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Cardiastethus fasciiventris (Garbiglietti, 1869) (Heteroptera: Anthocoridae) finally confirmed in Poland

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Abstract: *Cardiastethus fasciiventris* (Garbiglietti, 1869) (Heteroptera: Anthocoridae) is a Mediterranean-Atlantic species, known to inhabit a wide range of host plants, primarily conifers, and is of economic importance as a biocontrol agent. The species was reported for the first time from Poland by Péricart in 1972 and was subsequently included in the Polish heteropteran checklist. However, we consider this record questionable, and the origin of the specimen on which the claim was based, unclear. Other reports of this species from Poland have been found to be misidentifications. Therefore, we provide the first confirmed record of this species in Poland. On the 20th of June 2022, a male specimen was collected in Wrocław-Maślice, Lower Silesia, during light trapping. We also list eleven other heteropteran species collected at this site. The presented record of *Cardiastethus fasciiventris* represents the northeasternmost known locality for the species in Europe. The increase in Central European records suggests an ongoing range expansion, potentially facilitated by climate change.

Keywords: true-bugs, first country record, Silesia, insect expansions

Introduction

Cardiastethus Fieber, 1860 is a widely distributed genus within the family Anthocoridae. Approximately 50 species have been described so far, mainly in the tropics and subtropics (cf. Péricart 1972, Lattin & Stanton 1993, Yamada & Hirowatari 2007, Yamada 2016). Seven of these species are known to occur in the Palaearctic region, two in Europe: *C. fasciiventris* (Garbiglietti, 1869) (described in detail below) and *C. nazarenus* Reuter, 1884 distributed around Mediterranean Sea (Aukema & Rieger 1996). The species of *Cardiastethus* are of economic interest as they play an important role in agrocenoses as biocontrol agents against agricultural pests in plantations, especially of coconut palm and mango (Nasser & Abdurahiman 1998).

Cardiastethus fasciiventris is a species with a Mediterranean-Atlantic distribution, ranging from the Iberian Peninsula and north-western Africa to western Greece and Egypt (Péricart 1972). The recent increase in records from Central Europe may suggest an ongoing expansion of the species in this region (Rietschel 2000, Günther 2002, Baugnée 2004, Fließ *et al.* 2005, Aukema & Hermes 2009, Aukema *et al.* 2020, Winkelmann 2021, Bäse & Bäse 2024). The easternmost locations in Europe include Austria (Fließ *et al.* 2005) and Germany (Winkelmann 2021).

The species has been reported from a relatively broad range of host plants. Primarily, it is found on coniferous trees of the genera *Pinus, Abies,* and *Picea* (Péricart 1972), but has also been observed on other conifers such as *Thuja* and *Juniperus communis* L. (Aukema 2016). Additionally, it has been found on deciduous trees, including *Quercus* and *Crataegus,* as well as on *Sarothamnus scoparius* (L.), mistletoe parasitising apple trees, and even on dead oak branches lying on the ground (Aukema *et al.* 2020, Winkelmann 2021, Bäse & Bäse 2024). In the Mediterranean region, it is primarily found on *Tamarix, Quercus, Pistacia,* and various fruit trees (Wachmann *et al.* 2006). Adults prey on

Psocoptera, while larvae also feed on pollen (Péricart 1972, Wachmann *et al.* 2006).

Occurrence of *Cardiastethus fasciiventris* in Poland

Cardiastethus fasciiventris was first mentioned in the monographic work by Péricart (1972): *Hémiptères Anthocoridae, Cimicidae et Microphysidae de L'ouest-Paléarctique.* The original citation reads: „POLOGNE: Silésie : Lucht, 1 ex. (M. Be!)". This record led to the species being included in the checklist of heteropteran bugs of Poland (Gorczyca 2004). The voucher specimen, stored in the Museum für Naturkunde in Berlin, is illustrated in Fig. 1. However, the collector`s surname is actually "Luchs" (Dr) not "Lucht". Unfortunately, no further information regarding the origin of this specimen is available, neither on the attached labels (Fig. 1), nor in the entry book of the collection. In Dr. Luchs' collection, which is housed in the Museum für Naturkunde in Berlin, some other heteropteran species are clearly labelled with the location "Silesia", but even so, there is no conclusive evidence that they originated from the Polish part of Silesia.

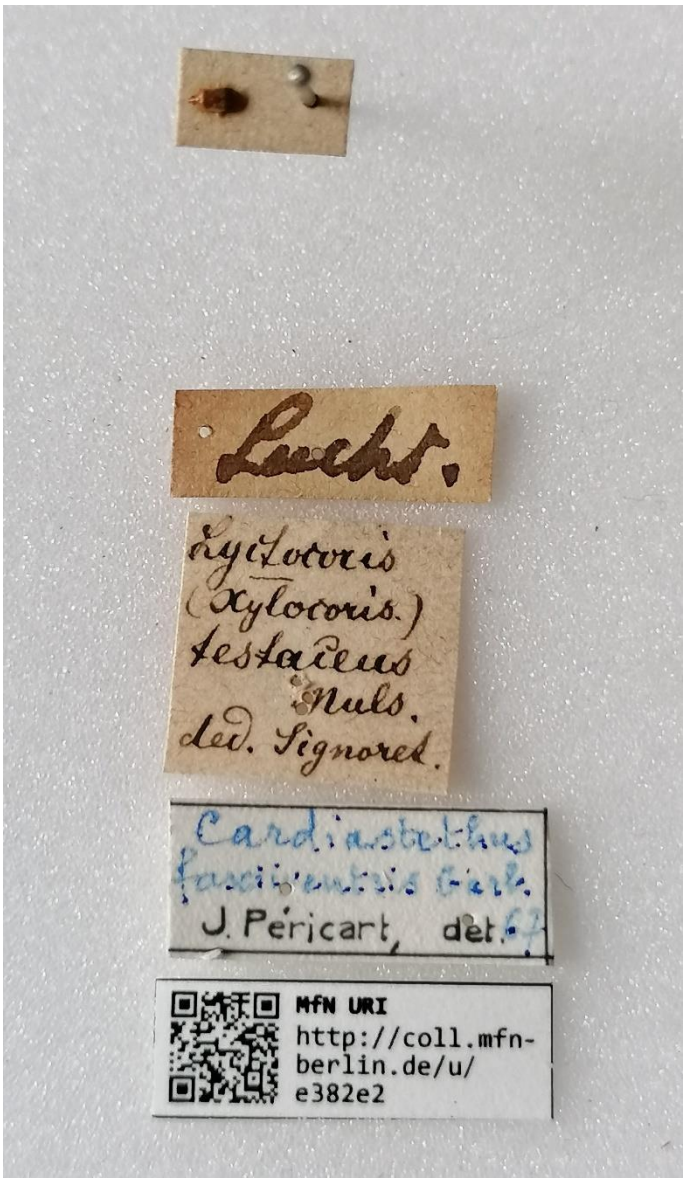

Fig 1. *Cardiastethus fasciiventris* from the collection of Dr Luchs, deposited in the Museum für Naturkunde in Berlin and original labels. Photo B. Jaenicke.

The next record of this species comes from Huta Szklana (Korcz 2010). The specimen was initially identified by Prof. Barbara Lis as *Cardiastethus fasciiventris*. However, that identification was incorrect, and the specimen actually belonged to *Amphiareus obscuriceps* (Poppius, 1909). Surprisingly, the species also appeared on the list of fauna of Rybnik (Vanellus Eco 2017) – a city in Upper Silesia, Poland – but this record was also erroneous, the specimen actually belonged to a species of the genus *Anthocoris*.

Finally, on 20.06.2022, a single specimen (male) of *Cardiastethus fasciiventris* was collected during light trapping in the area of allotment gardens "ROD Tęcza" in Wrocław-Maślice [UTM: XS36], GPS: N51.1479, E16.9519, leg. M. Wanat, det. G. Hebda (Fig. 2). This constitutes the first confirmed record of this species in Poland.

We provide body measurements of the collected specimen:

Body length: 2.3 mm, body width: 0.95 mm, pronotum width: 0.82 mm, head length: 0.29 mm, head width: 0.39 mm, antennal segment: I – 0.12 mm, II – 0.32 mm, III – 0.35 mm, IV – 0.30 mm. Head width/interocular ratio: 1.94.

Fig 2. *Cardiastethus fasciiventris* from Wrocław-Maślice, Poland. Fot. M.A. Mazur.

Fig 3. *Amphiareus obscuriceps* from Wrocław-Maślice, Poland. Fot. M.A. Mazur.

The "ROD Tęcza" allotment complex is situated on the outskirts of Wrocław, between Kozanów and Maślice estates. To the northeast, the gardens border a meadow along the river Ślęża with the adjacent Pilczycki Forest designated as a Natura 2000 Special Area of Conservation (PLH020069). To the west, the gardens are bordered by a floodbank bearing a row of old oaks, protected as nature monuments. In the northwestern part, the

gardens are also in close proximity to the embankment of the Wrocław A8 Motorway Bypass, possibly enhancing migration of some insect species across the Wrocław agglomeration.

In addition to *Cardiastethus fasciiventris*, eleven other species of true bugs (Heteroptera) were collected at this site, including several that are rarely encountered in Poland:

ANTHOCORIDAE

***Amphiareus obscuriceps* (Poppius, 1909)**

30.06.2022, 1 ex.; 20.07.2022, 1 ex.; 04.08.2022, 2 exx.; 08.08.2022, 1 ex.

This species is known from approximately 20 localities in Poland, distributed across 11 zoogeographical regions (Gierlasiński & Taszakowski 2013-2025). In Lower Silesia, it has been recorded only in Brzeg (Gierlasiński *et al.* 2019), Kościerzyce (Gierlasiński *et al.* 2020a, 2021), and Suchy Bór (Lis B. 2017).

***Orius majusculus* (Reuter, 1879)**

04.08.2022, 1 ex.

ARTHENEIDAE

***Chilacis typhae* (Perris, 1857)**

21.06.2023, 1 ex.

A relatively rare species, typically known from isolated localities within various regions (Gierlasiński & Taszakowski 2013-2025). However, in Silesia, it is encountered more frequently, with records from five localities in Lower Silesia: Lewin Brzeski, Stroszowice, Bielice, Górażdże, and Skarbimierz (Hohol-Kilinkiewicz & Czaja 2006, Gierlasiński *et al.* 2019, 2020b, 2022, 2023).

MIRIDAE

***Chlamydatus pullus* (Reuter, 1870)**

04.08.2022, 1 ex.

***Closterotomus fulvomaculatus* (De Geer, 1773)**

21.06.2023, 1 ex.

***Deraeocoris olivaceus* (Fabricius, 1777)**

21.06.2023, 1 ex.

Known from approximately 25 localities across 11 regions in Poland (Gierlasiński & Taszakowski 2013-2025). In Lower Silesia, recorded from only three sites: Gogolin (Gierlasiński *et al.* 2021), Opole (Skora *et al.* 2013), and Wrocław (Polentz 1944).

***Lopus decolor* (Fallén, 1807)**

30.06.2022, 1 ex.

***Pilophorus perplexus* (Douglas et Scott, 1875)**

04.08.2022, 1 ex.

A species known from several dozen localities in Poland (Gierlasiński & Taszakowski 2013-2025). In Lower Silesia, post-World War II records are limited to two: Opole (Skora *et al.* 2013) and Stobrawa by the Oder River (Lis & Łęgowski 2023). Earlier records also exist from Wrocław (Polentz 1943).

***Psallus perrisi* (Mulsant et Rey, 1852)**

27.06.2022, 2 exx.

***Pseudoloxops coccineus* (Meyer-Dür, 1843)**

30.06.2022, 1 ex.

This species is known from approximately 20 localities in 10 regions (Gierlasiński & Taszakowski 2013-2025). In Lower Silesia, it has been recorded only from a single locality: Kietrz (Gorczyca & Chłond 2005).

SALDIDAE

***Saldula opacula* (Zetterstedt, 1838)**

04.08.2022, 1 ex.

Discussion

Cardiastethus fasciiventris may be, and has been (see earlier note regarding the specimen from Huta Szklana), confused particularly with *Amphiareus obscuriceps*. Diagnostic keys for the identification of the genus *Cardiastethus* and *Amphiareus* are clearly presented in the work by Péricart (1972), although that publication lists a different representative of

the latter genus, *A. constrictus* Stål. However, the two species are readily distinguishable at first glance by their general body shape (Fig. 2 and 3). *C. fasciiventris* is smaller (body length 2.3–2.7 mm) and more oval, whereas *A. obscuriceps* is larger (2.6–2.9 mm in length) and more elongate. The body length-to-width ratio in the measured specimen of *C. fasciiventris* from Wrocław-Maślice is 2.26, while in *A. obscuriceps* (3 exx.) this index is 2.53. The hemelytra of *C. fasciiventris* are darker, more matte, and only weakly transparent, whereas in *A. obscuriceps* they are lighter, glossy, and more transparent. According to Péricart (1972), a clear distinction between the genera *Cardiastethus* and *Amphiareus* is also observed in total antennal length, particularly in the ratio of the second antennal segment to the head width. In *C. fasciiventris*, the antennae are shorter, and the second segment is shorter than the head width including the eyes; in contrast, in *Amphiareus* representatives, this segment is at least slightly longer than the head width. Additionally, *C. fasciiventris* lacks a metasternal apophysis, and the dorso-abdominal fissures extend to the posterior margin of tergite III. In *Amphiareus*, the metasternum is posteriorly prolonged into a long bifid apophysis, and the dorso-abdominal fissures are restricted to tergite II (Péricart 1972).

The collection site of the specimen has been an entomologically explored location since 2018, systematically surveyed by M. Wanat, using a light trap. Numerous rare beetle species have been recorded at this site, including *Bagous argillaceus* Gyllenhal, 1836, *Gymnetron rotundicolle* Gyllenhal, 1838 (Curculionidae) (Wanat *et al.* 2022), *Polistichus connexus* (Carabidae) (Wanat 2018), and even species rare for Central Europe, such as *Anthicus schmidtii* Rosenhauer, 1847 (Anthicidae) (Grzywocz *et al.* 2019). Interestingly, *Cardiastethus fasciiventris* was collected in an extensive allotment garden area on the outskirts of one of Poland's largest city. This may suggest that the species was introduced via cultivated plant material.

The first record of *Cardiastethus fasciiventris* in Poland also represents the northeasternmost locality of this species in Europe, confirming its ongoing expansion in Central Europe. One possible explanation for this trend is global warming, which creates more favorable environmental conditions for southern species in this part of the continent. Interestingly, the second European representative of the genus, *C. nazarenus*, also appears to be expanding its geographical range northward, with recent records from new localities in Croatia and Slovenia (Gogala 2004, Tescari 2008).

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