

# INHIBITION OF MAMMALIAN ACETYLCHOLINESTERASE BY CARBOFURAN AND PROTECTION BY VITAMIN C AND CITRUS LIMON FRUIT EXTRACT

Sharma B, Jaiswal S K and Gupta V K

University of Allahabad, Uttar Pradesh, India

Since the application of carbamates was found to be the best options as pesticides to control the pests thereby improving the crop productivity. However, the indiscriminate application of these chemicals in farm practices has caused serious adverse effects in many non-targets including mammalian systems. The present study has been undertaken to assess the carbofuran induced alterations in the activity of acetyl choline esterase (AChE) in brain and serum and the time dependent recovery in the presence of vitamin C or *C. limon* fruit extract. We have exposed the rats with two sub-lethal doses of carbofuran (20% and 40% of LD<sub>50</sub> value i.e. 1.6 mg Kg<sup>-1</sup> and 3.2 mg Kg<sup>-1</sup> body weight) up to 72h at the interval of 24h. In another set, the carbofuran treated animals were allowed to recover for next 48h. Under these experimental conditions, the activity profiles of AChE, a key target of carbofuran, have been determined in brain and serum of rats. In control group, the level of AChE activity was 20 times higher in brain as compared to that of serum. The carbofuran exposure resulted in sharp decrease in AChE activity in all these organs of rats. The administration of vitamin C and *C. limon* fruit extract in carbofuran treated rats indicated significant recovery in enzyme activity in brain, and serum, suggesting the ameliorative effects of vitamin C and *C. limon* fruit extract. However, after next 48h from the carbofuran treatment, the activity profiles of AChE in rat's brain, and serum indicated a trend of self-recovery in all the experimental groups, albeit to varying extent. The results from present investigation reflected that the introduction of vitamin C and *C. limon* fruit extract may offer protection from carbofuran induced toxicity in mammalian systems. The withdrawal from the carbofuran exposure up to 48h may help in partial self recovery.

sharmabi@yahoo.com