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ASSESSMENT OF JAJROOD RIVER WATERSHED MICROBIAL POLLUTION: SOURCES AND FATES

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Abstract

The Jajrood River watershed is one of the main drinking water resources of Tehran, the capital city of Iran. In addition it provides many recreational usages. However, a variety of microbial pollutions is commonly perceived in the Jajrood River, among them a high concentration of coliform group bacteria that has caused strong concerns. In this article, different aspects of microbial pollution as well as the main microbial pollution sources in the region are discussed. Coliform group bacterial die-off rates have been evaluated as the key parameters that govern bacterial fate in the watershed and were estimated using both laboratory and field data investigations. The high values of the bacterial die-off rates cause significant reduction in the bacteria population naturally. According to the first order decay equation, around 74% of the microbial pollution from domestic wastewater of the 3 main cities in the study area would be attenuated naturally before arrivals to the watershed outlet. In addition, around 98.1% of the microbial population of the animal excretion in the surface area would be decayed naturally. By investigating both sources and fates in the Jajrood River watershed, our knowledge about coliform group bacteria dynamics in this watershed would be enhanced. Therefore, microbial pollution can be managed in a sustainable way by evaluation and use of natural capacity of bacteria die-off in the environment. The derived values for bacterial die-off rates can be a useful reference in microbial studies and modeling attempts..

Key words: coliform group bacteria, die-off rate Jajrood River, microbial pollution, source and fate

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