Determining the Most Effective Ratio of Natural Materials for Water Filtration

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This investigation addresses clean water insufficiency in marginalized communities by exploring the viability of natural materials for water filtration. It was determined whether different ratios of sand and moss in natural filters could match or exceed the performance of a conventional store-bought filter in improving water clarity, which was measured by the light intensity (Lux) of the filtered water. This study compared two natural filters–one with a ratio of 40 grams of sand to 60 grams of moss and another with a ratio of 60 grams of sand to 40 grams of moss–to a PUR water filter as the conventional filter. Each filter was tasked with purifying 250 mL of contaminated water, with the resulting filtered water light intensity serving as the primary metric for comparison. The 40 to 60 filter generated filtered water with the highest light intensity average of 17.6 Lux, along with demonstrating a 95% statistically significant difference between the Lux of the dirty and filtered water. In the first and second trials, the 40 to 60 filter had the highest of 21.9 Lux and 21.5 Lux, respectively, surpassing the PUR water filter which had the highest of 21 Lux in the third trial. The experiment illustrates that utilizing a higher ratio of moss than sand was effective, and can offer a potential sustainable and accessible solution for underserved areas dealing with a contaminated water crisis. Further experiments would be recommended to optimize this ratio of natural materials for water clarity improvement.

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