Investigation into the Phytoremediation Potential of Some Selected Wetlands Species for the Restoration of Oil Polluted Wetlands

GEORGE GYAN ADDO

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ABSTRACT

This project was carried out to study the phytoremediation potential of three selected wetland plant species, *Typha australis, Paspalidium germinatum* and *Alternanthera nodiflora,* commonly found in almost all wetlands along the coast of Ghana after surviving an initial two-week screening period on the application of 2% w/w Spent Motor Oil as a soil drench.

At the main experimental setup, the three wetland plant species, Typha australis, Paspalidium germinatum and Alternanthera nodiflora, were grown in 1%, 2% and 3% w/w of Spent Motor Oil contaminated soils and observed for a number of 31 days. Sampling was done before both planted and unplanted soils were contaminated with Spent Motor Oil. Sampling was also done a day, 11 days, 21 days and 31 days after soils with plants were contaminated with Spent Motor Oil. At the end of the study period, the mean percentage degradation of Spent Motor Oil was highest for Typha australis soils which recorded $(42.0\pm8.0\%)$ at 1% w/w Spent Motor Oil; (43.0±7.0%) at 2% w/w Spent Motor Oil; and (42.0±9.0%) at 3% w/w Spent Motor Oil concentrations; followed by Paspalidium germinatum soils which recorded (35.0±5.0%), the lowest recorded at 1 % w/w Spent Motor Oil; (33.0±6.0%) at 2% w/w Spent Motor Oil; and (34.0±5.0%) at 3% w/w Spent Motor Oil concentrations; Alternanthera nodiflora soils however recorded the second highest mean percentage Spent Motor Oil degradation at 1 % w/w Spent Motor Oil contamination with (42.0±10.0%); (33.0±9.0%) at 2% w/w Spent Motor Oil; and (28.0±7.0%) at 3% w/w Spent Motor Oil concentrations; with unplanted soils recording the least mean percentage degradation of Spent Motor Oil at all concentrations with, $(28.0\pm10.0\%)$ at 1% w/w Spent Motor Oil; (25.0±5.0%) at 2% w/w Spent Motor Oil; and (22.0±4.0%) at 3% w/w

Spent Motor Oil concentrations. The wetland species *Typha australis* and *Paspalidium germinatum* are strongly recommended for phytoremediation based on the results of this study. The plant species *Alternanthera nodiflora* is however not recommended because of its inability to grow large masses of roots and its poor development in Spent Motor Oil contaminated soils despite its values recorded at the 1 % concentration of Spent Motor Oil contamination.

Supervisors

Prof. Lewis Enu Kwesi Mr. Ayaa Kojo Armah