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# **The Book of Abstracts and Programme**

**of 9th International Symposium of  
Ecologists of Montenegro - ISEM9**

**Virtual Conference**

**4-5 November 2020  
Montenegro**

**PUBLISHER**  
***Institute for Biodiversity and Ecology***

**EDITOR**  
***Vladimir Pešić***

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*This Book is part of Ecologica Montenegrina Book of Abstracts and Conference Proceedings Series.*

***Podgorica, November 2020***

CIP - Каталогизација у публикацији  
Национална библиотека Црне Горе, Цетиње

**ISBN 978-9940-798-00-0**  
COBISS.CG-ID 15453444

# Microcosm approach: In situ effects of microplastic mixture on community structure of freshwater benthic macroinvertebrates

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## Abstract

Benthic communities represent one of the most threatened organisms in aquatic habitats due to accumulation of plastic particles in sediments. High abundance of MPs in aquatic habitats indicate higher probability of macroinvertebrates to ingest microplastic particles. Benthic community was exposed to high concentration of MPs, 80 g m<sup>-2</sup> in sediment, and control, without addition of MPs. Mixture of MPs contained polyethylene (PE), polyvinyl-chloride (PVC) and polyamide (PA) in a ratio of 50%: 25%: 25%, respectively. In situ experiment lasted for 100 days. Total number of taxa that colonized the trays were 22 (17 in control, 18 in HC treatment). Most dominant group within macroinvertebrate community was dipteran family Chironomidae, both in control and HC treatment. No significant differences in abundance and biomass at community level between control and HC treatment was recorded by PERMANOVA ((F=0.993; p=0.456 and F=0.344; p=0.797, respectively). Mixture of microplastics did not influence abundance and biomass of functional feeding groups within macroinvertebrate community (F=1.810; p=0.137 and F=0.377; p=0.736, respectively). Species richness (S), species abundance (N), biomass (B), Shannon's diversity index (H) and Simpson's index (D) showed no statistically significant differences between the control and treatment groups.

**Keywords:** Microplastics, Macroinvertebrates, Benthic community, Functional feeding groups, Microcosms