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## Toxicological evaluation of chlorpyrifos, cypermethrin and their combination in earthworm and their impact on acetylcholinesterase

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The increasing applications of pesticides in the agricultural fields have adverse impact on flora and fauna of the soil ecosystem. The role of earthworms in the agricultural practices is well known as they immensely contribute in increasing the quality and fertility of soil. So, it acts as a bio-indicator for the ecotoxicological analysis of pesticide induced soil pollution. Therefore, the present study was aimed to explore the impact of chlorpyrifos (an organophosphate; OP), cypermethrin (a pyrethroid) and their combination (chlorpyrifos+cypermethrin) on earthworm, *Eudrilus eugeniae*. *E. eugeniae* were exposed to different concentrations of pesticides for 48 hours by paper contact toxicity method. The LC<sub>50</sub> for commercial grade chlorpyrifos, cypermethrin and their combination were determined as 0.165, 0.020 and 0.066 µg/cm<sup>2</sup> respectively. To assess the sub-lethal effect of these pesticides, *E. eugeniae* were exposed to 5% and 10% of LC<sub>50</sub> pesticides for 48 hours. Alterations in morpho-behavioral patterns such as coiling, clitellar swelling, mucus release and bleeding followed by fragmentation of body in earthworms were observed following exposure. Acetylcholinesterase (AChE) activity was assayed in different regions of body segment which exhibits significant ( $p < 0.05$ ) decrease in AChE activity particularly in pre-clitellar region followed by clitellar and post-clitellar regions and in comparison, to whole body. The decreased AChE activity with increasing concentration of pesticides indicates the effect at neuronal level which apparent from the behavioral changes. Therefore, from the present findings it can be concluded that long term exposure to these pesticides could lead to severe and irreparable effects on biochemical mechanisms of earthworms.

### Biography

Rishikesh Kumar Tiwari is presently working as a Doctoral Fellow with Professor Ravi S Pandey, Biochemistry Laboratory, Department of Zoology, University of Allahabad. He has completed his MSc with Cytogenetics specialization from University of Allahabad, India. He has 10 research/review articles in national/international journal of repute and one book chapter in USA based publishing house.

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