The Homemade Integration of Biodegradable Materials Into Hydroponics: Using Sawdust and Tannins to Detoxify Greywater

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No practical method of treating greywater has been integrated into agriculture. The purpose of this research was to develop a hydroponic filter that increases the ecological sustainability of greywater. Construction of PVC hydroponics systems and tannin-sawdust filters was the initial part of the investigation. Of the three systems compared in plant growth, the system circulating tap water was the control. Two experimental greywater-based hydroponic systems were used, and one utilized the filter. Designing a filter consisting of biodegradable materials that could still positively impact plant growth was the crux of this experiment. The data affirmed how greywater use lowers the health safety of the hydroponic systems and proved that tannin filtration lowers greywater's negative impact on the systems. For hydroponics system analysis, Daphnia magna and organic Ocimum basilcum were used. Daphnia magna are small crustacean-organisms that exhibit high sensitivity to water quality. Ocimum basilcum was analyzed to demonstrate the plant growth that resulted from each system's conditions. Observation scales took multiple aspects of each organism's health into account and were used to determine the viability of each system. General composite scores were calculated each day to translate the conditions of each system. Because the filtered greywater system yielded similar scores to the control tap water system, the filter can hypothetically be utilized in regions of the world without access to filtered or tap water.

Awards Won:

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Shanghai this summer, to two finalists. Outstanding students will be given priority with full scholarships for undergraduate admissions, applicable to any major, at Westlake University.