

**Characterizing phytoremediation of carcinogenic polycyclic aromatic hydrocarbon naphthalene by *Eichhornia crassipes* (Mart.) Solms aquatic plant**

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**Abstract**

The smallest polycyclic aromatic hydrocarbon, naphthalene can be found in many crude oil-contaminated water bodies. Naphthalene is persistent and considered as very toxic to aquatic life. It is also a cancer-causing agent. Phytoremediation is a cost effective and environment friendly process of removing pollutants from soil or water by living plants. Surfactants can enhance plant uptake of some pollutants. *E. crassipes* is a free-floating aquatic plant commonly found in fresh water bodies in Sri Lanka. We hypothesized that *E. crassipes* has the ability to absorb naphthalene from water and surfactant Triton X-100 can enhance naphthalene absorption. Two sets of *E. crassipes* plants were grown in naphthalene-spiked crude oil-containing water. One set was treated with Triton X-100. Plants grown in fresh water and crude oil-containing water in the presence or absence of Triton X-100 were used as controls. Plant roots were separated, cleaned and freeze dried. Naphthalene was extracted by sonication using 1:1 dichloromethane: acetone mixture and further purified by a silica column. Naphthalene identification and quantification was done using high performance liquid chromatography (HPLC) with a C18 column. According to the results, *E. crassipes* plant was capable of absorbing naphthalene with an average concentration of  $1.14 \pm 0.07$  mg kg<sup>-1</sup>. However, surfactant Triton X-100 treatment did not significantly enhance naphthalene absorption. We conclude that *E. crassipes* plant can be used for phytoremediation of naphthalene. However, surfactant-enhanced phytoremediation was not evident.

**Keywords:** *Eichhornia crassipes*, Naphthalene, Phytoremediation, Triton X-100