

Pimmanee Ruparseart 2015: The Utilization of Water Hyacinth Stem Bioadsorbent as Growing Material in Constructed Wetland Systems for Dyestuff Removal.
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Nipon Tungkananuruk, Ph.D. 110 pages.

This research was to investigate the feasibility of using the constructed wetland which mixing the bioadsorbent from water hyacinth stem with soil for removal textile dyes in aqueous solution. Batch experiments showed that, six reactive dyes (2%Yellow LS-R-01, 2%Red LS-B, 2%Blue LS-3R, 4%Navy LS-G, 2%Blue G and 2%Turquoise H-Gn) were adsorbed by water hyacinth stem bioadsorbent. Maximum decolorization of each dyes was observed at 3 hr of contact time and the percentage of removal was over than 90% with the exception of 2%Yellow LS-R-01 was 76.20%. Adsorption of dyes was found to follow the Freundlich and Langmuir isotherm model. The suitable ratio by weight of bioadsorbent to soil was 1:30. The column experiments were conducted to simulate the growing material layers which consisted of gravel, coarse sand, sand and mixture of water hyacinth and soil (1:30) from the bottom to the top. The resulted revealed that the 2-days stagnation and 2-days drainage gave the better removal efficiency. Furthermore, the constructed wetland model was carried out in square plastic tank size 51×51×54 cm. which containing the growing layers, growing *Vetiveriazizanioides* and *Typhaangustifolia* in each tank and treatment by the 2-days stagnation and 2-days drainage. The results showed that the two treatment plants were effective in removal of dyes nearly at 85.07 % and 84.20 % respectively. The treatment unit which had bioadsorbent gave the better removal efficiency than unit which without bioadsorbent. Therefore, the constructed wetland which using water hyacinth adsorbent could be applied to treat textile wastewater which contaminated with these six reactive dyes.

Student's signature

Thesis Advisor's signature