

Metataxonomics for the Micro-plastic and other Particle Attached Habitats in the Northeastern Mediterranean Sea

Selin Küçükavşar¹, K. Gökdağ², AE Kıdeys³, Arzu Karahan^{4}*

^{1,2,3,4}Middle East Technical University, Institute of Marine Sciences, Erdemli, Mersin, Turkey
Corresponding author e-mail: arzukarahan@ims.metu.edu.tr

Plastic now pollutes every corner of earth and it is one of the major environmental problems of nowadays. Beside of being directly harmful as a mimic of food sources of marine organisms, as being suitable substrate for different kind of microbes they have also indirect damage. Metataxonomics analysis using Next Generation Sequencing (NGS) technology have revealed numerous previously unrecognized microorganisms. In the present study, micro-plastic attached bacterial community of samples taken from four different depths (0, 25, 150, 200 m) from a North-eastern Mediterranean offshore station (200 m) were investigated using metataxonomics amplicon sequencing technique. Targeted marine samples were micro-plastic attached microorganisms, but because of the limited evidence it has been called as Micro-plastic and other particle attached habitats. Those samples also compared with free-living organisms in the area. About 664 Operational Taxonomic Units (OTUs-sequence variants) from 65,457 sequences were observed for all the depths. Caulobacteraceae was the most dominant order in the micro-plastic particle attached marine environment, which the members of taxa are usually known to be biofilm colonizer whereas, SAR 11 clade found to be abundant in the free-living community. Another common bacterium for marine environment was Phenyllobacterium that degrades the Chloridazon herbicide and Acinetobacter junii which was shown to have the ability to degrade biodegradable plastic. This is a first study using a culture-independent approach for identify the North-eastern Mediterranean free-living and micro-plastic particle-attached marine microorganisms.

Keywords: 16S rDNA, Metataxonomics, micro-plastic, particle-attached

Influences of climate and land use on the ecology of Mediterranean shallow lakes: a space-for-time substitution approach

*Meryem Beklioğlu**

*Middle East Technical Univ. Limnology Lab., Biol. sciences. Dept.

Climate warming threatens the functioning and biodiversity of shallow lakes, not least lakes located in Mediterranean climatic zones that are subjected to additional stressors such as intensive land and water use. We used a space-for-time substitution approach to assess the response of trophic and community structures and biodiversity to temperature and hydrological constraints. We selected fourth-four lakes covering a wide climatic and nutrient gradients in the western Anatolian plateau of Turkey. Lakes located in the northern highlands, with the lowest agricultural activity and temperatures, had low nutrients and chlorophyll a (Chl a), low proportions of small fish, large proportions of piscivores, the dominance of large-bodied cladocerans and calanoid copepods, all of which indicate low top-down control by fish. In contrast, lowland lakes with higher temperatures and higher agricultural impact had a higher proportion of small fish and higher nutrient and Chl a concentrations with cyanobacteria dominance. The Chl a: TP ratio, omnivorous fish biomass and the fish:zooplankton biomass ratio were also higher, whereas the zooplankton:phytoplankton biomass ratio and macrophyte coverage were lower, suggesting a high top-down trophic control of fish on zooplankton. Our results indicate that climate warming in Mediterranean lakes may result in higher salinization and eutrophication with more cyanobacteria blooms and