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**INVESTIGATION ON THE NATURAL WATER COAGULANT,
Strychnos potatorum ("INGINI") SEED POWDER FOR
DRINKING WATER TREATMENT**

A PROJECT REPORT PRESENTED BY

PULAHINGE DON THILINA RODRIGO

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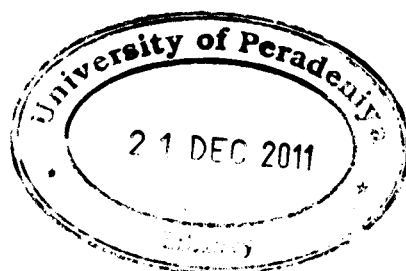
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**INVESTIGATION ON THE NATURAL WATER COAGULANT,
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P.D.T. Rodrigo

Department of Chemistry

University of Peradeniya

Peradeniya

Sri Lanka

The treatments of water with the common inorganic coagulants have a number of disadvantages especially for developing nations. The *Strychnos potatorum* ("Ingini") is one of the natural coagulants that have been tested over the years as an alternative to the use of inorganic and synthetic coagulants. It has been found to be effective for turbidity waters. The seed and its powder form have been used for water clarification on small scale in some parts of the developing world. This study was aimed at investigating the effectiveness of the *Strychnos potatorum* (Sri Lankan plant) seed powder coagulant for the removal of turbidity, water hardness causing cations (Mg^{2+} , Ca^{2+}), heavy metal cations (Pb^{2+} , Cr^{3+} , Cd^{2+}), Fluoride (F⁻) and Chemical Oxygen Demand (COD) of treated water.

Finley ground *Strychnos potatorum* ("Ingini") seed materials were used in this study was purchased from the local market without further grinding and sieving. Turbid water was prepared by soaking natural clay overnight in distilled water and ionic water samples were prepared using corresponding salts dissolved in deionized water. Jar test experiments were carried out to evaluate parameters by leaving overnight contact period on without disturbing condition. The results showed the effectiveness of *S. potatorum* for turbidity removals of up to 92%, 91% and 85% for initial turbidities of 25, 50 and 100 Nephelometric Turbidity Units (NTU) respectively. There was no desired pattern of conductivity variation of treated water on the dose of seed powder. Although, pH value was decreased as seed powder amount progressed. Further, COD value was proportionally increased due to extraction of organic compounds from the seed powder. Both Mg^{2+} and Ca^{2+} were not removed on treatment and results have indicated that those ion concentrations were raised

with the added dose. Thus it may possibly increase finished water hardness. The test on Fluoride removal was ineffective on operating system parameters; such as F^- initial concentration, powder dose and pH. Heavy metal removal was effective and it was tested on initial ion concentration and adsorbent loading dose. The FTIR study revealed the various functional groups are responsible for the adsorption process. The XRF spectra showed those adsorbed heavy metals are not run off on adsorbent.