

NEW RECORD AND NEW ASSOCIATIONS OF TWO LEAF MINER PARASITOIDS (HYMENOPTERA: BRACONIDAE: MICROGASTRINAE) FROM IRAN

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Abstract – In this study, two braconid species were reared on leaf miners collected from the vicinity of Shahin Dezh, West Azerbaijan province (northwest of Iran). *Apanteles corvinus* Reinhard was reared on *Leucoptera malifoliella* (Costa) (Lepidoptera: Lyonetidae) on apple and *Protopanteles liparidis* (Bouché) was reared on *Phyllonorycter populifoliella* (Trenschke) on *Populus*. This is the first report of *A. corvinus* from Iran and of the new trophic association of *P. liparidis* with poplar leaf miner, *P. populifoliella*.

Key words: *Braconidae*; *parasitoids*; *Iran*; *leaf miners*; *trophic associations*

INTRODUCTION

Leaf miners cause damage to varying degrees by consuming the mesophyll of leaves and forming holes and galleries of different shapes in the leaf tissue. Thereby they reduce the photosynthetic capacity of the leaves. These types of pests belong to four holometabolous insect orders: Diptera, Coleoptera, Hymenoptera, and Lepidoptera (Salvo and Valladares, 2007). The list of natural enemies attacking leaf miners is large. It is mainly comprised of hymenopterous parasitoids from the superfamilies Chalcidoidea and Ichneumonoidea. As far as the territory of Iran is concerned, there is lack of information on parasitoids. Recently, data of chalcidoid parasitoid fauna and their trophic associations with the leaf-mining hosts were reported by Baniamiri and Mohammadi-

Pour (2007), Zargarani et al. (2010) and Sadeghi et al. (2012a, b).

MATERIALS AND METHODS

This study was conducted in the vicinity of Shahin Dezh (south of West Azerbaijan province, Iran) in order to identify parasitoids of some trees' leaf miners. Samplings were performed from April to November 2009. Infested leaves were kept in plastic containers in the Entomology Laboratory of Department of Plant Protection, Agricultural and Natural Resources Research Center of East Azerbaijan, Tabriz.

The reared parasitoids were separated based on morphological characters into two superfamilies (Chalcidoidea and Ichneumonoidea). Chalcidoids,

which were the subject of two previously published papers (see Sadeghi et al., 2012a, b), and two braconid species were studied in this research. Identification was made using Telenga (1955), Tobias (1976, 1986), Nixon (1973), Papp (1984) and Achterberg (2002). The specimens were deposited in the Insect Collection of the Department of Plant Protection, Agricultural and Natural Resources Research Center of East Azerbaijan, Tabriz. Part of the examined material is deposited in the personal collection of the first author.

RESULTS AND DISCUSSION

In this study, two braconid species were reared from two leaf miner species belonging to the families Gracillariidae and Lyonetidae.

APANTELES CORVINUS REINHARD, 1880

Material examined - Iran, West Azerbaijan province, Shahin Dezh, July, 2010, ex *Leucoptera malifoliella* (Costa) (Lep.: Lyonetidae) on *Malus domestica*, 2♀.

Notes - Body length about 2.5 mm. Metacarpus more than 3-times as long as its distance from the wing apex. Ovipositor sheaths slightly longer than half of the hind tibia, partly covered with hairs. Koinobiont, endoparasitoid, gregarious (Telenga, 1955) or solitary parasitoid (Wilkinson, 1945; Shaw and Askew 1976; Svyrydov, 2002).

Hosts - *Anthonomus pomorum* L. (Fulmek, 1968); *Bucculatrix bechsteiniella* Bechstein and Scharfenberg on *Pyrus communis* L. (Balevski and Tomov, 1998); *Bucculatrix crataegi* (Bechstein and Scharfenberg) on *Pyrus communis* (Balevski and Tomov, 1997); *Coleophora coracipennella* (Hübner) (e.g. Nixon, 1973); *Coleophora nigricella* (Stephens) (e.g. Tobias, 1976); *Coleophora serratella* (L.) (Wilkinson, 1936; Tobias, 1986); *Hedya nubiferana* (Haworth) (e.g. Nixon, 1973); *Leucoptera malifoliella* (Costa) on *Crataegus monogyna* Jacq. (Shaw and Askew, 1976); *Leucoptera malifoliella* (Costa) on *Malus domestica* L. (Papp, 1984) and on *Malus sylvestris* Miller (Balevski and Tomov, 1998); *Lyonetia clerkella* L. on *Prunus*

persica L. (Togashi, 1988) and on *Sorbus aucuparia* L. (Vidal, 1993); *Lyonetia prunifoliella* (Hübner) on *Malus sylvestris* (Balevski and Tomov, 1997); *Paraswammerdamia lutarea* (Haworth) (eg. Wilkinson, 1945); *Phyllonorycter leucographella* (Zeller) (Godfray et al., 1995); *Phyllonorycter oxyacanthae* (Frey) on *Crataegus monogyna* (Shaw and Askew, 1976).

Distribution - *Apanteles corvinus* has been reported from the Palaearctic region (Azerbaijan, Bulgaria, Canada, Czech Republic, Finland, Georgia, Germany, Greece, Hungary, Ireland, Japan, Kazakhstan, Lithuania, Moldova, Mongolia, Netherlands, Poland, Romania, Russia, Sweden, Tajikistan, Turkmenistan, Ukraine, United Kingdom, Uzbekistan) (Yu et al. 2012). The species was introduced in Canada (Raske, 1978) to control the birch casebearer moth *Coleophora serratella* L. (Lep.: Coleophoridae).

PROTAPANTELES LIPARIDIS (BOUCHÉ, 1834)

Material examined - Iran, West Azerbaijan province, Shahin Dezh, July, 2010, ex *Phyllonorycter populifoliella* (Treitschke, 1833) (Lep.: Gracillariidae), 2♀.

Note - Based on van Achterberg and Polaszek (1994), this genus differs from *Apanteles* mainly by the fact that the first metasomal tergite is comparatively more slender and gradually narrowed apically; the width of the second tergite is more than 1.5-times the apical width of the first tergite; the propodeum is largely smooth, but may be reticulate posteriorly or largely rugulose-punctate, the ovipositor is usually short, hardly protruding beyond the apex of the metasoma (shorter than the basitarsus of the hind leg) and its sheath is only apically setose. *Gregarious endoparasitoid* (Herard et al., 1979)

Hosts - *Acronicta rumicis* (L.) (Cho et al., 2006), *Calliteara abietis* (Denis et Schiffermüller) (Tobias, 1986), *C. pudibunda* (L.) (Mazzoglio et al., 2005), *Clostera anastomosis* (L.) (Tobias, 1986), *Dasychira pseudabietis* (Butler) (Telenga, 1955), *Dendrolimus albolineatus* Butler (Telenga, 1955), *D. pini* (L.) (Telenga, 1955); *D. punctatus* (Walker) (Sun and Liu, 1958), *D. sibiricus* Tschetverikov (Telenga, 1955), *D.*

spectabilis Butler (Telenga, 1955), *D. superans* Butler (Kamijo, 1982), *Epicalia villica* (L.) (Telenga, 1955), *Eriogaster lanestris* (L.) (Tobias, 1986), *Euproctis chrysorrhoea* (L.) (Tobias, 1986), *Euproctis taiwana* (Shiraki) (Chen et al., 2009), *Ivela auripes* (Butler) on *Cornus controversa* Hemsley (Togashi, 1988), *Lymantria dispar* (L.) on *Quercus cerris* L., *Q. petraea* (Matt.) et *Q. rubra* L. (Bouché, 1834; Telenga, 1955, Yu et al., 2012), *Lymantria obfuscata* Walker (Sankaran, 1976), *Malacosoma neustria* (L.) (Telenga, 1955), *Orgyia australis* Walker (Sonan, 1944), *O. australis postica* (Walker) (Telenga, 1955), *O. thyellina* Butler (Togashi, 1981), *Rhyacionia buoliana* (Denis and Schiffermiiller) (Papp, 1984), *Teia antiquiodes* Hübner (Telenga, 1955).

Distribution - This species has been reported from the Palearctic region (Austria, Belarus, Bulgaria, China, Czech Republic, Finland, France, Germany, Hungary, India, Italy, Japan, Kazakhstan, Korea, Lithuania, Moldova, Mongolia, Poland, Romania, Russia, Serbia, Slovakia, Spain, Sweden, Switzerland, Ukraine, United Kingdom, North Africa) (Yu et al., 2012), Iran (Herard et al., 1979; Fallahzadeh and Saghaei 2010). Introduced in USA. (Burgess, and Crossman, 1929).

This is the first report from Iran on *Apanteles corvinus*, a very important natural enemy of various caterpillars on cultivar plants. The second species, *Protopanteles liparidis* has already been reared in Iran, but this is the first time it has been reared in trophic association with *Phyllonorycter populifoliella* (Gracilariidae). Worldwide, the species *P. liparidis* is known as a parasitoid of the gypsy moth, *Lymantria dispar* (L.) (Schopf and Steinberger, 1996; Herard et al., 1979). In Iran, we found this species as a gregarious endoparasitoid mainly on 2nd and 3rd larval instars.

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