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## Usage of *Strychnos potatorum* seeds for the reduction of diazinon residues in water

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The need to fulfil the current food demand has led to the heavy usage of agrochemicals such as synthetic fertilizers, pesticides, and herbicides in agricultural sector. However, pesticide malpractices can cause severe adverse effects on both human health and the environment. Therefore, removal of remaining pesticide traces from water prior to human consumption is essential. Among the organochloride pesticides used in Sri Lanka, diazinon was selected as the candidate pesticide for this model study considering its common usage in local agriculture. *Strychnos potatorum* (SP) is a plant which can be found in central parts of Asia. In several studies, SP seeds have been effectively used for treating polluted water. Therefore, SP seeds were used as the material to treat Diazinon contaminated water. The objective of this study was to assess the efficiency of reduction of diazinon residues from water using raw SP seeds. High Performance Liquid Chromatography (HPLC) analysis was used to determine the diazinon concentration in the medium and the peak for diazinon was identified at ~12 min detected at 254 nm using Agilent infinity 1260 II HPLC performed in a reversed-phase Zorbax Eclipse plus C18 Column, with a mobile phase consisting of acetonitrile/water (65/35, v/v) at ambient temperature with an injection volume of 10 µL and flow-rate at 1 mL/min. Optimization of SP biomass dose/seed biomass was performed by agitating diazinon aqueous solution (10 mg/L, 50.0 mL) with different SP seed pieces varying from 10 g to 50 g. Biomass optimization was done for different agitation conditions (1-inch-long and 1.5-inch-long magnetic bar sizes). Two different biomass-diazinon interaction quenching techniques (filtering using filter paper and centrifugation) were tested. Optimization of treatment time was performed by agitating diazinon aqueous solution (10 mg/L) and SP seed pieces (0.2 g/mL). Treatment was conducted up to 120 mins. A control study was carried out by providing conditions similar to the treatment study without using SP biomass/ seed biomass. Results of this study revealed that SP seed is an effective material for reduction of the diazinon pesticide from the water which showed  $67 \pm 10\%$  diazinon concentration reduction. The efficient SP biomass was identified as 0.2 g/L for 10 mg/L diazinon concentration. The reduction of diazinon concentration was higher with the use of 1.5-inch magnetic bar than the 0.5-inch magnetic bar which revealed that stirring mechanism was significant for the diazinon reduction. The optimum time of treatment was identified as 100 min for SP seeds 0.2 g/mL and for the 10 mg/L solution of diazinon.

**Keywords:** Diazinon, HPLC, *Strychnos potatorum* seeds

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