

**A STUDY ON *Escherichea coli* ADSORPTION OF
SELECTED PLANT MATERIALS:
AS A WATER PURIFICATION METHOD**

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by

DHEENA MOHAMED MUNSOOR

**Faculty of Science and Technology
Uva Wellassa University, Sri Lanka**

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Abstract

Drinking water is one the most essential requirement of healthy human life, which is limited on the earth. The quantity of potable water is rapidly diminishing mainly due to the increasing human population. Faecal contamination of drinking water sources is one of the major issues of undeveloped countries, which reveals a high demand for the development of low cost water purification system. With reference to previous studies, many plant materials are identified as potential low cost adsorbents. On the basis of that, three types of locally available plant materials were selected and used for the study which consists of corn cob, clearing nut and rice husk. *Escherichia coli sp.* was used in different concentrations in the experiment, as it is a commonly used faecal indicator. The study was conducted to determine the *Escherichia coli* adsorbance of selected plant materials. The filtration test was carried out by changing three parameters such as plant material, particle size and concentration of *Escherichia coli* solution. The *Escherichia coli* solution of 200 cells/ml, 100 cells/ml and 50 cells/ml were prepared. Concentrations of the *Escherichia coli* solution were determined by the optical density method with the use of spectrophotometer. The plant materials of three different sizes were obtained (1 mm, 500 μm and 125 μm). The filtration test was carried out for every combination of *Escherichia coli* solution, plant material and particle sizes. Three replicates were maintained for each combination. The filtered solutions were cultured in Nutrient Agar medium and the remaining number of *Escherichia coli* in the filtered solutions, were determined. In accordance to the percentage of filtered number of *Escherichia coli*, best combination of the efficient filtration was identified. According to the analysis, the identified best combination was corn cob, 0.125 mm with the initial concentration 200 cells/ml. The maximum usage time and the maximum volume of water that can be filtered by 1g of each filtering particle were determined by doing the filtration test including five trials, with the same filtering particles. The 1 g corn cob particles of 0.125 mm can be used for 51 minutes and 30 ml is the maximum volume which can be filtered through.