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## Summary

Pestban is broad spectrum organophosphate insecticide with growing concern due to its aquatic toxicity especially freshwater fish as (*Oreochromis niloticus*) locally called Nile tilapia is an important popular fish species in Egypt and is abundant in the natural water source. Green barley has many antioxidants such as antioxidant vitamins, superoxidismutase, catalyze enzyme and chlorophyll which chelate and adsorb toxic materials as pesticide.

### **This work was planned to investigate:**

1-Determination of the median lethal concentration of Pestban which cause death to 50% of tilapia fish ( $45\pm 5g$ ,  $12.5\pm 0.5cm$ ) at 96-h. This experiment used 180 tilapia fish divided into ten concentrations (0.07: 0.6mg/l) of Pestban.

2- Study protective effect of barley grass powder (10% and 20% in diet) on toxic effects of pestban this experiment used 540 tilapia fish divided into 4 groups as follows:

Group I: control (-ve) basal diet.

Group II: (control +ve) barley grass powder 10%

(Control +ve) barley grass powder 20%.

Group III: divided into 3 sub groups:

a: 1/10 of 96-h  $LC_{50}$  Pestban for one week.

b1: 1/20 of 96-h  $LC_{50}$  Pestban for four weeks.

b2: 1/20 of 96-h  $LC_{50}$  Pestban for eight weeks.

Group IV: :( Mixed group) pestban exposure concomitant with barley grass powder divided into 6 sub groups

a 1: 1/10 LC<sub>50</sub> of pestban +10% barley grass powder diet for one week.

a 2: 1/10 LC<sub>50</sub> of pestban +20% barley grass powder diet for one week.

b1<sup>/</sup>: 1/20 LC<sub>50</sub> of pestban +10% barley grass powder diet for 4 weeks.

b2<sup>/</sup>: 1/20 LC<sub>50</sub> of pestban +10% barley grass powder diet for 8 weeks.

b1<sup>//</sup>: 1/20 LC<sub>50</sub> of pestban +20% barley grass powder diet for 4 weeks.

b2<sup>//</sup>: 1/20 LC<sub>50</sub> of pestban +20% barley grass powder diet for 8 weeks.

**The results of this investigation could be summarized as following:**

1-Calculated 96-hLC<sub>50</sub> of pestban was 0.36mg/l.

2-Behavior changes observed in pestban intoxication caused nervous manifestation loss of equilibrium, decreased body weight and post mortem lesion characters by distended gall bladder, enlarged liver, abdomen filled with gases while little changes in pestban treated with barley.

3-Biochemical investigation inhibition brain cholinesterase and increased significantly SOD, MDA,GR in gills ,liver and muscle in pestban intoxication ,pestban treatment with barley grass powder resulted in no changed in brain cholinesterase and slight improvement in SOD,MDA,GR in gills, liver and muscle .

4-The histopathological investigations of tilapia species exposed to pestban revealed different pathological tissue alterations in different organs namely, gills, liver, kidney and brain in the gills showed hyperplasia, edema and complete sloughing of secondary lamellae. In the liver showed congestion of central vein, and vacuolar degeneration. In the kidney are showed alternation areas of activation, depletion of hemopoietic element and condensed glomeruli with edema in Bowaman's capsule. Brain revealed congestion of meningeal blood

vessels and cerebral blood vessel, the spinal cord showing pronounced malacia, vacuolar degeneration of optic lobe, and focal necrosis in the inner granular layer of cerebellum and pyknosis in Purkinje cells while pestban treatment with barley grass powder resulted amelioration in pathological tissue alterations.

5-The residual analysis of chloropyrifos in gills and muscle exposed to different exposure of pestban revealed increased residues in gills and muscle. While decrease residue of pestban in gills and muscle treated with barley.

### **Conclusion**

Addition 10% and 20% barley grass powder in diet of fish slight improvement alteration behavior, body gain, biochemical and pathology while 20% was effectively decrease residual accumulation of CPF in gills and muscle counteract its pathological alterations.