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STUDIES ON *Trametes versicolor* TOLERANCE TO PARATHION AND LINDANE, AND THE INTERACTION FUNGUS- DENITRIFYING MICROFLORA IN THE PERSPECTIVE OF FUNGAL REMEDIATION OF SOILS

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Abstract

Parathion and lindane have negative impacts on human health and the environment. Bacterial degradation of pesticides in slurry reactors has been shown to be feasible; on the other hand, it is also known that ligninolytic fungi have the potential to degrade a wide variety of pollutants. Thus, the objective of this work was to determine the tolerance of the ligninolytic fungus *Trametes versicolor* (*Tv*) to parathion and lindane and also evaluate the fungus-denitrifying microflora interactions to gain ifnroamtion for future denitrifying-fungal soil bioremediation.

PDA agar Petri plates were prepared with each pesticide at 5 different concentrations and with a pesticide mixture. Mycelium of *Tv* was inoculated and the mycelium area was determined. Interaction tests were carried out by inoculating *Tv* mycelium disks along with different denitrifying bacterial consortium dilutions in agar PDA Petri plates.

Considering lindane and the pesticides mixture *Tv* presented more than 90 % growth as compared with the no pesticide control (relative tolerance), as well as less growth in parathion. Relative tolerance drastically decreased in special units with pesticide concentration 3 fold the saturation solubility. In the interaction study an inhibition was caused by the denitrifying microflora on *T. versicolor*. On the other hand, denitrifying microflora was not inhibited by the fungus.

According to the results, *Tv* was more tolerant to lindane than to parathion under our experimental conditions. With the pesticides mixture the growth was more than 90% suggesting that the pesticides might interact antagonically considering toxicity. Regarding pesticides concentrations higher than the respective saturation solubilities the fungus growth decreased to 40%. It was reported a similar performance employing 10 mg/L lindane where the growth inhibition of several ligninolyitic fungi was complete or superior to 80%. The inhibition pattern of the fungus could be due to an antibiotic effect since soil bacteria generally produce a wide range of secondary metabolites owning antibiotic activity in order to compete with microorganisms colonizing similar niches.

Finally, in bioremediation treatment employing denitrifying - fungal sequential slurry bioreactors would be possible to use the fungus without previous acclimation to the pesticides. Yet, it will be necessary to overcome negative action of denitrifying microflora on the fungus.