Evaluation of Water Quality of Karaj River Based on BMWP Biological Index

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Abstract

The BMWP Biological Index (Bioligical Monitoring Working Party) is one of the most common indicators taken from Macrobenthos, which uses quality scores on collected families to assess the quality of the health of river ecosystems. In this study, sampling was carried out in nine stations from Varanghehroud and Dizin along the Karaj Rever to the Bilqan station near the city of Karaj, seasonally from Autumn 2018 to Summer 2019. Macrobenthos were sampled with sorbers sampler and after fixation with 5% formalin and staining, the samples were identified and separating. Based on results out of total 38,400 macrobenthos samples collected, 51 taxa from 42 families were identified. The average annual density in the Karaj River was 2911 (number/square meter). The Arthropoda and Ringworms populations together account for 97% of the identified macrobenthos density. The average of the total BMWP index in Karaj river is 48.8 and the range of changes of BMWP index based on station is (4.0-109.0). The maximum annual average value of this index (73.83) was observed in Varangehroud station and its minimum value (26.50) was observed in Shahrestanak station. The trend of changes in this index from upstream to downstream of the river is decreasing. Classification and zoning of quality status of Karaj river using BMWP index showed that downstream stations such as Bilqan, Pol-e Khab, Asara and Shahrestanak are in poor condition, upstream stations including Shahrestanak, Hassankadar, Gachsar and Dizin are in average condition and station 9 (Varangehroud) is in good condition. The Pole Chobi station after Karaj Dam, despite being downstream of the river, has been of medium quality. It seems that stations where poor ecological status has been assessed need to be prioritized by management programs to protect and reduce pollution load.

Keywords: BMWP, Macrobenthos, Karaj River, Biological Index, Water Quality.