

## Biohydrogen Production from Rice Water Using Bacteria Isolated from Wetland Sediment

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**Abstract :** Hydrogen is the most essential gas that can be used for many purposes. During the production of hydrogen using raw materials like Soil and leftover cooked rice water (kanjivellam), the major by-product formed is water. Soil is collected from three different places in kottayam district: Kallara, Meenachilar, and Athirampuzha. Collected samples are mixed with rice water and tested for traces of hydrogen using a biohydrogen sensor after 72 hours. The result was the presence of hydrogen in all the 3 samples. After streaking, PCR and gel electrophoresis detected the bacteria which produced the hydrogen. RGCB Thiruvananthapuram conducted the sequencing of the PCR resultant. And identified the bacterial strains. Five variants of Bacillus bacteria ( (1) Bacillus cereus strain JTM GenBank: OP278839.1 (2) Bacillus toyonensis strain JTM2 GenBank: OP278841.1 (3) Bacillus anthracis strain JTM\_SR2989-3-R\_H08 GenBank: OP278960.1 (4) Bacillus thuringiensis strain JRY1 GenBank: OP278976.1 (5) Bacillus anthracis strain JTM\_SR2989-3-F\_H07 GenBank: OP278959.1 ) are identified and successfully registered in NCBI Gen bank. These Bacillus bacteria are major types of Rhizobacteria that can form spores and can survive in the soil for a long time period under harsh environmental conditions. Also, plant growth is enhanced by PGPR (Plant growth promoting rhizobacteria) through the induction of systemic resistance, antibiosis, and competitive omission. The molecular sequencing was submitted to the NCBI Gen Bank, and the accession numbers were allotted for the bacterial cultures.

**Keywords :** bio hydrogen production, bacterial bio hydrogen production, plant related to bacillus bacteria., bacillus bacteria study

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