# DIFFERENTIAL MUTAGENIC POTENTIALITIES OF PESTICIDES DUE TO THE CHEMICAL NATURE.

BY
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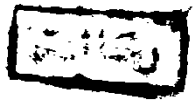

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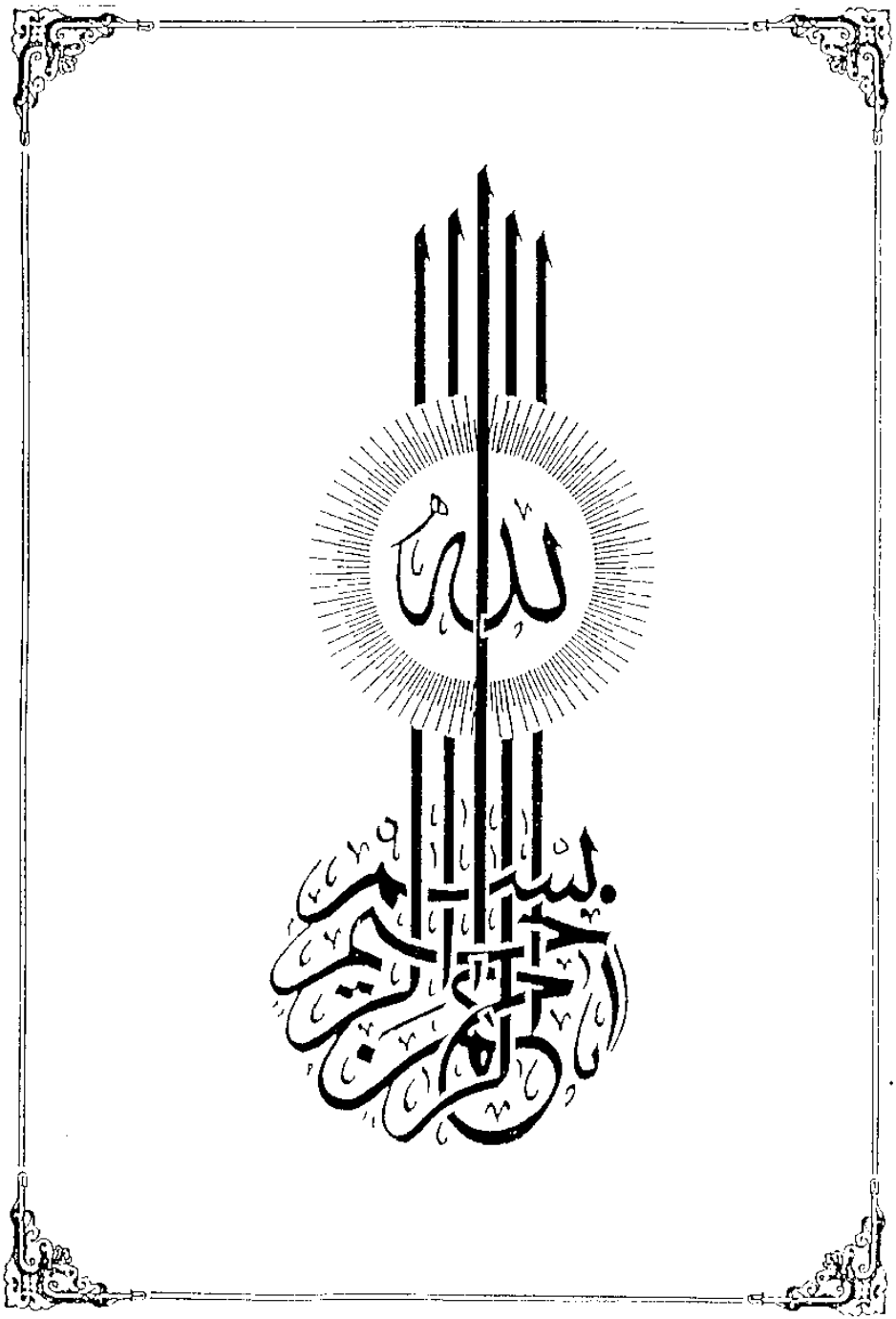

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## Abstract

Cytological examination of Allium cepa root tip cells (var. Giza 6) and Vicia faba flower buds (var. Giza 1) were used to test the mutagenic potentiality of fenthion, methyl gusathion and cyfluthrin insecticides. They induced a marked reduction in the mitotic index. Therefore they could be considered as potential antimitotic agents. In addition, different types of chromosomal anomalies have been induced in both mitotic and meiotic divisions. Moreover, the interphase stage was also affected by the insecticide treatments.

Although, the three insecticides were potential in inducing chromosomal aberrations in both plant systems, cyfluthrin was the least effective and therefore it could be considered as a weak mutagenic agent.

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# INTRODUCTION

# INTRODUCTION

Pesticides are used, nowadays, on a large scale to reduce the harmful effects of undesirable organisms. These pesticides may cause hereditary variations (chromosomal aberration or gene mutation) in plants similar to mutagenic agents (Unrau and Larter, 1952), which, consequently, may lead to a reduction in yield quantity or quality in subsequent generations. Accordingly, many cytological studies have been carried out to detect the mutagenic effects of pesticides (Tobgy et al. 1969a and b, Selim et al. 1981, Mousa, 1982a and b, Badr et al. 1983 and Hussein et al. 1984).

Therefore, it is well known now that the wide application of insecticides is probably accompanied by potentially hazardous impact on human, animals and plants. With the advent of environmental mutagenesis the need to asses the genetic damage by environmental contaminants to which people are directly or indirectly exposed has been amply discussed by many investigators. Chromosomal aberrations constitute areliable, effective and economical bioassay for environmental pollutions such as pesticides. Previous studies have shown that plant chromosomes are excellent material, as they are large and sensitive to changes in environment. The use of chromosomal aberrations induced by pesticides in crop plants is being accepted as indicators of genetic damage (Ma 1982). Plant root tips, particulary those of Allium cepa and Vicia faba, as a bioassay test system for the mutagenic potentiality of pesticides has shown extremely good correlation with the bacterial and mamalian systems.

Another common effect of pesticides is inhibition of cell division, some workers have attributed the inhibition of cell division, by these chemicals to an action on DNA and RNA in the cells (Chand and Roy 1981).

The aim of the present study is to demonstrate the mutagenic potentiality of three pesticides and their various effects on chromosomes, in an attempt to elucidate their mode of action at the cellular level. The three tested pesticides were, fenthion, methyl gusathion and cyfluthrin. The cytological effects were tested on Allium cepa root tips and Vicia faba PMC's.

# REVIEW OF LITERATURE

# REVIEW OF LITERATURE

Reddy and Rao (1968), studied the cytological effect of two organophosphorus systemic insecticides i.e. dimecron 100 and rogar 40 with different concentrations in Vicia faba L.in concern to any irregularities in the visible cnromosomal structure and benaviour chromosome and chromatid breaks, dot deletions, fragments and anaphase bridges were noticed in both metaphase and anaphase stages of mitosis; A maximum of 7.08% of aberrant cells were noticed at 0.1% concentration of rogar-40 as against 5.97% in the same concentration of Dimecron-100. Dimecron 100 was found to cause less aberrations than rogar-40. Aberrations like fagments, ring chromosomes, anaphase bridges, laggards and tetraploidy were noticed in meiosis . A maximum of 9.70% of aberrant cells were occurred in the 0.1% concentration of rogar-40 as against 4.7% the same concentration of dimecron-100. Even in the 0.05% concentration, a mean of 3.39% and 7.18% of cells with aberrations were noticed in the material treated with dimecron 100 and rogar 40 respectively.

El-Sadek (1972a) studied cytotoxic effects of some synthesized arylarsonic compounds in maize root tips.

The results demonstrated that these compounds induced several degrees of cytotoxicity, these ranged from slight to total mitotic inhibition. The sodium salt of P-methyl-phenylarsonic acid and the aronium salt of