Evaluating the Decolorization Efficiency of an Invasive Species, Lonicera japonica, in Removing Acid Blue 113 Dye

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Today, dye effluents produced by textile industries contribute to approximately 20% of the world's water pollution. Due to the costly and complicated dye removal process involved in conventional methods, many countries fail to dispose of their wastewater accurately. This study thus aims to test if an invasive species is effective in removing Acid Blue 113 (AB113) by comparing the reduction in absorbance of the dye solution after the dye interacts with six different types of invasive species. The dye solution that interacted with Lonicera Japonica (LJ) showed the steepest decrease in absorbance, thus indicating that LJ is most effective in removing AB113 within 24 hours. After identifying the most efficient adsorbent, we extended the scope of the study to examine the influence of several parameters such as the dosage of LJ plant powder, time of contact, salinity, and temperature on the absorbance. We created 159 random samples under various conditions and analyzed the collected data through Random Forest Regression Algorithm. The result indicates that as the dosage concentration of the adsorbent increased from 0.2g to 1.0g, the rate of adsorption generally increased. Also, LJ reaches its decolorization efficiency of 90.1% when 1.2 grams of dye adsorbent was put into contact with the solution. Although salinity and temperature have a minimal effect on LJ's adsorption capacity, 0g/L of salinity and temperature above 20? are the conditions for LJ to exhibit the highest decolorization efficiency. In conclusion, LJ demonstrates potential as a cheap, simple to prepare, and easily accessible adsorbent that will positively contribute to the environment.

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