

Isolation and identification of biocellulose-producing bacterial strains from Malaysian acidic fruits

ABSTRACT

Biocellulose (BC) is pure extracellular cellulose produced by several species of micro-organisms that has numerous applications in the food, biomedical and paper industries. However, the existing biocellulose-producing bacterial strain with high yield was limited. The aim of this study was to isolate and identify the potential biocellulose-producing bacterial isolates from Malaysian acidic fruits. One hundred and ninety-three bacterial isolates were obtained from 19 local acidic fruits collected in Malaysia and screened for their ability to produce BC. A total of 15 potential bacterial isolates were then cultured in standard Hestrin-Schramm (HS) medium statically at 30°C for 2 weeks to determine the BC production. The most potent bacterial isolates were identified using 16S rRNA gene sequence analysis, morphological and biochemical characteristics. Three new and potent biocellulose-producing bacterial strains were isolated from soursop fruit and identified as *Stenotrophomonas maltophilia* WAUPM42, *Pantoea vagans* WAUPM45 and *Beijerinckia fluminensis* WAUPM53. *Stenotrophomonas maltophilia* WAUPM42 was the most potent biocellulose-producing bacterial strain that produced the highest amount of BC 0.58 g l⁻¹ in standard HS medium. Whereas, the isolates *P. vagans* WAUPM45 and *B. fluminensis* WAUPM53 showed 0.50 and 0.52 g l⁻¹ of BC production, respectively.

Keyword: Acidic fruit; Biocellulose; Biocellulose yield; Biocellulose-producing bacterial isolate; Isolation