



Potential of Native *Trichoderma harzianum* Isolate T103 to Metabolize Predominantly Used Pesticides Monocrotophos and Dimethonate

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ABSTRACT: Heavy agriculture inputs and their persistent has lead to pesticide accumulation and associated toxicity. Monocrotophos and dimethoate are insecticides that show lethal affects on central nervous system upon over exposure in human beings. Thus there is a dire need for breaking down the residual pesticide compound to safer end products in the environment and also removal of their residual amounts. In our study we have studied the tolerance and break down abilities of *Trichoderma harzianum* (T103) for remediating the monocrotophos and dimethoate. To study the tolerance levels of T103, enrichment culturing method was attempted through plate assay and liquid media providing increasing pesticides concentrations ranging from 0-2000mg/L respectively. At 1500mg/L concentration of dimethoate pesticide we observed isolates exhibiting 100% growth and afterwards the growth was reduced to 89% at 2000mg/L. With monocrotophos the isolate showed constant growth till 1250mg/L and afterwards it was reduced to 37% at 2000mg/L concentration on solid agar plate. However in liquid media isolate with dimethoate showed maximum growth only till 500mg/ml concentration an initial increase in growth (dry weight) attaining and subsequently reduction upto 54% at 2000mg/L concentration where as with monocrotophos there was a progressive growth reduction which reached to 31% at 2000mg/L concentration. Further, the isolate was able to utilize both the pesticides as nitrogen source under minimal conditions. Quantitative enzyme assays were carried out under induced (with pesticides) and non induced condition to evaluate the isolate's potential in degradation. Isolate treated with dimethoate showed higher acid phosphate enzyme activity (65U/ml) where as alkaline phosphitase activity was higher in culture treated with monocrotophos (55U/ml) as compared to the non-induced condition. Isolate treated with monocrotophos showed higher esterase activity i.e. 14U/ml. Hence we report the ability of T103 to endure higher concentration of pesticides upto 2000mg/L with an ability to degrade monocrotophos and dimethoate. The study has huge application of remediation in pesticides thus helping to obtain crop product free from toxic pesticides accumulation. © 2016 iGlobal Research and Publishing Foundation. All rights reserved.

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