

Seven new records of Mantids (Insecta: Mantodea) for Alborz Mountains, (Tehran Province) Iran

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There are few papers about the fauna of the mantids in Iran and should be considered as poorly known taxon in Iran. New faunistic records of 10 species of mantids for the fauna of Iran are presented. Seven species- *Empusa fasciata*, *E. hedenborgii*, *E. pennicornis* (Empusidae), *Bolivaria brachyptera*, *Ameles persa* (Mantidae), *Iris nana*, *I. polystictica* (Tarachodidae) – are new records for the mantid fauna of Iran.

Key words: *Mantodea*, *Alborz Mountain*, *Iranian Plateau*, *New records*

INTRODUCTION

Mantids (Insecta: Mantodea) generally known as "praying mantids" play an important role in the terrestrial ecosystems helping to control the populations of noxious insect pests. They are predatory insects actively feeding on a variety of other insects like grasshoppers, moths, flies and aphids. They are also well known for their camouflage and mimicry. Despite rich insect fauna in Iran, our knowledge on the diversity and biological attributes of the mantids is far from satisfactory. The fauna of Iranian Mantodea was poorly studied by a few scattered studies (Uvarov 1938, Uvarov & Dirsh 1952, Beier 1956, Mofidi-Neyestanak 2000, 2014, Battiston & Massa 2008, Ghahari et al. 2008, Sakenin et al. 2008a, b & 2011, Morshedi Aghbolagh et al. 2012, Ghahari & El-Den Nasser 2014). Afshar (1952) recorded 11 Species from several region of Iran. Mirzayans (1995) recorded two genera and three species of mantids for Iran. Ghahari et al (1999) investigated predators on rice fields and reported four species from two families of mantids from North of Iran. Mofidi-Neyestanak (2003) reported one subfamily, two genera and 14 species of mantids for the first time for Iran. Ghahari and El-Den Nasser (2014) reported 17 species from 11 genera from various region of Iran. Among these papers *Mantis religiosa*, *Iris oratoria*, *Fischeria baetica*, *Geomantis larvoides* and *Hierodula transcaucasia* were reported for the study area. In this study 10 species belong to six genera (*Empusa* Illiger, 1798, *Ameles* Burmeister, 1838, *Mantis* Linnaeus, 1758, *Iris* Saussure (1869), *Hierodula* Burmeister, 1838, *Bolivaria* Stal, 1877) and three families (Empusidae, Mantidae, and Tarachodidae) were collected and identified of which seven species are new records for the study area.



FIGURE 1. Collecting sites of Mantodea: Tehran province (green color) within Iran (Left); the districts (Right) (for localities and details see Table 1).

MATERIAL AND METHODS

Tehran is a Province in northern Iran and south of Alborz Mountains (Figure 1). Tehran Province is one among few regions where we can see all geographical and climate diversity within a short-range. Tehran is 18,814 square kilometers and lies between latitudes 34°-36.5°N and 50°-53° E (Tehran Investment & Public Participation Organization, 2009). The specimens collected from March 2014 to August 2014 (Figure 2, Table 1) using insect net or with hand-picked in day-time. The collected specimens preserved by dry/ wet preservation method. Identification was carried out following Giglio-Tos (1927), Beier (1934, 1935), Battiston et al. (2010), Mohammad et al. (2011) and Ghahari & El-Den Nasser (2014).

RESULTS

In the present study 10 species have been identified from different localities of Tehran Province. Identification key and distribution data are given below.

Key to species

- 1 Small sized mantis. Frontal sclerite transvers often bi-carinate.....*Ameles persa*
Large sized mantis. Frontal sclerite carinate.....2
- 2 Mid coxae with an evident rounded lobe.....*Empusa fasciata*
Mid coxae without or with not well developed lobes.....3
- 3 Pseudophallus of the male with a triangular protuberance.....*Empusa hedenborgii*
Pseudophallus of the male with a rounded protuberance.....*Empusa pennicornis*
- 4 Forewing without eye spot*Mantis religiosa*
Forewing with eye spot.....*Hierodula transcaucasica*
- 5 Eyes prominent. Wings in both sexes short.....*Bolivaria brachyptera*
Eyes moderately projecting. Wings in male long but in female short.....6
- 6 Black spot of hind wing compact.....*Iris oratoria*
Black spot of hind wing not compact.....7
- 7 Black spot of hind wings with radial stripes.....*Iris nana*
Black spot of hind wings with convergent black stripes.....*Iris polystictica*

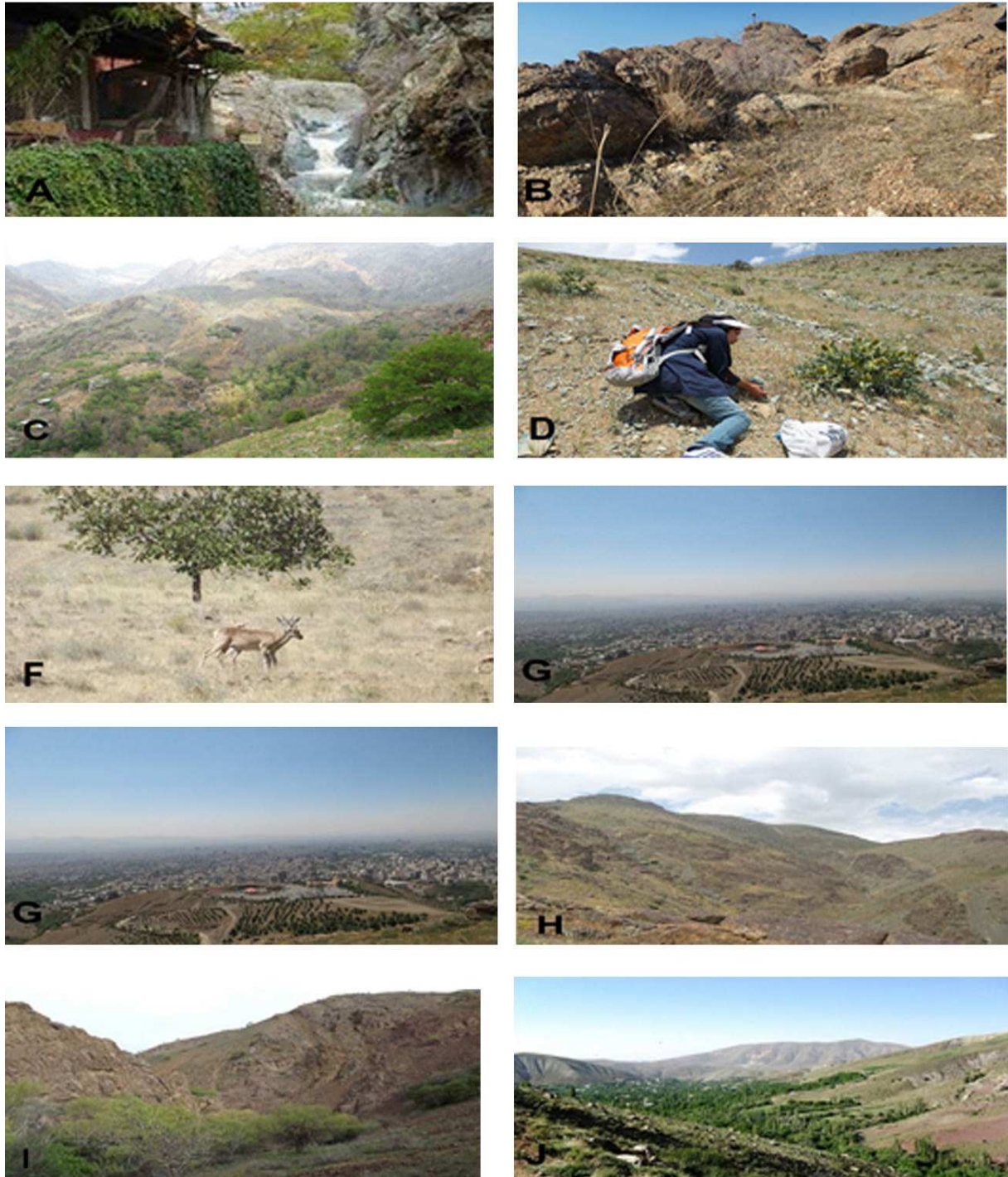


FIGURE 2. Collecting sites of Mantodea (for localities and details see Table 1).

Table1. Collecting sites of Mantodea and their coordinates in southern part of Alborz Mountain.

Figure	Districts	Altitude(m)	North latitude	East longitude
A	Drrake	3900	51° 26" 25'	35° 48' 00'
B	Jamshidiye	1800-2100	51° 27" 00'	35° 49" 31'
C	Darband	1700	51° 35" 30'	35° 49" 23'
D	Alborz	10-4300	36° 35" 17'	51° 36" 11'
F	Khojir	1400-1987	35° 45" 00'	51° 40" 20'
G	Tochal	3950	35° 53" 07'	51° 25" 12'
H	Kolakchal	3350	35° 51" 30'	51° 27" 21'
I	Sorkhe Hesar	1147	30° 26" 65'	35° 48" 24'
J	Lavasan	1700	51° 38" 01'	35° 47" 21'
K	Varjin	1700-3940	51° 36" 41'	35° 55' 30"

List of species**Family Mantidae Burmeister, 1838****Subfamily Amelinae*****Ameles persa* Bolivar, 1911****(Fig. 3)**

Material examined: 11 ♀, 4 ♂, leg. Mirzaee. Date of collection should be added as well as the habitat.

Distribution: Afghanistan, Armenia, Iran.

Subfamily Miomantinae***Bolivaria brachyptera* Pallas, 1773****(Fig. 4)**

Material examined: 31 ♀, 20 ♂, leg. Mirzaee.

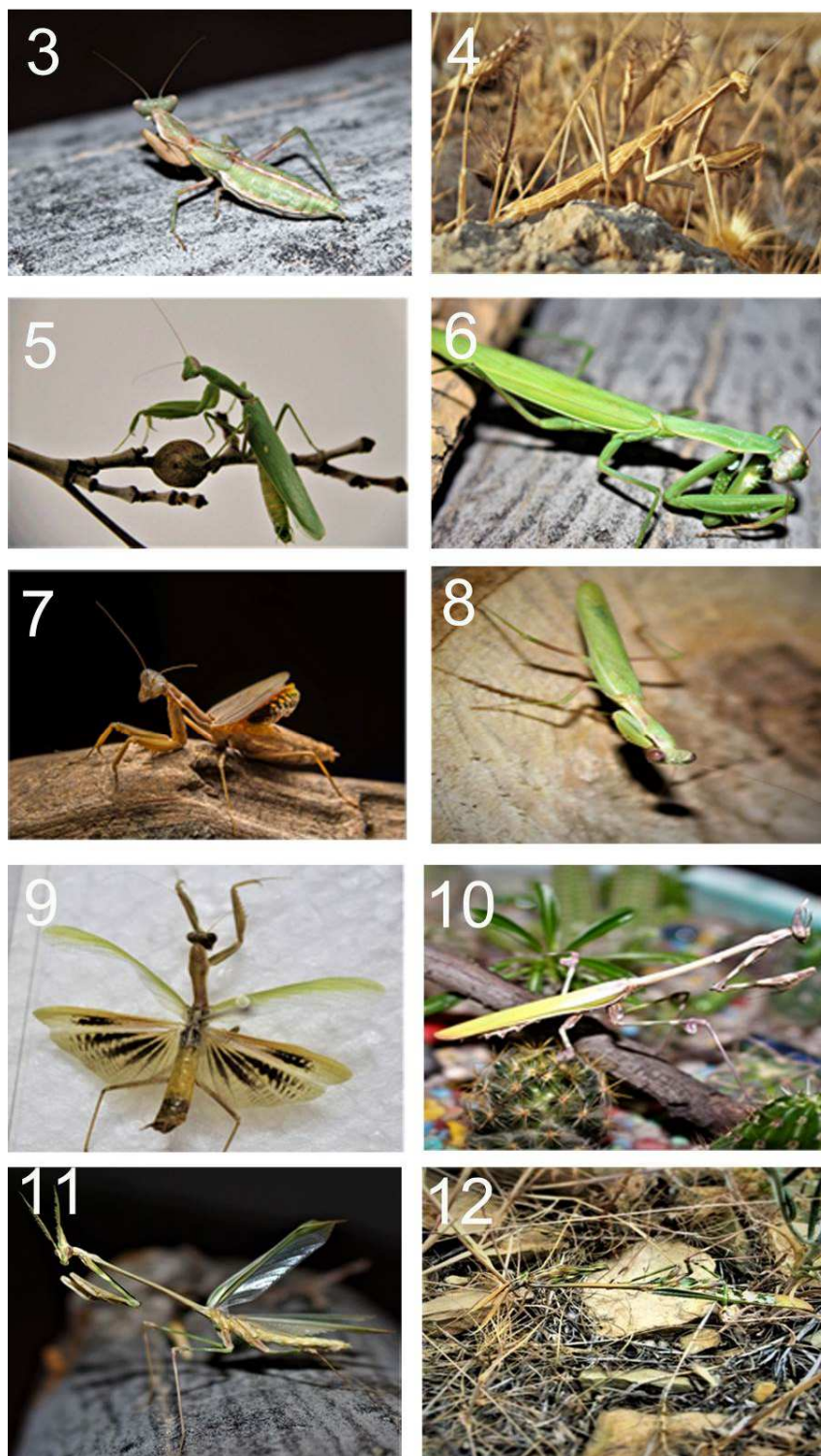
Distribution: Afghanistan, Armenia, Iran, Magnolia, Turkey.

Subfamily Mantinae***Hierodula transcaucasica* Brunner von Wattenwyl, 1878****(Fig. 5)**

Material examined: 5 ♀, 2 ♂, leg. Mirzaee.

Distribution: Afghanistan, Armenia, Georgia, Iran, Central Asia.

Comment: Front femora have four external spines which they are black at their tips, four discoidal spines which the 1th and 2th and the 3th of them are entirely black but the 4th is only black at the tip, the internal spines are alternatively one entirely black but the rest of them only black at the tip.



FIGURES 3-12. 3) *Ameles persa*, Female habitus; 4) *Bolivaria brachyptera*, Female habitus; 5) *Hierodula transcaucasica*, Male habitus; 6) *Mantis religiosa*, Female habitus; 7) *Iris oratoria*, Female habitus; 8) *Iris polystictica*, Male habitus; 9) *Iris nana*, Male habitus; 10) *Empusa fasciata*, Female habitus; 11) *Empusa bedenborgii*, Male habitus; 12) *Empusa pennicornis*, Male habitus. All pictures were taken by the first author.

Mantis religiosa* (Linne, 1758)*(Fig. 6)**

Material examined: 1♀, leg. Mirzaee.

Distribution: Africa, Asia, Australia, Europe, North America. Cosmopolitan insect, its distribution is in continuous expansion.

Family Empusidae Burmeister, 1838**Subfamily Empusinae*****Empusa fasciata* Brulle, 1832****(Fig. 7)**

Material examined: 11♀, 4♂, leg. Mirzaee

Distribution: Algeria, Armenia, Bosnia, Crete, Dalmatia, Egypt, Greece, India, Iran, Israel, Jordan, Macedonia, Middle East, Palestine, Romania, Syria, Turkey, Cyprus, Italy.

Empusa hedenborgii* Stal, 1871*(Fig. 8)**

Material examined: 5♀, 3♂, leg. Mirzaee

Distribution: South West Asia including Iran, Saudi Arabia, North Somalia, Sudan, Ethiopia, Yemen.

Empusa pennicornis* Pallas, 1773*(Fig. 9)**

Material examined: 8♀, 2♂, leg. Mirzaee

Distribution: Afghanistan, China, Georgia, Iran, Iraq, Kazakhstan, Russia, Syria, Turkey, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

Family Tarachodidae Handlirsch, 1930**Subfamily Tarachodinae*****Iris polystictica* Fischer-Walheim, 1846****(Fig. 10)**

Material examined: 21♀, 4♂, leg. Mirzaee

Distribution: Afghanistan, China, Georgia, Iran, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Turkestan, Uzbekistan.

Iris oratoria* Linne, 1758*(Fig. 11)**

Material examined: 15♀, 6♂, leg. Mirzaee

Distribution: Algeria, Chad, Cyprus, Dalmatia, Egypt, France, Greece, India, Iran, Israel, Italia, Jordan, Morocco, North America, Tunisia, Turkey, Spain, Syria.

Iris nana* Uvarov, 1930*(Fig. 12)**

Material examined: 1♂, leg. Mirzaee.

Distribution: Iran, Afghanistan.

DISCUSSION

Mantid fauna was poorly studied in most regions of the world due to low population density. Iran is a large country that have various geographical regions and climates, especially most contain warm climates, so we expect more diverse fauna of mantids in different regions of Iran especially in

southern, and central parts. The objective of this study is to contribute to the knowledge of fauna of praying mantids in Southern part of Alborz Mountain (Tehran province). To our knowledge, this is attempted for the first time. Mantids are often caught incidentally in studies concerning other insect groups, but they rarely receive full attention in biodiversity studies. In this study Order Mantodea represent by 10 species belonging to six genera, five subfamilies and three families. Among these, family Mantidae represent by four species *Ameles persa* Bolivar, 1911, *Bolivaria brachyptera* Pallas, 1773, *Hierodula transcaucasica* Brunner von Wattenwyl, 1878, *Mantis religiosa* (Linne, 1758) which the species *Bolivaria brachyptera* Pallas, 1773 was the most specimen were found in all distinct it seems that this species is dominant in the study region. The family Empusidae represent by three species *Empusa fasciata* Brulle, 1832, *Empusa hedenborgii* Stal, 1871, *Empusa pennicornis* Pallas, 1773. Family Tarachodidae represent by three species *Iris polystrictica* Fischer-Walheim, 1846, *Iris nana* Uvarov, 1930, *Iris oratoria* Linne, 1758. Most species (*A. persa*, *B. brachyptera*, *M. religiosa*, *I. nana*, *I. oratoria*, *I. polystrictica* H. Transcaucasia) seem to maintain an annual life cycle with a growth and development of nymphs during spring and an adult stage reached in summer. On the other hand species from genus *Empusa* seems that eggs are laid at the beginning of summer overwinters as nymph and adult stage reached in late spring. The existence of 10 species from Southern part of Alborz Mountain (Tehran province), we can safely say that diversity of Mantid spices of this region is considerably rich. From earlier record, some species such as *Geomantis larvoides* and *Blepharopsis mendica* could not be found due to climate and vegetation of southern part of Alborz Mountain (Tehran Province). There is a great need of further studies, to complete the poor knowledge on the ecology and taxonomy of mantids of this country and also further information about the impact of anthropogenic disturbance on mantid communities.

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LITERATURE CITED

- Battiston R., Massa B., 2008. The Mantids of Caucasus (Insecta Mantodea). *Atti Della Accademia Roveretana degli Agiati*; 3, 5-28.
- Battiston R., Picciau L., Fontana P., Marshall J., 2010. Mantids of Euro-Mediterranean Area. Verona-Italy.
- Ghahari, M.G. El-Den nasser, 2014. A contribution to the knowledge of the Mantodea (Insecta) fauna of Iran. *Linzer biologische Beiträge*; 46, 665-673.
- Jadhav S., Sureshan P. M., Ghate H. V., 2006. Addition to the mantid fauna (Insecta: Mantodea) of Pench National Park, Maharashtra, India. *Zoo's Print Journal*; 21, 2261-2262.
- Miram E., 1937. Blattodea, Mantodea, phasmodea and Orthoptera of the south of Turkmenistan – works coun. *stud. Product power turcomenian*; 9, 297-304.
- Mirzayans H., 1951. Les Orthoptera de l'Iran. *Iranian Journal of Plant Pathology*; 10, 12-21.

- Mirzayans H., 1995. Liste des Orthoptera et leurs distribution an Iran. Iranian Journal of Plant Pathology; 18, 10-30.
- Mofidi-Neyestanak M., 2003. First report of one subfamily, two genera and 14 species of mantids (Hex., Mantodea) from Iran. Iranian Journal of Plant Pathology; 71, 38-39.
- Otte D., Spearman L., 2005. Mantida- species file. Catalog of the Mantids of the World. Insect Diversity Association Publication; 1, 1- 489.
- Rivera J., 2010.A historical review of praying mantid taxonomy and systematics in the Neotropical Region: state of knowledge and recent advances (Insecta: Mantodea). Zootaxa; 2638, 44–64.
- Rabab F., El-Hamouly H., El- Din Nasser M., 2010. Pilot study of population density and biodiversity index of Mantodea fauna in El- Fayoum governorate- Egypt. Egypt Academy Journals of Biology; 2, 19 – 26.
- Uvarov. , 1930. Annuals Magazine. Natural History; 632, 5-10
- Uvarov. , 1938. Orthoptera from Iraq and Iran. Zoology Ser. Field. Museum Natural History; 20, 439-451.
- Uvarov B.P., dirsh V.M., 1952.Orthoptera collected in Iran. Ergebnisse einer botanischzoologischen Sammelreise durch den Iran 1948/49.Verhandlungen der Naturforschenden Gesellschaft in Basel; 63, 1-16.
- Wagan MS., Soomro NM. , Soomro MH. , 1995. Praying mantids (Mantodea) of Sindh province, Pakistan. Journal of Orthoptera Research; 4, 161-162.