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***Polistes mongolicus* du BUYSSON, 1911, a new species of paper wasp in Poland (Hymenoptera, Vespidae: Polistinae)**

<https://doi.org/10.5281/zenodo.8098866>

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Abstract: The paper provides the first information on the occurrence of *Polistes mongolicus* du BUYSSON, 1911 (Hymenoptera, Vespidae: Polistinae) in Poland. Two males were collected during research in Biebrza National Park.

Key words: Hymenoptera, Vespidae, *Polistes mongolicus*, Poland, Biebrza National Park, distribution.

INTRODUCTION

There are 17 species of the genus *Polistes* in the Western Palearctic, 14 of which inhabit Europe (SCHMID-EGGER *et al.* 2017). To date, four species have been recorded in Poland: *Polistes albellus* GIORDANI SOIKA, 1976, *P. biglumis* (LINNAEUS, 1758), *P. dominula* (CHRIST, 1791) and *P. nimpha* (CHRIST, 1791) (ŻYŁA *et al.* 2019). Paper wasps are social wasps that build their nests in the shape of a single comb from chewed papery material, usually attached to bushes, grasses, or under some kind of shelter. Adult wasps are melitophages, but the larvae are fed on animal proteins, derived from insects the adults have killed and comminuted. Some species are parasitic, without a worker caste.

The taxonomic classification of the Western Palearctic *Polistes* species has caused problems for decades (ARENS 2011, NEUMEYER *et al.* 2014, 2015). On the basis of the male head structure, BLÜTHGEN (1943) proposed the subgeneric appellation *Leptopolistes* for several nonparasitic European species, among them *Polistes associus* (KOHL, 1898), *P. bischoffi* WEYRAUCH, 1937 and *P. gallicus* (LINNAEUS, 1767). The remaining species were placed in the subgenus *Polistes*. The parasitic species, in turn, were placed in a separate subgenus *Sulcopolistes*. CARPENTER (1996) classified all European species of *Polistes*

within the subgenus *Polistes*. However, the species previously included in *Leptopolistes* were still regarded as being closely related (CARPENTER 1997). Based on genetic studies and morphometric characteristics, SCHMID-EGGER *et al.* (2017) carried out a revision of the Western Palearctic species, which led to their being divided into two groups. The “*Polistes gallicus* group” contained *Polistes albellus* GIORDANI SOIKA, 1976, *P. biglumis* (LINNAEUS, 1758), *P. bischoffi* WEYRAUCH, 1937, *P. foederatus* KOHL, 1898, *P. gallicus* (LINNAEUS, 1767) and *P. mongolicus* du BUYSSON, 1911, whereas the “*P. dominula* group” comprised *Polistes associus* KOHL, 1898, *P. bucharensis* ERICHSON, 1849, *P. dominula* (CHRIST, 1791) and *P. nimpha* (CHRIST, 1791). Parasitic species: *P. atrimandibularis* ZIMMERMANN, 1930, *P. austrooccidentalis* van ACHTERBERG & NEUMEYER, 2017, *P. maroccanus* SCHMID-EGGER, 2017 and *P. semenowi* MORAWITZ, 1889 were included in a separate group. In the non-parasitic species of the ‘*P. gallicus* group’, the females are distinguished by the black colouration of the malar space and temples, the yellow mandibles and the clypeus roughly as wide as high in the centre. In males (except for *P. biglumis*), the clypeus is gently tapering and rounded at its apex, while the temples, seen from above, are narrow and almost straight (Fig. 3-A, 4-A). In the ‘*P. dominula* group’, the females have yellow malar space and temples, black mandibles, and the clypeus somewhat wider than high. The temples of the males are wide and convex, while the sides of the clypeus are almost parallel, but with a triangular apical margin. The species of *Polistes*, especially those in the ‘*P. gallicus* group’, exhibit a very considerable variation, which can cause serious problems with their identification.

MATERIAL AND METHODS

In Biebrza National Park (Fig. 1), the Forest Research Institute was investigating the effects of the wildfire that broke out in April 2020 on different group of insects (include Aculeata) in selected natural habitats of the Park – *Salici-Betuletum* birch forest, sandy dry grassland on inland dune, *Caricetum appropinquatae*, *Salicetum pentandro-cinereae*, *Molinia* meadows and alder forest. The study was carried out using yellow Moericke traps suspended from wooden poles about 1 m above the ground and purple 12-funnel traps hung on trees at an average height of approximately 4 m above the ground. The conservation agent in the traps was propylene glycol with added detergent. The traps, deployed from mid-May to the end of September in 2020 and 2021, were inspected roughly once a fortnight. All the material was preserved in a dry form. The specimens are housed at the Upper Silesian Museum in Bytom.

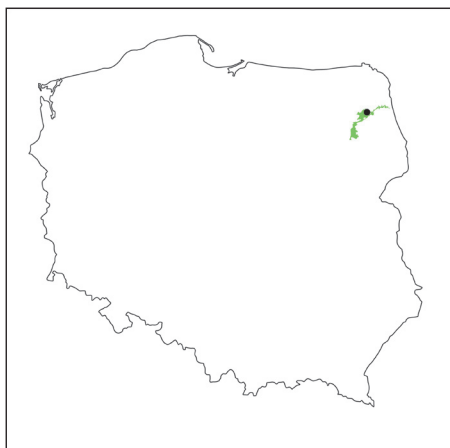


Fig. 1. Location of Biebrza National Park.



Fig. 2. The site affected by the wildfire in 2020: an area of dry and sandy grasslands on an inland dune in the Grzędy Forestry Area, Biebrza National Park. Photo by C. Bystrowski.

RESULTS

The fieldwork yielded two males of *Polistes mongolicus* du BUYSSON. Both specimens were trapped in the Grzędy Forestry Area, Biebrza National Park [UTM: FE24], on an inland dune covered with sandy grassland that had been burnt (Fig. 2). They were collected in the yellow pan traps at some time between 9 and 29 September 2020.

DISCUSSION

P. mongolicus is a species widely distributed in the Palearctic. It inhabits warm regions of Europe. It occurs on the Balkan Peninsula from Croatia to Greece, in the east across Turkey to Central Asia, Mongolia, and China, and in the south as far as Israel and Egypt (SCHMID-EGGER *et al.* 2017). At present, this is the northernmost locality of this species in Europe. A problematic aspect was the atypical colouring of the specimens from the Biebrza National Park, which deviated from the descriptions in the revision by SCHMID-EGGER *et al.* (2017). According to those authors, the key characters included the colour of the mid and hind coxae from above, which should be mostly yellow, and that of the mesosternum, which is either wholly black or black with a pair of yellow stripes. In the Polish specimens, on the contrary, the coxae are black with a small yellow spot, while the mesosternum is completely yellow in one specimen and mostly yellow in the other (Fig. 4 – A, B). The differences are so great that genetic analysis had to be used to definitively identify the species. Another question is about their path of migration to Poland. To date, this species has not been recorded in any



Fig. 3. *Polistes mongolicus* du BUYSSON (♂) trapped in Biebrza National Park: A – dorsal view, B – lateral view. Photo A. Larysz.



Fig. 4. *Polistes mongolicus* du BUYSSON (♂♂). A – frontal view of the head, B – hind coxae, C, and D – mesosterna of the specimens collected in the Biebrza National Park. Photo A. Larysz.

country bordering Poland. Its presence in Biebrza National Park suggests that it could have entered Poland from the east. However, this is difficult to prove, as there are no records from that part of Europe. This aspect requires further research.

ACKNOWLEDGMENTS

We are greatly indebted to Christian Schmid-Egger for his assistance with the identification of the specimens.

* Funded by the State Forest Administration from Forestry Foundation funds as part of a contract with Biebrza National Park.

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Accepted: 14 May 2023; published: 30 June 2023

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