selections can develop characteristics that will make the toxicant ineffective or uneconomical to use. Resistance to the fumigants methyl bromide, phosphine (Champ and Dyte, 1976) and ethylene dibromide (Bond, 1973) has been found in field populations of stored-products insects in recent years.

In a survey of the tolerance of Tribolium confusum Jacquelin duVal and Tribolium castaneum (Herbst) to ethylene dibromide, methyl bromide and hydrogen cyanide from several parts of the U.S.A. only a small degree of resistance to ethylene dibromide and hydrogen cyanide was found (Lindgren and Vincent, 1965). However resistance to fumigants does not need to be great in degree to be of practical significance for insect control. The california red scale developed an increased tolerance to hydrogen cyanide of only 1-5 fold over the normal strain and the commercial treatment had to be abandoned because injury to the plants occurred at the increased dosages required. Increases in tolerance of stored product insects to fumigants could be important because increased dosages might produce excessive residues in food materials as well as substantially increase the cost of the treatment. Monro et al. (1961) showed that, in the laboratory, resistance to one of the principle fumigants, methyl bromide, could be produced in the granary weevil Sitophilus granarius (L.) Monro et al. (1972) reported also that S. granarius adults selected for tolerance to phosphine were found,

after 28 selections, to be able to tolerate exposure to the gas for more than three times as long as unselected insects. Suspension of selection for 9 generations resulted in a small reduction in tolerance but this was regained after selection was resumed for 3 generations. Cross tolerance of the selected strain to other fumigants was found to be very low except with chlorpicrin where a 2-7 fold tolerance was recorded.

In Egypt, fumigation of stored products had been widely practiced since 1960. Under field conditions, complains of incomplete kill after fumigations with phosphine and methyl bromide in some localities were reported. It was believed that such failures might be attributed to development of resistance among stored grain insects to the fumigants used.

The aim of this work was to study:

* **The development of resistance in the red flour beetle (Tribolium castaneum Herbst) to phosphine in the laboratory.**
* **The susceptibility of some field strains of the red flour beetle (Tribolium castaneum Herbst) and the rice weevil (Sitophilus oryzae (L.1) collected from different Governorates in Egypt to phosphine, in comparison to** a laboratory strain of each.
* The biological parameters of a phosphine resistant strain (F_4) of T. castaneum in comparison to the parental