

## ARTIGO / ARTÍCULO / ARTICLE

### A study on the ground beetles (Coleoptera: Carabidae) from some regions of Northwestern Iran.

Najmeh Samin

<sup>1</sup> Department of Plant Protection, Yadegar - e- Imam Khomeini (RAH) Branch, Islamic Azad University, Tehran (IRAN).  
e-mail: n\_samin63@yahoo.com

**Abstract:** The fauna of ground beetles (Coleoptera: Carabidae) from some regions of Northwestern Iran is studied in this paper. In total 28 species belonging to 23 genera and 9 subfamilies (Bembidiinae, Brachininae, Callistinae, Carabinae, Cicindelinae, Harpalinae, Lebiinae, Nebriinae, Pterostichinae) within the family Carabidae are recorded.

**Key words:** Coleoptera, Carabidae, faunistic study, distribution, Northwestern Iran.

**Resumen:** Estudio de los carábidos (Coleoptera: Carabidae) de algunas regiones del noroeste de Irán. En este trabajo se estudia la fauna de carábidos (Coleoptera: Carabidae) de algunas regiones del noroeste de Irán. En total, se registran 23 especies pertenecientes a 23 géneros y 9 subfamilias (Bembidiinae, Brachininae, Callistinae, Carabinae, Cicindelinae, Harpalinae, Lebiinae, Nebriinae, Pterostichinae) de la familia Carabidae.

**Palabras clave:** Coleoptera, Carabidae, estudio faunístico, distribución, noroeste de Irán.

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## Introduction

Carabid beetles (Coleoptera: Carabidae) are physically and physiologically robust, and one of the most successful animals in terms of diversity (Evans 1994). The third largest family within the order Coleoptera, the family Carabidae, comprises approximately 40,000 described species worldwide (Lövei & Sunderland 1996). Carabid habitat ranges from caves to trees in the tropics, and from sea level to the Himalayan peaks, and are governed by abiotic and biotic factors such as light, temperature, humidity, food supply, predator presence, and life history strategies (Thiele 1979; Ball & Bousquet 2001).

The fauna of Carabidae of Iran is quite well studied. Some important studies on Iranian Carabidae were made by Jaeger (1990, 1992), Hejkal (2000), Lassalle (2001), Heinz (2002), Magrini & Pavesi (2003), Mohammadzadeh Fard & Hojjat (2005), Jaskuła (2007), Toledano & Marggi (2007), Mohammadzadeh Fard (2008), Ghahari *et al.* (2009a, b, c, 2010), Samin *et al.* (2011), Hasanisaadi & Sadeghi Namaghi (2011), Rezaei Nodeh *et al.* (2012), Atamehr (2013), Salari Gougheri *et al.* (2013), Samin & Kesdek (2014), and Samin & Sakenin (2014). The aim of this investigation is to determine the fauna of ground beetles of some regions of Northwestern Iran (provinces of Ardabil, East Azarbaijan, and West Azarbaijan) where it was not well studied so far exception the recent work of Atamehr (2013).

## Material and methods

The specimens were collected in different regions of Northwestern Iran (provinces of Ardabil, East Azarbaijan, and West Azarbaijan) during 2011-2013. Several plastic pitfall traps, 8.5x10 cm

(diameter x depth), were installed at 100 m intervals in different regions and were partially filled with a mixture of Zolon and water. The traps were emptied weekly and the fallen beetles were collected and identified. In addition to the pitfall traps, sweepings were conducted randomly in different regions. Classification and nomenclature of the Carabidae is given *sensu* Trautner & Geigenmüller (1987), Ball & Bousquet (2001) and Löbl & Smetana (2003).

Collecting of 28 species belonging to 23 genera and 9 subfamilies of the Carabidae is the result of the present research and proves the quite high carabid diversity in Northwestern Iran.

## Results

### Subfamily Bembidiinae

#### Genus *Bembidion* Latreille, 1802

##### *Bembidion (Ocydromus) amnicola* Sahlberg, 1900

Material examined: Province of East Azarbaijan: Ahar, 38°30'N 47°08'E, 2♀♀, 15 March 2011.

### Subfamily Brachininae

#### Genus *Brachinus* Weber, 1801

##### *Brachinus (Brachynidius) sclopeta* (Fabricius, 1792)

Material examined: Province of West Azarbaijan: Ourmieh, 37°33'N 45°00'E, 2♀♀, 3-5 August 2013.

#### Genus *Pheropsophus* Solier, 1833

##### *Pheropsophus (Stenaptinus) catoirei* Dejean, 1825

Material examined: Province of East Azarbaijan: Kaleybar, 38°54'N 47°03'E, 3♀♀, 7 July 2012.

### Subfamily Callistinae

#### Genus *Chlaenius* Bonelli, 1810

##### *Chlaenius (Chlaenius) festivus* (Panzer, 1796)

Material examined: Province of West Azarbaijan: Salmas, 38°11'N 44°44'E, 2♀♀, 3-6 April 2013.

##### *Chlaenius (Chlaeniellus) vestitus* (Paykull, 1790)

Material examined: Province of East Azarbaijan: Maragheh, 37°23'N 46°24'E, 1♀, 2♂♂, 28-30 May 2011.

### Subfamily Carabinae

#### Genus *Calosoma* F. Weber, 1801

##### *Calosoma (Campalita) algiricum* Géhin, 1885

Material examined: Province of West Azarbaijan: Maku, 39°29'N 44.51°E, 1♂, 19 July 2011.

**Genus *Carabus* Linnaeus, 1758*****Carabus (Procrustes) chevrolati* Cristoforis & Jan, 1837**

Material examined: Province of Ardabil: Germe, 39°00'N 47°57'E, 2♂♂, 2♀♀, 10 September 2011.

***Carabus (Procrustes) coriaceus* Linnaeus, 1758**

Material examined: Province of West Azarbaijan: Ourmieh, 37°33'N 45°00'E, 1♂, 7-11 June 2012.

***Carabus (Pachystus) graecus* Dejean, 1826**

Material examined: Province of East Azarbaijan: Kaleybar, 38°54'N 47°03'E, 1♂, 1♀, 7 July 2012.

**Subfamily Cicindelinae****Genus *Cicindela* Linnaeus, 1758*****Cicindela (Myriochile) melancholica* Fabricius, 1798**

Material examined: Province of Ardabil: Ardabil, 38°15'N 48°18'E, 2♀♀, 9 September 2011.

***Cicindela (Cicindela) monticola* Ménétrières, 1832**

Material examined: Province of East Azarbaijan: Ahar, 38°30'N 47°08'E, 3♂♂, 15 March 2011.

**Subfamily Harpalinae****Genus *Acinopus* Dejean, 1821*****Acinopus (Acinopus) picipes* (Olivier, 1795)**

Material examined: Province of East Azarbaijan: Azarshahr, 37°49'N 45°52'E, 1♀, 4 October 2011.

Province of West Azarbaijan: Salmas, 38°11'N 44°44'E, 2♂♂, 1♀, 3-6 April 2013.

**Genus *Diachromus* Erichson, 1837*****Diachromus (Diachromus) germanus* (Linnaeus, 1758)**

Material examined: Province of Ardabil: Germe, 39°00'N 47°57'E, 3♀♀, 10 September 2011.

**Genus *Harpalus* Latreille, 1802*****Harpalus (Harpalus) affinis* (Schrank, 1781)**

Material examined: Province of West Azarbaijan: Ourmieh, 37°33'N 45°00'E, 1♂, 1♀, 3-5 August 2013.

**Genus *Ophonus* Dejean, 1821*****Ophonus (Ophonus) azureus* (Fabricius, 1775)**

Material examined: Province of West Azarbaijan: Ourmieh, 37°33'N 45°00'E, 1♂, 2♀♀, 7-11 June 2012.

**Genus *Pachycarus* Solier, 1835**

***Pachycarus (Paramystropterus) bravipennis* Chaudoir, 1850**

**Material examined:** Province of West Azarbaijan: Piranshahr, 36°42'N 45°10'E, 1♂, August 2012.

**Genus *Pseudoophonus* Motschulsky, 1844**

***Pseudoophonus (Pseudoophonus) rufipes* (De Geer, 1774)**

**Material examined:** Province of East Azarbaijan: Azarshahr, 37°49'N 45°52'E, 3♂♂, 4♀♀, 4 October 2011.

**Genus *Stenolophus* Dejean, 1821**

***Stenolophus (Stenolophus) teutonius* (Schrank, 1781)**

**Material examined:** Province of West Azarbaijan: Oshnavieh, 37°03'N 45°05'E, 2♂♂, 3♀♀, 14 May 2013.

**Subfamily Lebiinae**

**Genus *Cymindis* Latreille, 1806**

***Cymindis (Cymindis) variolosa* (Fabricius, 1794)**

**Material examined:** Province of West Azarbaijan: Khoy, 38°33'N 44°57'E, 1♂, 2♀♀, 15-17 May 2012.

**Genus *Lebia* Latreille, 1802**

***Lebia (Lamprias) cyanocephala* (Linnaeus, 1758)**

**Material examined:** Province of East Azarbaijan: Maragheh, 37°23'N 46°24'E, 1♀, 28-30 May 2011.  
Province of West Azarbaijan: Maku, 39°29'N 44.51°E, 1♀, 19 July 2011.

**Subfamily Nebriinae**

**Genus *Leistus* Frölich, 1799**

***Leistus (Pogonophorus) spinibarbis rufipes* Chaudoir, 1843**

**Material examined:** Province of West Azarbaijan: Miandoab, 36°57'N 46°00'E, 1♂, 14-16 Apr 2013.

**Genus *Nebria* Latreille, 1802**

***Nebria (Nebria) hemprichi* Klug, 1832**

**Material examined:** Province of West Azarbaijan: Khoy, 38°33'N 44°57'E, 2♀♀, 15-17 May 2012.

**Subfamily Pterostichinae**

**Genus *Agonum* Bonelli, 1810**

***Agonum (Agonum) marginatum* (Linnaeus, 1758)**

**Material examined:** Province of East Azarbaijan: Ahar, 38°30'N 47°08'E, 1♂, 3♀♀, 15 March 2011; Maragheh, 37°23'N 46°24'E, 2♀, 28-30 May 2011.

**Genus *Calathus* Bonelli, 1810*****Calathus (Neocalathus) melanocephalus* (Linnaeus, 1758)**

**Material examined:** Province of East Azarbaijan: Maragheh, 37°23'N 46°24'E, 1♂, 1♀, 28-30 May 2011.

**Genus *Dolichus* Bonelli, 1810*****Dolichus (Dolichus) halensis* (Schaller, 1783)**

**Material examined:** Province of East Azarbaijan: Kaleybar, 38°54'N 47°03'E, 2♂♂, 4♀♀, 7 July 2012.

**Genus *Scybalicus* Schaum, 1862*****Scybalicus (Scybalicus) oblongiusculus* (Dejean, 1829)**

**Material examined:** Province of Ardabil: Pars-Abad, 39°35'N 47°55'E, 1♀, 12 September 2011.

**Genus *Zabrus* Clairville, 1806*****Zabrus (Pelor) spectabilis* Hampe, 1852**

**Material examined:** Province of West Azarbaijan: Maku, 39°29'N 44.51°E, 1♀, 19 July 2011.

***Zabrus (Zabrus) tenebrioides* (Goeze, 1777)**

**Material examined:** Province of East Azarbaijan: Maragheh, 37°23'N 46°24'E, 1♂, 2♀♀, 28-30 May 2011. Province of West Azarbaijan: Miandoab, 36°57'N 46°00'E, 2♀, 14-16 April 2013.

**Conclusions**

Despite the fact that the Iranian fauna of Carabidae is quite well studied (see references), it is very diverse since Iran is a large country with various geographical regions and climates, so publishing new records occasionally shows the high diversity of this family in Iran. The faunistic works help to determining the distribution of carabids in different localities and also different ecosystems and agro-ecosystems of Iran. Vegetation structure affects carabid spatial distribution, perhaps due to the microclimatic differences found in different plant architectures, or conversely, due to the differentiation of faunal communities and faunal interactions by plant structures (den Boer 1977; Luff 1998). Carabids respond more to the physical structure of the environment than to the species composition (Brose 2003; Jeanneret *et al.* 2003). Human activity seems to affect the distribution of some carabid beetles. Therefore the species diversity of Carabidae is affected by various factors from which we can emphasize on the agricultural pesticides which damage to the population density and species diversity of Carabidae (Desender *et al.* 1994). Since these insects are beneficial predators that attack the agricultural pests, conservation of them is necessary what can be taught to farmers.

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## References

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- Atamehr, A. 2013. Ground beetles (Coleoptera: Carabidae) of Azarbaijan, Iran. *Turkish Journal of Zoology* **37**: 188-194.
- Ball, G.E. & Bousquet, Y. 2001. *Carabidae Latreille*, pp. 32-132. In: Arnett, R. & Thomas, M. (eds.), *American Beetles*. CRC Press, Boca Raton, FL, USA, xvi + 443 pp.
- Brose, U. 2003. Bottom-up control of carabid beetle communities in early successional wetlands: mediated by vegetation structure or plant diversity? *Oecologia* **135**: 407-413.
- den Boer, P.J. 1977. Dispersal power and survival. Carabids in a cultivated countryside (with a mathematical appendix by J. Reddingius). *Misc Pap Landbouwhogesch Wageningen* **14**: 1-190.
- Desender, K.; Dufrene, M.; Loreau, M.; Luff, M.L. & Maelfait, J.-P. 1994. *Carabid beetles: ecology and evolution*. Kluwer Academic Publishers, Dordrecht, 474 pp.
- Evans, M.E.G. 1994. *The carabid body plan: a functional interpretation*, pp. 25-31. In: Desender, K.; Dufrene, M.; Loreau, M.; Luff, M.L. & Maelfait, J.-P. (eds.). *Carabid beetles: ecology and evolution*. Kluwer Academic Publishers, Dordrecht, 474 pp.
- Ghahari, H.; Kesdek, M.; Samin, N.; Ostovan, H.; Havaskary, M. & Imani, S. 2009a. Ground beetles (Coleoptera: Carabidae) of Iranian cotton fields and surrounding grasslands. *Munis Entomology & Zoology* **4**(2): 436-450.
- Ghahari, H.; Jedryczkowski, W.B.; Kesdek, M.; Ostovan, H. & Tabari, M. 2009b. Ground beetles (Coleoptera: Carabidae) from rice fields and surrounding grasslands of Northern Iran. *Journal of Biological Control* **23**(2): 105-109.
- Ghahari, H.; Sakenin, H. & Kesdek, M. 2009c. *Ground beetles (Coleoptera: Carabidae) fauna and dominant species in fruit orchards of Mazandaran province, northern Iran*, p. 597. *Proceedings of the 3<sup>rd</sup> International Symposium on Biological control of Arthropods*, February 8-13, 2009, Christchurch, New Zealand,
- Ghahari, H.; Avgin, S.S. & Ostovan, H. 2010. Carabid beetles (Coleoptera: Carabidae) collected from different ecosystems in Iran with new records. *Türkiye Entomoloji Dergisi* **34**(2): 179-195.
- Hasanisaadi, S. & Sadeghi Namaghi, H. 2011. *Species diversity of carabid beetles (Coleoptera: Carabidae) inhabiting agroecosystems in Kerman province*, p. 77. *Proceedings of 2<sup>nd</sup> Iranian Pest Management Conference (IPMC)*, Shahid Bahonar University of Kerman.
- Heinz, W. 2002. Beschreibung einer neuen *Carabus* (*Lamprostus*)-Art aus Persien (Coleoptera: Carabidae). *Zoology in the Middle East* **26**: 157-162.

- Hejkal, J. 2000. *Amara (Amara) elborzensis* sp. n. (Coleoptera: Carabidae) from Iran. *Klapalekiana* **36**: 225-232.
- Jaeger, B. 1990. Zur Verbreitung von *Bradycellus csikii* Laczo, 1912 und *B. distinctus* Dejean, 1829 sowie Beschreibung von *Bradycellus heinzei* n. sp. aus dem Nord-Iran (Col., Carabidae). *Entomologische Nachrichten und Berichte* **34**: 9-13.
- Jaeger, B. 1992. Beitrag zur Erforschung der *Acupalpus*-Fauna des Iran und der Türkei nebst Beschreibung von *Acupalpus turcicus* n. sp. (Col., Carabidae). *Entomologische Nachrichten und Berichte* **36**: 223-230.
- Jeanneret, P.; Schupbach, B. & Luka, H. 2003. Quantifying the impact of landscape and habitat features on biodiversity in cultivated landscapes. *Agriculture, Ecosystems, and Environment* **98**: 311-320.
- Jaskuła, R. 2007. First record of *Lebia trimaculata* from Iran (Coleoptera: Carabidae). *Entomological Problems* **37**(1-2): 48.
- Lassalle, B. 2001. Les *Sphodristocarabus* d'Iran (Coleoptera, Carabidae). *Le Coléoptériste* **43**: 169-170.
- Löbl, I. & Smetana, A. 2003. *Catalogue of Palearctic Coleoptera. Volume I. Archostemata-Myxophaga-Adephaga*. Apollo Books. Stenstrup, Denmark, 819 pp.
- Lövei, G.L. & Sunderland, K.D. 1996. Ecology and behavior of ground beetles (Coleoptera: Carabidae). *Annual Review of Entomology* **41**: 231-256.
- Luff, M.L. 1998. *Provisional atlas of the ground beetles (Coleoptera, Carabidae) of Britain*. Centre for Ecology and Hydrology, Natural Environment Research Council, 202 pp.
- Magrini, P. & Pavesi, M. 2003. A new Iranian species of *Neoblemus* (Coleoptera Carabidae). *Bollettino della Società Entomologica Italiana* **135**(2): 71-78.
- Mohammadzadeh Fard, S. 2008. Description of female *Axonya farsica* (Coleoptera: Carabidae: Broscinae). *Journal of Entomological Society of Iran (Supplement)* **27**(2): 23-24.
- Mohammadzadeh Fard, S. & Hojjat, S.H. 2005. New records on carabid beetles in Iran. *Journal of Entomological Society of Iran* **24**(2): 144.
- Rezaei Nodeh, M.; Afshari, A.; Yazdanian, M. & Assadeh, Gh.A. 2012. Biodiversity of the ground beetles (Coleoptera: Carabidae) in orchard ecosystems of Azadshahr region, Golestan province, Iran. *Journal of Entomological Society of Iran* **32**(1): 59-79.
- Salari Gougheri, M.; Hosseini, R. & Hajizadeh, J. 2013. A faunal study on the subfamilies Harpalinae and Lebiinae (Coleoptera: Carabidae) in Guilan province, Iran. *Entomofauna* **34**(15): 193-200.
- Samin, N.; Sakenin, H.; Kesdek, M. & Imani, S. 2011. Ground beetles (Coleoptera: Carabidae) from some regions of Iran. *Linzer biologische Beiträge* **43**/1: 873-880.
- Samin, N. & Kesdek, M. 2014. A Faunistic Study on the Carabidae (Coleoptera) From Golestan Province, Northern Iran. *Persian Gulf Crop Protection* **3**(1): 41-45.
- Samin, N. & Sakenin, H. 2014. A study on the ground beetles in Mazandaran province, northern Iran (Coleoptera, Carabidae). *Entomofauna* **36**: 505-512.

Thiele, H.U. 1979. *Relationships between annual and daily rhythms, climatic demands and habitat selection in carabid beetles*, pp. 449-470. In: Erwin, T.L.; Ball, G.E. & Whitehead, D.R. (eds.), *Carabid beetles: Their evolution, natural history, and classification*. W. Junk, The Hague, 646 pp.

Toledano, L. & Marggi, W. 2007. A new *Bembidion* subg. *Trepanes* Motschulsky, 1864 from Iran (Coleoptera: Carabidae). *Atti della Società italiana di Scienze naturali e del Museo Civico di Storia naturale di Milano* **148**(I): 127-134.

Trautner, J. & Geigenmüller, K. 1987. *Tiger beetles, ground beetles. Illustrated key to the Cicindelidae and Carabidae of Europe*. Margraf, Aichtal, 488 pp.