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A New Host *Acherontia atropos* (Linnaeus, 1758) (Lepidoptera: Sphingidae) Record for *Drino atropivora* (Robineau-Desvoidy 1830): (Diptera: Tachinidae) from Turkey

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ABSTRACT

The present study was carried out in Diyarbakır province between 2010-2013 on Solanaceae species (*Physalis angulata* L. and *Solanum melongena* L.) infested with the larvae hawk moth *Acherontia atropos* (Linnaeus, 1758) (Lepidoptera: Sphingidae). Tachinid parasitoid, *Drino atropivora* (Robineau-Desvoidy 1830): (Diptera: Tachinidae), were obtained from *Acherontia atropos* larvae collected from Solanaceae species in Diyarbakır. *Acherontia atropos* is a new host record for *Drino atropivora* from Turkey.

Key words: Acherontia atropos, *Drino atropivora*, *Physalis angulata*, *Solanum melongena,* Turkey.

INTRODUCTION

The Tachinidae is the largest family of Diptera (among the suborder Brachycera). Larvae live as endoparasitoids in insects (Lepidoptera, Hymenoptera, Coleoptera, Heteroptera, Orthoptera and a few others) (Tschorsnig and Barták, 2001). The detailed general information on host data could be obtained by Herting (1960), Tschorsnig *et al*. (1994), and the most recent data about hosts of Turkish Tachinidae were given by Kara and Tschorsnig (2003). This family includes approximately 10,000 species worldwide, of which about 1650 are found in the Palearctic Region (Herting, 1960). Because of their role as natural enemies of pests in agricultural and forest ecosystems, some species of tachinids have been the focus of applied biological control studies (Greiner, 1988).

Acherontia atropos lays single egg on the bottom side of solanaceous plants, especially potato. It also uses plants from families Verbenaceae, Cannabaceae, Oleaceae, as hosts. Caterpillars grow to a maximum of 12-13 cm, and in some stage have various horns on their back and coloration patterns varying between yellow, green and brown (Visser, 2006). *Acherontia atropos*, *Acherontia styx* and *Acherontia lachesis* species are commonly observed raiding beehives of different species of honey bee for honey; *A. atropos* only attacks colonies of the well-known Western honey bee,

Apis mellifera. They can move about in hives without being disturbed because they mimic the scent of the bees (Moritz *et al.*, 1991).

The aim of this study was to determine the natural enemies of the harmful *Acherontia atropos* on Solanaceae species in Diyarbakır.

MATERIAL AND METHODS

Larvae of *Acherontia atropos* were reared (During the study, a total of 9 the larvae were collected) between 2010 and 2013 in boxes containing *Physalis angulata* and *Solanum melongena* (Solanaceae) leaves from the same field in Diyarbakır (37°53'N, 40°16'E, altitude 700 m). The larvae were reared at a temperature of 26±1°C, relative humidity of 65±5, and illumination of 3500 lux for 16 hours per day. The boxes were checked daily. Host pupae and tachinid puparia were placed in separate petri dishes containing moistened cotton until the adult moths and flies emerged.

RESULTS AND DISCUSSIONS

In this study, 2 of them from 9 sphingid larvae cultured been seen with infectious tachinid maggots and 148 tachinid maggots were obtained (Fig. 1). The other seven sphingid larvae were pupae. This interference was observed in one of the sphingid pupae and 45 tachinid maggots were obtained. Total of 183 tachinid pupae obtained was only 35 adult flies out (Fig. 2).

As a result of this study, one parasitoid species *Drino atropivora* was obtained from pupae and larvae of *Acherontia atropos*. Such registered parasitoids are Ichneumonidae: *Amblyjoppa fuscipennis* (Wesmael), *A. proteus* (Christ), *Callajoppa cirrogaster* (Schrank), *C. exaltatoria* (Panzer), *Diphyus longigena* (Thomson), *D. palliatorius* (Gravenhorst), *Ichneumon cerinthius* Gravenhorst, *Netelia vinulae* (Scopoli); Tachinidae: *Compsilura concinnata* (Meigen), *Drino* (*Zygobothria*) *atropivora* (Robineau-Desvoidy), *Masicera pavoniae* (Robineau-Desvoidy), *Winthemia rufiventris* (Macquart). *Drino atropivora* has even been recorded as a parasitoid from Malta (Schembri *et al.*,1991).

***Acherontia atropos* (Linnaeus, 1758) (Lepidoptera: Sphingidae) (Fig. 3)**

Distribution: *Acherontia atropos* occurs throughout the Middle East and the Mediterranean region, much of Africa down to the southern tip, and increasingly as far north as southern Great Britain due to recently mild British winters. It occurs as far east as India and western Saudi Arabia, and as far west as the Canary Islands and Azores (Pittaway, 1993). It is an Afrotropical species which extends north to the Mediterranean (including the whole of North Africa and the Middle East) and across Cyprus (Lewandowski and Fisher, 2002), Turkey (Daniel, 1932; de Freina, 1979), the Republic of Georgia (Didmanidze *et al.*, 2013) to north-eastern Iran (Bienert, 1870; Sutton, 1963), the Ukraine (Dubatolov, 1999), Turkmenistan (Danov and Pereladov, 1985; Danner *et al.*, 1998), Mesopotamia (Wiltshire, 1957), Kuwait (Pittaway, 1993) and western Saudi Arabia (Wiltshire, 1986). It is also found in the Canary Islands, Madeira

(Martin *et al.*, 2000) and the Azores (Meyer, 1991), and throughout Europe as a migrant, including Iceland (Wolff, 1971). Recorded as a vagrant as far north as Izvail' in european Russia (Tatarinov *et al.*, 2003), and as far east as Pavlodar in north-eastern Kazakhstan, where an example was collected in September 2006 (Dubatolov and Titov, 2011)

Figs. 1-2. *Drino atropivora* 1. larvae hatching from the last instar caterpillar of *Acherontia atropos*. 2. empty puparia and adults.

Fig. 3. *Acherontia atropos* A. larva and B. pupa

Recorded in Albania, Andorra, Austria, Azores, Belarus, Belgium, Bosnia and Herzegovina, Britain, Bulgaria, Canary Island, Corsica, Croatia, Cyprus, Czech Republic, Danish mainland, Estonia, European Turkey, Faroe Island, Finland, French mainland, Germany, Gibraltar, Greek mainland, Hungary, Iceland, Ireland, Italian mainland, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madeira, Malta, Moldova, Portuguese mainland, Romania, Russia, Sardinia, Sicily, Slovakia, Slovenia, Sweden, Switzerland, The Netherlands, Ukraine, Near East Asian: Turkey, Caucasian Russian republics, Afro-tropical region, near East, north Africa (de Jong,, 2014).

Distribution in Turkey: Recorded in İzmir (Zümreoğlu and Akbulut, 1988), Ilgaz Mount National Park (Yenice-Doruk) (Şimşek *et al.*, 2010), in Çanakkale (Gelibolu) (Mathew, 1881). In Kahramanmaraş (Daniel, 1932; de Freina, 1979). In Izmir (Bornova) and Samsun (City center) (Kansu, 1963). In Adana (Balcali, Haciali, Pozanti), Icel (Tarsus) (Kornosor and Sertkaya, 1996). On *Fraxinus* sp and *Nerium* sp: Istanbul

(Florya) and Trabzon (Acatay, 1943). On *Fraxinus* sp: In Istanbul (Belgrad Forest) (Mol and Avci, 1997). In Muğla (Fethiye- Butterflies Valley) (Mol *et al.*, 2003).

Host plant: Sesame (*Sesamum indicum* L.) in İzmir (Zümreoğlu and Akbulut, 1988)

Major host plants in the world: *Solanum tuberosum*, *S. dulcamara, Ligustrum, Datura, Cannabis, Atropa, Lycium, Philadelphus, Nicotiana, Nerium, Olea, Schrebera alata, Stachytarpeta indica, Clerodendron, Tecomaria, Tecoma, Withania, Hoslundia* and *Fraxinus* (Akkuzu *et al.*, 2007).

Minor host plants: Verbenaceae (*Vitex agnus-castus*), Oleaceae, *Beta vulgaris, Buddleja, Cannabis sativa, Malus pumila, Pyrus communis, Sambucus* and many other plants. An occasional local pest of olive trees (Turati and Zanon, 1922), even to this day (Stavrakis, 1976).

Material examined: Locality: Diyarbakır (37°53'N, 40°16'E at altitude of about 669 m.)

Parasitoid *Drino atropivora* (Robineau-Desvoidy, 1830): (Diptera: Tachinidae) (Fig. 4)

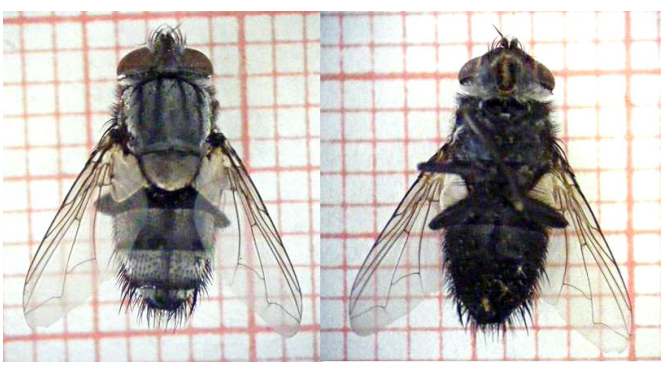

Fig. 4. *Drino atropivora* adults

Recorded hosts: *Acherontia atropos*, *Agrius convolvuli*, *Sphinx ligustri* (Lepidoptera: Sphingidae) in Italy (Cerretti and Tschorsnig, 2010); *Acherontia lachesis* (Fabricius, 1798) (Lepidoptera: Sphingidae) in Singapore (Leong, 2011).

New host record: In the present study *Acherontia atropos* was recorded as a new host of *Drino atropivora* for Turkey.

Host plant: Solanaceae species (*Physalis angulata* L. and *Solanum melongena* L.).

Distribution: Recorded in Austria, Bosnia and Herzegovina, Britain, Bulgaria, Canary Island, Corsica, Croatia, Cyprus, French mainland, Germany, Hungary, Italian mainland, Macedonia, Malta, Poland, Portuguese mainland, Romania, Russia central, Sicily, Spanish mainland, Switzerland, Ukraine (Moritz *et al.*, 1991).

Distribution in Turkey: New record for the territory of Turkey.

Material examined: Total of 183 tachinid pupae obtained was 35 adult flies out, Diyarbakır (37°53'N, 40°16'E at altitude of about 669 m).

This study showed that there are many hitherto unrecorded parasitoids of *Acherontia atropos* in Turkey. More studies should be conducted on the parasitoid fauna of *A. atropos*, including studies on their biology.

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