

**THE DIVERSITY OF THE TURBELLARIAN (PLATHELMINTES:  
TURBELLARIA) AND MALACOSTRACEAN FAUNA  
(CRUSTACEA: MALACOSTRACA) FROM THE NATURAL PARC  
APUSENI**

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**ABSTRACT**

*The data from this paper represents a contribution to the knowledge of the diversity of fresh water invertebrates' fauna from Apuseni Mountains, which are less studied in the aquatic ecosystems from this area. We present some dates concerning the diversity of turbellarian and crustaceans fauna, especially tricladids and malacostraceans orders. As consequence to the examination of many samples collected from various aquatic biotopes, there were identified 5 species of turbellarians, 3 of amphipods and one of decapods.*

**KEY WORDS:**

*fresh water, turbellarian, amphipod, decapod, Bdellocephala, Dugesia, Polycelis, Gammarus, Niphargus, Austropotamobius, Apuseni Natural Park*

**INTRODUCTION**

Through this paper we want to bring our contribution to the knowledge of the benthonic structure of fauna for the rivers that exist in The Natural Park Apuseni. Turbellarians are one of the benthonic elements of fauna which are known as good indicators of water quality level because their sensibility and reaction to the action of chemical factors (Radu & Radu, 1958).

Crustacea subphylum holds small weight related to the specific diversity of Arthropoda Phylum. However crustaceans have important position concerning to the size of the populations from the aquatic ecosystem, therefore they are considered the most important elements in transforming primary sustenance resources into animal biomass. Still, they are considered sanitarians of water and also a richly food source for the aquatic vertebrates. Malacostraceans are represented in the mountain brooks by: amphipods, isopods and decapods.

**MATERIALS AND METHODS**

By the means of the voluntaries program organized by the Natural Park Apuseni Administration have been gathered qualitative samples from 32 points situated on rivers and lakes during the period 02-12 August 2005. It was used a benthos net of 350  $\mu$ m size by dragging it through the substratum of river (or the lakes limits), rummaging the stones from upstream the river. Considering the space and the habitat was repeated on different points under the same hydrographic unit. The gathered material was sorted; afterwards the invertebrates groups were identified, and kept into 3mL Eppendorf recipients containing 4% concentration of aldoform and then kept in the collection of Lucian Pârvulescu, Department of

Biology in the Chemistry-Biology and Geography Faculty, Timisoara. Into the laboratory, the identification was made using a stereomicroscope, for details also we take microscopically samples. In order to identify the turbellarians we used papers of the following authors: Godeanu (2002), Brauer (1909), Mellanby (1963), Bellman *et al.* (1991), Udrescu & Chiriac (1965), for amphipods: Cărăușu *et al.* (1955), Godeanu (2002) and for decapods Băcescu (1967).

#### **RESULTS AND DISCUSSIONS**

It was examined 32 points and has been identified 5 species of turbellarians, one from the Dendrocoelidae Family, 3 from the Dugesiidae Family and one from the Planariidae Family. Among the malacostraceans we found 3 species of amphipods, 2 of the Gammaridae Family, one of the Niphargidae Family and one species of decapods of the Astacidae Family.

Following we will present a general table from each species of turbellarians and malacostraceans that have been found, separately on river. Each collecting point was georeferenced with DMS coordinates and we presented two topographic maps bellow (Fig 1 and 2), maps which were Inkscape processed (version 0.45 software).

#### ***Someșul Cald River basin***

This zone includes many affluent and also a peat-bog (Molhașurile de la Izbuce) and a lake (Vărășoia). Among the river Someșul Cald we have gathered samples from two points, one of them on the downstream of Someșului Cald canyon (col. pt. 1 = N46<sup>0</sup>38'38'' E22<sup>0</sup>43'27'') and another one only a few meters after the confluence with the Rădeasa River (col. pt. 2 = N46<sup>0</sup>38'04'' E22<sup>0</sup>42'40''). Here, the turbellarians are represented by *Dugesia gonocephala* species, which was found at the point situated on the downstream from the gorge and also the amphipods belonging to the *Gammarus balcanicus* species. Another samples was collected among the Rădeasa River, upstream from the confluence with Somes (before the entry in the Cetățile Rădesei canyon, col. pt. 3 = N46<sup>0</sup>38'00'' E22<sup>0</sup>42'33'') and bring *Dugesia fusca* turbellarian and *Gammarus fossarum* amphipod. Bătrâna brook, as an affluent of Someșul Cald, has been examined between peat-bog (col. pt. 4 = N46<sup>0</sup>36'55'' E22<sup>0</sup>47'27''). There was found only the *Dugesia gonocephala* turbellarian.

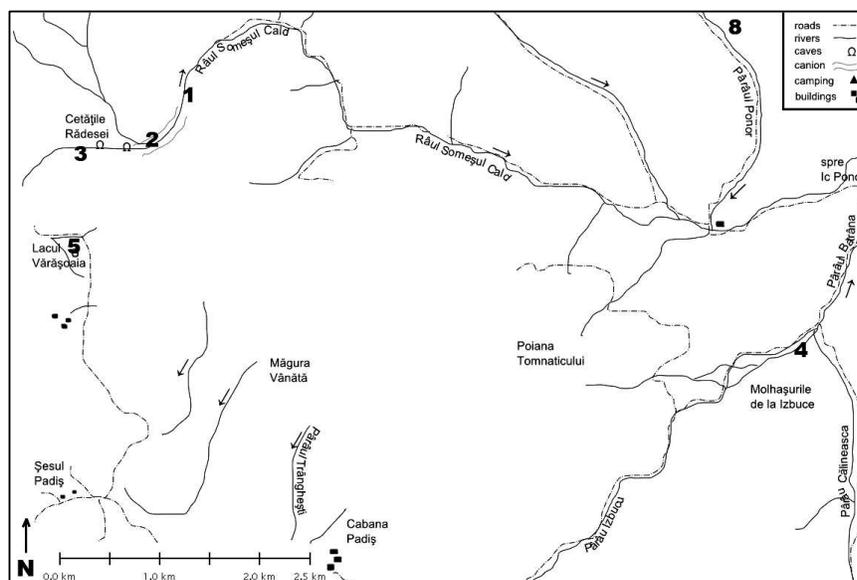


Figure 1. Someșul Cald River basin and collecting points map

Within the lentic habitat in the peat-bog Molhașurile de la Izbuce, haven't found turbellarians or malacostraceans, but along the brook which drains the peat the benthonic fauna is well represented, with many turbellarians and the amphipods: *Dugesia fusca* and *Gammarus balcanicus*.

In Vărășoia Lake (col. pt. 5 = N46°37'25'' E22°42'15'') have not been found species of turbellarians or malacostraceans (to be mentioned that around the lake was observed and photographed a male from *Triturus alpestris*).

#### ***Cetățile-Ponorului – Ursului – Seaca - Galbena System***

This is a complex system which can be analyzed only by each hydrologic unity because of the karstic relief which gives a significant diversity for the habitats. We tried to research the biggest part from this system, including also the lakes from Șesul Padiș meadow.

The lakes from Șesul Padiș are a very interesting habitat. There have not been found any turbellarians or malacostraceans.

Valea Cetății Brook brings an important contribution to this system that is the reason for we have gathered samples from 4 relevant points. The first one is located on the springs, near Glăvoi (col. pt. 6 = N46°35'01'' E22°41'59''), upstream the camping area. Turbellarians fauna is very well represented by 3 species: *Dugesia fusca*, *Bdellocephala punctata* and *Polycelis cornuta*. We have found one species of crustaceans: *Gammarus balcanicus*. We also made research in the area of tents (col. pt. 7 = N46°35'17'' E22°41'43'') and we found one amphipod specie *Gammarus balcanicus*. Downstream the area of tents, after Glăvoi, the gathered samples emphasize a benthonic fauna very weakly

represented. Also on Valea Cetății Brook have been found samples before the entry in the karstic system Cetățile Ponorului, but the benthonic fauna, probably because of the high flood, is also very weakly represented.

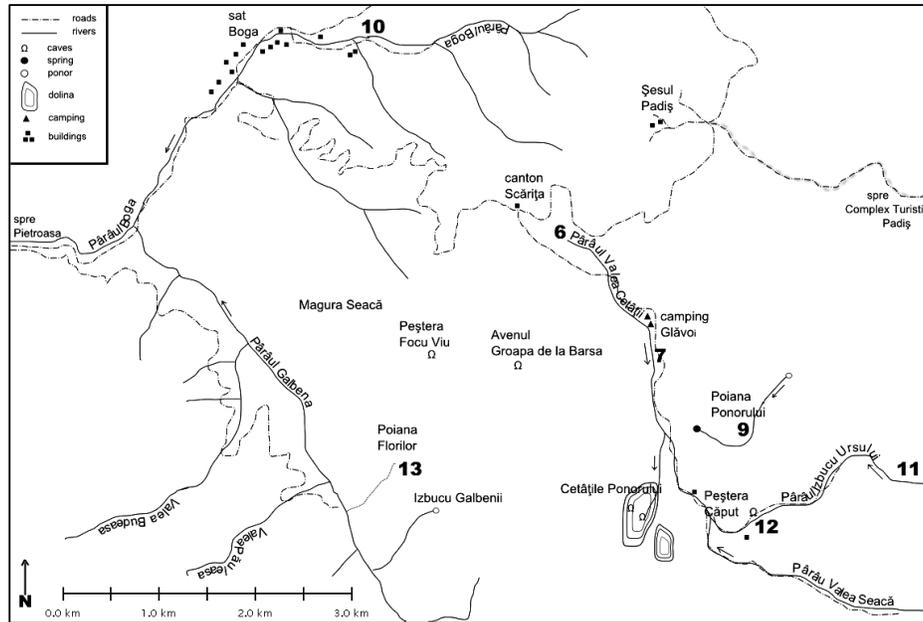


Figure 2. Cetățile-Ponorului – Ursului – Seaca - Galbena System and collecting points map

Ponor brook has been examined in a point to the spring (col. pt. 8 =  $N46^{\circ}39'40''$   $E22^{\circ}46'15''$ ) and we have found one turbellarian *Dugesia gonocephala* and another point was situated downstream from Izbuc Ponor (col. pt. 9 =  $N46^{\circ}34'20''$   $E22^{\circ}42'47''$ ), there has been identified a very significant number of amphipods from *Gammarus balcanicus*.

Into Padiș area we have gathered samples from Trînghești Brook but with no turbellarians or malacostraceans in the samples.

Along Valea Boghii River (col. pt. 10 =  $N46^{\circ}36'30''$   $E22^{\circ}39'31''$ ) was caught and identified the decapod *Austropotamobius torrentium*, together with the amphipod *Gammarus balcanicus*.

Into Caput area, at Izvorul Rece (col. pt. 11 =  $N46^{\circ}34'09''$   $E22^{\circ}44'10''$ ) we have found the turbellarians: *Dugesia fusca* and *Dugesia lugubris* together with the amphipod *Gammarus balcanicus*, the entire benthonic fauna was very well represented there as number of specimens.

Along Izbucul Ursului River we have gathered samples before the entry into Caput Cave (col. pt. 12 =  $N46^{\circ}33'51''$   $E22^{\circ}42'53''$ ) and we have identified

two species of amphipods: *Gammarus balcanicus* and *Niphargus foreli* (as phreatic species).

Along Galbena River we make only one point of collections because of the higher level of water within that period. We have not found any species of turbellarians or crustaceans because the river had a very turbulent flow. Neither Luncoșoara River (Galbena's tributary) we have not found interest species.

At Poiana Florilor spring (col. pt. 13 = N46<sup>0</sup>33'57'' E22<sup>0</sup>40'32'') we have found a very healthy benthonic fauna, identifying 3 species of turbellarians: *Dugesia lugubris*, *Dugesia fusca* and *Dugesia gonocephala*, also the amphipod *Gammarus fossarum*.

Next we present the identified species in the systematical table with the collected points on the right table:

Phylum Platyhelminthes	
Class Turbellaria	
Order Seriata	
Suborder Tricladida	Collecting points:
<b>Family Dendrocoelidae:</b> <i>Bdellocephala punctata</i> (Pallas 1774)	6
<b>Family Dugesiidae:</b> <i>Dugesia gonocephala</i> (Dugès 1830) <i>Dugesia fusca</i> (Pallas 1774) <i>Dugesia lugubris</i> (Schmidt 1861)	1, 4, 8, 13 3, 6, 11, 13 11, 13
<b>Family Planariidae:</b> <i>Polycelis cornuta</i> (Johnson 1828)	6

Phylum Arthropoda	
Subphylum Crustacea	
Class Malacostraca	
Order Decapoda	Collecting points:
<b>Family Astacidae:</b> <i>Austropotamobius torrentium</i> (Schrank 1803)	10
Order Amphipoda	
<b>Family Gammaridae:</b> <i>Gammarus balcanicus</i> Schäferna 1922 <i>Gammarus fossarum</i> Panzer 1835	1, 6, 7, 9, 10, 11, 12 3, 13
<b>Family Niphargidae:</b> <i>Niphargus foreli</i> Humbert 1877	12

### CONCLUSIONS

The results from the qualitative samples placed on the rivers and brooks from Natural Park Apuseni have brought us to the following conclusions regarding the diversity of the turbellarians and malacostraceans fauna:

- There have been identified 5 species of turbellarians which belonged to the next Families: Dendrocoelidae, Dugesiidae and Planariidae, 3 species of

amphipods from Gammaridae and Niphargidae Families, also one species of decapods from Astacidae Family.

- About the distribution between the two types of aquatic ecosystems we can say that all species of turbellarians and malacostraceans have been found in the lotic ecosystem.
- *Dugesia gonocephala* is the prevailing species within the turbellarians fauna into Natural Park Apuseni.
- The dominant species of amphipods is *Gammarus balcanicus*, which lives in the most running waters, *Niphargus foreli* species lives only in surrounding with lack of light, into caves, it can be seen only casually in surface water, near to karstic systems.
- About the degree of the water pollution, we can say that in the case of Valea Cetății Brook it is remarkable lowering the species number for the benthonic invertebrate downstream the camping area, a trait which was seen also along Trînghești Brook, within the touristic area Padiș.

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