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A study on the ground beetles in Mazandaran province, northern Iran

(Coleoptera, Carabidae)

Najmeh SAMIN & Hamid SAKENIN

Abstract

The fauna of ground beetles (Coleoptera: Carabidae) in Mazandaran province is studied in this paper. Totally 15 species from 13 genera and 9 subfamilies were collected during 2011-2012. Two species *Chlaenius steveni* Quensel and *Carabus cribratus porrectangulus* Gehin are new records for Iran.

Zusammenfassung

Die Laufkäferfauna der Mazandaran Provinz wurde studiert. Insgesamt konnten 15 Arten aus 13 Gattungen und 9 Unterfamilien während der Sammelperiode 2011-2012 erfasst werden. *Chlaenius steveni* Quensel und *Carabus cribratus porrectangulus* Gehin sind Neumeldungen für den Iran.

Introduction

The family Carabidae (Coleoptera) is among the dominant groups of terrestrial predators and includes more than 32,000 species worldwide (BOUSQUET & LAROCHELLE 1993), making it one of the largest families of beetles (OBER 2002). Almost of these insects are powerful predators of agricultural and forest pests and can have efficient role in biological control. Most ground beetles are found in the tropics. More than 30% of species are

arboreal, though in general temperate species are terrestrial, most are also flightless and predatory (LOVEI & SUNDERLAND 1996). They are commonly found under stones, logs, leaves, bark, debris, or foraging on the ground. They run rapidly, but seldom fly. Many species are equipped for digging and burrowing in the soil. Most species are nocturnal and a few are attracted to lights especially at night. They are predaceous on insects, worms, slugs, snails, caterpillars, grubs and maggots (THIELE 1977; STORK 1990; LUFF et al. 1992). Carabid habitat and microdistribution (the precise distribution of one or more kinds of organisms in a microenvironment or in part of an ecosystem) are governed by abiotic and biotic factors such as light, temperature, and humidity extremes, food supply, predator presence and distribution, and life history strategies (THIELE 1979; LOVEI & SUNDERLAND 1996). Also, carabid beetles are increasingly used as taxonomic study group in biodiversity and as bio-indicators in monitoring or site assessment studies for nature conservation purposes (LOREAU 1994; HEIJERMAN & TURIN 1995; DESENDER 1996).

The fauna of Iranian Carabidae was studied rather well. Some important studies on Iranian Carabidae were made by Jaeger (1990, 1992), HEJKAL (2000), LASSALLE (2001), HEINZ (2002), MAGRINI & PAVESI (2003), MOHAMMADZADEHFARD & HOJJAT (2005), JASKUŁA (2007), TOLEDANO & MARGGI (2007), MOHAMMADZADEH FARD (2008), GHAHARI et al. (2009 a, b, c, 2010), SAMIN et al. (2011), HASANISAADI & SADEGHI NAMAGHI (2011), REZAEI NODEH et al. (2012), ATAMEHR (2013), SALARI GOUGHERI et al. (2013). The aim of this research is to determining of carabids in Mazandaran province (northern Iran).

Materials and Methods

The specimens were collected from different regions of Mazandaran province. Many plastic pitfall traps, 8.5×10 cm (diameter × depth), were installed at 100 m intervals in different regions and were part-filled with mixture of Zolon and water. The traps were emptied weekly and the fallen beetles were collected and identified. The majority of carabid beetles are relatively easily collected in a more or less standardized way by means of pitfall trapping. Nevertheless, much discussion remains on the necessary methodologies in sampling as well as in data analyses or in diversity assessment (SOUTHWOOD 1978; DESENDER 1996). In addition to the pitfall traps, sweepings were conducted randomly in different regions. The nomenclature of the Carabidae is given sensu TRAUTNER & GEIGENMÜLLER (1987) and LÖBL & SMETANA (2003).

Results

In total 15 species from 13 genera and 9 subfamilies of Carabidae were collected and identified from some regions of Mazandaran province. The list of species is given below.

Subfamily **B e m b i d i i n a e**

Genus *Bembidion* LATREILLE, 1802

***Bembidion dalmatinum haupti* REITTER, 1908**

Material examined: Mazandaran province: Noor (8 m), 2♂♂, September 2011.

Subfamily **Brachininae**

Genus *Brachinus* Weber, 1801

***Brachinus cruciatus* Quensel, 1806**

Material examined: Mazandaran province: Savadkooh (543 m), 1♂, July 2012.

Subfamily **Callistinae**

Genus *Chlaenius* Boneli, 1810

***Chlaenius steveni* Quensel, 1806**

Material examined: Mazandaran province: Babol (27 m), 1♀, August 2011. *New record for Iran.*

Subfamily **Carabinae**

Genus *Carabus* Linneaus, 1758

***Carabus cribratus porrectangulus* Gehin, 1885**

Material examined: Mazandaran province: Sari (10 m), 2♀♀, April 2012. *New record for Iran.*

Subfamily **Cicindelinae**

Genus *Cicindela* Linneaus, 1758

***Cicindela* (*Cicindela*) *rhodoterena* Tschitschitscherine, 1903**

Material examined: Mazandaran province: Kiasar (1082 m), 2♀♀, April 2011.

Subfamily **Harpalinae**

Genus *Harpalus* Latreille, 1802

***Harpalus cupreus* Dejean, 1829**

Material examined: Mazandaran province: Qaemshahr (9 m), 2♂♂, September 2011.

***Harpalus saxicola* Dejean, 1829**

Material examined: Mazandaran province: Noor (8 m), 1♀, September 2011.

Genus *Ophonus* DEJEAN, 1821

***Ophonus nitidulus* STEPHENS, 1828**

Material examined: Mazandaran province: Nooshahr (48 m), 1♀, 1♂, August 2012.

Genus *Stenolophus* STEPHENS, 1827

***Stenolophus steveni* KRYNICKI, 1832**

Material examined: Mazandaran province: Nooshahr (48 m), 3♀♀, August 2012. Mazandaran province: Kiasar (1082 m), 1♀, 2♂♂, April 2011.

Subfamily **Lebiinae**

Genus *Cymindis* LATREILLE, 1806

***Cymindis vaporarium* (LINNAEUS, 1758)**

Material examined: Mazandaran province: Savadkooh (550 m), 2♂♂, July 2012. Mazandaran province: Sari (10 m), 2♀♀, 3♂♂, April 2012.

Genus *Drypta* LATREILLE, 1796

***Drypta dentata* (ROSSI, 1790)**

Material examined: Mazandaran province: Amol (196 m), 1♀, 1♂, July 2012.

Genus *Parazuphium* JEANNEL, 1942

***Parazuphium chevrolati* (CASTELNAU, 1833)**

Material examined: Mazandaran province: Babol (23 m), 1♀, 1♂, August 2011; Amol (196 m), 1♀, July 2012.

Subfamily **Nebriinae**

Genus *Leistus* FRÖLICH, 1799

***Leistus* (*Leistus*) *caucasicus* CHAUDOIR, 1867**

Material examined: Mazandaran province: Sari (12 m), 3♀♀, April 2012.

***Leistus* (*Pogonophorus*) *hermonis* PIOCHARD DE LA BRÛLERIE, 1875**

M a t e r i a l e x a m i n e d : Mazandaran province: Qaemshahr (9 m), 2♂♂, September 2011.

Subfamily **P t e r o s t i c h i n a e**

Genus *Zabrus* CLAIRVILLE, 1806

***Zabrus spinipes* (FABRICIUS, 1798)**

M a t e r i a l e x a m i n e d : Mazandaran province: Savadkooh (543 m), 1♀, July 2012.

Discussion

This research shows that in despite of several conducted researches on the fauna of Carabidae in different regions of Iran, there are unknown species still. Continuing these faunistic researches will result to new data on species diversity and also distribution of Iranian Carabidae. Of course there are some problems in studying on the diversity of Carabidae. One of them is to assess which part of the collected species in a certain locality actually belongs to the local fauna and has reproducing populations. Another problem is the lack of knowledge on year-to-year variation in numbers of many carabid species, in other words data on the magnitude of population dynamics in more or less natural situations. Such studies of course require a continuous long term sampling program, which is probably the most obvious reason for their scarcity (DESENDER 1996). Additionally, although pesticides affect destructively on the survival of carabid beetles, but these beneficial insects can recover their population density gradually and can have efficient role in biological control of agricultural and forest pests (GHAHARI et al. 2005). Therefore, training the farmers in order to applying the safe or at least low-dangerous strategies under IPM (integrated pest management) is necessary for conservation of carabid beetles.

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Authors addresses:

Najmeh SAMIN
Young Researchers Club and Elites, Science and Research Branch
Islamic Azad University
Tehran, Iran
E-mail: n_samin63@yahoo.com

Hamid SAKENIN
Department of Plant Protection, Qaemshahr Branch
Islamic Azad University
Mazandaran, Iran
E-mail: hchelave@yahoo.com

Druck, Eigentümer, Herausgeber, Verleger und für den Inhalt verantwortlich:
Maximilian SCHWARZ, Konsulent f. Wissenschaft der Oberösterreichischen Landesregierung, Eibenweg 6, 4052 Ansfelden, Austria. E-Mail: maximilian.schwarz@liwest.at.

Redaktion: Erich DILLER, ZSM, Münchhausenstraße 21, 81247 München;
Roland GERSTMEIER, Lehrstuhl f. Tierökologie, Hans-Carl-von-Carlowitz-Platz 2, 85350 Freising;
Fritz GUSENLEITNER, Lungitzerstr. 51, 4222 St. Georgen/Gusen, Austria;
Wolfgang SPEIDEL, MWM, Tengstraße 33, 80796 München;
Thomas WITT, Tengstraße 33, 80796 München.

Adresse: Entomofauna, Redaktion und Schriftentausch c/o Museum Witt, Tengstr. 33, 80796 München, Deutschland, E-Mail: thomas@witt-thomas.com; Entomofauna, Redaktion c/o Fritz Gusenleitner, Lungitzerstr. 51, 4222 St. Georgen/Gusen, Austria, E-Mail: f.gusenleitner@landesmuseum.at