Report of Coccinellidae (Coleoptera: Coccinellidae) and Orius (Hemiptera: Anthocoridae) Species in The Alfalfa Fields of Chadegan, Isfahan, Iran

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INTRODUCTION

The genus Orius Wolff, 1811, belonging to the family Anthocoridae, comprises about 70 species distributed throughout all zoogeographical regions, of which 15 species are found in South America [8]. Riudevets [9], in a review of Orius, mentioned several species like Orius albidipennis Orius insidiosus, Orius laevigatus, Orius majuscus, Orius minutus (L., 1758), Orius niger and Orius tristicolor, as Orius limbatis in the Canary Islands [2] which prey on F. occidentalis and in Japan, Orius sauteri (Poppius), Orius strigicolis (Poppius) and Orius tantillus (Motschulsky), which prey on Thrips palmi Karny, 1925 [10]. In Iran, the most abundant species is O. albidipennis.

From a human perspective ladybirds are one of the most beautiful insects [3]. Various and widespread research has been done to report list of ladybird species for different region of world. In Iran we have lots of Coccinellidae reports for example Khorasan, by Mosadegh, Chaharmahal va bakhtiyari, by bagheri, Esfahan by Haghshenas et al, Khozestan by Ebrahim Zade and Mosadegh, Mazandaran by Ghahari et al, Lorestan by Jafari and Kamali Mashhad by Farahi and Nameghi Khoramabad by Ansari Pour and Shakarami.

This research in to ladybird and Orius species of the alfalfa fields of the Chadegan region, aims to identify various species and to pave the way for more extensive future research in the field. It is hoped that this research will lead to more widespread use of these useful insectsin fields as a natural enemy to enable a reduction in the use of pesticides.

MATERIAL AND METHODS

The specimens were collected in various cultivated alfalfa in 23 locations in Chadegan. Transparent plastic bags were utilized for the collection of the insects, in which plants or parts of plants to be sampled were placed. The predators were stored in flasks containing 70% alcohol for preservation and identification based on patterns of the wings, body and male and female genitalia which, according to some authors, are the most reliable structures for taxonomic determination [5,4,8].
The male abdomen was removed, macerated in 10% KOH, and boiled in a water bath for approximately 20 min. afterwards, transferred to a watch glass with distilled water where the removal of the genitalia was carried out with the use of very fine entomological stylets. The genitalia were placed in clove oil, where remained for 15 min. and they were subsequently mounted on slides with Hoyers solution and sealed with varnish. The female genitalia were prepared following the methodology given by Hadi Ostovan (personal communication), who recommends the genital pore (abdominal sternit VIII) as a reliable structure for female identification. Abdominal sternit VIII can be mounted on a slide and observed after preparation of the abdomen with a clearing solution.

Samples of adult ladybirds were kept in 70% ethanol (alcohol) to be used for the separation and preparation of their genitalia for microscope slides. For the preparation of the microscopic slides, the ladybirds’ abdomens (that in term of size are large) were separated from other parts of the body and placed in cold 10% potassium hydroxide solution for 24 hours but for the ladybirds with small bodies, the whole insect was placed into a solution of potassium hydroxide. This procedure was used to decolorize the genital organs in order for them to appear clear on the microscope slide. In the next step, the sections of insects necessary for observation were put in to alcohol with various proportions until the texture showed a state of dehydration and air bubbles were observed on the surface of the samples. Then the male genitalia that include the sipho and tegmen were separated using two dissecting needles and then placed on a slide.

**Fig. 1:** Map of Chadegan, Isfahan.

**RESULTS AND DISCUSSION**

In this study, a total of 8 species of ladybird and 5 species of Orius were collected from the alfalfa fields and identified. They were from different parts of the Chadegan, Isfahan region. Descriptions of some important characteristics of the morphologies are identified below:

**Orius albidipennis:**
Length 1.7-2mm. Black. Ist antennal segment black, 2nd yellowish, 3rd and 4th segments embrowned. Hemelytra pale yellow-brown. Sometimes embrowned; membrane hyaline 'immaculate' Legs yellowish. Hind femora and tibiae, sometimes also other femora, often blackish Calli of pronotum small. Separated from each other by punctuate median band, posterior lobe densely and finely punctuate.

**Orius niger wolff, 1811:**
Length 1.7-2.3mm. Shiny black. Antennae yellowish, 1st segment black. Hemelytra yellow-brown with cuneus and apical margin of corium black; membrane brownish. Femora and middle and hind tibiae black, fore tibiae and apices of fore femora pale yellowish. Antennae in male incrassate, in female gracile. Posterior lobe of pronotum fine punctuates. Holopalaecitic. The most common species in Guilan. On herbaceous plants, especially, Asteraaccae such as Artemisia and Matricaria in meadows gardens and fields. Active predator of Aphids, Thysanoptera and Acarina. Also feeding on eggs of Pentatomidae and Lepidoptera.

**Orius (Heterorius) horvathi (Reuter, 1884):**
Length 2.0-2.5 mm. Like preceding species Legs pale or embrowned. Style Conical process slanders strongly recurved, claw-like. Euro-Siberian
O. niger aegyptiacus:
Length 1.7-2.3 mm. Shiny black. Antennae yellowish, 1st segment black. Hemelytra yellow-brown with cuneus and apical margin of corium black; membrane brownish. Femora and middle and hind tibiae black, fore tibiae and apices of fore femora pale yellowish. Antennae in male incrassate, in female gracile. Posterior lobe of pronotum fine punctuate. Paramer have a one-branch flagellum, black in the base.

*Coccinella* septempunctata (Linnaeus, 1758):
The length of body in this ladybird is 7-8.5 mm. The elytra are red with seven black spots. This ladybird can be regarded as 'the sultan of ladybirds of Chadegan Seven-spotted ladybird is the most famous ladybird species in the world.

*Hippodamia variegata* (Goeze, 1777):
This ladybird species has a length of 3 – 3.5 mm. The elytra are red with spots. Numbers of spots on the elytra are highly variable hence the name of this ladybird (*variegata*). This species has been reported in most areas of Iran.

*Hyperaspis quadrimaculata* (Redtenbacher, 1843):
This ladybird species has a length of 3 – 3.5 mm. The elytra are black and with 4 reddish-orange spots on them. The pronotum is black with 2 reddish-orange spots on it. The tegmen is asymmetrical in the male genitalia and easily identified from other genera of coccinellidae. This ladybird was reported for the first time in the Khorraramabad region by Ansari pour & Shakarami.

*Oenopia conglobata* (Linnaeus, 1758):
This ladybird species has a length of 3 – 4.5 mm. The elytra are a reddish-orange color and with 16 black spots. The pronotum is a pale red color with 5 black spots. This ladybird was collected from alfalfa fields near peach gardens. This ladybird has also been reported in other areas of Iran: in the province of Kerman, Mazandaran, South eastern Khorasan province, Chahar and Bakhtiari, in Mashhad, Gilan, Lorestan province) and in Khorasan.

*Oenopia oncina* (Olivier, 1808):
This species of ladybird has a length of 3.5 – 4 mm. The elytra are black in color with 5 yellowish-orange colored spots. This species usually feeds on Aphididae.

*Propylea quatuordecimpunctata* (Linnaeus, 1758):
This species has a length of 3.5 – 5 mm. The elytra are yellow in color with 7 quadrangular shaped black spots. Other areas where this ladybird has been reported are cited as follows; by in Chahar Mahal and Bakhtiari, in Mashhad, Gilan, Lorestan province, Khorasan Golestan province and Khorraramabad district.

*Stethorus gilvifrons*:
This *Oval coccinellid has a length of 3.5 – 5 mm. The elytra, pronotum and sternum are black in color but mouthparts, antenna and legs are brown. Body is hairy and grey. Antennae with 11 segments and clubbed. Tarsus with 3 segments. Male genitalia with long and slender siphon and siphonal capsule in apex have two branches.

*Stethorus punctillum*:
*Stethorus* adults are very small, hairy, oval-shaped black beetles with yellow mouthparts and antennae, with variable amounts of yellow to brownish-yellow coloration on legs. Total body mass of an adult ranges from 400 to 500 micrograms. *S. punctillum* pupae are also hairy and black (see image below) and larvae are grayish in color, rather slow moving with conspicuous legs.

*Exochomus nigromaculatus*:
black ladybird (with two orange-red markings on the pronotum, and orange-red legs).

**REFERENCES**