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Nesting biology of *Paravespa rex* (von Schulthess 1924) (Hymenoptera: Vespidae: Eumeninae) in the Crimea, Ukraine

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Abstract

Paravespa rex is the only species of the wasp genus *Paravespa* that occurs in Europe. Females of this species nest in clay loam soil of proluvial terraces and deluvial aprons of badlands. The nests are vertical burrows 10–12 cm deep, surmounted by turrets of two distinct architectural forms: funnel-shaped and curved. The nests contain 1–3 vertical cells (mean—1.9) not different from the other parts of nest burrow. An egg is laid onto the bottom of the cell without attaching; it stands vertically via the moist adhesive surface of the bottom and then with the help of the position of the first prey, which is laid around the egg. The species is univoltine; prepupae hibernate in the cocoon for one or several years. Females hunt for caterpillars of two species of the noctuid genus *Heliothis*; 3–7 caterpillars (mean—3.7) are stored per cell. Adult feeding is recorded on flowers of *Thymus tauricus*. Males look for females at their water-collecting sites. Only a third of the cells are successful; the other ones are damaged by rain and the gold wasp, *Chrysis valesiana*, parasitizing in the nests. Nest-building and hunting activity of the species is described with the duration of certain nesting acts. Nesting biology of *Paravespa* species, rarity of *P. rex*, turret function, egg position, and measures for species conservation are discussed.

Key words: potter wasps, turret building wasps, nest construction, daily activity, trophic links, egg position

Introduction

The genus *Paravespa* Radoszkowski, 1886, includes 17 species belonging to two subgenera: *Paravespa* with four Palearctic species and *Gestrodynerus* Giordani Soika, 1960, with 13 Ethiopian species (Kurzenko 1977, Carpenter 1986, Carpenter *et al.* 2010). All representatives of the genus are large wasps with bright coloration.

Bionomics of the genus are little-known. Blüthgen (1957) summarized the data on the nests and prey of *Paravespa* (*Paravespa*) *grandis* (Morawitz 1885) and *P. (P.) mimetica* (von Schulthess 1924). These species are ground-nesting; they excavate nest burrows on horizontal surfaces lacked vegetation, and surmount them by “chimneys”—mud turrets constructed around the entrances to the nests. Both species hunted for caterpillars of noctuid-moths (Lepidoptera: Noctuidae). The data on the nesting of *P. grandis* published by Blüthgen had been taken from observations made by E. Schmidt and also published by him later (Schmidt 1959). Gess and Gess (1988) described in detail nesting sites, nests, prey, adult behavior, and associated insects of *Paravespa* (*Gestrodynerus*) *mima* Giordani Soika 1960. This species was also nesting on horizontal surfaces and noctuid-hunting. Among other things, they noted that the nests of *P. (G.) mima* were multicellular and had turrets of two distinct architectural forms: funnel-shaped and curved.

Bionomics of *P. (P.) rex* (von Schulthess 1924) have not been studied. In the Crimea this very rare species was known only from a few specimens. The first record of the species was made in 1922, the second one—in 1928, and the third one—only in 1995 (Fateryga & Ivanov 2009). We successfully observed in 2010–2011 an outbreak of population abundance of *P. rex* and studied its nesting biology, ecology and behavior.