

TRICHOGRAMMA BRASSICAE BEZDENKO (HYMENOPTERA: TRICHOGRAMMATIDAE), NEWLY RECORDED EGG PARASITOID FROM CORN FIELDS IN SAKARYA, TURKEY

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[Gülser, G. & Öztemiz, S. 2020. *Trichogramma brassicae* Bezdenko (Hymenoptera: Trichogrammatidae), newly recorded egg parasitoid from corn fields in Sakarya, Turkey. *Munis Entomology & Zoology*, 15 (1): 35-38]

ABSTRACT: The paper presents the egg parasitoid, *Trichogramma brassicae* Bezdenko (Hymenoptera: Trichogrammatidae) which occurrence in Sakarya/Turkey was first confirmed. The parasitized eggs were collected from European corn borer eggs in corn fields in April-June 2018 and identified by molecular methods. This species can be candidates for biological control programs of lepidopterous pests in North-Western Region of Turkey.

KEY WORDS: Corn, new record, *Ostrinia nubilalis*, *Trichogramma brassicae*, Sakarya

The egg parasitoid *Trichogramma* species (Hymenoptera: Trichogrammatidae) are important biological control agents and have been found on a wide range of lepidopterous hosts (Orr et al., 2000). To date, eleven *Trichogramma* species identified in Turkey, and *Trichogramma evanescens* Westwood has been identified in European corn borer eggs in Marmara and Black Sea Region so far (Ozpinar et al., 1996; Oztemiz, 2007; Oztemiz et al., 2013). Considering the agricultural areas, climatic conditions and biodiversity of our country, the number of species is very low. Therefore, the number of species is thought to be much more. For this reason, to identify the species of *Trichogramma* naturally associated with eggs of pest lepidopterous in corn fields of Sakarya, Turkey was aimed in the study.

MATERIAL AND METHODS

Sampling place

Sakarya is located in the Marmara Region, in Northwestern Turkey, between the Black Sea and Sapanca Lake. The GPS-coordinates of Sakarya are: 40° 46' 23.066" N 30° 23' 41.341" E. The field work was carried out in the Arifiye, Sapanca, Adapazarı, Erenler, Serdivan, Akyazi, Karasu, Kocaali, Hendek, Kaynarca, Sogutlu, Ferizli, Taraklı, Geyve, Pamukova districts of Sakarya (Fig. 1).

Sampling method

Parasitized eggs of the European corn borer, *Ostrinia nubilalis* (Lepidoptera: Noctuidae) were collected from the corn fields in North-Western of Turkey (Fig. 2). Samples were collected by random sampling method from twelve districts (Arifiye, Sapanca, Adapazarı, Erenler, Serdivan, Akyazi, Karasu, Kocaali, Hendek, Kaynarca, Sogutlu, Ferizli) of Sakarya province (Fig. 1) during April-June 2018. The collections of eggs or egg masses of pest were made by visual inspection. The collected eggs or egg masses of pest were transported to the Entomology Laboratory at the Duzce University, Faculty of Agriculture and Natural Science, campus in the city of Konuralp, Duzce. The collected eggs or egg masses of pest

were cultured in the laboratory under room conditions. Observations were made on a daily until the parasitoid wasps had emerged. Females that emerged from parasitized corn borer eggs were used to initiate isofemale lines, which were subsequently maintained on eggs of *Ephestia kuehniella* Zeller (Lepidoptera: Pyralidae) at 24 ± 1 °C, $70 \pm 5\%$ RH, and under a light regime of 14h L:10 h D (Tuncbilek et al. 2009). Cultures are reared on eggs of *Ephestia kuehniella* Zeller (Lepidoptera: Pyralidae).

Identification of samples

The molecular identification of the parasitoids was made by Assoc. Prof. Dr. Fahriye Ercan (Ahi Evran University, Faculty of Agriculture Sciences and Technology, Plant Protection Department, Kirsehir, Turkey).

RESULTS AND DISCUSSION

The parasitoids collected from 12 districts were defined as *Trichogramma brassicae* Bezdenko (Hymenoptera: Trichogrammatidae). This is the first report of parasitism by *T. brassicae* from *O. nubilalis* eggs in Sakarya (Fig. 3). Specimens have been deposited in the insect museum unit of the Duzce University, Faculty of Agriculture and Natural Science, Duzce, Turkey. With this study, the number of *Trichogramma* species increased in Marmara region of Turkey. These results may contribute to better knowledge of Trichogrammatids fauna in Turkey and have the potential to provide information on the biological control to be carried out in the integrated pest management programs in the future (Li et al., 1994; Bohinc et al., 2015; Jalali et al., 2016). *Trichogramma brassicae* was first found in the former soviet republic of Moldavia and described by Bezdenko (1968). *T. brassicae* may parasitize several species of lepidopterous pests, one of them is *O. nubilalis* eggs naturally parasitized by *T. brassicae* in corn fields (Fig. 4) (Maini et al., 1982; Uzun, 1995). Besides *T. brassicae* was used to control *O. nubilalis* in European countries such as Switzerland (Bigler, 1983, 1986), France, Italy, Austria and the Netherlands (Van Schelt & Ravensberg, 1991; Burgio & Maini, 1995), Slovenia (Bohinc et al., 2015). The result obtained in this study are expected to contribute to biological control of the pest in corn fields.

CONCLUSION

As a result of the study, a new species was added to the *Trichogramma* fauna of Sakarya Province, North western of Turkey. The possibilities of using this species in biological control should be studied in corn fields of Sakarya province where corn planting is high.

ACKNOWLEDGEMENTS

The study is a part of the master thesis of the first author. We thank Assoc. Prof. Dr. Fahriye Ercan (Ahi Evran University, Faculty of Agriculture Sciences and Technology, Plant Protection Department, Kirsehir, Turkey) for identification the *Trichogramma* species in this study.

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Figure 1. Surveyed districts of Sakarya province.



Figure 2. Survey made Turkey's place in the province.



Figure 3. Egg masses of *Ostrinia nubilalis* Hbn.



Figure 4. Eggs collected from the corn fields.