

# Stygofauna of Karstic Ecosystem in Ponor Mountains, Western Bulgaria: Present Knowledge and Research Challenges

*Vesela V. Evtimova<sup>1\*</sup>, Ivan S. Pandourski<sup>1</sup>, Aleksey D. Benderev<sup>2</sup>*

<sup>1</sup>Institute of Zoology, Bulgarian Academy of Sciences, 1, Tsar Osvoboditel Blvd., 1000 Sofia, Bulgaria;  
E-mails: evtimovv@tcd.ie; pandourski@gmail.com;

<sup>2</sup>Geological Institute, Bulgarian Academy of Sciences, Acad. G. Bonchev str., bl. 24, 1113 Sofia, Bulgaria;  
E-mail: aleksey@router.geology.bas.bg

**Abstract:** The purpose of this research is to examine the relationships between the karstic complexes and the hydrogeological characteristics of karst on one hand, and the distribution of stygobiont species, on the other. The research was conducted in the karstic region of Ponor Mountains, part of Stara Planina range, Western Bulgaria, with an area of approximately 60 km<sup>2</sup> and average elevation of about 1000 m a.s.l. The karstic springs in the foot of the mountains are the only water source for nearly 15 000 people. Two basic rock complexes can be distinguished regarding karstification: Triassic karstic complex and Upper Jurassic complex. The principal collector of the groundwater is the Triassic complex with annual discharge of 2900 dm<sup>3</sup>/s from which 80% is leaving the system through the Iskretski izvori springs. The Jurassic complex is lacking superficial outflow which determines its precipitation alimentation. The stygofauna of Ponor Mountains is very heterogeneously distributed and its composition varies greatly from one station to another. Nevertheless, the similarity calculated on the basis of presence/absence of stygobiont species is high (above 0.7) for the locations from Quaternary and Jurassic complexes. The aquifers in rocks with Triassic age do not demonstrate such similarity owing to the large percentage of local endemic species. Only in some isolated cases faunistic similarity between certain stations is higher. Some of the stations in Triassic aquifer are more similar to stations in Jurassic aquifers or to Quaternary sites, proving the hydrological connections between the Triassic and the other two complexes. Spatial distribution and relationships between Jurassic and Triassic complexes are determined by tectonic peculiarities of this part of Stara Planina Mountains.

**Key words:** stygofauna, faunal similarity, Triassic, Jurassic karstic complexes