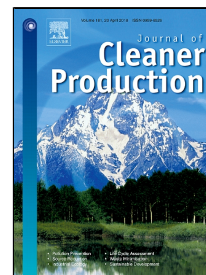


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Locally Produced Lactic Acid Bacteria for Pathogen Inactivation and Odor Control in Fecal Sludge



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1 **Locally Produced Lactic Acid Bacteria for Pathogen Inactivation** 2 **and Odor Control in Fecal Sludge**

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7 **Abstract**

8 Providing safe fecal sludge (FS) sanitation has remained an important goal of global
9 communities because of the high risks imposed on human health of the exposure to un-sanitized
10 FS. This study used lactic acid fermentation as a pre-treatment technology to evaluate the
11 sanitization effect of lactic acid bacteria (LAB) on FS. A combination of fermented rice flour and
12 brown sugar was used as the medium to prepare LAB, and fecal coliforms were used as the
13 indicator organisms. The addition of a LAB suspension grown in fermented rice flour and brown
14 sugar to FS was studied to evaluate the survival of fecal coliforms. The pH decreased during
15 ongoing lactic acid fermentation after the addition of the LAB suspension. The results revealed
16 that fecal coliforms in reactors containing 1:1 and 2:1 w/w of FS and LAB suspension decreased
17 to half of the initial concentration within seven days of the treatment process in comparison with
18 that of the control reactor. Viable plate counts of 0.9×10^8 , 0.6×10^8 , and 2.4×10^8 CFU/100 mL
19 were recorded from reactors 1:1, 2:1, and the control, respectively. The total elimination of the
20 fecal coliforms below the detection limit ($<3 \log_{10}$ CFU/100mL) was observed in both reactors
21 after 15–17 days, whereas the number of fecal coliforms remained at 2.3×10^8 CFU/100 mL in
22 the control reactor. The fecal coliforms were eliminated because of the acidification caused by
23 the LAB during the incubation time. The final pH in the treatment reactors was 3.5. The results

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