

On a summer collection of mantids (Insecta: Mantodea) from Lorestan province with nine new records

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In late summer 2016, the first author collected 34 specimens from nine species of Mantodea from Lorestan, chiefly Kuhdasht at the eastern part of the province. Although nine species were determined as new records for this part of the country, more searches in different seasons may lead to finding more species even new ones because this group of insects poorly studied in Iran especially in mountainous western part of the country. It is argued that much more diversity from a short time collecting effort is an evidence of our poor knowledge of the fauna of Iranian mantids. The present work is the first study on this region of Lorestan province which led to reporting nine species for the first time namely, *Blepharopsis mendica*, *Empusa bedenborgii* (Empusidae), *Ameles persa*, *Bolivaria brachyptera*, *Mantis religiosa*, *Microthespis dmitriewi*, *Oxyothespis persica*, *Rivetina caucasica* (Mantidae), *Iris oratoria* (Tarachodidae).

Key words: Zoology, Mantodea, Mantids, Iran.

INTRODUCTION

Several authors have studied various aspects of biology of praying mantids (Brues, 1929; Snodgrass, 1935; Leverault, 1937; Chopard, 1938, 1949; Beier, 1934, 1939, 1968, 1974; Gangwere, 1965; Imms, 1988), but in Iran, mantids have received less attention than the other countries. We just found few papers from some parts of Iran (Uvarov 1938, Uvarov & Dirsh 1952, Beier 1956, Battiston & Massa 2008, Mirzaee & Pashaie Rad 2017). They exhibit extensive variation in morphological adaptations and life history strategies. Mantids are very efficient deadly predators that capture and eat a variety of insects and other small prey. They are regarded as terrific pest exterminators. They keep down the population of various insects that are a threat to farming thus; they can be used as an efficient biocontrol agent and are one of the most important insects in every ecosystem. They usually prey on other insects; but occasionally they attack small vertebrates such as snakes, lizards, frogs, and hummingbirds (Prete & Wolfe 1992). Their efficient hunting techniques mean that they play a potentially important role in the control of insect pests (Sampaio *et al.* 2008). From a taxonomic point of view, our knowledge about the fauna of Mantodea in Iran is trivial in spite of the wide variety of the species; this is regrettable because Iran is at the crossroad between Oriental, Palearctic and with lesser rate, Afrotropical biogeographic regions. In here, we present the results of a short collecting trip to Lorestan to improve our knowledge about the distribution of Iranian mantids. This

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study represents nine species belonging to three families and nine genera that are new data for this part of the country.

MATERIAL AND METHODS

Kuhdasht, eastern part of Lorestan province, is a small city and situated at elevation 1190 meters above sea level. Kuhdasht is a large plain that is surrounded by the Zagros Mountains. The specimens were collected during 16 days field trip from morning till late evening on July to September 2016, in Lorestan province, between latitudes 33°- 32'- N and 47°- 36' E. Most of the species were collected by hand catching from dens shrubby, and bushes in plains and hills. Collecting site of the specimens is shown in table 1 and figure 1. The samples preserved by dry or wet preservation methods. The collected specimens are deposited in Zoological Museum of Shiraz University (ZM-CBSU). Identification was carried out using Giglio-Tos (1927), Beier (1934, 1935), Battiston *et al.* (2010).



FIGURE 1. A: Lorestan province within Iran, B, C, and D: Collecting sites of Mantodea (for localities and details see Table 1).

TABLE 1. Collecting sites of Mantodea and their coordinates.

| Figure | Districts | Altitude(m) | North latitude | East longitude |
|--------|-------------------------|-------------|----------------|----------------|
| B | Chengari Mountain | 1195 | 36° 79' 34" | 46° 16' 72" |
| C | Shirez Vally | 200 | 33° 49' 28" | 47° 29' 50" |
| D | Naal Shekasteh Mountain | 1484 | 33° 31' 04" | 45° 28' 83" |

RESULTS AND DISCUSSION

In this study, nine species belonging to nine genera and nine subfamilies of Mantodea were identified. All of them are new records for the study area. Because of geographical and bioclimatic variation of Iran, the species diversity of these beneficial insects is rather diverse and need much more studies, to fill the gap of the knowledge on ecology and taxonomy of mantids of Iran and also we need further information about the impact of anthropogenic disturbance on mantid communities. There are few papers that deal with the mantid fauna of Iran but in these papers, mantids are neither described properly nor illustrated or photographed. For example, Ghahari and Nasser (2014) published a contribution on the mantid fauna of Iran reporting eleven species, five of them as new records for this country but without pictures, drawings or other material for comparison or validation. For some of these species, they reported obsolete taxonomy like *Ameles crassinervis* Dirsh (1927) that synonymized in 2011 by Ehrmann (after Beier, 1956) with *Ameles persa* Bolivar (1911) already known for Iran, or with wrong distribution or discriminative characters like the West Mediterranean *Ameles picteti* Saussure (1869), described with rounded and not conical/tuberculate eyes. *Ameles arabica* Uvarov (1939) with the same characters of the already known for Iran *Ameles persa* without reporting the most discriminative characters in the male pseudophallus. Other species are doubtful as the Afro-Arabic *Iris caeca* (coeca) Uvarov (1931) described with the same characters of *Iris oratoria* (L. 1758) or *Iris persa* Uvarov (1922) already known for Iran or *Iris splendida* (Uvarov, 1922) separated from the first one by a general “different coloration” of the hind wings. *Mantis religiosa* (L. 1758) is reported with the subspecies *religiosa* and not with the *inornata* known for Iran, while the discriminative characters that separate the two subspecies are not reported.

Similar problems with “Samin *et al.*, 2016”, where eight species are reported for the Western part of Iran: *Empusa fasciata* Brulle (1832); *Empusa pennicornis* Pallas (1773); *Ameles syriensis* Giglio-Tos (1915); *Mantis religiosa religiosa*; *Sphodromantis viridis* Forskål (1775); *Microthespis dmitriewi* Werner (1908); *Eremiaphila andresi* Werner (1910); *Iris oratoria*. All these records are presented without justifications, descriptions, pictures, drawings or other material for comparison or validation. Most of these four species (*A. syriensis*, *S. viridis*, *M. dmitriewi*, *E. andresi*) are known to have a West Mediterranean/Middle East distribution (Ehrmann, 2002) and their discontinuous appearance in West Iran need to be supported with a morphological comparison with topotypical populations to be confirmed and included in the checklist of the Iranian mantids. Here some photos along with distribution, diagnosis, and male and female morphometric data of the studied species are given.

Family: Empusidae

Subfamily: Blepharodinae

Tribe: Blepharodini

Genus: *Blepharopsis* Rehn 1902

Blepharopsis Rehn 1902: 316. *Blepharis* Audinet-Serville 1831: 47.

Blepharopsis mendica (Fabricius 1775) *Mantis mendica* Fabricius 1775: 275. *Mantis marmorata* Olivier 1792: 641. *Gongylus mendicus* Thunberg 1815: 295. *Blepharopsis mendica* Fabricius 1793 (cited in Krauss 1890: 236). *Blepharopsis mendica* Ebner 1921: 113. (Fig. 2)

Material examined: Kuhdasht, Sorkh Dom Lori, (1adult ♂), March 2017. Leg, Mirzaee.

Distribution: Afghanistan, Asia Minor, Cyprus, Canary Islands, Turkey, Sudan, Pakistan, Oman Iran, Iraq, Northern Africa, Chad (Battiston *et al.*, 2010).

Diagnosis: Medium sized mantis. Color green, rarely brown-rose, marbled with white. Antenna of male pectinate, simple in the female. Pronotum broad, dilated. Legs with white ring color.

Male morphometry: body length: ♂ 48mm; pronotum: ♂ 12mm; fore wing: ♂ 43mm



FIGURE 2. *Blepharopsis mendica*, Male habitus. Photo by Z. Mirzaee.

Subfamily: Empusinae

Tribe: Empusini

Genus: *Empusa* Illiger 1798

Empusa Illiger 1798: 499.

Empusa bedenborgii Stål 1877 *Mantis pectinicornis* Linnaeus 1767: 691 (possible synonym, nomen dubium). *Empusa bedenborgii* Stål 1877: 77. (Fig. 3)

Material examined: Kuhdasht, Shirez, (1adult ♂), August 2016. Leg, Mirzaee.

Distribution: Iran, Egypt, Saudi Arabia, Yemen (Battiston *et al.*, 2010).

Diagnosis: very similar to *Empusa pennata*, but apex of the frontal sclerite bent externally, the frontal process more slender, pronotum more slender and longer.

Male and female morphometry: body length: ♂: 44mm, ♀: 63mm; pronotum: ♂: 22mm, ♀: 30mm; forewing: ♂: 25mm, ♀: 33mm.



FIGURE 3. *Empusa hedenborgii*, Male habitus. Photo by Z. Mirzaee.

Family: Mantidae

Subfamily: Amelinae

Tribe: Amelini

Ameles Burmeister, 1838

Ameles Burmeister, 1838: 531. *Parameles* Saussure, 1869: 59, 72.

Ameles persa Bolivar, 1911. Bull. Soc. Amis. Aci. Nat. Rouen 1911:32. (Fig. 4)

Material examined: Kuhdasht, Sorkh Dom Lori, (1 adult ♂ and 2 adult ♀), July 2016. Leg, Mirzaee.

Distribution: Afghanistan, Armenia, Iran (Battiston *et al.*, 2010).

Diagnosis: Small sized mantis. Frontal sclerite transvers often bi-carinate. Similar to *A. spallanzania* but with a smaller and more transverse supra anal plate.

Male and female morphometry: body length: ♂: 29mm, ♀: 25mm; pronotum: ♂ and ♀: 5mm; forewing: 17mm, ♀: 5mm.

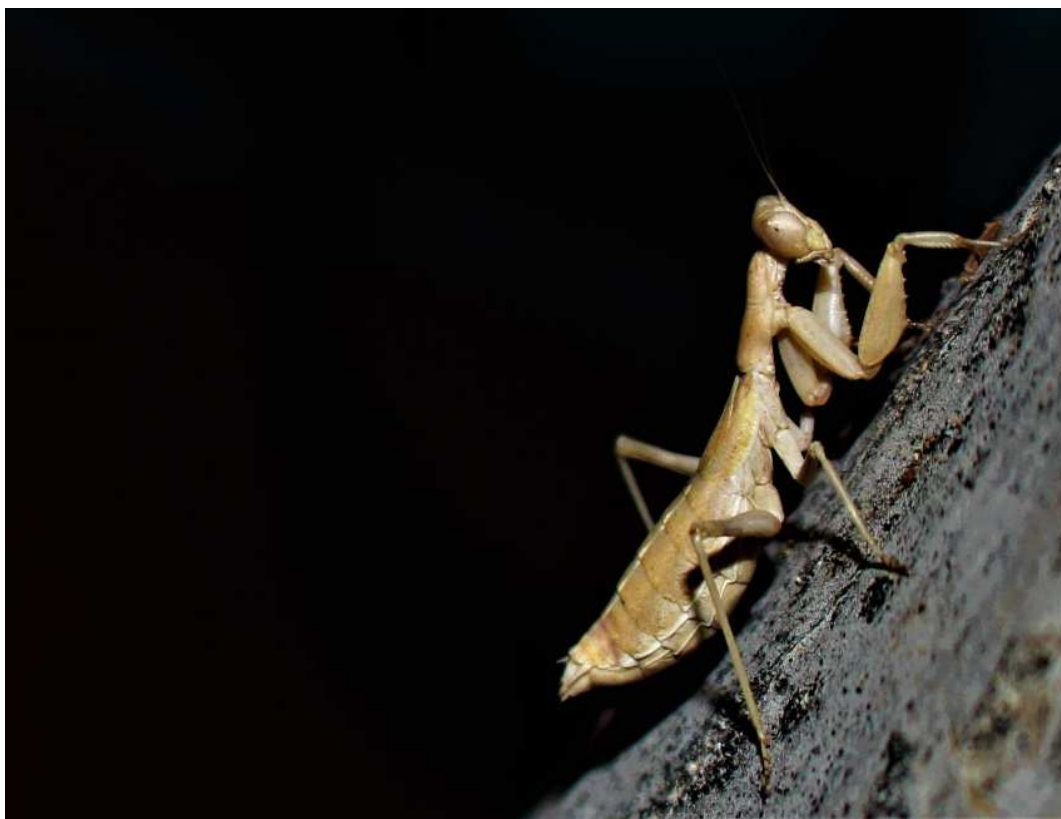


FIGURE 4. *Ameles persa*, Female habitus. Photo by Z. Mirzaee.

Subfamily: Miomantinae

Tribe: Rivetinini

Genus: *Bolivaria* Stål, 1877

Bolivaria Stål 1877.

Bolivaria brachyptera (Pallas 1773) *Mantis brachyptera* Pallas 1773: 728. *Mantis commutata* Fiebkr 1853: 95.

Iris pallasii Saussure 1869: 65. (Fig. 5)

Material examined: Kuhdasht, Shirez, (1 adult ♂ and 2 adult ♀), August 2016. Leg, Mirzaee.

Distribution: Afghanistan, Armenia, East Europe, Turkey, Palestine, Iran (Battiston *et al.*, 2010).

Diagnosis: Medium sized mantis. Color dark gray to brown to yellowish. Forewing in both sexes as long as the pronotum. Mid and hind legs with spines near the knee.

Male and female morphometry: body length: ♂: 37mm, ♀: 45mm; pronotum: ♂: 10mm ♀: 12mm; forewing: 8mm, ♀: 10mm.



FIGURE 5. *Bolivaria brachyptera*, Female habitus. Photo by Z. Mirzaee.

Subfamily: Mantinae

Tribe: Mantini

Genus: *Mantis* Linne, 1758

Mantis religiosa Linnaeus, 1758

Gryllus (Mantis) religiosus Linnaeus, 1758: 426. *Mantis sancta* Fabricius 1787: 228. *Mantis maroccana* thunberg 1815: 287. *Mantis pia* Audinet-Serville 1839: 193. *Mantis radiata* Fischer-Waldheim 1846: 101. *Mantis capensis* Saussure 1872: 46. *Mantis religiosa* Linnaeus 1758 (cited in Werner 1913: 211). *Mantis religiosa* Linnaeus 1758 (cited in Storey 1918: 50). *Mantis griveaudi* Paulian 1959: 33. *Mantis griveaudi* in Roy 1967: 127. (Fig. 6)

Material examined: Kuhdasht, Kohzad castle, (2 adult ♀), August 2016. Leg, Mirzaee.

Distribution: Africa, Asia, Australia, Europe, North America. Cosmopolitan insect, its distribution is in continuous expansion (Battiston *et al.*, 2010).

Diagnosis: Very variable sized mantids. Color from green to yellowish to brown. Anterior coxae of raptorial leg with a black and white spot. The claw groove is black.

Male and female morphometry: body length: ♂: 51mm, ♀: 60mm; pronotum: ♂: 14mm, ♀: 18mm; forewing: 36mm, ♀: 51mm.

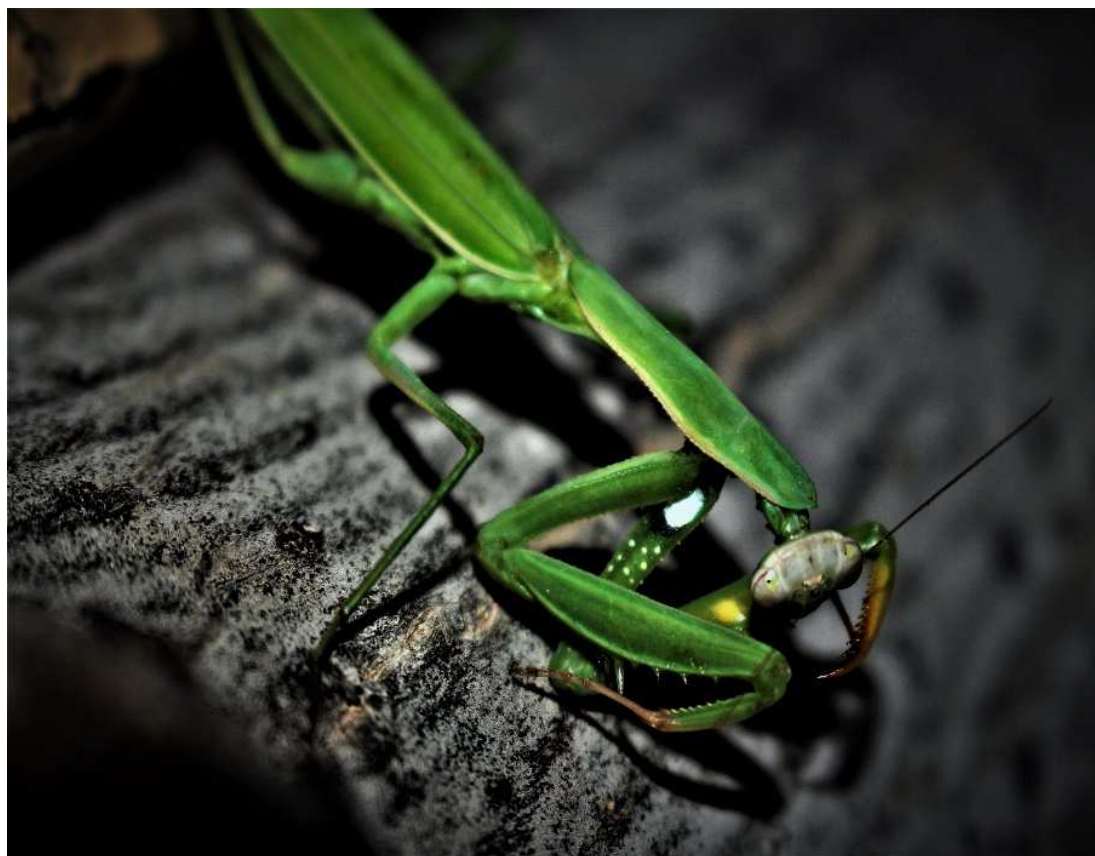


FIGURE 6. *Mantis religiosa*, Female habitus. Photo by Z. Mirzaee.

Sub family: Mimomantinae

Tribe: Rivetinini

Genus: *Microthespis* Werner, 1908

Microthespis Werner, 1908: 119.

Microthespis dmitrievi Werner, 1908 *Microthespis dmitrievi* Werner, 1908: 120. (Fig. 7)

Material examined: Kuhdasht, Shirez, (1 adult ♂ and 1 adult ♀), September 2016. Leg, Mirzaee.

Distribution: Iran, Palestine, Jordan, Yemen, Pakistan, United Arab Emirates (Battiston *et al.*, 2010).

Diagnosis: Small sized mantis. Color grey-brownish. There is a black heart shape in ventral view of pronotum.

Male and female morphometry: body length: ♂ and ♀: 26mm; pronotum: ♂ and ♀: 6mm; forewing: ♂ and ♀: 18mm.

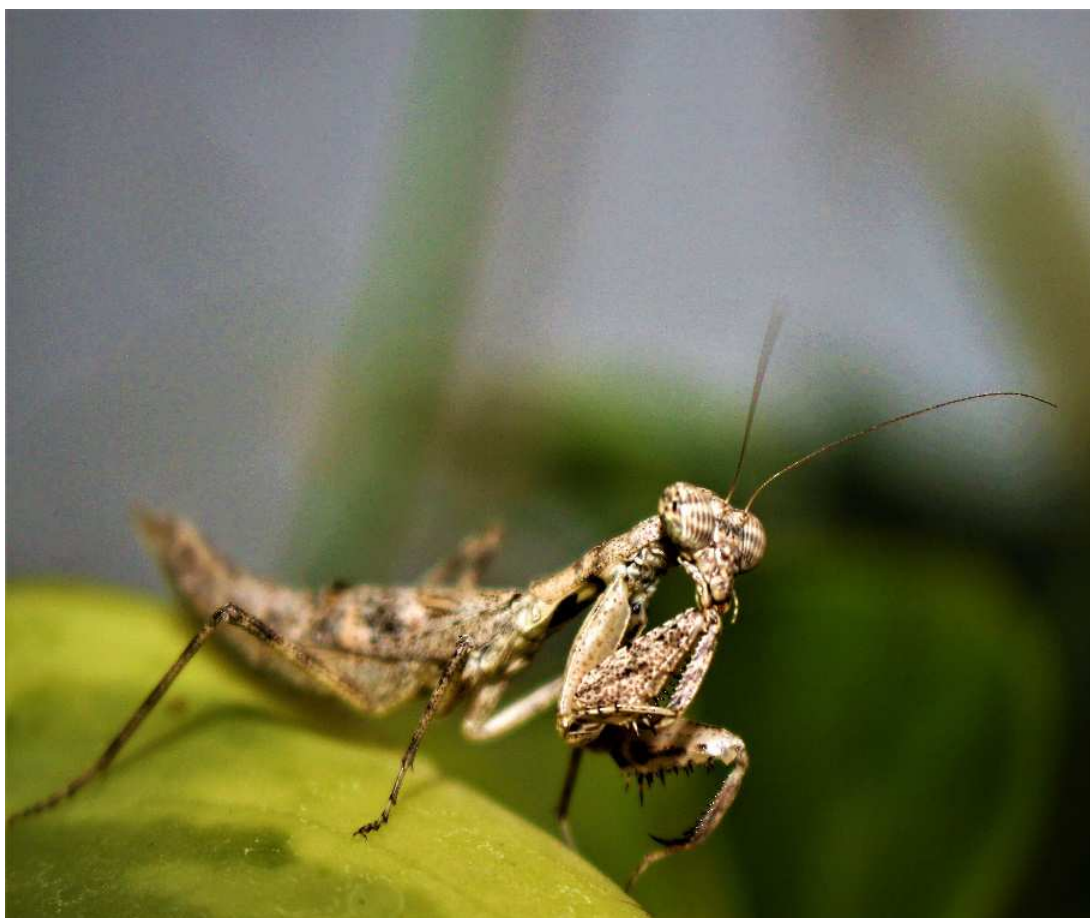


FIGURE 7. *Microthespis dmitrievi*, Female habitus. Photo by Z. Mirzaee.

Subfamily: Oxyothespinae

Tribe: Oxyothespini

Genus: *Oxythespis* Saussure 1871

Oxyothespis Saussure 1870: 234. *Oxythespis* Saussure 1871: 127.

Oxythespis persica Bolivar 1913 *Oxythespis persica* Bolivar 1913: 605-606. (Fig. 8)

Material examined: Kuhdasht, Kohzad castle, (2 adult ♂ and 3 adult ♀), August 2017. Leg, Mirzaee.

Distribution: Iran, Belutschistan (Shveta Patel & Rajendra Singh, 2016)

Diagnosis: Medium sized mantis. Body very slender. Antenna more or less ciliated. Eyes laterally conical and ending in a spine.

Male and female morphometry: body length: ♂: 38mm, ♀: 40mm; pronotum: ♂: 10mm, ♀: 13mm; forewing: 31mm, ♀: 22mm.



FIGURE 8. *Oxythespis persica*, Female habitus. Photo by Z. Mirzaee.

Sub family: Mimomantinae

Tribe: Rivetinini

Genus: *Rivetina* Berland & Chopard, 1922

Rivetina caucasica (Saussure, 1871)

Iris caucasica Saussure, 1871. Mem. Soc. Hist. nat. Geneve 21: 258.

Eufischeriella caucasica (Saussure, 1871). In: Giglio-Tos, 1927. Tierreich 50: 485.

Kinzelbachia ragnari Harz, 1988. Articulata 3:207. (Fig. 9)

Material examined: Kuhdasht, Shirez, (2 adult ♂), September 2016. Leg. Mirzaee.

Distribution: Iran, Syria, Caucasus, Turkey, Tadjikistan (Battiston *et al.*, 2010).

Diagnosis: Large sized mantis. Color brown and yellowish. Supra coxal dilatation not well marked and with parallel edges.

Male and female morphometry: body length: ♂: 50mm; pronotum: ♂: 15mm; forewing: 30mm.



FIGURE 9. *Rivetina caucasica*, Male habitus. Photo by Z. Mirzaee.

Family: Tarachodidae

Subfamily: Tarachodinae

Tribe: Tarachodini

Genus: *Iris* Saussure, 1869

Iris Saussure, 1869: 64.

Iris oratoria (Linnaeus, 1758) *Gryllus* (*Mantis*) *oratorius* Linné, 1758. *Mantis dentata* Goeze, 1778. *Mantis bella* Salzmann, 1817. *Ameles minima* Charpentier, 1825. *Mantis fenestrata* Brullé, 1832. (Fig. 10)

Material examined: Kuhdasht, Shirez, (2 adult ♀), August 2017. Leg, Mirzaee.

Distribution: Iran, Syria, Italy, Turkey, Spain, Egypt, Algeria, Crete, Croatia, Greece, France, India, Jordan, Morocco, Pakistan, Palestine, Tunisia (Battiston *et al.*, 2010).

Diagnosis: Medium sized mantis. Color green to brown. Pronotum slender. Fore wings of the male exceeding the abdomen, hyaline, opaque or almost opaque in their anterior half. Fore wings of the female shorter than the abdomen.

Male and female morphometry: body length: ♀: 40mm; pronotum: ♀: 13mm; forewing: ♀: 18mm.

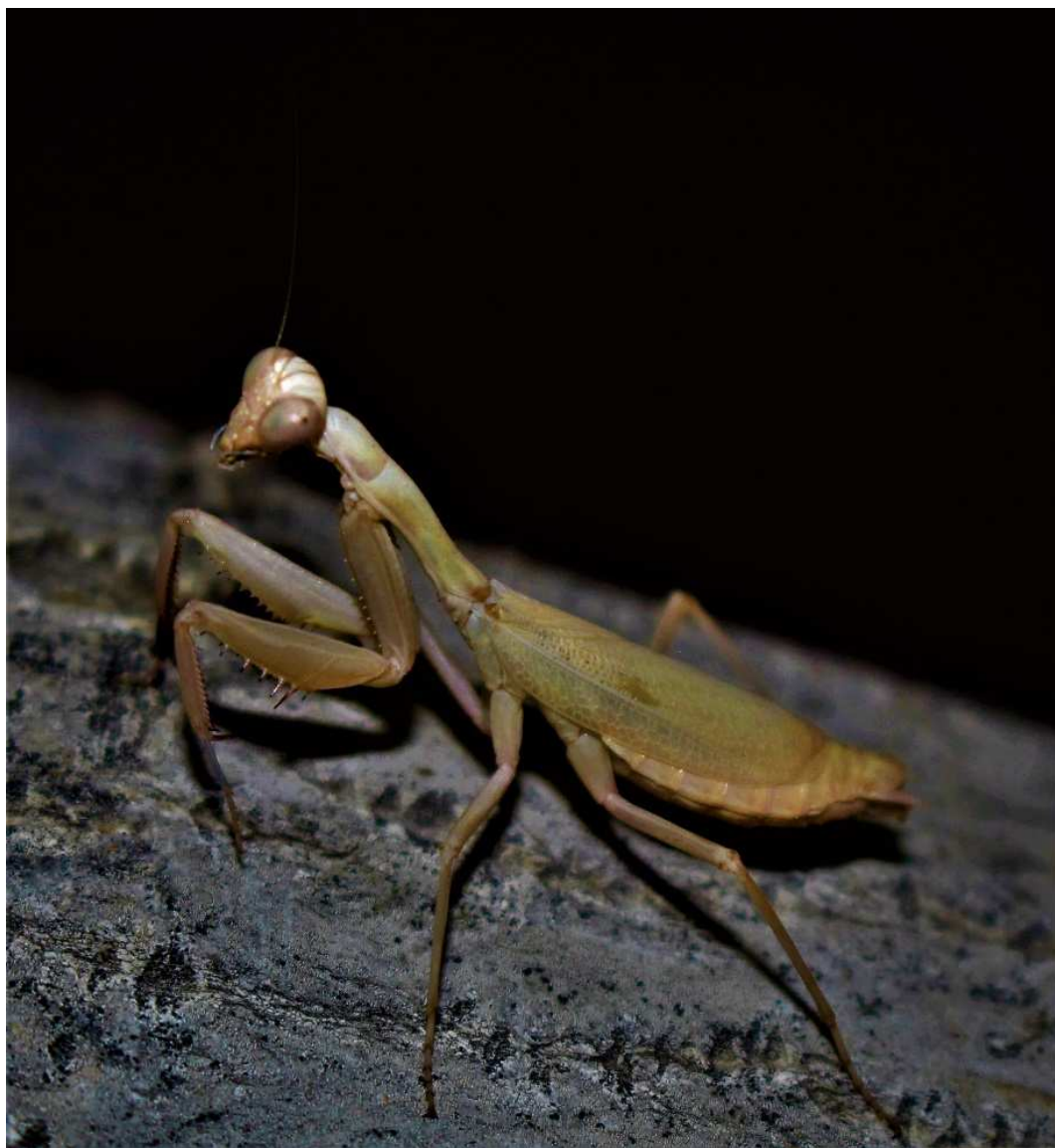


FIGURE 10. *Iris oratoria*, Female habitus. Photo by Z. Mirzaee.

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