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THE ABILITY OF *L. ARTICULATA* TO REMOVE POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) FROM DIESEL CONTAMINATED WATER IN HORIZONTAL PILOT CONSTRUCTED WETLANDS (HCWS) REACTORS

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ABSTRACT

This study proceeds to determine the performance of *Lepironia articulata* (*L. articulata*) in removing PAHs from wastewater on the larger scale of horizontal pilot constructed wetlands (HCWs) in batch operating mode. HCWs dimensions are (1.8 L × 0.9 W × 0.9 H) meters and they operated with constant aeration rate (1 L/min). They were planted with the plant (*L. articulata*) and the water contaminated by diesel at different concentrations of 0 (control), 0.5, 1.25 and 2% (V_{diesel}/V_{water}). The sampling performed on days 0, 7, 15, 20, 40, and 70 and (PAHs) concentrations measured in water to determine PAHs removal by *L. articulata* occurring in phytoremediation. The PAHs concentration in the synthetic waste-water contaminated with diesel was determined through a liquid-liquid extraction method using a gas chromatography (GC-FID). HCWs were affected using *L. articulata* and the percentage removal of PAHs from contaminated water was 98.62%, 98.6% and 96.3% for 0.5%, 1.25% and 2% diesel concentrations, respectively. The biomass parameters of stem height and root length were measured to assess the effect of diesel-contaminated water on *L. articulata* growth and the result suggested that *L. articulata* was able to grow in all diesel-contaminated water concentrations (0.5, 1.25 and 2%). Also, temperature, T (°C), pH, and total suspended solid (TSS) were measured. The percentage of TSS removal from contaminated water with all the concentration was ranged from 90 to 96%.

Keywords: Phytoremediation, HCWs, *L. articulata*, polycyclic aromatic hydrocarbon (PAH), water treatment.