

عنوان مقاله:

Sub-surface flow constructed wetland for the treatment of sewage generated in a municipal park

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خلاصه مقاله:

BACKGROUND AND OBJECTIVES: The Municipal Park of Areguais is located in the Central Department of Paraguay. Part of this Park is within the area of influence of Ypakarai Lake, which is widely recognized by vacationers for its natural spaces. Despite being one of the most representative ecological reserves in the country, annual water quality reports indicate the presence of a high content of pollutants; mainly nitrogen, phosphorus, and fecal coliforms, among others. These conditions promote the proliferation of cyanobacteria which consume the available oxygen and compromise the reserve's flora and fauna. Following several laboratory tests, the present work has the objective of evaluating the impact of the park's recently constructed wetland on the treatment of residual waters. There are several parameters evaluated in this study of final wastewater discharge disposal treatment through a constructed wetland of horizontal flow with *Typhadomingensis*. The objective is to develop an adequate system for the treatment of residual waters that can be replicated in places with similar conditions. **METHODS:** The evaluation consisted of analyzing the residual water and finding the removal percentage for each of the following parameters such as chemical oxygen demand; biochemical oxygen demand; total phosphorus; total nitrogen; fecal coliforms; hydrogen potential; and temperature. The quality of the treated water was determined by comparing it with the limits established in Article V of Resolution Number 222/02 of the Environment Secretary for effluents. The results demonstrate that this system is a viable option for the removal of fecal coliforms and nutrients such as phosphorus and nitrogen. **FINDINGS:** In terms of the quality of the treated water, the parameters studied are within the limits, established by Resolution Number 222/02 of the Environment Secretary for Class 2 waters, for water to be discharged into the receiving body. The results obtained were: 88.9 percent fecal coliform removal; 84.9 percent total nitrogen; 73.3 percent chemical oxygen demand; 61.4 percent biochemical oxygen demand; and 14.2 percent Total Phosphorus. Considering Resolution 222/02, the biochemical oxygen demand, Total Nitrogen, and Total Phosphorus were outside the admissible limits. **CONCLUSION:** It is very feasible for wastewater generated in public parks to be treated through the construction of sub-surface flow wetlands. This study confirms that the treated wastewater is within the established limits for all the parameters: temperature, hydrogen potential, biochemical oxygen demand, chemical

کلمات کلیدی:

Bioremediation, Black water, Constructed wetlands, *Typha domingensis*

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