Zoogeography and Faunistics
Research Article

ACTA ZOOLOGICA BULGARICA
Acta zool. bulg., 69 (4), 2017: 501-506

New Records of Flea Beetles (Coleoptera: Chrysomelidae: Galerucinae: Alticini) from Iran

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Abstract: The species diversity of flea beetles (Coleoptera: Chrysomelidae: Galerucinae: Alticini) from some regions of Iran is studied in this paper. We collected and identified as new records for the fauna of Iran a total of 16 species belonging to nine genera: *Altica* Geoffroy (2 species), *Aphthon* Chevrolat (2), *Chaetocnema* Stephens (2), *Dibolia* Latreille (3), *Epitrix* Foundras (1), *Longitarsus* Latreille (1), *Mantura* Stephens (1), *Phyllotreta* Chevrolat (3) and *Psylliodes* Latreille (1).

Key words: Alticini, fauna, distribution, new records, Iran

Introduction

The coleopteran family Chrysomelidae, with its 37,000-40,000 described species that are widespread in all zoogeographical regions, is one of the most species-rich families of phytophagous insects (Schmitt 1996, Biondi & D'Alessandro 2012). This family comprises many species that show high level of ecological and biological specialisation, at least in temperate regions, and a significant trend towards differentiation and endemism (Biondi et al. 2013). Alticini (flea beetles) is a very large and diverse tribe of leaf beetles within the subfamily Galerucinae according to the current classification of Chrysomelidae (Bouchard et al. 2011), with about 8,000 recognised species of more than 500 genera (Nadein 2015, Aslan et al. 2016).

Most species are agricultural pests and attack only one plant group or closely related groups. Common agricultural and garden hosts include members of the families Brassicaceae (mustard, broccoli, kale, cabbage, collards, etc.) and Solanaceae (potatoes, tomatoes, eggplant, peppers, etc.). Other hosts include alder, currant, evening primrose, sedum, skunkbrush, sumac, willow and a variety of weeds and grasses. Some species act as biological control agents of weeds. The larvae of most flea beetle species feed on small roots or root hairs which may reduce slightly plant health and vigour, but typically does not result in substantial economic loss. An exception is damage by the tuber flea beetle larvae to potato tubers (Jolivet & Hawkeswood 1995, Jolivet & Verma 2002, Jolivet et al. 2004, Aslan & Gök 2006).

The fauna of Iranian flea beetles has been poorly studied and there are only several detailed and comprehensive contributions (e.g. Warchalowski 1967, 1973, Rapilly 1978, Lopatin 1990, Modarres Awal 1997, Boroumand 2000, Alavi 2006, Alavi & Khalili 2006, Kavosi *2007,* Serri & Naserzadeh 2008, Döberl 2010b, Ghahari & Hawkeswood 2011, Ghahari & Jędryczkowski 2012, Samin et al. 2014, Serri et al. 2016). The aim of the present article is to report the first records in Iran of 16 species of the tribe Alticini.

Materials and Methods

This study was based on specimens collected during 2007-2011 from some regions of Iran by the author and some colleagues and students. The specimens were collected using entomological net and a

Malaise trap. The specimens were identified to the species level under a stereomicroscope using the taxonomic keys and figures given by Konstantinov & Vanderberg (1996), Konstantinov (1998) and Warchalowski (2010). They were sent to Prof. A. Warchalowski (Poland) and Prof. B. Gruev (Bulgaria) for confirmation.

Data about classification, nomenclature and distribution in adjacent countries of Iran (Afghanistan, Armenia, Azerbaijan, Iraq, Pakistan, Turkey and Turkmenistan) are according to Döberl (2010a). The identification of chorotypes are based on Taglianti et al. (1999).

Results

In total, 16 new records of Alticini (Chrysomelidae: Galerucinae) belonging to eight genera were registered from 15 provinces of Iran (Fig. 1). The list of species is given below alphabetically with distribution data (in adjacent countries of Iran) and chorotypes.

Family Chrysomelidae Latreille, 1802
Subfamily Galerucinae Latreille, 1802
Tribe Alticini Newman, 1834
Genus *Altica* Geoffroy, 1762

1. *Altica ampelophaga ampelophaga* Guérin-Néneville, 1858

Material examined: Golestan Province, Gorgan, 36°50′N 54°30′E, 1 ex., on *Circium arvense* (L.) (Asteraceae), September 2009. Distribution in adjacent countries: Azerbaijan. Chorotype: Europeo-Mediterranean.

2. *Altica balassogloi* Jakobson, 1892

Material examined: Mazandaran Province, Babol, 36°30′N 52°35′E, 1 ex., on *Rubus idaeus* L. (Rosaceae), April 2007; Razavi Khorasan Province, Mashhad, 36°17′N 59°40′E, 2 exx, *Lactuca sativa* L. (Asteraceae), April 2009. Distribution in adjacent countries: Afghanistan, Pakistan. Chorotype: Centralasiatic.

Genus *Aphthon* Chevrolat, 1836

3. *Aphthona franzi* Heikertinger, 1944

Material examined: West Azarbaijan Province: Ourmieh, 37°33′N 45°00′E, 1 ex., on *Euphorbia macroclenda* Boiss. (Euphorbiaceae), September 2007. Distribution in adjacent countries: Armenia, Turkey. Chorotype: Sibero-European.

4. *Aphthon nigriceps* W. Redtenbacher, 1842

Material examined: Hamadan Province: Nahavand, 34°14′N 48°14′E, 3 ex., on *Euphorbia seguieriana* Neck. (Euphorbiaceae), June 2008. Distribution in adjacent countries: Armenia, Azerbaijan, Turkey. Chorotype: Europeo-Mediterranean.

Genus *Chaetocnema* Stephens, 1831

5. *Chaetocnema* (*Chaetocnema*) *obesa* Boieldieu, 1859

Material examined: Guilan Province, Lahijan, 37°14′N 50°02′E, 3 ex., on *Amaranthus retroflexus* L. (Amaranthaceae), July 2008; Mazandaran Province, Noor, 36°19′N 52°00′E, 2 exx, August 2010 [Malaise trap]. Distribution in adjacent countries: Iraq, Turkey. Chorotype: Centralasiatic-Europeo-Mediterranean.

6. *Chaetocnema* (*Tlanoma*) *chlofophanga* Duftschmid, 1825

Material examined: Golestan Province, Minudasht, 37°10′N 55°30′E, 2 ex., on *Convolvulus arvensis* (Convolvulaceae), August 2009; Isfahan Province, Kashan, 34°00′N 51°20′E, 1 ex., June 2011 [Malaise trap]. Distribution in adjacent countries: Azerbaijan, Iraq, Turkey. Chorotype: Centralasiatic-Europeo-Mediterranean.

Genus *Dibolia* Latreille, 1829

7. *Dibolia* (*Dibolia*) *cryptocephala* Koch, 1803

Material examined: Northern Khorasan Province, Bojnord, 3 ex., 37°35′N 57°20′E, on *Abutilon theophrasti* Medik (Malvaceae), June 2009; Semnan Province, Shahrud, 35°30′N 55°30′E, 1 ex., May 2011 [Malaise trap]. Distribution in adjacent countries: Armenia, Azerbaijan, Turkey. Chorotype: Turano-European.

8. *Dibolia* (*Dibolia*) *rugulosa* K. Redtenbacher, 1849

Material examined: Guilan Province, Rudsar, 36°42′N 50°18′E, 3 ex., *Phlomis olivieri* Bth. (Lamiaceae), September 2010. Distribution in adjacent countries: Armenia, Azerbaijan, Turkey. Chorotype: European.

9. *Dibolia* (*Eudibolia*) *carpathica* Weise, 1893

Material examined: West Azarbaijan Province, Oshnavieh, 37°03′N 45°05′E, 1 ex., on *Stachys pubescens* Ten. (Lamiacecae), September 2007. Distribution in adjacent countries: Armenia, Azerbaijan, Turkey. Chorotype: Turano-European.

Genus *Epitrix* Foundras, 1861

10. *Epitrix atropae* Foudras, 1861

Material examined: Ardabil Province, Namin, 38°23′N 48°31′E, 2 ex., on *Solanum persicum* Willd. (Solanaceae), July 2007. Distribution in adjacent countries: Armenia, Azerbaijan, Turkey. Chorotype: Europeo-Mediterranean.

Genus *Longitarsus* Latreille, 1829

11. *Longitarsus* (*Longitarsus*) *echii* Koch, 1803

Material examined: Kermanshah Province: Javanrud, 34°46′N 46°19′E, 2 ex., on *Salvia nemorosa* subsp. *pseudosylvestris* (Stapf) Bornm.

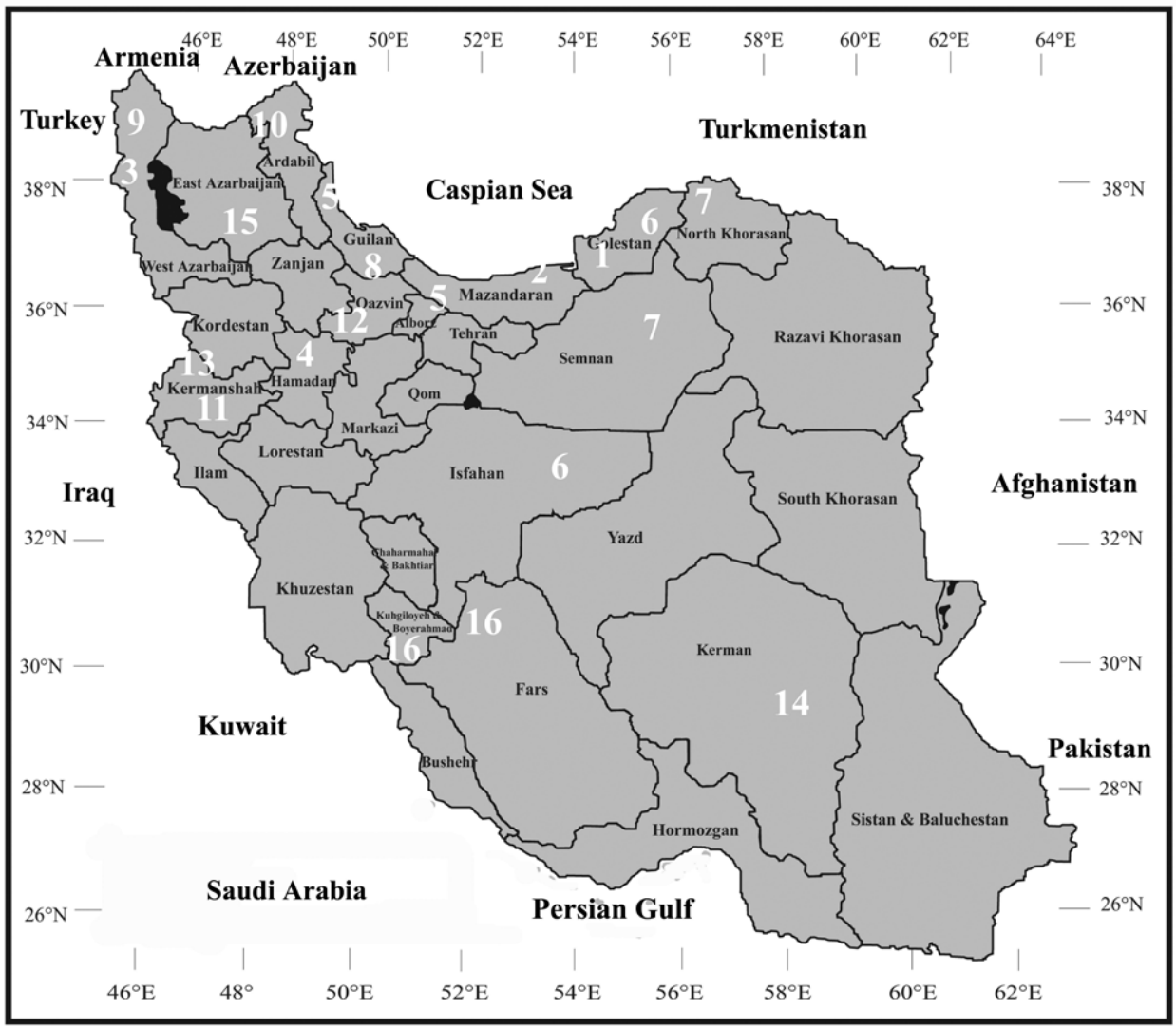

Fig. 1. Map of Iran with boundaries of provinces for showing the distribution of 16 new country records.

(Lamiaceae), August 2008. Distribution in adjacent countries: Afghanistan, Turkey. Chorotype: Europeo-Mediterranean + Afrotropical + Australian.

Genus *Mantura* Stephens, 1831

12. *Mantura* (*Mantura*) *rustica* Linnaeus, 1767

Material examined: Qazvin Province: Qazvin, 36°26′N 49°49′E, 1 ex., on *Rumex scutatus* L. (Polygonaceae), July 2008. Distribution in adjacent countries: Pakistan, Turkey. Chorotype: Asiatic-European.

Genus *Phyllotreta* Chevrolat, 1836

13. *Phyllotreta acutecarinata* Heikertinger, 1941

Material examined: Kermanshah Province, Sonqor, 34°50′N 47°30′E, 1 ex., on *Brassica napus* (Brassicaceae), June 2010. Distribution in adjacent countries: Afghanistan, Turkey. Chorotype: Turano-European.

14. *Phyllotreta balcanica* Heikertinger, 1909

Material examined: Kerman Province, Jiroft, 28°50′N 57°35′E, 3 ex., *Cardaria draba* (L.) (Brassicaceae), April 2010. Isfahan Province, Kashan, 2 exx, 34°00′N 51°20′E, *Raphanus* sp. (Brassicaceae), June 2011. Distribution in adjacent countries: Afghanistan, Azerbaijan, Turkey. Chorotype: Centralasiatic-European.

15. *Phyllotreta caucasicola* Heikertinger, 1941

Material examined: East Azarbaijan Province, Maragheh, 37°23′N 46°24′E, 2 ex., *Brassica oleraceae* L. (Brassicaceae), August 2007. Distribution in adjacent countries: Armenia, Iraq, Turkey. Chorotype: SW-Asiatic (Anatolo-Caucasian).

Genus *Psylliodes* Latreille, 1829

16. *Psylliodes* (*Psylliodes*) *affinis* Paykull, 1799

Material examined: Kuhgiloyeh & Boyerahmad

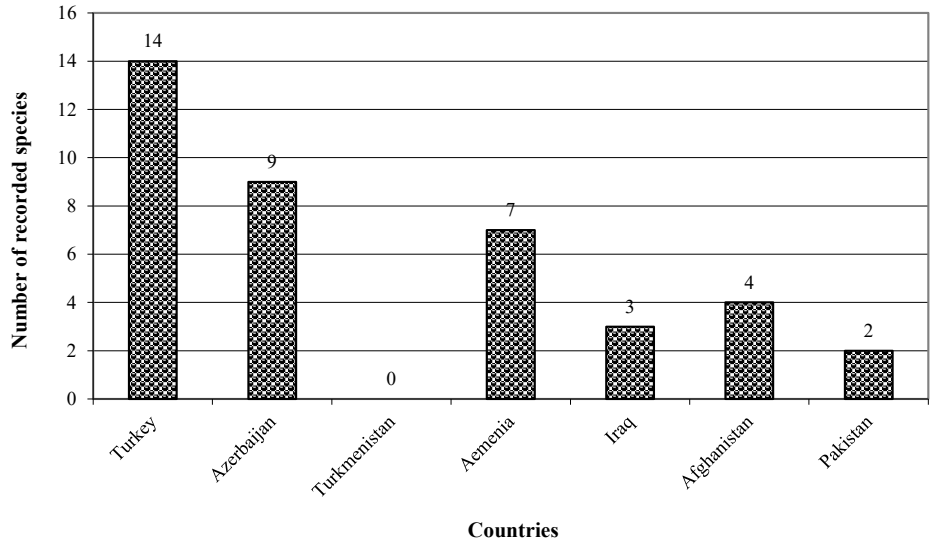

Fig. 2. Number of the species recorded by the present occurring in the countries adjacent to Iran.

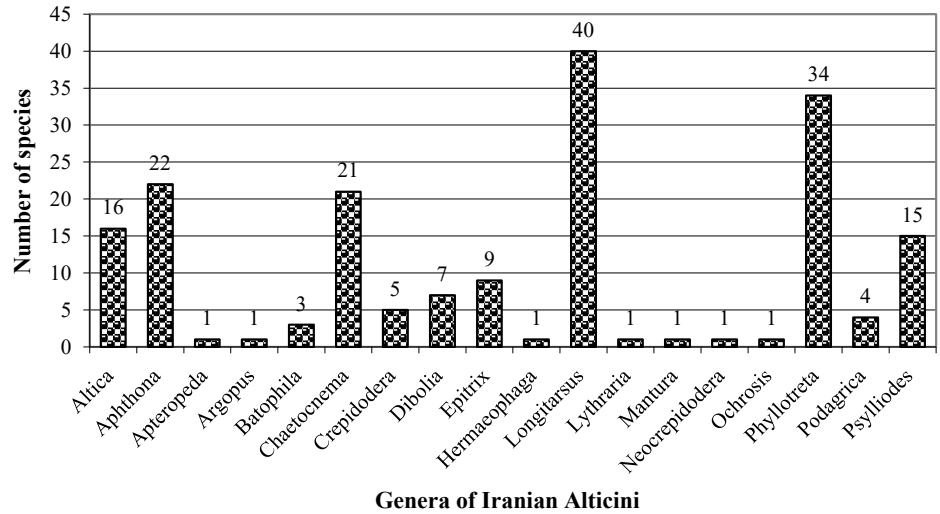

Fig. 3. Species diversity of the Iranian genera of the tribe Alticini (Coleoptera: Chrysomelidae).

Province, Lordegan, 31°26′N 50°50′E, 2 ex., on *Sinapis arvensis* L. (Brassicaceae), April 2009; Fars Province, Abadeh, 31°15′N 52°30′E, 1 ex., on *Alyssum campestre* L. (Brassicaceae), May 2010. Distribution in adjacent countries: Azerbaijan, Turkey. Chorotype: Palaearctic.

Discussion

Finding 16 new records indicates that the fauna of Iranian Alticini is diverse and poorly known. The still low number of species recorded is due to the ways of collection and the limited sampled areas. Nevertheless, the overall results are very interesting. Until now a total of 167 Alticini species had been reported from Iran (Warchalowski 1967, 1973, Rapilly 1978, Lopatin 1990, Modarres Awal 1997, Serri & Naserzadeh 2008, Döberl 2010a, b, Ghahari & Hawkeswood 2011, Ghahari & Jędryczkowski 2012, Samin et al. 2014, Serri et al. 2016). Together with these 16 new records, the total number of Iranian flea beetles reaches 183 species in 18 genera. Iran forms a large part of the Iranian Plateau and covers an area of 1,623,779 km². It borders to the north with the Caucasus Mountains, Middle Asian natural regions and the Caspian Sea (-27 m below sea level); to the west with the Anatolian and Mesopotamian regions; to the east with the eastern part of the Iranian Plateau (Afghanistan and adjacent west Pakistan) and the Baluch-Sindian region; and finally to the south with the Persian Gulf and Gulf of Oman, which are connected by the latter to the Indian Ocean (Fig. 1; Zehzad et al. 2002). Of course regarding the vari-

ous geographical regions and climate in Iran, and the fauna of adjacent countries of Iran (e.g. Turkey with 340 species from 22 genera (Özdikmen 2014), it seems likely that many other species remain to be discovered in the future. In addition to these 16 new records several other specimens have been collected and are currently under identification. Further, all the species of this study are distributed at least in one neighbouring country, especially in Turkey with 14 recorded species (Fig. 2). Among the recorded genera in Iran, *Longitarsus* and *Phyllotreta* with 40 and 34 species, respectively, are more diverse than the others (Fig. 3). Nevertheless, very little attention has been paid till now to the host plants of the Iranian Alticini.

Acknowledgements: I would like to express my sincere thanks to Prof. A. Warchalowski and Dr. W.J. Jędryczkowski (Poland) and Prof. B. Gruev (Bulgaria) for invaluable cooperation, Dr. J. Rastegar, Dr. H. Sakenin, Dr. S. Imani for providing some specimens from insect collections of Islamic Azad University. The research was supported by the Islamic Azad University (Yadegar-e- Imam Khomeini (RAH) Shahre Rey Branch).

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Received: 14.10.2016
Accepted: 31.10.2017