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NOTE

Hepatoprotective Activity of Roots of *Desmodium gangeticum* (Linn.) DC

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The chloroform extract of roots of *Desmodium gangeticum* (Linn.) DC was tested for hepatoprotective activity against carbon tetrachloride induced liver damage in rats. The evaluation was done by measuring the increased serum levels of total proteins and decreased levels of bilirubin (total and direct), serum glutamate oxaloacetate transaminase and serum glutamate pyruvate transaminase in the group of rats pretreated with the chloroform extract.

Key Words: *Desmodium gangeticum*, Chloroform extract, Carbon tetrachloride, Hepatoprotective.

Desmodium gangeticum (Linn.) DC[1-5] belongs to the family Leguminosae (Syn. *Hedysérum gangeticum*). The root is astringent, digestive, alterative, diuretic, aphrodisiac and bitter tonic. It is used in diarrhea, chronic fever, cough, bronchitis, asthma, vomiting bilousness, hazy vision, snakebite and scorpion sting. It is also used in piles, inflammation, hemicrania and is said to be anthelmintic. The root is one of the ingredients in Dasamula Kwatha, Dasamularishtam, etc., used in Ayurveda. Efforts had been made to establish the hepatoprotective activity with the chloroform extract of roots of *D. gangeticum* as the drug is used in bilousness and no systematic studies on liver protective activity have been reported on the plant material.

All the chemicals used were of analytical grade obtained from Glaxo Laboratories, DPH Division, Mumbai, India, S.D. Fine Chemicals Ltd., Mumbai, India and Dr. Reddy's Laboratories, Diagnostic Division, Hyderabad, India.

The dried roots of the plant *Desmodium gangeticum* were purchased from the local market and identified by Dr. P. Brinda, Asst. Research officer, Captain Srinivasa Murthy Reasearch Institute for Ayurveda, Arumbakkam, Chennai. The roots were cut into small pieces, shade dried and then coarsely powdered in a ball

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mill. The material was used for extraction with chloroform. The extract did not contain any alkaloid and was tested for hepatoprotective activity.

The hepatoprotective activity[6] of the chloroform extract of *Desmodium gangeticum* was carried out on healthy albino rats of either sex (weighed 200–250 g) obtained from the animal house of C.L. Baid, Metha College of Pharmacy, Chennai. They were housed in well ventilated rooms, fed with standard rat food and had free access to water.

The animals were divided into 4 groups each of six: Group I: Normal control group; Group II: Toxic control group; Group III: Experimental group; and Group IV: Standard control group.

The animals of the normal control group (group I) were fed with normal diet for 7 days. The animals of the toxic group (group II) were administered 50% (v/v) of carbon tetrachloride. The animals of the experimental group (group III) were pretreated with the extract suspended in 1% carboxymethyl cellulose (CMC) for 7 days. The animals of the standard control group (group IV) were pretreated with Liv-52 for 7 days (0.15 mL/kg). The animals of groups II, III and IV were administered 50% (v/v) of carbon tetrachloride in olive oil (4 mL/kg) on 7th day 1 h prior to the administration of the drug. The animals of all the groups were sacrificed 24 h after the last dose of oral administration. The blood samples were collected, allowed to clot and the serum was separated by centrifugation and was used for the biochemical parameters.

Biochemical parameters such as bilirubin[7] (total and direct), serum glutamate oxaloacetate transaminase (SGOT) and serum glutamate pyruvate transaminase[8] (SGPT) and serum protein[9] have been estimated.

TABLE-1

Parameter	Control	CCl_4	Chloroform extract	Liv-52
Total bilirubin	0.55 ± 0.040	1.34 ± 0.036*	0.56 ± 0.010*	0.49 ± 0.020*
Direct bilirubin	0.14 ± 0.010	0.24 ± 0.012*	0.12 ± 0.010*	0.16 ± 0.026*
SGOT	21.25 ± 1.42	47.08 ± 1.68*	32.23 ± 1.56*	31.23 ± 3.65*
SGPT	22.18 ± 1.80	49.92 ± 1.68*	25.52 ± 2.56*	19.52 ± 2.10*
Total protein	06.09 ± 0.05	03.72 ± 0.02*	06.74 ± 0.03*	6.02 ± 0.03*

n = 6 reported as mean ± SEM, $p < 0.001$.

As seen from Table-1, there is a significant increase in the levels of bilirubin (total and direct), SGOT and SGPT and decrease in protein levels were found due to the treatment with CCl_4 in group II animals. The oral administration of the chloroform extract *Dasmodium gangeticum* in group III animals, decreased the levels of bilirubin (total and direct), SGOT and SGPT and increased the proteins levels. Animals treated with Liv-52 also acted against the hepatotoxicity

in group IV. Carbon tetrachloride, widely used as hepatotoxicant, is biotransformed by the cytochrome P 450 systems to produce the trichloromethyl free radical, which in turn covalently bonds to cell membranes and organ cell, elicits lipid peroxidation, disturbs Ca^{2+} haemostasis and finally results in cell death. The efficiency of any hepatoprotective drug reduces the harmful effects for maintaining the normal hepatic physiology which has been destructed in hepatotoxins. In the experimental models, group III, the extract decreases the increased bilirubin (total and direct), SGOT and SGPT suggested the production of structural integrity of hepatocyte cell membrane or regeneration of damaged liver cells by the extract. This indicates the effectiveness of the extract in maintaining the normal function of the liver. The increases in the protein levels in group III, supported the hepatoprotection of *Desmodium gangeticum.*

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