Low-Cost Ecological Filter for Water Treatment, Made on the Basis of Activated Carbon From the Biomass of the Black Jurema (Mimosa hostilis)

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Bearing in mind the scarcity of water in the Northeast region of Brazil and throughout the whole country, scientific initiatives are needed in order to seek ways to provide clean water to the population but, above all, to needy families. In the present work, wastewater was treated with the help of an ecological filter composed of activated carbon made from the selected and studied biomasses. In the city of Pedra Branca - CE, which is at the epicenter of the caatinga biome, there is an abundance of black jurema (Mimosa hostilis) vegetation, a plant constantly discarded improperly. The study was carried out with different biomasses, and based on the analyses, the use of black jurema proved itself to be advantageous. After the carbonization of the source material, the activated carbon was crushed, becoming granular. To assess the efficiency of the activated carbon, the pH test was performed. This test resulted in a value of 7, therefore proving it to be a neutral charcoal, ideal for water treatment. In order to bring a better application for the prototype, the porosity activation and the adsorption test were carried out, through qualitative and quantitative means, to analyze the retention capacity of the waste. After this process, the assembly of the filter began, using a PET bottle and consisting of layers, the first having a siliconized polymer, the second having granular charcoal, the third having sand, and the fourth having stones. From this point on, the water treatment was carried out, and its efficiency was verified through physical-chemical and microscopic analysis of the raw and of the treated water. The work concluded with the elaboration and application of the project, a viable alternative for the reuse of contaminated water.

Awards Won:
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