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Entomofauna

ZEITSCHRIFT FÜR ENTOMOLOGIE

Band 34, Heft 15: 193-200 ISSN 0250-4413 Ansfelden, 2. Januar 2013

A faunal study on the subfamilies Harpalinae and Lebiinae (Coleoptera: Carabidae) in Guilan province, Iran

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Abstract

The ground beetles of Carabidae are one of the largest families of beetles. They comprise 1.500 genera and about 30.000 described species distributed worldwide. This research is a faunal study on the subfamilies Harpalinae and Lebiinae (Coleoptera: Carabidae) collected from different regions of Guilan province. In total 15 species belonging to 11 genera were collected and identified from 16 different localities.

Key words: Fauna, Harpalinae, Lebiinae, Carabidae, Guilan province, Iran.

Zusammenfassung

Die Laufkäfer (Carabidae), sind eine der größten Käferfamilien. Sie umfassen 1.500 Gattungen und etwa 30.000 weltweit beschriebene Arten. Diese Arbeit ist eine faunistische Studie der Familien Harpalinae und Lebiinae (Coleoptera: Carabidae) welche in verschiedenen Regionen der Provinz Guilan gesammelt wurden. Insgesamt wurden von 16 verschiedenen Fundorten 15 Arten, welche 11 Gattungen angehören, gesammelt und bestimmt.

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Introduction

Carabid beetles (Coleoptera: Carabidae) are one of the rich species families in the order of Coleoptera and abundant in arable habitats. Adults and larvae of carabid beetles are polyphagous and important natural enemy on many agricultural pests. Their food list contains a wide range of aphids, dipteran eggs, larvae and pupae, eggs and larval stages of insects and even slugs (KROMP 1999). The subfamily Harpalinae is the largest (about 19.000 species), worldwide distributed and multiformous group of beetles, which are abundant in the subtropical areas (LINDROTH 1986, OBER 2002). Lebiinae is another subfamily of this family that is recognized from subfamily Harpalinae by different features including elytra feature, elytra with apex transversally or obliquely truncate, at least last abdominal segment partly visible from above (TRAUTNER & GEIGENMÜLLER 1987).

The carabid beetle fauna of Iran has poorly been studied. However, a number of publications have been published on Iranian beetles in different regions (HEJKAL 2000; LASSALLE 2001; JAEGER 1990, 1992; HEINZ 2002; FALLAHZADEH et al. 2005; MOHAMMADZADEH FARD & HODJAT 2008; MUILWIJKAND & FELIX 2008; SADEGHI NAMAGHI et al. 2010, 2011).

As a part of an extensive research on Carabid beetles in Guilan, the aim of this study was to collect and identify the species of the subfamilies Harpalinae and Lebiinae in Guilan province.

Some Information about Guilan Province

Topography of Guilan

The Guilan province (36˚36'-38˚ 27' N, 48˚30'-50˚30' E; total area 14.709 km²) is located on the southern coast of the Caspian Sea (LINNAVUORI & HOSSEINI 2000). This province neighbors with Mazandaran province in the East, Ardabil province in the West, Caspian Sea in the north and Zanjan province in the South. The capital of this province is Rasht, where consists 16 cities (Ministry of Interior, Guilan portal 2012). Guilan province consists of coastal and central plains (altitude from -25m u.s.l. at Astara up about 1000 m a.s.l), which are bordered by mountain ranges (Maximum altitude about 3000m), the Talesh, Masuleh and Poshtekuh mountains in the West and the Alborze (Elburze) mountains in the South. The mountain ranges are traversed by the Sefid Rud valley in Central Guilan (LINNAVUORI & HOSSEINI 2000).

Climatography of Guilan

Owing to the influence of the Caspian Sea and the topography, the climate in Guilan is unique in the Middle East. The annual rainfall in Rasht is about 1.300 mm and in the seaside of the mountains even 2.000mm or more. In the inland side of the mountains the rainfall decreases rapidly, and the climate is semiarid resembling that of the neighboring areas of the Zanjan province (LINNAVUORI & HOSSEINI 2000).

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Materials and Methods

This study was carried out at 16 survey sites including: Jouben, Khohmam, Kouchesfahan, Khomeiran (Bandare Anzali), Lahijan, Ghaleroudkhan, Shaft, Miankouh (Talesh), Talesh, Rasht, Roudbar, Astaneh Ashrafyeh, Asalem, Rostamabad, Kalasham (Fouman) and Lowshan in Guilan province in summer 2011. Material was collected by pitfall traps, light traps and directly by hand from the ground, under the stones or trunks and etc. One quarter of each pitfall trap was filled by water or ethanol 70 %. In some pitfall traps a piece of meat (obtained from butchery) was placed, to attract the beetles.

All specimens were identified by using relevant taxonomic keys (TRAUTNER & GEIGENMÜLLER 1987; LINDROTH 1985, 1986; LAROCHELLE & LARIVIERE 2007; BOUSQUET 2010). All specimens were sent to Dr. R. Felix (Berkel Enschot, The Netherlands) for confirmation of identifications.

All specimens were deposited in the department of Plant Protection, College of Agriculture, University of Guilan, Rasht, Iran.

Results

In this study, a total of 107 specimens belonging to 15 species and 11 genera were collected, *Parophonus dia* is a new record for Iranian fauna. The list of species is as follow:

Subfamily: H a r p a l i n a e BONELLI 1810

Tribe: H a r p a l i n i BONELLI 1810

***Ophonus* (*Hesperophonus*) *subquadratus* (DEJEAN 1829)**

M a t e r i a l e x a m i n e d : 3 specimens, Iran, Guilan province, Rostam abad, June 2011 (171m, 36˚54'02"N, 49˚29'08"E).

D i s t r i b u t i o n : Europe: Bulgaria, Croatia, France, Greece, Italy, Portugal, Spain, Ukraine. North Africa: Algeria. Asia: Armenia, Cyprus, Georgia, Iran, Turkmenistan (LÖBL & SMETANA 2003).

***Ophonus sabulicula* (PANZER 1796)**

M a t e r i a l e x a m i n e d : 7 specimens, Iran, Guilan province, Miankouh (Talesh), August 2011 (-1m, 37˚48'59"N, 48˚56'45"E'), Kouchesfahan, July 2011 (1m, 37˚16'33"N, 49˚45'27"E), Rasht, July 2011 (31m, 37˚11'36"N, 49˚38'27"E).

D i s t r i b u t i o n : Europe: Azerbaijan, Albania, Armenia, Austria, Belgium, Bulgaria, Croatia, France, Germany, Italy, Portugal, Ukraine, former Yugoslavia. Asia: Iran, Iraq, Turkey (LÖBL & SMETANA 2003).

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***Pseudoophonus rufipes* (DEGEER 1774)**

Material examined: 6 specimens, Iran, Guilan province, Khomeiran (Bandare Anzali), August 2011 (-17m, 37˚29'14"N, 49˚15'55"E), Kalasham (Fouman), August 2011 (-2m, 37˚16'14"N, 49˚25'20"E), Miankouh (Talesh), August 2011 (-1m, 37˚48' 59"N, 48˚56'45"E), Roudbar, July 2011 (229m, 36˚49'32"N, 49˚25'45"E), Talesh, September 2011 (98m, 37˚48'36"N, 48˚54'15"E).

Distribution: Europe: Albania, Austria, Belgium, Bulgaria, Croatia, Denmark, Greece, Italy, Russia (Central Europe Territory), Sweden. North Africa: Algeria, Morocco, Tunisia. Asia: Afghanistan, Armenia, Azerbaijan, Cyprus, Georgia, Iran, Iraq, Kyrgyzstan, Tadzhikistan, Turkmenistan, Turkey, Uzbekistan (LÖBL & SMETANA 2003).

***Pseudoophonus griseus* (PANZER 1796)**

Material examined: 3 specimens, Iran, Guilan province, Miankouh (Talesh), August 2011 (-1m, 37˚48'59"N, 48˚56'45"E), Astaneh Ashrafyeh, July 2011 (-11m, 37˚16'38"N, 49˚56'40"E).

Distribution: Europe: Albania, Austria, Azores, Belgium, Croatia, Denmark, England, France, Greece, Hungary, Italy, Norway, Poland, Portugal, Slovenia, Ukraine, former Yugoslavia. North Africa: Algeria, Egypt, Morocco, Tunisia. Asia: Afghanistan, Armenia, Azerbaijan, Cyprus, Iran, Iraq, Kyrgyzstan, Russia (East and West Siberia), South Korea, Tadzhikistan, Uzbekistan (LÖBL & SMETANA 2003).

***Parophonus dia* (REITTER 1900)**

Material examined: 6 specimens, Iran, Guilan province, Ghaleroudkhan, September 2011 (677m, 37˚03'51"N, 49˚14'23"E), Miankouh (Talesh), August 2011, (-1m, 37˚48'59"N, 48˚56'45"E), Khomam, August 2011(-17m, 37˚22'28"N, 49˚38'44"E), Rostamabad, June 2011 (171m, 36˚54'02"N, 49˚29'08"E).

Distribution: Asia: Cyprus (LÖBL & SMETANA 2003), Turkey (AVGIN & ISKENDRI 2007). New record for the Iranian fauna.

***Stenolophus abdominalis persicus* (MANNERHEIM 1844)**

Material examined: 24 specimens, Iran, Guilan province, Miankouh (Talesh), August 2011, (-1m, 37˚48'59"N, 48˚56'45"E), Khomam, August 2011(-17m, 37˚22'28"N, 49˚38'44"E).

Distribution: Europe: Bulgaria, Croatia, Greece, Hungary, Italy, Romania, Ukraine, former Yugoslavia. Asia: Afghanistan, Armenia, Azerbaijan, Georgia, Iran, Iraq, Kyrgyzstan, Syria, Pakistan, Tadzhikistan, Turkmenistan, Turkey, Uzbekistan (LÖBL & SMETANA 2003).

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***Stenolophus steveni* (KRYNICKI 1832)**

Material examined: 7 specimens, Iran, Guilan province, Astaneh Ashrafyeh, July 2011 (-11m, 37˚16'38"N, 49˚56'40"E), Khomam, August 2011 (-17m, 37˚22'28"N, 49˚38'44"E).

Distribution: Europe: Croatia, Hungary, Romania, Ukraine. Asia: Azerbaijan, Armenia, Georgia, Turkmenistan, Turkey (LÖBL & SMETANA 2003), Iran (WRASE 2005).

***Anisodactylus* (*Pseudanisodactylus*) *signatus* (PANZER 1796)**

Material examined: 13 specimens, Iran, Guilan province, Khomeiran (Bandare Anzali), August 2011 (-17m, 37˚29'14"N, 49˚15'55"E), Kouchesfahan, July 2011 (1m, 37˚16'33"N, 49˚45'27"E), Lahijan, July 2011 (-8m, 37°12'48"N, 50˚0'57"E), Lowshan, July 2011 (271m, 36˚40'04"N, 49˚25'47"E), Shaft, August 2011 (43m, 37˚10'18"N, 49˚24'10"E).

Distribution: Europe: Austria, Belgium, Russia (Central European Territory), Denmark, France, Germany, Hungary, Italy, Norway, Portugal, Slovakia, former Yugoslavia. Asia: China, Cyprus, Georgia, Iran, Japan, Kyrgyzstan, Kazakhstan, North Korea, Pakistan, South Korea, Tadzhikistan, Uzbekistan (LÖBL & SMETANA 2003).

***Anisodactylus binotatus* (FABRICIUS 1787)**

Material examined: 3 specimens, Iran, Guilan province, Khomeiran (Bandare Anzali), August 2011 (-17m, 37˚29'14"N, 49˚15'55"E), Kouchesfahan, July 2011, (1m, 37˚16' 33"N, 49˚45'27"E), Miankouh (Talesh), August 2011 (-1m, 37˚48'59"N, 48˚56'45"E).

Distribution: Europe: Albania, Austria, Azores, Belgium, Bulgaria, Croatia, Russia (Central European Territory), Denmark, England, Faeroe Islands, France, Germany, Hungary, Islands, Latvia, Norway, Poland, Portugal, Slovakia, Slovenia, Ukraine, former Yugoslavia. North Africa: Algeria, Morocco, Madeira Archipelago. Asia: Afghanistan, Armenia, Azerbaijan, Bahrain, Cyprus, Georgia, Kyrgyzstan, Syria, Tadzhikistan, Turkmenistan, Uzbekistan (LÖBL & SMETANA 2003).

***Acinopus laevigatus* (MENETRIES 1832)**

Material examined: 14 specimens, Iran, Guilan province, Jouben, August 2011 (158m, 36˚52'26"N, 49˚29'23"E).

Distribution: Europe: Belgium, Croatia, Romania. Asia: Afghanistan, Azerbaijan, Armenia, Georgia, Iran, Iraq, Kyrgyzstan, Kazakhstan, Tadzhikistan, Turkmenistan, Uzbekistan (LÖBL & SMETANA 2003).

***Dixus obscurus* (DEJEAN 1825)**

Material examined: 1 specimen, Iran, Guilan province, Rostamabad, June 2011 (171m, 36˚54'02"N, 49˚29'08"E).

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Distribution: Europe: Russia (South European Territory). Asia: Afghanistan, Iran, Kyrgyzstan, Kazakhstan, Tadzhikistan, Turkmenistan, Uzbekistan (LÖBL & SMETANA 2003).

***Loxoncus procerus* (SCHAUM 1858)**

Material examined: 5 specimens, Iran, Guilan province, Astaneh Ashrafyeh, July 2011 (-11m, 37°16'38"N, 49°56'40"E), Khomam, August 2011 (-17m, 37°22'28"N, 49°38'44"E).

Distribution: Europe: Albania, Bulgaria, Greece, Italy, Turkey. North Africa: Algeria. Asia: Afghanistan, Azerbaijan, Iran, Kazakhstan, Syria, Turkmenistan, Uzbekistan (LÖBL & SMETANA 2003).

***Bradycellus heinzi* (JAEGER 1990)**

Material examined: 3 specimens, Iran, Guilan province, Rasht, July 2011 (31m, 37°11'36"N, 49°38'27"E).

Distribution: Asia: Azerbaijan, Iran (LÖBL & SMETANA 2003).

Subfamily: Lebiinae BONELLI 1810

Tribe: Lebiini BONELLI 1810

***Lebia scapularis* (GEOFFROY 1785)**

Material examined: 1 specimen, Iran, Guilan province, Lowshan, July 2011 (271m, 36°40'04"N, 49°25'47"E).

Distribution: Europe: Austria, Bulgaria, France, Greece, Hungary, Italy, Poland, Portugal, Romania, Slovenia, Spain, Ukraine, former Yugoslavia. North Africa: Algeria, Morocco, Tunisia. Asia: Azerbaijan, Armenia, Iran, Kyrgyzstan, Tadzhikistan, Turkmenistan, Uzbekistan (LÖBL & SMETANA 2003).

***Apristus reticulatus* (SCHAUM 1857)**

Material examined: 4 specimens, Iran, Guilan province, Rasht, July 2011 (1m, 37°11'36"N, 49°38'27"E).

Distribution: Europe: Bulgaria, Greece, Italy. Asia: Azerbaijan, Iran, Kyrgyzstan, Turkey, Uzbekistan (LÖBL & SMETANA 2003).

Acknowledgements

The authors are grateful to Dr. R. Felix (The Netherlands) for the approval of accurate identification.

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Druck, Eigentümer, Herausgeber, Verleger und für den Inhalt verantwortlich:

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Digitale Literatur/Digital Literature

Zeitschrift/Journal: Entomofauna

Jahr/Year: 2013

Band/Volume: 0034

Autor(en)/Author(s): Salari Gougheri Moslem, Hosseini Reza, Hajizadeh Jalil

Artikel/Article: A faunal study on the subfamilies Harpalinae and Lebiinae (Coleoptera: Carabidae) in Guilan province, Iran 193-200