ARTYKUŁ / ARTICLE

A new record of *Ontholestes haroldi* (EPPELSHEIM, 1884) (Coleoptera: Staphylinidae) in the Cracow area with remarks on its ecology

Nowe stanowisko Ontholestes haroldi (EPPELSHEIM, 1884) (Coleoptera: Staphylinidae) w rejonie Krakowa z uwagami na temat jego ekologii

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ABSTRACT. Ontholestes haroldi (EPPELSHEIM, 1884) is a rather rare species of rove beetles (Coleoptera: Staphylinidae), whose occurrence in Europe, including Poland, is poorly documented. A field study conducted in Kraków provided new data on the distribution of this species in southern Poland. The beetles were collected using Barber traps set near pig carcasses. The results indicate that *O. haroldi* occurs in anthropogenically pressured environments, suggesting that it is a ubiquitous species. Despite its low population density, analysis of the literature and the data collected suggests that *O. haroldi* has a role as a predator in the regulation of insect populations, especially flies. This study enhances our understanding of the ecology and distribution of this beetle in Poland, emphasizing the need for further research to better determine its habitat requirements and population dynamics.

KEY WORDS: faunistic, rove beetles, distribution, urban environment.

Introduction

The genus Ontholestes spp. currently includes more than 30 described species. Only three of them occur in Central Europe, including Poland: Ontholestes murinus (LINNAEUS, 1758), O. tesselatus (GEOFFROY, 1785), and O. haroldi (EPPELSHEIM, 1884). The first two are common species, widely distributed across the country. In contrast, little is known about O. haroldi. It is a rare species, recorded so far only sporadically and usually as single individuals (JAŁOSZYŃSKI & WANAT 2021). In Europe until now, its presence has been recorded in countries such as Germany, Poland, the Czech Republic, Slovakia, Ukraine, France, Switzerland, Austria, Italy, Romania, Latvia, and Moldova (MOSSENTA & STERGULC 2006, MIHAILOV 2016, MAZUR & MELKE 2022).

The first record of *O. haroldi* in Poland dates back to 1924, when it was identified near Warsaw (TENEN-BAUM 1926). It was not until 2009 that its presence was again confirmed in Libusza (TASZAKOWSKI *et al.* 2018). After this time, the number of observations of

this beetle began to slowly increase. Many new locations and accurate data on its occurrence in the country were collected in their monograph by MAZUR & MELKE (2022). Analyzing the information provided there, it can be seen that the species was caught mainly in the area of southern Poland.

The aim of this work is to present new localities of this species in Poland and, by doing so, to add to the data on its distribution.

Material and methods

All specimens were trapped using Barber traps during forensic entomology studies involving pig (*Sus scrofa domestica* L.) carcasses weighing approximately 35-40 kg as bait. The study was conducted from June 28, 2024, to August 17, 2024. The traps were filled with ethylene glycol and emptied twice a day. The first collection occurred around 9 a.m., and the next collection around 4 p.m. After August 17, sampling was discontinued, but a subsequent experiment was conducted from September 21 until spring, allowing for further observations of insect activity in colder months.

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Identification was carried out based on morphological features. Additionally, the copulatory apparatus of males was dissected to confirm the determinations (SZUJECKI 1980). However, according to JAŁO-SZYŃSKI & WANAT (2021), the most reliable method of identification for this species remains the characteristic coloration of the legs, which was clearly visible in all collected specimens.

Results

20 specimens of *O. haroldi* were collected during the study (Fig. 1 & 2):

- DA24 Redit Fort No. 7 'Za rzeką' in Bronowice (50.0920°N, 19.9031°E): 30 June 2024 (1♀), 8 July 2024 (1♀), 10 July 2024 (1♀), 12 July 2024 (1♂), 18 July 2024 (1♀, 1♂), 23 July 2024 (3♂), 10 Aug 2024 (2♀, 1♂), 16 Aug 2024 (1♀, 1♂)
 ground trap, scrub, moderately sunny, sparsely wooded site, leg. et det. D. KADŁUB;
- DA24 Za Torem 22 (50.0385°N, 19.9568°E):
 1 July 2024 (1♀, 1♂) 2 July 2024 (1♂), 3 July 2024 (1♀), 8 July 2024 (1♂), 17 July 2024 (1♀) ground trap, scrubby, shaded site, leg. et det. D. KADŁUB.



Fig. 1. Occurrence of *Ontholestes haroldi* in southern Poland:
- new observation, ● - observation from 1924, ● - observations after 2000.

Ryc. 1. Występowanie *Ontholestes haroldi* na terenie południowej Polski: ● – nowe obserwacje, ● – obserwacja z 1924, ● – obserwacje po 2000.



Fig. 2. Localities of *Ontholestes haroldi* in Krakow: A – grove at Za Torem St.; B – grove at Rydla St.; C – caught specimen of *O. haroldi*. (Photo by D. KADŁUB)

Ryc. 2. Stanowiska *Ontholestes haroldi* w Krakowie: A – zagajnik przy ul. Za Torem; B – zarośla przy ul. Rydla; C – odłowiony osobnik *O. haroldi*. (fot. D. KADŁUB)

Discussion

Ontholestes haroldi remains a relatively rare species. Hence, there is still little knowledge of its biology and ecology. Our study confirms previous observations, which indicate that O. haroldi prefers thinned forests and thickets characterized by dry and warm microclimates (ŠUSTEK & TÓTH 1986, MAZUR & MELKE 2022). In the literature, O. haroldi is described as being mainly associated with warm, open areas such as dry oak forests (ŠUSTEK & TÓTH 1986). Our results confirm this preference, as most of the individuals caught were from sites with moderate sunlight (Fig. 2). The occurrence of this species in open biotopes (meadows, fields, gardens, nurseries, and pond banks) and on sandy-muddy stream banks has also been reported so far (EISINGER 2011).

In a study to better understand the requirements of this species, ŠUSTEK & TÓTH (1986) suggested that this beetle may be a tolerant species to urban pollution. The ability to adapt to different environments, including heavily polluted ones, may be evidence of a certain ecological plasticity of this species, making it an interesting object of study. Our data confirm this assumption, as we have caught it in urban environments, on sites bordering heavily transformed by man. This confirms that *O. haroldi* is able to adapt to different habitat conditions, including anthropogenic environments.

It is certain that O. haroldi is a predatory species, as are the other two European species of the genus. MIHAILOV'S (2016) observations suggest that it actively regulates populations of insects, such as flies and aphids, mainly by feeding on immature stages. Analysis of the literature showed that O. haroldi can be considered a coprophilous beetle (MIHAILOV & DERJANSCHI 2010, MAZUR & MELKE 2022). It is caught in areas with decaying organic material (ŠUSTEK & TÓTH 1986), so it probably feeds readily on developing fly larvae. During our study, the beetles were most active while the begining of the advanced decomposition process of the carcass was at its most active phase, and some of the fly larvae move away from the body to pupate (MATUSZEWSKI et al. 2010). The use of Barber traps baited with carrion has proven to be an effective trapping method, confirming the association of this species with such microhabitat. O. haroldi is usually caught

singly (TASZAKOWSKI *et al.* 2018). This species, despite being increasingly observed in Poland, still appears rare and scattered. At our sites, although we caught twenty individuals, they tended to appear singly. This suggests that the low population density makes it difficult to find it more frequently.

According to the literature, *O. haroldi* has been recorded from late April to October (ŠUSTEK & TÓTH 1986, JAŁOSZYŃSKI & WANAT 2021), with peak activity reported at the end of May and the beginning of September (ŠUSTEK & TÓTH 1986). However, in our study, the vast majority of individuals were caught in July, which does not fully align with the seasonal patterns previously described. In September, the species was not observed, probably due to relatively low temperatures limiting insect activity. In addition, during the study we caught most individuals from the traps in the morning, which may indicate that *O. haroldi* may be less active during the day. It may also infer that this is a species that prefers lower temperatures or less sunlight.

In conclusion, our study provides new information on the occurrence and ecology of *O. haroldi* in Poland. Although the species is still rare, observations from new locations extend our knowledge of its habitat preferences and potential adaptability to diverse conditions. Further field studies may contribute to a better understanding of the population dynamics of this beetle.

STRESZCZENIE

Ontholestes haroldi (EPPELSHEIM, 1884) to stosunkowo słabo poznany gatunek chrząszcza z rodziny kusakowatych (Coleoptera: Staphylinidae), którego występowanie w Polsce nie jest wystarczająco udokumentowane. Badania z entomologii sądowej, prowadzone w środowisku miejskim Krakowa dostarczyły nowych danych o rozmieszczeniu tego gatunku w południowej Polsce. Chrząszcze odłowiono za pomocą pułapek Barbera, które znajdowały się w pobliżu padliny świni. Wyniki wskazują, że kusak ten radzi sobie w zróżnicowanych warunkach siedliskowych, nawet tych silnie zmienionych przez człowieka. Analiza literatury i uzyskanych danych sugeruje, że ten drapieżny kusak może odgrywać dość istotną rolę w regulacji populacji owadów, będąc nie tylko gatunkiem koprofilnym, ale też nekrofilnym. Ponadto obserwacje sugeruja, że może być bardziej aktywny po zmierzchu. Przeprowadzone badania poszerzają wiedzę o ekologii i rozmieszczeniu tego chrząszcza w Polsce, jednocześnie podkreślając potrzebę dalszych obserwacji.

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