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Original Article

HEPATOPROTECTIVE ACTIVITY OF *MURRAYA KOENIGII LINN BARK*

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Abstract : ***The ethanomedicinal plant Murraya koenigii Linn. is a common ingredient in indian curry. Phytochemically, leaves of the plant are found to contain various biomolecules effective against various diseases and disorders. In present work, dried bark powder subjected to solvent extraction method using different organic solvents. After phytochemical screening of all extracts by TLC method, dried extracts were subjected to testing of hepatoprotective activity.*** CCl_4 ***was used as liver damaging agent. Changes induced in biochemical parameters like SGOT, SGPT, Alcpase and total billirubin was studied. Histopathology of control ,CC4 treated and drug treated rat liver was also carried out to check the extent of degenerative changes in liver. Results of the study clearly indicates bark of Murraya koenigii possess hepatoprotective activity. The acetone extracts showed prominent protection of liver cells as compared to control group.***

Keyword: Hepatoprotective active, *Murraya koenigii* Bark, meetha neem, Rutaceae

INTRODUCTION

Leaves of *Murraya koenigii* are commonly used as flavoring agent in Indian curry preparations since ancient times. The Indian *M. koenigii* and Chinese *M. paniculata* are the two species available and both have some common medicinal properties. On phytochemical investigation researcher claimed that leaves of Murraya found to contain alkaloid [1], volatile oil[2], Glycozoline[3], Xanthotoxin[4], and Sesquiterpine[5]. The leaf has been found to be useful as antibacterial[6], anti-inflammatory, antifeedant[7], antidysentric, externally cures eruption, antivometic, tonic and for stomachic purposes. Inspite of its various medicinal uses no systematic studies on use of bark extract for liver protective activity has been reported. The preliminary successive solvent extraction and chemical tests revealed that various extracts provide clue for further investigation to establish hepatoprotective activity of thye bark extract.

MATERIALS AND METHODS

Adult Swiss albino rats (200-250g) were selected from laboratory animal stock and acclimatized to the laboratory conditions ($25^0 \pm 3^0$and 60 ± 10 % relative humidity) for one week. The animals were feed with standard balanced diet (Hindustan Liver). The animals were divided into seven groups of five animals each. Group I served as a control received 1 ml of vehicle (1% w/v sodium carboxy methyl cellulose (CMC), Group II received toxicant Carbon tetrachloride - Liquid paraffin 1:1 (1.25ml b.w.i.p.), Group III received benzene extract, Group IV received petroleum ether extract, Group V chloroform extract, Group VI received acetone extract and Group VII received methanol extract.

The bark of *Murraya koenigii* were procured from local area and their identity was confirmed by comparing with herbal specimen preserved in Dept. of Botany, BU, Bhopal. The barks were first dried in

Table- 1: Effect of different extracts of bark of *M. koenigii* on CCl_4 induced hepatotoxicity.

Groups	Alkaline Phosphate (µ/ml)	Total Billirubin (mg/dl)	SGOT (µ/ml)	SGPT (µ/ml)
Control	62.8±7.01	0.75±0.052	33.85±2.64	36.18±2.26
CCl_4	95.9±9.95	1.178±0.26	54.6±3.72	59.86 ± 4.44
Acetone	64.28±5.04***	0.76±0.125***	34.77±1.20***	37.39 ± 4.14***
Petroleum Ether	75.86± 4.24**	1.122±0.72**	42.80 ± 3.30**	49.86 ± 3.73**
Chloroform	92.26 ± 8.25*	1.24±0.153*	51.72 ± 1.68*	55.22 ± 9.86*
Benzene	71.24 ± 4.92*	1.18 ± 0.82*	40.58 ± 1.97*	54.15 ± 1.34*
Methanol	97.01 ± 9.00*	1.129 ± 0.127*	51.99 ± 2.01*	51.86 ± 3.14 *

No. of Animal in each group = 5

*** Significant reduction at $P < 0.001$,

** Significant reduction at $P < 0.01$,

* Significant reduction at $P < 0.5$,

shade and then in an oven at 40-50°C for 4 to 5 hours. The dried plant material was then subjected to size reduction to obtain coarse powder using grinding mill. The coarse powder (60#) was extracted successively with petroleum ether, benzene, chloroform, acetone, and methanol. Each time before extracting with next solvent the powder of the plant material was dried in hot air oven bellow 50°C and relevant yield of each extract was noted. All extracts were subjected for preliminary phytochemical screening[8], . All extracts were then subjected to vacuum drying and utilized for further evaluation. The bark extracts of plant in form of suspension were administered orally three times at 12 hrs interval. A single dose of CCl_4 was administered 30 minutes after the first dose of test sample. After fourth day of CCl_4 administration 2 to 3 ml of blood was collected by puncturing retro-orbital plexus. This was allowed to clot for 45 min at room temperature and serum was separated by centrifugation at 2500 rpm for 15 min was used for estimation of various biochemical parameters[9]. The determination of SGOT, SGPT[10], alkaline phosphate (PNPP method) and total billirubin was carried out.

Hepatoprotective activity of the different extracts was also evaluated by carrying out histopathological studies on liver tissue of different groups. One rat was selected from each group for the histopathological studies. A small portion of liver piece was washed in ice cold distilled water to remove excess blood, blotted dry and kept in Bouins fluid (Picric acid: Formalin: Glacial acetic acid 75:25:5) for 12 hrs for fixation. Parrafin blocks were prepared and 8 mm thick sections were cut on rocking microtone. The sections were then stained in Haemotoxylin eosin and were then mounted in DPX.

The mean value ± SE was calculated for each parameter and variation in set of data was estimated by performing t-test. Difference among mean was analyzed by least significant difference procedure at various confidence level[11] (Table No. 1).

RESULT AND DISCUSSION

The present study involved the biological evaluation of *Murraya koenigii* bark extracts prepared in various organic solvents for hepatoprotective activity.

The petroleum ether extract showed presence of volatile oil. The acetone extract responded prominently for alkaloid test and TLC spots for volatile oil. Similarly chloroform, benzene and methanol extracts confirmed the presence of alkaloid. Carbohydrates were observed only in water fraction.

The acetone extract of bark of *Murraya koenigii* exhibited ability to significantly reduce the CCl_4 induced increase in various of biochemical parameters. The SGOT, SGPT, alkaline phosphate and total billirubin level was found to increase two times approximately in group II revealing degenerative changes in liver tissue due to which enzyme escaped in maximum concentration in serum. While, after treatment only acetone extract significantly reduced the SGOT, SGPT, alkaline phosphate and total billirubin. Remaining extracts did not showed significant effect on the increased level of parameters studied.

Present study thus clearly indicates that bark of *Murraya koenigii* possess hepatoprotective activity, though, acetone extracts has only shown the promising results.

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