

Ground beetles (Coleoptera, Carabidae) collected in winter wheat fields of the western Azerbaijan

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Abstract

Five subspecies and 12 species of carabid beetles (Carabidae) belonging to 11 genera and 6 subfamilies were found during 2006-2010 in west of Azerbaijan. *Harpalus froelichii* Sturm, 1818, *Dixus obscurus* Dejean, 1825, *Scarites cylindronotus* Faldermann, 1836, *Sphodrus leucophthalmus* Linnaeus, 1758, *Calathus longicollis* Motschulsky, 1865 were new records. Five subspecies new for the fauna of Azerbaijan are *Zabrus tenebrioides longulus* Reiche & Saulcy, 1855, *Z. morio morio* Ménétries, 1832, *Cryptophonus melancholicus melancholicus* Dejean, 1829, *Calathus ambiguus ambiguus* (Paykull, 1790), *Nebria picicornis luteipes* Chaudoir, 1850.

Key words: Carabids, cereals, western Azerbaijan, winter wheat, pest

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Introduction

About 40 000 species of carabid beetles are described in the World (Larsen *et al.*, 2003), and approximately 300 species were recorded in Azerbaijan (Aliyev, 2004). Most carabids live on the ground feeding on various invertebrates. From the appearance of most species of this family indicates their predatory lifestyle. Ex.: *Calosoma* Weber, *Broscus* Panzer, *Scarites* Hamilton, *Carabus* Linnaeus. Many species of ground beetles are very sensitive to changes in soil PH and humidity and they are successfully used as biological indicators (Hurka, 1996). Carabid beetles are considered to be mostly opportunistic feeders that consume a variety of foods; however, the majority of species have been observed as primarily predatory, feeding on other insects and related organisms. Most species locate food by random search, although some day-active (diurnal) species hunt by sight. A few species have also been observed to detect chemical cues from springtails, mollusks, and aphids (Lovei & Sunderland, 1996). Therefore, carabids are important model organisms in numerous ecological works for a long period of time.

The high diversity of carabids in Azerbaijan and presence of species which are pests of crops in the fauna of the country, makes this group of beetles important for investigation.

Material and Methods

The research was carried out in the laboratory and in the field from 2006 to 2010. Collection was made in the west Azerbaijan in spring, summer, autumn, and early in winter. The materials (larvae, pupae and adults) were collected and treated according to methods of Fasulati (Fasulati, 1971). The laboratory works were carried out at the Institute of Zoology of Azerbaijan NAS. All the specimens are deposited in the entomological collection of the institute of Zoology in Baku. Beetles were identified by prof. K.V. Makarov from Moscow State Pedagogical University. The western regions of Azerbaijan are Ganja, Shamkir, Tovuz, Aghstafa, Gazakh. Approximately 145 species of Poaceae Barnhart are part of the vegetation of the steppes in this region. *Triticum aestivum* Linney (1753) is dominated. Fields of winter wheat and wild cereal meadows and steppes were preferred for study (Figure 1).

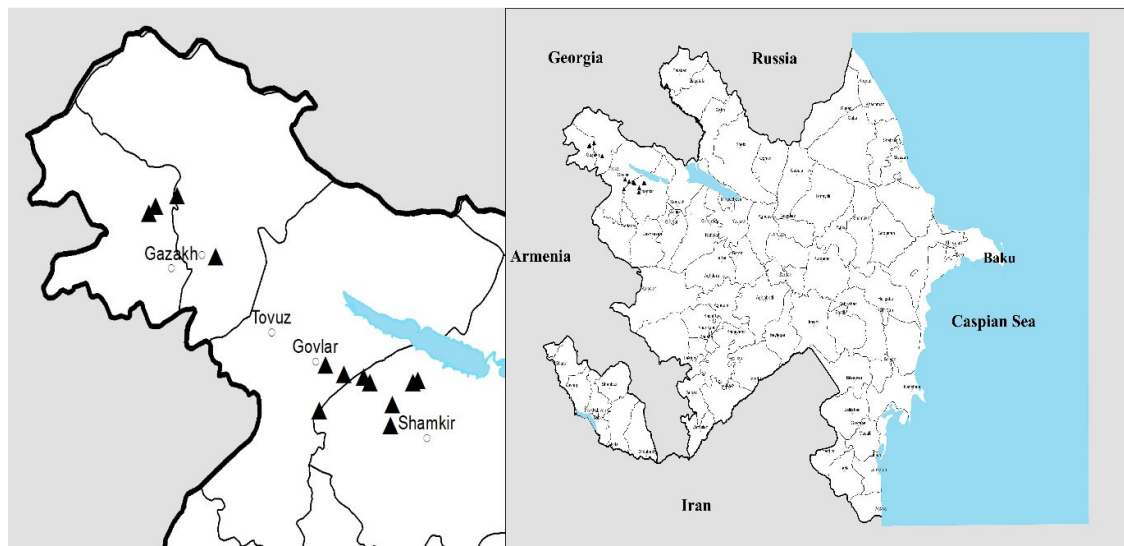


Fig. 1-Map of Azerbaijan. ▲ – material collected area.

The systematics of species presented in this paper is given according to Biolib (Zicha O (ed.), 1999-2014) and Fauna Europaea (De Jong, 2014) electronic databases, while their distribution according to Carabidae of the World (Anichtchenko, 2007-2015) electronic database.

Abbreviations: v. – village; sp. – species; L – larva; leg. – legislation; m. – male; f. – female

Results and Discussion

During the period of research 5 subspecies and 12 species of carabid beetles (Carabidae) belonging to 11 genera and 6 subfamilies were found. Of these 5 species and 5 subspecies are new for the fauna of Azerbaijan. Following is the annotated list and collection data of all collected species.

1– *Pterostichus (Platysma) niger* Shaller, 1783

Subfamily Pterostichinae Bonelli, 1810

Tribe Pterostichini Bonelli, 1810

Genus *Pterostichus* Bonelli, 1810;

Specimens examined: Shamkir District, Saritepe v., 17 May 2006, *T.aestivum* L., 1 sp.; Same District, Saritepe v., 21 June 2007, *T.aestivum* L., 2 spp.; Same District, Sabirkend v., 21 June 2007, *T.aestivum* L., 1 sp.; Same District, Shishtepe v., 8 July 2007, pasture area (*Koeleria* Persoon, 1805, *Agropyron* Gaertner, 1770), 2 spp.; Gazakh District, Orta Salahli v., 17 June 2010, pasture area (*Agropyron* Gaertn.), 1 sp.

Distribution: Europe (Austria, Belgium, Bosnia & Herzegovina, Bulgaria, Byelorussia, Czech, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Hungary, Italy, Latvia, Lithuania, Moldavia, Netherlands, Norway, Poland, Russia, Serbia, Slovakia, Slovenia, Sweden, Switzerland, Ukraine), Asia (Kazakhstan, Tadjikistan).

Remarks: Adult specimens of this species were collected in lowland winter wheat fields from second decade of May to July. It is the largest species of the genus. A eutopic species, especially characteristic of woodland, occurring in almost every type of forest community, predominantly in deciduous and mixed stands on humus-rich, rather moist soil. It overwinters at larvae stage, and predominantly nocturnal mesophilous, thermophilic, litter stratobiont. According to literature it is typical zoophage (the food of which consists of insect larvae as well as of dead animals), but occasionally feed's on sprouts of *Lactuca sativa* L. and fruits of *Fragaria vesca* L. (Nuriyeva, 2010).

2– *Zabrus tenebrioides longulus* Reiche & Saulcy, 1855

Tribe Zabrinini Bonelli, 1810

Genus *Zabrus* Clairville, 1806

Specimens examined: Shamkir District, Saritepe v., 17 May 2006, *T.aestivum* L., 3 spp.; Same District, Shishtepe v., 8 July 2006, *T.aestivum* L., 4 f; Same District, Sabirkend v., 29 March 2007, *T.aestivum* L., 3 L2; Same District, Sabirkend v., 18 April 2007, *T.aestivum* L., 4 L3; Same District, Duyarli v., 19 May 2007, *T.aestivum* L., 5 f, 6 m; Same District, Saritepe v., 21 June 2007, *T.aestivum* L., 2 f, 3 m; Tovuz District, Meshediler v., 18 May 2008, *T.aestivum* L., 2 spp.; Shamkir District, Duyarli v., 1 June 2010, *T.aestivum* L., leg. Mammadov E., 3 spp; Gazakh District, Orta Salahly v., 17 June 2010, pasture area (*Agropyron* Gaertn., *Alopecurus* Linney, 1753), leg. Mammadov E., 3 spp.; Same District, Orta Salahly v., 17 June 2010, *T.aestivum* L., leg. Mammadov E., 1 sp.; Agstapha District, 18 June 2010, *T.aestivum* L., leg. Mammadov E., 2 spp.

Distribution: Europe (Austria, Albania, Armenia, Belgium, Bosnia & Herzegovina, Bulgaria, Byelorussia, Croatia, Cyprus, Czech, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Macedonia, Moldavia, Netherlands, Poland, Romania, Russia, Slovakia, Slovenia, Sweden, Spain, Switzerland, Ukraine), Asia (Iran, Kazakhstan, Turkey).

Remarks: In western Azerbaijan it is considered as major pest of winter wheat in the larval and adult stage. Predominantly in cereal fields and near-by grassland, both on sandy and clayish soil, it regularly causes damage to cereals. In the study area infestation of plants by *Z.tenebrioides longulus* R&S constituted 11.44% / m² (118 plants) in March and 11.06% / m² (118 plants) in April.

New record for the fauna of Azerbaijan.

3– *Zabrus morio morio* Ménetries, 1832

Specimens examined: Shamkir District, Sabirkend v., 18 April 2007, *T.aestivum* L., 3 L3; Same District, Saritepe v., 21 June 2007, *T.aestivum* L., 1 sp.; Gazakh District, Orta Salahly v., 23 May 2008, *T.aestivum* L., 2 spp.; Shamkir District, Duyarli v., 1 June 2010, *T.aestivum* L., leg. Mammadov E., 4 spp.

Distribution: Europe (Armenia, Georgia), Asia (Afghanistan, Iran, Kazakhstan, Pakistan, Syria, Turkey, Turkmenistan, Uzbekistan).

Remarks: Periodically reproduces in mass numbers. with one generation per year. Over winters at larval stage. Pupation occurs in the soil at depths of 12-15 cm. In the study area mature individuals start to appear at the end of May. Night active species. Daytime spends in different hidden places. During warm and dry summer months, adult specimens enter to diapause. Herbivore, feeding primarily on winter wheat. In western Azerbaijan, it is one of the most harmful species of winter wheat from third decade of April to first decade of June.

New record for Azerbaijan fauna.

4– *Harpalus (Harpalus) froelichii* Sturm, 1818

Subfamily Harpalinae Bonelli, 1810

Tribe Harpalini Bonelli, 1810

Genus *Harpalus* Latreille, 1802

Specimens examined: Shamkir District, Shishtepe v., 22 September 2009, *T.aestivum* L., leg. Mammadov E., 2 spp.; Agstapha District, 18 June 2010, *T.aestivum* L., leg. Mammadov E., 2 spp.

Distribution: Europe (Austria, Belgium, Bulgaria, Byelorussia, Czech, Denmark, Finland, France, Georgia, Germany, Great Britain, Hungary, Italy, Latvia, Lithuania, Moldavia, Netherlands, Poland, Romania, Russia, Slovakia, Slovenia, Sweden, Switzerland, Ukraine), Asia (China, Kazakhstan, Kyrgyzstan, Mongolia, North Korea, Turkmenistan, Uzbekistan).

Remarks: The species was found at the end of June and September, night-active species. During the day, it usually burrows the sand at plant roots. Both larvae and adults are mixophytophage feeding on plant grains. Mesophilous, stenothermic, geo-chortobiont. New record for the fauna of Azerbaijan.

5– *Harpalus (Harpalus) tardus* (Panzer, 1797)

Specimens examined: Shamkir District, Sabirkend v., 20 June 2007, *T.aestivum* L., 1 m; Same District, Saritepe v., 21 June 2007, *T.aestivum* L., 2 m., 1 f.

Distribution: Europe (Albania, Armenia, Austria, Belgium, Bosnia & Herzegovina, Bulgaria, Byelorussia, Croatia, Czech, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Moldavia, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine), Asia (Iran, Turkey, Uzbekistan), New Zealand.

Remarks: Mixophytophagous. Mesophilous, thermophilic, geo-chortobiont species. Xerophilous, usually occurring in open country on sandy, sometimes clay-mixed soil with more and less dense vegetation, also on cultivated soil. According to our observations this common species in western Azerbaijan reaches the highest density in winter wheat fields.

6- *Harpalus (Pseudoophonus) griseus (Panzer, 1797)*

Specimens examined: Shamkir District, Shishtepe v., 19 April 2007, *T.aestivum* L., 2 spp.; Same District, Duyarli v., 19 May 2007, *T.aestivum* L., 3 f; Tovuz District, Meshediler v., 21 May 2007, *T.aestivum* L., 4 m, 2 f; Gazakh District, Orta Salahly v., 02 October, 2009, leg. Mammadov E., pasture area (*Agropyron* Gaertn., *Alopecurus* L.), 2 spp.; Gazakh District, Pirili v., 17 June 2010, leg. Mammadov E., *T.aestivum* L., 2 spp.; Gazakh District, Orta Salahly v., 17 June 2010, *T.aestivum* L., leg. Mammadov E., 2 spp.

Distribution: Europe (Armenia, Austria, Azores, Belgium, Bosnia & Herzegovina, Bulgaria, Byelorussia, Croatia, Czech, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Moldavia, Netherlands, Poland, Romania, Russia, Ukraine, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland), Asia (Afghanistan, Azerbaijan, China, Iraq, Iran, Israel, Japan, Kazakhstan, North Korea, South Korea, Tadjikistan, Turkey, Turkmenistan, Uzbekistan), Africa (Algeria, Egypt, Morocco, Tunisia).

Remarks: In the study area occurs from third decade of April to October. A xerophilous, mesophilous geo-chortobiont species, which occurs on dry, sandy meadows and grassland with sparse vegetation also in fallow fields. Predominantly night-active species sometimes attracted in large numbers to electric light. During daytime rests under stones or among plant roots. Representatives of this species were collected in cereal fields and adjacent pastures.

7- *Harpalus (Pseudoophonus) rufipes (De Geer 1774)*

Specimens examined: Shamkir District, Shishtepe v., 19 April 2007, *T.aestivum* L., 3 spp.; Same District, Duyarli v., 19 May 2007, *T.aestivum* L., 1 f; Tovuz District, Govlar v., 21 May 2007, *T.aestivum* L., 3 m, 2 f; Shamkir District, Duyarli v., 1 June 2010, *T.aestivum* L., leg. Mammadov E., 1 sp.; Gazakh District, Pirili v., 17 June 2010, *T.aestivum* L., 2 spp.

Distribution: Europe (Albania, Armenia, Austria, Azores, Belgium, Bulgaria, Bosnia & Herzegovina, Byelorussia, Croatia, Cyprus, Czech, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Denmark, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Moldavia, Morocco, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine), Asia (Afghanistan, Azerbaijan, China, Iraq, Iran, Kazakhstan, Kyrgyzstan, Tadjikistan, Turkey, Turkmenistan, Uzbekistan), Africa (Algeria, Tunisia).

Remarks: Eurytopic, stenothermic geo-chortobiont. It migrates to man-made landscapes from various mesophilous biotopes. In western Azerbaijan produces one generation per year. Adult specimens were found from the end of April to the end of June. Hibernates at larval stage. In the study area, this species is most harmful at imago stage when they feed on immature grains of winter wheat. A eurytopic species, which occurs on almost every kind of open ground, notably on clay, mull-rich soil. It is especially typical of cultivated fields, meadows and gardens also on waste land and ruderal places. While being mixophytophagous as adult, it is a polyphagous predator at larval stage preying upon larvae and pupa of different beetles. Due to this fact *H.rufipes* DeGeer is frequently found in those biotopes where epigeic beetles are especially abundant.

8- *Harpalus (Pseudoophonus) calceatus* (Duftschmid, 1812)

Specimens examined: Shamkir District, Sabirkend v., 26 March 2007, *T.aestivum* L., 1 L; Same District, Shishtepe v., 19 April 2007, *T.aestivum* L., 2 L.; Same District, Duyarli v., 19 May 2007, *T.aestivum* L., 1 m; Tovuz District, Govlar v., 21 May 2007, *T.aestivum* L., 1 m, 1 f; Shamkir District, Sabirkend v., 22 September 2009, *T.aestivum* L., 2 spp; Shamkir District, Shishtepe v., 22 September 2009, *T.aestivum* L., 3 spp.; Same District, Duyarli v., 1 June 2010, *T.aestivum* L., leg. Mammadov E., 1 sp.

Distribution: Europe (Albania, Andorra, Armenia, Austria, Belgium, Bulgaria, Bosnia & Herzegovina, Byelorussia, Croatia, Czech, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Moldavia, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine), Asia (Azerbaijan, Afghanistan, China, Japan, Kazakhstan, Kyrgyzstan, Mongolia, North Korea, Tadjikistan, Turkey, Turkmenistan, Uzbekistan).

Remarks: At larval stage preys upon various animals occurring in soil. In western Azerbaijan adult specimens occur from the end of May (depending on temperature, sometimes from the beginning of June) to the end of September – beginning of October. Females lay their eggs to rather moist layers of soil. Hibernates at larval stage. Produces one generation per year. Imagines being mixophytophagous feed on grains of winter wheat. A xerophilous species, occurring on open, sandy ground with sparse vegetation of grasses, also on agricultural land, e.g. in fallow fields. Predominantly nocturnal species, often flying at night and readily coming to light.

9- *Cryptophonus melancholicus melancholicus* Dejean, 1829

Genus *Cryptophonus* Brandmayr & Zetto Brandmayr, 1981

Specimens examined: Shamkir District, Duyarli v., 19 May 2007, *T.aestivum* L., 1 m, 2 f; Tovuz District, Govlar v., 21 May 2007, *T.aestivum* L., 1 m, 1 f; Shamkir District, Duyarli v., 1 June 2010, leg. Mammadov E., *T.aestivum* L., 1 sp.; Gazakh District, Pirili v., 17 June 2010, *T.aestivum* L., 1 sp.; Aghstafa District, 18 June 2010, pasture area (*Agropyron* Gaertn., *Dactylis* L., *Koeleria* Pers.), 2 spp.

Distribution: Europe (Austria, Belgium, Bosnia & Herzegovina, Bulgaria, Croatia, Czech, Denmark, France, Germany, Great Britain, Greece, Hungary, Moldavia, Poland, Portugal, Romania, Russia, Slovakia, Sweden, Ukraine), Asia (Iran, Turkey).

Remarks: This species was collected in the winter wheat fields and neighboring pastures in May - June. Confined to dry, sandy habitats with sparse vegetation. Usually near coasts: on sandy grassland under *Artemisia*. During daytime, the beetles are buried in the sand at the roots of plants (Lindroth, 1986). Mixophytophagous, mesophilous species.

New record for the fauna of Azerbaijan.

10- *Acinopus (Acinopus) picipes* (Olivier, 1795)

Genus *Acinopus* Dejean, 1821

Specimens examined: Shamkir District, Sabirkend v., 19 May 2007, *T.aestivum* L., 2 spp.; Tovuz District, Govlar v., 21 May 2007, *T.aestivum* L., 2 m; Shamkir District, Saritepe v., 21 June 2007, *T.aestivum* L., 1 f; Same District, Shishtepe, 19 June 2007, *T.aestivum* L., 1 m, 2 f; Tovuz District, Meshediler v., 18 May 2008, *T.aestivum* L., 1 m, 2 f; Aghstafa District, 18 June 2010, *T.aestivum* L., 2 spp.

Distribution: Europe (Albania, Armenia, Bosnia & Herzegovina, Bulgaria, Croatia, Cyprus, France, Georgia, Greece, Hungary, Italy, Macedonia, Malta, Moldavia, Portugal, Romania, Russia, Slovenia, Spain, Ukraine), Asia (Iraq, Iran, Israel, Turkey).

Remarks: Mesophilous, phytophagous geo-chortobiontous species. Very common inhabitant of winter wheat plantings in Ganja-Gazakh zone, where feeds on immature grains of winter wheat. In western Azerbaijan occurs from the second decade of May to the end of June.

11– *Dixus obscures* Dejean, 1825

Genus *Dixus* Billberg, 1820

Specimens examined: Shamkir District, Sabirkend v., 16 May 2006, *T.aestivum* L., 1 m, 1 f; Same District, Shishtepe v., 8 July 2006, *T.aestivum* L., 2 f; Same District, Sabirkend v., 21 June 2007, *T.aestivum* L., 2 m; Tovuz District, Govlar v., 21 May 2008, *T.aestivum* L., 2 spp.; Gazakh District, Pirili v., 17 June 2010, leg. Mammadov E., *T.aestivum* L., 2 spp.; Shamkir District, Duyarli v., 1 June 2010, *T.aestivum* L., leg. Mammadov E., 2 spp.

Distribution: Europe (Albania, Armenia, Bulgaria, Cyprus, Georgia, Greece, Italy, Macedonia, Moldavia, Romania, Ukraine), Asia (Azerbaijan, India, Iran, Israel, Syria, Turkey).

Remarks: According to my observations this species occurs in numbers in winter wheat fields of western Azerbaijan from middle of May to the early of July, where feeds on fully matured grains of winter wheat. Phytophagous, xerophylous, geo-chortobiontous species. Primarily day-active.

12- *Scarites (Scarites) cylindronotus* Faldermann, 1836

Subfamily Scaritinae Bonelli, 1810

Tribe Scaritini Bonelli, 1810

Genus *Scarites* Fabricius, 1775

Specimens examined: Shamkir District, Shishtepe v., 8 July 2006, *T.aestivum* L., 1 sp.; Same District, Sabirkend v., 1 June 2010, *T.aestivum* L., 2 spp.

Distribution: Asia (Iran, Kazakhstan, Kyrgyzstan, Uzbekistan, Pakistan, Tadzhikistan, Turkmenistan).

Remarks: Mesophilous, fossorial geobiont. Predatory species. We observed representatives of this species in pastures predominated by wild cereals from the first decade of June to July. It is a rare primarily nocturnal species collected in single individuals.

New record for the fauna of Azerbaijan.

13– *Sphodrus leucophthalmus* Linnaeus, 1758

Subfamily Platyninae Bonelli, 1810

Tribe Sphodrini Laporte, 1834

Genus *Sphodrus* Clairville, 1806

Specimens examined: Shamkir District, Duyarli v., 19 May 2007, *T.aestivum* L., 2 f; Same District, Shishtepe v., 20 May 2007, *T.aestivum* L., 1 sp.; Tovuz District, Govlar v., 21 May 2007, *T.aestivum* L., 3 m, 2 f; Tovuz District, 24 September 2009, pasture area (*Agropyron* Gaertn., *Dactylis* L.), 1 sp.; Aghstafa District, 18 June 2010, pasture area (*Agropyron* Gaertn., *Dactylis* L., *Koeleria* Pers.), 3 spp.

Distribution: Europe (Armenia, Austria, Belgium, Bulgaria, Byelorussia, Croatia, Cyprus, Czech, Denmark, Finland, France, Italy, Georgia, Germany, Great Britain, Greece, Hungary, Latvia, Netherlands, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Switzerland, Sweden, Turkey, Ukraine), Asia (Afghanistan, India, Iraq, Kashmir, Saudi Arabia, Syria, Yemen), Africa (Algeria, Egypt, Libya, Morocco, Tunisia)

Remarks: In western Azerbaijan, it was collected in pastures in second decade of May, June and September. Running-fossorial geo-chortobiontous predator. Exclusively synanthropic species, occurring in cellars, stables, bakeries, mills, etc., sometimes a company with *Laemostenus terricola* (Herbst, 1784) and *Blaps* (Lindroth, 1986).

New record for the fauna of Azerbaijan.

14- *Calatus (Neocalathus) ambiguus ambiguus* (Paykull, 1790)

Subfamily Platyninae Bonelli, 1810

Tribe Sphodrini Laporte, 1834

Genus *Calathus* Bonelli, 1810

Specimens examined: Shamkir District, Duyarli v., 19 May 2007, *T.aestivum* L., 2 f; Tovuz District, Govlar v., 21 May 2007, *T.aestivum* L., 3 m, 2 f; Shamkir District, Sabirkend v., 21 June 2007, *T.aestivum* L., 1 sp.; Tovuz District, 24 September 2009, pasture area (*Agropyron* Gaertn., *Dactylis* L.), 2 spp.; Aghstafa District, 18 June 2010, pasture area (*Agropyron* Gaertn., *Dactylis* L., *Koeleria* Pers.), 4 spp.

Distribution: Europe (Albania, Armenia, Austria, Belgium, Bosnia & Herzegovina, Bulgaria, Byelorussia, Croatia, Czech, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Hungary, Israel, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Moldavia, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Switzerland, Turkey, Ukraine), Asia (Afghanistan, Iran, Kazakhstan, Syria, Tadjikistan, Turkmenistan, Uzbekistan).

Remarks: Litter stratobiont. I collected representatives of this species in winter wheat fields, at margins of lakes and in pastures predominated by wild cereals. In the study area, it is most abundant from third half of May and end of September. Living in open, dry country on sandy or gravelly, sometimes clay-mixed soil with sparse vegetation, notably on southern slopes. Eurytopic, mesophilous, mixophytophagous species.

First record for the fauna of Azerbaijan.

15- *Calathus (Calathus) longicollis* Motschulsky, 1865

Specimens examined: Shamkir District, Duyarli v., 19 May 2007, *T.aestivum* L., 1 f; Same District, Sabirkend v., 21 June 2007, *T.aestivum* L., 1 m, 1 f; Same District, Shishtepe v., 22 September 2009, *T.aestivum* L., 2 spp.; Same District, Duyarli v., 1 June 2010, leg. Mammadov E., *T.aestivum* L., 1 sp.; Gazakh District, Pirili v., 17 June 2010, *T.aestivum* L., 2 spp.

Distribution: Europe (Armenia, Bulgaria, Cyprus, Georgia, Greece, Israel, Russia, Turkey), Asia (Lebanon).

Remarks: Despite adult specimens of this species are found in numbers in June, some individuals could be observed starting from second half of May. Hibernates at adult stage. Overwinters chose the underside of rocks or upper layers of soil. Produces one generation per year. Mesophilous, mixophagous, stratobiont inhabiting upper layer of litter. In the study area frequents mostly in winter wheat fields.

New record for the fauna of Azerbaijan.

16- *Nebria (Eunebria) picicornis luteipes* Chaudoir, 1850

Subfamily Nebriinae Laporte, 1834

Tribe Nebriini Laporte 1834

Genus *Nebria* Latreille, 1802

Specimens examined: Shamkir District, Sabirkend v., 22 September 2009, pasture area (*Agropyron* Gaertn., *Dactylus* L., *Koeleria* Pers.), 1 sp.; Gazakh District, Orta Salahly v., 02 October 2009, leg. Mammadov E., pasture area (*Agropyron* Gaertn., *Alopecurus* L.), 1 sp.

Distribution: Europe (Austria, Belgium, Czech, France, Germany, Italy, Poland, Slovakia, Spain, Switzerland, Turkey, Ukraine), Asia (Iran).

Remarks: Hygrophilous, mixozoophagous species. Enters to diapause in winter and summer. Periods of activity are spring and summer. I collected the species at the end of September and early October. New record for the fauna of Azerbaijan.

17 - *Broscus semistriatus* (Dejean, 1828)

Subfamily Broscinae Hope, 1838

Tribe Broscini Hope, 1838

Genus *Broscus* Panzer, 1813

Specimens examined: Shamkir District, Sabirkend v., 22 September 2009, pasture area (*Agropyron* Gaertn., *Dactylus* L., *Koeleria* Pers.), 1 sp.; Gazakh District, Pirili v., 1 June 2010, leg. Mammadov E., pasture area (*Agropyron* Gaertn., *Dactylus* L., *Koeleria* Pers.), 2 spp.

Distribution: Europe (Albania, Bulgaria, Moldavia, Romania, Russia, Ukraine), Asia (Azerbaijan, Kazakhstan).

Remarks: Cursorial, heat-preferent, xerophilous species. According to its ecological peculiarities belongs to running fossorial geobionts. It should be noted that despite the common characteristics in literature of this species as xerophilous, I collected its representatives in mesic areas such as pastures predominated by wild cereals. Active nocturnal predator. Daytime spends in burrows or under stones.

Discussion.

The most abundant species from above listed carabids occurring in cereal agro- and biocenoses in western Azerbaijan are: *Z.tenebrioides longulus* R&S., *C.ambiguus ambiguus* Pay., *H.griseus* Pan., *A.picipes* Ol. and *D.obscurus* Dej.

Harmfulness degree and feeding strategies of carabid beetles (Carabidae) occurring in western Azerbaijan have shown in table 1.

According to life forms the carabids occurring in western Azerbaijan could be divided into the following groups (the division is based on well known system suggested by Sharova (Sharova, 1981):

1-Geo-chortobionts: a) zabroid geo-chortobionts–*Z.tenebrioides longulus* R&S, *Z.morio morio* Mén., *A.picipes* Ol.; b) harpaloid geo-chortobionts–*H.froelichii* S., *H.tardus* Pan., *H.griseus* Pan., *H.rufipes* DeGeer, *H. calceatus* Duft., *C.melancholicus melancholicus* Dej., 1829; c) ditomoid geo-chortobionts–*D. obscurus* Dej.

2- Stratobionts: A) crevice stratobionts: a) surface litter stratobionts–*N. picicornis luteipes* Ch., *C. longicollis* Mot., *C. ambiguus ambiguus* Pay.; B) soil burrowing stratobionts: a) litter-soil stratobionts–*P.niger* Sh.

3- Geobionts: a) running-fossorial geobionts–*B.semistriatus* Dej.; b) fossorial geobionts–*S. cylindronotus* Fal., *S. leucophthalmus* L.

Ecological features of Carabid beetles have provided in table 2.

Generalizing above presented data one can conclude that carabid beetles occurring in cereal fields and biocenoses predominated by wild cereals in western Azerbaijan represented by geo-chortobionts–58.8% (among them 17.6% zabroid geo-chortobionts, 35.3% harpaloid geo-chortobionts and 5.9% ditomoid geo-chortobionts), litter stratobionts-17.6%, surface litter stratobionts - 5.9%, fossorial geobionts–11.8% and running-fossorial geobionts-5.9%.

By relation to humidity, 82.3% constitute mezophilous species, 11.8% xerophilous and 5.9% hygrophilous.

The number of species collected at various years in different location of Azerbaijan and the number of carabid beetles (Carabidae) in winter wheat fields of the western Azerbaijan in the years of 2006-2010 have given in table 3.

Table 1- Harmfulness degree and feeding strategies of carabid beetles (Carabidae) occurring in western Azerbaijan

№	Species	Harmfulness degree	Feeding strategy
1.	<i>Z. tenebrioides longulus</i> R&S	+++	Phytophage
2.	<i>Z. morio morio</i> Mén.	++	Phytophage
3.	<i>P. niger</i> Sh.	-	Zoophage
4.	<i>H. froelichii</i> S.	++	Mixophytophage
5.	<i>H. tardus</i> Pan.	++	Mixophytophage
6.	<i>H. griseus</i> Pan.	++	Mixophytophage
7.	<i>H. rufipes</i> DeGeer	++	Mixophytophage
8.	<i>H. calceatus</i> Duft.	++	Mixophytophage
9.	<i>C. melancholicus melancholicus</i> Dej.	+	Mixophytophage
10.	<i>A. picipes</i> Ol.	+++	Phytophage
11.	<i>D. obscurus</i> Dej.	+++	Phytophage
12.	<i>S. cylindronotus</i> Fal.	-	Zoophage
13.	<i>S. leucophthalmus</i> L.	-	Zoophage
14.	<i>C. ambiguus ambiguus</i> Pay.	+	Mixozoophage
15.	<i>C. longicollis</i> Mot.	+	Mixozoophage
16.	<i>N. picicornis luteipes</i> Ch.	+	Mixozoophage
17.	<i>B. semistriatus</i> Dej.	-	Zoophage

+++ - strongly harmful; ++ - moderately harmful; + - little harmful; - - harmless

Table 2- Ecological features of carabid beetles (Carabidae) distributed in the western Azerbaijan

№	Species	Ecological indices		
		<i>Life forms of Carabid adult specimens</i>	<i>Relation to humidity</i>	<i>Distribution by biotopes</i>
1.	<i>Z. tenebrioides longulus</i> R&S	zabroid geo-chortobiont	mesophilous	<i>T. aestivum</i> L.
2.	<i>Z. morio morio</i> Mén.	zabroid geo-chortobiont	mesophilous	<i>T. aestivum</i> L.
3.	<i>P. niger</i> Sh.	litter-soil stratobiont	mesophilous	pasture area
4.	<i>H. froelichii</i> S.	harpaloid geo-chortobiont	mesophilous	<i>T. aestivum</i> L.
5.	<i>H. tardus</i> Pan.	harpaloid geo-chortobiont	mesophilous	<i>T. aestivum</i> L.
6.	<i>H. griseus</i> Pan.	harpaloid geo-chortobiont	mesophilous	<i>T. aestivum</i> L. pasture area
7.	<i>H. rufipes</i> DeGeer	harpaloid geo-chortobiont	mesophilous	<i>T. aestivum</i> L.
8.	<i>H. calceatus</i> Dej.	harpaloid geo-chortobiont	mesophilous	<i>T. aestivum</i> L.
9.	<i>C. melancholicus melancholicus</i> Dej.	harpaloid geo-chortobiont	mesophilous	<i>T. aestivum</i> L. pasture area
10.	<i>A. picipes</i> Ol.	zabroid geo-chortobiont	mesophilous	<i>T. aestivum</i> L.
11.	<i>D. obscurus</i> Dej.	ditomoid geo-chortobiont	xerophilous	<i>T. aestivum</i> L.
12.	<i>S. cylindronotus</i> Fal.	fossorial geobiont	mesophilous	pasture area
13.	<i>S. leucophthalmus</i> L.	fossorial geobiont	mesophilous	pasture area
14.	<i>C. ambiguus ambiguous</i> Pay.	surface litter stratobiont	mesophilous	<i>T. aestivum</i> L. pasture area
15.	<i>C. longicollis</i> Mot.	surface litter stratobiont	mesophilous	<i>T. aestivum</i> L. pasture area
16.	<i>N. picicornis luteipes</i> Ch.	surface litter stratobiont	hygrophilous	lakeside pasture area
17.	<i>B. semistriatus</i> Dej.	running-fossorial geobiont	xerophilous	pasture area

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سوسک‌های کارابیده (سخت‌بالپوشان، کارابیده) جمع‌آوری شده از مزارع گندم زمستانه در غرب کشور آذربایجان

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چکیده

۵ زیر گونه و ۱۲ گونه از سوسک‌های کارابیده (Carabidae) متعلق به ۱۱ جنس و ۶ زیرخانواده طی سال‌های ۲۰۰۶-۲۰۱۰ در غرب کشور آذربایجان جمع‌آوری و شناسایی شد. گونه‌های *Harpalus froelichii* Sturm, 1818، *Sphodrus leucophthalmus* Linnaeus، *Scarites cylindronotus* Faldermann, 1836، *Dixus obscurus* Dejean, 1825 و 1758 و *Calathus longicollis* Motschulsky, 1865 برای فون کشور جدید بودند. پنج زیرگونه جدید برای فون کشور آذربایجان شامل *Zabrus tenebrioides longulus* Reiche & Saulcy, 1855، *Z. morio morio* Ménetries, 1832، *Cryptophonus melancholicus melancholicus* Dejean, 1829 و *Calathus ambiguus ambiguus* (Paykull, 1790)، *Nebria picicornis luteipes* Chaudoir, 1850 می‌باشند.

واژه‌های کلیدی: Carabidae، غلات، آذربایجان، گندم زمستانه، آفت

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