International Conference on
ENVIRONMENTAL MICROBIOLOGY & MICROBIAL ECOLOGY
&
International Conference on
ECOLOGY, ECOSYSTEMS & CONSERVATION BIOLOGY
July 11-12, 2018 | Toronto, Canada

Chlorpyrifos-induced alterations in cell surface topography, total protein content and optimization of key growth and degradation regulators of *Bacillus spp.*

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Intensive and modern agriculture is extensively and purely based on the usage of pesticides for enhancing the crop productivity. In India, due to warm and humid climatic condition in most of the parts the agricultural productivity is under the major threat of variety of insects and pests. Hence, the highest consumption of pesticides is in agricultural sector. Organophosphates are one of the widely and globally used pesticides due to its easy availability and low economic price. Continuous and repeated use of organophosphates has become a major threat to soil environment due to its low water solubility, longer persistence and high soil adsorption coefficient. The present study emphasized on isolation and molecular authentication of organophosphate tolerant bacterial strains from paddy growing field using stimulated natural environment procedure. Molecular characterization identified the bacterial strains to be the member of *Bacillus* and *Streptomyces* genera. Scanning electron microscopy of one of the best tolerant bacteria revealed alterations in their cell surface as well as in their length and width. Total protein content was determined in the control sample and organophosphate (Chlorpyrifos) treated bacterial cells and accumulated data indicated a significant impact of applied concentrations of Chlorpyrifos on content of total protein predicting the expression of Chlorpyrifos responsive enzymes. Moreover, optimization of key growth regulators for the bacterial cell revealed that the 0.25% of Fructose and Yeast Extract was the optimum carbon and nitrogen source as well as 27.5°C and 8.0 were the best temperature and pH. Even, induction of Chlorpyrifos degrading enzymes was highest at pH 8.0 and temperature 30°C. Thus overall study suggested that the bacterium would be efficient and can be studied further in detail to be used for bioremediation of Chlorpyrifos contaminated sites.

Biography

Shweta Nistala recently defended for Ph.D degree from School of Studies in Biotechnology, Pt. Ravishankar Shukla University, Raipur, India. She is working as an environmental microbiologist and has expertise regarding isolation of the microbes using the modern cultivation approaches. She has been testing the microbes for biodegradation purpose of pesticides for achieving sustainability and also optimizing the growth and degradation conditions for the bacteria. She has been working in this particular area since three years. Achievements of isolating positive and responsive pollutant (especially pesticides) degrading bacteria have been made. In relation to this, she has published one paper and others are in communication.

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