

## Executive summary

The accumulation of polyhydroxybutyrate (PHB) granule in cells of *Bacillus megaterium*, *Alcaligenes eutrophus*, *Azotobacter vinelandi*, *Ralstonia eutropha* and *Azohydromonas lata* was significantly depended on the ratio of C-source and N-source in the medium culture. Sugarcane molasses (MOL) and corn steep liquor (CSL) were used as renewable raw materials, since they were rich in carbon and nitrogen respectively, leading to develop a low cost process of PHB production. The highest PHB production from *B. megaterium* and *A. eutrophus* was observed after 45 h of growth (43% w/w, dry matter) when 4% molasses and 4% CSL were used., whereas the highest biomass ( $7.2 \text{ g l}^{-1}$ ) was obtained at 4% molasses and 6% CSL. This indicated that bacterial growth increased as CSL concentration increased, whereas the PHB accumulation decreased. The formation rate of PHB up to  $0.016 \text{ h}^{-1}$  and specific growth rate up to  $0.25 \text{ h}^{-1}$  were observed during growth. The chemical structure and thermal properties of PHB produced from molasses and CSL were obtained the same properties as commercial PHB, except for the higher molecular mass (approx.  $3.9 \times 10^6 \text{ Da}$ ) and the lower degree of crystallinity (60%  $X_c$ ). Thus, the present data indicate that molasses and CSL could be alternatively used for PHB production by theses bacterium with high PHB content and adequate properties of biopolymer from a low cost process.