

DISINFECTION & COAGULATION ABILITIES OF THE NATURAL PLANT MATERIALS FOR WATER TREATMENT

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Abstract

In certain instances chemical compounds are used in water purification plants as disinfectants and coagulants which would cause adverse environmental and health issues. Present study aimed by finding a suitable plant materials as disinfectants and coagulants for both water and wastewater treatment. In disinfection test, leaves of *Carica papaya*, *Azadirachta indica*, *Terminalia arjuna* and bark of *T. arjuna* were used. Plant powder (20 g) of each species was mixed in 70% ethanol (100 mL) separately and 2.5 mL of mixture was used to treat *Escherichia coli* suspension. In control, *E. coli* suspension was treated by 2.5 mL of 70% ethanol. Treated suspensions were incubated (100 rpm, 15 hours), re-cultured in a Nutrient Agar, incubated for 24 hours and number of colonies were counted. In coagulation test, seed powder of *Zea mays*, *Moringa oleifera*, *C. papaya* and *Cicer arietinum* mixed in water (0.5 g, 1.0 g, and 1.5 g/100 mL) separately and added to 500 mL of raw water and jar test was performed. Turbidity, pH and conductivity were measured in treated water. Complete Randomized Design was followed in both experiments with three replicates. Data were analyzed by ANOVA. According to the results of disinfection test, all treatments showed the reduction of *E.coli* colony count in comparison to control. *C. papaya* showed the least colony count. Turbidity and pH of coagulated samples were significantly different ($p < 0.05$) among treatments. The least turbidity was observed under *M. oleifera*. *Zea mays*, *M. oleifera* and *C. arietinum* maintained the pH of treated water around 7. *Carica papaya* maintained the basic water pH. Least conductivity was given by *C. papaya* but not significant ($p > 0.05$). Effective concentration for turbidity and conductivity maintenance was 0.5 g /100 mL whereas pH was maintained with 1.5g/100 mL concentration. In conclusion, according to the results obtained from the study, the most effective disinfectant and coagulant was powder of *C. papaya* leaves and *M. oleifera* seeds respectively.