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The Ground Beetles of the Guilan province, Iran (Coleoptera, Carabidae)

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Abstract

A faunistic study of ground beetles in different locations of the northern region of Iran (Guilan province) was carried out in summer 2011. In this paper 16 species of the family Carabidae are presented.

Zusammenfassung

Im Sommer 2011 wurde eine faunistische Studie über Laufkäfer in verschiedenen Lokalitäten der nordiranischen Provinz Guilan durchgeführt. In dieser Arbeit werden 16 Arten der Familie Carabidae vorgestellt.

Introduction

The beetles (including carabids) are very important elements in all sorts of terrestrial ecosystems, and used in many ecological studies (DESENDER et al. 1991).

There are more studies on Carabidae family because of their importance as generalist predators that feed on a number of invertebrate groups (SUNDERLAND 2002; SYMONDSON 2002; TOFT & BILDE 2002). Investigations on the carabid fauna provide information on the ecosystems degrees of preservation or deterioration and support the climate change

assessment (THIELE 1977; MAGURA et al. 2000; BRANDMAYR et al. 2005). These beetles have been used effectively as a model taxon to evaluate effects of disturbance on diversity (NIEMELA et al. 2000; KOIVULA et al. 2002; MAGURA et al. 2004; VANBERGEN et al. 2005; PEARCE & VENIER 2006). Ground beetles are famous taxonomically, ecologically, and they are sensitive to changes in the environment (KOIVULA et al. 1999; SAINT-GERMAIN & MAUFFETTE 2001; NIEMELA et al. 2000; LAROCHELLE & LARIVIÈRE 2003). With such features, ground beetles are applied as suitable indicators of changing biotic or abiotic conditions of the environment (NIEMELA et al. 2000; RAINIO & NIEMELA 2003; LANGOR & SPENCE 2006). Ground beetles diversity has been studied to show effects caused by urbanization (NIEMELA et al. 2002), forest management (NIEMELA et al. 1993; DU BUS DE WARNAFFE & LEBRUN 2003; KOIVULA & NIEMELA 2003; SAINT-GERMAIN et al. 2005), succession (KOIVULA et al. 2002) and land use (VANBERGEN et al. 2005).

With respect to the mentioned reasons and the importance of carabidae family, faunal study of these beetles is necessary. The Iranian Carabidae fauna is not well known, however a few studies have been conducted such as: AFSHAR 1944; FARAHBAKHS 1961; JAEGER 1990, 1992; MODARRES AWAL 1997; HEJKAL 2000; LASSALLE 2001; HEINZ 2002; FALLAHZADEH et al. 2005; MOHAMMADZADEH FARD 2008; MUILWIJKAND & FELIX 2008; SADEGHI NAMAGHI et al. 2010; SADEGHI NAMAGHI et al. 2011 and SALARI GOUGHERI et al. (2013). This research was conducted accordingly and helps the identification of this family beetles in Guilan province.

Materials and Methods

Collection sites

Specimens were collected from 17 sites including Mardakkeh (Shaft), Khomam, Kouchesfahan, Khomeiran (Bandare Anzali), Lahijan, Ghaleroudkhan, Shaft, Miankouh (Talesh), Talesh, Rasht, Roudbar, Astaneh Ashrafyeh, Asalem, Rostam Abad, Kalasham (Fouman) and Lowshan in Guilan province in summer 2011.

Sampling methods

In this study specimens were collected using the following techniques: pitfall trapping where several plastic pitfall traps with about 6 cm in diameter and 8 cm depth were installed and filled by different materials such as: water; 75% ethanol; or 75% ethanol and rotten meat, light trapping and directly by hand from fallen trees, pieces of wood, logs at the base of trees and the underside of big stones, lifting the loose bark of logs and fallen trees, digging at the base of plants, inspecting soil crevices and the tunnels of small vertebrates, garden compost and etc.

Preparation of specimens

All specimens were put in the plastic containers and labeled with the locality name collection date, collector's name and geographical location then transported to the laboratory. After proper preparation of the specimens, they were identified by valid taxonomical keys. All specimens were sent to Dr. R. FELIX (Berkel Enschoot, The

Netherlands) for confirmation of identifications. All specimens were deposited in the department of Plant Protection, faculty of Agriculture, University of Guilan, Rasht, Iran.

Results

In total 117 specimens of ground beetles belonging to 16 species, 9 genera, 5 tribes and 6 subfamilies were collected from Guilan province.

Subfamily: Carabinae LATREILLE, 1802

Tribe: Carabini LATREILLE, 1802

***Calosoma* WEBER, 1801**

***Calosoma inquisitor cupreum* DEJEAN, 1826**

Material examined: 2 specimens, Guilan province, Gysoum 37° 40' 21" N; 49° 0' 53" E, elev. 2m September 2011, Rasht 37° 11' 36" N; 49° 38' 27" E, elev. 31m, July 2011.

Geographical distribution: Europe: Azerbaijan, Armenia, Russia (South European Territory), Asia: Iran (LÖBL & SMETANA 2003).

***Calosoma (Campalita) auropunctatum dzungaricum* GEBLER, 1833**

Material examined: 2 specimens, Guilan province, Gysoum 37° 40' 21" N; 49° 0' 53" E, elev. 2m September 2011, Asalem 37° 42' 43" N; 48° 57' 37" E, elev. 43m, May 2008.

Geographical distribution: Europe: Greece, Romania, Asia: Afghanistan, Kyrgyzstan (LÖBL & SMETANA 2003), Iran (HOSSEINI et al. 2012)

***Carabus* LINNAEUS, 1758**

***Carabus sculpturatus* MÉNÉTRIÉS, 1832**

Material examined: 6 specimens, Guilan province, Gysoum 37° 40' 21" N; 49° 0' 53" E, elev. 2m September 2011.

Geographical distribution: Europe: Azerbaijan, Asia: Iran (LÖBL & SMETANA 2003).

Subfamily: Trechinae BONELLI, 1810

Tribe: Bembidini STEPHENS, 1827

***Bembidion* LATREILLE, 1802**

***Bembidion (Nepha) tetrasemum* CHAUDOIR, 1846**

Material examined: 4 specimens, Guilan province, Ghaleroudkhan 37° 03' 51" N; 49° 14' 23" E, elev. 677m September 2011.

Geographical distribution: Europe: Azerbaijan, Armenia, Georgia, Moldavia, Russia (South European Territory) Asia: Iran (LÖBL & SMETANA 2003).

***Asaphidion* GOZIS, 1886**

***Asaphidion flavicorne* SOLSKY, 1874**

Material examined: 3 Specimens, Guilan province, Ghaleroudkhan 37° 03' 51" N; 49° 14' 23" E, elev. 677m September 2011.

Geographical distribution: Europe: Azerbaijan, Bulgaria, Greece, Asia: Iran, Kyrgyzstan, Kazakhstan, Turkey, Uzbekistan (LÖBL & SMETANA 2003).

Subfamily: Callistinae LAPORTE, 1834

Tribe: Chlaeniini BRULLÉ, 1834

***Chlaenius* BONELLI, 1810**

***Chlaenius (Chlaeniellus) vestitus* PAYKULL, 1790**

Material examined: 2 specimens, Guilan province, Ghaleroudkhan 37° 03' 51" N; 49° 14' 23" E, elev. September 2011, Rasht 37° 11' 36" N; 49° 38' 27" E. elev. 1m July 2011.

Geographical distribution: Europe: Azerbaijan, Albania, Armenia, Belgium, Bulgaria, Croatia, Denmark, England, France, Germany, Georgia, Hungary, Italy, Latvia, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Turkey, former Yugoslavia, Asia: Iran, Turkey (LÖBL & SMETANA 2003).

***Chlaenius (Chlaenites) spoliatus* P. ROSSI, 1792**

Material examined: 9 specimens, Guilan province, Khomeiran, Bandare Anzali 37° 29' 14" N; 49° 15' 55" E, elev. -17m August 2011, Mardakkeh Shaft 37° 10' 36" N; 49° 23' 23" E, elev. 41m August 2011, Talesh 37° 48' 36" N; 48° 54' 15" E, elev. 98m September 2011.

Geographical distribution: Europe: Azerbaijan, Albania, Armenia, Austria, Bulgaria, Croatia, Denmark, England, France, Germany, Hungary, Italy, Kazakhstan, Romania, Slovakia, Slovenia, Spain, Turkey, Ukraine, former Yugoslavia, North Africa: Algeria,

Canary Island, Egypt, Libya, Morocco, Tunisia, Asia: Afghanistan, Cyprus, Iran, Iraq, Kyrgyzstan, Kazakhstan, Lebanon, Syria, Turkey, Uzbekistan (LÖBL & SMETANA 2003).

***Chlaenius festivus* PANZER, 1796**

Material examined: 8 specimens, Guilan province, Shaft 37° 10' 18" N; 49° 24' 10" E, elev. 43m, August 2011, Mardakheh, Shaft 37° 10' 36" N; 49° 23' 23" E, elev. 41m August 2011, Miankouh, Talesh, 37° 48' 59" N; 48° 56' 45" E, elev. 1m, August 2011.

Geographical distribution: Europe: Azerbaijan, Albania, Armenia, Austria, Bulgaria, France, Georgia, Hungary, Italy, Kazakhstan, Latvia, Romania, Slovakia, Slovenia, Turkey, Ukraine, former Yugoslavia, North Africa: Algeria, Canary Island, Egypt, Libya, Morocco, Tunisia, Asia: Afghanistan, China, Cyprus, Iran, Iraq, Kyrgyzstan, Kazakhstan, Syria, Turkey, Uzbekistan (LÖBL & SMETANA 2003).

***Chlaenius (Agostenus) alutaceus* GEBLER, 1829**

Material examined: 9 specimens, Guilan province, Khomeiran, Bandare Anzali, 37° 29' 14" N; 49° 15' 55" E, elev. -17m, August 2011.

Geographical distribution: Europe: Azerbaijan, Armenia, Bulgaria, Kazakhstan, Romania, Ukraine, Asia: China, Iran, Kyrgyzstan, Kazakhstan, Uzbekistan (LÖBL & SMETANA 2003).

***Chlaenius (Amblygenius) dimidiatus* CHAUDOIR, 1842**

Material examined: 22 specimens, Guilan province, Rasht 37° 11' 36" N; 49° 38' 27" E, elev. 31m July 2011, Khomeiran, Bandare Anzali 37° 29' 14" N; 49° 15' 55" E, elev. -17m, August 2011, Miankouh, Talesh 37° 48' 59" N; 48° 56' 45" E, elev. -1m August 2011, Shaft 37° 10' 18" N; 49° 24' 10" E, elev. 43m August 2011, Mardakheh Shaft 37° 10' 36" N; 49° 23' 23" E, elev. 41m, August 2011, Kouchesfahan 37° 16' 33" N; 49° 45' 27" E, elev. 1m, July 2011.

Geographical distribution: Europe: Azerbaijan, Turkey, North Africa: Egypt, Asia: Iran, Syria, Turkmenistan, Turkey (LÖBL & SMETANA 2003).

Tribe: Oodini LAFERTÉ-SÉNECTÈRE, 1851

***Oodes* BONELLI, 1810**

***Oodes helopioides* FABRICIUS, 1792**

Material examined: 1 Specimen, Guilan province, Rostamabad 36° 54' 02" N; 49° 29' 08" E, elev. 171m June 2011.

Geographical distribution: Europe: Albania, Austria, Bulgaria, Belgium, Croatia, Denmark, England, France, Germany, Greece, Italy, Poland, Romania, Spain, Ukraine, former Yugoslavia North Africa: Morocco, Asia: Kazakhstan, Turkey (LÖBL & SMETANA 2003), Iran (SALARI GOUGHERI et al. 2012).

Subfamily: Brachininae BONELLI, 1810

Tribe: Brachinini, BONELLI, 1810

***Brachinus* WEBER, 1810**

***Brachinus crepitans* LINNAEUS, 1758**

M a t e r i a l e x a m i n e d: 31 specimens, Guilan province, Rostamabad 36° 54' 02" N; 49° 29' 08" E, elev. 171m June 2011, Rasht 37° 11' 36" N; 49° 38' 27" E, elev. 31m July 2011, Astaneh Ashrafyeh 37° 16' 38" N; 49° 56' 40" E, elev. -11m July 2011, Khomam 37° 22' 28" N; 49° 38' 44" E, elev. -17m August 2011, Khomeiran Bandare Anzali 37° 29' 14" N; 49° 15' 55" E, elev. -17m August 2011, Kalasham Fouman 37° 16' 14" N; 49° 25' 20" E, elev. -2m August 2011, Miankouh Talesh 37° 48' 59" N; 48° 56' 45" E, elev. -1m, August 2011, Ghaleroudkhan 37° 03' 51" N; 49° 14' 23" E, elev. 677m September 2011, Talesh 37° 48' 36" N; 48° 54' 15" E, elev. 98m September 2011.

Geographical distribution: Europe: Azerbaijan, Albania, Armenia, Austria, Belgium, Croatia, Denmark, England, France, Germany, Georgia, Greece, Hungary, Italy, Poland, Portugal, Slovakia, Slovenia, Turkey, Ukraine, former Yugoslavia, Asia: Cyprus, Iran, Iraq, Kyrgyzstan, Kyrgyzstan, Syria, Uzbekistan (LÖBL & SMETANA 2003).

Subfamily: Nebriinae LAPORTE, 1834

Tribe: Nebriini LAPORTE, 1834

***Nebria* LATREILLE, 1802**

***Nebria elbursiaca* BODEMEYER, 1927**

M a t e r i a l e x a m i n e d: 1 specimen, Iran, Guilan province, Rostamabad 36° 54' 02" N; 49° 29' 08" E, elev. 171m June 2011.

Geographical distribution: Asia: Iran (LÖBL & SMETANA 2003).

Comment: The endemic Iranian *Nebria* (*Nebria*) *elbursiaca* BODEMEYER, 1927, is classified as a good species in the world monograph of *Nebria* (LEDoux & ROUX 2005), with two subspecies: ssp. *elbursiaca* s.str. and ssp. *bagrovdaghensis* SHILENKOV, 1983. This is an alpine *Nebria* of northern Iran generally found at elevations above 2000 m. Collection in a locality at 171 m is interesting.

Rostamabad is located in Sefid rud valley on the northern range of Alborz (Elbourz) mountain which the altitude reaches to more than 2000 meter. It is believed that this specimen was accidentally found in this area.

Subfamily: Cicindelinae LATREILLE, 1802

Tribe: Cicindelini LATREILLE, 1802

***Cicindela* LINNAEUS, 1758**

***Cylindera* (*Cylindera*) *germanica* LINNAEUS, 1758**

M a t e r i a l e x a m i n e d: 10 specimens, Guilan province, Rasht 37° 11' 36" N; 49° 38' 27" E, elev. 31m July 2011, Lahijan 37° 12' 48" N; 50° 0' 57" E, elev. -8m July 2011, Kouchesfahan 37° 16' 33" N;

49° 45' 27" E, elev. 1m July 2011, Miankouh Talesh, 37° 48' 59" N; 48° 56' 45" E, elev. -1m, August 2011, Mardakheh Shaft 37° 10' 36" N; 49° 23' 23" E, elev. 41m August 2011.

Geographical distribution: Europe: Azerbaijan, Albania, Armenia, Austria, Belgium, Bulgaria, Croatia, Denmark, England, France, Germany, Georgia, Hungary, Italy, Poland, Portugal, Kazakhstan, Slovakia, Slovenia, Ukraine, former Yugoslavia, North Africa: Algeria, Canary Island, Egypt, Libya, Morocco, Tunisia, Asia: Cyprus, Iran, Iraq, Kazakhstan, Syria, Turkey (LÖBL & SMETANA 2003).

***Cicindela (Calomera) caucasica* ADAMS, 1817**

Material examined: 2 specimens, Guilan province, Rasht 37° 11' 36" N; 49° 38' 27" E, elev. 31m July 2011, Khomam 37° 22' 28" N; 49° 38' 44" E, elev. -17m August 2011.

Geographical distribution: Europe: Azerbaijan, Armenia, Georgia, Asia: Iran, Iraq, Turkey (LÖBL & SMETANA 2003).

***Cicindela (Cicindela) clypeata* FISCHER VON WALDHEIM, 1821**

Material examined: 1 specimen, Guilan province, Rasht 37° 11' 36" N; 49° 38' 27" E, elev. 31m July 2011.

Geographical distribution: Europe: Russia (Central Europe Territory), Asia: Afghanistan, Iran, Kazakhstan, Turkmenistan, Uzbekistan (LÖBL & SMETANA 2003).

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Buchbesprechung

Mittermeier, R.A., Rylands, A.B., Wilson, D.E. (eds): **Handbook of the Mammals of the World. Vol. 3. Primates.** - Lynx Edicions, Barcelona, Spanien, 2013. 951 S.

Mit geringfügiger Verspätung ist nun der dritte Band des "Handbook of the Mammals of the World", die "Primaten" erschienen, mit 951 Seiten der bisher umfangreichste Band dieser Reihe. Er beinhaltet 57 Farbtafeln, 716 Farbfotos, 495 Verbreitungskarten und ca. 8000 Literaturzitate.

Während man in den 1980er Jahren noch von rund 160 Arten ausging, werden in dieser Monographie 479 Primatenarten (insgesamt 681 Taxa) in 77 Gattungen und 16 Familien dargestellt. Die größte Artenvielfalt beherbergt Afrika (208 Arten), wobei allerdings allein 98 Arten auf Madagaskar entfallen; die Neotropis (156 Arten) wird gefolgt von Asien (116 Arten). Der Artenreichtum von Madagaskar wird länderspezifisch nur von Brasilien (116 Arten) übertroffen. Die Länder mit höchstem Endemismus sind Madagaskar (100%), Indonesien (68%) und Brasilien (53%). Der deutliche Anstieg der Artenzahlen seit den 1980er Jahren basiert einerseits auf einer starken Zunahme der Feldforschung, andererseits auch durch verbesserte molekulargenetische Techniken. Dank dieser neuen Techniken konnten auch neue Gattungen beschrieben werden und das Bild einer phylogenetischen Verwandtschaft wird immer klarer. Dies ist nun aber auch der einzige "Mangel" dieses Buches, dass der Leser nicht mit einem aktuellen Stammbaum versorgt wird. Natürlich ist der Inhalt "verwandtschaftlich" geordnet, beginnt also mit den Prosimiern, die immerhin 25% aller lebenden Primaten ausmachen. Die meisten davon sind Lemuren, eine bemerkenswerte und diverse Radiation von fünf Familien: Cheirogaleidae, Lepilemuridae, Lemuridae, Indriidae und Daubentoniidae. Die folgende Infraordnung beinhaltet die Galagidae und Lorisidae, nachtaktive und baumbewohnende Arten Afrikas und Asiens. 11 Arten bilden die südostasiatische Familie Tarsiidae. Die folgenden Affen und Menschenaffen gliedern sich in die traditionellen Gruppierungen Neuwelt- und Altweltaffen. In der "Feinsystematik" hat sich hier aber einiges geändert; so werden heute insgesamt fünf Familien behandelt: Callitrichidae, Cebidae (neu definiert), Aotidae, Pitheciidae und Atelidae. Die Altweltaffen beginnen mit der größten aller

Primatenfamilien, den Cercopitheciidae (159 Arten, 270 Taxa). Den Abschluss des Buches bilden die Hylobatidae und Hominidae.

Die überaus reichhaltig und fantastisch bebilderten Beschreibungen beginnen mit einer Einführung in die Systematik der jeweiligen Familie, in der auch die einzelnen Taxa (Arten, Unterarten) in ihren supraspezifischen Einheiten und mit ihrer Verbreitung kurz vorgestellt werden. Es folgen ausführliche Teile zu morphologischen Aspekten, Habitat, allgemeine Verhaltensweisen, Kommunikation, Ernährung, Fortpflanzung, sozialer Organisation sowie Schutzstatus und Naturschutz. In ähnlicher Organisation werden auch die einzelnen Arten behandelt, beginnend mit den Trivialnamen in Englisch, Französisch, Deutsch und Spanisch sowie einer detaillierten Verbreitungskarte. Jeweils abschließend sind Autoren und Jahr der relevanten Publikationen aufgelistet. In die Artbeschreibungen sind die handgezeichneten Farbtafeln von Arten und Unterarten integriert.

Eine phänomenal umfassende und überaus empfehlenswerte Monographie, die über Jahrzehnte als Standardwerk fungieren wird.

R. Gerstmeier

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