



**A CONTRIBUTION TO THE KNOWLEDGE ON THE DISTRIBUTION
OF NATIVE CRAYFISH *Austropotamobius torrentium* (SCHRANK, 1803)
IN SERBIA**

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ABSTRACT

The native crayfish species *Austropotamobius torrentium* presumably inhabits mountainous streams at higher altitudes. As Serbia is one of few countries in its native range with general lack of data regarding conservation status of *A. torrentium*, there is a need to provide up-to-date basic data regarding distribution and population status of the species. Therefore, as a starting point for planned future investigation in this paper we present a current state of knowledge of *A. torrentium* distribution in the target area. To date based on previously published and new findings, stone crayfish was found at 48 localities, covering seven major river basins, in total.

Key words: stone crayfish, new findings, Serbia.

INTRODUCTION

Stone crayfish *Austropotamobius torrentium* (Schrank, 1803) is one of a five autochthonous decapod species in Europe and one of three recorded in Serbia. It inhabits unpolluted mountainous streams of the Danube and Elbe basins in South-eastern and Central Europe [1]. According to IUCN criteria (Version 3.1) [2] this species is categorized as "Data Deficient" with decreasing population trends in the majority of countries.

Serbia is one of few countries in its native range with general lack of data regarding status of this species. According to the Appendix I of the Book of Regulations on the designation and protection of protected and strictly protected wild species of plants, animals and fungi [3] it is listed as strictly protected species.

Increased anthropogenic pressures on aquatic habitats – pollution, habitat destruction, construction of small hydropower plants, as one of the most frequent hydromorphological alterations with severe impact are the most threatened factors that

cause population declines in a majority of countries [4, 5]. Regarding distribution and conservation of this protected species some steps were already undertaken [6, 7, 8, 9] but there is obvious need to fill existing gaps with continued and more detailed investigation. The aim of this paper is to summarize current knowledge of *A. torrentium* distribution in Serbia, as the basis for future investigation.

MATERIAL AND METHODS

The information regarding the distribution of *A. torrentium* presented in this paper were obtained from available literature [7, 9], and unpublished recent data from regular field research conducted by Institute of Biology and Ecology, Faculty of Science, University of Kragujevac and Institute for Biological Research „Siniša Stanković“, University of Belgrade. Individuals of the stone crayfish were collected by hand or LiNi traps. These are cylindrical, folding nets with two conical entrances with 15 mm mesh size. In traps bait was placed in order to attract crayfishes, usually small part of smelly meat (hot dog or salami). With a long rope or stones traps were secured and left in a water over night for 10 hours. In total, eight to ten traps were placed in a stream along transect of 100 m. All caught individuals were kept in plastic containers for measurement. Also, leg or antennal tissue were taken and preserved in 95% ethanol for further genetic analysis.

RESULTS AND DISCUSSION

In total *A. torrentium* was recorded at 48 localities in Serbia (Figure 1). Among them, during recent fieldwork at 13 new localities the presence of this crayfish was confirmed. Out of ten major drainages in Serbia, seven of them were inhabited by *A. torrentium* – the Danube, Drina, Kolubara, Zapadna Morava, Južna Morava and Timok basins, as well as drainages of rivers belonging to the Aegean sea basin. The distribution of stone crayfish is restricted presumably to the springs and streams with stony bottom in mountainous parts of the western, southern and eastern Serbia, but according to literature [7] the densest populations were found in watercourses at lower altitude (500 m).

In the same paper authors assessed the population status of the species as good, with adequate sex ration and age structure. As those results were published nearly ten years ago, and having in mind a general decreasing population trend of the species in majority of countries within its range there is need to re-evaluate its status. As the main treats to *A. torrentium* spreading of alien crayfish species, in addition to overall deterioration of water habitats could be singled out. [10]. Also, due to habitat deterioration (canalization of the lower stretches and building of small hydropower plants) natural dispersion of the stone crayfish throughout watercourse is enabled and they are remaining isolated is the headwater section [11].



Figure 1. New findings localities codes: 1) Izgara (Sinji Vir), 2) stream Jarmenovački potok, 3) river Javorska reka, 4) river Crna reka (Mlava), 5) river Crna reka (Divčibare), 6) stream Šutanovački potok, 7) river Polonska reka, 8) river Boračka reka, 9) Visočica, 10) river Jelovička reka, 11) river Vučja reka, 12) Belorečka Reservoir, 13) river Brankovačka reka.

Future investigations are planned for next two years. Beside already documented localities, rivers and streams considered to be suitable for inhabiting *A. torrentium* will be studied, at least one stream for each drainage. Eventually presence of the species in the northern part of the country (Fruška Gora and Vršачke planine mountains) will be checked in order to find isolated populations. To describe localities, following data will be used: mean width and depth of the watercourse, bottom type (according to AQEM protocol and standardized crayfish protocol), water temperature, average surface speed of the water, conductivity, pH and coordinates.

Field work will be focused on detailed investigations of recorded populations. For each caught individual symptoms of diseases, injuries and presence of epibionts will be observed. In the same period samples for DNA analyses will be collected. Genetic data will provide basis for estimating population diversity and accompanied with habitat data, will provide better insight into populations status. Found haplotypes will be compared to the already known and will classify them into existing phylogenetic lines.

Important aspect of the investigation will be to determine major threatened factors for survival of *A. torrentium*.

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