Coagulation Flocculation Sedimentation Filtration of Microplastics

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The Purpose of my project is to test the effectiveness of different natural coagulants in the removal of microplastics from water. The Independent variables I tested were the coagulants, (Moringa powder, Fava Beans, and Peanuts) the dependent variable was the amount of microplastics removed. To determine the amount of microplastics removed I measured the turbidity (quality of being cloudy due to suspended particles) of my solutions by using a spectrometer. I added 15 milliliters of a natural coagulant powder to 300 milliliters of water, 0.5 milliliters of soap, and 15 milliliters of microplastics in order to test the coagulant's effectiveness. I then mixed the solution for one minute at 400 rpm for the coagulation process, when the coagulant begins to coagulate the microplastics, and bonds start to form. After the solution settled for five minutes, I mixed it at 50 rpm for ten minutes. In this Flocculation process, the flocs of microplastics grow in size by sticking together, enabling them to be filtered. After resting for 15 minutes in the sedimentation process, the solution was measured. The results were compared to a baseline reading of water, soap, and coagulant. I measured the amount of light transmitted because the more effective the coagulant, the less turbid the solution is, and therefore more light is transmitted. According to my data, the Fava Beans were the most effective, letting in 21.50388% more light. This process is important because it uses natural ways to rid water of microplastics.

Awards Won: