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Pteromalidae (Hymenoptera: Chalcidoidea) of Iran: New records and a preliminary checklist

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Abstract

The Pteromalidae DALMAN, 1820 (Hymenoptera: Chalcidoidea) of Iran are reviewed, based mainly on material collected by authors and available literature. 78 species are listed (as genus-species) from Asaphinae (1-1), Cerocephalinae (1-2), Cleonyminae (1-1), Colotrechninae (1-1), Eunotinae (2-2), Miscogasterinae (3-7), Ormocerinae (1-2), Pteromalinae (38-59), Spalangiinae (1-3). The subfamilies Colotrechninae and Ormocerinae, thirty species belonging to twenty-two genera are recorded for the first time from Iran. Finally the composition of species is compared with those of the world and the Palearctic regions. Available biological data and geographical distribution of each species is mentioned briefly.

Introduction

The family Pteromalidae DALMAN, 1820 (Hym.: Chalcidoidea) with more than 3.500 described species ordered in 390 genera is one of the largest families among parasitic Hymenoptera of the superfamily Chalcidoidea. It includes important natural enemies of many harmful insects widely distributed in major insect orders such as Coleoptera (attacked by species of 7 subfamilies), Diptera (by 6 subfamilies), Lepidoptera (by 2 subfamilies), Hymenoptera (by 4 subfamilies) and Homoptera (by 4 subfamilies)

(DZHANOKMEN 1989, DZHANOKMEN 1990). Despite there are a few reliable records of successful utilization of this family in biological control programs (BOUČEK & RASPLUS 1994). BOUČEK & RASPLUS (1994) gave a list of pteromalids, introduced into Europe or other parts of the world as biological control agents of different pests. In addition to biological diversities, they are very variable morphologically and there aren't morphological synapomorphies supporting its monophyly (GIBSON et al. 1999). Cladistic analyses of TÖRÖK & ABRAHAM (2001) treating 90 morphological characters on 38 pteromalid genera indicated that the pteromalids do not represent a natural taxon. The major subfamilies, Pteromalinae and Miscogasterinae, appeared to be polyphyletic and finally the Spalanginae and Asaphinae are of the most ancient taxa among the Pteromalidae (TÖRÖK & ABRAHAM 2001). Morphological results were validated again by analysis of molecular data using 28S-D2 region on five subfamilies (of 32 subfamilies) so it showed that this family is not a monophyletic group (CAMPBELL et al. 2000).

BOUČEK & RASPLUS (1994) believed that this family had been studied very little in North Africa and Middle East and many undescribed taxa may be discovered in these areas. The pteromalid wasps of Iran have received relatively a little attention so the first list of parasitoid provided by DAVACHI & CHODJAI (1968) included only 7 pteromalid species. GOLDANSAZ et al. (1996), HABIBPOUR et al. (2002), JALILVAND & GHOLIPOUR (2002), MEHRNEJAD (2002, 2003), REZAEI et al. (2003), SADEGHI & ASKARY (2001), SADEGHI & EBRAHIMI (2002), SHARIFI & JAVADI (1971), STEFFAN (1968), LOTFALIZADEH (2002a, 2002b, 2004) and LOTFALIZADEH & AHMADI (1998, 2000) added some new records to the list without providing any additional information.

Beside of Persian reports there are some pteromalids listed in the report of international Organization of Biological Control named "entomophagous insects in the West-Palaearctic" (OILB 1971).

Being widely scattered information in the Persian journals and considerable amount of new materials collected over the past five years encouraged the authors to prepare a preliminary checklist which facilitate taxonomic and ecological studies in the future.

The present study is based on examination of more than 350 specimens from different parts of Iran. Previously reported species were listed as well. Available complementary biological, ecological and morphological information originated from Iranian studies were accompanied. Finally composition of Pteromalidae is compared with those of the other arctic including the world and Palaearctic. For identification of specimens, following alphabetically arranged keys and references were used: ASKEW (1972), BOUČEK (1958, 1963, 1972), BOUČEK & RASPLUS (1994), DOĞANLAR (1986), DOĞANLAR & BOLU (2004), DZHANOKMEN (1978, 2001), GIBSON (2001), GRAHAM (1961, 1969, 1972, 1992), HEDQUIST (1975) and XIAO & HUANG (2001). Terminology and morphology follow BOUČEK (1988) and BOUČEK & RASPLUS (1994).

Species is ordered alphabetically and new species and genus records are indicated by one and two asterisks respectively.

List of species

Anisopteromalus calandrae (HOWARD, 1881)

A. calandrae, reared by Shodjai (HAESSELBARTH 1983) on *Callosobruchus maculatus* F. (Col.: Bruchidae), is a well-known cosmopolitan parasite of various beetles in stored grains pests (BOUČEK & RASPLUS 1994). This common species has a wide distribution and reported from all arctics. Its biological and ecological parameters were studied on *C. maculatus* in laboratory conditions (KAZEMI et al. 2004). They showed that this parasitoid prefers fourth larval instar (22.25 % parasitism) in comparison with pupal (8.33 %) and second larval parasitism (0.92 %). This parasitoid does not lay egg on first larval instar. Functional response of *A. calandrae* reared on fourth larval instar matches with type II. The searching efficiency and handling time are 0.092 ± 0.0423 and 4.81 ± 0.0437 , respectively (KAZEMI et al. 2004).

Anisopteromalus mollis RUSCHKA, 1912

DAVATCHI & CHODJAI (1968) reported this wasp as parasitoid of bruchid beetle, *Callosobruchus quadrimaculatus* FABR., on bean from Karadj (Tehran Province).

Arthrolytus ocellus (WALKER, 1834)**

Material examined: Ilam Province, Ghalajeh Pass, iii.2002, ex gall of *Chilaspis israeli* (Hym.: Cynipidae), (B. GHARALI), 1 ♀ & 2 ♂ ♂.

Based on GRAHAM's key (1969) *A. ocellus* belongs to subgenus *Anartholytus* GRAHAM, 1969. Cynipid gall wasp, *Chilaspis israeli* (SCTERNLICHT) on *Quercus* is recorded as new host for this parasitoid. Previously it has been reared on *Callirhytis glandium* (GIRAUD) (GRAHAM 1969).

Asaphes suspensus (NEES, 1834)

Material examined: Azarbaijan-e-Sharghi Province, Marand, vi.2002-15.vi.2003, (H. LOTFALIZADEH), 3 ♀ ♀.

It is a widely distributed species, reported as secondary parasitoid of Braconidae (Aphidinae) from the most parts of the arctic (NOYES 2006). MIRKARIMI (1998) give some interesting information about egg and larval stages as follow:

Table 1: Some morphological attributes of *Asaphes suspensus* in Iran (MIRKARIMI, 1998)

	Egg	1 th instar	2 nd instar	3 rd instar	4 th instar
Size	0.2mm×0.07mm	0.97mm×0.15mm	1.77mm×0.31mm	2.27mm×0.62mm	3.33mm×1.11mm
Description	oval	Hymenoptriform With 14 segments, falciform mandibles, body	Mandibles vestigied, short spins on abdominal	Mandibles invisible	Mandibles visible, dorsum of each segment with short

	Egg	1 th instar	2 nd instar	3 rd instar	4 th instar
		dorsally and laterally covered with long spines	segments, antennal plates visible		transverse furrow
Longevity	-	72h	17h	30h	23h

***Caenacis inflexa* (RATZEBURG, 1848)**

Material examined: Azərbaycan-e-Shərqi Province, Marand, on *Rosa damascena* MILL., 17.viii.2003, (H. LOTFALIZADEH), 8 ♀♀, 1 ♂.

LOTFALIZADEH et al. (2006) reported it as a parasitoid of rose leaf gall, *Diplolepis* sp. (*?nervosa*) (Hym.: Cynipidae). It is widely distributed in Europe but doesn't occur in the Middle East (NOYES 2006). Its hosts include three genera of the cynipid wasps, e.i. *Andricus*, *Diplolepis* and *Periclistus* (GRAHAM, 1966; NOYES, 2006).

***Caenocrepis ?bothynoderi* GROMAKOV, 1940**

HUBER & VAYSSIERES (1990) during biological and ecological study on heliotrope weevil, *Pachycerus cordiger* GERMAR (Col.: Curculionidae) reared this egg parasitoid from different localities (including Iran). It causes 18 % mortality at one site near Ghazvin city (HUBER & VAYSSIERES 1990). This species distributes in Turkey, Ukraine and former USSR (NOYES 2006).

Catolaccus ater* (RATZEBURG, 1852)

Material examined: İlam Province, Dehloran, vi.2002, ex wild safflower (*Carthamus oxyacantha* M.B.), (B. GHARALI), 1 ♀.

It is a primary and secondary parasitoid of different groups of insects: weevils (Curculionidae), gall midges (Cecidomyiidae), wasps (Braconidae, Bethyliidae, Ichneumonidae), moths and butterflies (Arctiidae, Gelechiidae, Geometridae, Lymantriidae, Noctuidae, Nymphalidae, Pieridae, Tortricidae, Yponomeutidae) (NOYES 2001). It is collected from Caucasian area to the west of Europe (NOYES 2006).

***Catolaccus crassiceps* (MASI, 1911)**

Material examined: Ardebil Province, Moghan, Pars-Abad, cotton field, v.2001, (H. LOTFALIZADEH), 1 ♀; Azərbaycan-e-Shərqi Province, Marand, Peyam, 30.iv.2007, ex gall of *Diplolepis fructuum* (Hym.: Cynipidae) on *Rosa canina*, (H. LOTFALIZADEH), 1 ♀; Fars Province, Shiraz, ex lacewings (Chrysopidae) on cypress tree, (H. LOTFALIZADEH), 10 ♀♀, 5 ♂♂.

Catolaccus crassiceps reared on cocoon of two species of chrysopids, *Chrysoperla carnea* (STEPHANS) and *Suaris fedschenkoi* (MCLACHLAN) (LOTFALIZADEH & AHMADI 2000). It is widely distributed from India to Europe and north of Africa (NOYES 2006). It was reared for the first time on the cynipid gall wasp, *Diplolepis fructuum* (RÜBSAAMEN).

Cecidostiba fungosa* (GEOFFROY, 1785)*

Material examined: Lorestan Province, Ghalai, ex *Chilaspis israeli* on *Quercus brantii*, (E. AZIZKHANI), 7 ♀ ♀.

This species is widely distributed in Europe without any report from the Middle East (NOYES 2006). It is a parasitoid of gall-maker cynipid wasps, *Andricus*, *Biorhiza*, *Ceroptres*, *Cynips* and *Synergus* on oak trees but this is first record on *Chilaspis israeli*.

***Chalcedectus balachowskyi* STEFFAN, 1968**

STEFFAN (1968) described this parasitoid from Iran as a parasitoid of *Osphranteria coerulescens* REDTENBACHER (Col.: Cerambycidae) on *Rosa*. Again SHARIFI & JAVADI (1971) reared it on the rosaceae branch borer.

Cheiropachus quadrum* (FABRICIUS, 1787)

Material examined: Azarbajjan-e-Sharghi Province, Marand, ix.2002, ex *Rogulascolytus mediteraneus* EGG. (Col.: Scolytidae) on dead wood of apple tree, (H. LOTFALIZADEH), 8 ♀ ♀ & 21 ♂ ♂.

It is a widespread parasitoid of xlyophagous beetles especially families Scolytidae and Bostrichidae. BOUČEK & RASPLUS (1994) listed this species in the occasionally introduced species into Northern America before 1900 along its host.

Chlorocythus spicatus* (WALKER, 1835)*

Material examined: Ilam Province, Shirvan Chardaval, Safflower field (*Carthamus tinctorius*), iii.2003, Malaise trap, (B. GHARALI), 1 ♀.

The genus *Chlorocythus* GRAHAM with 34 described species (NOYES 2006) is one of the largest genera of Pteromalinae. In this genus, *C. spicatus*, is distributed in the Palearctic as parasitoid of agromyziids.

***Chlorocythus* sp.1**

Material examined: Azarbajjan-e-Sharghi Province, Marand, swept on grass, 10.ix.2003, (H. LOTFALIZADEH), 1 ♂.

***Chlorocythus* sp.2**

Material examined: Ilam Province, Shirvan Chardaval, iii.2003, Malaise trap, (B. GHARALI), 1 ♀.

Identification of these two species (sp. 1 and sp. 2) is postponed until more materials are collected.

Colotrechnus viridis* (MASI, 1921)

Material examined: Ilam Province, Dehloran, vi.2002, ex fruit flies (Dip.: Tephritidae) on safflower (*Carthamus oxycantha*), (B. GHARALI), 2 ♀, 1 ♂.

It is widely dispersed in the West Palearctic but not reported from Iran. This species was reared on safflower attacked by fruit flies, *Acanthiophilus helianthi* ROSSI, *Chaetorella carthami* STACKELBERG, *Terellia luteola* R.D. and *Urophora mauritanica* MACQUART. All are new host records for this species.

***Conomorium patulum* (WALKER, 1835)**

The genus *Conomorium* MASI with six species has been received relatively little attention until now that its revision in the West Palearctic area is being prepared by G. DELVARE et al. (personal communication).

This broadly distributed species from Japan to UK was reared by Abai (HAESSELBARTH 1983) on *Euproctis* sp. in the north of Iran. Meanwhile it was reared as a gregarious pupal parasitoid of brown-tail moth, *Euproctis chrysorrhoea* (L.) in Azarbaijan-e-Sharghi Province (NIKDEL et al. 2007).

***Conomorium* sp.**

Material examined: Azarbaijan-e-Sharghi Province, Maragheh, 15.vi.2003, swept in *Medicago sativa* field, (A. MEHRVAR), 1 ♀.

This single female specimen belongs to a new species that is being described (G. DELVARE, personal communication).

***Cyrtogaster vulgaris* WALKER, 1833**

Material examined: Azarbaijan-e-Sharghi Province, Maragheh, 3.viii.2003, swept in *Medicago sativa* field, (A. MEHRVAR), 1 ♀ & 1 ♂; Ardebil Province, Moghan, Pars Abad, summer.2003, ex crucifer leaf miner (Agromyzidae), (M. TAGHIZADEH), 1 ♂.

Specimens of second locality were reared on two crucifer leaf miners (Dip.: Agromyzidae): *Chromatomyia horticola* (GOUREAU) and *Liriomyza sativae* (BLANCHARD). This formerly recorded species from Iran (OILB 1971) was released in Canada against leafminer agromyziids on English holly, *Ilex aquifolium* L. (Aquifoliaceae) (BOUČEK & RASPLUS 1994).

***Cyrtoptyx pistaciae* (NIKOL'SKAYA, 1935)**

Material examined: Qazvin Province, Qazvin, ex *Pistacia vera*, (N. JALILVAND), 5 ♀ ♀; Lorestan Province, ex *Pistacia khinjuk*, ix.1995, 2 ♀ ♀, 1 ♂.

It is a species associated with *Pistacia* trees and was recorded from East Europe and Central Asia as parasitoid of *Megastimus pistaciae* WALKER, 1871 (Hym.: Torymidae). Its occurrence in Iran was mentioned by JALILVAND & GHOLIPOUR (2002). *Pistacia khinjuk* is recorded as new host plant for this species.

***Dibrachoides dynastes* (FÖRSTER, 1841)**

The genus *Dibrachoides* KURDJUMOV with three species is a small genus. HERTING (1973) in his catalogue reported *D. dynastes* from Iran. It is used as biocontrol agent of *Hypera postica* (GYLLENHAL) on lucerne (BOUČEK & RASPLUS 1994).

***Dibrachys boarmiae* (WALKER, 1863)**

GOLDANSAZ et al. (1996) mentioned this species as a parasitoid of lesser wax moth, *Achroia grisella* FAB. in Iran, later MEHRNEJAD (2002, 2003) published its biological and ecological attributes as a parasitoid of the pistachio twig borer moth, *Kermania pistaciella* AMSEL (Lep.: Tineidae). It has been recorded as primary parasitoid of Pyralidae, Chrysomelidae and Anobiidae and hyperparasitoid of Braconidae (DZHANOKMEN 1978). Recently MASHHADI-JAFARLOO & TALEBI-CHAICHI (2002) studied bioecological features of this species as gregarious ectoparasitoid of codling moth. Their field observations in East-Azarbaijan (= Azarbaijan-e-Sharghi) Province indicate that adults start emerging when apple trees bloom. Males emerge before females from May to November. Three or more complete generations are known in the apple growing area. The highest larval parasitism in the last generation of the pest was 21.4 % in year 2000. Under the laboratory conditions, egg hatching lasts 4±1 days, the larval stages last 14.3±2.3 days and pupal stage is 10.8±1.5 days.

It is distributed in Argentina and Australia as well as the West- Palearctic region (NOYES 2006).

Table 2: Some bioecological information of *Dibrachys boarmiae* in Iran (after MASHHADI-JAFARLOO & TALEBI-CHAICHI 2002).

Attributes	In field	In laboratory
Sex ratio	1: 0.71	1: 0.64
Female longevity	35.8±7.4 days	17.6±8.1 days
Male longevity	19.4±7.5 days	12.3±3.9 days
Parasitism (%)	1.2±0.63	-

***Dibrachys cavus* (WALKER, 1835)**

There is just one report of this species as a parasitoid of *Leucoma wiltshirei* COLLEN (Lep.: Lymanteriidae) on *Quercus persica* in Kazeroun (Fars Province) (HAESSELBARTH 1983). Also it is a parasitoid of xylophagous moth *Kermania pistaciella* AMSEL on pistachio in Iran (JAFARI & SHAIKAN 1993).

***Dinarmus vagabundus* (TIMBERLAKE, 1926)**

It is widely distributed parasitoid of bruchids (NOYES 2006). Gregarism in this species was studied in Iran on three bruchid species, *Callosobruchus maculatus* (F.), *C. chinensis* (F.) and *C. analis* (F.). About 80 % of parasitized hosts included at least two eggs (ESLAMI 1998).

***Dinotiscus colon* (LINNAEUS, 1758)**

D. colon was recorded as *Cheiropachus colon* L. on *Ruguloscolytus mediterraneus* Eggrs and *Phloeosinus bicolor* BRULLÉ from Iran (DAVATCHI & CHODJAI 1968). It is widely distributed in the Holarctic (NOYES 2006).

Erdoesina alboannulata* (RATZEBURG, 1852)*

Material examined: Azarbajjan-e-Sharghi Province, Marand, swept on grass, 10.ix.2003, (H. LOTFALIZADEH), 1 ♀.

It was collected as parasitoid of Lepidoptera in the eastern part of Europe (GRAHAM 1969 and DZHANOKMEN 1978). BOUČEK (1967) separated this species from other known species (*E. boarmiae* BOUČEK), by bare basal fold of forewing, longer marginal vein (almost 1.5 times as long as stigmal vein) and hidden ovipositor (not visible from above).

***Euneura lachni* (ASHMEAD, 1887)**

This is hyperparasitoid of Aphididae and it was reported from Iran in 1971 (OILB). The genus *Euneura* with five species is closely related to *Pachyneuron* (GRAHAM 1969 and DOĞANLAR 1986) but DOĞANLAR (1986) differentiated them based on the structure of hypopygia.

***Eunotus nigriclavis* (FÖRSTER, 1856)**

In only record of *E. nigriclavis* from Iran, Abai (HAESSELBARTH, 1983) mentioned *Acantholecnium haloxyloni* HOTT. (Hom.: Coccidae) as its host in the Northwest of Iran. It belongs to subfamily Eunotinae.

Gugolzia harmolitae* DELUCCHI & STEFFAN, 1956*

Material examined: Ardebil Province, Moghan, Pars Abad, boarder of Iran with Azarbajjan, 5.ix.2003, swept on Graminae, (H. LOTFALIZADEH), 4 ♂♂.

So far distribution of *G. harmolitae* was confined to France where its type species reared on *Tetramesa romana* (WALKER) (Hym.: Eurytomidae). Male specimens were swept on grasses next to giant reed, *Arundo donax* L. (Gramineae) in the north-west of Iran propose wider distribution of this species.

Gugolzia bademia* DOĞANLAR, 2004

Material examined: Chahar mahal-e-Bakhtiari Province, Shahr-e-kord, iii.2004, ex *Eurytoma amygdali* on *Amygdalus comminus* (Rosaceae), (A. AVAND- FAGHIH), 2 ♀♀, 4 ♂♂.

This genus includes two species which can be distinguished by Doğanlar's key (DOĞANLAR & BOLU 2004). *Gugolzia bademia* had been known only from Turkey and this is the second report of this species from Palearctic. DOĞANLAR & BOLU (2004)

reported this species as a solitary ectoparasitoid on almond seed wasp. Similarly material reared on *Eurytoma amygdali* ENDERLEIN (Hym.: Eurytomidae) in Iran.

It can be separated morphologically from *G. harmolitae* in female by relatively shorter first antennal funicule (2.4 time longer than broad), bilobed clypeus (not bilobed in *G. harmolitae*), coarsely distributed sensillae on antennal funicules (widely distributed in *G. harmolitae*) and in male by the shape of antennal funicule, with two annelli and without erected setae as in female (in *G. harmolitae*, antennal segments with very long segments and erected setae and completely different from female).

***Halticoptera aenea* (WALKER, 1833)**

Halticoptera SPINOLA with 68 species is the largest genus of the subfamily Miscogasterinae but only two species has been reported from Iran. *H. aenea* was recorded from Iran by OILB (1971) as a parasitoid of agromyziids. It is a parasitoid of flies (families Agromyzidae, Cecidomyiidae, Chloropidae, Drosophilidae) and moth (Lasiocampidae) (NOYES 2006).

Halticoptera circula* (WALKER, 1833)

M a t e r i a l e x a m i n e d : Azarbaijan-e-Sharghi Province, Maragheh, 15.vi.2003, swept in *Medicago sativa* field, (A. MEHRVAR), 1♂.

Males of the genus *Halticoptera* are characterized by inflated maxillary palpi (BOUČEK & RASPLUS 1995). HEDQVIST (1975) used size and shape of this character as diagnostic features of the males in his key. This species is widely distributed in the Holarctic region (NOYES 2006). This species can be identified with combination of following characters: Maxillary palpi distinctly inflated; maxillary stipites not reaching to top of foramen magnum (in dorsal view); fore wing relatively narrow, with 5-10 hairs on basal cell; femora yellow; antennae yellow, scape apically and pedicellus dorsally fuscous.

Halticoptera violacea* ASKEW, 1972

M a t e r i a l e x a m i n e d : Hormozghan Province, Rudan, 15.iii.2005, swept on Graminae, (H. LOTFALIZADEH), 1♀.

Single female specimen was collected from the costal area of the Persian Gulf. *H. violacea* was recorded from northern areas of Europe (NOYES 2006). It is similar to *Halticoptera crius* (WALKER) but in *H. violacea*, propodeum is faintly reticulate (smooth in *H. crius*); antennal scape testaceous (metallic in *H. crius*); marginal vein 1.7 times as long as stigmal vein (2 times in *crius*) and basal cell of fore wing usually with 1-4 hairs (maximum 2 hairs in *H. crius*).

Halticoptera near patellana* (DALMAN, 1818)

M a t e r i a l e x a m i n e d : Azarbaijan-e-Sharghi Province, Maragheh, 15.vi.2003, swept in *Medicago sativa* field, (A. MEHRVAR), 1♀.

Based on key to females of the genus *Halticoptera* presented by GRAHAM (1969) this species is identified as *H. patellana* (DALMAN) but propodeum of this specimen is not reticulate (opposite to *H. patellana*) and in our idea it belongs to an undescribed species but we hesitate name it as new species because of insufficient number of specimen and unavailability of type materials of *H. patellana*.

Halticopterina moczari* ERDÖS, 1954*

M a t e r i a l e x a m i n e d : Azarbaijan-e-Sharghi Province, Maragheh, 15.vi.2003, swept in *Medicago sativa* field, (A. MEHRVAR), 1 ♀.

This species was reported from Hungary and Slovakia (NOYES 2006). The genus *Halticopterina* is closely related to the genus *Halticoptera* from which is separated by 3-segmented anelli and its variable size 1.5-4.5 mm (2-segmented and body below 2 mm in *Halticoptera*) (BOUČEK & RASPLUS 1991).

***Heydenia pretiosa* FÖRSTER, 1856**

M a t e r i a l e x a m i n e d : Azarbaijan-e-Sharghi Province, Maramd, 12.vii.2007, Malaise trap, (H. LOTFALIZADEH), 1 ♀.

Heydenia FÖRSTER is the only recorded genus of subfamily Cleonyminae from Iran. DAVATCHI & CHODJAI (1968) and HERTING (1973) reported *H. pretiosa* as a parasitoid of xylophagous beetles (Buprestidae, Scolytidae, Cerambycidae also Curculionidae). Our material was collected by Malaise trap located near to infected tree branch by *Xylopertha reflexicauda* LESNE, (1937) (Col.: Bostrychidae). This species was reared on *Ruguloscolytus mediterraneus* EGGER and *Phloeosinus bicolour* BRULLE on fruit trees and *Biota orientalis* in Karadj (DAVATCHI & CHODJAI 1968).

***Hobbya stenonota* (RATZEBURG, 1848)**

M a t e r i a l e x a m i n e d : No labelled, ex cynipid galls on *Quercus*, 8 ♀ ♀.

These specimens were collected on oak cynipid galls similar to European materials without complementary biological information. Recently ASKEW et al. (2006) has been recovered *Hobbya stenonota* on *Rosa* as parasitoid of *Diplolepis mayri* (SCHLECHTENDAL). It is widely distributed species in Europe (NOYES 2006).

***Mesopolobus amaenus* (WALKER, 1834)**

The genus *Mesopolobus* WESTWOOD is the second largest genus of the subfamily Pteromalinae with only one species recorded from Iran. Shodjai reared *M. amaenus* as a parasitoid of *Leucoma wiltshirei* on *Quercus persica* from Kazearoun (Fars Province) (HAESSELBARTH 1983). Newly it has been reported by single specimen reared on rose gall wasp, *Diplolepis mayri* (SCHLECHTENDAL) (ASKEW et al. 2006).

***Metastenus concinnus* WALKER, 1834**

It was reared on pupae of lady beetle, *Cryptolaemus montrouzieri* MULS. (Coccinellidae) in the coast of Caspian Sea (GHARIZADEH & HESAMI 2003). It seems that lady beetles are the main host of this species (GRAHAM 1969, DZHANOKMEN 1978).

Miscogaster elegans* WALKER, 1833*

M a t e r i a l e x a m i n e d : Ilam Province, Shirvan Chardaval, iii.2003, Malaise trap, (B. GHARALI), 2♀.

The genus *Miscogaster* WALKER with having petiolate gaster (petiole is longer than broad), large stigmal vein (subtrianangular to semi-circular) and long antennae is a distinct genus in the family Pteromalidae. In the West-Palaearctic region five species were reported as parasites of various agromyzids on herbaceous plants (BOUČEK & RASPLUS 1991). In this genus, *M. elegans* is a unique species with shorter scape (not reaching the median ocellus) and testaceous femora, trochanters and tibiae.

Miscogaster rufipes* WALKER, 1833

M a t e r i a l e x a m i n e d : Ilam Province, Shirvan Chardaval, xii.2002, yellow sticky trap, (B. GHARALI), 1♀.

Female specimen with expanded antennal scape distally; long eye (×5 as long as malar space) and 4 rows of sensilla on funicular segments runs to *M. rufipes* in Graham's key (1969) *M. rufipes* was recorded from Europe as a parasitoid of Agromyzidae (NOYES 2006).

***Moranila californica* (HOWARD, 1881)**

In the Palearctic region, this is unique species of the genus *Moranila* CAMERON. DAVOODI (2004) reported *M. californica* as egg predator of *Saissetia oleae* (OLIVER) and *Ceroplastes floridensis* Coms when studied on parasitoids of soft scales in Tehran. Also, it is known as a parasitoid of true bugs (Asterolecaniidae, Coccidae, Eriococcidae, Pseudococcidae), Lacewings (Sympherobiidae) in the Afrotropical, Australian, Palearctic and Nearctic regions (NOYES 2006). *M. californica* was introduced from California and released in the south of France against *Saissetia olea* (BOUČEK & RASPLUS 1994).

***Muscidifurax raptor* GIRAULT & SANDERS, 1910**

It was reared on house fly pupae by IRANPOUR et al. (1991). They mentioned some biological information of this species. Life span of females and males last 13.33 and 5.66 days respectively (at 27 °C) and each female deposit 25 eggs during her life. *M. raptor* is mostly a parasitoid of several families of synanthropic flies (Anthomyiidae, Calliphoridae and Muscidae) (DZHANOKMEN 1978).

***Nasonia vitripennis* (WALKER, 1836)**

It was reported by IRANPOUR et al., (1991) as a polyembryonic parasitoid of house fly pupae. Females and males live for 8.25 and 2.5 days respectively at 27 °C (IRANPOUR et al. 1991). *N. vitripennis* is a species with Palearctic distribution. CAMPBELL et al. (1993) studied phylogeny of the closely related species of *Nasonia* using nuclear non-coding internal transcribed spacer 2 (ITS2) and 28S rDNA sequences.

***Pachyneuron aphidis* (BOUCHÉ, 1834)**

M a t e r i a l e x a m i n e d : Ardebil Province, Moghan, Pars Abad, 5.ix.2003, ex *Aphids gossypii* on cotton and *Brevicoryne brassicae* on Rape seed (*Brassica napus*), (H. LOTFALIZADEH), 8♀ ♀ 1♂.

This common species was reported by DVATCHI & CHODJAI (1968) and OILB (1971) and then by HAESSELBARTH (1983) from Karadj city (Tehran Province). LOTFALIZADEH (2002a, 2002b) and DVATCHI & CHODJAI (1968) recorded *Aphis gossypii* (Hom.: Aphidae) on cotton and *Brevicoryne brassicae* on Rape seed as its primary hosts and *Aphelinus varipes* (FÖRSTER) and *Diaeretiella rapae* (M^oINTOSH) (Hym.: Braconidae) as its secondary hosts. NOYES (2006) mentioned ninety countries as its distribution area. Furthermore, GIBSON (2001) and NOYES (2006) listed more than 120 species as hosts for *P. aphidis* in various taxa as flies (families Cecidomyiidae, Syrphidae), Aphids (families Aphididae, Pemphigidae), scales (families Coccidae, Kermesidae, Pseudococcidae), Psyllidae, chalcids (families Aphelinidae and Encyrtidae), braconids (Braconidae) and moth (Tortricidae). *P. aphidis* with 3 segmented anelli is a distinctive species because other species have 2 segmented anelli.

Pachyneuron erzurumicum* DOĞANLAR, 1986

M a t e r i a l e x a m i n e d : Ilam Province, Shirvan-Chardaval, iii.2002, by Malaise trap, (B. GHARALI), 1♀.

Iranian specimens have all features of *P. erzurumicum* described by DOĞANLAR (1986) from Turkey. This species is very similar to *Pachyneuron nelsoni* [= *P. aneum* (MASI)] in having fore wing without cilia apically but dimensions of antennal flagellar segments and forewing venation are completely different (see DOĞANLAR 1986).

***Pachyneuron formosum* WALKER, 1833**

M a t e r i a l e x a m i n e d : Ilam Province, Shirvan-Chardaval, iii.2003, in safflower field by Malaise trap, (B. GHARALI), 5♀.

It is known from Palearctic region from Japan to Western Europe (NOYES 2006). It was recorded from Iran in 1971 (OILB 1971). It is a primary parasitoid of hover flies, aphids and mealybugs and hyperparasitoid of ichneumonid, *Diplazon laetatorius* parasite of hover flies (NOYES 2006).

***Pachyneuron grande* THOMSON, 1878**

P. grande occurs in the northern coastal region of Iran. SADEGHI & EBRAHIMI (2001) reported it as parasitoid of hover fly larvae feeding on black poplar aphid, *Pterocomma populeum* (KATT.).

Pachyneuron groenlandicum* (HOLMGREN, 1872)

Material examined: Ilam Province, Shirvan Chardaval, xii.2002, Yellow sticky trap, (B. GHARALI), 1 ♀.

It was reared on *Phleomyzus passerine* Signoret in Iran (Karadj city) by M. ABAI (HAESELBARTH 1983). *P. groenlandicum* is widely distributed in the Palearctic area as a primary parasitoid of various insects belonging to families Chloropidae, Psilidae, Syrphidae, Aphididae, Coccidae and Noctuidae and as hyperparasitoid of Braconidae (NOYES 2006).

***Pachyneuron leucopiscida* MANI, 1939**

P. leucopiscida was recorded as *P. cremifaniae* MASI from Kerman Province (EMAMI & MEHRNEJAD, 2004). It is hyperparasitoid of *Aphis gossypii* (GLOVER) and *Aphis craccivora* Koch parasitized by *Lysiphlebus fabarum* (MARSHALL). It has been recorded from some countries of the Middle East, Europe and India (NOYES 2006). DOĞANLAR (1986) believes that it is near to *P. aghlaense* MANI and forms a species group, which can be separated by interiorly sclerotized hypopygium from other species.

***Pachyneuron muscarum* (FÖRSTER, 1841)**

Material examined: Fars Province, Shiraz, vi.1998, ex *Chrysoperla carnea* (STEPHANS) and *Suarium fedschenkoi* (MCLACHLAN) (Neuroptera: Chrysopidae) on cypress tree, (H. LOTFALIZADEH), 3 ♀ ♀ 2 ♂ ♂; Tehran, ex *Eulecanium tiliae* (Hom.: Coccidae) on Olmus, summer.2003, (A. DAVOODI), 11 ♀ ♀, 3 ♂ ♂.

Pachyneuron muscarum is widely distributed in the southern and central parts of Iran and has been recorded as *Pachyneuron concolor* (synonym of *P. muscarum*) from Shiraz (LOTFALIZADEH & AHMADI 2000). Before them, it was recorded from Iran by OILB (1971) and was reared as hyperparasitoid of *Psylla pyricola* FOREST. on pear, *Pyrus communis* L. from Tehran (HAESELBARTH 1989). Again DAVOODI (2004) reared it as hyperparasitoid of soft brown scales, *Coccous hesperidum* L., *Eulecanium coryli* (L.), *Eulecanium tiliae* (L.), *Sphaerolecanium prunastri* (FONSCOLOMBE) and *Didesmococcus unifasciatus* (BORCHSENIUS). It occurs from Caucasus to the West of Europe (NOYES 2006).

***Pachyneuron nelsoni* GIRAULT, 1928**

Material examined: Azərbaycan-e-Sharghi Province, Marand, Anamag, 17.ix.2003, ex syrphid fly (*Paragus* sp.) pupa, (H. LOTFALIZADEH), 12 ♀ ♀, 8 ♂ ♂.

It is a gregarious parasitoid of hover flies (Dip.: Syrphidae) in pupal stage which is separated from other species of *Pachyneuron* by lacking a marginal fringe (GRAHAM 1969 and DOĞANLAR 1986). BOUČEK (1988) synonymized it with *Pachyneuron aeneus*.

Peridesmia discus* (WALKER 1835)*

Material examined: Azərbayjan-e-Sharghi Province, Maragheh, 15.vi/20.vii.2003, swept in *Medicago sativa* field, (A. MEHRVAR), 6♂♂.

Male specimens run to *Peridesmia discus* in Graham's (1969) key. It is an egg predator of the alfalfa weevil, *Hypera postica* (GYLLENHAL) (Col.: Curculionidae) in Europe (GRAHAM 1969) and has been introduced in USA as a biological control agent.

Pseudocatolaccus nitescens* (WALKER, 1834)*

Material examined: Azərbayjan-e-Sharghi Province, Marand, 10.ix.2003, swept on grass, (H. LOTFALIZADEH), 1♀.

This widely distributed species in Europe is obscure also in Kazakestan and Morocco (NOYES 2006) without any record from Iran. The genus *Pseudocatolaccus* with 13 species in the world is mostly parasitoid of gall midges (Cecidomyiidae) although it has been recorded from some beetles (families: Bruchidae, Coccinellidae and Curculionidae).

***Psychophagus omnivorus* (WALKER, 1835)**

Psychophagus is a monotypic genus of pteromalid wasps. *P. omnivorus* was reared on American white webworm, *Hyphantria cunea* DRURY (Lep.: Arctiidae) in Iran (REZAEI et al. 2003). They reared this pupal parasite in the Caspian Sea coast at September and October. It is a parasitoid of several families of insect orders including Lepidoptera, Coleoptera and Hymenoptera (NOYES 2006) in the Holarctic region.

***Pteromalus bedeguaris* THOMSON, 1878**

Material examined: Azərbayjan-e-Sharghi Province, Peyam, ex *D. fructuum* on *R. canina*, 18.v.2002, (H. LOTFALIZADEH), 24♀♀, 10♂♂; Peyam, ex *D. fructuum* on *R. canina*, 12.ix.2003, (H. LOTFALIZADEH), 19♀♀, 5♂♂; Peyam, ex *D. fructuum* on *R. canina*, 30.iv.2005, (H. LOTFALIZADEH), 14♀♀, 11♂♂. Azərbayjan-e-Sharghi Province, Zonuz, ex. leaf-gall on *Rosa damascena*, 11.viii.2002, (H. LOTFALIZADEH), 2♀♀, 3♂♂; Tehran, Evin, ex *D. fructuum* on *R. canina*, 11.viii.2002, (H. LOTFALIZADEH), 18♀♀, 10♂♂.

Pteromalus is one of the largest pteromalid genera (includes 499 species) and has mainly Holarctic distribution (NOYES 2006). *P. bedeguaris* is widely distributed from North-west of Iran (OILB 1971 and LOTFALIZADEH et al. 2006) to south-west (ASKEW et al. 2006). It was reared on several rose gall wasps, *Diplolepis fructuum* (RÜBSAAMEN) (LOTFALIZADEH et al. 2007), *D. mayri* (SCHLECHTEHDAL) (ASKEW et al. 2006), *Diplolepis* sp. (RAKHAHNI et al. 2003).

***Pteromalus bifoveolatus* FÖRSTER, 1861**

It was reported as a gregarious parasitoid of *Vespa orientalis* (Hym.: Vespidae) and recently has been reared on larval of *Malocosoma castrense* (Lep.: Lasiocampidae) (HEIDARI et al. 2004).

***Pteromalus puparum* (LINNAEUS, 1758)**

Material examined: Tehran, Kahrizak, 19.6.2005, ex. *Plutella xylostella* on *Brassica oleracea*, (A. GHOLIZADEH), 1 ♀.

Pteromalus puparum, a common species attacking *Pieris brassicae* L. (Lep.: Pieridae) on *Brassica oleracea*, is widely distributed in all arctic. It was reported in 1968 (DAVATCHI & CHODJAI 1968) and 1971 (OILB 1971) from Iran. FARID (1987) reared *P. puparum* as the most important natural enemy of citrus butterfly, *Papilio demoleus* L. (Lep.: Papilionidae) in Jiroft (Sistan & Baluchestan Province). Rate of parasitism in the laboratory condition was 60 %, 62 %, 75 %, 86 %, 83.5 %, 75 % and 30 % from 1st to seventh generations respectively and in the nature it was estimated 62 %. It is a gregarious parasitoid of pupae with 48 to 186 wasps on a single host (FARID 1987). It is used as a biocontrol agent of butter flies in several countries (NOYES 2006).

***Pteromalus veneris* FÖRSTER, 1841**

It was reported as *Pteromalus venustus* from Iran, as a natural enemy of *Megachile rotundata* (FABRICIUS) (MIRABZADEH 1989).

All of the Iranian species of the genus *Pteromalus* belong to the subgenus *Habroclytus* except *P. puparum* (GRAHAM 1969 and DZHANOKMEN 1998).

Rhaphitelus maculatus* WALKER, 1834*

Material examined: Azarbaijan-e-Sharghi Province, Marand, ix.2002, ex *Rogulascolytus mediterraneus* (Col.: Scolytidae) on dead wood of apple, (H. LOTFALIZADEH), 4 ♂♂.

Three species has been known in the genus *Rhaphitelus* so far. *Rhaphitelus maculatus* was collected from Karadj (Tehran Province) and Pars-Abad (Ardebil Province) (DAVATCHI & CHODJAI 1968). This widely distributed species is a parasitoid of xylophagous Coleoptera especially Scolytidae in Iran but there is also some reports on other families such as Curculionidae (NOYES 2006).

***Schizonotus sieboldi* (RATZEBURG, 1848)**

Material examined: Fars Province, Shiraz, Badjghah, iii.1997, (H. LOTFALIZADEH), 10 ♀♀ & 8 ♂♂; Ilam Province, Shirvan Chardaval, iii.2003, Malaise trap, (B. GHARALI), 1 ♀.

S. sieboldi is a gregarious parasitoid of the poplar leaf beetle, *Melasoma populi* L. (Col.: Chrysomelidae) (LOTFALIZADEH & AHMADI 1998). Rate of parasitism in Fars province

was 76 % also SADEGHI & ASKARY (2001) calculated this rate on six different *Populus* species in Iran (Karadj), with a maximum 15.9 % on *P. nigra*.

BOUČEK (1958) mentioned distinctive characters of *S. sieboldi* as follow: head less transverse in frontal view; eyes relatively smaller; clypeus protruding down beyond the level of ventral ends of cheeks; scape as long as basal part of flagellum from base of pedicellus to half of the 4th funicular segment; the two anelli together longer than second wide, funicle slender, but 2nd funicle segment very slightly transverse, subquadrate, flagellum yellow beneath along the whole length, only club wholly dark brown to blackish; sculpture of mesoscutum very coarse in the middle.

***Spalangia endius* WALKER, 1839**

It was reported as biological control agent of *Musca domestica* L from Iran (BEHBAHANI et al. 1995). As shown in the following table in 30 °C, *S. endius* has the most parasitic effort. The sex ratio is 2.5: 1 (female: male) and each female lays 5 eggs during its lifespan.

Table 3: Some biological attributes of *S. endius* in different temperatures (BEHBAHANI et al. 1995).

Temperature (°C)	Mean number of pupae killed per parasitoid (days)	Total longevity (days)
20	7.66 ± 1.73	33
25	9.77 ± 5.7	26
30	12.85 ± 4.03	19
35	6 ± 1.84	16

***Spalangia nigroaenea* CURTIS, 1839**

Material examined: Azərbaycan-e-Sharhi Province, Marand, 17.viii.2003, (H. LOTFALIZADEH), 1 ♀.

S. nigroaenea was swept on road sides grasses in the north-west of Iran (LOTFALIZADEH 2004). It is a widely distributed species reported from all geographical regions (Palearctic, Nearctic, Afrotropical, Oriental, Australian) (BOUČEK 1963). Its hosts include some species of flies families Muscidae, Calliphoridae and Sarcophagidae so it was hopefully used as biological control agent of Muscidae in some areas.

***Spalangia subpunctata* FÖRSTER, 1850**

Material examined: Azərbaycan-e-Sharhi Province, Maragheh, 15.vi.2003, swept in *Medicago sativa* field, (A. MEHRVAR), 1 ♀.

S. subpunctata was reported from Iran as a parasitoid of housefly (IRANPOUR et al. 1991 and LOTFALIZADEH 2004). Its hosts belong to flies families Syrphidae (*Syrietta pipiens* L.) and Otitidae (*Physiphora demandata* F.) in the Palearctic region. BOUČEK (1963) believed that this Holarctic species is found on pastures associated with sheep and cattle droppings.

Spaniopus dissimilis* WALKER, 1833*

Material examined: Ilam Province, Shirvan Chardaval, Safflower field, iv.2003, Malaise trap, (B. GHARALI), 1 ♀.

S. dissimilis is a species with the Holarctic distribution (Nearctic and the West of Europe), without any report from the Middle East region (NOYES 2006). It has not been reported from Iran but it is a primary parasitoid of parasitoid of *Diplolepis rosae*, *Mayetiola destructor* and *Platygaster zosine* (GRAHAM 1969). It is separated from its closely allied species, *S. amoneus* Förster, by weakly clavate and fuscous flagellar segment or hardly paler basally (BOUČEK 1972).

Spaniopus polyspilus* GRAHAM, 1956

Material examined: Ilam Province, Shirvan Chardaval, iii.2003, Safflower field, Malaise trap, (B. GHARALI), 1 ♀.

Spaniopus polyspilus was recorded from Northern countries of Europe on Reed plant, *Phragmites communis* TRIN. (Poaceae) (GRAHAM 1969). It has relatively small eyes; width of frons in frontal view is about equal to height of head; forewing has usually several dispersed spots; marginal vein is about 2 times as long as the stigmal vein.

Sphegigaster nigricornis* (NEES, 1834)

Material examined: Azarbaijan-e-Sharghi Province, Marand, 28.ix.2003, (H. LOTFALIZADEH), 1 ♀; Ilam Province, Shirvan Chardaval, iii.2003, Malaise trap, (B. GHARALI), 1 ♀.

This species is a primary parasitoid of Agromyzidae. *S. nigricornis* occurs in the western parts of Iran. It was recorded from the northern countries of Europe (NOYES 2006). GRAHAM (1969) separated *Sphegigaster nigricornis* from *S. aculeata* WALKER by dark green or blue coloration and longer gastral petiole (2.8-3.3× as long as broad) and from *S. intersita* GRAHAM by longer scape (reaching to the median ocellus) and longer flagellar segments.

***Sphegigaster orobanchiae* KURDJUMOV, 1912**

This parasitoid of leaf miners (Dip.: Agromyzidae) has been recorded from Iran (OILB 1971). It occurs in Europe and Middle East (Iran and Iraq) (NOYES 2006).

***Sphegigaster* sp.**

Material examined: Ardebil Province, Moghan, Pars Abad, summer 2003, ex Crucifer leaf miner (Agromyzidae), (M. TAGHIZADEH), 1 ♂.

This unknown species of *Sphegigaster* similar to *Cyrtogaster vulgaris* was reared on two leaf miners (*C. horticola* and *L. sativae*) on crucifer.

Stenetra* sp. *

M a t e r i a l e x a m i n e d : Qazvin Province, Qazvin, x.2000, ex seed of *Sphora alopecuroides*, (A. ARBAB), 1 ♀.

Two species of this genus (*Stenetra hungarica* (SZELÉNYI), *Stenetra ligustica* MASI) have unknown biology. The first species has been described from Hungary and the second one is found in Azarbaijan, Croatia, Czeck Republic, Italy and Spain (NOYES 2006). Single collected specimen doesn't shares all characters of any species.

Systasis angustula* GRAHAM, 1969*

M a t e r i a l e x a m i n e d : Ardebil Province, Moghan, Pars Abad, viii.2001, swept on *Medicago sativa*, (H. LOTFALIZADEH), 3 ♀ ♀.

The genus *Systasis* WALKER with about 49 species has wide distribution over the world. Twelve species is found in the Palearctic (XIAO & HUANG 2001). *Systasis angustula* is known from Canary Islands and UK (NOYES 2006). This is the first record of subfamily Ormocerinae to which, *Systasis* belongs.

***Systasis near annulipes* (WALKER, 1834) ***

M a t e r i a l e x a m i n e d : Azarbaijan-e-Sharghi Province, Marand, Koshksaray, 14.viii.2003, (H. LOTFALIZADEH), 1 ♀.

This single specimen is undoubtedly represent an undescribed species. It belongs to subgenus *Systasina* BOUČEK and nearly allied to *Systasis anulipes* (WALKER) with having not (or weakly) sculptured and shiny metapleuron, forwing with a few hairs in distal part of basal cell, scape not reaching the median ocellus and slightly longer than half as long as an eye, gaster distinctly lanceolate, flagellum distinctly clavate but it is well separated from *S. anulipes* by the longer gaster (distinctly longer than thorax plus head), open basal cell in below and all funicular segments as long as broad (except preclaval segment). Body is green metallic except for the following parts: all femora distally, all tibiae basally and the first basal segment of tarsi yellow; distal tarsomers dark-brown. Nevertheless because of the insufficient material description of new species is postponed.

Syntomopus incisus* THOMSON, 1878*

M a t e r i a l e x a m i n e d : Ilam Province, Shirvan Chardaval, iii.2002, by Malaise trap, (B. GHARALI), 1 ♀.

The sixteen species of this genus are parasitoids of leaf miners (Agromyzidae). *S. incisus* occurs from Kazakhstan to Canary Islands (NOYES 2006).

***Theocolax elegans* (WESTWOOD, 1874)**

The genus *Theocolax* WESTWOOD, 1832 belongs to subfamily Cerocephalinae and has eight described species in the world (NOYES 2006). *T. elegans* is a cosmopolitan parasitoid of stored products and it was reported from south-west of Iran (Khuzestan Province) (HABIBPOUR et al. 2002). It was applied for biological control of pest species of families Anobiidae, Bostrichidae, Chrysomelidae, Curculionidae and Gelechiidae (GRAHAM 1969).

***Theocolax formiciformis* WESTWOD, 1832**

This species has been recently reared on pupae of the rice weevil, *Sitophilus oryzae* L. (Col.: Curculionidae) in Mazandaran Province (ASSEMI & SHOJAI 2004).

Thureonella* sp. *

Material examined: Ilam Province, Shirvan Chardaval, iii.2002, by Malaise trap, (B. GHARALI), 1♀.

The genus *Thureonella* is a monotypic genus with *T. punctata* GIJSWIJT, 1990 as its type species. The wing of an undescribed species was illustrated by BOUČEK & RASPLUS (1991). Our specimen obviously differs from the both species by following characters: forewing faded infumate below parastigmal vein; body brown, except antenna, tarsal segments and all tibiae distally yellow.

Trichomalus campestris* (WALKER, 1834)*

Material examined: Azərbaycan-e-Sharqhi Province, Maragheh, 1.vi.2003, swept in *Medicago sativa* field, (A. MEHRVAR), 2♀♀.

The genus *Trichomalus* THOMSON with 69 described species is a moderately large group without any report from Iran. *T. campestris*, with the European distribution (NOYES 2006), is a parasite of the genus *Apion* (Col.: Apionidae) on alfalfa (*Medicago sativa*).

***Trichomalus rufinus* (WALKER, 1835) ***

Material examined: Azərbaycan-e-Sharqhi Province, Maragheh, 8.vi.2003, swept in *Medicago sativa* field, (A. MEHRVAR), 1♀.

The species is widely distributed in Europe (NOYES 2006). In Greece it was reared on *Apion croceifemoratum* GYLLENHAL (Col.: Curculionidae) (STAVRAKI 1986). Iranian specimen was similarly collected in alfalfa.

***Urolepis maritima* (WALKER, 1834)**

Urolepis WALKER, 1846 has three species which among them only *U. maritima* has been reported from Iran (GIBSON 2000). It is a solitary pupal ectoparasitoid of *Ephydra afganica* DAHL (Dip.: Ephydriidae) in Iran. *U. maritima* is widely distributed from Mazandaran Province in the coastal area of Caspian Sea to Fars Province (Kamfirouz, 15.vi.1989) in the south of Iran. Also it was collected from Tehran (7 Km east of Sharyar, 10.vii.1978) and Esfahan Province (Lenjan, 1.viii.1986) (GIBSON 2000). Flies belonging to the families Agromyzidae, Anthomyiidae, Coelopidae, Ephydriidae, Muscidae, Piophilidae, Sarcophagidae, Sepsidae and Syrphidae were recorded as host of these parasites.

Conclusion

At present species of the family Pteromalidae recorded from Iran include 78 species belonging to 49 genera and 9 subfamilies. Of these, two subfamilies, Colotrechninae and Ormocerinae are new to Iran fauna. As shown in Fig. 1, the subfamily Pteromalinae, with 59-recorded species arranged in 38 genera is the largest subfamily. This is a reasonable result because it is the largest subfamily in the West-Palearctic region and includes 75 % of pteromalid genera (BOUČEK & RASPLUS 199). The other subfamilies, Asaphinae, Cleonyminae and Colotrechninae are represented in the checklist with only one species and Cerocephalinae, Ormocerinae and Spalanginae with one genus comprising 2, 2 and 3 species, respectively. After Pteromalinae, the subfamilies Miscogasterinae, Eunotinae and Ormocerinae are the largest taxa.

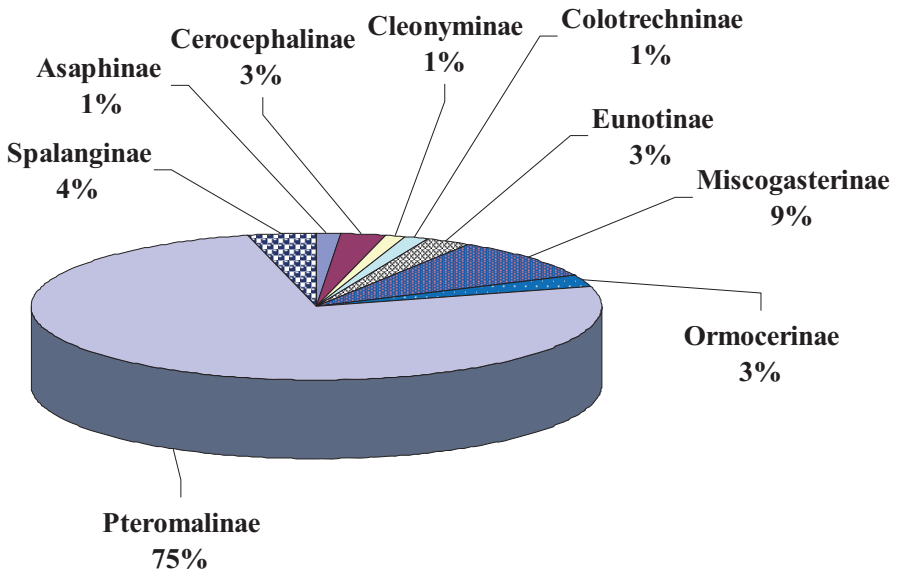


Fig. 1: Composition of Pteromalidae of Iran

Sixteen genera, *Arthrolytus* THOMSON, *Cecidostiba* THOMSON, *Chlorocyclus* GRAHAM, *Erdoesina* GRAHAM, *Gugolzia* DELUCCHI & STEFFAN, *Halticopterina* ERDÖS, *Miscogaster* WALKER, *Peridesmia* FÖRSTER, *Pseudocatolaccus* MASI, *Rhaphitelus* WALKER, *Spaniopus* WALKER, *Stenetra* MASI, *Syntomopus* WALKER, *Systasis* WALKER, *Thureonella* GIJSWIJT and *Trichomalus* THOMSON) and 30 species (Table 2) are new records to Iran. Also there are several species that we reported as unknown (or near to a known species) because for describing new species more specimens are needed.

Table 4 also shows the composition of species compared with those of the Palearctic and world fauna.

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Table 4. List of Pteromalidae of Iran compared with the world and Palearctic fauna (NOYES 2006).

Species	Distribution		
	Iran	World NOYES 2006 (NOYES 2001)	Palearctic NOYES 2001
Asaphinae <i>Asaphes</i> WALKER, 1834 (<i>suspensus</i>)	1	15 (10)	7
Cerocephalinae <i>Theocolax</i> WESTWOOD, 1832 (<i>elegans</i> , <i>formiciformis</i>)	2	8 (6)	3
Cleonyminae <i>Heydenia</i> FÖRSTER, 1856 (<i>pretiosa</i>)	1	17 (15)	4
Colotrechninae <i>Colotrechnus</i> THOMSON, 1878 (<i>viridis</i> *)	1	5 (5)	2
Eunotinae <i>Eunotus</i> WALKER, 1834 (<i>nigriclavus</i>)	1	18 (14)	11
<i>Moranila</i> CAMERON, 1883 (<i>californica</i>)	1	9 (9)	1
Miscogasterinae <i>Halticoptera</i> SPINOLA, 1811 (<i>aenea</i> , <i>circula</i> *, <i>violacea</i> *, near <i>patellana</i> *)	4	68 (60)	36
<i>Halticopterina</i> ERDŐS, 1946 (<i>moczari</i> *)	1	6 (6)	3

Species	Distribution		
	Iran	World NOYES 2006 (NOYES 2001)	Palearctic NOYES 2001
<i>Miscogaster</i> WALKER, 1833 (<i>elegans*</i> , <i>rufipes*</i>)	2	12 (13)	10
Ormocerinae <i>Systasis</i> WALKER, 1834 (<i>angustula*</i> , near <i>anulipes*</i>)	2	54 (49)	13
Pteromalinae <i>Anisopteromalus</i> [RUSCHKA], 1912 (<i>calandrae</i> , <i>mollis</i>)	2	6 (8)	3
<i>Arthrolytus</i> THOMSON, 1878 (<i>ocellus*</i>)	1	13 (12)	8
<i>Caenacis</i> FÖRSTER, 1856 (<i>inflexa</i>)	1	7 (7)	5
<i>Caenocrepis</i> THOMSON, 1878 (? <i>bothynoderi</i>)	1	2 (2)	2
<i>Catolaccus</i> THOMSON, 1878 (<i>ater*</i> , <i>crassiceps</i>)	2	19 (16)	4
<i>Cecidostiba</i> THOMSON, 1878 (<i>fungosa*</i>)	1	9 (10)	8
<i>Chalcedectus</i> WALKER, 1852 (<i>balachowskyi</i>)	1	20 (2)	1
<i>Cheiropachus</i> WESTWOOD, 1829 (<i>quadrum*</i>)	1	13 (12)	8
<i>Chlorocytyus</i> GRAHAM, 1956 (<i>spicatus*</i> , <i>sp.1*</i> , <i>sp.2*</i>)	3	34 (30)	25
<i>Conomorium</i> MASI, 1924 (<i>patulum</i> , <i>sp.</i>)	2	6 (5)	4
<i>Cyrtogaster</i> WALKER, 1833 (<i>vulgaris</i>)	1	21 (19)	7
<i>Cyrtotypx</i> DELUCCHI, 1956 (<i>pistaciae</i>)	1	9 (8)	6
<i>Dibrachoides</i> KURDJUMOV, 1913 (<i>dynastes</i>)	1	3 (3)	3
<i>Dibrachys</i> FÖRSTER, 1856 (<i>boarmiae</i> , <i>cavus</i>)	2	22 (21)	15
<i>Dinarmus</i> THOMSON, 1878 (<i>vagabundus</i>)	1	25 (24)	8
<i>Dinotiscus</i> GHESQUIÈRE, 1946 (<i>colon</i>)	1	11(10)	8
<i>Erdoesina</i> GRAHAM, 1957 (<i>alboannulata*</i>)	1	2 (2)	2
<i>Euneura</i> WALKER, 1844 (<i>lachni</i>)	1	5 (5)	3
<i>Gugolzia</i> DELUCCHI & STEFFAN, 1956 (<i>harmolita*</i> , <i>bademia*</i>)	2	2 (1)	1
<i>Hobbya</i> DELUCCHI, 1957 (<i>stenonota</i>)	1	1 (1)	1
<i>Mesopolobus</i> WESTWOOD, 1833 (<i>amaenus</i>)	1	123 (112)	88
<i>Metastenus</i> WALKER, 1834 (<i>concinus</i>)	1	5 (4)	2

Species	Distribution		
	Iran	World NOYES 2006 (NOYES 2001)	Palearctic NOYES 2001
<i>Muscidifurax</i> GIRAULT & SANDERS, 1910 (<i>raptor</i>)	1	5 (5)	2
<i>Nasonia</i> ASHMEAD, 1904 (<i>vitripennis</i>)	1	3 (3)	1
<i>Pachyneuron</i> WALKER, 1833 (<i>aphidis</i> , <i>erzurumicum</i> *, <i>formosum</i> , <i>grande</i> , <i>groenlandicum</i> *, <i>leucopiscida</i> , <i>nelsoni</i> *, <i>muscarum</i>)	8	52 (48)	24
<i>Peridesmia</i> FÖRSTER, 1856 (<i>discus</i> *)	1	4 (4)	4
<i>Pseudocatolaccus</i> MASI, 1908 (<i>nitescens</i> *)	1	13 (13)	5
<i>Psychophagus</i> MAYR, 1904 (<i>omnivorus</i>)	1	1 (1)	1
<i>Pteromalus</i> SWEDERUS, 1795 (<i>bedeguaris</i> , <i>bifoveolatus</i> , <i>cardui</i> , <i>puparum</i>)	4	499 (479)	386
<i>Rhaphitelus</i> WALKER, 1834 (<i>maculates</i> *)	1	3 (3)	2
<i>Schizonotus</i> RATZEBURG, 1852 (<i>sieboldi</i>)	1	3 (3)	2
<i>Spaniopus</i> WALKER, 1833 (<i>dissimilis</i> *, <i>polyspilus</i> *)	2	11 (11)	9
<i>Sphégigaster</i> SPINOLA, 1811 (<i>nigricornis</i> *, <i>orobanchiae</i> , sp.*)	3	53 (59)	24
<i>Stenetra</i> MASI, 1931 (sp.*)	1	2 (2)	1
<i>Syntomopus</i> WALKER, 1833 (<i>incisus</i> *)	1	17 (16)	7
<i>Thureonella</i> GIJSWIJT, 1990 (sp.*)	1	1 (1)	1
<i>Trichomalus</i> THOMSON, 1878 (<i>campestris</i> *, <i>rufinus</i> *)	2	69 (68)	62
<i>Urolepis</i> WALKER, 1846 (<i>maritime</i>)	1	3 (3)	2
<i>S p a l a n g i i n a e</i> <i>Spalangia</i> LATREILLE, 1805 (<i>subpunctata</i> , <i>endius</i> , <i>nigroaenea</i>)	3	55 (51)	19

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