

A contribution to the study of subfamilies *Microgastrinae* and *Opiinae* (Hymenoptera: Braconidae) from the Arasbaran Biosphere Reserve and vicinity, Northwestern Iran

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GHAHARI, H. & VAN ACHTERBERG, C.: *A contribution to the study of subfamilies Microgastrinae and Opiinae (Hymenoptera: Braconidae) from the Arasbaran Biosphere Reserve and vicinity, Northwestern Iran.*

Abstract: This paper deals with the fauna of the subfamilies Microgastrinae and Opiinae (Hymenoptera: Braconidae) from the Arasbaran Biosphere Reserve and vicinity (Northwestern Iran). In total 14 species from 7 genera, *Apanteles* Forster (3 species), *Pholetesor* Mason (1 species) and *Cotesia* Cameron (3 species) (Microgastrinae), *Biosteres* Foerster (1 species), *Eurytenes* Förster (1 species), *Opius* Wesmäl (3 species) and *Phaedrotoma* Förster (2 species) (Opiinae) were collected and identified. *Apanteles britannicus* Wilkinson, 1941 is new record for the fauna of Iran.

Keywords: Hymenoptera, Braconidae, Microgastrinae, Opiinae, fauna, Arasbaran, Iran

Introduction

Microgastrine wasps with 2,230 described species worldwide (YU et al. 2012, FERNÁNDEZ-TRIANA et al. 2014), are cosmopolitan and comprising solitary or gregarious koinobiont larval endoparasitoids which attack a wide range of Lepidoptera (WHITFIELD 1997, İNANÇ & BEYARSLAN 1990, RUOHOMÄKI et al. 2013). There are 757 species of Microgastrinae currently known in the Palearctic region of which 529 are recorded from the western Palearctic region and 496 from eastern Palearctic region (YU et al. 2012; FERNÁNDEZ-TRIANA et al. 2014).

Opiinae with 2000 described species worldwide is one of the largest subfamilies of Braconidae (YU et al. 2012). The members of this subfamily are solitary koinobiont endoparasitoids of larvae of cyclorhaphous Diptera, but oviposition may take place in the egg of the hosts (egg-larval parasitoids) (WHARTON 1984, 1997).

Arasbaran (38°40' to 39°08'N; 46°39' to 47°02'E) where its elevation (meters above sea level) is +250 to +2,887, is situated in the north of Iran at the border to Armenia and Azerbaijan and belongs to the Caucasus Iranian Highlands (Fig. 1). In between the Caspian, Caucasus and Mediterranean region, the area covers mountains up to 2200



Fig. 1: Arasbaran Biosphere Reserve and its neighboring areas (Northwestern Iran)

meters, including high alpine meadows, semi-arid steppes, rangelands and forests, rivers and springs. Arasbaran is the territory of about 23,500 nomads who are mainly living in the buffer and transition zones. The braconids' fauna of Arasbaran was poorly studied and the alone research was conducted by GHAHARI et al. (2009). The fauna of Iranian Braconidae was studied rather well as some subfamilies are catalogued step by step (GADALLAH & GHAHARI 2013a,b, 2015, KHAJEH et al. 2014, GADALLAH et al. 2015a,b, 2016a,b). The aim of this faunistic paper is determining of the collected braconid specimens from some regions of Arasbaran and vicinity (northwestern Iran).

Material and Methods

The materials were collected from different regions of Arasbaran and vicinity (northwestern Iran) in September 2012. The sampling methods were Malaise traps and sweeping net, and also rearing of hosts in optimum condition (25 ± 2 °C, $65 \pm 5\%$ RH, 14: 10 L: D) in incubator. The specimens were put in alcohol 75% or mounted on triangular labels and were examined with a stereoscopic binocular microscope. Classification, nomenclature, distribution and host data of Braconidae suggested by YU et al. (2012) have been followed. For later additions and changes, the exact references are given.

Results

In this research 7 species of Microgastrinae and 7 species of Opiinae were collected and identified from the Arasbaran Biosphere Reserve and vicinity. One species, *Apanteles britannicus* Wilkinson, 1941 is new record for the fauna of Iran. The list of species is given below alphabetically with distribution data.

Subfamily **Microgastrinae** Förster, 1862
Tribe **Apantilini** Viereck, 1918

Genus *Apanteles* Förster, 1862
Apanteles britannicus Wilkinson, 1941

Material examined: Ardabil province, Aslandooz, 212 m, 1♀, 15 August 2013. New record for Iran.

Distribution outside Iran: Widely distributed in the Palearctic region. Armenia, Greece, Hungary, Russia, Slovakia, Tajikistan, Turkey, Ukraine, United Kingdom (YU et al., 2012).

Apanteles candidatus (Haliday, 1834)

Material examined: East Azarbaijan province, Maragheh, 1494 m, 2♀, 2♂, 10 September 2012.

Distribution outside Iran: Azerbaijan, Bulgaria, Germany, Greece, Hungary, Ireland, Macedonia, Mongolia, Romania, Russia, Serbia, Sweden, Tajikistan, Turkmenistan, United Kingdom, Uzbekistan (YU et al. 2012), Finland, France, Netherlands (SHENEFELT 1972), Turkey (İNANÇ & BEYARSLAN 1990, 2001).

Host records: *Paraswammerdamia lutarea* (SHENEFELT 1972, NIXON 1973, PAPP 1988, YU et al. 2012). SHENEFELT (1972) recorded the following hosts: *Acrobasis consociella*, *Anthophila pariana*, *Archips piceana*, *A. podana*, *Batodes angustiorana*, *Blastodacna atra*, *Caloptilia populetorum*, *Chorestoneura murinana*, *Choreutis nemorana*, *Clavigesta sylvestrana*, *Lasionycta proxima*, *Malacosoma neustria*, *Panolis piniperda*, *Perrisia pyri*, *Phyllonorycter corylifoliella*, *Pieris brassicae*, *Recurvaria leucatella*, *Solenobia inconspicuellata*, *Tortrix buoliana*, *T. resinanae* and *Zeiraphera rufimitrana*. PAPP (1988) cited as host of this species *Acrolepia pygmaeana*, *Agonopterix ocellana*, *Anarsia eleagnella*, *A. lineatella*, *Anthophila fabriciana*, *Argyresthia pruniella*, *Blastodacna atra*, *Bucculatrix cristatella*, *Callisto denticulella*, *Caloptilia populetorum*, *Carcina quercana*, *Carpatolechia proximella*, *Choreutis nemorana*, *Ch. pariana*, *Diurnea fagella*, *Gracillaria anastomosis*, *Mompha subbistrigella*, *Paraswammerdamia albicapitella*, *Phyllonorycter corylifoliella*, *Plutella maculipennis*, *Prays oleae*, *Solenobia inconspicuellata*, *S. lichenella* and *Swammerdamia pyrella*. Also, other species as *Abraxas grosulariata*, *Diurna lipsiella*, *Euproctis chrysorrhoea*, *Gracillaria syringella*, *Hedya dimioalba*, *Pandemis cerasana*, *Paraswammerdamia lutarea*, *Spilonota ocellana* and *Swammerdamia caesiella* were recorded by YU et al. (2012). TOBIAS (1986) and PAPP (1988) reported *Atemelia torquatella*. It has also been reported from *Dasystema salicella*, *Recurvaria leucatella*, and *Dichomeris fasciella* (TOBIAS 1986).

Apanteles obscurus (Nees, 1834)

Material examined: East Azarbaijan province, Varzaqan, 1687 m, 2♀, 13-14 September 2012.

Distribution outside Iran: Albania, Armenia, Azerbaijan, Belgium, Croatia, Czech Republic, Denmark, Finland, France, Georgia, Germany, Greece, Hungary, Ireland,

Italy, Kazakhstan, Lithuania, Macedonia, Moldova, Mongolia, Montenegro, Netherlands, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom (YU et al. 2012).

Host records: *Aldedonia terrealis*, *Boiea murana*, *Chlorissa viridata*, *Choristoneura murinana*, *Clepsis pallidana*, *Ebulea crocealis*, *Epermenia chaerophyllella*, *Eurodryas aurinia*, *Gracillaria syringella*, *Olethreutes arbutella*, *Pyrausta cingulata*, *Tebenna bjer-kandrella*, *Tephritis arnica*, *Udea ferrugalis*, *Zygaena filipendulae* (YU et al. 2012), *Amicta armena*, *Epermenia chaerophyllella*, *Euphydryas sibirica*, *Gracillaria syringella*, *Pegomya nigratarsis* and *Udea ferrugalis* (SHENEFELT 1972), *Argyroploce arbutella* (TOBIAS 1986).

Genus ***Pholetesor*** Mason, 1981

Pholetesor circumscriptus (Nees von Esenbeck, 1834)

Material examined: East Azarbaijan province, Khajeh, 1520 m, 2♀, 1♂, 10-11 September 2012.

Distribution outside Iran: Armenia, Austria, Azerbaijan, Belgium, Bulgaria, Croatia, Finland, Georgia, Germany, Greece, Hungary, Ireland, Israel, Italy, Korea, Latvia, Lithuania, Madeira Islands, Moldova, Netherlands, New Zealand, Poland, Romania, Russia, Slovakia, Spain, Switzerland, United States of America, Ukraine, United Kingdom (YU et al. 2012), Japan (WATANABE 1932, SHENEFELT 1972).

Host records: *Phyllonorycter blancardella* (BEHDAD 1991, GHAHARI et al. 2010, YU et al. 2012), *Elachista gleichinella*, *E. luticomella*, *E. megerlell*, *E. humilis*, *E. gangabella*, *Ph. emberzipenella*, *Ph. junoniella*, *Ph. lantanella*, *Ph. lautella*, *Ph. messaniella*, *Ph. nigrescentell*, *Ph. populifoliella*, *Ph. scabiosella*, *Ph. pomonella*, *Ph. quercifoliella*, *Ph. tenerella* (SHENEFELT 1972, NIXON 1973, PAPP 1988, YU et al. 2012), *Acleris ferrugana*, *Baryscapus endemus*, *Bucculatrix ulmifoliae*, *Caloptilia alchimiella*, *C. semifascia*, *Calybites auroguttellus*, *Cameraria ohridella*, *Choreutis pariana*, *Chrysocharis laomedon*, *Ch. nepherea*, *Ch. nitetis*, *Cirrospilus lyncus*, *C. pictus*, *C. pulcher*, *C. viticola*, *Closterocerus trifasciatus*, *Coleophora ardeaepennella*, *Dibrachys micogastris*, *Elachista apicipunctella*, *E. luticomella*, *E. megerlella*, *E. poae*, *E. regificella*, *E. revinctella*, *E. taeniata*, *Encrateola laevigata*, *Epinotoa ferrugana*, *Eupelmus urozonus*, *Eurytima* sp., *Gelis mutillatus*, *Gracillaria syringella*, *Leucoptera malifoliella*, *L. sinuella*, *Lyonetia rajella*, *Melanchra persicariae*, *Minotetrastichus frontalis*, *M. platanellus*, *Parectopa robiniella*, *Parornix devoniella*, *P. fagivora*, *P. finitimella*, *P. petiolella*, *P. torquillella*, *Pediobius saulius*, *Phyllonorycter agilella*, *Ph. apparella*, *Ph. blancardella*, *Ph. cavella*, *Ph. comparella*, *Ph. conjunctella*, *Ph. connexella*, *Ph. coryli*, *Ph. corylifoliella*, *Ph. emberizaepennella*, *Ph. fraxinella*, *Ph. froelichiella*, *Ph. harrisella*, *Ph. ilicifoliella*, *Ph. junoniella*, *Ph. lantanella*, *Ph. leucographella*, *Ph. maestingella*, *Ph. mahalebella*, *Ph. manni*, *Ph. mespilella*, *Ph. messaniella*, *Ph. millierella*, *Ph. nicellii*, *Ph. nigrescentella*, *Ph. oxyacanthae*, *Ph. platani*, *Ph. pomifoliella*, *Ph. populifoliella*, *Ph. ringoniella*, *Ph. robiniella*, *Ph. scabiosella*, *Ph. schreberella*, *Ph. sorbi*, *Ph. strigulatella*, *Ph. trifasciella*, *Ph. ulmifoliella*, *Pnigalio agraulis*, *P. pectinicornis*, *Stephensia brunichella*, *Sympiesis acalle*, *S. gordius*, *S. sericeicornis*, *Tortrix viridana* (YU et al. 2012), *Orgyia thyellina* and *Porthesia similis* (WATANABE 1932), *Callisto denticulella*, *Gracillaria fidella* and *Parornix carpinella* (PAPP 1988), *Argyresthia mendica*, *Phyllonorycter lautella*, *Ph. spinicolella*, *Ph. kleemannella*, *Coleophora glitzella*, *Callisto denticulella* (WATANABE 1937, TOBIAS 1986).

Tribe *Cotesiini* Mason, 1981

Genus *Cotesia* Cameron, 1891

Cotesia flavipes Cameron, 1891

Material examined: East Azarbaijan province, Marand, 1326 m, 2♀, 1♂, 15-16 September 2012. East Azarbaijan province, Hoorand, 1113 m, 1♀, 14-15 September 2012.

Distribution outside Iran: Australia, Bangladesh, Barbados, Brazil, China, Cota Rica, Ethiopia, India, Indonesia, Jamaica, Japan, Kenya, Madagascar, Malaysia, Mauritius, Mexico, Mozambique, Myanmar, Nepal, Pakistan, Papua New Guinea, Peru, Philippines, Sri Lanka, Tanzania, Thailand, Trinidad-Tobago, United States of America, Uganda, Venezuela, Vietnam (YU et al. 2012), Burma, Sri Lanka, Malaya (SHENEFELT 1972).

Host records: *Amsacta albistriga*, *Aphanogmus fijiensis*, *Bathytricha truncata*, *Bissetia steniella*, *Busseola fusca*, *Catolaccus crassiceps*, *Chilo auricilius*, *Ch. batri*, *Ch. ceylonica*, *Ch. diffusilineus*, *Ch. infuscatellus*, *Ch. orichalcociliellus*, *Ch. partellus*, *Ch. polychrysa*, *Ch. sacchariphagus indicus*, *Ch. suppressalis*, *Ch. tumidicostalis*, *Ch. zonellus*, *Ceraphron braconiphaga*, *Cnaphalocrocis medinalis*, *Cotesia sesamiae*, *Curculio chinensis*, *Diatraea flavipennella*, *D. grandiosella*, *D. lineolata*, *D. saccharalis*, *Eldana saccharina*, *Eoreuma loftini*, *Euclystis steniellus*, *Euproctis fraternal*, *Eurytoma* sp., *Glaucoccharis reniella*, *Leucania loreyi*, *Metagonistylum minense*, *Parallorhogas pyralophagus*, *Procerata venosata*, *Psalis pennatula*, *Scirpophaga incertulas*, *S. innotata*, *Sesamia calamistis*, *S. griseascens*, *S. inferens*, *S. uniformis*, *Solenopsis invicta*, *Spilarctia oblique*, *Tetramoera schistaceana*, *Tetrastichus howardi*, *Trichogramma galloi*, *Trichomalopsis apanteloctena* (YU et al. 2012), *Aporia crataegi*, *Corcyra cephalonica*, *Helicoverpa armigera* and *Spodoptera mauritia* (SHENEFELT 1972), *Orocrambus simplex* (WILKINSON 1928, WATANABE 1937), *Sesamia gresescens* and *S. inferens* (KUNIATA and SWEET 1994).

Cotesia glomerata (Linnaeus, 1758)

Material examined: East Azarbaijan province, Varzaqan, 1687 m, 2♀, 2♂, 13-14 September 2012. East Azarbaijan province, Haris, 1922 m, 2♀, 1♂, 12-13 September 2012. East Azarbaijan province, Maragheh, 1494 m, 1♀, 1♂, 10 September 2012.

Distribution outside Iran: Austria, Malta, Norway, Palestine (SHENEFELT 1972), Australia, Azerbaijan, Azores, Barbados, Belarus, Belgium, Brazil, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Estonia, Fiji, Finland, France, Germany, Hungary, India, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Macedonia, Moldova, Morocco, Netherlands, New Zealand, Pakistan, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Spain, Sweden, Switzerland, Syria, Turkey, United States of America, Ukraine, United Kingdom, Uruguay, Uzbekistan, Vietnam (YU et al. 2012).

Host records: *Antheraeopsis assama* (YU et al. 2012), *Pieris rapae*, *P. canidia* (LONG and BELOKOBYSKIJ 2003), *Celerio euphorbiae*, *Notodonta dromaderius*, *Limantoria monacha*, *Macroglossa stellatarum*, *Hemaris fuciformis* (SHENEFELT 1972), *Aporia crataegi*, *Pieris brassicae*, *P. daplidice*, *P. rapae* (FAHRINGER 1936), *P. rapae* and *P. crataegi* (WATANABE 1937). NIXON (1974) reported this species as an abundant gregarious parasitoid of *Pieris brassicae*, *Aporia crataegi* and *Pontia daplidice*, *Agrotis segetum* (ALIZADEH and MOGHADDAM 2004, KHANJANI 2004, 2006), and *Sesamia nonagrioides botanephaga* (KHANJANI 2004). In Iran it was reported as the parasitoid of *Saturniidae* (GHAHARI et al. 2010), and larval parasitoid of *Pieris brassicae* (RAZMI et al. 2011).

Cotesia ruficrus (Haliday, 1834)

Material examined: East Azarbaijan province, Hoorand, 1113 m, 2♀, 1♂, 14-15 September 2012. East Azarbaijan province, Haris, 1922 m, 2♂, 12-13 September 2012.

East Azarbaijan province, Varzaqan, 1687 m, 2♀, 13-14 September 2012. Ardabil province, Aslandooz, 212 m, 1♀, 15 August 2013.

Distribution outside Iran: Algeria, Armenia, Australia, Azerbaijan, Bangladesh, Belarus, Belgium, Bulgaria, Cameroon, China, Cyprus, Czech Republic, Egypt, Ethiopia, Fiji, Finland, France, Georgia, Germany, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Japan, Kazakhstan, Kenya, Korea, Libya, Lithuania, Madagascar, Malaysia, Mauritius, Moldova, Mongolia, Nepal, Netherlands, New Zealand, Nigeria, Pakistan, Philippines, Poland, Romania, Russia, Senegal, Slovakia, Slovenia, Somalia, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Tanzania, Thailand, Trinidad & Tobago, Turkey, Turkmenistan, United States of America, Uganda, Ukraine, United Kingdom, Vietnam, Yemen, former Yugoslavia, Zimbabwe (YU et al. 2012).

Host records: *Mythimna unipunctata* (ABBASIPOUR and TAGHAVI 2004, ABBASIPOUR et al. 2004, KHANJANI 2004 as *Pseudaletia unipunctata*, *Chromatomyia horticola* on *Matricaria* sp., *Lirionomyza strigata* on *Cucumis sativus* and from *L. trifolii* on *Vicia faba* (ÇIKIM and UYGUN 2003), *Mythimna* spp., *Naranga aenescens*, *Spodoptera mauritia*, *Helicoverpa armigera* and *Chrysodeixis eriosoma* on maize and rice fields throughout Vietnam (LONG and BELOKOBYSKIY 2003, YU et al. 2012), *Leucania impura*, *L. pallens*, *Polia oleracea* (FAHRINGER 1936), and in Africa from *Cirphis loreyi* (WILKINSON 1928), *Sesamia cretica* (GAHAN 1917), *Hypsipyla robusta* and *Condica capensis* (WILKINSON 1928; YU et al. 2012), *Spodoptera mauritia* (WILKINSON 1928, YU et al. 2012), *Naranga aenescens* (VIERECK 1913, YU et al. 2012), *Cirphis unipuncta* (WATANABE 1937), *Acrionicta rumisis*, *Coenophila subrosea* (NIXON 1974, YU et al. 2012), *Anomis flava* (in Fiji), *Leucania venalba* (in Malaya), *Agrotis ipsilon* (in Egypt), *Mythimna loreyi* (in E. Africa), *Helicoverpa armigera* (in Australia), *Spodoptera exigua* (in India), *Pelopidas mathias* (in India and Malaya), *Melanitis leda* (in Hong Kong), *Prospalta capensis* (in India), *Plusia* sp. and *S. littura* (in Ceylon), *Spodoptera* sp. (in Malaya), *S. mauritia* (in Ceylon), *Chrysodeixis argentifera* (in Australia), *Sesamia inferens* (in India), *Phthorimaea operculella* (in Australia) (NIXON 1974, YU et al. 2012), *Sesamia inferens* (ZHANG 1986, YU et al. 2012), *Anomis flava* (WOO and HSIANG 1939, YU et al. 2012). YU et al. (2012) reported also *Aclastus etorofuensis*, *Agrapha agnata*, *A. segetum*, *Anticollix sparsata*, *Autographa gamma*, *A. nigrisigna*, *Bathythrix kuwanae*, *Catolaccus* sp., *Chilo auricilius*, *Ch. partellus*, *Ch. suppressalis*, *Ch. zacconius*, *Ch. chalcites*, *Cnaphalocrocis medicinalis*, *Colias croceus*, *Cucullia chamomillae*, *Deudorix antalus*, *Diatora prodeniae*, *Diloba caeruleocephala*, *Dinoderus minutus*, *Epicallia villica*, *Glaucoccharis reniella*, *Gonepteryx rhamni*, *H. zea*, *Hyphantria cunea*, *Hyposidra aquilaria*, *Lacanobia oleracea*, *Leucoma salicis*, *Loxostege sticticalis*, *Lymantria obfuscata*, *Malacosoma neustria*, *Maliarpha separatella*, *Mamestra brassicae*, *Melitaea cinxia*, *Mesochorus anomalus*, *M. discitergus*, *Meteorus rubens*, *Mythimma impura*, *M. litoralis*, *M. pallens*, *M. separata*, *Naranga diffusa*, *Ochropleura praecox*, *Ocnogyna loewii*, *Orthosia gracilis*, *Ostrinia nubilalis*, *Parnara guttata*, *Pectinophora gossypiella*, *Pediobius afronigripes*, *P. foveolatus*, *Philolema syleptae*, *Pieris brassicae*, *P. rapae*, *Plutella xylostella*, *Procerata africana*, *Protarchanara brevilinea*, *Pseudaletia convecta*, *P. unipuncta*, *P. includens*, *Pteromalus crassinervis*, *Sesamia nonagrioides*, *Shargacucullia verbasci*, *Sparganothis pilleriana*, *Spilarctia obliqua*, *Spilosoma lubricipedum*, *Spodoptera exempta*, *S. frugiperda*, *S. littoralis*, *Stictopisthus chinensis*, *S. srinaraini*, *Syllepte retractalis*, *Trichomalopsis apanteloctena*, *T. oryzae*, *Trichoplusia ni*, *T. orichalcea*.

Subfamily **Opiinae** Blanchard, 1845

Tribe **Biosterini** Fischer, 1970

Genus **Biosteres** Foerster, 1862

Biosteres (Chilotrichia) haemorrhoeus (Haliday, 1837)

Material examined: East Azarbaijan province, Haris, 1922 m, 1♀, 12-13 September 2012.

Distribution outside Iran: Austria, Belgium, Bulgaria, Canada, Czech Republic, Denmark, Finland, France, Georgia, Germany, Hungary, Ireland, Italy, Netherlands, Poland, Romania, Russia, Slovakia, Sweden, Switzerland, Turkey, United States of America, United Kingdom, former Yugoslavia (YU et al. 2012), Malta (PAPP 2015).

Host records: *Pegomya bicolor*, *P. holostaea* and *P. solennis* (Diptera: Antomyiidae) (FISCHER and KOPONEN 1999, YU et al. 2012).

Tribe **Opiini** Blanchard, 1845

Genus **Eurytenes** Förster, 1862

Eurytenes (Stigmatopoea) macrocerus (Thomson, 1895)

Material examined: East Azarbaijan province, Marand, 1326 m, 1♀, 15-16 September 2012.

Distribution outside Iran: Austria, Bulgaria, Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Netherlands, Poland, Romania, Russia, Slovakia, Switzerland, Turkey, United States of America, United Kingdom (YU et al. 2012), Montenegro (ŽIKIĆ et al. 2013), Norway (RIEDEL and HANSEN 2014).

Host records: *Agromyza prespana* (Diptera: Agromyzidae) on *Elymus repens*; *Trypeta immaculata* (Diptera: Tephritidae) (FISCHER and KOPONEN 1999, YU et al. 2012), *Euleia heraclei* (Diptera: Tephritidae) (YU et al. 2012).

Genus **Opius** Wesmael, 1835

Opius (Gastrosema) caucasi Tobias, 1986

Material examined: East Azarbaijan province, Varzaqan, 1687 m, 2♀, 13-14 September 2012.

Distribution outside Iran: Caucasus (Tobias 1986, Fischer 1991, 2006), Japan, Russia, Turkey (YU et al. 2012).

Host records: *Chromatomyia horticola* (Goureau 1851) (Diptera: Agromyzidae) (TOBIAS 1986, YU et al. 2012).

Opius (Allotypus) irregularis Wesmael, 1835

Material examined: East Azarbaijan province, Maragheh, 1494 m, 1♀, 10 September 2012. East Azarbaijan province, Khajeh, 1520 m, 1♀, 10-11 September 2012.

Distribution outside Iran: Austria, Azerbaijan, Belgium, Canada, former Czechoslovakia, Denmark, Faeroe Islands, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Kazakhstan, Korea, Lithuania, Netherlands, Poland, Romania, Russia, Spain, Sweden, Switzerland, Turkey, United States of America, United Kingdom (YU et al. 2012), Serbia (ŽIKIĆ et al. 2013).

Host records: *Chromatomyia primulae* (Diptera: Agromyzidae), *Pegomya solennis* (Diptera: Anthomyiidae), *Asphondylia verbasci* (Diptera: Cecidomyiidae), *Hydrellia griseola* (Diptera: Ephydriidae), *Tephritis leontodontis* (Diptera: Tephritidae) (YU et al. 2012, ŽIKIĆ et al. 2013), *Ancylis mitterbacheriana* (Lepidoptera: Tortricidae) (YU et al. 2012).

Phaedrotoma depeculator Foerster, 1862

Material examined: Ardabil province, Aslandooz, 212 m, 1♀, 1♂, 15 August 2013.

Distribution outside Iran: Armenia, Austria, Czech Republic, Denmark, Estonia,

Finland, France, Georgia, Germany, Hungary, Ireland, Italy, Kyrgyzstan, Netherlands, Poland, Romania, Russia, Spain, Switzerland, Turkey, United Kingdom, Uzbekistan (YU et al. 2012), Montenegro, Serbia (ŽIKIĆ et al. 2013).

Host records: Agromyzidae (Diptera): *Cerodontha denticornis* on *Holcus lanstris*, *Ophiomyia* sp. on *Medicago sativa*, *Phytomyza griffithsi* on *Plantago media*, *Ph. plantaginis* on *Plantago lanceolata*, *Ph. ramosa*, *Ph. succisae* (FISCHER and KOPONEN 1999). ŽIKIĆ et al. (2013) reported the following host species: *Cerodontha denticornis*, *Chromatomyia ramosa*, *Ch. succisae*, *Ophiomyia* sp., *Phytomyza griffithsi*, *Ph. plantaginis* (Diptera: Agromyzidae).

Genus *Phaedrotoma* Förster, 1862

Phaedrotoma diversa (Szépligeti, 1898)

Material examined: East Azarbaijan province, Hoorand, 1113 m, 1♀, 14-15 September 2012.

Distribution outside Iran: Austria, Bulgaria, former Czechoslovakia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Israel, Italy, Poland, Romania, Russia, Spain, Sweden, Turkey, United Kingdom, Uzbekistan (YU et al. 2012), Montenegro, Serbia (ŽIKIĆ et al. 2013).

Host records: *Calycomyza solidaginis*, *Chromatomyia scabiosae*, *Ch. succisae*, *Ch. syngenesiae*, *Liriomyza centaureae*, *Phytomyza gentianae*, *Ph. plantaginis* (Diptera: Agromyzidae) (YU et al. 2012, ŽIKIĆ et al. 2013).

Phaedrotoma exigua (Wesmael, 1835)

Material examined: Ardabil province, Aslandooz, 212 m, 1♀, August 2012. East Azarbaijan province, Haris, 1922 m, 1♂, 12-13 September 2012.

Distribution outside Iran: Afghanistan, Austria, Belgium, Bulgaria, Canary Islands, Czech Republic, Denmark, Egypt, Estonia, Ethiopia, Finland, France, Germany, Greece, Hungary, India, Ireland, Israel, Italy, Kazakhstan, Korea, Liechtenstein, Lithuania, Madeira Islands, Mongolia, Poland, Russia, Serbia, South Africa, Spain, Sweden, Switzerland, Turkey, Turkmenistan, United Kingdom, Uzbekistan, former Yugoslavia (YU et al. 2012), Caucasus (FISCHER and KOPONEN 1999).

Host records: *Agromyza* spp., *Liriomyza* spp., *Phytomyza* spp. (AVINENT and JIMÉNEZ 1987), *Chromatomyia horticola*, *Liriomyza trifolii* (Diptera: Agromyzidae) (ÇIKMAN and UYGUN, 2003), *Liriomyza congesta*, *L. flaveola*, *L. strigata*, *Phytomyza glechomae* (Diptera: Agromyzidae), *Scaptomyza graminum* (Diptera: Drosophilidae) (FISCHER 1996a,b). ŽIKIĆ et al. (2013) reported the following host records: *Agromyza nana*, *A. rondensis*, *Calycomyza solidaginis*, *Chromatomyia horticola*, *Ch. scabiosae*, *Ch. succisae*, *Ch. syngenesiae*, *Liriomyza centaureae*, *L. congesta*, *L. flaveola*, *L. sonchi*, *L. strigata*, *Phytomyza alpina*, *Ph. crassisetia*, *Ph. gentianae*, *Ph. glechomae*, *Ph. griffithsi*, *Ph. plantaginis*, *Ph. pullula*, *Scaptomyza graminum* (Diptera: Agromyzidae).

Acknowledgements

A lot of thanks are due to M. Fischer (Austria), J. Papp (Hungary) and N.S. Gadallah (Egypt) for their scientific help, S. Khodaparast and P. Farhadi for collecting the materials. The research was supported Islamic Azad University (Yadegar – e- Imam Khomeini (RAH) Shahre Rey Branch) and Naturalis Biodiversity Center.

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