PATNA WOMEN'S COLLEGE AUTONOMOUS 1940

IRIS
Journal for Young Scientists
ISSN 2278 – 618X **(Print)**
ISSN 2278 – 6384 **(Online)**

http://www.patnawomenscollege.in/journal

Isolation and Characterization of Plant Growth Promoting Rhizobacteria from Rice field

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Received : November 2019
Accepted : March 2020
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Abstract : *The use of Plant growth-promoting rhizobacteria (PGPR) is steadily increasing in sustainable agriculture and offers an attractive way to replace chemical fertilizers, pesticides, and supplements. In this study, isolation and characterization of PGPR from the rhizospheric soil of standing rice plant was done by collecting rhizospheric soil from a rice field in Bihta region of Patna district in Bihar. Five isolates of bacteria, designated as R1,R2, R3, R4 and R5 were successfully isolated and characterized by Gram staining ,motility test ,plating on selective medium and biochemical tests. Isolates were also subjected to in vitro PGPR characterization tests i.e indole acetic acid (IAA) production test ,biological nitrogen fixation test using Burk's media and phosphate solubilization test using Pikovaskay's media. Subsequently, to investigate the effects of PGPR isolates on the growth of Bengal gram (Cicer arietinum L.), a seed germination test was conducted.Where seeds were treated with PGPR isolates . Furthermore, PGPR isolates remarkably increased seed germination of gram seeds. The present study, therefore, suggests that after further field trials and pot experiments the use of PGPR isolates as inoculant biofertilizer.*

Keywords *- PGPR, rhizosphere ,sustainable agriculture, biofertilizer.*

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Introduction:

India is the country of farmers and orchards. There are several acres of land which are used only for cultivation of different crops like tomato, potato, rice, wheat, sugarcane, apples etc. Agriculture contributes about 16% of total GDP and is a major share of national income. But at the same time, huge amount of chemical fertilizers are also used to enhance the crop yield. The indiscriminate use of chemical fertilizers and pesticides affect not only the soil sustainability but also impart the negative impact on environment and human health, besides increasing the input cost for crop production especially for the marginal farmers (Dey et al., 2004) .As The fertility of soil is determined by several components including soil structure, type of soils, microbe communities, type of microbes, and type of plants. If one of the components is damaged