

Bio Control Potential of Rice Endophytes Against Rice Diseases

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Abstract:

Rapid population growth demands for increased food production. In a report by UN/FAO there is a need of 40% increase of food production by 2030 and 70% by 2050 (FAO 2009). Rice, one of the primary graminaceous crops constitutes the main nutrient resource for 60% world's population including most developing countries. Rice has been severely affected by several diseases and insect pests resulting the average productivity of rice is comparatively low in India. Abuse of chemical pesticides, which are the most common approach for control, can destroy the balance of ecosystems and the contamination by their toxic residues may cause harm to humans and domestic animals. Hence, it is needed to stop the using of chemical pesticides for yield loss and find out some suitable alternative approaches.

Endophytes the "hidden treasures", reside inside the plants without causing any harm instead offering a multitude of benefits like providing protection against plant pathogens, insects, nematodes. The relationship between the host and the endophyte may range from symbiotic to near pathogenic. Endophytic microorganisms are a significant reservoir of genetic diversity, and an important source for the discovery of novel bioactive secondary metabolites. As a general rule, a single endophytic strain will produce multiple bioactive substances. The reported natural products from endophytes include antibiotics, antipathogens, immunosuppressant, anticancer compounds, antioxidant agents and other biologically active substances. In present work different endophytic fungi and bacteria have been isolated from leaves, roots, stems and seeds of wild rice spp. namely *Oryza rufipogon*, *O. nivara*, *O. longistaminata*, *O. barthii*. These are screened on the basis of their morphological characteristics under microscope and will identified using molecular tools like ITS, TEF, RPB-II. The endophytes have been screened for their biocontrol efficiency against *Sclerotium oryzae*, *Rhizoctonia solani* etc. Selected endophytes are recently being used for seed treatment to know about their effect on rice plants both for protection against pathogens and growth promotion. Endophytic bacteria have been gram stained and mostly are gram -ve bacteria. These are tested for different biochemical analysis like Catalase test, Antibiotic test, Urease activity, Ammonia production etc. Further work will be done to know how diverse endophytes from wild rice specially *oryza rufipogon*, *o. nivara*, *o. bartii*, *o. longistaminata* can be of use for the growth promotion and management of rice diseases.