

1-1-2014

## Ichneumonid parasitoids of the sawfly *Cimbex quadrimaculata* (Müller) feeding on almonds in Antalya, along with a new parasitoid and new record

HİKMET ÖZBEK

Follow this and additional works at: <https://journals.tubitak.gov.tr/zoology>



Part of the [Zoology Commons](#)

---

### Recommended Citation

ÖZBEK, HİKMET (2014) "Ichneumonid parasitoids of the sawfly *Cimbex quadrimaculata* (Müller) feeding on almonds in Antalya, along with a new parasitoid and new record," *Turkish Journal of Zoology*. Vol. 38: No. 5, Article 19. <https://doi.org/10.3906/zoo-1311-47>  
Available at: <https://journals.tubitak.gov.tr/zoology/vol38/iss5/19>

This Article is brought to you for free and open access by TÜBİTAK Academic Journals. It has been accepted for inclusion in Turkish Journal of Zoology by an authorized editor of TÜBİTAK Academic Journals. For more information, please contact [academic.publications@tubitak.gov.tr](mailto:academic.publications@tubitak.gov.tr).

## Ichneumonid parasitoids of the sawfly *Cimbex quadrimaculata* (Müller) feeding on almonds in Antalya, along with a new parasitoid and new record

Hikmet ÖZBEK\*

Department of Plant Protection, Agricultural Faculty, Atatürk University, Erzurum, Turkey

Received: 24.11.2013

Accepted: 10.03.2014

Published Online: 14.07.2014

Printed: 13.08.2014

**Abstract:** The sawfly *Cimbex quadrimaculata* (Müller) (Hymenoptera: Cimbicidae) has been identified as a serious defoliator of young almond plants in Antalya. Two ichneumonid parasitoids, *Opheltes glaucopterus* (Linnaeus) and *Phobetes nigriceps* (Gravenhorst) (Hymenoptera: Ichneumonidae: Ctenopelmantinae), were reared as larva–pupa parasitoids of *C. quadrimaculata*. Of these, *P. nigriceps* was obtained for the first time from *C. quadrimaculata*; it is a new record for the Turkish fauna as well as for the continent of Asia.

**Key words:** *Cimbex quadrimaculata*, Ichneumonidae, new parasitoid, new record, *Phobetes nigriceps*, Turkey

The suborder Symphyta (known as sawflies) of the Hymenoptera may be recognized by the absence of a marked constriction between the first and second abdominal segments, and by the possession of at least one closed anal cell in the forewing. The larvae have a well-developed head capsule and most have thoracic legs; the majority of free-feeding larvae are caterpillar-like with abdominal prolegs. With the exception of the Orussidae, the larvae are phytophagous (Gauld and Bolton, 1988; Goulet and Huber, 1993). There are approximately 8755 Symphyta species worldwide. The Cimbicidae is a small family, with 196 species occurring in the world (Taeger and Blank, 2011). Turkey has 23 species in 6 genera (Önder, 2011). Cimbicids are large- to medium-sized, often-hairy sawflies, with antennae with a prominent apical club or knob and 6 to 7 segments. All larvae are external leaf feeders on plants of the families Rosaceae, Betulaceae, Salicaceae, Caprifoliaceae, and Dipsacaceae (Gauld and Bolton, 1988).

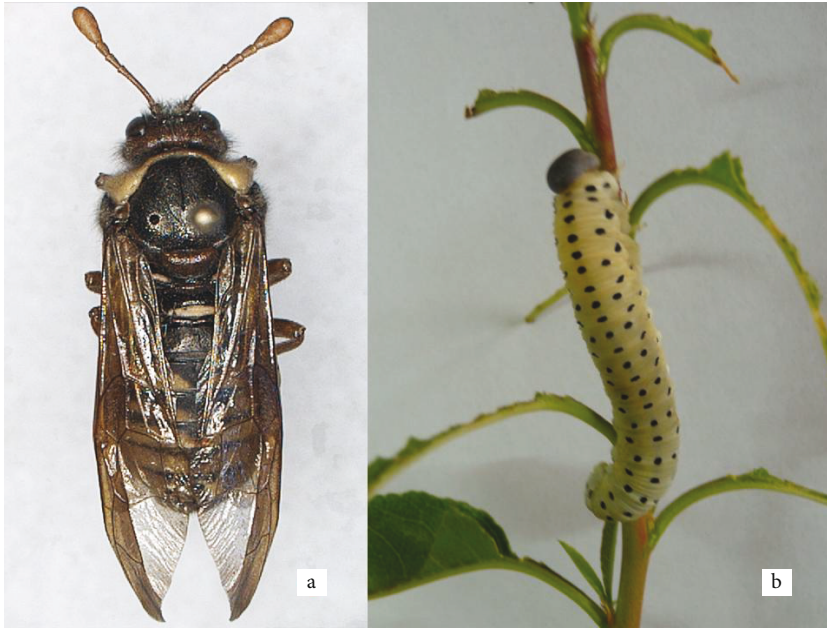
*Cimbex* (= *Palaeocimbex*) *quadrimaculata* (Müller) is, in Turkish, commonly known as “badem yaprak testereli arısı”. The body is large, 19–21 mm long; the antennae end in a club and have 6 segments (Figure 1a). The fully grown larva is 50 mm long (Figure 1b). It occurs in Europe and in the Mediterranean area, including the Middle East. It is a pest mainly on almond, but also feeds on apricot, peach, pear, and cherry in Turkey (Maçan, 1986; Özbek et al., 1998).

The larvae of *C. quadrimaculata* were initially detected in early June in 2012 on the foliage of young almond plants in a newly established (in 2010) orchard in Antalya (Varsak). There has been no documentation of this species causing severe defoliation in areas where it has been observed. Observations were continued in the orchard until the end of June 2012 at 2- or 3-day intervals to observe the damage and behavior of the larvae. An attempt was also made to rear the larvae indoors to obtain larval parasitoids. Before larvae became full-grown, some of them were randomly collected with shoots and leaves of almond plants, inserted into glass jars with wet tissue paper at the bottom, and stored at 22–24 °C in natural light. Every 2 days, withered leaves were replaced with fresh ones.

The larvae fed on the edges of the leaves by consuming the whole leaf laminae or leaving only the midrib (Figure 1b). Damage caused to young almond plants by *C. quadrimaculata* was very significant; a great deal of reduction of the foliage occurred. Therefore, in heavily infested areas of the orchard, the gardener applied various control measures, particularly collecting and killing the larvae by hand.

The larvae in the glass jar spun cocoons in 10 days, at the end of June 2012. In September, the cocoons were transferred into the refrigerator (about 5 °C) for overwintering. At the beginning of May of the following year, the cocoons were transferred again to the room at 22–24 °C with natural light. At the end of May, it was observed that adults of *C. quadrimaculata* and its parasitoids emerged

\* Correspondence: hozbek@atauni.edu.tr



**Figure 1.** *Cimbex quadrimaculata* (Müller): a) Adult; b) Larva and its damage on almond foliage.

in 2013. Two parasitoid species, *Opheltes glaucopterus* (L.) (Figure 2a) and *Phobetes nigriceps* (Gravenhorst) (Figure 2b), in the subfamily Ctenopelmatinae (Hymenoptera: Ichneumonidae) were defined as larva–pupa parasitoids from *C. quadrimaculata*.

*Opheltes glaucopterus* was first detected by Faggioli (1938) as a parasitoid of *C. quadrimaculata*. It has a Holarctic distribution range (Yu et al., 2012). Concerning the occurrence of *O. glaucopterus* in Turkey, Kolarov (1995) listed it in his catalog based on Fahringer (1922).



**Figure 2.** Parasitoids of *Cimbex quadrimaculata* (Müller): a) *Opheltes glaucopterus* (L.); b) *Phobetes nigriceps* (Gravenhorst).

Recently, Gürbüz et al. (2009) recorded one male in Isparta. *O. glaucopterus* is polyphagous, and its hosts are mainly *Cimbex* species: *Cimbex americana* Leach, *C. connate* Schrank, *C. femorata* L., *C. femorata japonica* Kirby, *C. humeralis* Geoffroy, *C. quadrimaculata* L., *C. lutea* L., *C. taukushi* Marlatt (Cimbicidae), *Deilephila elpenor* L., *Mimas tiliae* L. (Sphingidae), *Dendrolimus albolineatus* Matsumura, *D. sibiricus* Rozhkov, *D. superans* Bulter (Lasiocampidae), and *Lymantria dispar* (L.) (Lymantridae) (Yu et al., 2012).

*Phobetres nigriceps* (Figure 2b) also has a large distribution range; it has been reported from Belarus, Czechoslovakia, Finland, France, Germany, Hungary, Italy, Japan, Lithuania, Macedonia, Netherlands, Norway, Poland, Romania, Russia, Sweden, United Kingdom, and the former Yugoslavia (Yu et al., 2012). It is a parasitoid on some sawfly species, namely *Cimbex luteus* (L.), *Pseudoclavellaria amerinae* (L.), *Trichiosoma glabrata* (Fallén), *T. lucorum* (L.), *T. sorbi* (Hartig), *T. vitellina* (L.) (Cimbicidae), and *Scolioneura betule* (Klug) (Tenthredinidae) (Yu et al., 2012). *Phobetres nigriceps* was first reared from the larva of *C. quadrimaculata* as a larva-pupa parasitoid. Moreover, *P. nigriceps* is a new record for the Turkish fauna as well as for the Asian continent.

In addition to *O. glaucopterus* and *P. nigriceps* determined in the present study, Özgen et al.

(2010) obtained *Listrognathus mactator* (Thunberg) (Hymenoptera: Ichneumonidae: Cryptinae) as a parasitoid of *C. quadrimaculata* in Diyarbakır for the first time. A cotton pest, *Earias insulana* Boisd. (Lepidoptera: Noctuidae), was known as the only host of *L. mactator* (Aubert, 1970); it is distributed in the Palearctic region, mainly in Europe (Horstmann, 1990). It is worth noting that the family Ichneumonidae plays an essential role in the functioning of most ecosystems, and in recent years they have been used successfully as biocontrol agents of various agricultural pests (Wahl, 1993). In Turkey, the presence of 3 parasitoid species of *C. quadrimaculata*, which is an important almond pest, has significant importance in enhancing the potential to control the abundance of *C. quadrimaculata* in almond orchards. Thus, in the control of this pest, an Integrated Pest Management program should be applied.

### Acknowledgements

The author is grateful to the following scientists for the identifications: Dr Dave Smith (Washington, DC, USA) for the sawfly and Dr Janko Kolarov (Bulgaria) for ichneumonid samples. I thank Dr Matthias Riedel for reviewing the manuscript. I also thank the anonymous referees, who provided helpful comments on earlier versions of the manuscript.

### References

- Aubert JF (1970). Ichneumonides pétiolées inédites. B Soc Entom Mulhouse (Septembre–Octobre): 65–73 (in French).
- Fahringer J (1922). Ein neues Ichneumoniden genus aus Kleinasien. Verh Zool Bot Ges Wien 71: 7–10 (in German).
- Faggioli D (1938). Appunti entomologici. V Bollettino dell'Istituto di Entomologia della università degli Studi di Bologna 11: 19–40 (in Italian).
- Gauld B, Bolton I (1988). The Hymenoptera. Oxford, UK: Oxford University Press.
- Goulet H, Huber JT (1993). Hymenoptera of the World: An Identification Guide to Families. Ottawa, Canada: Canada Communication Group Publishing.
- Gürbüz MF, Aksoylar MY, Buncukçu A (2009). A faunistic study on Ichneumonidae (Hymenoptera) in Isparta, Turkey. Linzer biol Beitr 41: 1969–1984.
- Horstmann K (1990). Die westpaläarktischen Arten einiger Gattungen der Cryptini (Hymenoptera, Ichneumonidae). Mitt Münchner Entomol Gesellschaft 79: 65–89 (in German).
- Kolarov J (1995). A catalog of the Turkish Ichneumonidae (Hymenoptera). Entomofauna 7: 137–188.
- Maçan G (1986). Güneydoğu Anadolu Bölgesi'nde bademlerde zarar yapan böcek türleri, önemlilerinin tanımları, yayılışları ve ekonomik önemleri. Diyarbakır Bölge Zirai Mücadele Araştırma Enstitüsü, araştırma eserleri serisi no: 5, Ankara (article in Turkish with an abstract in English).
- Önder Ç (2011). Check-list of the family Cimbridae of Turkey and some biological observations (Hymenoptera: Symphyta). Mun Ent Zool 6: 779–784.
- Özbek H, Güçlü Ş, Hayat R, Yıldırım E (1998). Meyve, Bağ ve Bazı Süs Bitkileri Zararlıları. Atatürk Üniversitesi, Ziraat Fakültesi, Ders Kitapları Serisi No: 72, Erzurum.
- Özgen İ, Yurtcan M, Bolu H, Kolarov J (2010). *Listrognathus mactator* (Thunberg, 1824) (Hymenoptera: Ichneumonidae): a new recorded parasitoid of *Cimbex quadrimaculatus* (Müller, 1776) (Hymenoptera: Cimbridae) in Turkey. Entomol News 121: 391–392.
- Taeger A, Blank SM (2011). ECatSym - Electronic world catalog of Symphyta (Insecta: Hymenoptera Program version 3.10, data version 38(07.12.2011)).
- Wahl DB (1993). Family Ichneumonidae. In: Goulet H, Huber J, editors. Hymenoptera of the World: an Identification Guide to Families. Ottawa, Canada: Canada Communication Group Publishing, pp. 395–448.
- Yu DS, Achterberg C, Horstmann K (2012). Interactive Catalogue of World Ichneumonoidea. Taxonomy, biology, morphology and distribution. Compact Disc (Master version). Taxapad.