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First record of *Plagiolepis alluaudi* EMERY, 1894 (Hymenoptera: Formicidae) from Poland

<http://doi.org/10.5281/zenodo.6522444>

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Abstract: We report the first Polish record of the tropical ant species *Plagiolepis alluaudi* EMERY, 1894, found living in greenhouses of Botanical Garden of the University of Wrocław, Poland. *Plagiolepis alluaudi* is native to the Malagasy region and has been previously reported from greenhouses in a few European countries. The number of introduced ant species known from Poland increases to 11. Additionally, Wrocław, most likely due to the progressing development of Botanical Garden and Wrocław ZOO, appears to host the highest number of exotic ant taxa in this country.

Key words: biological invasion, exotic species, house pests, pest ants, tramp species.

INTRODUCTION

Ten introduced ant species have been previously reported from Poland. *Monomorium pharaonis* (LINNAEUS, 1758), the Pharaoh ant, is a common species occurring in Polish towns, especially in apartment blocks and hospitals (CZECHOWSKI *et al.* 2012). *Hypoponera punctatissima* (ROGER, 1859) and *H. ergatandria* (FOREL, 1893) are two other relatively common introduced species collected from hothouses and greenhouses across the country (CZECHOWSKI *et al.* 2012, SALATA *et al.* 2015, MICHLEWICZ & PLESKOT 2017). The Argentine ant, *Linepithema humile* (MAYR, 1868) was found in Poland only once in greenhouse of Botanical Garden in Wrocław (CZECHOWSKI *et al.* 2012). Because the greenhouse was recently closed and dismantled, this species is considered extinct in this country. Recently, SALATA *et al.* 2015, confirmed presence of *Tetramorium insolens* (SMITH F., 1861) in Palm House in Poznań (Wielkopolsko-Kujawska Lowland). Later, SALATA *et al.* (2018) noted *Nylanderia jaegerskioeldi* (MAYR, 1904) in Wrocław Zoological Garden. The most recent contribution to studies on introduced ant species in Poland is a discovery of *Strumigenys emmae* (EMERY, 1890) in Palm House in Poznań (MICHLEWICZ 2022). Poland is also a terra

typica for *Tetramorium caldarium* (ROGER, 1857) – the species was described in 1857 from a hothouse of Rudy in Upper Silesia. However, this finding remains, so far, the only known record of *T. caldarium* in Poland.

There are also two introduced ant species that maintain outdoor colonies in Poland. *Lasius neglectus* VAN LOON *et al.*, 1990 was reported only from Warsaw (Masovian Lowland) where it is known from several recreation areas spread across the city (CZECHOWSKI *et al.* 2012). While *Tetramorium immigrans* SANTSCHI, 1927 was found only in few locations in Wrocław (Lower Silesia) (BOROWIEC & SALATA 2018).

MATERIAL AND METHODS

Greenhouses of Botanical Garden in Wrocław were searched for specimens of introduced invertebrate species. The main method applied in all sites was a hand collecting, later supplemented with pitfall traps. The main part of collected material is preserved in vials with 95% EtOH and is deposited in the Department of Biodiversity and Evolutionary Taxonomy, University of Wrocław (DBET). Several pinned specimens were donated to Museum of Natural History, University of Wrocław (MNHW). Part of pinned specimens is deposited in Upper Silesian Museum, Bytom, Poland (USMB).

RESULTS

Plagiolepis alluaudi EMERY, 1894

Figs. 1–4

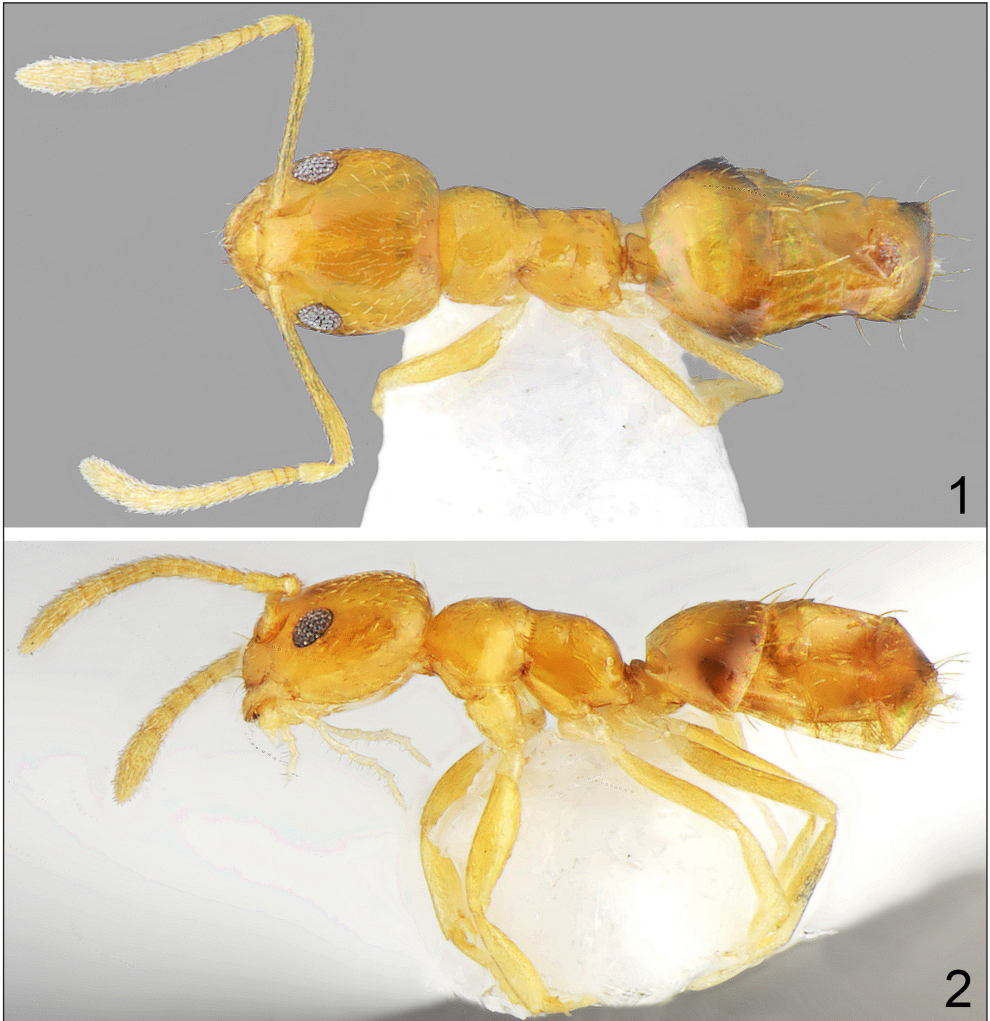
Poland: Lower Silesia, Wrocław, Botanical Garden (indoors), 51.1163 17.0454, 121 m a.s.l., hand collecting, leg. F. Pawluk, 18.11.2021, 20 workers (DBET, MNHW, USMB).

Plagiolepis alluaudi EMERY, 1894 was observed for the very first time in winter 2020 in one of the greenhouses of Botanical Garden of the University of Wrocław. At the time of the first observation, specimens were noted on the leaves of the fern *Platycerium bifurcatum* (CAV.) C. CHR., with visible scale bug (Diaspididae) infestation. The greenhouse, where the specimens were noticed, is one of the most humid (humidity > 75%) and warmest (temperature always > 18 °C) of all facilities of Botanical Garden. In November 2021 the number of specimens significantly increased and individuals of *P. alluaudi* were also noted in several other greenhouses of Botanical Garden. Foraging workers of *P. alluaudi* are now common in Botanical Garden of the University of Wrocław and they feed on honeydew produced by scale bugs (Fig. 4) and plant nectar. In the greenhouses, the species co-exists (but do not interact) with two other species *Tetramorium immigrans*, and *Lasius emarginatus*.

DISCUSSION

Plagiolepis alluaudi is a tropical species, considered native to the Malagasy region, which has spread to many tropical and subtropical regions (WETTERER 2014, 2017, CHOUVENC *et al.* 2018, STAAB 2019). In Europe, it has been previously reported from numerous greenhouses in the United Kingdom, Ireland, Switzerland, the Netherlands, France, Belgium, and Estonia (WETTERER 2014, 2020, MALUMPHY 2016, BLATRIX *et al.* 2018). Its minute workers have no negative impact on plants in the occupied facilities and are usually tending a variety of plantfeeding Hemiptera, especially scale insects (WETTERER 2020). Also, it does not appear to pose any threat of expanding into local natural habitats in temperate areas.

Botanical Garden of the University of Wrocław is the only known locality of this species in Poland. Also, it appears that Wrocław hosts the highest number of introduced ant species



Figs. 1–2. *Plagiolepis alluaudi* EMERY, 1894. 1 – dorsal view. 2 – lateral view.

in this country. So far, 50% of all introduced in Poland species are known from this city, and, additionally, *Linepithema humile*, *Nylanderia jaegerskioeldi*, *Tetramorium immigrans*, and now *Plagiolepis alluaudi* are known only from locations placed in Wrocław. Most likely, this high record is due to progressing development of Botanical Garden and Wrocław ZOO. Transportation of plants used in construction of new greenhouses and hothouses appears to be the most possible way of introduction of exotic ant species in these places.



Figs. 3–4. *Plagiolepis alluaudi* EMERY, 1894. 3 – head. 4 – workers at the leaves of the fern *Platyserium bifurcatum* (Cav.) C. CHR., with visible scale bug (Diaspididae) infestation.

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Accepted: 27 April 2022; published: 5 May 2022

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