PDF - THE EFFECT OF PESTICIDES DICHLORODIPHENYL TRICHLOROEYHANE (D.D.Y) AND BENZENE HEXACHRORIDE (BHC) ON THE MICROFLORA OF THE THREE TYPES OF SOIL - researchcub.info

ABSTRACT

The effect of pesticides, chchlorodipheny trichloroethane (DDY) and Benzene hexaxhoride (BHc) on the microflora of the three types of soil (loamy, clay and sandy soil) was conducted. The serial dietitian technique was employed up to 10-3 using nutrient agar, potato dextrose agar and sabourand agar plates. The isolation of both bacterial and fungal organisms were made before treating the soil types with the two pesticides), D.D.T and BHC. and after treating the soil types with D.D.T after treating and BHc. The highest bacterial count before treating the soil types with D.D.T and BHc was got in loamy soil with 133 per ml having PH 7.1, followed by clay soil with 78 per ml and least was sandy soil with 42 per ml. while the highest bacterial count after treating the soil types with D.D.T was gotten in loamy soil 105 per ml, followed by clay soil with 51 and least count was got in sandy with 28 per ml. Also the highest bacterial count after treatment with BHc was obtained in loamy soil with 12F per ml, followed by clay soil with 64 per ml and the least count was got from sand soil with 37 per ml. The highest bacterial isolate from all the soil types before treatment with the two pesticides was pseudomonas with 25 per ml, followed by Bacillus SPP with 24 per ml, and next was achnomycetes with 19 per ml while the least bacterial organism was Rhizobrium SPP. The fungal organisms isolates were Aspergillus species, syncophatastrum species, pernicillum species and mucor species. The results of this project showed that there was reduction in microflora of the soil types after treatment separately with the two pesticides. But the effect was more with D.D.T than with BHc. Also the effects of the two pesticides was highest in sandy soil followed by clay and lastly the loamy soil.

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CHAPTER ONE

INTRODUCTION

According to crupta and Daroren (2003) soil is that portion of the surface of the land which is essential for plant growth. Plant are anchored in the soil by their root, which spread in all direction and which by holding on to the soil keep the plant in position plant draw all their water and most of their food or nutrient from the soil. Soil is therefore the source of food for plants, animals and man. Soil is of different types, sandy, clay and loamy soil. Sandy soil has or size range of 0.2 to 2mm diameter. They are free draining and do not retain any appreciable amount of soil water. It is brown loose and dry. While clay soil range in size from 0.002mm and lower and contains more than 40% of clay particles. They are sticky, plastic and easily moldable into shape. Another type is loamy soil which contains a fair balance of clay , silt and sand particle and it is the best soil for agriculture, as it has a high proportion of organic matter or content soil organic malter represents on accumulation of partially decayed and animal residues. Such material is continually being broken down as a result of the work of soil micro –organism consequently. It is a rather transitory soil constituent and must be renewed constantly by the additionb of plant residues. The organic matter content of a soil is small, only 3-5 percent by weight in a representative minerals topsoil. It is a major soil source of two important mineral elements namely phosphorous and suefur and essentially the sole source of nitrogen. Through its effect on the physical condition of soil, organic matter also increase the amount of water a soil can hold and the proportion of water available for plant growth. Further more organic matter is the main source of energy for soil microflora. Without it biochemical activity would come practically to a stand still soil organic matter consist of two groups (a) Original tissue and its partially decomposed equivalent and (b) the humus. The original tissue include the under composed roots and the tops of higher plants. The materials are subject to vigorous attack by soil organism and both plant and animal which use them as sources of energy and tissue building material. The gelatinous, more resistant products of this decompository both the synthesized by the micro organisms and those modified from the original plant tissue are collectively known as HUMUS. This material, usually black or brown in colour is coloidal in nature.

Its capacity to hold water and nutrient ions greatly exceeds that of clay, its inorganic counterpart. Small amount of humus thus augment remarkably the soil capacity to promote plant production.

According to Burges and Raw (1967) loamy like clay is a product of degradation and synthesis. And the agencies responsible are the living organisms in the soil both the animal (fauna) and the plant (flora). These organism engineer a myriad of biochemical changes as decay takes place. They also physically chum the soil and help stabilize soil structure. A rast number of organism live in the soil. By far the greater proportion of these belong to plant life. Yet animal are not to be minimized especially in the early stage of organic decomposition.

Edward and lofty in 1969 explain that the activities of specific group of soil organisms are commonly identified by (a) their numbers in the soil (b) their weight per unit volume or area of soil (biomass) and (c) their metabolic activity. Although the relative metabolic activities are not shown, they are generally related to biomass of the organism. As might be expected, the numbers are highest among the micro organism. So great are microflora number that they do minate the biomass in spite of the minute size of each individual organisms. The microflora monopolize the metabolic activity in soil. It is estimated that 60-80% of the total soiil metabolism is due to the microflora.

They further said that some of the many naturally and artificially occuring substance have deleterious effect on the life of at least some species of organism in the soil by inhibiting the development of these species. However, there is continuing concern that these chemical substance may also adversary affect various non parasitic segment of the soil microflora. These chemical compound substance are called pesticide. Pesticides are therefore material useful for the control nutigation of animals detrimental to human or economy. Algaecides, deforlant and descant herbicides plant growth regulator and fungicide are used to regulate population of undesirable organisms which compete with or pristine crop or namental plants. Attractant insecticides, muticides, accredits, molluscide, nematodes, repellant and rodenticide are used principally to reduce parasitism and trasmission in domestic animals, the loss of crop plant, the destruction of processed food textile wood products as well as parasitism and disease transmission to human.

Jones (1956) and fletcher (1960) have shown the effect of different pesticide on type, number and activities. They explain that herbicide and insecticides can destroy soil micro organism or suppress their activities if applied at excessive rate. But when applied at recommended rate these chemicals reach soil concentration of more than 2 or 3 part per million (PPm) however, some pesticide are obtained from plant and minerals, while few other are obtained by the mixed culture of micro organisms insecticides like pyrethin, cruelties and nicotine are extracted from plant. Also toxin produced by bacillus thuringiesis are active ingredient against moth and butterfly larrac. The toxins are sometime called miracle gene". DDt is an out standing example of insecticide and probably the most commonly used pesticide. It is known to contain remarkable properties and does not occur naturally too. Its first synthesis was recorded in 1874 by a German research chemist called. Zeidler

In the mid 60s, the benefits steaming from the ability of DDT to control insect pest could be counter balanced by adverse effects on other element of the enriroment. Detailed reviews of properties, stability, prehistoric and impact upon all facets of the environment were carried out with DDT and other chlorinated organic insecticides. Concern over the undesirable effects of pesticide culminated insecticides, fungicide,nd rodenticide act (FIFRA) by public. Law o2-516, the federal environmental pesticide control act (FEPCA) in united state of American to prevent unreasonable environmental hazard from pesticides for general and

restricted users as a function of acute toxicity Benzene hexachloride (BHC) is an organochiloride pesticide for its efficiency in the control of anthropoid pests. There is fear that BHc will probable have adverse effect on non targeted microflora of the soil the aplastic anemia reported in individual said to have been exposed to BHC has been attributed to benzene, which causes aplastic anaemia. But BHc is based on cylohexane. Which does not cause anaemia (grawhill 1982).

1.2 AIM AND OBJECTIVES

i. To determine the effect of pesticide dicblorodipheny trichloroethane (DDT) and benzene hexachloride (BHC) on the microflora of three types of soil.

ii. To isolate soil microflora from the three types of soil.

Iii To identify soil microflora of the three type of soil.

iv. To determine the type of soil that is mostly affected by pesticides.

1.3 STATEMENT OF PROBLEM

According to (Higa 1990) Agricultural practices can have a significant positive and negative impact on soil. For example wrong application of pesticides (DDT) and BHC) is detrimental to soil microflora. Therefore it is necessary to determine the effect of D.D.T and BHC. On the microflora of three types o soil.

1.4 HYPOTHESIS

Ho Pesticides do have detrimental effect on the microflora of three types of soil.

Ho Pesticide do not have detrimental effect on microflora of the three types of soil.

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