

Isolation and Characterization of Acetic Acid Bacteria from Toddy to Produce a High Yield of Vinegar

06 Nov.
NSM32

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The aim of this study was to produce vinegar by isolating and identifying Acetic Acid Bacterial (AAB) species from toddy that has the highest capability for acetic acid production. Coconut toddy samples were collected from various toddy shops located in Sri Lanka. The toddy samples were exposed to air and AAB were isolated using Carr's Ethanol medium. From the preliminary screening, 06 Gram negative bacterial isolates produced yellow colorization around the colonies that indicated the acetic acid production. Motility and endospore staining also were carried out. Furthermore, biochemical characterization of the 06 bacterial isolates resulted *Acetobacter aceti*, *Acetobacter xylinus*, *Gluconobacter hansenii* and *Gluconobacter liquefaciens*. Three isolates were identified as *A. aceti* strains. Isolates were tested for acetic acid productivity, ethanol tolerance, temperature tolerance and acetic acid tolerance. All the Isolates were allowed to ferment 5ml of ethanol-yeast extract medium (ethanol 5%) for 14 days and was titrated against NaOH at 2 day intervals. This was repeated thrice and the Isolate 05 (*Acetobacter aceti*) resulted the highest acetic acid concentration of 5.62% within 14 days of shaking incubation. It was able to grow at temperatures of 30°C, 37°C, 40°C, was able to tolerate ethanol concentrations of 4-10% and remained viable at acetic acid concentrations of 2-4%. This organism was able to produce vinegar consisting of 5.62% acetic acid concentration under laboratory conditions. This *Acetobacter aceti* bacterium has the potential to generate high yields of acetic acid.

Keywords: Acetic acid bacteria, toddy, ethanol