

A CONTRIBUTION TO THE FAUNA OF WEEVILS (COLEOPTERA: CURCULIONIDAE) ASSOCIATED WITH SUGAR BEET FIELDS IN NORTH–EAST OF IRAN

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ABSTRACT: In a faunistic survey on curculionidae inhabiting sugar beet fields in the main sugar beet growing areas of Iran, the province of Razavi Khorasan, 17 curculionid species belonging to 3 subfamilies and 4 tribes were identified. 14 of which are first records for the study area, including 10 new for Iran. This brings the total number of weevils fauna of sugar beet recorded from Iran to 49 species. Clearly, more species are to be expected after more intensively collecting.

KEY WORDS: Faunistic records, Beet crop, Snout beetle, Razavi Khorasan, Iran.

Sugar beet (*Beta vulgaris* L.) is one of the most important sucrose-producing crops in temperate regions. Over 35% of the world's sugar is produced by sugar beet in around 8 million hectares of land. In Iran, nearly 70 % of the sugar consumed derived from sugar beet that is cultivated on about 160,000 ha in 21 of the 30 provinces of Iran. The province of Razavi Khorasan, with it's about 55,000 ha ranks the first in sugar beet acreage and production in Iran.

Among the families of curculionoidea which compromise about 15.5 % of a total of 400,000 described beetle species, the family curculionidae with about 51,000 described species, i.e.80 % of all weevil species is one of the largest families of insects, in which the majority of its species are plant feeders, and many are serious pests on a variety of plants. Almost every part of a plant, from roots upward may be attacked. The larvae usually feed inside the tissues of the plants, and the adults drill holes in aerial plant parts (Borror et al., 1989). A few species of this family are considered as serious pests of beet crop in Iran. Literature review (e.g., Afshar, 1938; Davatchi & Kheyri, 1964; Perrin, 1970; Broumand, 1976; Kheyri, 1989; Broumand, 1998; Zarrabi et al., 2007) showed that the weevil fauna of sugar beet in Iran is not yet completely surveyed and would benefit from further detailed study. To reach this goal, regional field studies should be carried out in every part of Iran. Previous faunistic surveys on the curculionid species inhabiting sugar beet fields in different parts of Iran have resulted in a list of 39 species, of which only 12 species were reported from northeastern region of Iran. To the best of our knowledge there has been no previous specific study on Curculionidae associated with sugar beet in this region.

MATERIALS AND METHODS

The study area, Razavi Khorasan province is an area of 127432 sq. kilometres located at 30°, 21' - 38°, 17' N & 55°, 28' - 61°, 20' E. It is bounded on the north by North Khorasan and the Republic of Turkmenistan, on the east by Afghanistan,

on the south by the province of South Khorasan, and on the west by provinces of Yazd and Semnan.

During the years 2008 and 2009, the first two authors collected weevils in different locations of Razavi Khorasan province. The majority of specimens collected directly by hands when walking through the sugar beet fields. Also, collections were made using pitfall traps. To do this, several plastic pitfall traps with about 8 cm in diameter and 10 cm depth, filled partly with ethanol 75% and a few drops of glycerin were used inside the fields during the growth season. Addition to these, several other collected specimens by the students have been included. Data, such as number of specimens, locations and dates were recorded. The materials were identified by the third author. Classification and nomenclature used in this paper followed the data base, www.faunaeur.org, and Alonso-Zarazaga & Lyal (1999).

The voucher specimens are held in the Department of Plant Protection, College of Agriculture, Ferdowsi University of Mashhad, Iran.

RESULTS

A total of 17 weevil species belonging to 3 subfamilies and 4 tribes were identified in this study. 14 of recorded species are new to the study area, including 10 new for Iran. The list of species is given below:

Subfamily Lixinae Tribe Cleonini

***Adosomus strabus* (Gyllenhal, 1834)**

Material examined: 2 specimens, Fariman, August 2006; 1 specimen, Ghochan, July 2008; 8 specimens, Chenaran, July-August 2009; 5 specimens, Mashhad, July 2009; 1 specimen, Torbat-heydariyah, August 2007.

Previous records for Iran: This is the first report of the occurrence of this weevil species in Iran.

***Ammocleonus aschabadensis* (Faust, 1884)**

Material examined: 3 specimens, Chenaran, July 2009; 1 specimen Mashhad, June 2008; 1 specimen Neyshabor, May 2008.

Previous records for Iran: Fars, Kerman (Broumand, 1975; Kheyri, 1989). This is the first record of this species in the province of Razavi Khorasan.

***Asproparthenis nubeculosus* (Gyllenhal, 1834)**

Material examined: 2 specimens, Mashhad, September 2009; 1 specimen Ghochan, August 2007; 2 specimens Torbat-heydariyah, October 2008.

Previous records for Iran: This record is new for Iran.

***Conorhynchus nigrivittis* (Pallas, 1781)**

Material examined: 2 specimens, Mashhad, September 2009; 1 specimen, Fariman, November 2008.

Previous records for Iran: West Azarbaijan, Khorasan and Tehran (Kheyri 1989; Modarres Awal 1997).

***Conorhynchus faldermanni* (Fahraeus, 1842)**

Material examined: 2 specimens Chenaran, July 2009.

Previous records for Iran: This is a new record for Iran.

***Conorhynchus hololeucus* (Pallas, 1781)**

Material examined: 1 specimen, Mashhad, September 2009; 1 specimen Neyshabor (Ghadamgah), June 2008.

Previous records for Iran: This is the first record of this species from Iran.

***Coniocleonus nigrosuturatus* (Goeze, 1777)**

Material examined: 1 specimen, Chenaran, May 2009; 1 specimen Mashhad (Toos), August 2007.

Previous records for Iran: Fars, Tehran and Isfahan (Broumand 1976; Kheyri, 1989, Zarrabi et al., 2007). This species is recorded for the first time from Razavi Khorasan Province.

***Terminasia granosa* (Zoubkov, 1833)**

Material examined: 1 specimen, Ghochan, September 2009.

Previous records for Iran: This species is recorded for the first time from Iran.

***Temnorhinus verecundus* (Faust, 1883)**

Material examined: 2 specimens, Mashhad (Golmakan), July 2009; 1 specimen, Torbat-Jam, May 2008.

Previous records for Iran: This is a new record for Iran.

***Mecaspis darwini* Faust, 1883**

Material examined: 1 specimen, Fariman, October 2008.

Previous records for Iran: This species is recorded for the first time from Iran.

***Chromosomus fischeri* (Fahraeus, 1842)**

Material examined: 1 specimen Mashhad (Torogh), June 2009.

Previous records for Iran: Fars, Khorasan, Isfahan (Broumand, 1976; Kheyri, 1989; Zarrabi et al., 2007).

Tribe Lixini Schoenherr, 1828***Lixus incanescens* Boheman, 1835**

Material examined: 2 specimens, Chenaran, July 2009; 1 specimen, Neyshabor, May 2008; 1 specimen, Mashhad, November 2008.

Previous records for Iran: West Azarbaijan, Khorasan, Tehran, Fars, Isfahan, Kerman (Kheyri & Davatchi, 1966; Kheyri, 1989; Zomorodi, 1990; Modarres Awal, 1997).

***Lixus desertorum* Gebler, 1830**

Material examined: 1 specimen, Fariman, June 2008.

Previous records for Iran: This record is new for Iran.

***Lixus linearis* Boheman, 1836**

Material examined: 1 specimen, Mashhad, September 2009.

Previous records for Iran: This is a new record for the fauna of Iran.

Subfamily Entiminae**Tribe Sitonini*****Sitona cylindricollis* (Fahraeus, 1840)**

Material examined: 2 specimens, Chenaran, August 2009; 1 specimen Torbat-heydariyah, June 2008.

Previous records for Iran: Semnan, Tehran, Fars (Broumand, 1976; Kheyri, 1989; Modarres Awal, 1997). This is a new record for the fauna of the province.

***Sitona humeralis* Stephens, 1831**

Material examined: 1 specimen Mashhad (Toos), October 2009).

Previous records for Iran: Isfahan, Fars, Semnan, Markazi, Tehran, East Azarbaijan (Broumand, 1976; Modarres Awal, 1997).

Subfamily Molytinae

Tribe Mecysolobini

***Sternuchopsis karelini* (Boheman, 1844)**

Material examined: 1 specimen, Torbat-Jam, July 2008; 1 specimen Mashhad, November 2009.

Previous records for Iran: This is the first report of the occurrence of this species in Iran.

DISCUSSION

During this study up to 23 species associated with sugar beet fields in Razavi Khorasan, were collected. However, only the 17 known species were reported here.

A few species belonging to the following tribes and genera: Cleonini, Polydrusini and *Larinus* sp., *Lixus* sp., *Asproparthenis* sp., *Adosomus* sp. remained undetermined.

The following weevils have already been reported from sugar beet field in the study area, but not encountered in this study:

Bothynoderes carinatus Zubk., *B. punctiventris* Germ., *B. steveni* Farh., *Chromonotus confluens* Fahr., *Conorhynchus brevirostris* Gyll., *Monocleonus anxius* Gyll., *Pachycerus cordiger* Germ., *Sitona puncticollis* Steph., *Stephanophorus vagus* Bed.

The new records for Iranian fauna:

Sternuchopsis (= *Alcides*) *karelini* (Boheman, 1844)

Lixus linearis (= *cribricollis*) Boheman, 1836

Lixus desertorum Gebler, 1830

Mecaspis darwini Faust, 1883

Temnorhinus verecundus (Faust, 1883)

Terminasiana (= *Isomerus*) *granosa* (Zoubkov, 1833)

Conorhynchus hololeucus (Pallas, 1781)

Conorhynchus faldermanni (Fahraeus, 1842)

Asproparthenis (= *Bothynoderes*) *nubeculosus* (Gyllenhal, 1834)

Adosomus (= *Stephanophorus*) *strabus* (Gyllenhal, 1834)

The first records for the study area:

Coniocleonus nigrosuturatus (Goeze, 1777)

Ammocleonus aschabadensis (Faust, 1884)

Sitona cylindricollis (Fahraeus, 1840)

Sitona humeralis Stephens, 1831

According to Zarrabi et al. (2007), among the reported curculionid species from sugar beet fields in Iran, two species namely *Conorhynchus brevirostris* and *Lixus incanescens* are the most common ones in the country. However, this study did not found the first species in the study area. Instead, we found *Adosomus strabus* the most abundant and widespread in sugar beet fields of north-east of Iran. In the meantime, although the curculionids reported in this study have been collected from sugar beet fields, this does not necessarily mean that sugar beet is their host. In other word, it is likely that some species may accidentally occur in the sampled fields or their preferred host is another plant species. For example, the weevil, *Pachycerus cordiger* Germar has been reported as sugar beet weevil in

Iran (Modarres Awal, 1997; Khanjani, 2005), while the adults feed on leaves and larvae feed on main root of the weed, *Heliotropium europaeum* L. (Boraginaceae) in Australia, and it is considered as a biocontrol agent of this weed (Huber & Vayssieres, 1990). Host preferences and distribution of recorded weevils in this study needs further investigations.

CONCLUSION

This study added 14 and 10 new records of weevils to the fauna of the Razavi Khorasan province and Iran respectively. Also, it was found that the curculionid, *Stephanophorus strabus* was more abundant and wide spread than other species collected from sugar beet fields of the study area. By this study, the total number of weevils inhabiting sugar beet plantations in Iran reached to 49 species. Clearly, more species are to be expected after more intensively collecting.

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