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# Chlamydospore of Trichoderma promotes plant growth and imparts higher stress tolerance as compared to conidia

**Harekrushna Swain[1,2], Totan Adak[1], Sarmistha Sarangi[1], Ansuman Khandual[1], Soumendra K Naik[2], and Arup K Mukherjeea[1]**

*[1]ICAR-National Rice Research Institute, Cuttack, Odisha, India*

*[2]Ravenshaw University, Cuttack, Odisha, India*

*Email: harekrushnaswain21@gmail.com*

**Abstract:**

The population of the world is increasing very fast and it is expected in 2050 the world population to be around 9.6 billion. So, one of the challenging problems is being able to cover the nutrition need of the fast-increasing population. Rice is India's pre-eminent crop and is the staple food of the people of eastern and southern parts of the country. Hence, yield increase in rice has been the major focus in all the rice growing countries under agricultural research programs. The production of rice is mainly affected by different rice diseases and to overcome this huge amount of fungicides, pesticides are used which pollutes the environment. The major constrain of rice production is different biotic and abiotic stresses which reduces yield considerably and also postharvest losses due to climatic and other factors. So, in order to manage the disease due to biotic stress in an eco-friendly manner it is needed to search for alternative management practices. Several organisms being used presently as biocontrol agent (BCA) to control diseases and pests of crops but Trichoderma based biocontrol agents possess better ability to promote plant growth and soil remediation activity compared to their counter parts. However, most of the Trichoderma based formulations available in market are based on either conidia or fragments of mycelia which are not that much of stable in the changing climatic conditions (i.e. exposure to high temperature and UV radiation). So, there is a need to find out a better alternative and the chlamydospore (thick-walled hyphae-derived asexual structures important for survival of a fungus), which is stable and remain active for a longer period can be a suitable one. But the main problem is that most of the Trichoderma spp. doesn't form chlamydospore naturally. Numbers of workers have tried to induce chlamydospore artificially but with little or no success. In the present study the formation of chlamydospore is artificially induced in Trichoderma spp. and they are separated from mycelia by using physical and chemical methods. In-vitro and In-vivo experiments were carried out for disease management, growth promotion and defense related enzyme activity. On the basis of the experiments we found that Chlamydospore can be used as a better alternative for management of rice diseases.

**Keywords:** Chlamydospore; Conidia; Trichoderma; Rice; Biocontrol Agent; Disease Management; Growth Promotion; Defense Enzyme.