

Beneficial Effects of Pecan Nut Shell (*Carya illinoensis*) on Cyclophosphamide-induced Oxidative Stress in Rat Testis

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Cyclophosphamide (CP) is a chemotherapeutic alkylating agent with antitumor and immunosuppressant properties. CP causes adverse effects including testicular toxicity in humans and animals. Under normal physiological conditions, reactive oxygen species (ROS) are generated in testis and scavenged by antioxidant defense systems. However, CP can easily break the prooxidant-antioxidant balance, leading to cellular dysfunction. Pecan shell aqueous extract (AE) showed a marked antioxidant potential. The total phenolics, condensed tannin content and antioxidant capacity of the shells are higher than the kernels. CP treatment increased the lipid peroxidation in testis of rats ($505,2 \pm 164,4$ η mol MDA/g tissue) and this effect was reduced by AE ($245,9 \pm 72,8$ η mol MDA/g tissue). The levels of glutathione (SH) and the activity of catalase (CAT) and lactate dehydrogenase (LDH) in rat testis were reduced by CP treatment ($3,0 \pm 0,9$ μ mol SH/g tissue; $365,1 \pm 73,4$ μ mol H₂O₂/mg tissue/minute and $1097,2 \pm 96,1$ U/L (μ mol NADH/minute/L), respectively). The co-treatment with AE reversed it and these biochemical measurements returned to basal levels ($4,0 \pm 0,5$ μ mol SH/g tissue; $520,6 \pm 149,6$ μ mol H₂O₂/mg tissue/minute and $1204,0 \pm 73,0$ U/L, respectively). Data were analyzed by one-way ANOVA followed by Duncan's test ($p < 0,05$). Pecan shell AE was capable of sustaining antioxidants in testicular cells, leading to decreased oxidative stress and cellular damage initiated by CP.

Keywords: Cyclophosphamide; *Carya illinoensis*; antioxidant.

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