

Contribution to the diving beetles and whirligig beetles study (Coleoptera: Dytiscoidea, Gyrinoidea)

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Abstract

Within the Criş program, the author has made an itinerant study concerning the Dytiscoidea and Gyrinoidea fauna, from the hydrographical basins of Crişul Alb and Crişul Negru rivers. The material sampling has been made from the following sites: Aciuţa lake (quarry), Aciuţa-Avram Iancu (Small pools of the Tăcăşele river), Mihăileni dam upstream and Chişineu-Criş (all in the dept. of Arad-western Romania - for the Crişul Alb river), Poiana village upstream (in the dept of Bihor) and Zerind (Arad dept. - for the Crişul Negru river).

After the analyses of the collected material, we are established larger or more strict relationships between the different species and biotopes.

Generally, we mention a relative good quality for the studied biotopes.

Keywords: Dytiscoidea, Gyrinoidea

Introduction

The Dytiscoidea and Gyrinoidea fauna studies from Transylvania and surroundings concerning the faunistical and zoogeographical points have been found in works by Petri (1912) Ieniştea (1978) and Ruicănescu (1988, 1993).

These works do not give sufficient ecological information. Because of this, we have considered it necessary to complete these data with ecological information, for our enrolling in these program rules.

The arguments for this work are:

1. These insects represent (in the most frequent cases) the peak of the consumers level. From this case, they are very sensitive to the allochthonous chemicals or other effects of the anthropic activity.

2. Being generally good flyers and with “short living” preimaginal phases, these insects can indicate, by their absence, any alteration of the local habitat.

Methods and material

The material consists of Dytiscoidea and Gyrinoidea specimens collected from the following sites: Aciuța-quarry, Aciuța-Avram Iancu (small pools of the Tăcășele river), Mihăileni dam (all in the dept. of Arad-western Romania - for the Crișul Alb river), Poiana village (in the dept of Bihor - for the Crișul Negru river).

The collecting has been made through the bottom dredging of the pools and lakes or the specimen collecting through the visual control of the habitats.

One part of this material was collected in the night time by the Hg vapour lamp.

In the material, 483 specimens has been determined and are stored in our collection. A part of the specimens, belonging to well known species and identifiable directly in the field, has been recorded in the notepad and then released.

Results and discussion

The collected material consists of 364 specimens belonging to 5 families and 35 species of Dytiscoidea and 19 specimens, belonging to 2 families and 2 species of Gyrinoidea (Table 1).

After the analyses of the results of our observation concerning the environmental conditions of these insects collected from these sites, we can define the following kind of ecosystems:

- Total or most exposed to solar radiation - pools or lakes, on a hill substrate: Aciuța-A. Iancu pools and Aciuța quarry lake (Arad department).
- Total or partially shaded by the trees crowning pools or lakes, on a hill substrate: Aciuța-A. Iancu pools.
- Superior river sector, on the limestone substrate: Crișul Alb river, upstream of the Mihăileni dam (Arad department) and Crișul Negru river, upstream of Poiana (Bihor department).
- Inferior river sector: Crișul Alb river at Chișinău-Criș, and Crișul Negru river at Zerind (both in the Arad department)

Table 1. The species list of Dytiscoidea and Gyrinoidea species collected and observed during the Criș expedition

Taxa	Loc.	Biotope				Nr. spec.	Zoog.	Freq. %	Obs.
		1	2	3	4				
Superfam. Dytiscoidea									
<i>Nereis clavicornis</i>	AA	?			1	Med.	14.28	C	
<i>N. trassicornis</i>	AA	?	?		10(20)	Sib	14.28	C	
<i>Pachynus variegatus</i>	AA	?			1	Med	14.28	C	
<i>L. hyalinus</i>	AA	??			15(50)	Med	57.14	C	
	A				50				
	C			?	5				
	Z			?	7				
<i>Hyphyrius ovaris</i>	A	?			5	Med	14.28	R	
<i>Crangonius pusillus</i>	AA	?	?		13(100)	Med	42.85	C	
	A	?			20(50)				
	M	?			30				
<i>Coelambus confluentis</i>	AA	?			1	Med	14.28	rC	
<i>C. impressopunctatus</i>	AA	?			1	Sib	14.28	C	
<i>Hydroporus palustris</i>	AA	?	??		9	Sib	14.28	C	
<i>H. planus</i>	AA	?			3	Med	14.28	C	
<i>Platambus maculatus</i>	uM		?		5(7)	Eur	28.57	C	
	P		?		3(7)				
<i>Gaurodytes bipustulatus</i>	AA	?	?		18	Balc	14.28	C	
<i>Hytrus fuliginosus</i>	AA	?	?		7	Sib	14.28	C	
<i>I. obscurus</i>	AA	?			3	Sib	14.28	C	
	(l. s.) ^{1*}								
<i>I. afer</i>	AA	?			5	Sib	14.28	R	
<i>Rhantus pulverosus</i>	AA	?	?		10(5)	Med	14.28	C	
<i>Colymbetes fuscus</i>	AA	?	?		13	Balc	14.28	C	
<i>Hydaticus transversalis</i>	AA	?			1	Sib	14.28	C	
<i>Graphoderus austriacus</i>	AA	?			1	Sib	14.28	C	
<i>Acius sulcatus</i>	AA	?			2	Sib	14.28	C	
<i>Dytiscus marginalis</i>	AA	?	?		10	Sib	14.28	C	
<i>D. circumcinctus</i>	AA	?	?		15	Sib	14.28	rC	
Superfam. Gyrinoidea									
<i>Gyrinus distinctus</i>	uM		?		1	Sib	28.56	C	
<i>Orectochilus villosus</i>	uM		?		5	Sib	28.56	rC	
	P		?		13				

^{1*} This species has been collected at the light screen here, but in other places, we have found in exposed pools or lakes

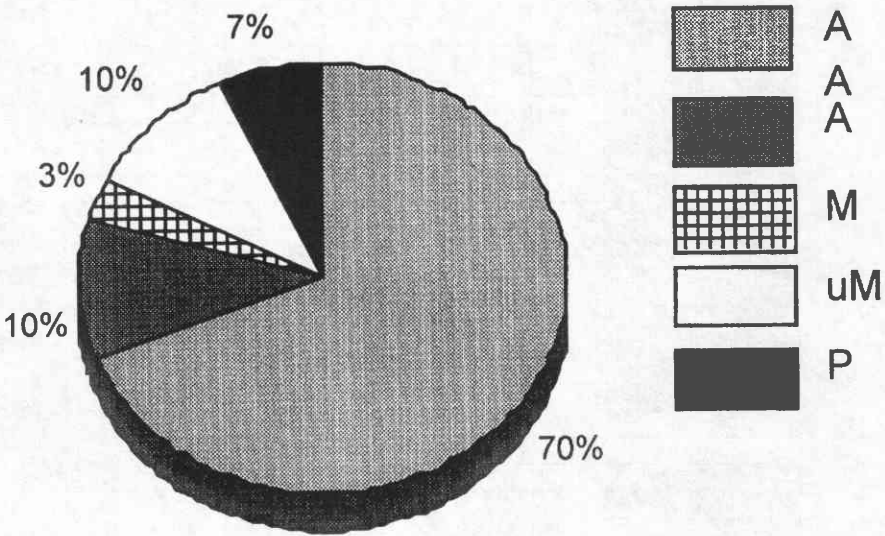
Abbreviations: Table head: Nr. spec.=number of specimens (between parenthesis, number of specimens observed and released); Zoog.=Zoogeographical element, 1=exposed pools, 2=shady pools, 3=river superior sector, 4=river inferior sector; Obs. Observations; Locality column: A=Aciuța lake, AA=Pools between Avram Iancu and

Aciuța, C=Chișinău-Criș, M=Mihăileni dam (pool altered by the anthropic activity), uM=upstream Mihăileni dam, P=upstream Poiana locality, Z=Zerind; Observations column: C=commons species, rC=relatively common species, R=rare species, with small, but actually not endangered populations.

In the table we have listed all the species collected and observed. Each species is accompanied by ecological and zoogeographical data.

The maximum occurrence of the predaceous diving beetles (Dytiscoidea) is in the pools between A. Iancu and Aciuța, the other occurrences are reproduced in Fig. 1.

Fig. 1. The diagram of the occurrence localities for the Dytiscoidea and Gyrinoidea species (see the table abbreviation for the locality legend)



The biotopes occurrence is dominated by the exposed pools, from where we have collected 18 Dytiscoidea species (Fig. 2.).

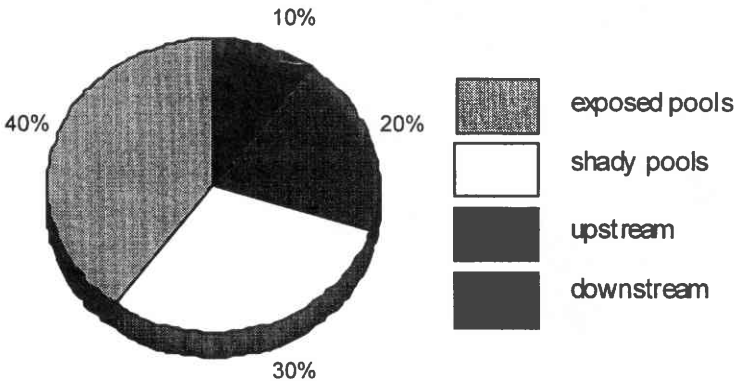


Fig. 2. The diagram of the occurrence of biotopes for the Dytiscoidea and Gyrynoidea species

The zoogeographical structure has been dominated by the Siberian elements, that is represented by 14 species (Fig. 3.).

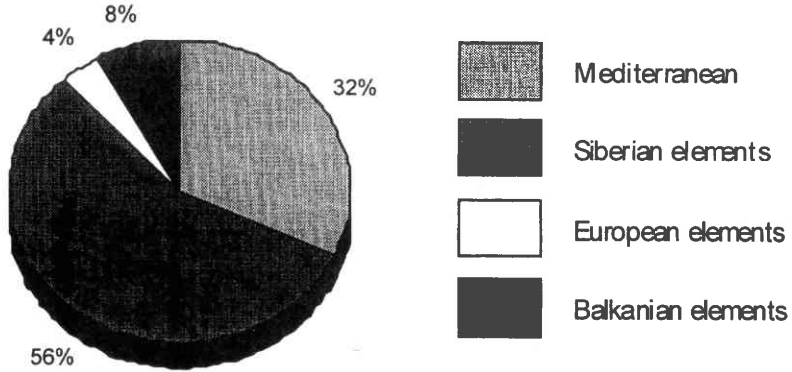


Fig. 3. The diagram of the zoogeographical structure of the Dytiscoidea and Gyrynoidea communities

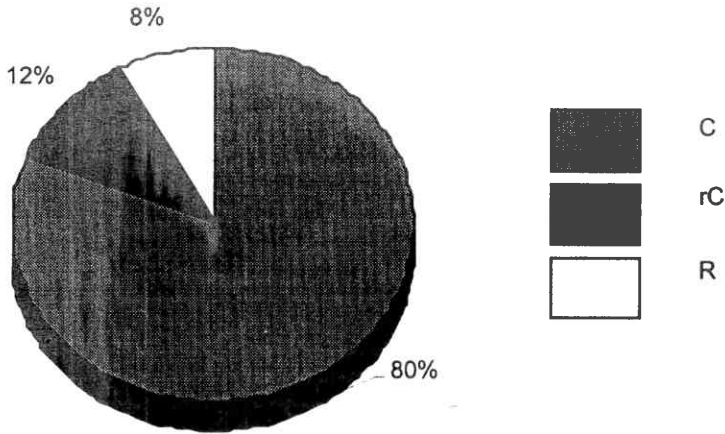


Fig. 4. The diagram of the faunistic importance structure of the Dytiscoidea and Gyrinoidea communities

From the faunistic importance point of view, there exists 80% common species, 12% relatively common species and 8% rare species. We don't find extinct or endangered species, but the pond or swamp cleansing can damage the Dytiscoidea and Gyrinoidea populations.

Conclusions

Plenty of Dytiscoidea and Gyrinoidea species have been collected during this expedition. Generally, each biotope has been populated with the typical diving beetles and whirligig beetles species communities.

The biodiversity and the occurrences are proving that the anthropic activity is not presently endangered in this area.

From the faunistic importance point of view, we do not find extinct or endangered species, but the pond or swamp cleansing can damage the Dytiscoidea and Gyrinoidea populations.

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