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التوثيق الالكتروني والميكروفيلم

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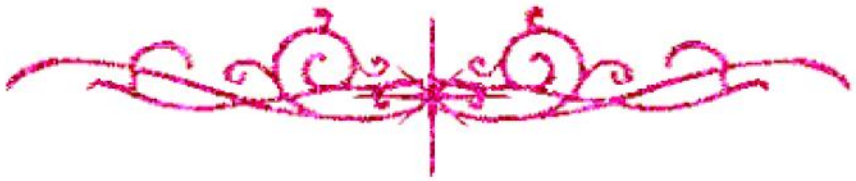

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بالرسالة صفحات

لم ترد بالأصل

HOSSAM MAGHRABY

بسم الله الرحمن الرحيم

EFFECT OF SYNTHETIC PYRETHROIDS ON RAT IMMUNE SYSTEM

A Thesis

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I. INTRODUCTION

An over view on the history of pyrethroids:

The term "pesticide" is a general classification that includes a variety of chemicals with different uses. Pesticidal chemicals have in common the capability of destroying life of some form and are classified as pesticides because the organisms against which they are directed are deemed to be undesirable by the person or society that applies them. Indeed, insecticides represent one group of pesticides that are used in large quantities and have a history begining before the mid- 1940s where the primary pesticides in use were botanical in origin and compounds of heavy metals. Subsequently, there has been a marked increase in total pesticide usage and a rapid proliferation of synthetic organic compounds; hence, in the beginings of 1940s, halogenated aromatic hydrocarbons (HAHs), a class of widely disseminated compounds consisting of fused benzene rings sharing an anthracene nucleus; were introduced. HAHs are by- products during the manufacture of halogenated biphenyls or phenols and produced at commercial incinerators. These compounds include specific chlorinated dibenzo-p-dioxins, dibenzofurans, hexachlorobenzene, polychlorinated biphenyls (PCBs) and polybrominated biphenyls[1,2].

Following reports of animal and human toxicity, the production of HAHs was suspended, because they are inert and resistant to environmental degradation and thus tend to accumulate in the environment. Human exposure occurs via inhalation or ingestion . The high lipid solubility of these compounds allows them to accumulate up the food chain [3] .Additionally, selected isomers of this class of compounds have been associated with teratogenic, carcinogenic, neurotoxic and hepatotoxic effects[4].

In the mid- 1950s there was a shift in the types of insecticides used, from the organochlorine to the less stable organophosphate and carbamate classes. Shifts in uses of major classes reflect not only developments in agricultural practice but also the effect of regulatory restrictions and the development of resistance by pests to certain class of chemicals.

Organophosphoric compounds are considered to be nerve agents of high toxicity, used intensively during the 2nd world war as chemical weapons. This class of pentavalent phosphoric compounds include phosphostigmines, diisopropyl fluorophosphonate (DFP), ethylpyrophosphate, malation, parathion and other analogues. The cumulative, widespread and long acting effects of organo-phosphates make them unsuitable for usage due to their high acute toxicity when ingested, inhaled or absorbed through intact skin. Being lipid-soluble, they readily penetrate the blood brain barrier and can exert serious toxic effects in the central nervous system.

Similar to the organophosphates, carbamate esters and methyl carbamate insecticides were discovered as anticholinesterases and also considered to be very hazardous. Poisoning produced from carbamate insecticides is clinically similar to that produced by organophosphates. Carbaryl is the common representative of the N-methyl carbamates used for insecticidal application[5]. The problem of cross resistance resulted in expiration of the potential of many of these new compounds and thus limited its application period. However, the build up of resistance and the high persistance of all these insecticides opened the way for introduction and large scale development of natural and synthetic pyrethroids.

Pyrethroid insecticides are neurotoxins that have achieved widespread agricultural and environmental health applications, due to their strongly insecticidal properties. The pyrethroids are derivatives of natural pyrethrins[6,7],