

Another gynandromorph specimen of the genus *Hylaeus* (Hymenoptera: Apidae) from Vienna

Sabine SCHODER

Abstract

This article describes a gynander of *Hylaeus* (*Spatulariella*) *hyalinatus* SMITH, 1842. In previous literature, only four cases of gynandromorphy in masked bees (*Hylaeus* spp.) are known. The herein described *H. hyalinatus* fits best into the bilateral gynander category, the male and female characters being distributed more or less symmetrically on the left and the right part of the body.

Key words: *Hylaeus hyalinatus*, masked bees, gynander, sexual dimorphism, Apidae, Colletinae.

Zusammenfassung

Dieser Artikel beschreibt einen Gynander der Art *Hylaeus* (*Spatulariella*) *hyalinatus* SMITH, 1842. Aus aktuellen Publikationen sind nur vier Fälle von Gynandromorphie bei Maskenbienen (*Hylaeus* spp.) bekannt. Der nun beschriebene *H. hyalinatus* passt am besten in die Kategorie eines bilateralen Gynanders, bei welchem die männlichen und weiblichen Merkmale mehr oder weniger symmetrisch auf die linke und rechte Körperhälfte verteilt sind.

Introduction

A gynandromorph organism possesses genotypically as well as phenotypically male and female tissue (NARITA et al. 2010), thus showing male and female characters. Whereas in case of mosaic gynanders the male and female tissue is randomly distributed across the body, it is distributed clearly along a particular body axis in case of transversal and bilateral gynanders (WCISLO et al. 2004, MICHEZ et al. 2009). The genetic mechanism of gynandromorphism will not be described in the current article, but is already mentioned in SCHODER & ZETTEL (2017).

During the last decades many cases of gynandromorphism in Apidae have been reported, but before 2017 only three cases had been detected in the genus *Hylaeus* (Apidae s.l. listed by MICHEZ et al. 2009). Whereas in 2017 a *H. intermedius* gynander was described (SCHODER & ZETTEL 2017), it is now a *H. hyalinatus* gynander, collected at the same locality in Vienna.

Hylaeus hyalinatus is common and widespread in Eurasia, and also introduced to Canada and the USA. It is a very unselective species concerning flower visit and habitat, occurring at light forests, flower- and structurally rich grassland, sand-, gravel- and clay-banks, railway constructions, in rural as well as urban areas (SCHEUCHL & WILLNER 2016).

Tab. 1: Differences between the left (female) and right (male) side of the *H. hyalinatus* gynander. Characters deviating from a typical bilateral gynander are underlined.

Character	Female	Male	Gynander
Head			
Clypeus	black	mostly yellow	<u>entirely male</u>
Side of face	black with broad yellow stripes	mostly yellow	r: male, l: female
Antenna	12-segmented	13-segmented	r: missing; l: female
Scape	narrow, black	moderately broadened, black or partly yellow	r: missing; l: female
Foveal groove	deeply engraved	hardly visible	r: male; l: female
Mesosoma			
Pronotal crest	swollen	narrow	r: male; l: female
Mesonotum	interspaces chagreened	interspaces smooth	r: male; l: female
Mesopleuron	slightly bulging in the front, interspaces chagreened	strongly bulging in the front, interspaces smooth	r: male; l: female
Protibia	black, only basally yellow	mostly yellow	r: male; l: female
Metatarsus	black	yellow	r: male; l: female
Metasoma			
Tergites 1–4	T1 puncturation sparse and shallow, T1 with conspicuous latero-apical hair fringe	T1 puncturation dense and deep, T1 with inconspicuous latero-apical hair fringe	r: male; l: female
Terminalia	sting apparatus	genitalia	<u>entirely female</u>

Material and methods

The described gynander of *Hylaeus (Spatulariella) hyalinatus* SMITH, 1842 was collected on August 24, 2016 at the premises of the former Nordbahnhof in Vienna (ca. N 48° 13.65' E 16° 23.5', 160 m a.s.l., leg., det. & coll. S. Schoder). It was caught together with other *Hylaeus* specimens, which were used for another purpose, stored in ethanol and pin-mounted in winter of 2017. Identification was done with the key by DATHE et al. (2016).

Results

Description of gynander: Body length: ca. 6.5 mm.

Male and female characters of the described *H. hyalinatus* gynander are more or less symmetrically distributed on the left (female) and right (male) half of the body (Figs. 1, 2, Tab. 1). Therefore, it fits best into the bilateral gynander category.

Head (Fig. 3): Whereas the left part of the head, including the lateral face, fovea, antenna, and scape, displays female characters, the right part displays male characters – excluding antenna and scape, which are missing there. Only the clypeus is entirely male, thus yellow colored.

Mesosoma (Figs. 1–2, 4): The mesosoma is also divided into a left female and right male half. Conspicuous differences occur at the pronotal crest and mesopleura, furthermore



Figs. 1–2: Gynander of *Hylaeus hyalinatus*, lateral aspect. (1) Left, “female side”; (2) right, “male side”.



Figs. 3–5: Gynander of *Hylaeus hyalinatus*. (3) Head, frontal aspect; (4) pronotal crest, dorsal aspect; (5) metasoma, tergite 1, dorsal aspect.

the left and right sides of the mesonotum differ in their surface structure. The legs differ in coloration: whereas the left protibia and metatarsi are – like in females – almost black, the right ones are mostly yellow.

Metasoma (Fig. 5): Differences at the metasoma concern especially puncturation and interspaces of tergite 1, as well as its pilosity. The terminalia are completely developed as a female sting apparatus.

Discussion

The phenomenon of gynandromorphism seems rather uncommon within the genus *Hylaeus*, as only three cases – all belonging to the transversal gynander category – are reported in MICHEZ et al. (2009): *H. brevicornis* NYLANDER by MORICE (1915), *H. minuta* (FABRICIUS) by NOSKIEWICZ (1923), and *H. albofasciatus* FRIESE by STÖCKHERT (1924). Strikingly, just one year ago, a *H. intermedius* gynander was described from the same locality – the premises of the former Nordbahnhof in Vienna (SCHODER & ZETTEL 2017). Both, the *H. intermedius* and the *H. hyalinatus* gynander best fit into the bilateral gynander category, but the male and female halves are inverted. Whereas the clypeus is entirely female and the terminalia male in case of the *H. intermedius* gynander (SCHODER & ZETTEL 2017), the clypeus is entirely male and the terminalia developed as a female sting apparatus in case of the now described *H. hyalinatus* specimen.

The head of the described *H. hyalinatus* gynander was partly destroyed while transferring the bee from the net into the collecting tube, therefore one antenna including scape is missing and the right eye is slightly deformed (Fig. 3).

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Author's address: Sabine SCHODER MSc, 2nd Zoological Department, Natural History Museum Vienna, Burgring 7, 1010 Vienna, Austria; Department of Integrative Zoology, University of Vienna, Althanstraße 14, 1090 Vienna, Austria. E-Mail: sabineschoder@gmx.at

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