Pentachlorophenol Exhibits Differential Redox Chemistry under *in Vitro* and *in Vivo* conditions in Rats’ Brain

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**ABSTRACT**

The present study sought to determine the possible oxidative effect or otherwise of pentachlorophenol (PCP) on mammalian cerebral lipids under *in vitro* and *in vivo* conditions. Production of aldehydic products was used as a marker of cerebral lipids oxidative damage in rats' whole brain subjected to oxidants and/or PCP assaults. The results show that PCP exerted considerable inhibitory effect on cerebral lipid peroxidation subjected to iron (II), sodium nitroprusside, hydrogen peroxide and sodium oxalate oxidative attacks *in vitro*. Conversely, administration of 37.5 - 300 mg/kg body weight PCP into rats for 30 minutes caused an increase in cerebral aldehydic compounds. This phenomenon was accompanied by reduced level in total cerebral thiols *in vivo*. Hence, the seemingly antagonistic redox chemistry of PCP under *in vitro* and *in vivo* conditions possibly suggests that bio-transformed metabolic intermediate(s) of PCP may be intrinsic to its toxicity *in vivo* and that such intermediates possibly exert their toxicity using mechanisms related to oxidative stress.

Key words: Pentachlorophenol, Oxidative stress, cerebral lipids

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