

## FIRST RECORD OF *HALICTUS BRUNNESCENS* (EVERSMANN 1852) (HYMENOPTERA: HALICTIDAE) FOR ROMANIA

BOGDAN TOMOZII\*

### ABSTRACT

Our observations confirm the occurrence of *Halictus brunnescens* (Eversmann, 1852) in Romania, based on specimens collected from the eastern part of the country, specifically in Vaslui County, within the Moldova region. The species *Halictus brunnescens* (Eversmann, 1852) closely resembles *Halictus quadricinctus* (Fabricius, 1776), which can lead to misidentification during cursory checks. Although its presence in Romania was expected, the species is not mentioned in published papers. Additional data were gathered through the examination of our museum collection, providing new insights into its distribution across the country.

**Key words:** first record, *Halictus brunnescens*, Romania

### Introduction

The bee fauna of Romania presents a great diversity due to a wide variety of habitats resulting from the influence of the 5 biogeographical regions over which the country's territory overlaps.

Recently, the list of bee species has been drawn up around 763 species of Apoidea, Anthophila (168 Andrenidae, 238 Apidae, 53 Colletidae, 149 Halictidae, 140 Megachilidae and 16 Melittidae) placing Romania among the countries with high diversity of bee fauna in Europe. This list may be improved, and further records will be added in the future to complete the overall picture of bee species in the Romanian fauna. This note is no exception, it refers to a species of the genus *Halictus* as new record for the country's fauna.

*Halictus brunnescens* was recorded during field campaigns conducted in the eastern part of the Moldova region, where we collected three male specimens. Based on this observation, we reviewed our collection and identified additional specimens belonging to this species.

In Romania, species of the genus *Halictus* have been recorded over time in numerous faunistic lists scattered temporally, some of these, more consistent, published by Mocsary (1900), Scobiola - Palade & Osîciniuk (1974), Pascu (1996), Goagă (1999) since the 20th century, are relevant for the knowledge of the specific diversity of the genus in certain historical regions of the country. None of the published papers mention *Halictus brunnescens*. One of the reasons this species has been overlooked is its resemblance to *Halictus quadricinctus*, with which it has been confused over time. Most probably

some of the published records of *Halictus quadricinctus* from Romania, actually refer to *Halictus brunnescens*, the species being sympatric.

In this paper, we confirm the occurrence of *Halictus brunnescens* for Romania, updating the distribution of this species and providing some elements of differentiation of the species based on the studied specimens.

### Material and methods

The material examined in this study belongs to the collection of the “Ion Borcea” Museum of Natural Sciences Complex, Bacău, Romania. Identifications of the species were made according to Blüthgen (1923), Ebmer (1988), Pesenko (2005b). The photos of the habitus and structures were made using an Olympus C-5060 Wide Zoom camera adapted to an Olympus SZ61 stereomicroscope. The quality of several images was improved using Helicon Focus 8.1.0 software. Terminology used to describe the external morphology of the specimens follows Michener (2000), Pesenko et al. (2000), Pesenko (2005b).

### Results and discussions

*Material examined.* Turnu Severin (Mehedinți County), 20.07.1965, 1 ♂, leg. Nemeș I.; Herculane (Caraș-Severin County), 21.07.1965, 2 ♂, leg. Nemeș I.; Murighiol (Tulcea County), 5.06.1972, 1 ♀, leg. Goagă A.; Cetatea Histria (Constanța County), 3.06.1972, 1 ♀, leg. Goagă A.; Agigea (Constanța County), 9.08.1974, 1 ♀, leg. Nemeș I.; Agigea (Constanța County), 12.08.1976, 2 ♂, leg. Nemeș I.; Brăila (Brăila County), 25.08.1998, 2 ♂, 1 ♀, leg. Chirilă Ctin.; Periprava (Tulcea County), 16.07.2000, 1 ♀, leg. Tomozii B.; Crețești (Vaslui

\*“Ion Borcea” Natural Sciences Museum Complex of Bacău, Romania, e-mail: bogdantomozei@yahoo.com

County), 15.10.2021, 1 ♂, leg. Tomozii B, on *Cephalaria* sp.; Boțești – Gugești (Vaslui County), 10.08.2022, 2 ♂, leg. Tomozii B, on *Carduus achantoides*.

#### Taxonomy.

The genus *Halictus* Latreille, 1804 comprises 90 species in the Palaearctic (Pesenko, 2005b), of which 49 species are known in Europe included in 8 subgenera (Reverté et al. 2023). In Romania, the genus *Halictus* is known by 17 species (Tomozii, 2010). The genus *Halictus* consists of generally solitary bees that nest in the ground in dry, warm areas, some species express a more complex, primitively eusocial behaviour. Morphologically, the genus *Halictus* is characterized by a specific wing venation in which 3 submarginal cells are present, the first cell is larger than the third cell. Venation is well defined. The basal vein is visibly, strongly curved. The metasoma pubescence is arranged in the form of lateral spots or entire or interrupted bands towards the apical margin of the terga. Females are easily distinguished by a furrow visible on the middle of tergite 5 (Michez et al. 2019).

*Halictus brunnescens* belongs to the subgenus *Halictus* Latreille, 1804. Species of this subgenus are characterized by large size, females have scattered and uneven punctures on the mesoscutum, males characteristically have fine and long hairs on the underside of the antennal flagellum, the basitarsus of the hind legs is clearly curved, the last article of the antennal flagellum flattened and slightly curved, sternum 5 strongly emarginated, sternum 6 depressed with pilosity variably covering the surface of the sternite. This subgenus has Palearctic distribution and includes 4 species (Pesenko, 2004). In Romania, the genus includes 2 species (Tomozii, 2010).

#### Diagnosis.

Females are easily distinguishable on fresh specimens. Identification becomes difficult on older specimens where the bands of hairs have worn off. The female of *Halictus brunnescens* differ from that of *Halictus quadricinctus* by the presence on the disc of the first tergite of whitish hairs spots arranged laterally and by the posterior bands of hairs on terga which are entire and wider, sometimes narrowed to the middle (Fig.2A). In *Halictus quadricinctus* the first tergite is lacking of whitish hairs spots arranged laterally on the disc, the posterior bands of hairs are visibly narrowed or interrupted in the middle (Fig.2B). The mesoscutum in *Halictus brunnescens* is uneven and scattered

punctured, while in *Halictus quadricinctus* is more densely punctured.

The male of *Halictus brunnescens* has a yellow - light brown antennal flagellum on the upper side with the exception of segment 12 which is partially and 13 entirely dark. The first 4-6 flagellar segments with large darker spots that can vary in size (Fig. 6A,B). The light coloration sometimes extends to the pedicel as well, in the form of a yellowish spot or reddish. The scape is variably colored, most often with an apical conical spot or a narrow pale yellow stripe that extends along the lower length (Fig. 7A,B,C). In *Halictus quadricinctus* the upper side of the antennal flagellum is entirely dark coloured (Fig. 6C), as well as the pedicel and scapus (Fig. 7D).

In *Halictus brunnescens* the tergite 2 and sometimes 3, with anterior bands of hairs or lateral spots, well visible on fresh specimens, often obliterated on old specimens, while in *Halictus quadricinctus* these anterior bands of hairs are not conspicuous.

Also, the male of *Halictus brunnescens* differs from that of *Halictus quadricinctus* by the extent of coverage with pubescence of the sternite 6 and its arrangement. In *H. brunnescens*, the pubescence is thick, short, golden-yellow in colour, covering a large part of the sternite surface, leaving a small area visible (Fig. 3A). In *H. quadricinctus* the pubescence of sternite 6 is reduced, a larger area of the sternite remains visible (Fig. 3B).

Sternum 5 has at the center of the posterior margin in *Halictus brunnescens* short and sparse hairs (Fig.4A), while in *H. quadricinctus*, the golden hairs are arranged compactly, like in a small, well-defined triangular brush (Fig.4B).

Males are also differentiated on the basis of genitalia features, particularly by the shape of the gonostylus. In the subgenus *Halictus* the gonostylus has a more elaborate structure, consisting of 2 parts, a dorsal and a ventral part (Dikmen et al. 2011).

In *Halictus brunnescens* the dorsal part of the gonostylus has long hairs with a brush - like arrangement (Fig. 5 A, C) unlike *Halictus quadricinctus* in which the dorsal part of the gonostylus has much longer and denser golden hairs (Fig. 5 B, D). As for the ventral part of the gonostylus, in *Halictus brunnescens* it is less broadened in the distal half (Fig. 5E), whereas in *Halictus quadricinctus* the ventral part of the gonostyle is clearly widened terminally (Fig. 5F).

#### Description of the collection sites.

The recently collected specimens (2021-2022) were captured from the southeast of the Central Moldavian Plateau, in the forest-steppe zone, specifically from the localities of Crețești and Boțești in Vaslui County. In Boțești, the species was collected in a valley in the southern part of the commune, at the edge of the communal road between Boțești and Gugești (Fig.9). The specimens were collected from *Carduus acanthoides* in a ruderal association with *Onopordum acanthium* and *Cirsium arvense*, located in a degraded pasture dominated by *Festuca valesiaca* and *Poa pratensis*. A male specimen was also collected from Crețești, on *Cephalaria transsilvanica*, from abandoned agricultural land.

#### Habitat preference.

The species is found in warm regions, primarily in dry, steppe-like habitats, ranging from lowlands to mountainous areas in southern Europe (e.g., Greece, pers. observ.).

#### Food plants.

The species it is known to be polylectic visiting plants from Fabaceae, Boraginaceae, Malvaceae (Khodaparast & Monfared, 2012), Caprifoliaceae, with a preference to Asteraceae (Scheuchl & Willner, 2016).

#### Distribution.

*Halictus brunnescens* is found in North Africa (Morocco, Tunisia, Egypt), Europe (France, Portugal, Spain, Italy, Greece, Austria, Bulgaria, Croatia, Czech Republic, Slovakia, Hungary, Serbia, Bulgaria, Romania, Ukraine), Asia (Israel, Asia Minor, Transcaucasus, Afghanistan, Iran, Kazakhstan, Pakistan, northwestern and northern China) (Pesenko, 2005a, Reverté *et al.* 2023).

#### Rezumat

Observațiile noastre confirmă prezența speciei *Halictus brunnescens* (Eversmann, 1852) în România, pe baza unor exemplare colectate din partea de est a țării, din județul Vaslui. Specia *Halictus brunnescens* (Eversmann, 1852) este asemănătoare morfologic cu *Halictus quadricinctus* (Fabricius, 1776), aspect care poate genera erori de identificare, în cazul unor verificări sumare. Deși prezența sa în România era de anticipat, specia nu apare menționată în literatura de specialitate. Examinarea colecției muzeului ne-a furnizat date suplimentare privind distribuția acestei specii la nivel național.

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A



B

**Fig. 1 – Male habitus (dorsal view):**  
A. *Halictus brunnescens* (Eversmann 1852), Boțești (Vaslui County)  
B. *Halictus quadricinctus* (Fabricius 1776), Gherăiești (Bacău County)



A

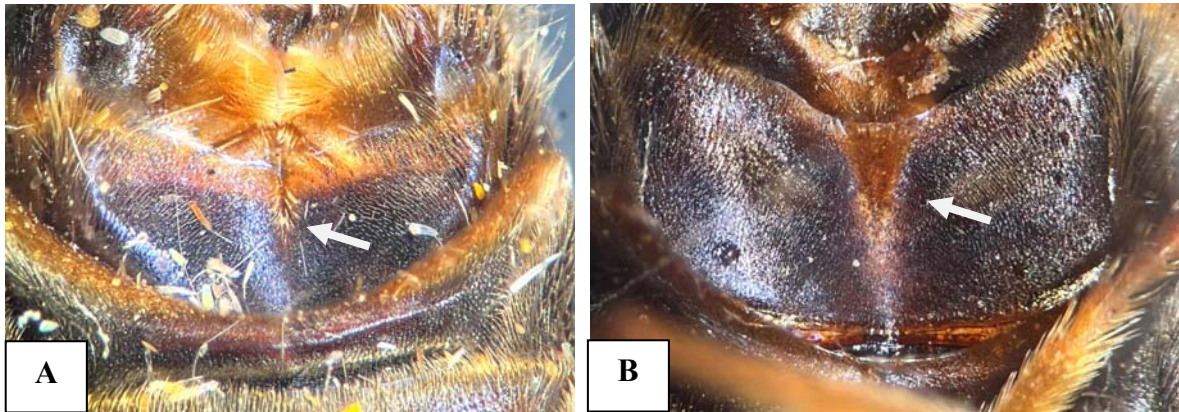


B

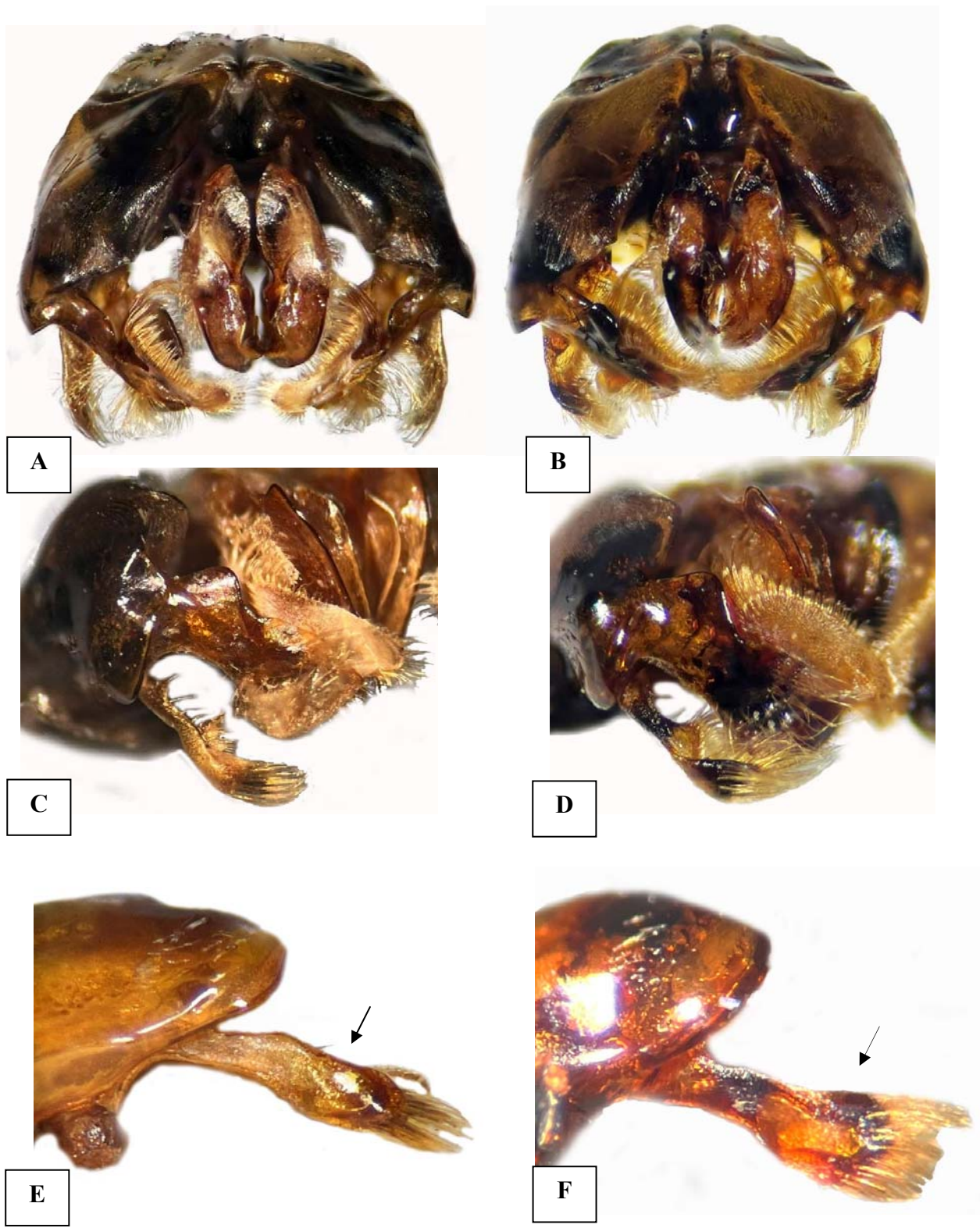
**Fig. 2** – Female habitus (dorsal view):  
A. *Halictus brunnescens* (Eversmann 1852), Periprava (Tulcea County)  
B. *Halictus quadricinctus* (Fabricius 1776), Valea Budului (Bacău County)



**Fig. 3** – Male sternum 6:  
A. *H. brunnescens*; B. *H. quadricinctus*



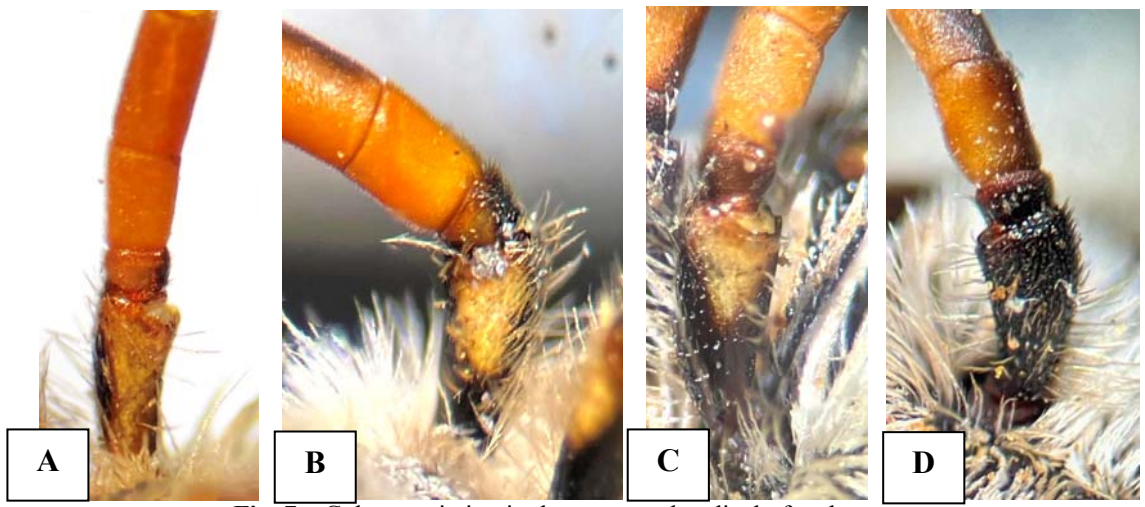
**Fig. 4** – Male sternum 5:  
A. *H. brunnescens*; B. *H. quadricinctus*



**Fig. 5** – Male genitalia of *Halictus brunnescens* (A, C, E) and *Halictus quadricinctus* (B, D, F): A, B - dorsal view; C, D – dorsal and ventral parts of gonostylus; E, F – ventral part of gonostylus isolated from genitalia.



**Fig. 6 – Male antenna:**  
 A., B. *Halictus brunnescens*; C. *Halictus quadricinctus*



**Fig. 7 – Colour variation in the scape and pedicel of male antenna:**  
 A., B, C. *Halictus brunnescens*; D. *Halictus quadricinctus*



**Fig. 8** - Male of *Halictus brunnescens* on *Cephalaria transsilvanica* (Crețești, Vaslui County, October 2021)  
(Foto: Bogdan Tomozii)



**Fig. 9** – The collection site of *Halictus brunnescens* in Boțești, Vaslui County, Moldova region, Romania  
(Foto: Bogdan Tomozii)