

Biosynthesis and characterization of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) copolymer from wild type *Comamonas* sp. EB172.

Abstract

Poly(3-hydroxybutyrate) [P(3HB)] homopolymer and poly(3-hydroxybutyrate-co-3-hydroxyvalerate) [P(3HB-co-3HV)] copolymer was produced by *Comamonas* sp. EB172 using single and mixture of carbon sources. Poly(3-hydroxyvalerate) P(3HV) incorporation in the copolymer was obtained when propionic and valeric acid was used as precursors. Incorporation of 3HV fractions in the copolymer varied from 45 to 86 mol% when initial pH of the medium was regulated. In fed-batch cultivation, organic acids derived from anaerobically treated palm oil mill effluent (POME) were shown to be suitable carbon sources for polyhydroxyalkanoate (PHA) production by *Comamonas* sp. EB172. Number average molecular weight (M_n) produced by the strain was in the range of 153–412 kDa with polydispersity index (M_w/M_n) in the range of 2.2–2.6, respectively. Incorporation of higher 3HV units improved the thermal stability of P(3HB-co-3HV) copolymer. Thus the newly isolated bacterium *Comamonas* sp. EB172 is a suitable candidate for PHA production using POME as renewable and alternative cheap raw materials.

Keyword: Polyhydroxyalkanoates; Poly(3-hydroxybutyrate-co-3-hydroxyvalerate); Palm oil mill effluent; *Comamonas* sp.; Characterization.