

## Ground beetle fauna (Coleoptera, Carabidae) of Lepenec river valley in the Republic of Macedonia

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### Abstract

Faunistic data on ground beetles (Coleoptera, Carabidae) in riparian habitats of Lepenec river valley (north of Skopje, Republic of Macedonia) are presented in this study. The material was collected by pitfalls and hand collection. In total, 354 specimens of 56 ground beetle species were established. Highest numbers of species were recorded in muddy banks and wet meadows, while the lowest number was recorded in the degraded Poplar stands. *Dyschirius substriatus priscus* represents a new record for the Macedonian fauna. *Dyschirius laeviusculus*, *Parophonus planicollis*, *Ophonus ardosiacus* and *Ditomus calydonius* can be considered as rare species for Macedonia.

**Key words:** Carabidae, ground beetles, riparian habitats

### Introduction

Species composition of ground beetles (Coleoptera, Carabidae) fauna of Macedonia is well known with 577 species (Hristovski and Guéorguiev 2015, Chehlarov et al. 2016, Neri 2017). However, many regions in Macedonia are still insufficiently explored. Hence, only few data on ground beetles of Lepenec river valley have been published only recently (Hristovski and Guéorguiev 2015). These data concern the area of the Lepenec inflow into river Vardar. The ground beetle fauna of the rest of the Lepenec valley in Macedonia has not been studied so far. Thus, the aim of this paper is to present the fauna of ground beetles of Lepenec river valley and degree of its association with riparian habitats.

### Material and methods

River Lepenec is left tributary of river Vardar. Its headwaters are on Šar Planina mountain in Kosovo. Its total length is 75 km, out of which 15 km are in the Republic of Macedonia.

The study of ground beetles was conducted in the Macedonian part of river Lepenec. This part has characteristic of relatively slow running waters at an altitude between 350 and 250 m a.s.l. with marked alluvial sedimentation (Hadži Pecova et al. 2017).

The stream integrity of Lepenec river basin was assessed from good (entrance point from Kosovo in Macedonia) through fair to poor at the confluence in river Vardar while the main river valley itself was assessed as poor in all of its length in Macedonia, especially in terms of riparian vegetation cover, presence of wetlands, etc. (Jovanovska et al. 2013).

Ground beetles were collected by pitfall traps (vinegar+formaline solution was used as an attractant and for preservation of beetles) and by hand collection in seven localities (Fig. 1) in spring of 2016 and 2017. The following habitats were studied: Poplar stands with natural origin, but degraded (D); sandy and muddy river banks (C and B, respectively), meadows (A), wet meadows (F) and dry grasslands (E) and sparsely vegetated river bank (G). The material is kept in private collection of the author (cSH).



Figure 1. Study area in the Lepenec watershed with depicted sampling sites (A-G)

## Results and discussion

In total, 354 specimens of 56 ground beetle species were identified during the research. This number included also the species published for the Lepenec inflow into river Vardar – Locality G in Tab. 1 (Hristovski and Guéorguiev 2015). The faunistic composition shows the domination of species characteristic for riparian habitats and smaller number of species that are connected to dry grassland habitats. The most common species were *Dyschirius agnatus*, *Stenolophus teutonius*, *Elaphrus aureus aureus*, *Limodromus assimilis*, *Chlaenius nitidulus* and *Bembidion subcostatum* vau (Tab. 1).

The richest habitats in species were muddy banks and wet meadows (28 and 27 species, respectively). The lowest number of species was recorded in Poplar stand, probably to the high level of degradation of this habitat in Lepenec valley (Jovanovska et al. 2013, Hadži Pecova et al. 2017) due to land conversion and wood exploitation. Otherwise, higher species diversity can be expected in better preserved Poplar habitats in Europe (Allegro and Sciaky 2003).

*Dyschirius substriatus priscus* represents a new record for the Macedonian fauna. This subspecies is distributed on the Pyrenees, Balkan Peninsula (Albania, Bulgaria, Greece, Romania), lower Dnieper area and Turkey (Fedorenko 1996, Loeb and Smetana 2003, Arndt et al. 2011).

*Dyschirius laeviusculus*, *Parophonus planicollis*, *Ophonus ardosiacus* and *Ditomus calydonius* can be considered rare species in Macedonia due to the small number of known localities (Hristovski and Guéorguiev 2015).

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Table 1. Ground beetles (Coleoptera, Carabidae) collected in Lepenec river valley

Species	A	B	C	D	E	F	G	Total
<i>Agonum</i> sp.		8				2		10
<i>Agonum viduum</i> (Panzer, 1796)		3				1		4
<i>Amara communis</i> (Panzer, 1797)	1							1
<i>Anchomenus dorsalis</i> (Pontoppidan, 1763)	6	2						8
<i>Anisodactylus binotatus</i> (Fabricius, 1787)	6	3						9
<i>Asaphidion flavipes</i> (Linnaeus, 1761)	11	4						15
<i>Bembidion articulatum</i> (Panzer, 1796)		4	9					13
<i>Bembidion azurescens azurescens</i> Dalla Torre, 1877		5	10					15
<i>Bembidion bualei bualei</i> Jacquelin du Val, 1852						1		1
<i>Bembidion dalmatinum dalmatinum</i> Dejean, 1831		1						1
<i>Bembidion splendidum splendidum</i> Sturm, 1825		1	1			3		5
<i>Bembidion subcostatum vau</i> Netolitzky, 1913	2	6	1			11		20
<i>Carabus granulatus interstitialis</i> Duftschmid, 1812	2							2
<i>Chlaenius festivus festivus</i> (Panzer, 1796)	1	5						6
<i>Chlaenius nitidulus</i> (Schrank, 1781)	5	16						21
<i>Chlaenius vestitus</i> (Paykull, 1790)	1	13				1		15
<i>Cicindela campestris campestris</i> Linnaeus, 1758						1		1
<i>Clivina collaris</i> (Herbst, 1784)	4	6				1		11
<i>Diachromus germanus</i> (Linnaeus, 1758)	1		1					2
<i>Ditomus calydonius calydonius</i> (P. Rossi, 1790)							1	1
<i>Dyschirius agnatus</i> Motschulsky, 1844		20	8					28
<i>Dyschirius intermedius</i> Putzeys, 1846	2		2					4
<i>Dyschirius laeviusculus</i> Putzeys, 1846		1						1
<i>Dyschirius substriatus priscus</i> J.Muller, 1922		1						1
<i>Elaphrus aureus aureus</i> P. W. J. Müller, 1821	4	19						23
<i>Harpalus autumnalis</i> (Duftschmid, 1812)	3							3
<i>Harpalus calceatus</i> (Duftschmid, 1812)							1	1
<i>Harpalus froelichii</i> Sturm, 1818							2	2
<i>Harpalus progrediens</i> Schaubberger, 1922	4							4
<i>Harpalus rubripes</i> (Duftschmid, 1812)	3				3			6

Table 1. Ground beetles (Coleoptera, Carabidae) collected in Lepenec river valley (continuation)

Species	A	B	C	D	E	F	G	Total
<i>Harpalus serripes serripes</i> (Quensel, 1806)				2	3	1		6
<i>Harpalus solitaris</i> Dejean, 1829							1	1
<i>Harpalus subcylindricus</i> Dejean, 1829	1				1	2		4
<i>Limodromus assimilis</i> (Paykull, 1790)	1	20				1		22
<i>Myas chalybaeus</i> (Palliard, 1825)				1				1
<i>Omophron limbatum</i> (Fabricius, 1777)	1	1						2
<i>Ophonus ardosiacus</i> (Lutschnik, 1922)							2	2
<i>Ophonus cribricollis</i> (Dejean, 1829)							1	1
<i>Ophonus oblongus</i> (Schaum, 1858)							2	2
<i>Ophonus rufibarbis</i> (Fabricius, 1792)				1				1
<i>Ophonus subquadratus</i> (Dejean, 1829)	2							2
<i>Paranchus albipes</i> (Fabricius, 1796)		3						3
<i>Paratachys micros</i> (Fischer von Waldheim, 1828)			1					1
<i>Parophonus dejeani</i> (Csiki, 1932)	14							14
<i>Parophonus hirsutulus</i> (Dejean, 1829)	1				3	3		7
<i>Parophonus maculicornis</i> (Duftschmid, 1812)	6							6
<i>Parophonus planicollis</i> (Dejean, 1829)							1	1
<i>Poecilus cupreus cupreus</i> (Linnaeus, 1758)		1						1
<i>Pterostichus anthracinus</i> (Illiger, 1798)	1	2				2		5
<i>Pterostichus elongatus</i> (Duftschmid, 1812)							1	1
<i>Pterostichus leonisi</i> Apfelbeck, 1904	1	1						2
<i>Pterostichus nigrita</i> (Paykull, 1790)		1						1
<i>Sinechostictus tarsicus</i> (Peyron, 1858)	1	2				5		8
<i>Stenolophus discophorus</i> (Fischer von Waldheim, 1823)		1						1
<i>Stenolophus teutonius</i> (Schrank, 1781)	20	3	1					24
<i>Syntomus obscuroguttatus</i> (Duftschmid, 1812)					1	1		2
<b>Total number of specimens</b>	<b>105</b>	<b>153</b>	<b>34</b>	<b>4</b>	<b>11</b>	<b>35</b>	<b>12</b>	<b>354</b>

A: Skopje, Lepenec, meadow, 310 m a.s.l., 05-19.06.2016. B: Skopje, Lepenec, muddy bank, 310 m a.s.l., 05-19.06.2016. C: Skopje, Lepenec, sandy bank, 310 m a.s.l., 05.06.2016. D: Skopje, Lepenec, Poplar stand, 285 m a.s.l., 05-19.06.2016. E: Skopje, Lepenec, dry grassland, 290 m a.s.l., 05-19.06.2016. F: Skopje, Lepenec, wet meadows, 250 m a.s.l., 25.03.2017. G: Skopje, Momin Potok, Lepenec inflow into Vardar, 250 m a.s.l., 04.08.2004 (published in Hristovski & Guèorguiev 2015).

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## **Фауна на тркачите (Coleoptera, Carabidae) во долината на реката Лепенец во Република Македонија**

Славчо Христовски

Во оваа студија се прикажани фаунистички податоци за тркачите (Coleoptera, Carabidae) за крајречните хабитати во долината на реката Лепенец (северно од Скопје, Република Македонија). Од вкупно уловените 354 примероци беа констатирани 56 видови тркачи. Најголем број видови беше регистриран по калливите брегови на реката и влажните ливада, а најмал во деградираните топоволи состоини. *Dyschirius substriatus priscus* претставува нов вид за фауната на Република Македонија. Видовите *Dyschirius laeviusculus*, *Parophonus planicollis*, *Ophonus ardosiacus* and *Ditomus calydonius* се ретки видови во македонската фауна.

**Клучни зборови:** крајречни живеалишта, тркачи, Carabidae