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## Assessment of toxicogenetic activity of oleoresins of five Copaifera species for prediction of potential human risks

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The uses of Copaifera species in folk medicine are related to a wide variety of pharmacological properties. This paper reports the cytotoxic and genotoxic analysis of oleoresins of five Copaifera species: *C. duckei, C. multijuga, C. paupera, C. pubiflora and C. reticulata. In vitro* assays were performed using Chinese hamster lung fibroblasts (V79 cells). The clonogenic efficiency and cytokinesis-block micronucleus assays were employed for the cytotoxicity and genotoxicity assessment, respectively. The mouse bone marrow micronucleus test was used for *in vivo* studies. The HPLC-MS and CG/MS analysis of Copaifera oleoresins allowed the identification of the 10 acid diterpenes and 11 major volatile compounds. The results showed that the oleoresins were cytotoxic by the clonogenic efficiency assay. The IC50 values ranged from 9.8 to 60.8 µg/mL. However, no cytotoxic effect was observed in the *in vivo* studies. Additionally, the treatments with oleoresins did not significantly increase the frequency of micronuclei in both *in vivo* mammalian cells. The oleoresins of five Copaifera species evaluated were not cytotoxic *in vivo*, as well as they were not genotoxic in both *in vivo* and *in vivo* test systems, under the experimental conditions used. Therefore, the oleoresins of the species Copaifera evaluated were considered safe for human use.

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## Alleviation chronic cadmium stress toxicity in albino rats using some domestic plants

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Cadmium is an environmental contaminant in air, soil, water and can induce damage to various tissues in very low concentration. Biological experiment has been occurred to focus on Cd oxidative stress. In drinking water rat received daily 100 mg/kg body weight cadmium (CdCl2.2½H2O). Female rats fed standard chow diet mixed with 100 mg/kg body weight N-acetyl cysteine NAC as standard protective agent. Rats in other tested groups fed chow diet mixed with 200 mg/kg body weight dried husk tomato, nabk and sycamore in separated groups as natural edible powder plant. The toxicity of cadmium in biomedical and histopathological analysis was investigated without and with protective powder plants compare to NAC. Four weeks experiment showed the toxic contaminated cadmium in serum alkaline phosphatase, creatinine, malondialdehyde and catalase activity beside the histological patterns for liver, kidney, ovary and brain sections. Results showed that husk tomato poses high protective effect closed to that for NAC in most values. Moreover, the proven potential for NAC and husk was clearly found in body weight, food efficiency ratio, liver and kidney disorders. The health values of lipid peroxidation and catalase activity as oxidative stress markers were observed in NAC and husk as well. Liver tissue, the most related organ to Cd toxicity was improved in histology patterns through NAC and husk administration.

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