

Abstract

Ten strains of photosynthetic bacteria were isolated from eight soil samples and nine water samples. All strains grew well at 42^o C. When growth and hydrogen production were compared with those of Rhodospseudomonas sphaeroides (B₅), it was found that eight of the strains showed higher growth rates than Rops. sphaeroides using a malate-glutamate medium under illumination and anaerobic conditions at 42^oC. Measurement of hydrogen gas production by the Syringe technique in a malate-glutamate medium at 42^oC showed that the strain numbers 1, 3, 5.1, 5.2, 7, 8, 9, 11 and 12 produced more gas than Rops. sphaeroides (B₅) with strain number 7 exhibiting, the highest hydrogen gas production rate of 3.75 ml/day.

Identification of the isolated strains was carried out by testing their ability to utilize organic substance, sulfide and thiosulfate as well as by their growth factor requirements. In this ways, six strains were identified as Rops. gelatinosa, two as Rops. sulfidophila, and one each as Rops. plaustris and Rops. capsulata. Hydrogen production of these isolate detected by gas chromatograph were lower than Rops. sphaeroides B₅ at 40° C.

Rops. sphaeroides B₅ grew well in Tofu whey at pH 7, adding 0.5% glucose 0.1% NH₄SO₄ 1.5×10^{-3} g/l CoCl₂, nicotinic acid, thiamine and biotion (1 g/l). The incubation condition were anaerobic light at 30°C. Maximum biomass produced, reducing sugar, and COD removal, after 60 hr. were 5.22 g cell/l., 90% and 98% repectively.