*J. Entomol. Res. Soc., 23(1): 83-87, 2021* *Research Article*
*Doi: 10.51963/jers.v23i1.1985* *Online ISSN:2651-3579*

# *Billaea adelpha* (Loew, 1873) (Diptera: Tachinidae), a New Parasitoid of *Xylotrechus sieversi baiocchii* Rapuzzi & Sama, 2018 (Coleoptera: Cerambycidae) from Turkey

Halil BOLU[1]* Turgut ATAY[2] Hakan ÇELİK[3] Kenan KARA[4]

[1,3]Dicle University, Faculty of Agriculture, Department of Plant Protection, 21280 Diyarbakır, TURKEY
[2,4]Tokat Gaziosmanpasa University, Faculty of Agriculture, Department of Plant Protection, Tokat, TURKEY
e-mails: [1]*besni@dicle.edu.tr,[2]turgut.atay@gop.edu.tr, [3]144061018a@gmail.com, [4]kenan.kara@gop.edu.tr
ORCID IDs: [1,]*0000-0001-5488-0056, [2]0000-0002-9074-0816, [3]0000-0002-2318-3474, [4]0000-0003-0439-5639

## ABSTRACT

A new dipteran larval parasitoid of longhorn beetles (Coleoptera: Cerambycidae), *Billaea adelpha* (Loew) (Diptera: Tachinidae) was reared from *Xylotrechus sieversi baiocchii* Rapuzzi & Sama, 2018 on *Astragalus* plants in Karacağ Mountain of Diyarbakır, Turkey. *X. sieversi baiocchii* was recorded for the first time as host of this parasitoid. Some information on the host-parasitoid couple is given.

*Key words: Billaea adelpha*, new host record, *Xylotrechus sieversi baiocchii*, Turkey.

Bolu, H., Atay, T., Çelik, H., & Kara, K., (2021). *Billaea adelpha* (Loew, 1873) (Diptera: Tachinidae), a new Parasitoid of *Xylotrechus sieversi baiocchii* Rapuzzi & Sama, 2018 (Coleoptera: Cerambycidae) from Turkey, *Journal of the Entomological Research Society*, 23(1), 83-87.

## INTRODUCTION

The Tachinidae is the largest and most important family of insect parasitic flies, with more than 8500 species in the world (O'Hara, Henderson, & Wood, 2019). There are currently 341 tachinid species known from Turkey (Kara, Tschorsnig, & Atay, 2020). All tachinids are endoparasitoids of a variety of insect, mostly phytophagous. There are many important pests of culture plants that are suppressed by tachinids. Some Tachinidae species have been used in classical biological control programmes against lepidopterous defoliators and sawflies, especially in the Nearctic and Neotropical regions (Grenier, 1988; Stireman, O'Hara, & Wood, 2006). In this context, it is important to determine the hosts of tachinids and their relations with their hosts. However, many of the hosts are still unknown. Kara & Tschorsnig (2003) and Tschorsnig (2017) have recently provided the most detailed host-parasitoid catalogue of Turkey and Palaearctic Region respectively.

The genus *Billaea* Robineau-Desvoidy, 1830 is represented with 12 species in Europe (O'Hara et al, 2019). There are two species of the *genus Billaea* in Turkey: *B. adelpha* and *B. irrorata* (Kara, 2001; Özbek, Tozlu, & Çoruh, 2009). Among these, only *B. irrorata* was reared from a host. Like other *Billaea* species, *B. adelpha* shows a strong parasitic preference on coleopteran larvae, primarily cerambycids (Tschorsnig, 2017). *B. adelpha* is the first record of a tachinid for *Xylotrechus sieversi baiocchii* Rapuzzi & Sama, 2018.

## MATERIAL AND METHODS

### Study area

Karacadağ Mountain, which is an extinct volcano that separates the Diyarbakır basin and the Şanlıurfa Plateau in the north-south direction, in the middle of the Southeastern Anatolia Region. Its highest point is 1952 m. The climate around Karacadağ is dominated by a local steppe climate, summers are hot and dry, winters are cold and rainy. Until recently, there were more forests on it, but the forests remain in secluded areas now. *Quercus* spp., *Celtis* spp., *Crataegus* spp., *Pistacia terebinthus*, and *Fraxinus* spp. are the tree species seen in the area. *Astragalus* plants cover the environment.

### Cerambycid species

*Xylotrechus sieversi baiocchii* Rapuzzi & Sama, 2018. Length 14,0 mm, width 5 mm. The body is black except for elytra and antennae that are light brown, and all tibiae are dark brown (Fig. 1). All the specimens were reared from dead branches, drums, and roots of *Astragalus* cfr. *gummifer* (Fabaceae). The plants often were previously killed by the larvae of *Sphenoptera* sp. (Coleoptera, Buprestidae) (Rapuzzi & Sama, 2018).

### Collecting of larvae and rearing of parasitoid

*Astragalus* plants with larval galleries and adult exit holes of *X. sieversi baiocchii* were collected in Diyarbakır Karacadağ Mountain in 2020. Stems were cut by secateurs

and brought to the laboratory. Field-collected larvae were reared at room temperature (25 ± 2 °C and 60 - 70% relative humidity) (Atay & Kara, 2014). Rearing containers were regularly checked and emergence date of parasitoids and some other observations (pupal duration and the appearance period of adult parasitoids) were noted.

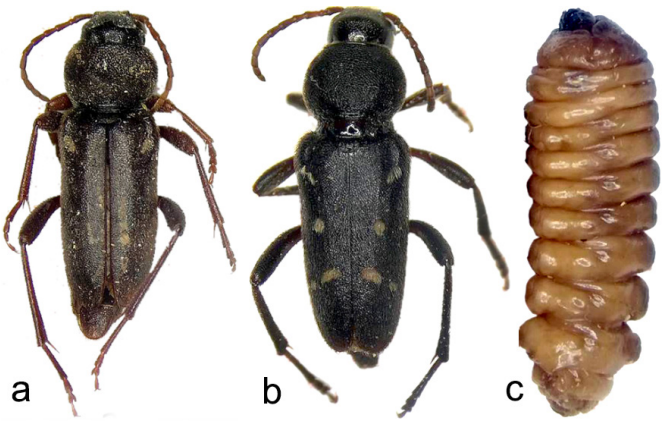


Fig. 1. *Xylotrechus sieversi baiocchii* Rapuzzi & Sama a. ♂ b. ♀ c. larva.

**Identification**

Tachinid identification was performed by using the identification keys of Tschorsnig & Herting (1994) and Tschorsnig & Richter (1998). The host was identified by Dr. Hüseyin Özdikmen (Gazi University, Faculty of Sciences, Department of Biology, Ankara, Turkey). Images were taken using a Leica MC 170 digital camera mounted on a Leica M205 C stereoscopic microscope and processed with Helicon Focus Pro software. The tachinid specimens were deposited at the Plant Protection Museum in Tokat Gaziosmanpaşa University, Agricultural Faculty, Tokat, Turkey.

## RESULTS

The identification, distribution, hosts, and some additional information related to tachinid and host are as follows.

Host. *Xylotrechus sieversi baiocchii* Rapuzzi & Sama, 2018 (Coleoptera: Cerambycidae)

Material examined: The larvae of *X. sieversi baiocchii* were collected in Karacadağ mountain - Diyarbakır (Bağlar), 26.05.2020, 21.06.2020, N 37°44'52.69", E 39°52'45.11", 1600 m, on *Astragalus* cfr. *gummifer* (Fabaceae).

### *Billaea adelpha* (Loew, 1873) (Diptera: Tachinidae: Dexiinae)

Reared Material: 02.06.2020, 1♀, 1♂; 29.06.2020, 1♀, 1♀.

Distribution: West Palaearctic (O'Hara et al., 2019). In Turkey: Tokat (Kara, 2001).

Description: Arista with hairs at least as wide as the 3rd antennal segment (Fig. 2a). Basicosta yellow, sternopleuron with 3 bristles (Fig. 2b). Females: Hind tibia anterodorsally with a regular bristle comb, at most with an intermediary bristle (Fig. 2c).

Remarks: Larvae of *Billaea adelpha* emerge from host and pupation occurs inside stem of the host plant (Fig. 2d). Pupal duration is approximately one week.

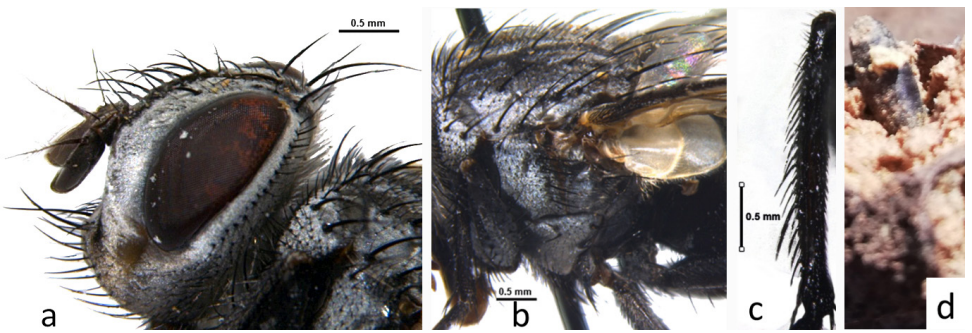


Fig. 2. Adult of *Billaea adelpha* a. Head- lateral view, b. Thorax- lateral view, c. Hind tibia d. Puparium.

## DISCUSSION

The genus *Billaea* Robineau-Desvoidy belongs to the Dexiinae subfamily and is seen commonly in the world (O'Hara, Henderson, & Wood, 2019). *Billaea adelpha* has western Palearctic distribution extending to Azerbaijan (Herting, 1984). It prefers dry and hot areas (Tschorsnig & Herting, 1994). This species has been detected on Apiaceae plants and on the shadows of large stones in field studies (Tschorsnig, 1992). *B. adelpha* develops as a parasitoid especially on Cerambycidae (Coleoptera) larvae. Besides, it was reared from a buprestid and a scarabeid (Tschorsnig, 2017). There are two species belonging to the genus *Billaea* in Turkey. *B. adelpha* was obtained with sweeping net by (Kara, 2001) during fieldwork in Tokat, Turkey. *B. irrorata*, the other species belonging to this genus in Turkey, was reared from *Saperda populnea* (L.) (Col.: Cerambycidae) by Özbek et al. (2009). In this study, *B. adelpha* was first reared from *Xylotrechus sieversi baiocchii* Rapuzzi & Sama, 2018. The location where the host is found is Karacadağ, with hot and dry summers dominated by steppe climate. This information is similar to the given data by Tschorsnig & Herting (1994).

## ACKNOWLEDGEMENTS

We are grateful to Dr. Hüseyin Özdikmen (Gazi University, Faculty of Sciences, Department of Biology, Ankara, Turkey) for identification of the host.

## REFERENCES

Atay, T. & Kara, K. (2014). Tachinids (Diptera: Tachinidae) reared from lepidopterous and heteropterous hosts from some localities in the Kelkit Valley (Amasya, Tokat, Sivas) of Turkey. *Turkish Journal of Zoology*, 38(4), 500-507.

Grenier, S. (1988). Applied biologial control with tachinid flies (Diptera, Tachinidae). A review, *Anzeiger für Schädlingskunde, Pflanzenschutz, Umweltschutz*, 61(3), 49-56.

Herting, B. (1984). Catalogue of Palearctic Tachinidae (Diptera). *Stuttgarter Beiträge zur Naturkunde, Serie A (Biologie)*, 369, 1-228.

Kara, K. (2001). Additions to the fauna of Turkish Tachinidae (Insecta, Diptera). *Zoology in the Middle East*, 23(1), 85-88.

Kara, K. & Tschorsnig, H.-P. (2003). Host Catalogue for the Turkish Tachinidae (Diptera). *Journal of Applied Entomology*, 127, 465-476.

Kara, K., Tschorsnig, H.-P., & Atay, T. (2020). Checklist of Turkish Tachinidae (Insecta, Diptera) with New Records. *Journal of the Entomological Research Society*, 22(2), 163-190.

O'Hara, J.E., Henderson, S.J., & Wood, D.M. (2019). Preliminary checklist of the Tachinidae of the world. Version 1.0. PDF document, 681p. Retrieved from http://www.nadsdiptera.org/Tach/WorldTachs/Checklist/Worldchecklist.html. (09.09.2020).

Özbek, H., Tozlu, G., & Çoruh, S. (2009). Parasitoids of the Small Poplar Longhorn Beetle, *Saperda populnea* (L.) (Coleoptera: Cerambycidae) in the Aras Valley (Kars and Erzurum province), Turkey. *Turkish Journal of Zoology*, 33, 111-113.

Rapuzzi, P. & Sama, G. (2018). New taxa and notes on the systematic of Palearctic Longhorn-beetles (Coleoptera: Cerambycidae). *Munis Entomology & Zoology*, 13(1), 1-39.

Stireman, J. O., O'Hara, J. E., & Wood, D. M. (2006). Tachinidae: Evolution, Behavior and Ecology. *Annual Review of Entomology*, 51(1), 525-555.

Tschorsnig, H.-P. (1992). Tachinidae (Diptera) from the Iberian Peninsula and Mallorca. *Stuttgarter Beiträge zur Naturkunde, Serie A (Biologie)*, 472, 1-76.

Tschorsnig H.-P. & Herting, B. (1994). *Die Raupenfliegen (Diptera: Tachinidae) Mitteleuropas: Bestimmungstabellen und Angaben zur Verbreitung und Ökologie der einzelnen Arten*. Stuttgarter Beiträge zur Naturkunde (A) 506: 1-170. Online Authorized Version of English Translation by Rayner R. & Raper C.: Tschorsnig H.P. and Herting B., 2001: The Tachinids (Diptera:Tachinidae) of Central Europe: Identification Keys for the Species and Data on Distribution and Ecology,Retrieved from http://tachinidae.org.uk/site/downloads.php. (12.06.2006).

Tschorsnig, H-P. & Richter, V.A. (1998). Family Tachinidae. In: Papp, L., Darvas, B. (Eds.). *Contributions to a Manual of Palaearctic Diptera*, Science Herald Publishers (pp. 691-827), Budapest.

Tschorsnig, H.-P. (2017). Preliminary host catalogue of Palaearctic Tachinidae (Diptera). 480pp. Retrieved fromwww.nadsdiptera.org/Tach/WorldTachs/CatPalHosts/Home.html. (09.09.2020).

*Received: November 23, 2020* *Accepted: March 09, 2021*