

ON THE CRUSTACEANS OF SHALLOW WATERS AND SPRINGS OF STARA PLANINA MOUNTAINS IN SERBIA

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ABSTRACT. Lack of knowledge on taxonomy and biogeography of crustacean fauna in small waters and springs of the Stara Planina Mountains denoted this region as “blank area” in Limno Fauna Europaea. Up to now, this is the only attempt to summarize data on the crustacean diversity of shallow-waters, including small pools and springs of this territory. During our investigations the appearance of four classes (Branchiopoda, Ostracoda, Copepoda and Malacostraca) was noted. In this work to the presence of the ostracods and non-cladoceran branchiopods was checked. The appearance of two branchiopods (*Branchipus schaefferi* Schaeffer, 1766 and *Leptestheria* sp. Sars, 1898) and four ostracods (*Heterocypris incongruens* (Ramd., 1808), *Notodromas monacha* (O. F. Müller, 1776), *Potamocypris variegata* (Br. et Norm. 1889 and *Cyclocypris ovum* Jurine, 1820) were noted. *P. variegata* was rediscovered after more than 40 years in Serbia and Montenegro.

KEY WORDS: Crustacea, Stara Planina Mountains, Serbia

INTRODUCTION

Knowledge of some crustacean taxa is scarce in Serbia and Montenegro. Some major groups have never been studied or, at least, have not been sufficiently studied. Lack of detailed knowledge on taxonomy and biogeography of crustacean fauna in small waters and springs of the Stara Planina Mountains denoted this region as “blank area” in Limno Fauna Europaea (Illies, 1967).

The aims of our work are:

1. Summarizing data on the crustacean diversity of shallow waters, including pools, ditches and small lakes of this territory;
2. Checking the presence of the non-cladoceran branchiopod and ostracod genera and species.

MATERIAL AND METHODS

Our research is based on investigations during the 2000, 2004 and 2005 in the Western Stara Planina Mountains, near the border between Serbia and Bulgaria territory. Investigated area included two groups of localities:

Group A: Localities along the banks of the Nišava river, on the foot of the mountain (at the altitude of about 400 m).

Group B: Localities at the upper parts of the mountain (at the altitude of 600 – 950 m).

Both temporary and permanent water bodies were checked at nine points of the investigated area (Figure 1).

Group A:

- (1) Village of Poljska Ržana
- (2) Village of Trnjana
- (3) Village of Gradište
- (4) St. Jovan Monastery
- (5) Marsh in the vicinity of village Krupac
- (6) Village of Srećkovac
- (7) Ditch near the Pirot

Group B:

- (1) Village of Smilovci
- (2) Village of Brlog

Samples were taken with a hand net and fixed in 70% ethyl-alcohol. Sampled material was determined in Institute of Zoology in Belgrade. All animals shown here were photographed with digital camera HP Photosmart 735, using the Carl Zeiss binocular lens.

RESULTS

We noted the presence of four classes of Crustacea, as follows:

- Classis Branchiopoda - orders Anostraca, Conchostraca and Cladocera
- Classis Ostracoda – order Podocopida
- Classis Copepoda
- Classis Malacostraca –order Amphipoda

Habitats showed some abiotic and biotic differences within the studied area.

Sites of the Group A had peculiarities as follows:

(1) Village of Poljska Ržana: ephemeral rain filled ponds situated in neighbour village of Poljska Ržana. They were small, shallow and turbid, with muddy bottom and without vegetation. There was a lot of solid waste in the vicinity of these ponds. We found only one branchiopod species - *Branchipus schaefferi* (Anostraca) and some cladocerans.

(2) Village of Trnjana: the ponds situated on unpaved road between the left bank of the Nišava and field near the village. They were similar to ponds at Poljska Ržana. In the vicinity of some of them a lot of solid waste was situated too. We found: *Branchipus schaefferi* (Anostraca), *Leptestheria* sp. (Conchostraca), Cladocera, ostracod *Heterocypris incongruens* and some amphipods. (Figure 2).

(3) The site Gradište situated on the left bank of the Nišava river, 10 km from Pirot. The cress-pit and agricultural lands in the vicinity were situated. With the branchiopods (*Branchipus schaefferi* and Cladocera) ostracod *Heterocypris incongruens* co-occurred.

(4) On the local Pirot – Krupac road (at the right bank of the Nišava river) we found several pools without vegetation. The site situated in the vicinity of St. Jovan Monastery, about 7 km east from Pirot. Ponds lay at the unpaved road, across the agricultural field. Some of them were inhabited by *Branchipus schaefferi*.

(5) About 10 km east of Pirot is situated a large village of Krupac with a small and well vegetated lake in the vicinity (Krupac Marsh). We noted some amphipods in the peripheral parts of the water body.

(6) More or less stagnant water bodies along the Pirot – Dimitrovgrad railway, near the village Srećkovac are situated. Ostracods *Notodromas monacha* and *Cyclocypris ovum* were collected. Also, some Cladocera and Copepoda were found.

(7) The same taxa inhabited ditch near the Nišava river, in the surroundings of Pirot.

Localities of the Group B:

(8) The small village of Smilovci situated at the altitude of 735 m, about 10 km from the Serbian - Bulgarian border. The near by spring was inhabited by ostracod *Potamocypris variegata*, amphipods, cladocerans and Copepods.

(9) A mountain-village Brlog is situated at the northeast part of the studied area, on altitude of about 950 meters. In small ephemeral ponds on the road we noted ostracod *Heterocypris incongruens* (many females) and cladocerans as well.

DISCUSSION

Up to now crustacean fauna on the West Stara Planina Mt. was the unjustifiably neglected in Serbia and Montenegro. Region south of Sava and Danube rivers is characterized by smaller branchiopod diversity (Petrov et al, 1999). In 2000. Cvetković – Miličić et al. (*in press*) first noted the presence of branchiopods in eastern Serbia. It was the first record on the presence of the genus *Branchipus* and *Leptestheria* in this area and the second one in the limnological area of East Balkans (Illies, 1967).

In spite of the great importance of Cladocera in aquatic ecosystems, taxonomic data of this group are insufficient both in the Serbia (Kalafatić, 1995; Ostojić et Simić, 1997) and in the region of Stara Planina Mt.

Investigations of Ostracoda in the area of the Balkans were commenced at the end of the nineteenth century (Vávra, 1893) and at the beginning of twentieth (Klie, 1925;

1936). The intensive investigations of this group on the territory of Serbia have been conducted since the beginning of this century (Karan – Žnidaršič, 2005). So far, relatively frequent species *Heterocypris incongruens* and *Cyclocypris ovum* presented here were noted only in northern parts of Serbia and in Montenegro. It is very interesting that these ostracods were mentioned in Trakia province in Bulgaria too (Cvetkov, 1966). To date *Notodromas monacha* was found only in the vicinity of Kraljevo (Petkovski, 1959) and in Banat district (Karan – Žnidaršič, 2005). *Potamocypris variegata* observed in ponds of our study was noted only once, before 1961 during the investigations of the Skadar Lake (Petkovski, 1961), and thus have not been found for more than 40 years in Serbia and Montenegro. *Potamocypris variegata* was also observed in Bulgaria (Cvetkov, 1966).

Amphipods are relatively poor investigated in Serbia. There are some recent data on the presence of these crustaceans in some springs in east Serbia (Marković, 1998), but localities of Stara Planina, unfortunately, were not included.

In spite the fact that our investigations are preliminary ones, they significantly contribute to the knowledge on crustacean fauna of Western Stara Planina Mt. Extensive studies of this region should be carried out in the future.

CONCLUSION

Up to now crustacean fauna on the West Stara Planina Mt. was the unjustifiably neglected in Serbia and Montenegro. In spite these investigations are preliminary ones, records presented in this study indicates the richness of habitats and considerable crustacean diversity in this area.

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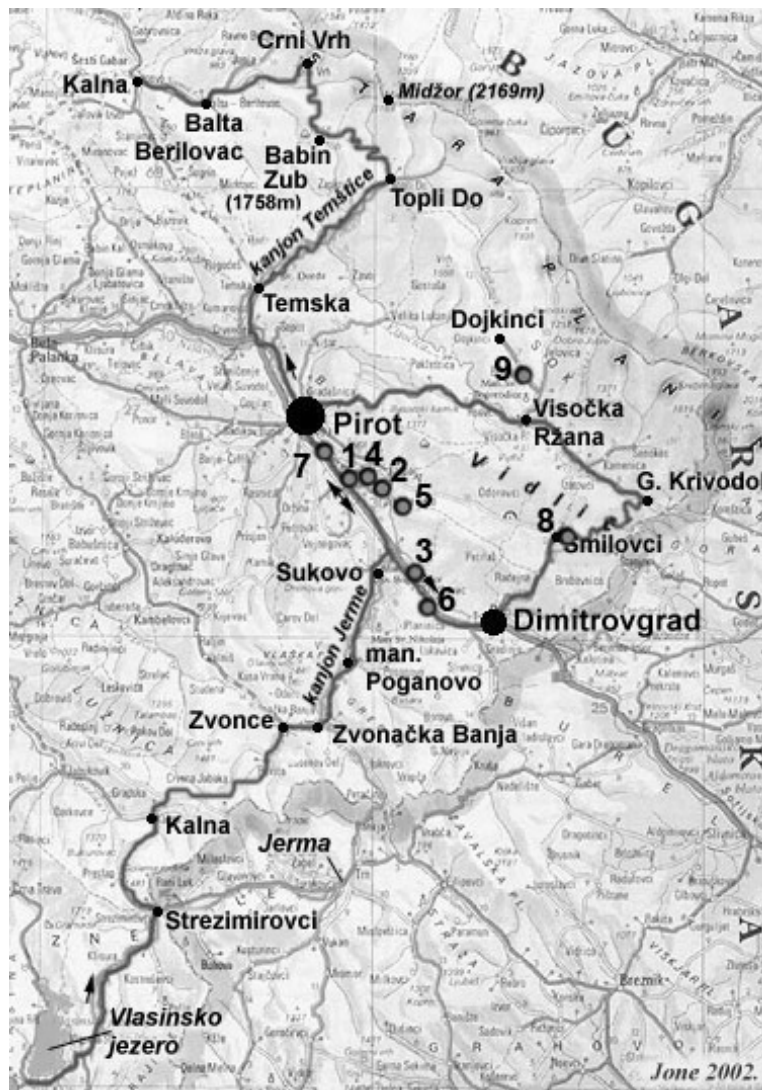


Figure 1. Studied area. Legend: (1) Poljska Ržana; (2) Trnjana; (3) Gradište; (4) St. Jovan Monastery; (5) Krupac Marsh; (6) Srećkovac; (7) Ditch near Pirot; (8) Smilovci; (9) Brlog

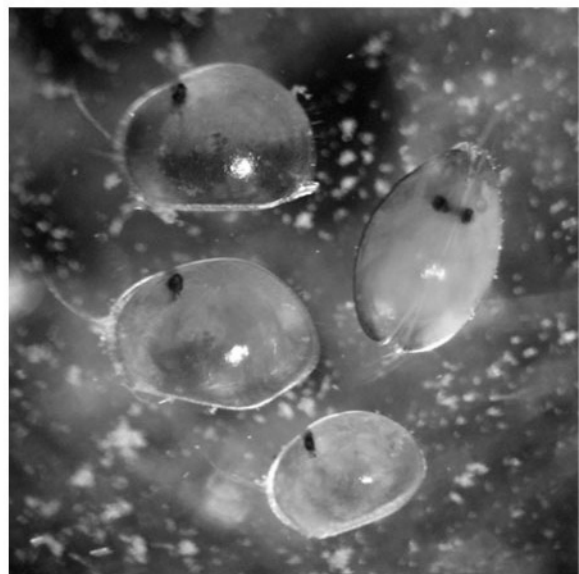
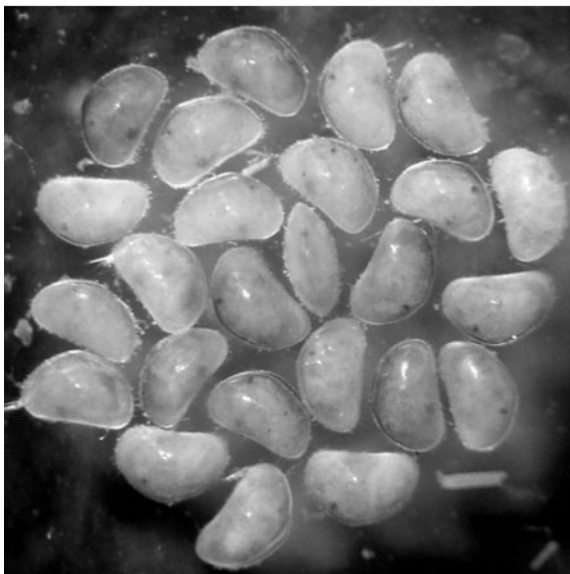
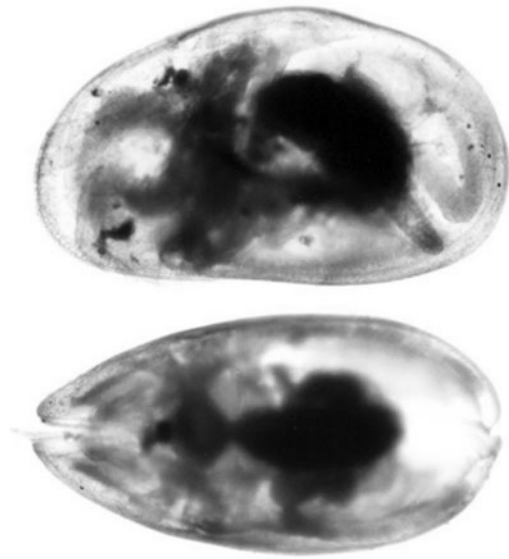
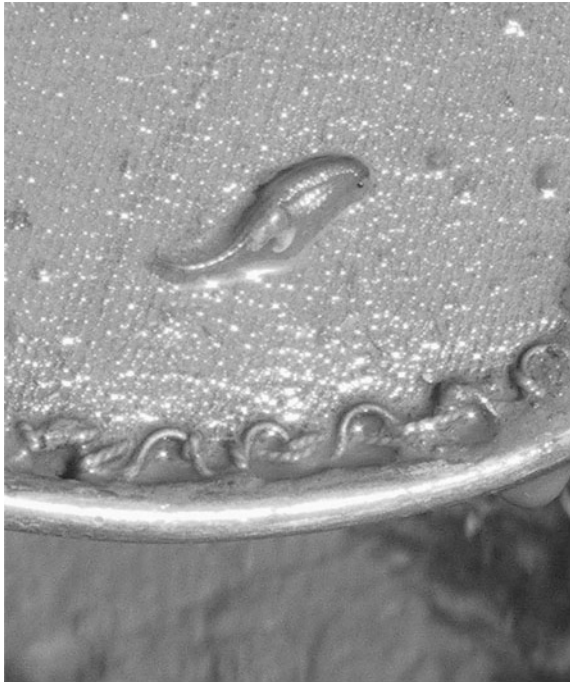


Figure 2. *Some crustaceans of the Stara Planina Mountain in Serbia*