

Some Coccinellid Scale and Aphid Predators (Coleoptera, Subfamily, Chilocorinae) Prevalent in North East, Khorasan Province of Iran

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Abstract

Yaghmaee, F. 2003. Some Coccinellid Scale and Aphid Predators (Coleoptera, Subfamily, Chilocorinae) Prevalent in North East, Khorasan Province of Iran. Arab J. Pl. Prot. 21: 60-62.

The study of Coccinellidae (Coleoptera, subfamily Chilocorinae) fauna was conducted in 1997/1998 in north east of Khorasan Province of Iran. Collected species from subfamily Chilocorinae belonged to tribe Chilocorini. In this paper one tribe, three genera and five species were recorded: *Brumus octosignatus* Gebler, *Chilocorus bipustulatus* L., *Exochomus quadripustulatus* L., *E. flavipes* Thunberg. and *E. melanocephalus* Zoubkoff. from subfamily Chilocorinae. Their distribution and host range in Mashhad region were described. Among the five species studied, one was recorded for the first time from Iran and all five for the first time in Khorasan province.

Key word: Coccinellidae, Chilocorinae, predators, Khorasan, Iran

Introduction

The lady beetles are a well-known group of insects of economic importance and containing some of predator species, that mostly feed on harmful arthropods which attack cultivated crops. Except the species of the genus *Epilachna*, the lady beetles are very beneficial group of insects. The preys of these ladybirds are often sucking insects such as aphids, scale insects, hoppers, psyllids, whiteflies and immature stages of phytophagous beetles, moths and plant mites (1, 3, 4, 5, 7, 11, 13, 14, 16).

Lady birds are of great importance in biological control of pests (8, 9). Coccinellid larvae during their growth period and their adults feed on different pests (4, 8, 16).

It was determined that among the recorded species from Iran, three species *Coccinella Septempunctata* L., *Epilachna chrysomelina* F. and *Bulea lichatschovi* Hummel are reported inclusively from north east, Khorasan. The fauna of Khorasan province is considerably rich with beneficial insects specially ladybirds, due to variety of climates, diversity of crops and large size which make of the whole country.

According to infestation of fruit trees with different scale insects and aphids in north east Khorasan, it was noticed that the members of the subfamily Chilocorinae, species belonging to *Chilocorus* and *Exochomus* have a great influence on pest population.

The purpose of this research is to study and introduce the ladybirds of this subfamily in north east Khorasan province, which have an important role in pest control in the region.

Material and Methods

In spring, Summer, early fall and late winter of 1997/1998, samples were collected from 80 fields, gardens and parks of north east Khorasan cities such as Mashhad, Chenaran, Kalat, Sarakhs, Ahmadabad, Fariman, Torghabeh (Figure 1).

One of the simplest ways to collect shiny colored ladybirds from tall plant is by the naked eye, although it requires hard work (9, 11). The insects were collected from different crops such as alfalfa, wheat, barley and from the weeds around them. Adult ladybirds were collected by sweeping net (6). Collecting samples from tree trunks was done by suction. The collected ladybirds were taken to the

laboratory, killed by sodium cyanide, and fixed on triangular cards, with the date, name of collections site and collector were marked on the label. Preliminary separation of specimens was done basically on external morphological characteristics, but the species identification was based on the structure of genitalia of both sexes.

To prepare the genitalia, the abdomen was separated from thorax with a fine needle, and kept in cold 10% potassium hydroxide (KOH) solution for twenty four hours, then washed several times with distilled water and transferred to 75% ethanol. The abdomen was carefully opened with pointed forceps along the pleural thine and male and female genitalia were removed.

The integument was taken out from ethanol and glued close to the specimen of the card. The female genitalia was stained with fushin acid (0.030 M) for few minutes and then washed with distilled water. The genitalia was held in 50, 75 and 90% ethanol until hardened, then transferred successively to clove oil and xylene for about 5 minutes each prior to mount in Canada balsam on a microscope slide.

Results and Discussion

Research on subfamily chilocorinae in north east Khorasan province was carried out to identify the naturally occurring species, their diet and distribution.

1) *Chilocorus bipustulatus* (Linnaeus)

This species is abundant and it's specific host data records are as follows: *Lepidosaphes malicola* B., *Eulecanium coryli* L., *Aphis pomi* Deegeer, *Mysus persicae* Sulzer, *Acyrtosiphum pisum* Harris. *Aphis craccivora* Koch and alfalfa weevil (*Hypera postica* Gyll).

During spring and summer, samples were collected from Chenaran, Fariman, Mashhad and Ahmadabad regions. This species was found on beneath the bark of spruce fir (*Populus tremula* L.), Plant tree (*Plantanus orientalis* L.) and scot pine (*Pinus sylvestris* L.) in the middle of winter in the Mashhad and Torghabeh regions while they were hibernating.

Chilocorus bipustulatus L. was found in most locations of Iran where fruit trees and citrus are attacked by scale insects (4) and it is one of the best and most useful predator of *Chrysomphalus dictyospermi* Morgan in northern parts of Iran (4, 10, 16).

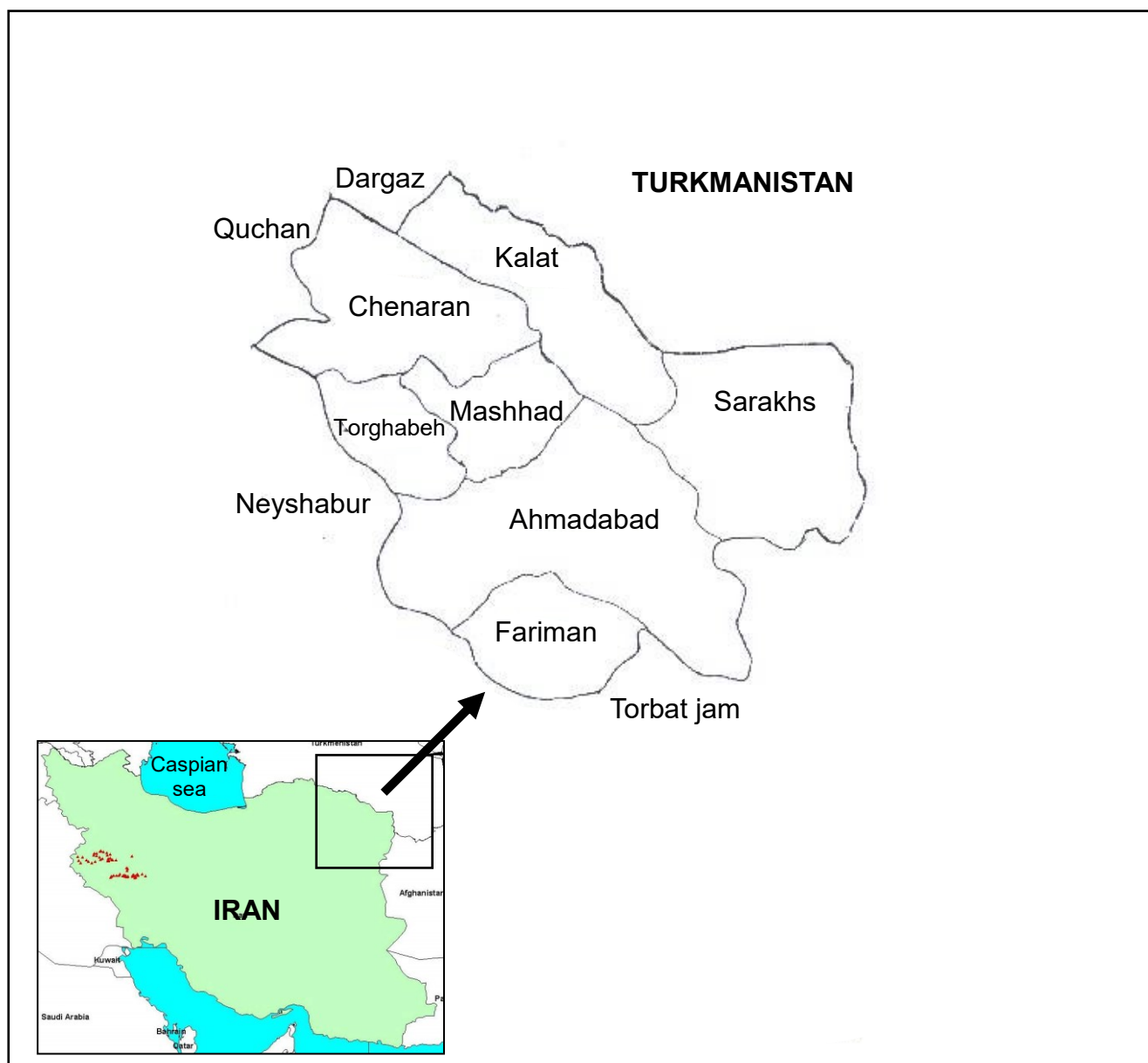


Figure 1. Map of north east of Khorasan province, Iran showing different regions surveyed for members of Coccinellidae, sub-family Chilocorinae.

The species is distributed in all Asian, European and North African countries and was introduced to North–America for the purpose of biological control (8). A variety of this species by the name of *Chilocorus bipustulatus* Var. *Iranesis* Ipert was also introduced into Nigeria from Iran (15). It has long been the most important predator of citrus scale insect in occupied Palestine (9).

In England, this species has specific host plant. In summer it is usually found only on ling (*Calluna vulgaris* L.) and heathers (*Erica* spp.). In the winter it is often found on bushes or trees overhanging heather, particularly scot pine (*Pinus sylvestris* L.) and common grose (*Ulex europaeus* L.). In the spring it is occasionally found on the trunks of deciduous trees, particularly birch (*Betula* spp.) and oak (*Quercus* spp.). In Cornwall, UK, there are two winter records, one from ash (*Fraxinus excelsior* L.) and one from black thorn (*Prunus spinosa* L.) (12).

In France, this species is called coccidophage (10). It's also one of the natural enemies of most important insect pests including diaspidids, lecaniids, pseudococcids and margarodids of woody ornamental plant (2).

2) *Exochomus quadripustulatus* (L.)

This species was collected from Mashhad, Chenaran and Ahmadabad regions during spring and summer. It's specific hosts are: *Lepidosphes malicala* (B.), *Eulecanium coryli* L., *Parlatoria oleae* (Colvee), *Myzus persicae* Sulzer and *Aphis pomi* Degeer.

Host plants were apple, peach and pear trees. In the chilly months of the year, adult insects were collected individually and collectively from beneath the bark of almond, spruce fir and ash trees. Collecting was done in Mashhad and Torghabeh regions. Geographical distribution of this species is wide as compared to other species of *Exochomus*. It was found in most parts of Iran especially in northern regions of the country (Mazandaran). It mostly feed on *Chrysomphalus dictyospermi* Morgan and *Parlatoria oleae* (Colvee) (16). The species was introduced to north – American countries, Canada and Australia for biological control. It is now established in California, where it feeds on several species of scale insects (7).

3) *Exochomus flavipes* Thunberg

This species was collected from Mashhad, Chenaran and Ahmabad regions during spring and summer. It feeds on different hosts such as *Aphis pomi* Degeer, *Lepidosaphes malicola* B. on apple trees, *Pterochlorus persicae* Cho., *Eulecanium coryli* L. on peach trees, and *Therioaphis maculatus* Backt, *Acyrtosiphum pisum* Harris on alfalfa.

In north of Iran it feeds on pseudococcidae (16). These species and others such as *Chilocorus bipustulatus* and *E. quadripustulatus* are considered as important predators of plant scale insects (10).

4) *Exochomus melanocephalus* Zoubkoff, 1833.

In summer, this species occurred in the Sarakhs region in alfalfa fields attacked by the alfalfa weevil (*Hypera postica* Gylh) and *Acyrtosiphum pisum* Harris and was first reported from Iran. It is known to occur in Russia (Southern parts), Iran and Iraq (H. Fursch, personal communication).

5) *Brumus octosignatus* (Gebler.)

Observations were made in Mashhad and Fariman regions during summer and spring. The beetle was collected from peach and apricot trees while feeding on scale insects and aphids. In the beginning of autumn to spring the lady birds were collected in the form of monospecific clusters from *Cercium* sp. and also individually from spruce fir trees while hibernating. The ladybird is also gathered from northern provinces of Iran, Kashan and Karaj while feeding on *Pseudococcus citri* Risso, *Phenococcus aceris* Goffroy, *Tetranychus urticae* Koch and *Pananychus citri* Mc Gregor (16).

Despite of great use of insecticides in North east of Khorasan, the region is rich in fauna of useful insects, which are used vastly in pest control. Therefor identification of different species must be the first step in pest control management.

المخلص

ياغامعي، ف. 2003. بعض الخنافس المفترسة للحشرات القشرية والمنّ السائدة في شمالي شرق مقاطعة خراسان في إيران. مجلة وقاية النبات العربية. 21: 60-62.

تمت دراسة خنافس أبي العيد (رتبة Coleoptera: تحت عائلة Chilocorinae) في موسم 1997/1998 في شمال شرق مقاطعة خراسان في إيران. وتبين أن الأنواع المجموعة من تحت عائلة Chilocorinae تتبع لقبيلة Chilocoini. وقد تم تسجيل قبيلة واحدة و 3 أجناس و 5 أنواع هي: *Brumus octosignatus* Gebler، *Chilocorus bipustulatus* L.، *Exochomus quadripustulatus* L.، *E. flavips* Thunberg. و *E. melanocephalus* Zoubkoff. من تحت عائلة Chilocorinae. وتم وصف توزيعهم ومداهم العائلي في منطقة مشهد. ومن بين الأنواع الخمس المسجلة، واحد يتم تسجيله للمرة الأولى في إيران والأنواع الخمسة للمرة الأولى في مقاطعة خراسان بإيران.

كلمات مفتاحية: خراسان، مفترسات، Chiloorinae، Coccinellidae، إيران.

عنوان المراسلة: ف. ياغامعي، قسم وقاية النبات، كلية الزراعة، جامعة فردوسي، مشهد، إيران.

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Received: October 24, 2000; Accepted: July 22, 2002

تاريخ الاستلام: 2000/10/24؛ تاريخ الموافقة على النشر: 2002/7/22