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## Isolation and characterization of dark fermentative hydrogen producing bacteria from soil

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Hydrogen production by dark fermentation is a promising technique for energy generation because of high production rate and utilization of a wide variety of substrates. In this study hydrogen producing facultative anaerobic bacterial strains was isolated and identified. Their H<sub>2</sub> production parameters were optimized using glucose as substrate under anaerobic condition. On the basis of 16 S rDNA gene sequencing, the strains were identified as *Bacillus cereus* (B-1), *Staphylococcus* sp. (B-6) and *Enterobacter cloacae* (DH-89). Batch experiments were conducted to study the effects of initial glucose concentration and pH on the production of hydrogen gas. The maximum hydrogen production was recorded with initial glucose concentration of 20 g/L in all the three bacterial strains. The H<sub>2</sub> yield was obtained as 17.1 L/mol glucose, 13.32 L/mol glucose and 10.5 L/mol glucose for B-1, B-6, and DH-89 respectively. The optimum pH for maximum H<sub>2</sub> production was investigated and it was found that the optimum pH for strains *Bacillus* sp. and *Staphylococcus* sp. is 7.0. However in case of *Enterobacter* sp. the yield was increased to 29 L/mol glucose at pH 5.0. The ability of the strains for utilizing other monosaccharides and disaccharides were tested and it was observed that the strains are capable of utilizing other carbon sources as well. The strains showed positive test for catalase and lipase. B-1 and DH-89 showed positive test for cellulase. The present finding suggests that the isolated strains at their optimum condition can be used for fermentative hydrogen production from various waste materials.

### Biography

Payal Mazumder has completed her MSc from Tezpur University, India and currently pursuing her PhD. She has published one manuscript in an international conference and submitted two manuscripts for international journal which are under review.

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