Pesticide (chlorpyrifos) degradation by strains isolated from contaminated soil.

Gayathri V, Hindumathy CK .
Department of Biotechnology Vinayaka Mission University, Salem, India.
Corresponding author email: Hindumathyck@rediffmail.com

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ABSTRACT

Today's modern agriculture produces plentiful food, at a reasonable price, all year round. Most of us take it for granted that we can buy whatever food we want, whenever we want. We rightly expect our food to be safe and nutritious and we have also become used to food, particularly fruit and vegetables, not having any blemishes or other marks. We don't tend to think about how farmer's produce food or how it gets from the farm to the shops in "perfect" condition. Over the last 60 years farmers and growers have changed the way they produce food in order to meet the expectations of consumers, supermarkets and governments. In doing so they have made many changes to the way they farm. This often includes the use of "Pesticides". Farmers use pesticides to protect crops from insect pests, weeds, and fungal diseases while they are growing, to prevent rats, flies, and other insects from contaminating foods while they are being stored and also to safeguard human health, by stopping food crops being contaminated by fungi. However pesticides used to kill unwanted pests, moulds, and weeds, they can also harm people, wildlife and environment. One drawback to this is that pesticides generally kill not only the pest of concern, but also a wide range of other organisms, including beneficial insects and other pest predators. Another drawback to the increasing pesticide consumption use is the development of resistance in pest species. The individual pests that survive pesticide applications continue to breed, gradually producing a population with greater tolerance to the chemicals applied. Keeping the above effect the study was carried out on biological dissipation of pesticide in the Chlorpyrifos contaminated soil. In the present study, the effect of pesticide (Chlorpyrifos) on Rhizospheric soil and Non – Rhizospheric soil of two plants marigold and Canna has been investigated. Further, microorganisms have been isolated from Rhizospheric and Non – Rhizospheric soil, characterized and their pesticide degradation ability was investigated. Most of bio process materials have been taken and analyzed for microbial composition. The efficiency of microbial consortium obtained from each of this bio process material for chlorpyrifos degradation has been studied. Theresult indicates that presence of glucose supports more biomass, which in turn brings about higher degradation and dissipation of pesticide. Maximum 84.5% dissipation was observed through bacterial isolate in presence of glucose as compared to 73.3% dissipation in absence of glucose. In case of fungal isolate 76% dissipation occurred in presence

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of glucose and only 58% was dissipated in absence of glucose. Both the isolates showed resistance to chlorpyrifos at 10 ppm concentration and also brought about significant dissipation of this pesticide. Therefore, these isolated could be potential candidates for microbe mediated bioremediation of chlorpyrifos contaminated soils.

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