirmed their originally determined species status, i.e. *H. punctatissima*. These museum specimens are the voucher materials for papers reporting the species from Warsaw (MAZOVIAN Lowland, PISARSKI 1957, 1982, PISARSKI & CZECHOWSKI 1978 and CZECHOWSKI & CZECHOWSKA 1999), and Rokitno-Załącze ad Włoszczowa (Małopolska Upland; CZECHOWSKI & CZECHOWSKA 1999). There is also no doubt about the record from Rudy ad Racibórz (Upper Silesia) as it ("Rauden"; see CZECHOWSKI et al. 2002) is a type locality of *H. punctatissima* (ROGER 1859). Only the reports from Bytom (Upper Silesia; Nowotny 1937) and Łódź (Małopolska Upland; CZECHOWSKI et al. 2002) remain unchecked, for which the voucher specimens have not been preserved.

Including *H. schauinslandi* seven ant species coming from outside Europe have been recorded in Poland (CZECHOWSKI et al. 2002). Two of them, *Hypoponera punctatissima* and *Lasius neglectus* Van Loon, Boomsma et Andrasfalvy, are able to nest outdoors in Polish climatic conditions (although so far no outdoor nest of *H. punctatissima* was found in Poland; CZECHOWSKI et al. 2004). The species *Hypoponera punctatissima* usually uses heaps of fermenting organic material when nesting in North Europe (COLLINWOOD 1979).

L. neglectus on the other hand establishes numerous colonies in urban greenery (VAN LOON et al. 1990). The remaining five species [*H. schauinslandi*, *Linepithema humile* MAYR, *Monomorium pharaonis* (L.), *Tetramorium insolens* (F. SMITH) and *T. caldarium* (ROGER)] are strictly synanthropic, found only indoors, in spaces where constant favourable climatic conditions are maintained. From among these species so far only *M. pharaonis* has become a pest in Poland (see e.g. BRODNIWICZ et al. 1979, GLINIEWICZ et al. 2003, 2006).

Species with a cryptic mode of life, like *H. schauinslandi*, are among the most common tramp and invasive ants in the world (MCGLYNN 1999). *H. schauinslandi* is found in many European countries, although to the north of 48°N latitude it is able to survive only indoors (SEIFERT 2003, 2007). As its dispersion over the long distances depends on passive transport, e.g. with tropical plants, it occurs mainly in greenhouses of botanical and zoological gardens, where sometimes it becomes quite common. For example BOER & VIERBERGEN (2008) consider it as “the most successful exotic ant in Dutch greenhouses” present in every tropical greenhouse and exotic animal house with tropical and subtropical plants investigated by the authors.

However, *H. schauinslandi* is not considered as threat to native flora and fauna in the Central and Northern Europe. It is not able to fly over long distances or establish permanent colonies in natural habitats (SEIFERT 2003, 2007, DEKONINCK et al. 2006, BOER & VIERBERGEN 2008). It is also not likely to become a common indoor pest beyond greenhouses, because of its predatory behaviour. Nevertheless, BOER & VIERBERGEN (2008) mentioned some recorded findings in houses in the Netherlands and GRAY et al. (1995) reported the presence of *H. punctatissima*, also a predatory species, in a hospital in England. A possible problem exists because during dispersal flights young queens may sting painfully (BOER & VIERBERGEN 2008).

Although many introduced ant species never managed to establish permanent colonies in new places there is an urgent need to monitor exotic species in new habitats, as they may have a strong impact on natural ecosystems as well as human health and economy. The tropical, predatory species *H. schauinslandi*, is not likely to become a pest in Poland, however its presence is a reason for paying more attention to exotic species, accidentally transported by human.

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