

Identification and Characterization of Acetic Acid Bacteria Isolated from Sri Lanka

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Acetic acid bacteria (AAB) are a group of Gram-negative aerobic, rod-shaped bacteria, important in production of acetic acid, L-sorbose, and gluconic acid. The present work is focused on isolation, identification and characterization of AAB in Sri Lanka, where no previous studies have been performed. From various types of fruits and fermented products in Sri Lanka 41 isolates of AAB were obtained, and were identified using different physiological and biochemical methods. All the isolated strains were found to be Gram-negative, rod-shaped and catalase positive. According to the acetate oxidation pattern, 32 of the isolated strains were identified as *Acetobacter*, seven isolates as *Acidomonas* and only two strains were identified as *Gluconobacter* strains. The isolated *Acetobacter* strains were classified into *A. pomorum* (18 strains), *A. pasteurianus* (7 strains), *A. aceti* (6 strains), and *A. liquefaciens* (1 strain). The two *Gluconobacter* strains were identified as *G. frateurii*. All the isolates showed a good growth at both 30 °C and 37 °C, while few number of *Acetobacter* strains showed their growth at 40 °C, and none of the *Gluconobacter* strains grew at 40 °C. All the *Acetobacter* strains showed a good growth with 10% (v/v) and 4% (v/v) ethanol and acetic acid respectively, at 30 °C. At 37 °C, 75% of the isolates showed a good growth with 10% ethanol, while the rest grew well only up to 3% ethanol, and moderate growth up to 10% ethanol. When consider the acetic acid tolerance, few strains (16%) showed a good growth at 37 °C with 1% acetic acid, while 10% of the isolated strains showed a moderate growth, and rest of the strains showed a very poor growth at 37 °C even with 1% acetic acid. Growth of the isolated strains with 2-4% added acetic acid at 37 °C was very limited, while no growth was observed at 40 °C. In conclusion, variety of AAB were isolated from Sri Lanka that can be used in oxidative fermentation at higher temperatures, and further studies are required.

Keywords: Acetic acid bacteria, *Acetobacteraceae*, *Acetobacter*, *Gluconobacter*, Acetic acid