

Random Mutagenesis on *Wautersia Eutropha* for Improving Poly- β -Hydroxybutyrate Production from Inexpensive Carbon Sources

Das Santanu, Sikdar Munmun and Veerasamy Muralikrishnan

Abstract

Wautersia eutropha, a source of homopolymer and heteropolymers of biodegradable poly- β -hydroxybutyrate [P(3HB)] a potential alternative to recalcitrant plastics, was subjected to random mutagenesis using ultraviolet irradiation. Five mutant isolates, namely *Wautersia eutropha* M1, *Wautersia eutropha* M2, *Wautersia eutropha* M4, *Wautersia eutropha* M5, *Wautersia eutropha* M6 were obtained on screening for poly- β -hydroxybutyrate yield. All five mutant strains and wild-type *Wautersia eutropha* rendered better P(3HB) yield in minimal salt broth supplemented with surplus fructose than nutrient broth. *Wautersia eutropha* M2 and *Wautersia eutropha* M5 were screened for improved P(3HB) yield. *Wautersia eutropha* M5 efficiently utilized cane molasses rendering a highest P(3HB) content of 57.42% at 20g.L⁻¹ concentration whereas the other two strains showed insignificant P(3HB) yield from molasses. P(3HB) content increased with increasing concentration of sago industry liquid waste by the screened strains with a highest P(3HB) yield of 56.67% at 30g.L⁻¹ concentration by *Wautersia eutropha* M5. Arrack gave least growth and poor P(3HB) yield by the screened strains.

Valuable Antioxidant and Antimicrobial Extracts from *Rhizophora Mucronata* of Asiatic Mangrove Forests

Haq Imdadul, Sani Wirakarnain, Philip Koshy, Rafat Arash, Hossain A.B.M. Shariff and Taha Rosna Mat

Abstract

The antioxidant and antimicrobial properties of ethanol, methanol and chloroform extracts of *Rhizophora mucronata* leaves were examined in this study. The antioxidant activities of the samples were evaluated using a combination of enzymatic and non-enzymatic methods namely superoxide dismutase determination, erythrocyte haemolysis protection and 2,2-diphenyl-1-picrylhydrazil free radical scavenging assays. Folin-Ciocalteu reagent method was used to estimate the amount of total phenolic compounds of the extracts. Ethanol, chloroform and methanol extracts of the leaves showed the highest antioxidant potential in superoxide dismutase, erythrocyte haemolysis and free radical scavenging assays respectively. The highest total phenolic content was found in ethanol extract followed by methanol extract. Paper disk diffusion method was applied to determine the antimicrobial activities of ethanol and methanol extracts of the leaves. Both ethanol and methanol extracts could inhibit the growth of *Escherichia coli*, *Staphylococcus aureus* and *Bacillus cereus* while no inhibition was detected against *Pseudomonas aeruginosa*.