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NOTE

Phytochemicals Studies on *J. prostrata* and *J. aurea*

SHARAD KUMAR SRIVASTAVA* and FATEH BAHADUR
Department of Chemistry, K.N. Government P.G. College, Gyanpur-221 304, India
E-mail: dr_sharad@rediffmail.com

The antioxidant and hepatoprotective activity of *J. prostrata* and *J. aurea* have been investigated. Ethanolic extract of *J. prostrata* (100 mL/kg p.o. for 7 d) provided hepato protection against CCl_4 by significantly decreasing SGPT and SGOT levels to 272.63 ± 5.26 and 98.16 ± 3.50, respectively which were comparable to nirocil ($p < 0.02$, $p < 0.05$) found in *Phyllanthus amarus* (*P. niruri*).

Key Words: *J. prostrata*, *J. aurea*, Hepotoprotective, Nirocil, SGPT and SGOT.

A number of arylnaphthalene lignans have been isolated from different species of Justicia. Many of which exhibit diverse biological activities including antitumor[1,2], antiviral, insecticidal, cardiotonic, analgesic, inhibition of lipid peroxidation, antiinflammatory, platelet activating factor, antagonism and central nervous system depression and stimulation properties. For example (+)-nortrachelogenin causes depression in rabbits and prostalidins A, B and C produces a mild depression in rats and mice[3,4]. The bisepoxy lignan glycoside simplexoside causes depression in mice and rats, while its aglycone is a stimulant.

Hepatoprotective agents[5,6] are the substance which supports or promote the process of healing or segmentation of the injured liver. Plants contain various antioxidative compounds (ascorbic acid, α-tocopherol, phenolics, carotenoids) which are found to alleviate the severity of liver disorders[7]. Handa *et al.*[8,9] reported 170 phytoconstituents to be hepatoprotective isolated from 110 plants belonging to about 55 families.

Nirocil, ethanolic extracts of *J. prostrata*, ethanolic extract of *J. aurea*, and CCl_4 purchased from Qualigen fine chemicals. Albino rats of weight 100-150 g were randomly selected and maintained for 48 h light/dark cycle at an ambient temperature. The animals were allowed free access to lipton rat feed and water. The animals were fasted overnight before the experiment.

Preparation of drugs: Ethanolic extract of *J. prostrata* and *J. aurea* was prepared by extracting the dried plant materials with 95 % alcohol till exhaustion and the extract was then filtered and evaporated to dryness. A suspension was prepared in Tween 80 (5% solution in normal saline). Nirocil, the standard drug obtained from the market and a suspension was prepared in Tween 80 (5% solution in normal saline) and CCl_4 solution was diluted to 50 % using arachis oil.

Procedure: The animals were grouped into five groups of five animals each as shown in Table-1.

TABLE-1

Group	Treatment	Dose
1. Control	Vehicle only (5% Tween 80 in normal saline)	2 mL (kg/day p.o.)
2. Toxin	CCl_4 only	2 mL/kg, p.o. (50% dilution with arachis oil)
3. Standard	Nirocil	100 mg/kg/day p.o.
4. Treated I	Ethanolic extract of *J. prostrata*	100 mg/kg/day p.o.
5. Treated II	Ethanolic extract of *J. aurea*	100 g/kg/day, p.o.

(**i**) The drugs at the dose mentioned were administered orally to all the groups (except group B) for eight consecutive days. (**ii**) CCl_4 challenge, on the ninth day, except group A, all the other groups were administered CCl_4 and group A was given equivalent of Arachis oil. (**iii**) On the tenth day (after 24 h of CCl_4 challenge) all the animals were scarified by cervical dislocation and blood was collected by cardiac puncture in 1 mL tuberculin syringe. (**iv**) The blood so collected was centrifuged immediately at 1500 rpm for 0.5 h when the serum clearly separated out. (**v**) The serum was analyzed for SGPT and SGOT levels by using SGPT and SGOT diagnostic kits, respectively. These kits were standardized against the standard Karmen unit assay. (**vi**) The change in absorbance was recorded at 505 nm and the concentrations of enzymes were obtained from the standard graph. (**vii**) Statistical analysis of significance was then tested using 't' test.

In the present study, CCl_4 was used as the hepatotoxic agent and serum level of transaminases (SGPT and SGOT) were estimated as biochemical parameters of liver function.

As per control group the normal level of SGPT and SGOT were found to be 20.61 ± 2.58 and 32.70 ± 3.20, respectively. The CCl_4 administration (2 mL/kg, p.o.) produced significant increase in the values of SGPT and SGOT to 122.21 ± 5.02 and 152.18 ± 2.44, respectively ($p < 0.001$, $p < 0.001$). This indicates that CCl_4 (hepatotoxin) has a effected the endoplasmic reticulum of the liver cells and declined the enzyme activity of

glucose-6-phosphate and cytochrome P-450. Thus, the ability of endoplasmic reticulum to sequester Ca^{2+} ions got reduced and the permeability of the cells was affected leading to leakage of enzymes like SGPT and SGOT in blood reflecting the cirrhosis condition of liver.

The marketed tablet, nirocil (100 mg/kg, p.o. for 7 d), chosen as standard, showed significant reduction in the SGPT and SGOT levels to 64.50 ± 3.08 and 90.86 ± 2.19, respectively. ($p < 0.001$, $p < 0.001$).

Ethanolic extract of *J. prostrata* (100 mL/kg, p.o. for 7 d) provided hepatoprotection against CCl_4 by significantly decreasing the SGPT and SGOT levels to 72.63 ± 5.26 and 98.16 ± 3.50, respectively which were comparable to the standard Nirocil ($p < 0.02$, $p < 0.05$).

Ethanolic extract of *J. aurea* (100 mg/kg, p.o. for 7 d) decreased the level of SGPT and SGOT to 98.24 ± 4.34 and 124 .39 ± 1.80, respectively. It showed significantly less protection against CCl_4 induced elevation transamenases levels when compared to the standard nirocil ($p < 0.001$, $p < 0.001$).

This report shows that the ethanolic extract of *J. prostrata* which showed significant protection against CCl_4 induced hepatic damage might contain the polyphenolics which are responsible for the hepatoprotective action.

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