

Protective Effects of Sinapic Acid on Organophosphate Poisoning

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Abstract : Sinapic acid (SA) is a phenylpropanoid compound with anti-inflammatory, antioxidant, and neuroprotective activities. The purpose of this study was to characterize the possible protective effect of sinapic acid on chlorpyrifos (CPF), a common organophosphorus pesticide used worldwide, induced toxicity in rats. Forty male and female rats (240-270 g) were used in this study. Each group was composed of 5 male and 5 female rats. Sinapic acid (20 mg/kg or 40 mg/kg) or vehicle (olive oil, 1 ml/rat) were given orally for 5 days. CPF (279 mg/kg) or vehicle (peanut oil, 2 ml/kg, s.c.) was administered on the sixth day, immediately after the recording of the body weight of the animals. Twenty four hours following CPF administration body weight, body temperature and locomotor activity values were recorded before decapitation of the animals. Trunk blood, brain, and liver samples were collected for biochemical examinations. Chlorpyrifos administration decreased butyrylcholinesterase activity in blood, brain, and liver, while it increased malondialdehyde (MDA) levels and advanced oxidation protein products (AOPPs) ($p < 0.01 - 0.001$). Additionally, CPF administration reduced the body weight, body temperature, and locomotor activity values of the animals ($p < 0.01 - 0.001$). All these physiological and biochemical changes induced by CPF were reduced with the 40 mg/kg dose of SA ($p < 0.05 - 0.001$). Our results suggest that SA administration ameliorates CPF induced toxicity in rats, possibly by supporting the antioxidant mechanism.

Keywords : antioxidant, Chlorpyrifos, poisoning, sinapic acid

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