



## Ichneumonid (Hymenoptera) parasitoids of overwintering *Hyphantria cunea* (Drury) (Lepidoptera: Arctiidae) pupae in hazelnut plantations of the central Black Sea region of Turkey

G.T. SULLIVAN<sup>1,2,5</sup>, I. KARACA<sup>1</sup>, S.K. OZMAN-SULLIVAN<sup>3</sup> & J. KOLAROV<sup>4</sup>

<sup>1</sup>Suleyman Demirel University, Faculty of Agriculture, Department of Plant Protection, 32260 Isparta, Turkey

<sup>2</sup>Ondokuz Mayıs University, OYDEM, 55139 Samsun, Turkey

<sup>3</sup>Ondokuz Mayıs University, Faculty of Agriculture, Department of Plant Protection, 55139 Samsun, Turkey

<sup>4</sup>University of Plovdiv, Faculty of Pedagogie, 4000 Plovdiv, Bulgaria

<sup>5</sup>Corresponding author. Email: gsullivan@omu.edu.tr

### Abstract

Overwintering pupae of the phytophagous lepidopteran pest *Hyphantria cunea* (Drury) (Lepidoptera: Arctiidae) were collected from 38 hazelnut (*Corylus avellana* L.) plantations in Samsun province, Turkey. Five species of ichneumonids, *Virgichneumon dumeticola* (Gravenhorst), *V. albilineatus* (Gravenhorst), *Enicospilus ramidulus* (L.), *Pimpla rufipes* (Miller) and one *Gelis* sp. were reared. Average parasitism was 0.13% and 2.33% for 2008 and 2009, respectively. Highest site parasitism was 14.9% and highest site diversity was 4 species. *Virgichneumon dumeticola* was the commonest species, with 73% of the total specimens. *Virgichneumon albilineatus* and *E. ramidulus* are reported for the first time from *H. cunea*, and *V. albilineatus* is also reported for the first time from Turkey. *Gelis* sp. is reported for the first time as a parasitoid of *H. cunea* in Turkey.

**Key words:** Arctiidae, Ichneumonidae, biological control, parasitoid, hazelnut

### Introduction

*Hyphantria cunea* (Drury), a polyphagous lepidopteran pest generally known as the fall webworm, is native to North America, ranging from Canada to Mexico. It is one of the few insect pests introduced from North America to other continents (Gomi & Takeda 1996, Yang *et al.* 2008). It has been reported from many countries, including Russia (Sharov & Izhevskiy 1987), middle and eastern European countries (Szalay-Marzso 1971), Italy (Montermini & Oliva 1984), Iran (Rezaei *et al.* 2003) and Turkey (Iren 1977, Isik & Yanilmaz 1992, Tuncer 1992). Varjas and Sehnal (1973) reported that the polyvoltinism, ecological plasticity and polyphagy of this species have made its effective control difficult. It has been reported to feed on 636 species and is considered to be among the most polyphagous of insects (Warren & Tadic 1970).

In Turkey, *H. cunea* spread from west to east along the Black Sea coast, as far as the central Black Sea region (Iren 1977, Isik & Yanilmaz 1992), where it has become an important pest of hazelnut plantations at irregular intervals in limited areas. A severe outbreak occurred in the western and central Black Sea regions, especially in Samsun province in 1984–1985. There was a more limited outbreak in the same province in 2007–2008. The first summer generation in June generally causes little damage as populations are low, although in June 2010 it caused obvious damage. Because of the high fecundity of *H. cunea*, most damage is caused by second generation larvae in August/September.

There are complex interactions among the fall webworm and its parasitoids (Morris 1976). Johnson and Lyon (1991) reported more than 50 species of parasites and 36 species of predators of fall webworm in the U.S.A. Its numbers are regulated by many different entomophagous insects in Eastern Europe (Sharov &