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Cyphostemma glaucophilla May Serve as a Cheap Protectant of Liver and Kidney

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The environment around humans is composed of many hazardous and useful components, which have direct effect on health. The exposure to these components is determined by the socioeconomic status of people (Evans and Kantrowitz, 2002). The low income people are on the great chance of exposure to environmental toxins like, heavy metals, fine particles, smog, industrial wastes and indoor contaminants. Whereas, the high income community is least effected by such toxins, which is due to inverse relation of income and these risks. Allyl alcohol, amiodarone, arsenic, carbamazepine, carbon tetrachloride (CCl_4), diethylnitrosamine, dimethylformamide and diquat are some of the toxins found in the environment due to their industrial and medicinal uses (Waring *et al*., 2001). All these and many other like them are well known hepatotoxins. CCl_4 is usually studied for its hepatotoxic effects and is one of the major ozone depleting agents (Bigoniya *et al*., 2010; Xiao *et al*., 2010). Due to its industrial use it is highly emitted in the atmosphere with 74.1±4.3 Gg year^{-1} emission rate with major contribution by South and Southeast Asia. It cause liver inflammation and fibrogenesis, which is often mediated by the over activation of invariant natural killer T cell (Park *et al*., 2009). In liver, it also induces a lipid peroxidation response, which is mediated by increase in prostaglandins (regulate inflammation and are markers of oxidation stress) concentrations (Basu, 2011). So, its treatment needs special attention, which may be governed by the use of plants. As, they always provide a great protection to human health (Karim *et al*., 2011; Sohail *et al*., 2011) and are able to reduce the cytotoxicity of CCl_4 (Patrick-Iwuanyanwu *et al*., 2010; Rivas-Arreola *et al*., 2010). But plants may have some cytotoxic effects also, which should be investigated more precisely (Garba *et al*., 2006). Thus the search of plants with more reliable sources for CCl_4 inhibition can never be stopped.

Cyphostemma glaucophilla is a member of family Vitaceae and its extracts were considered as promoter for protein synthesis (Ojogbane and Nwodo, 2010a). Its leaves extract upon implementation in *Rattus norvegicus* (rat) increased the rate of protein synthesis, which was previously suppressed by some drugs. Its extracts also stimulated the protein concentration in wistar albino rat's liver and provide stability to erythrocyte (red blood cell) membrane (Ojogbane and Nwodo, 2010b). This stability in membrane structure protected the blood cell from hypotonicity-induced haemolysis. In a recent research conducted by Eleojo *et al*. (2012) *C. glaucophilla* was emerged as hepato and nephroprotective agent against CCl_4 caused toxicity. CCl_4 implementation in wistar albino rats induced cytotoxic effects both in liver and kidney. It increased the levels of liver enzymes (Aspartate aminotransferase (AST), Alanine aminotransferase (ALT) and Alkaline Phosphatase (ALP)) and kidney's catabolic products (bilirubin and creatinine). But those rats, pre and post-treated with *C. glaucophilla* leaves aqueous extracts showed the normal values of these parameters. Its aqueous extracts normalized the levels of liver enzymes in concentration dependant manner. At minor doses, its positive effects increased with an increase in its concentration but its higher doses possessed less positive effects. As at dose of 5 and 10 mg kg^{-1} it reduced the level of AST from 40.00±0.01 to 32.00±1.10 and 30.50±0.08, respectively. While at dose of 15 and 20 mg kg^{-1} it reduced the AST level only up to 35.50±0.10 and 35.50±0.01, respectively. Similar effect was observed for other (ALT and AP) enzymes. Although these effects of higher doses were significantly different from unhealthy control group, the smaller doses were more efficient in protecting liver. Same kind of concentration-dependant behavior was observed when the kidney parameters (levels of creatinine, total bilirubin and conjugated bilirubin) were studied. For example, the creatinine level in normal kidney was 0.40±0.01, which upon CCl_4 toxicity increased up to 0.50±0.001. This increase was significantly inhibited in rats implemented with 5 and 10 mg kg^{-1} of extracts. As it was only 0.40±0.05 and 0.38±0.01, respectively; on the other hand the implementations of higher doses were remained unable to produce such effects. Both higher doses (15 and 20 mg kg^{-1}) were equally effective in maintaining creatinine levels and they lowered its value up to 0.42±0.02. Although this value was far from CCl_4 cytotoxic levels, the lower doses provided more promising nephroprotective effects. Other kidney markers; total bilirubin and conjugated bilirubin levels were also reduced by smaller concentrations of extract. Thus the *C. glaucophilla*'s medicinal importance as hepato-nephroprotective agent was appreciable and at lower concentrations it induced more reliable effects. This would offer the treatment of large population with only small quantities of plant, but its use should be promoted only after sufficient examination of its phytochemical and their mode of action.

The investigation of medicinal plants attributes will help in generating varied sources of natural therapeutic compounds. As Eleojo *et al*. (2012) research on *C. glaucophilla* provided a new foundation for the protection of liver and kidney. This plant can protect the both organs (liver and kidney) form CCl_4 induced cytotoxicity and was previously reported as a stimulator of protein synthesis. It can also act as an antihemolytic protectant of erythrocyte, thus there should be more research on its cytoprotective role. This will help in developing a cheap source to cure various ailments.

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