

TOXIC EFFECT OF DDT, BHC AND ENDOSULFAN ON SOIL MICROBIAL BIOMASS (IN VITRO)

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ABSTRACT

The inhibitory doses studied for DDT, BHC and Endosulfan formulation were in the order DDT WP 50% 1500 mgkg⁻¹, BHC (Gammexane 25%) 1000 mgkg⁻¹ and Endosulfan 35% 100 mgkg⁻¹, the effect noted at normal field rate lasted for few days i.e. about three days. However, the pure compound showed a greater difference in doses as compared to formulation due to low water solubility.

INTRODUCTION

Widespread use of pesticides in agriculture has greatly benefited mankind by increasing food and fibre production. But from the aspect of environmental pollution, it is seen that the biological activity of pesticide is not restricted only to the target organisms which are of major concern as they are involved in many basic soil ecological processes.

Although pesticide may not be universally toxic to all species of microorganisms, they have the potential of disturbing microbial events in the environment, polluted by these chemicals. The overall effects of pesticides on non-targets can be categorized as reduction of species number, alteration of habitat with species reduction, changes in behaviour, growth changes, altered reproduction, changes in food quality and quantity, resistance, susceptibility and biological magnification as reported by Pimentel (1971).

Among the insecticides, the organochlorine com-

total soil microbial population in soil, Ko and Lockwood (1968). Same year it was reported that DDT 50 ugml⁻¹ affected the growth of *E. Coli* and was inhibitory at 50-100 ugml⁻¹ to the growth of *Ps. Flourescens* in media, Collins and Langlois (1968). DDT has been found to inhibit NADH oxidase in bacteria, Trudgill and Widdus, (1970). *The lethal action of DDT in Bacillus megaterium* was both time dependent and related to the binding of DDT to the membrane, Hicks, and Corner (1973) and Hicks (1976). In vitro studies, DDT showed effectiveness to the growth of marine green algae pyramimonas, during the lag phase, but, was not affected in exponential phase of growth, Morel, (1976). 50-100 mgkg⁻¹ concentrations of DDT inhibited the cell division of *Teterahymena pyriformis*, Ruplal and Saxena (1979). Laboratory experiments with DDT showed that soil micro-organisms could tolerate the presence of DDT, TU (1981)

BHC, alongwith other chlorinated hydrocarbons was reported to be ineffective on bacterial and fungal population in soil at the rate of 56-112 kgha⁻¹ (50-100 lbs acre⁻¹), Pathek, et.al (1961). In aerated culture, inhibition of *Nitrobacter agilis* occurred by BHC at 10 mgkg⁻¹, Winley and San Clemente (1970). BHC (lindane) at concentration 10-60 mgkg⁻¹ inhibited cell growth morphogenesis in *acetabularia*, Broghi et.al (1973). The