I N T R O D U C T I O N

The use of pesticides in general and insecticides in particular, has been the target of considerable criticism, especially since the publication of Rachel Carson's "Silent Spring" (1962). Critics and outright opponents of pesticides stress the harmful effects on wild life, and, speak of hazards to human health wrought by application of pesticides as well as entry of residues in our food. The brunt of the outcry has been directed towards the use of the so-called "Hard core" pesticides including the chlorinated organic insecticides such as D.D.T®, Aldrin, Dieldrin (Jacobson, 1975).

The extensive and indiscriminate use of pesticides by the affluent as well as developing nations of the world has not only created serious problems in pest management but also threatens man's health and pollutes his environment. Among the pesticides, the insecticides are most commonly used for the control of both household and field insect pests. Insecticides in particular are of greatest concern because they can (a) cause death through accidental poisoning, (b) lead to accumulation in man, (c) result in biological magnification in food chain, and, are often not biodegradable. Additionally, induction of resistance in pest populations and subsequent resurgence, as well as destruction of non-target beneficial insects, such as pest,

parasites and their predators, and pollinators. This dilemma has made it mandatory that alternate methods of controlling the insect pests be found that are not only effective but also healthwise acceptable. Research along this line is being conducted in laboratories and field stations of Federal and State Government agencies, Educational Institutions, Research Institutions and in private Industry. Among the approaches being followed those involving suppression of insect pest populations by deployment of natural predators, parasites and pathogens, sexual sterilization, sex pheromones and growth regulators (the so-called "third generation insecticides" or "Juvenile hormone") appear to offer promise of success, particularly, if applied as an integrated pest management programs.

In the past few years, research aimed at establishing alternative means of pest management has received increased attention. One of the most promising of these is the use of naturally occuring organic compounds that influence insect chemosensory behaviour as attractants, repellents, stimulants, deterrents and arrestants.

For the present purposes it is sufficient to recall that chemicals eliciting immediate behavioural responses in insects may be catagorized as : attractants (chemicals that cause insects to make oriented movements towards the source), arrestants (chemicals that elicit feeding, oviposition etc.), repellents (chemicals that cause insects

to make oriented movements away from the source), deterrents (chemicals that inhibit feeding or oviposition).

As is true of all animals, the response of an insect to its chemical environment assumes two categories: (a) delayed reactions (b) immediate reactions. Delayed reactions include symtoms of toxicity, growth, hormonal changes, and caste or reproductive differentiation. Immediate responses comprise many behavioural manifestations and these include the initiation or termination of locomotion, feeding, courtship, copulation, oviposition etc. (Wood et al. 1970). Chemicals of insect origin (both larval and imaginal) may fit into any of these categories. Their action is most usually associated with some links in the chain of behavioural patterns leading to ingestion or boviposition (Wood et al. 1970).

Insect species of economic importance are often named according to the obvious damage caused by them and for this reason L. serricorne (F.) Coleoptera: Anobiidae probably received the name tobacco or cigarette beetle. The tobacco beetles are world-wide pest of cured tobacco leaves and various other dried food stuffs (Powell, 1931 ; Dick, 1937; Howe, 1957). Inspite of being a major pest of dried food stuffs in storage, the tobacco beetles was recorded outdoors, eg. on semidried custard apples or garlic bulbs in Egypt and cotton bolls in Peru (Weidner, 1979). It prevails throughout the tropical and subtropical

region of the world and may be regularly carried to cooler and temperate countries, where its continual survival will depend on the availability of dried food stuffs in heated stores. It is difficult to detect the infestation of this pest untill their population has increased beyond the level of economic manageable threshold level because of their clandestine nature (Chuman et al. 1985).

Except sex pheromone secretion by the adult female L. serricorne, (Burkholder, 1970; Coffelt and Burkholder, 1972), there is no reports on other secretions from any of the stages of the pest. The paucity of available proper control methods prompted the present investigation on some aspects of controlling the pest by deploying certain conspecific organismic products. An effort was therefore made to find out some agents which can be used for possible alterations of behaviour - attraction/repulsion or oviposition etc. The primary goal of this investigation was to search for efficient clues for developing a programme for integrated management of the pest.