



## A survey on the click beetles (Coleoptera, Elateridae) in the province of Kurdistan (Iran), with three new records for the Iranian fauna

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**ABSTRACT.** This study was carried out in the province of Kurdistan (Iran) during April to August 2015 in order to document the click beetle fauna (Coleoptera: Elateridae) of this region. The specimens were collected using sticky traps, window traps and pan traps. Fifteen species from six genera were identified, of which three species are new for the fauna of Iran: *Melanotus krauchenkoi* Platia, 2010, *Melanotus orbachorum* Platia, 2010 and *Melanotus chikatunovi* Platia, 2010. In addition, nine species are recorded from the province of Kurdistan for the first time. Brief diagnoses for the new record species from Iran and zoogeographical information for all species are provided.

**Key words:** Click beetles, fauna, Iran, Kurdistan province, zoogeography

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### Introduction

The Elateridae is one of the largest families of the Coleoptera with more than 10,000 described species worldwide (Platia & Ghahari, 2016). Various studies were carried out on Iranian fauna of the Elateridae in the past (e.g. Cate et al., 2002; Platia et al., 2002; Bagheri et al., 2004a, 2004b; Platia & Gudenzi, 2005, 2006; Mertlik & Dusanek, 2006; Nasserzadeh et al., 2008, Platia & Németh, 2011; Gholikhajeh et al., 2012; Farhangian et al., 2013; Mardjanian et al., 2013; Mertlik & Németh, 2014; Németh & Platia, 2014; Platia & Ghahari, 2016; Mardjanian & Barimani, 2017; Nasserzadeh et al., 2018; Kundrata et al., 2019). According to the latest research of the click-beetles of Iran, 246 species were recorded from Iran (Platia & Ghahari, 2016; Kundrata et al., 2019). In this paper, three species are added to known fauna of Iranian Elateridae.

### Material and methods

The material was collected from different parts of Kurdistan Province (Iran) with different types of vegetation (rangelands, oak forests and gardens) by using different traps such as sticky traps,

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window traps and pan traps (Fig. 1). Data on the total distribution of beetles are given according to the Catalogue of Palaearctic Coleoptera (Cate, 2007), their original descriptions and reviews (Gurjeva, 1979; Marjanyan, 1987; Gurjeva, 1988; Platia, 2010). All specimens are deposited in the Collection of Invertebrates of the National Academy of Sciences of Armenia (CINASA).



**Figure 1.** Map of the sampling area of click beetles in Kurdistan. Red stars indicate the sampling locations.

## Results

Fifteen species belong to six genera are listed as follows. Details on the collecting localities and the general distribution and distribution in Iran are given for all species.

### Subfamily Agrypninae Candèze, 1857

#### *Lacon punctatus* (Herbst, 1779)

**Material examined:** IRAN, Kurdistan prov., Marivan-Sarvabad, (35°17'41" N, 46°22'25" E, 1160 m), 19.viii.2015, oak forest, 1♀, 2♂♂, leg. H. Ghobari (CINASA).

**General distribution:** Armenia, Azerbaijan, Bosnia Herzegovina, Bulgaria, Croatia, Russia: Central and South European Territory, Czech Republic, France, Germany, Georgia, Greece, Hungary, Italy, Malta, Portugal, Slovakia, Slovenia, Spain, Switzerland, Turkey, Ukrain, Serbia, Montenegro, Cyprus, Jordan, Syria, Morocco (incl. Western Sahara) (Cate, 2007), new record for Iran.

#### *Drasterius bimaculatus* (P. Rossi, 1790)

**Material examined:** IRAN, Kurdistan prov., Marivan-Garan, (35°32'02" N, 46°18'05" E, 1350 m), 18.vi.2015, oak forest, 3♀♀, 3♂♂, leg. H. Ghobari. (CINASA). IRAN, Kurdistan prov., Marivan-Sarvabad, (35°17'41" N /46°22'25" E, 1160 m), oak forest, 11.vii.2015, 2♀♀, 4♂♂, leg.

H. Ghobari, (CINASA). IRAN, Kurdistan prov., Sanandaj-Noshor, (35°01'39" N, 46°56'05" E, 1460 m), garden, 04.vii, 01.viii, and 16.viii.2015, 4♀♀, 1♂, leg. H. Ghobari, (CINASA).

**General distribution:** Albania, Armenia, Austria, Azerbaijan, Belgium, Bosnia Herzegovina, Bulgaria, Croatia, Russia: Central and South European Territory, Czech Republic, France (incl. Corsica, Monaco), Germany, Georgia, Greece (incl. Crete), Hungary, Italy (incl. San Marino, Sardinia, Sicily), Malta, Macedonia, Moldavia, Poland, Portugal, Romania, Slovakia, Slovenia, Spain (incl. Gibraltar), Switzerland, Ukraine, Yugoslavia (Serbia, Montenegro), North Africa: Algeria, Canary Islands, (Lanzarote) Egypt, Libya, Morocco (incl. Western Sahara), Tunisia, Asia: Afghanistan, Cyprus, Iran, Iraq, Israel, Jordan, Kazakhstan, Kyrgyzstan, Syria, Turkey, Turkmenistan, Uzbekistan (Cate, 2007).

**Distribution in Iran:** Alborz, Ardabil, Golestan, Sistan & Baluchestan, West Azarbaijan, Chaharmahal & Bakhtiari, Qom, East Azarbaijan, Guilan, Mazandaran, Isfahan, Tehran, Fars, Golestan, Hamadan, Kermanshah, Northern Khorasan (Platia & Ghahari, 2016), new record for Kurdistan.

#### Subfamily Elaterinae Leach, 1815

##### *Betarmon bisbimaculatus* (Fabricius, 1803)

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Noshor, (35°01'39" N, 46°56'05" E, 1460 m), garden, 04.vii.2015, 2♀♀, 2♂♂, leg. H. Ghobari, (CINASA).

**General distribution:** Armenia, Austria, Azerbaijan, Bulgaria, Croatia, Czech Republic, France (incl. Corsica, Monaco), Germany, Georgia, Hungary, Italy (incl. San Marino, Sardinia, Sicily), Poland, Romania, Slovakia, Slovenia, Spain (incl. Gibraltar), Switzerland, Ukraine, Yugoslavia (Serbia, Montenegro), Asia: Iran, Turkey (Cate, 2007).

**Distribution in Iran:** Guilan, Sistan & Baluchestan, Mazandaran, Golestan (Platia & Ghahari, 2016), new record for Kurdistan.

##### *Synaptus filiformis* (Fabricius, 1781)

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Noshor, (35°01'39" N, 46°56'05" E, 1460 m), garden, 11.vii, 01.viii, and 16.viii.2015, 1♀, 1♂, leg. H. Ghobari, (CINASA).

**General distribution:** Albania, Armenia, Austria, Azerbaijan, Belgium, Bosnia Herzegovina, Bulgaria, Belarus, Croatia, Russia: Central and South European Territory, Czech Republic, Estonia, France (incl. Corsica, Monaco), Germany, Georgia, Great Britain (incl. Channel Islands), Greece (incl. Crete), Hungary, Italy (incl. San Marino Sardinia, Sicily), Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Moldavia, The Netherlands, Poland, Portugal, Romania, Slovakia Slovenia, Spain (incl. Gibraltar), Switzerland, Ukraine, Yugoslavia (Serbia, Montenegro), Asia: Iran, Kazakhstan, Syria, Turkey (Cate, 2007), Lebanon, Tadjikistan (Platia, 2010).

**Distribution in Iran:** Guilan, Isfahan, Mazandaran (Platia & Ghahari, 2016), new record for Kurdistan.

##### *Adrastus dolini* Wellschmied, 1978

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Noshor, (35°01'39" N, 46°56'05" E, 1460 m), garden, 14.viii.2015, 1♀, 2♂♂, leg. H. Ghobari, (CINASA).

**General distribution:** Azerbaijan, Georgia, Russia: South European Territory, Asia: Iran, Turkey (Cate, 2007).

**Distribution in Iran:** Mazandaran (Platia & Ghahari, 2016), new record for Kurdistan.

*Melanotus castanipes* (Paykull, 1800)

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Saral station, (35°40'18" N, 47°07'07" E, 2070 m), rangeland, 20.vi.2015, 2♀♀, 2♂♂, leg. H. Ghobari, (CINASA).

**General distribution:** Austria, Belgium, Bosnia Herzegovina, Bulgaria, Belarus, Croatia, Russia: North and Central, South European Territory, Czech Republic, Denmark, Estonia, Finland, France (incl. Corsica, Monaco), Great Britain (incl. Channel Islands), Germany, Georgia, Greece (incl. Crete), Hungary, Italy (incl. San Marino, Sardinia, Sicily, ), Latvia, Liechtenstein, Lithuania, Luxembourg, Norway, Poland, Romania, Slovakia, Slovenia, Spain (incl. Gibraltar), Sweden, Switzerland, Ukraine, Yugoslavia (Serbia, Montenegro) Asia: China [Sichuan (Szechwan), Shanxi (Shansi), Yunnan], India: Uttaranchal, Iran, Jilin (Kirin), Pakistan, Turkey, , Uttar, Russia: west Siberia, (Cate, 2007).

**Distribution in Iran:** Guilan, Mazandaran (Platia & Ghahari, 2016), new record for Kurdistan.

*Melanotus monticola* Menetries, 1832

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Saral station, (35°40'18" N, 47°07'07" E, 2070 m), rangeland, 19.viii.2015, 3♀♀, 1♂, leg. H. Ghobari, (CINASA).

**General distribution:** Armenia, Azerbaijan, Bulgaria, Georgia, Russia: South European Territory, Asia: Iran, Turkey (Cate, 2007).

**Distribution in Iran:** East Azarbaijan, Mazandaran (Platia & Ghahari, 2016), new record for Kurdistan.

*Melanotus fulvus* Reitter, 1891

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Saral station, (35°40'18" N, 47°07'07" E, 2070 m), rangeland, 11.vii.2015, 1♀, 1♂, leg. H. Ghobari, (CINASA).

**General distribution:** Iran, Iraq, Turkmenistan (Cate, 2007).

**Distribution in Iran:** Alborz, Northern Khorasan, Razavi Khorasan, Fars, Kuhgiluyeh & Boyerahmad, Razavi Khorasan (Platia & Ghahari, 2016), new record for Kurdistan.

*Melanotus chikatunovi* Platia, 2010

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Saral station, (35°40'18" N, 47°07'07" E, 2070 m), rangeland, 19.viii.2015, 2♂♂, leg. H. Ghobari, (CINASA); Kurdistan prov., Sanandaj-Noshor, (35°01'39" N, 46°56'05" E, 1460 m), garden, 19.viii.2015, 1♂, leg. H. Ghobari, (CINASA).

**General distribution:** Israel (Platia, 2010), New record for Iran.

**Diagnostic characters:** The body is reddish brown entirely and covered with dense and long yellow vestiture that is erect at sides of elytra partially. The width of the pronotum is greater than its length. Scutellum is plate-shaped and dotted, elytra have the same width of pronotum. The species is similar to *M. fulvus* Reitter in color and overall shape of body

However; it can be distinguished by its larger body and longer antennae than *M. fulvus* Reitter the species (Platia, 2010). Body length: 12.5-13 mm.

#### *Melanotus kravchenkoi* Platia, 2010

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Saral station, (35°40'18" N, 47°07'07" E, 2070 m), rangeland, 19.viii.2015, 2 ♂♂, leg. H. Ghobari, (CINASA).

**General distribution:** Palestine, Israel (Platia, 2010), new record for Iran.

**Diagnostic characters:** very similar to *M. chikatunovi* the body is bright fairly and entirely dark brown, Like *M. chikatunovi* Platia, the body is covered with dense and long yellow vestiture (pubescens) that is erect at sides of elytra partially but can be distinguished by darker color and more elevated carina of posterior angles of pronotum (Platia, 2010). Body length: 11-12 mm .

#### *Melanotus dichroides* Platia & Gudenzi, 1999

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Noshor, (35°01'39" N, 46°56'05" E, 1460 m), garden, 19.viii.2015, 1♀, 1♂, leg. H. Ghobari, (CINASA).

**General distribution:** Iran (Cate, 2007; current study).

**Distribution in Iran:** Guilan (Platia & Ghahari, 2016), new record for Kurdistan.

#### *Melanotus orbachorum* Platia, 2010

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Saral station, (35°40'18" N, 47°07'07" E, 2070 m), rangeland, 11.vii.2015, 1♂, leg. H. Ghobari, (CINASA); Kurdistan prov., Sanandaj-Noshor, (35°01'39" N, 46°56'05" E, 1460 m), garden, 19.viii.2015, 1♀, 1♂, leg. H. Ghobari, (CINASA).

**General distribution:** Israel (Platia, 2010), New record for Iran.

**Diagnostic characters:** The body is black completely antennae and legs is dark brown and covered with fine pubescence and erected on head and pronotum. The width of the pronotum is greater than its length, Pronotum 1,2x wider than long. Scutellum is plate-shaped and dotted, elytra are longer than pronotum but they are the same width. Scutellum is shaped like a tongue. Elytra are punctured and have distinct striae. body covered with dense, yellowish vestiture (Platia, 2010). Body length: 14-17.5 mm.

#### *Melanotus fusciceps* (Gyllenhal, 1817)

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Saral station, (35°40'18" N, 47°07'07" E, 2070 m), rangeland, 27.vii.2015, 1♂♂, leg. H. Ghobari, (CINASA).

**General distribution:** Azerbaijan, Armenia, Azores, Bulgaria, Croatia, Russia: Central European Territory, Georgia, Macedonia, Moldavia, Romania, Russia: South European Territory, Ukraine, Cyprus, Kazakhstan, Iran, Iraq, Israel, Lebanon, Syria, Turkey (Cate, 2007).

**Distribution in Iran:** Ardabil, Chaharmahal & Bakhtiari, Isfahan, Markazi, Bushehr, Fars, Qazvin, West Azarbaijan, Zanzan, Golestan, Fars (Platia & Ghahari, 2016), new record for Kurdistan.

### Subfamily Cardiophorinae (Candeze, 1860)

#### *Cardiophorus nigratissimus* Buysson, 1891

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Saral station, (35°40'18" N, 47°07'07" E, 2070 m), rangeland, 20.06., 11.07. and 27.vii.2015, 2♀♀, 2♂♂, leg. H. Ghobari, (CINASA); Kurdistan prov., Sanandaj-Noshor, 35°01'39" N, 46°56'05" E, 1460 m, garden, 19.viii.2015, 2♀♀, 2♂♂, leg. H. Ghobari, (CINASA).

**General distribution:** Azerbaijan, Armenia, Georgia Iran, Iraq, Syria, Turkmenistan, Turkey (Cate, 2007).

**Distribution in Iran:** Bushehr, East Azarbaijan, Khuzestan, Zanjan, Chaharmahal & Bakhtiari, Fars, Qazvin, Tehran, Golestan, Fars, Guilan, Hamadan, Kurdistan, Lorestan, West Azarbaijan, Zanjan (Platia & Ghahari, 2016).

#### *Cardiophorus magnanii* Platia, Furlan & Gudenzi, 2002

**Material examined:** IRAN, Kurdistan prov., Sanandaj-Noshor, 35°01'39" N, 46°56'05" E, 1460 m, garden, 14.viii.2015, 3♀♀, 3♂♂, leg. H. Ghobari, (CINASA).

**Distribution:** Iran (Cate, 2007; current study).

### Discussion

This study provides additional zoogeographical data for the click beetle fauna of Kurdistan from the field. With three new records that have been documented in this study, the number of known click beetle species in Iran has increased to 249.

The heterogeneity of geography and microclimates in Iran has furnished a unique diversity of flora and vegetation cover across the country. This in turn seems to enhance the trends of diversity for many insects' families such as Elateridae. The results of this study demonstrate the urgent need for a more extensive and a long-term collection of click beetles across Iran. It also highlights the importance of involving regional taxonomic expertise in these studies.

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### Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

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## مطالعه سخت بالپوشان خانواده Elateridae Leach, 1815 در استان کردستان و سه گزارش جدید برای فون ایران

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**چکیده:** این مطالعه بر اساس بررسی نمونه های جمع آوری شده متعلق به خانواده سخت بالپوشان خانواده Elateridae از عرصه های طبیعی استان کردستان در طول ماه های اردیبهشت تا شهریور ماه سال ۱۳۹۴ انجام گرفته است. در طی این تحقیق از روش های مختلف شامل تله پنجره ای، تله های سطلی و چسبنده رنگی برای جمع آوری نمونه ها استفاده شد. بر اساس نتایج بدست آمده ۱۵ گونه از ۶ جنس شناسایی شدند، که از این تعداد ۳ گونه از آنها که شامل گونه های *Melanotus chikatunovi* Platia, 2010، *Melanotus orbachorum* Platia, 2010 و *M. kravchenkoi* Platia, 2010 برای فون ایران جدید تشخیص داده شدند. علاوه بر این ۹ گونه نیز برای اولین بار از استان کردستان گزارش شد. در این تحقیق خلاصه ای از خصوصیات مهم تشخیصی هر کدام از گونه های جدید برای فون ایران و همچنین پراکنش جغرافیایی هر کدام از گونه های جمع آوری شده، ارائه شده است.

**واژگان کلیدی:** سوسک های پشتکزن، فون، ایران، استان کردستان، جغرافیای جانوری