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Research Article

# HEPATOPROTECTIVE EFFECTS OF AQUEOUS EXTRACT OF *ANDROGRAPHIS PANICULATA* AGAINST $CCL_4$ INDUCED HEPATOTOXICITY IN ALBINO WISTAR RATS

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**ABSTRACT**

The effect of Andrographis Paniculata extract was studied on $CCL_4$ induced hepatic damage in rats.The degree of protection was measured by physical,biochemical changes.pretreatment with extract significantly prevented the physical ,biochemical changes [1] induced by $CCL_4$ in the liver.The effects of andrographis paniculata could be useful in preventing chemically induced[2] acute liver injury.It can be concluded that the aqueous extract of A.Paniculata[3] almost significant effective in the standard drug.

**Keywords:** Carbon tetra chloride,A.Paniculata,Hepatoprotective ,Liver enzymes.

## INTRODUCTION

Liver disease is a health related problem are on high today.A.paniculata is being investigated for its potential antiproliferative[4,5] for its potential and apoptotic effects.The A.paniculata have been extensively studied for their hepatoprotective [20,21] activity.The present pharmacologica [13] investigations focus on elevation[6] of the efficacy of aqueous extracts of A.paniculata for its protection against carbon tetrachloride[10,11] induced hepatotoxicity[7] in rats.

## MATERIAL AND METHODS

Extract of A.Paniculata and standard drug of silymarin were procured from Natural Remedies R&D Centre,Bangalore.

### Phytochemical Analysis

Aqeous extract of A.Paniculata was subjected to identity the contains of primary chemical constituents,diterpenoid lactones (andrographolides) paniculides,farnesols and flavonoids.. By the usal methods prescribed[18,19] in standard texts.

### Experimental animals

Albino wistar rats(100 to 120 gm) used in the present studies .The animals were fed with standard pellet diet(Gold mohur foods and feed Ltd,bangalore) and water ad libitum .All the animals were received the drug by oral.The laboratory condition duly undertaken by registered veterinary practitioners.

### Chemicals

All the chemicals were procured from sd.fine chemicals Ltd,Mumbai,India.Standard kids for SGOT,SGPT,ALP,LDH,ToT.Bil.,Dir.Bil.,were obtained from Span diagnostics Ltd,India.

### Toxicity studies

Healthy albno wistar rats of either sex weighing 100 to 120 gm maintained under standard laboratory conditions were used for acute oral toxicity[12] test according to organisation for economic co-operation and development guidelines 423 ,a total of three animals were used which received[16,17] a single oral dose of (200mg/kg) aqeous extract(8.9).after administration of extract the food was withheld for further 3-4h.Animals were observed individually at least once during first 30 mmts after dosing[22,23] ,periodically during first 24 h.(with special attention drug the first 3-4h) and daily thereafter for period for 3 days.

### Methodology

The rats were devided into five groups of six animals(n=6) in each.

**Group I**

Received water (10ml/kg,P.O) for 9 days once daily,and served as normal control.

**Group II**

Received carbon tetra chloride($CCL_4$)1ml/kg on 50%v/v olive oil,S.C on 7th day.

**Group III**

Received standard drug of silymarin (25mg/kg,P.O) for 9 days once daily and carbon tetra chloride($CCL_4$) 1ml/kg in 50%v/v olive oil,S.C on 7th day.

**Group IV**

Received aqeous extract of A.paniculata 50mg/kg 9 days once daily and carbon tetra chloride($CCL_4$)1ml/kg in 50% v/v olive oil,S.C on 7th day.

**Group V**

Received aqeous extract of A.paniculata 100mg/kg 9 days once daily and carbon tetrachloride($CCL_4$)1ml/kg in 50% v/v olive oil,S.C on 7th day.

**Group VI**

Received aqeous extract of A.Paniculata 200mg/kg 9 days once daily and carbon tetrachloride($CCL_4$)1ml/kg in 50%v/v olive oil,S.C on 7th day.

### Assessment of hepatotoxicity:

After 48 h of $CCL_4$ administration the blood was obtained from the animals by punctruring retro orbital plexus.the blood samples were allowed to clot for 45 mts at room temperature.the serum was separated by centrifugation at 2500 rpm at 30◦C for 15 mts and utilized for the estimation of various biochemical parameters including SGOT,SGPT,ALP,LDH,Tot.Bil,Dir.Bil. After collection of blood samples,the animals were sacrificed under deep ether anesthesia and their liver ,were excised immediately and washed with ice cold saline and a 10% homogenate prepared in phosphate buffer (PH 7.0).The homogenate was centrifuged at 3000 rpm for 15mts at 4◦C and the supernatant was used for the estimation glutathione and lipid peroxidation.

### Statistical significance

The results of the study were expressed as mean ±SEM ,n=6.ANOVA was used to analyse and compare the date ,followed by dunnett,s test for multiple comparisons.

**RESULTS**

Preliminary phytochemical studies the presence of various phytochemicals in aqeous extract of A.Paniculata was found to be nontoxic upto a dose of 200 mg/kg. $CCL_4$ caused significant evaluation of serum liver enzymes and bilirubin treatment with A.Paniculata (100,200mg/kg) caused significant hepatoprotective effects was almost comparable to that of silymarin ,the known hepatoprotective agent.

**Table1: Effects of aqeous extract of A.Paniculata on biochemical parameters viz.SGOT,SGPT,ALP,LDH, Tot.Bil, Dir.Bil**

| Groups | SGOT | SGPT | ALP |
|---|---|---|---|
| I Vehicle control | 65.54 ± 2.81 | 22.18 ± 1.29 | 170.25 ± 13.57 |
| II Intoxicated control $CCL_4$ | 95.67 ± 2.87 [a] | 29.37 ±1.11 [a] | 323.12 ± 6.55 [a] |
| III Silymarin (50gm/kg) | 69.03 ± 4.59 [b] | 23.45± 1.49 [b] | 191.58 ± 11.49 [b] |
| IV Extract of A.paniculata (50 mg/kg) | 85.46 ± 4.86 | 26.69 ± 0.75 | 251.54 ± 23.51 |
| V Extract of A.paniculata (100 mg/kg) | 75.12 ± 2.91 [b] | 23.61 ± 3.21 [b] | 202.53 ± 18.01 [b] |
| VI Extract of A.paniculata (200 mg/kg) | 72.56 ± 4.59 [b] | 23.28 ± 1.83 [b] | 187.62 ± 21.07 [b] |

| Groups | LDH | Tot.Bil. | Dir.Bil. |
|---|---|---|---|
| I Vehicle control | 1170.22 ± 124.22 | 0.117 ± 0.03 | 0.076 ± 0.015 |
| II Intoxicated control $CCL_4$ | 1998.84 ± 51.10 [a] | 0.411 ± 0.13 [a] | 0.268 ± 0.016 [a] |
| III Silymarin (50gm/kg) | 1219.60 ± 126.41 [b] | 0.153 ± 0.026 [b] | 0.079 ± 0.01 [b] |
| IV Extract of A.paniculata (50 mg/kg) | 1635.75 ± 114.12 | 0.185 ± 0.04 [b] | 0.145 ± 0.041 |
| V Extract of A.paniculata (100 mg/kg) | 1412.66 ± 85.12 [b] | 0.152 ± 0.015 [b] | 0.096 ± 0.016 [b] |
| VI Extract of A.paniculata (200 mg/kg) | 1311.79 ± 133.78 [b] | 0.141 ± 0.08 [b] | 0.092 ± 0.007 [b] |

**Table 2: Effect of Extract on biochemical liver parameters in $CCL_4$ induced hepatotoxicity**

| Treatment groups (mg/kg) | SOD (U/mg protin) | Catalase (U/mg protein) | GPx (U/mg protein) |
|---|---|---|---|
| Control | 14.01±0.27 | 0.4831±0.02 | 13.03±0.11 |
| Toxicant | 2.49±0.09 | 0.0862±0.01 | 2.16±0.05 |
| Extract-50 | 4.71±0.08 | 0.1112±0.002 | 3.31±0.07 |
| Extract-100 | 5.66±0.0 | 0.1845±0.002 | 5.03±0.10 |
| Extract-200 | 6.20±0.03 | 0.2457±0.002 | 6.66±0.14 |

| Treatment groups (mg/kg) | Total Protein(g/dl) | Albumin(g/dl) | Globulin(g/dl) |
|---|---|---|---|
| Control | 6.67± 0.22 | 3.83±0.16 | 2.57±0.22 |
| Toxicant | 5.38± 0.23 | 2.98±0.19 | 2.33±0.19 |
| Extract-50 | 5.76± 0.13 | 2.95±0.22 | 2.76±0.11 |
| Extract-100 | 5.65±0.11 | 3.46±0.14 | 2.47±0.15 |
| Extract-200 | 5.70±0.24 | 3.09±0.01 | 2.69±0.19 |

**DISCUSSION**

In the present study aqeous extract of A.Paniculata at the doses of 100,200 mg/kg caused a significant inhibition in the levels of SGOT,SGPT,ALP,LDH ,Tot.Bil,Dir.Bil. Towards the respective normal range and this is indication of stabilisation plasma membrane as well as repair of hepatic tissue damage caused by ccl4.

**CONCLUSION**

It can be concluded that the aqeous extract of A.Paniculata have significant hepatoprotective on $CCL_4$ induced hepatic damage(14,15) in rats, as evidence by the biochemical parameters.further work is in progress to isolate and characterise the active principles in these extracts .The result of this study demonstrate that A.Paniculata has a potent hepatoprotective action on $CCL_4$ induced hepatic damage in rats.

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