

# Some Biochemical Abnormalities Caused by Cypermethrin in adults of *Tribolium castaneum* (Herbst.)

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The average yield of wheat in Pakistan is about 2247 kg/ha, which is still the lowest in the world. Besides this, large percentage of grains are destroyed in the stores by the ravages of insect pests including *Tribolium castaneum* (Herbst.), which is very common pest in Pakistan and inflicts heavy losses to flour and other grain products. Several successful attempts have been made in the past to control this pest by using chemicals with effective killing potency. A fourth generation synthetic pyrethroid insecticide "Cypermethrin" (RS)--cyano-3-phenoxybenzyl (IRS)-cis, Trans3-(2, 2-dichlorovinyl)-2, 2-dimethyl-cyclopropanecarboxilate (IUPAC) was used in the present studies. Formulation of the above-mentioned insecticide instead of technical grades was used for the present study, as the chemical was available in this form for use in field. . Each dose was then applied to entire Petri dishes, and 100 adults were introduced to each dish.

The insects were exposed to insecticide for a total period of 48 hours. After 48 hours the insects were weighed and used for various biochemical studies like estimation of alkaline phosphatase (AkP: orthophosphoric monoesters phosphohydrolase), acid phosphatase (AcP: orthophosphoric monoesters phosphohydrolase), and other biochemical components like total soluble protein and free amino acids, etc. About 75-80 adult beetles were weighed in four different experiments and were crushed in 0.89% of sodium chloride (saline) solution with the help of a motor driven homogenizer. The homogenate was then centrifuged at 4500-x g for 45 minutes at 4°C. The supernatant was taken carefully with pasture pipettes and was used for the estimation of AkP activity and -amylase activity along with free amino acid and protein contents.

Biochemical effects of sub lethal doses LC10 and LC20 of cypermethrin were studied on some enzymes and macromolecule activities of adults of *Tribolium castaneum* (Herbst.). Cypermethrin at 0.785 ppm and 2.615 ppm (LC10, LC20) increased the alkaline phosphatase (AkP), acid phosphatase (AcP) and soluble protein activities whereas alpha-amylase and free amino acid (FAA) activities decreased for susceptible strain, while for resistant strain AkP and FAA activities increased the AcP, alpha-amylase and soluble protein activities at 0.8 and 3.08 ppm (LC10, LC20).