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Growth Rates of Planktonic Organisms in “Yerevanyan Lich” Reservoir and the Hrazdan River in Yerevan City, Armenia

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Abstract : Bacterio- and phytoplankton growth rates in 'Yerevanyan lich' reservoir and the Hrazdan river in Yerevan city, Armenia were investigated in April and June-August, 2015. Phytoplankton sampling and analysis were performed by the standard methods accepted in hydrobiological studies. The quantitative analysis of aerobic, coliform and E. coli bacteria is done by the 'RIDA COUNT' medium sheets (coated with ready-to-use culture medium). The investigations showed that the insufficient management of household discharges in Yerevan city caused the organic and fecal pollution of the Hrazdan river in this area which in turn resulted in an increase in bacterial count and increased sanitary and pathogenic risks to the environment and human health. During the investigation in April, the representatives of diatom algae prevailed quantitatively in the coastal area of 'Yerevanyan lich' reservoir, nevertheless, a significant change in the phytoplankton community in June occurred: due to green algae bloom in the reservoir, the quantitative parameters of phytoplankton increased significantly. This was probably conditioned by a seasonal increase in the water temperature in the conditions of the sufficient concentration of nutrients. However, a succession in phytoplankton groups during July-August occurred, and a dominant group (according to quantitative parameters) in the phytoplankton community was changed as follows: green algae-diatom algae-blue-green algae. Rapid increase in the quantitative parameters of diatom and blue-green algae in the reservoir may have been conditioned by increased organic matter level resulted from green algae bloom. Algal bloom in 'Yerevanyan lich' reservoir caused changes in phytoplankton community and an increase in bacterioplankton count not only in the reservoir but also in the Hrazdan river sites located in the downstream from the reservoir. Thus, the insufficient management of urban discharges and aquatic ecosystems in Yerevan city led to unfavorable changes in water quality and microbial and phytoplankton communities in “Yerevanyan lich” reservoir and the Hrazdan river which in turn caused increased sanitary and pathogenic risks to the environment and human health.

Keywords : algal bloom, bacterioplankton, phytoplankton, Hrazdan river, Yerevanyan lich reservoir
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