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PRODUCTION AND RECOVERY OF POLY- β -HYDROXYBUTYRATE FROM WHEY DEGRADATION BY AZOTOBACTER

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Abstract:

Three strains of Azotobacter chroococcum were studied to produce poly- β hydroxybutyrate as a inclusion body by whey degradation. Optimum degradation whey results were obtained when using whey broth as a fermentation medium without extra salt, temperature at 35 °C and pH 7 ($P < 0.05$). Lambda max for whey broth medium was determined probably about 400 nm. The effect of different nitrogenous rich compounds (NH_4NO_3 , Bactopeptone, Casein, Yeast extract, Meat extract, Protease peptone and Tryptone) on whey degradation showed that incorporation of nitrogenous compounds into the medium did not increase whey degradation by Azotobacter chroococcum 1723 ($P < 0.05$). But poly- β hydroxyl-butyrate production was increased in presence Meat extract up to 75% of the cell dry weight after 48h. The addition of nitrogenous sourced (except ammonium nitrate) had a positive effect on poly- β hydroxyl-butyrate production as it peaked in the presence of Meat extract and 4.43 g/L was accumulated in comparison to 0.5g at diazotrophically growing cells. Increasing the O_2 values resulted by shaking at 122 rpm in decreased poly- β hydroxyl-butyrate yield from 4.43 to 0.04 g/L. The results show that this medium supports the growth of strain 1735 and also that this waste could be utilized as a carbon and nitrogen source. Production of poly- β hydroxyl-butyrate by using whey as a medium looks promising, since the use of inexpensive feed-stocks for poly- β hydroxyl-butyrate is essential if bioplastics are to become competitive products.

Keywords:

[Azotobacter chroococcum](#) , [whey broth](#) , [poly- \$\beta\$ hydroxyl-butyrate and nitrogen source](#)

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