After the Second World War, there has been tremendous progress in the production of insecticides and their use in the control of insect pests. The relative effectiveness of these insecticides to control the insects has been mostly determined on the basis of the rate of mortality. Except on the nervous system, the effect of modern insecticides on different systems of insect body has been inadequately studied (Brown, 1963). For the rational control of insect pests, it is important to know the effect of different insecticides on various organs of the body. In the present investigation, histopathological observations have been made on the midgut and the caeca of hoppers and adults of *Hieroglyphus nigrorepletus* Bol., a major pest of *Zea mays* (Maize), *Sorghum vulgare* (Jowar) and *Pennisetum typhoidium* (Bajra), by feeding them some chlorinated hydrocarbons (5% DDT, 0.5% lindane, 2% endrin and 5% aldrin), parathion, sodium silicofluoride and copper aceto-meta-arsenite. The last two insecticides have been selected as classical stomach poisons to compare with the effect of modern insecticides mentioned above.

The selected insecticides were fed to the hoppers and adults in the form of a sandwich made of maize leaf and an approximate quantity of eaten insecticide was determined. Following the ingestion of these insecticides, external symptoms and macroscopic changes in the alimentary canal of
each insect was observed. Generally, after eating the insecticides, the insects showed hyperactivity which caused paralysis and finally death occurred within 24 hours. Following the ingestion of each insecticide, a few insects were dissected at regular intervals and their midgut and caeca were fixed for histopathological observations.

The histopathological effect of the above mentioned insecticides on the midgut and the caeca of different stages of *H. nigrorspletus* began in the form of discharge of cytoplasmic granules, globules and vesicles with nuclei. It was followed by nipping of the inner margin of the epithelium, detachment of epithelium from the basement membrane and finally the degeneration and dissolution of the epithelium of both midgut and caeca often that of connective tissue as well. The degeneration of digestive and regenerative nuclei was manifested by the gradual fusion of their chromatin granules which finally formed a large and amorphous mass. The completely degenerated nuclei had ruptured membrane and their amorphous mass escaped out.

The ingestion of sodium silicofluoride, copper acetometa-arsenite in about twelve hours caused complete degeneration of the epithelium and connective tissue of the midgut and the caeca of 3rd instar hoppers. In other stages similar changes took place later.
The present histopathological observations indicate comparative effectiveness of the used chlorinated hydrocarbons (5% DDT, 0.5% lindane, 2% endrin and 5% aldrin) on different stages of *H. nigrorepletus*. It shows that 5% DDT is most effective in 3rd instar hoppers to cause maximum histopathological changes in both midgut and caeca in shortest possible time. Whereas, the midgut and the caeca of 4th instar hoppers is most severely damaged by 0.5% lindane. However, such effects on the caeca of 4th instar hoppers are also caused by 5% DDT. In the 5th instar hoppers, 5% aldrin is most effective to cause complete disintegration of midgut epithelium. However, 0.5% lindane is next to 5% aldrin. The caecal epithelium of 5th instar hoppers is equally vulnerable to 5% aldrin and 0.5% lindane as both caused complete disintegration of the epithelium. Further, the midgut of adults *H. nigrorepletus* is most severely damaged by 0.5% lindane and the damage caused by 5% DDT, 2% endrin and 5% aldrin is in descending order. The same order of effectiveness is observed in these insecticides while causing maximum injury to the caecal epithelium. The pathological effect of 2% parathion was however, less than that of 5% DDT both on the midgut and the caeca of 3rd instar hoppers. But this insecticide as compared to 5% DDT, 0.5% lindane, 5% aldrin and 2% endrin was more effective in causing maximum pathological injury to the midgut and caeca of the adult and 4th instar hoppers.
On the basis of the present data on *H. nigrorepletus*, it can be recommended that in order of preference 5% DDT, 2% parathion and 5% aldrin may be used for the control of adults and hoppers. However, the use of sodium silicofluoride and copper aceto-meta-arsenite, which are most destructive stomach poisons, may be avoided due to their greater toxic hazards and high cost in comparison to the other insecticides used in the present investigation.