

Catalogue of Iranian subfamily Galerucinae s. str. (Coleoptera: Chrysomelidae)

Mirzaei, M.^{*a,b}, Nozari, J^b.

^a Iranian Research Institute of Plant Protection, Agricultural Zoology Research Department, Education and Extension Organization (AREEO), Tehran, Iran.

^b Department of Plant Protection, College of Agriculture, University of Tehran, Karaj, Iran

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The first comprehensive catalogue of leaf beetles of subfamily Galerucinae s. str. from Iran is presented. In total, 44 species belonging to 18 genera of three tribes (Galerucini, Hylaspini and Luperini) are listed. In Iran, Galerucinae is represented by 11 endemic species. For every species provincial distributions are given based mainly on available literature records, along with some additional distributional records from a field survey of several localities in Iran in 2012-2015. All species deposited in Jalal Afshar Zoological Museum (University of Tehran) were also examined. *Luperus perlucidus* Iablokoff-Khuzorian, 1956 is reported as a new record for Iranian Chrysomelidae fauna. Moreover, *Theone octocostata afghanistanica* Mandl, 1968, *Galerucella nymphaeae* (Linnaeus, 1758), *Galeruca pomonae* (Scopoli, 1763), *Exosoma thoracicum* (Redtenbacher, 1843) and *Luperus kiesewetteri* Joannis, 1865, which had been omitted in the catalogue of Palaearctic Coleoptera, were added again to the leaf beetle fauna of Iran. In addition, 13 new records for the administrative provinces of Iran are provided.

Key words: Chrysomelidae, Galerucinae, Catalogue, New record, Iran

INTRODUCTION

Iran is one of the most diverse areas of the west Palaearctic. The country with 1.648 million kilometers features three main climatic zones including arid and semi-arid regions, Mediterranean climate (mainly in the western Zagros Mountains) and humid and semi-humid regions (mainly in the Caspian). The country is divided to five floristic zones, called Irano-Turanian deserts and mountains, Zagrosian, Hyrcanian, Arasbaran and Khalij-o-Omanian. The complex and varied climates, topography, and geological formations have led to a varied and unique biological diversity (Department of Environment 2010). Family Chrysomelidae with over 37,000 described species is one of the largest phytophagous groups of Coleoptera (Jolivet et al., 2009). Nonetheless, so many species remain to be described and the number can reach up to 60000 species (Reid, 1995). Recently, some changes have been made in Chrysomelidae taxonomy, and the subfamily Alticinae is considered as a tribe within subfamily Galerucinae. Therefore, the subfamily Galerucinae currently including seven tribes; Alticini, Galerucini, Luperini, Metacyclini, Decarthrocerini, Oidini and Hylaspini. This subfamily is the biggest group in family Chrysomelidae (Bouchard et al. 2011). Skeletonizing leaf beetles, subfamily Galerucinae (excluding Alticinae) [this is our mean on Galerucinae in this paper], with about 5800 species is one of the biggest and most important groups, containing some serious agricultural and forest pests (Wilcox, 1971-1975). The Palaearctic Galerucinae fauna includes more than 2000 species (Beenen, 2010). In particular, in Turkey 76 species (7 endemic species) has been recorded (Ekiz et al., 2013). In Azerbaijan 41, Latvia 21, Belarus 27, Estonia 18, Lithuania 23, St.-Petersburg and Leningrad region (western Russia) 22,

*Corresponding Author: m_mirzaie@ut.ac.ir

Poland 35 and in Romania 33 species recorded (Silfverberg, 2004; Maican, 2005; Lopatin & Nesterova, 2005; Romantsov, 2007; Bukejs, 2009; Borowiec et al., 2011).



FIGURE 1. The administrative provinces of Iran

The Galerucinae of Iran is poorly known. Faunistic studies of Iranian Galerucinae have been irregularly investigated, until now. Several faunistic records based on the museum collections, private collections and scientific expeditions have been published from Iran.

Prior to this study, the main studies on the fauna of Iranian Galerucinae were done by Berti and Rapilly (1973), Medvedev (1975), Lopatin (1988), Borumand (2000), Beenen and Bezděk (2006), Bezděk (2008) and Beenen (2014). Nevertheless, based on the checklist of neighbouring countries, Iranian fauna of Galerucinae is likely more complex and probably some species are remaining unknown. We hope that this work could be useful on this important group for future studies.

MATERIAL AND METHODS

The species listed in this paper, elaborated mainly based on available literatures along with several field trips, all available published articles, checklists, books, congress proceedings and abstracts of congresses reporting Galerucinae fauna of Iran were considered to achieve a good knowledge of Galerucinae inhabiting Iran. Collection trip were done in Zanjan (Amand and Taham village), Alborz (Karaj city, Taleqan region, Nazarabad city, Khor village), Qazvin (Qazvin city, Roudbar city) and Chahar Mahall and Bakhtiari provinces (Choghakhur wetland). The specimens were collected by sweep net and shaking foliage. Detailed information of each specimen (location, latitude and

longitude, date and collector) registered and labelled. Finally, all species of Galerucinae which were reported from Iran are listed. All of these materials are deposited in Jalal Afshar Zoological

TABLE 1. Abbreviations of Iranian provinces used in this paper

Abbreviation	Province	Abbreviation	Province
AL	Alborz	KD	Kordestan
AR	Ardebil	LO	Lorestan
BS	Bushehr	MK	Markazi
CM	Chahar Mahall and Bakhtiari	MN	Mazandaran
EA	East Azarbaijan	NK	North Khorasan
ES	Esfahan	QZ	Qazvin
FA	Fars	QM	Qom
GI	Gilan	RK	Razavi Khorasan
GO	Golestan	SM	Semnan
HD	Hamadan	SB	Sistan and Baluchestan
HG	Hormozgan	SK	South Khorasan
IL	Ilam	TE	Tehran
KE	Kerman	WA	West Azarbaijan
KR	Kermanshah	YA	Yazd
KZ	Khuzestan	ZA	Zanjan
KB	Kohgiluyeh and Buyer Ahmad		

Museum (JAZM), University of Tehran, Iran. Furthermore, all species of the subfamily Galerucinae in JAZM were examined and included in the present paper.

Abbreviations of Iranian provinces listed in Table 1. For showing the administrative provinces of Iran a map is given (Fig. 1). The endemic species and new records for Iranian fauna are marked with one and two asterisks, respectively.

RESULTS

In total, 44 species belonging to 18 genera and three tribes of subfamily Galerucinae are catalogued from Iran. Iranian Galerucinae is characterized by 11 endemic species. *Luperus perlucidus* Iablokoff-Khuzorian, 1956 is reported as a new record for Iranian Chrysomelidae. In addition, 13 new records for the administrative provinces of Iran are provided. The subspecies that are present in Iran are mentioned in comment. Useful and critical points are also given for some species when needed.

Subfamily GALERUCINAE Latreille, 1802

Tribe GALERUCINI Latreille, 1802

Genus *Diorhabda* Weise, 1883

Diorhabda carinata (Faldermann, 1837)

Distribution: TE, GO, SM, KZ, BS, LO (Tracy & Robbins, 2009)

Comment: *Diorhabda elongata* (Brullé, 1836) transferred under *D. carinata*. Previous record from GO (Lopatin, 1981) refer to *D. carinata* (Tracy & Robbins, 2009: 56 and 65). Borumand's records (BS, FA, IL, KZ, KB, SB) must be re-identified based on Tracy and Robbins (2009). Most probably *D. elongata* doesn't occur from Iran.

General distribution: Ukraine, eastern Turkey and Syria to northwest China, Kyrgyzstan, Pakistan and Iran (Tracy & Robbins, 2009; Beenen, 2010).

Diorhabda carinulata (Desbrochers des Loges, 1870)

Distribution: SB, ES, RK, KE, GO (Tracy & Robbins, 2009)

General distribution: Southern Russia to Iran, Armenia, Afghanistan, Pakistan and northwestern Iraq and east to China and Mongolia (Tracy & Robbins, 2009; Beenen, 2010).

***Diorhabda meridionalis* Berti and Rapilly, 1973**

Distribution: HG, BS, KZ (Berti & Rapilly, 1973); BS, KE, SB (Borumand, 2000); SB, BS, FA, LO, KZ, RK (Tracy & Robbins, 2009)

General distribution: Iran, Pakistan and Syria (Tracy & Robbins, 2009; Beenen, 2010).

Genus *Farsogaleruca* Lopatin, 1981*

Farsogaleruca insperabilis* Lopatin, 1981

Distribution: KE (Lopatin, 1981)

Farsogaleruca rufina* Lopatin, 1981

Distribution: FA (Lopatin, 1981)

Genus *Galeruca* Geoffroy, 1762

Subgenus *Galeruca* Geoffroy, 1762

***Galeruca armeniaca* Weise, 1886**

Distribution: SB (Berti & Rapilly, 1973); AL, TE, QZ (Mirzaei et al., 2015); AR, ES, FA, QZ, GO, HD, SM, SB, TE, YA (Borumand, 2000); ZA (in this study)

Comment: One specimen is deposited in JAZM.

Material examined:

Iran, Prov. Zanzan (ZA), 7♂♂ and 5♀♀, 36°44'10" N 48°31'24" E, Amand village, 2131 m a.s.l., 25 v 2015, leg. M. Mirzaei.

General distribution: Russia south, Iran, Kyrgyzstan, Kazakhstan, Tajikistan, Turkmenistan, Turkey and Uzbekistan (Beenen, 2010).

***Galeruca jucunda* (Falderman, 1837)**

Distribution: ZA (Keyhanian & Taghaddosi, 2010); AL, QZ (in this study)

Comment: Beenen (2006) synonymized this species and *Galeruca circumdata* (Duftschmid, 1825). But Keyhanian and Taghaddosi (2010) were unaware about the paper of Beenen (2006) and reported *Galeruca circumdata* as a new record from Zanzan province, Iran. Seven specimens belonging to *Galeruca circumdata* are deposited in JAZM.

Material examined:

Iran, Prov. Alborz (AL), 1♂ and 2♀♀, 35°74'10" N 50°29'44" E, Karaj city, 1426 m a.s.l., 25 v 2015, leg. M. Mirzaei.

Iran, Prov. Qazvin (QZ), 1♀, 36°44'56" N 49°23'37" E, Qazvin city, 297 m a.s.l., 25 v 2015, leg. M. Mirzaei.

General distribution: Almost Europe, Afghanistan, Siberia, Mongolia, China, Syria, Iran, Turkey and Caucasus (Beenen, 2006 and 2010).

Galeruca planiuscula* Laboissière, 1937

Distribution: LO (Laboissière, 1937)

***Galeruca pomonae* (Scopoli, 1763)**

Distribution: GI, MN (Farahbakhsh, 1961); AL (in this study)

Comment: This species is omitted in the catalogue of Palearctic Coleoptera (Beenen, 2010).

Material examined:

Iran, Prov. Alborz (AL), 1♀, 36°18' N 50°36' E, Taleqan region, 20 vi 2013, leg. M. Mirzaei.

General distribution: Southern Russia, Portugal and Ireland to Central Asia (Beenen, 2010; Warchalowski, 2010).

***Galeruca spectabilis* Faldermann, 1837**

Distribution: EA, GO (Ogloblin, 1936); TE, MN (Lopatin, 1981); AL, ZA, CM (in this study)

Comment: In this species, two subspecies *Galeruca spectabilis lacericollis* Semenov, 1909 and *Galeruca spectabilis orientalis* Osculati, 1844 reported from Iran (Beenen, 2010). One specimen belonging to *Galeruca spectabilis lacericollis* Semenov, 1909 and two specimens belonging to *Galeruca spectabilis orientalis* Osculati, 1844 are deposited in JAZM.

Distribution of *Galeruca spectabilis orientalis*: QZ, GO, KE, KR, KD, MN, TE (Borumand, 2000).

Material examined:

Iran, Prov. Alborz, 1♂ and 1♀, 35°74'10" N 50°29'44"E, Karaj city, 1426 m a.s.l., 6 vi 2015, leg. M. Mirzaei.

Iran, Prov. Zanjan, 2♀♀, 36°44'59" N 48°28'44"E, Taham village, 1851 m a.s.l., 25 v 2015, leg. M. Mirzaei.

Iran, Prov. Chahar Mahall and Bakhtiari, 3♂♂ and 2♀♀, 32°16'59" N 51°0'45"E, Choghakhur wetland, 2155 m a.s.l., 9 vi 2015, leg. M. Mirzaei.

General distribution: Balkan peninsula, Asia minor, Syria, Iran and Central Asia (Beenen, 2010; Warchalowski, 2010).

Genus *Galerucella* Crotch, 1873

Subgenus *Galerucella* Crotch, 1873

***Galerucella nymphaeae* (Linnaeus, 1758)**

Distribution: FA (Silfverberg, 1974)

Comment: Although Silfverberg reported this species from south of Fars province, but Beenen (2010) did not include Iran in the catalogue of Palearctic Coleoptera.

General distribution: Whole Europe, Far East, Israel, Kazakhstan, Mongolia, Turkey (Beenen, 2010; Warchalowski, 2010) and Iran.

Subgenus *Neogalerucella* Chûjô, 1962

***Galerucella lineola lineola* (Fabricius, 1781)**

Distribution: GO (Sadeghi et al., 2004); GO, MN, GI (Medvedev, 1975; Borumand, 2000)

General distribution: from Ireland to Japan (Beenen, 2010).

***Galerucella pusilla* (Duftschmid, 1825)**

Distribution: MN (Berti & Rapilly, 1973)

Comment: Eight specimens are deposited in JAZM.

General distribution: from British Isls and Spain to Mongolia and China (Beenen, 2010).

Galerucella rishwani* Makhan, 2012

Distribution: LO (Makhan, 2012)

Genus *Lochmaea* Weise, 1883

Lochmaea limbata Pic, 1898

Distribution: FA (Bezdek, 2004)

General distribution: Iran, Israel, Jordan, Syria and Turkey (Beenen, 2010).

***Lochmaea machulkai* Roubal, 1926**

Distribution: GO, MN, EA (Bezděk, 2004)

Comment: All previously published data of *Lochmaea crataegi* Forster, 1771 by Berti and Rapilly (1973) and Medvedev (1975) from Iran refer to *L. machulkai* based on Bezděk (2004).

General distribution: Caucasian part of Russia, Armenia, Azerbaijan, Georgia, Iran and Turkey (Bezděk, 2004; Beenen, 2010).

Genus *Radymna* Reitter, 1913

***Radymna fischeri* (Faldermann, 1837)**

Distribution: FA, KE, SM (Borumand, 2000)

General distribution: Russia (South European territory), Azerbaijan, Georgia, Iran, Turkmenistan and Turkey (Beenen, 2010 and 2014).

Radymna latifrons* Beenen, 2014

Distribution: KE, SM (Beenen, 2014)

***Radymna maculicollis* Beenen, 2014**

Distribution: CM (Beenen, 2014)

General distribution: Iran, Israel and Turkey (Beenen, 2014).

***Radymna quadrimaculata* (Redtenbacher, 1850)**

Distribution: FA, CM, KB (Beenen, 2014)

General distribution: Iran, Turkey (Beenen, 2014).

***Radymna persica* (Faldermann, 1837)**

Distribution: KE, QZ, FA (Lopatin, 1981); BS, FA, IL, LO, SB (Borumand, 2000); AL, BS, FA, GO, HD, HG, KE, RK, QZ, SB, WA, YA, ZA (Beenen, 2014).

General distribution: Gorgia, Armenia, Greece, Azerbaijan, Afghanistan, Iran, Israel, Pakistan, Syria, Turkey, Kazakhstan and China (Xinjiang) (Beenen, 2010).

Genus *Theone* Gistel, 1857

***Theone octocostata afghanistanica* Mandl, 1968**

Distribution: FA, KE, RK (Borumand, 2000)

Comment: This species is omitted in the catalogue of Palaearctic Coleoptera (Beenen, 2010). Seven specimens are deposited in JAZM.

General distribution: Afghanistan (Beenen, 2010) and Iran.

***Theone silphoides silphoides* Dalman, 1823**

Distribution: EA (Lopatin, 2010)

General distribution: Russia (South European territory), Azerbaijan, Iran and Kazakhstan (Beenen, 2010 and 2014).

Genus *Xanthogaleruca* Laboissiere, 1934

***Xanthogaleruca luteola* (Müller, 1766)**

Distribution: AL (Berti & Rapilly, 1973; Azmayesh-Fard & Esmaili, 1981; Mirzaei et al., 2015); MN, TE (Lopatin, 1981); AR, ES, FA, KE, MK, MN, TE (Borumand, 2000); ZA (in this study)

Comment: 12 specimens are deposited in JAZM.

Material examined:

Iran, Prov. Zanjan (ZA), 8♂♂ and 11♀♀, 36°44'10" N 48°31'24" E, Amand village, 2131 m a.s.l., 25 v 2015, leg. M. Mirzaei.

General distribution: from Portugal to Iran and Middle Asia; Algeria and Morocco (Beenen, 2010).

Tribe HYLASPINI Chapuis, 1875

Genus *Agelastica* Chevrolat, 1836

***Agelastica alni* Linnaeus, 1758**

Distribution: TE (Berti & Rapilly, 1973); GI, GO, MN (Borumand, 2000); AL (Mirzaei et al., 2015); QZ (in this study)

Comment: Between two subspecies belonging to this species, only *Agelastica alni alni* (Linnaeus, 1758) reported from Iran. 12 specimens are deposited in JAZM.

Material examined:

Iran, Prov. Qazvin (QZ), 2♀♀, 36°48'13" N 49°24'45" E, Roudbar city, 207 m a.s.l. 19 v 2015, leg. M. Mirzaei.

General distribution: from Ireland and South Scandinavia to Caucasus, Asia Minor and Iran (Beenen, 2010).

Tribe LUPERINI Gistel, 1848

Subtribe AULACOPHORINA Chapuis, 1875

Genus *Aulacophora* Chevrolat, 1836

***Aulacophora foveicollis* (P. H. Lucas, 1849)**

Distribution: AL, TE, QZ (Mirzaei et al., 2015); FA, IL, KE, KZ, KB, LO, SM, SB, TE, YA (Borumand, 2000)

Comment: Eight specimens are deposited in JAZM.

General distribution: France, Italy, Portugal, Spain, Greece, Egypt, Cyprus, Afghanistan, Iran, Israel, Oman, Saudi Arabia, Kuwait and Russia (Southern European territory), Syria, Turkey, Yemen (Beenen, 2010; Warchalowski, 2010).

Subtribe LUPERINA Chapuis, 1875

Genus *Calomicrus* Dillwyn, 1829

***Calomicrus kaszabi* (Lopatin, 1963)**

Distribution: TE (Lopatin, 1981 and 1985)

General distribution: Afghanistan, Iran (Beenen, 2010; Warchalowski, 2010).

***Calomicrus ophthalmicus* (Ogloblin, 1936)**

Distribution: KE (Ogloblin, 1936); SB (Borumand, 2000)

General distribution: Afghanistan, Iran, Oman and Saudi Arabia (Beenen, 2010; Warchalowski, 2010).

Calomicrus velai* Bezděk, 2013

Distribution: GI (Bezděk et al., 2013)

Calomicrus wilcoxi* Lopatin, 1984

Distribution: FA (Lopatin, 1984)

Genus *Exosoma* Jacoby, 1903

***Exosoma lusitanicum* (Linnaeus, 1767)**

Distribution: FA (Lopatin, 1986); AL (in this study)

Material examined:

Iran, Prov. Alborz (AL), 2♂♂ and 4♀♀, 36°10'6" N, 50°45'40" E, Taleqan region, 17 v 2015, leg M. Mirzaei.

General distribution: France, Italy, Portugal, Spain, Switzerland, Algeria, Morocco, Tunisia and Iran (Beenen, 2010; Warchalowski, 2010).

***Exosoma thoracicum* (Redtenbacher, 1843)**

Distribution: EA, HD, QZ, IL, KR, KZ, TE (Borumand, 2000); AL (in this study)

Comment: This species is omitted in the catalogue of Palaearctic Coleoptera (Beenen, 2010). 11 specimens are deposited in JAZM.

Material examined:

Iran, Prov. Alborz (AL), 1♂ and 1♀, 34°16'59" N, 50°31'33" E, Nazarabad, 8 vii 2012, leg M. Mirzaei.

General distribution: Albania, Greece, Israel, Syria, Turkey (Beenen, 2010) and Iran.

Genus *Falsoexosoma* Pic, 1926

***Falsoexosoma cyanipenne* Reitter, 1902**

Distribution: MN (Ogloblin, 1936); GI, GO (Borumand, 2000); AL (Mirzaei et al., 2015).

Comment: Two specimens are deposited in JAZM.

General distribution: Azerbaijan, Azores, Iran and Turkmenistan (Beenen, 2010).

Genus *Luperus* Geoffroy, 1762

***Luperus kiesenwetteri* Joannis, 1865**

Distribution: MN (Sobhian, 1976)

Comment: This species is omitted in the catalogue of Palaearctic Coleoptera (Beenen, 2010).

General distribution: Azerbaijan, Syria, Russia (south European territory), Kazakhstan (Beenen, 2010; Warchalowski, 2010) and Iran.

***Luperus orientalis* Faldermann, 1837**

Distribution: MN (Medvedev, 1975)

Comment: In The taxonomic status of this species has been the subject of controversy among specialists, because in both Coleopterorum Catalogue (Wilcox, 1971-1975) and in the Catalogue of the Palaearctic Coleoptera (Beenen, 2010) this species was included in *Calomicrus*, while other recent authors (Warchalowski, 2003, 2010; Lopatin et al., 2004) included it in *Luperus*. So, it became necessary to study this species in more detail. It became clear that in this species third antennal segment has elongate and much longer than second antennal segment.

General distribution: Azerbaijan, Russia (south European territory), Iran and Turkmenistan (Beenen, 2010).

Luperus perlucidus* Iablokoff-Khnzorian, 1956*

(Figure 2 A-B)

Distribution: AL (in this study)

Comment: This is first report from Iran (Fig. 1).

Material examined:

Iran, Prov. Alborz (AL), 4♂ and 3♀, 35°54'27" N, 51°9'41" E, Khor village, 6 vi 2015, leg M. Mirzaei.

General distribution: Armenia, Turkey (Beenen, 2010) and Iran.



FIGURE 2. Dorsal (A) and ventral (B) view of *Luperus perlucidus* Iablokoff-Khinzorian, 1956.

Luperus silfverbergi* Lopatin, 1984

Distribution: KB (Lopatin, 1984); AL (in this study)

Material examined:

Iran, Prov. Alborz (AL), 2♂ and 7♀, 35°54'27" N, 51°9'41" E, Khor village, 6 vi 2015, leg M. Mirzaei.

Genus *Monolepta* Chevrolat, 1836

Monolepta impressipennis* Ogloblin, 1936

Distribution: SB (Ogloblin, 1936)

Comment: Ogloblin (1936) adds one more locality for this species as Ethiopia. In our opinion, it is strange and on the other hand base on the catalogue of palaeartic Coleoptera, vol. 6 (Beenen, 2010) this species is endemic to Iran. So we are think that this is misidentified to Ethiopia.

Genus *Nymphius* Weise, 1900

Nymphius gianassoi* Bezděk, 2008

Distribution: WA (Bezděk, 2008)

***Nymphius lydius* Weise, 1886**

Distribution: MN (Berti & Rapilly, 1973)

General distribution: Armenia, Bulgaria, Greece, Iran and Turkey (Beenen, 2010; Warchalowski, 2010).

***Nymphius stylifer* (Weise, 1899)**

Distribution: KD (Bogatchev, 1947); ES (Borumand, 1999; Bezděk, 2007); WA, QZ (Bezděk, 2008); AL (Mirzaei et al., 2015)

Comment: In this species, two subspecies *Nymphius stylifer ogloblini* Bogatchev, 1947 [Distribution: WA, QZ (Bezděk, 2008); WA (Bezděk, 2007); ES (Bezděk, 2007); KD (Bogatchev, 1947)] and *Nymphius stylifer stylifer* (Weise, 1899) [Distribution: WA (Bezděk, 2008)] is reported from Iran.

Material examined:

Iran, Prov. Alborz (AL), 3♂♂ and 1♀ of *Nymphius styliifer ogloblini*, 35°54'27" N, 51°9'41" E, Khor village, 6 vi 2015, leg M. Mirzaei.

General distribution: Armenia, Iran and Turkey (for subspecies *ogloblini*); Azerbaijan, Armenia, Georgia, Eastern Carpathians, Turkey and Iran (for subspecies *styliifer*) (Beenen, 2010; Warchalowski, 2010; Bezděk, 2008).

Genus *Phyllobrotica* Chevrolat, 1836

***Phyllobrotica frontalis* Weise, 1886**

Distribution: FA, KB, LO (Bezděk, 2010); FA (Lopatin, 1986)

General distribution: Iran, Syria and Turkey (Beenen, 2010).

***Phyllobrotica malinka* Bezděk, 2010**

Distribution: FA (Bezděk, 2010)

General distribution: Iran and Turkey (Bezděk, 2010).

Genus *Euluperus* Weise, 1886

Euluperus pseudoaltaicus* (Medvedev, 1975)

Distribution: MN (Medvedev, 1975; Beenen & Bezděk, 2006; Bezděk, 2015).

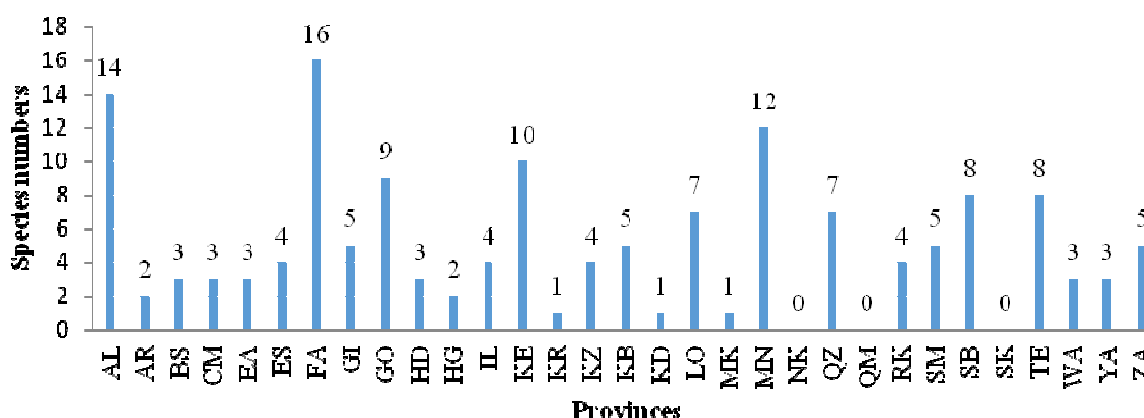


FIGURE 3. Frequency species of subfamily Galerucinae s. str. in all provinces of Iran

DISCUSSION

In total, 44 species are presented for Iranian Galerucinae s. str., of which 11 species are endemic. Fars province with 16 species had the most diversity (Fig. 3). In North Khorasan, Qom and South Khorasan provinces there were not any report of Galerucinae s. str. Therefore this could be more interesting for researchers to work on Chrysomelidae in the mentioned regions. Based on this research, the most frequent found species in Iran was *Radymna persica* (Faldermann, 1837) that existed in 15 provinces. According to this study, *Galeruca pomonae* (Scopoli, 1763), *Galerucella nymphaeae* (Linnaeus, 1758), *Theone octocostata afghanistanica* Mandl, 1968, *Exosoma thoracicum* (Redtenbacher, 1843) and *Luperus kiesewetteri* Joannis, 1865 which had been omitted in the volume 6 of the Catalogue of Palaearctic Coleoptera, subfamily Galerucinae (Beenen, 2010), should be added in the future version of this book. Additionally, *Luperus perlucidus* Iablokoff-Khinzorian, 1956 was a new record for Iranian fauna of Chrysomelidae. According to this new record and considering the

diversity of host plants and climates in Iran, we must continue our field research in order to make a comprehensive data of Iranian chrysomelids.

Finally, in this paper we did not mention out the doubtful or uncertain papers that were published by some inexpert authors; for example *Luperus flavipennis* Lucas, 1849, which was reported by Ghahari and Hawkeswood (2011), was very probably a misidentification, because this species occurs in Morocco and Algeria and surely not in Iran. Unfortunately, this species has not been deposited in any museum or collections for further evaluation. Thus, we decided to compile all available data and create a comprehensive catalogue of the subfamily Galerucinae s. str of Iran.

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