Screening and preliminary optimizations for dihydroxyacetone production from glycerol by the gluconobacter and asaia isolates Found in Thailand / Issara Poljungreed, Siwarutt Boonyarattanakalin, Pattaraporn Yukphan

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Abstrak

ABSTRAK
This study aims to investigate the feasibility of using a minimal glycerol medium with inorganic salt supplementation for a low-cost dihydroxyacetone (DHA) production by bacteria. Acetic acid bacterial isolates of Gluconobacter and Asaia, which are found in the Northern, North-Eastern, Middle, Western, and Southern regions of Thailand, were evaluated for their ability to produce DHA using glycerol as a carbon source. During the qualitative screening, 66 isolates, including Gluconobacter (61 isolates) and Asaia (5 isolates), from a total of 486 isolates showed highly positive results by the Fehling test. The 5 isolates of Asaia gave low DHA production in the quantitative screening, whereas Gluconobacter isolates showed DHA production at low (0-5.70 g/L), medium (5.71-11.40 g/L), and high (11.41-16.89 g/L) levels. Preliminary culture medium optimizations for G. frateurii BCC 36199, a most promising microorganism for DHA production, were also carried out using a low-cost minimal glycerol medium supplemented with an inorganic salt. G. frateurii BCC 36199 produced 18.67 g/L of DHA with ysp of 95.44% (DHA moles/glycerol moles) at 30°C, 20 g/L of glycerol, and pH 4.5. The cultivation of G. frateurii BCC 36199 in the developed minimal glycerol medium is practical and can be further optimized in order to apply for industry.