New records of *Colletes hederae* Schmidt & Westrich, 1993 (Hymenoptera, Apiformes) in Poland

Justyna Kierat

Received: 10 October 2023
Accepted 25 January 2024
Available online: 19 February 2024
Issue online

I. INTRODUCTION

Changes in the distribution of species can be a part of natural processes, but in recent years they are often the result of anthropogenic activity. Humans can directly affect a species’ range (e.g. by killing out its representatives in a given area or by introducing them outside of the native range). They can also affect the distribution indirectly, through anthropogenic climate change (Hofmann et al. 2018; Biella et al. 2021). In recent decades, several bee species have been observed to expand their ranges. *Megachile sculpturalis* Smith, 1853 has been successfully spreading in Europe since its accidental introduction from Asia, and its range expansion has probably been accelerated by multiple introduction events and accidental transferring by humans between different localities (Lanner et al. 2021; Dubaić et al. 2022). On the other hand, *Bombus haematurus* Kriechbaum, 1870, *Halictus scabiosae* (Rossi, 1790) and *Colletes hederae* Schmidt & Westrich, 1993 have increased their range without the direct influence of humans, although climate change is thought to be involved (Schweitzer and Theunert 2019; Hopfenmüller 2014).

The Ivy bee *Colletes hederae* is a member of the family Colletidae, described relatively recently as a new species (Schmidt & Westrich 1993). It belongs to the *succinctus* group, which now consists of three sibling species in Western Europe: *succinctus,*...
were observed only during the visits that took place before noon.

The collected specimens are listed below (Fig. 2C):
- Górzyca (UTM VU71), municipal cemetery (52°29′30″N 14°39′23″E), 17 September 2023 at about 10-11 a.m., 2 ♀ *C. hederae* on *H. helix*, leg. et det. J. Kierat (Fig. 1A-E)
- Kraków (UTM DA24), Wawel Castle (50°03′15″N 19°56′07″E), 22 September 2023 at about 10.30-12 a.m., 2 ♀ *C. hederae* on *H. helix*, leg. J. Kierat, A. Żmuda, det. J. Kierat.

Additionally, on 16 September at 11 a.m. in Górzyca, one *Colletes* cf. *hederae* female was observed foraging on the ivy flowers by me but the catch attempt failed. On 17 September, between 10 and 11 a.m. in Górzyca, at least one more female *Colletes* cf. *hederae* (apart from the two individuals that were caught earlier this day) was observed and photographed by me and K. Zapotoczny (Fig. 2B).

### III. RESULTS

In both of the examined localities, the ivy flowers were visited by a wide range of insects, including honeybees, wasps (Vespidae), flies (including hoverflies) and butterflies. Members of the genus *Colletes* were observed only during the visits that took place before noon.

The collected specimens are listed below (Fig. 2C):
- Górzyca (UTM VU71), municipal cemetery (52°29′30″N 14°39′23″E), 17 September 2023 at about 10-11 a.m., 2 ♀ *C. hederae* on *H. helix*, leg. et det. J. Kierat (Fig. 1A-E)
- Kraków (UTM DA24), Wawel Castle (50°03′15″N 19°56′07″E), 22 September 2023 at about 10.30-12 a.m., 2 ♀ *C. hederae* on *H. helix*, leg. J. Kierat, A. Żmuda, det. J. Kierat.

Additionally, on 16 September at 11 a.m. in Górzyca, one *Colletes* cf. *hederae* female was observed foraging on the ivy flowers by me but the catch attempt failed. On 17 September, between 10 and 11 a.m. in Górzyca, at least one more female *Colletes* cf. *hederae* (apart from the two individuals that were caught earlier this day) was observed and photographed by me and K. Zapotoczny (Fig. 2B).

### II. METHODS

The observations in Górzyca (Western Poland, a few kilometres from the Polish-German border) took place on 16 and 17 September 2023, at about 10-11 a.m. on both days and at 15-16 p.m. on the first day, on the blooming ivy growing on a brick wall surrounding the cemetery (Fig. 2A). The ivy had grown up to 2 m in height.

The observations in Kraków were conducted on 22 September 2023, at about 10.30-12 a.m., on the ivy growing on the Wawel Castle grounds, a historic complex located near the city centre on the bank of the Vistula River.

The bees were caught with a net, killed with ethylacetate and were later identified under a stereomicroscope using the identification keys in *Amiet* (2014) and *Falk & Lewington* (2017), and the photographs on Steven Falk’s Flickr page (https://www.flickr.com/photos/63075200@N07/collections/72157633396536539/, accessed 20.09.2023).

### III. RESULTS

In both of the examined localities, the ivy flowers were visited by a wide range of insects, including honeybees, wasps (Vespidae), flies (including hoverflies) and butterflies. Members of the genus *Colletes* were observed only during the visits that took place before noon.

The collected specimens are listed below (Fig. 2C):
- Górzyca (UTM VU71), municipal cemetery (52°29′30″N 14°39′23″E), 17 September 2023 at about 10-11 a.m., 2 ♀ *C. hederae* on *H. helix*, leg. et det. J. Kierat (Fig. 1A-E)
- Kraków (UTM DA24), Wawel Castle (50°03′15″N 19°56′07″E), 22 September 2023 at about 10.30-12 a.m., 2 ♀ *C. hederae* on *H. helix*, leg. J. Kierat, A. Żmuda, det. J. Kierat.

Additionally, on 16 September at 11 a.m. in Górzyca, one *Colletes* cf. *hederae* female was observed foraging on the ivy flowers by me but the catch attempt failed. On 17 September, between 10 and 11 a.m. in Górzyca, at least one more female *Colletes* cf. *hederae* (apart from the two individuals that were caught earlier this day) was observed and photographed by me and K. Zapotoczny (Fig. 2B).

### IV. DISCUSSION

This paper presents new evidence of *Colletes hederae* in Poland. To my knowledge, these are the first records of this species in the country. I know of no published records from Poland before September 2023. As valuable faunistic information is frequently recorded by amateurs and posted on public science platforms or social media (e.g. *Jaskula et al.* 2021), I also examined the iNaturalist database and some social media groups and blogs where photos of insects are posted, but this research revealed no reliable records of *C. hederae* in the country (i.e. with an added photo or from observers who are experienced in bee identification). Nonetheless, it can be assumed that after the first appearance of *C. hederae* in Poland, more records from the country will follow soon.

It is interesting to note that both of the reported records were separated by a distance of about 450 km. If the species were spreading into the Polish territory only from the west, it would be surprising that there were no earlier records from the area to the west of Kraków. It is also unlikely that the species would cover this distance in just one season. It is possible that the ivy bee was present but overlooked in previous years. However, there is an alternative possibility that the Kraków area, in contrast to Górzyca, was colonised from the south and not the west.
Fig. 1. *Colletes hederae*, a female collected in Górzyca on 17.09.2023: A – habitus; B – first two terga showing the translucent margin of tergite 1 and punctuation; C – hind tibia showing a row of dark hairs; D – clypeus with the characteristic sculpture; E – tongue showing a diagnostic sculpture of the galea.
Although examining a specimen might be crucial for the certain identification of *C. hederae*, especially in old and abraded individuals, this species can be often identified with a high level of probability in the field. It can easily be confused with honeybee and some hoverfly species, which are also frequently found on ivy, by an inexperienced observer. However, it can be distinguished with a low likelihood of mistake by amateur naturalists with more experience in bee identification, and by specialists on the basis of the photos. This makes the species an ideal case for involving citizen science in the monitoring.

*C. hederae* is present both in Slovakia, where it was first recorded in 2017, and in Czech Republic, where it has been known since 2020 (Bogusch et al. 2021). The first phase of the expansion of *Halictus scabiosae* in Poland showed a similar pattern: all the records in 2020 and 2021 were located along the western border of the country; but in 2022 the species was discovered in Kraków, about 230 km from the nearest known Polish locality (Kierat et al. 2023). It is suspected that *H. scabiosae* may have come over the mountains through the Moravian Gate. It is therefore possible that *C. hederae* followed a similar route.

Although examining a specimen might be crucial for the certain identification of *C. hederae*, especially in old and abraded individuals, this species can be often identified with a high level of probability in the field. It can easily be confused with honeybee and some hoverfly species, which are also frequently found on ivy, by an inexperienced observer. However, it can be distinguished with a low likelihood of mistake by amateur naturalists with more experience in bee identification, and by specialists on the basis of the photos. This makes the species an ideal case for involving citizen science in the monitoring.

---

**Fig. 2.** Habitat of *Colletes hederae* in Górzyca and records in Poland. A – outer wall of the cemetery, overgrown by ivy (photo: N. Duer); B – female *C. cf. hederae* collecting pollen from the ivy (for a further explanation, see the text); C – new records of *C. hederae* in Poland: red dot – Górzyca, blue dot – Kraków, presented in the 10 × 10 km grid of the UTM coordinate system (created with MapaUTM ver 5.4, Grzegorz Gierlasiński, https://www.heteroptera.us.edu.pl/mapautm.html).
In the UK this has been done since the first appearance of the ivy bee in 2001, where the monitoring is coordinated by BWARS (https://bwars.com/content/colletes-hederae-mapping-project, access 22.09.2023). In Poland, there are currently active public science projects that involve bee monitoring, e.g. the monitoring of Xylocopa spp., led by the Natura i Człowiek Association (Pawlowski et al. 2018; Stowarzyszenie Natura i Człowiek 2022). As a result, there is the potential to run a similar project that would document the spread of C. hederae in Poland.

Acknowledgments. I would like to thank Krystian Zapotoczny for all his support and help, Natalia Duer for giving me the opportunity to visit Górzycy during the Szungiac Trawy Nature Festival and for sharing information about the localities of ivy in bloom, Karolina Ujma for accompanying me in the field, and Aleksandra Żmuda for her assistance in the field, for catching one of the specimens of C. hederae in Kraków and for all the support.

CONFLICT OF INTEREST

The author declares no conflict of interest.

REFERENCES


Stowarzyszenie Natura i Człowiek. 2022. Raport projektu “czarna pszczoła”. Społeczny monitoring pszczół rodzaju Zadrzechnia w Polsce. [In Polish].