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Resveratrol prevents cypermethrin induced neurotoxicity in rat by increasing acetylcholine esterase activity

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The aim of the study was to evaluate neurotoxic effects of cypermethrin and protective role of resveratrol in Wistar rats. 30 male Wistar rats were divided into five groups. Group-A served as control. Rats of group-B were treated with cypermethrin at the dose of 3.38 mg/kgbw for 7 days by gavaging. Post-treatment and pre-treatment of resveratrol (20 mg/kgbw) were administered to group-C and D exposed to cypermethrin for 7 days. In group-E, resveratrol (20 mg/kgbw) was given alone for 7 days. Cypermethrin treated group showed elevation in lipid peroxidation (LPO 83.99%) and inhibition in glutathione (GSH 12.81%), superoxide dismutase (SOD 17.08%), catalase (CAT 11.51%), glutathione S transferase (GST 12.12%), glutathione reductase (GR 77.55%), glutathione peroxidise (GPx 23.78%), total protein (42.95%) and acetyl cholinesterase activity (AChE 47.64%) in rat brain. Post- and pre-treatment with resveratrol reversed the toxic effect induced by cypermethrin. Our findings strongly suggest that, cypermethrin induced neurotoxicity may be mediated through free radical formation, reduced antioxidant defence mechanism and inhibition of acetylcholinestrase activity (AChE). Cypermethrin may be showing AChE inhibitory activity by interacting with the anionic substrate binding site. Administration of resveratrol increased AChE activity and ameliorated cypermethrin induced brain damage in Wistar rats.

Biography

Rambir Singh completed his Ph.D. in 2004 from Dr. B. R. Ambedkar Center for Biomedical Research, University of Delhi, Delhi (India). Currently, he is working as associate Professor in Department of Biomedical Sciences, Bundelkhand University, Jhansi, Uttar Pradesh. He has published more than 37 papers in reputed journals and presented papers in national and international conferences. He has supervised 5 Ph.D. and 30 M.Sc. students. He is working in the areas of bioactive compounds from Ayurvedic medicinal plants (antidiabetic, antimicrobial and antioxidant), and health effects of probiotics. He has completed 2 research project fundings received from UGC (36 lacs), and CSIR (19 lacs) and running 1 research project grant received from UGC (11.99 lacs).

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