

Antennal teratology in *Ammophila sabulosa* (Hymenoptera: Sphecidae)

İlyas Can¹, Alexander B. Ruchin²

1 Department of Biology, Tokat Gaziosmanpaşa University, Tokat, 60250, Türkiye

2 Joint Directorate of Mordovia State Nature Reserve and National Park “Smolny”, Saransk, 430005, Russia

Corresponding author: İlyas Can (ilyascan41@gmail.com)

Academic editor: R. Yakovlev | Received 11 February 2026 | Accepted 7 March 2026 | Published 27 March 2026

<http://zoobank.org/8DF2ED32-DF29-4578-8A4D-6A97256C512C>

Citation: Can I, Ruchin AB (2026) Antennal teratology in *Ammophila sabulosa* (Hymenoptera: Sphecidae). Acta Biologica Sibirica 12: 287–290. <https://doi.org/10.5281/zenodo.19221070>

Abstract

A male *Ammophila sabulosa* specimen exhibiting antennal teratology is reported. Both antennae have 12 segments instead of the typical 13. Partial fusion of antennal segments (incomplete symphysocery) is present on both antennae, involving segments 4 and 5 on the left antenna and segment 4 on the right antenna. Additionally, the terminal segment of the left antenna is shorter than that of the right antenna. This represents a rare case of antennal malformation in *Ammophila*, characterized by a reduced number of antennal segments and bilateral asymmetry.

Keywords

Ammophila sabulosa, antennal teratology, symphysocery, Hymenoptera, Sphecidae

Introduction

Teratological alterations of antennal morphology are poorly documented in Hymenoptera and are primarily known from isolated records in faunistic and taxonomic literature. According to the teratological classification sensu Balazuc (1958), reported antennal anomalies include oligomery, polymery, symphysocery, anisomery, schistomely, and heteromery, the latter often expressed as bilateral asymmetry. Doc-

umentation of such abnormalities is important, as they may affect the interpretation of diagnostic characters and, in some cases, result in taxonomic misinterpretations. Previous studies have demonstrated that teratologies can lead to taxonomic confusion, as documented for *Birous* (Encyrtidae) (Erdős & Novicky 1955) and *Oligogaster* (Chrysididae) (Rosa 2024).

Within Hymenoptera, antennal teratologies have been recorded only sporadically. Popovici et al. (2014) reviewed antennal teratologies in Platygasteridae and Pteromalidae, explicitly adopting Balazuc's (1958) framework. Recent examples include cases of symphysocery and heteromery in *Nysson tridens* (Crabronidae) (Can et al. 2024). A comprehensive catalogue of teratologies, malformations, and other morphological abnormalities in cuckoo wasps (Chrysididae) was provided by Rosa & Zilioli (2025), who documented and illustrated a wide spectrum of teratological categories based on extensive material.

Here, an antennal teratology observed in a male *Ammophila sabulosa*, referable to incomplete symphysocery sensu Balazuc (1958), is described and illustrated (Fig. 1).

Materials and methods

A male specimen exhibiting antennal teratology was collected using a Malaise trap in August 2022 in the Republic of Mordovia, Ichalki District, National Park "Smolny", Kemlyanskoe forestry, European Russia. The specimen is deposited in the Entomology Research Laboratory, Department of Biology, Tokat Gaziosmanpaşa University (Tokat, Türkiye).

Observations were conducted using a Leica S6 stereomicroscope. Photographs were taken with a Leica MC190 HD digital camera equipped with a 1.0× plan apochromatic objective lens. Antennal terminology and segment numbering follow Goulet & Huber (1993), with antennal segments counted from the scape.

Results and discussion

Males of *Ammophila* normally possess 13 antennal segments, comprising a scape (segment 1), a pedicel (segment 2), and 11 flagellomeres (segments 3–13), with flagellomeres cylindrical in cross-section. The examined male *Ammophila sabulosa* exhibited antennal teratology affecting both antennae. Each antenna consisted of 12 segments rather than the usual 13 and showed incomplete symphysocery, sensu Balazuc (1958).

On the left antenna, partial fusion involves antennal segments 4 and 5, whereas on the right antenna, fusion involves segment 4 and the adjacent flagellomere. In addition, the terminal segment of the left antenna is distinctly shorter than that of

the right. Collectively, these features correspond to a combination of symphysocery, oligomery, and heteromery expressed as bilateral asymmetry.

Comparable antennal teratologies have been reported only sporadically in Hymenoptera. In *Nysson tridens* (Crabronidae), Can et al. (2024) documented fused and asymmetrical flagellomeres with incomplete symphysocery, suggesting that similar developmental disturbances may occur in Apoidea. Within Chrysididae, Rosa and Zilioli (2025) recorded a broad range of antennal teratologies, with symphysocery frequently associated with segment reduction and asymmetry, suggesting that such composite malformations are not restricted to a single hymenopteran lineage.



Figure 1. Antennal morphology and teratology in a male *Ammophila sabulosa*: (a) non-teratological specimen antenna, dorsal view; (b) head in dorsal view showing both anomalous antennae; arrows indicate areas of incomplete symphysocery on the flagellum; (c) left antenna, ventral view, detail of the partially fused segments 4 and 5 (arrow); (d) right antenna, ventral view, detail showing partial fusion involving segment 4 (arrow).

The present case represents a rare antennal malformation in *Ammophila sabulosa*, characterized by a reduced number of segments and partial fusion (incomplete symphysocery). Such anomalies are generally interpreted as resulting from disturbances during imaginal disc differentiation, which may be influenced by genetic factors or environmental stressors during larval or pupal development, including

temperature fluctuations, parasitism, or exposure to pollutants. Although the specific cause cannot be determined for this specimen, the combination of segment reduction and asymmetrical fusion is consistent with a developmental disturbance affecting antennal segmentation. Documenting such teratological cases is important for understanding the spectrum of morphological anomalies in Hymenoptera and highlights the potential variability arising during antennal morphogenesis. Further observations of similar anomalies will help clarify the diversity and developmental mechanisms underlying these rare morphological deviations.

Acknowledgements

The study was conducted within the framework of the state assignment of the Ministry of Natural Resources and Ecology of the Russian Federation on the scientific research topic "Inventory of invertebrates of the Mordovian Reserve and Smolny National Park".

References

- Balazuc J (1958) Les tératologies chez les insectes et spécialement chez les Hyménoptères. *Insectes Sociaux* 5(3): 309–320.
- Can İ, Ruchin AB (2024) A teratological case in the antenna of *Nysson tridens* (Hymenoptera: Crabronidae). *Acta Biologica Sibirica* 10: 1429–1432. <https://doi.org/10.5281/zenodo.14271429>
- Goulet H, Huber JT (1993) *Hymenoptera of the World: An Identification Guide to Families*. Agriculture Canada Publishing, Centre for Land and Biological Resources Research, Ottawa, 668 pp.
- Erdős J, Novicky S (1955) Genera Encyrtidarum regionis palaearticae. *Beiträge zur Entomologie* 5: 165–200. <https://doi.org/10.21248/contrib.entomol.5.1-2.165-202>
- Popovici OA, Mitroiu MD, Notton DG (2014) New teratological cases in Platygastriidae and Pteromalidae (Hymenoptera). *Turkish Journal of Zoology* 38: 491–499.
- Rosa P (2024) New teratological cases in cuckoo wasps, with synonymization of *Oligogaster* Soliman & Kimsey (Hymenoptera, Chrysididae). *Zootaxa* 5424 (2): 225–233. <https://doi.org/10.11646/zootaxa.5424.2.6>
- Rosa P, Zilioli M (2025) Teratologies, malformations and other abnormalities in cuckoo wasps (Hymenoptera, Chrysididae). *Natura* 115(1): 57. <https://doi.org/10.4081/nt.2025.917>