

(124)

Detection of Microbial Degradation of Natural Rubber Latex by Isolated Native Bacteria in Sri Lanka

G.Y. Liyanage, P.M. Manage*

Department of Zoology, University of Sri Jayewardenepura, Sri Lanka

**pathmalalmanage@gmail.com*

Abstract

Rubber waste management plays an important role to deal with high production and consumption of rubber. The main constituents of natural rubber is cis 1,4-polyisoprene. It is relatively resistant to microbial decomposition compared with many other natural polymers. The aim of study was to evaluate the potential effects of the *Bacillus cereus*, *Enterobacter* sp. and *Enterobacter ludwigii* on natural rubber latex degradation. Aliquots of 100 ml mineral salt medium were prepared and latex was spiked at different concentrations to make final dilutions at 1:10,000, 1:15,000. Each isolates were separately inoculated (3% v/v) to each dilution and incubated at 120 rpm for 12 days. Pour plate method was performed to confirm the resistance of bacteria against to latex. The amount of CO₂ liberation was determined during the cultivation of cells in mineral salt medium and the released CO₂ was trapped by 1M NaOH. Quantification of CO₂ was performed by titrimetric method. The liberation of CO₂ was gradually increased and reached at 8.67, 9.78 and 10.31 ppm for *E.ludwigii*, *B.cereus* and *Enterobacter* sp. respectively. CO₂ liberation was not detected in control. Based on the calculation adapted to the present study, 100% of latex degradation of latex by released CO₂ value should equal to 12.5 ppm. The present study showed that *B.cereus*, *E. ludwigii* and *Enterobacter* sp. have harbor gene which can produce enzyme to degrade latex and future studies are needed to elucidate the degradation mechanism.

Keywords: Natural Rubber Latex, *E.ludwigii*, *B. cereus*, *Enterobacter* sp.