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Assessment of anti-hepatotoxic potential and antioxidant defence status of aqueous extract of trachyspermumammi seeds to paracetamol hepatotoxicity in albino rats

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ABSTRACT

Aqueous extract of Trachyspermum ammi seeds (AETAS) was evaluated for its hepatoprotective activities in rats. The plant extract (200 and 400mg/kg, p.o.) showed a remarkable hepatoprotective and antioxidant activity against paracetamol-induced hepatotoxicity is judged from the serum marker enzymes and antioxidant level. Paracetamol - induced significant rise in AST, ALT, ALP, Total bilirubin with a reduction of total protein, albumin, SOD, Catalase, GSH and marked rise in LPO level. Treatment of rats with different doses of plant extracts (200 and 400mg/kg) significantly altered serum marker enzymes, antioxidant levels to near normal against paracetamol treated rats. The activity of the extracts was comparable to the standard drug silymarin (100mg/kg, p.o). Results indicate the hepatoprotective properties of (AETAS) against paracetamol-induced hepatotoxicity in rats.

Keywords— *Aspartate aminotranferase, Alanine aminotransferase, Alkaline phospatase, Superoxide dismutase, Glutathione reductase, Lipid peroxidase, Po-Per Oral, Aqueous Extract*

1. METHODS

1.1 PLANT MATERIAL

The whole seed of Trachyspermum ammi (500g) was washed and were air-dried at 25°C for 4 days. It was then pulverized using mortar and pestle into a fine powder. The pulverized-seeds were extracted with aqueous. About 100 g of pulverized seeds were soaked into 4L of water and left for 3 days at 60˚c in a water bath to made one-fourth of its volume. It was then filtered using Whatman No 1 filter paper and the filtrate was concentrated by allowing evaporating at 50°C on the water bath and then air-dried at 25° C to get approximately 25g of a powdered extract, then stored in an air-tightened sterile container until used.

1.2 SELECTION OF ANIMAL

The study was conducted on 30 healthy rats of either sex which are kept in the animal house of MES Medical College, Perinthalmanna All experimental protocols were approved by Institutional Animal Ethics Committee of CPCSEA, Govt. of India. Albino rats of both sexes weighing 150-250gm were selected. Rats were divided into 5 groups of 6. Each group was kept in a separate cage in the same room and under similar conditions (temperature 22±2°c and 12 hr light/dark cycle). Initially, all the groups were fed on a standard diet (starch, vitamin, minerals and fats) and water for 1 week for acclimatization before starting the experiment.

2. EVALUATION OF HEPATOPROTECTIVE ACTIVITY

Animals were divided into five groups, consisting of six animals each. The rat dose was calculated on the basis of the surface area ratio.
Group A - Normal control (corn oil 10 ml/kg, p.o.)
Group B - hepatotoxic control (paracetamol 500mg /kg, p.o.)
Group C - Served as Standard (Sylimarine 100 mg/kg, p.o.)
Group D - Aqueous extract of *Trachyspermum ammi* seeds (200mg/kg, p.o.) (Test I)
Group E - Aqueous extract of *Trachyspermum ammi* seed extract (400mg/kg, p.o.) (Test II)

Albino rats of either sex weighing between 150-200g were divided into five groups of six rats each. Group A was maintained as

normal control, which was given corn oil only. Group B received paracetamol 500mg/kg body wt. by p.o. once in daily for 10 days. Group C animals received paracetamol 500mg/kg body wt.1 hour before the administration of silymarin (100 mg/kg p.o.) for 10 days which served as standard. Group D and E animals received paracetamol 500mg/kg body wt. and were treated with two different doses of aqueous extract of *Trachyspermum ammi* seeds (200 mg/kg body wt.,400 mg/kg body wt.) respectively. The animals were then anesthetized using anesthetic ether, and blood collected by cardiac puncture and biochemical parameters like AST, ALT, ALP, Total Protein, Total bilirubin were estimated.

3. STATISTICAL ANALYSIS

Values are expressed as mean ± SD (n=6) using one way ANOVA followed by Tukey Kramer's test.

4. RESULTS

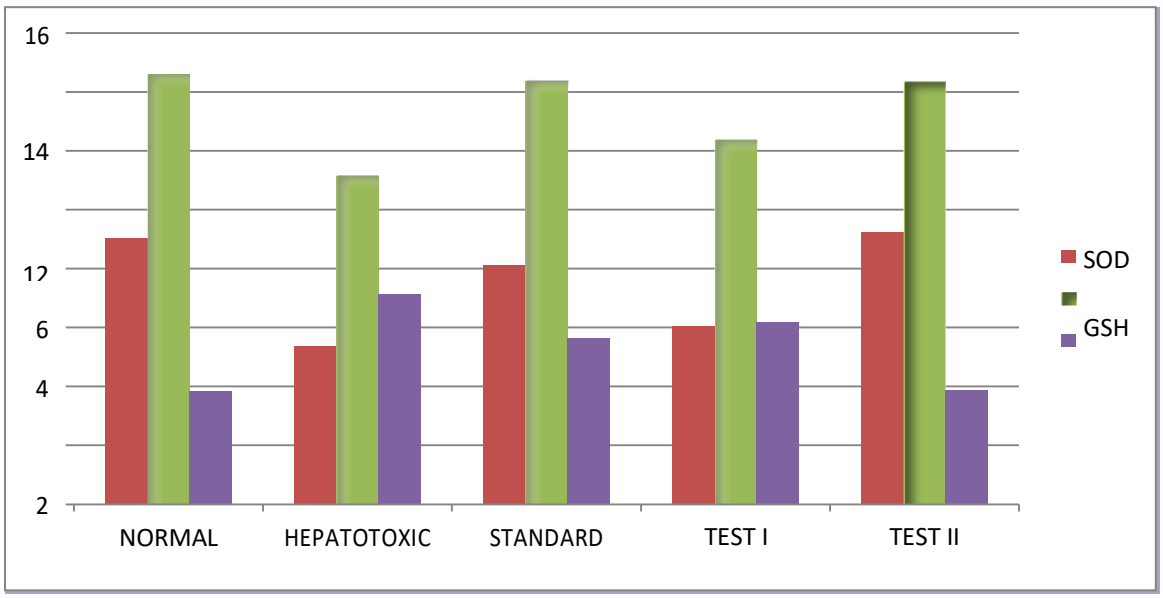

Fig.1: Comparison of Catalase, SOD, GSH, LPO level in normal control, hepatotoxic control, standard, test I and test II

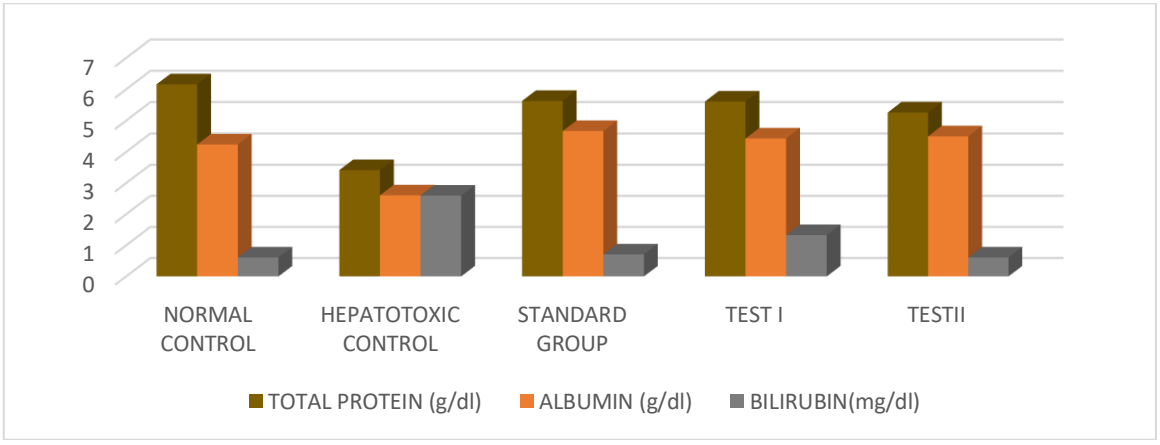

Fig: 2 Total protein, albumin and bilirubin level in Normal control, hepatotoxic control, standard, test I, test II

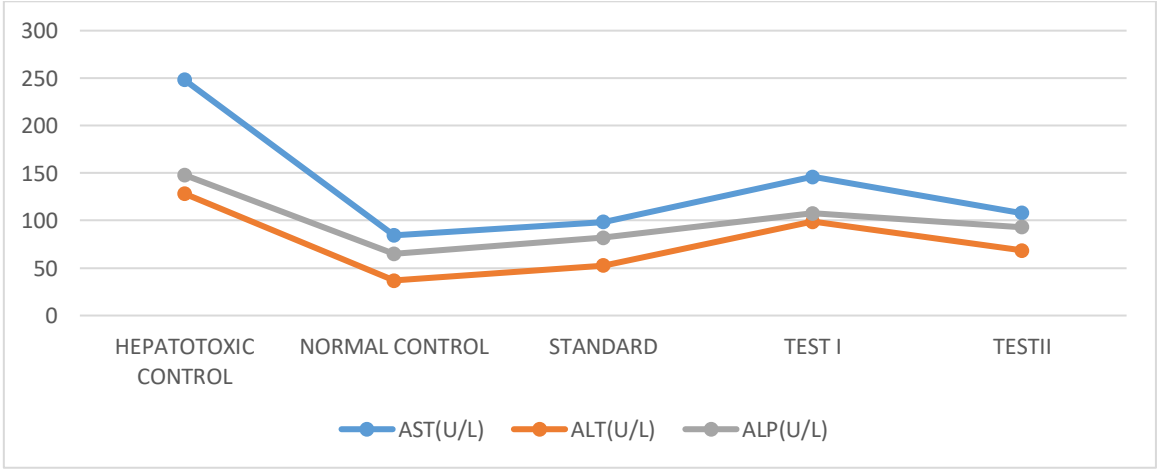

Fig. 3: AST, ALT, ALP level in hepatotoxic control, Normal control, standard, test I, test II

5. CONCLUSION

In conclusion, AETAS (200 mg/kg and 400 mg/kg) shows significant hepatoprotective activity against paracetamol-induced liver damaged rats. The present investigation indicates that AETAS exerts significant protection against paracetamol-induced toxicity by its ability to ameliorate the lipid peroxidation through the free radical scavenging activity, which enhanced the levels of the antioxidant defence system. Hence the present study justified the traditional use of *Trachyspermum ammi* in the treatment of liver diseases.

6. DISCUSSION

Acute administration of paracetamol produced a marked elevation of the serum levels of AST, ALT, ALP and total bilirubin in (Group B to E) and decrease in total protein and albumin levels when compared with that of the control group (Group A). TreatmentwithAETASatadoseof200mg/kgand400mg/kgsignificantlyreducedtheelevated levels of the enzymes.
Treatment with AETAS decreased the AST, ALT levels towards the respective normal value that is an indication of stabilization of plasma membrane as well as repair of hepatic tissue damage caused by paracetamol. The above changes can be considered as an expression of the functional improvement of hepatocytes, which may be caused by an accelerated regeneration of parenchyma cells.

Catalase and Superoxide dismutase is the most imperative antioxidants in the human body. They play a chief role in scavenging oxygen free radicals, such as superoxide anion radicals, hydroxyl radicals, supplementary free radicals as well as singlet oxygen, hydrogen peroxide and other reactive oxygen species that are disproportionate in the human body, thereby shielding biological membranes of cells against oxidative and lipoperoxidative damages. In the present study, lower levels of CAT, SOD and GSH were observed in the paracetamol control group. Groups treated with AETAS showed the significant amplification in the concentration of CAT, GSH and SOD as compared to the paracetamol control group as like the standard silymarin treated group.

7. REFERENCE

[1] Abdulrahman K, Al- Asmari, Elaiwi, et al. A review of hepatoprotective plants used in soudi traditional medicine. Evidence-based complementary and alternative medicine. 2014 (2):324-328
[2] K.sembulingam and prema sembulingam. Essentias of medical physiology. 5th ed: new Delhi. Jitender P Vijay,2010
[3] Amol P. pachpute, Thushar A. Deshmuk. Antioxidant and hepatoprotective activity of ethanol extract of piper cubeba fruits. International journal of research and development in pharmacy and life science. 2013,2(2):321-329
[4] Dr. F.L.N. Sasthry " Dravyaguna vijana" page540
[5] Atlanta. Anatomy and physiology of liver.journal of American cancer society.2010
[6] Mark, Lawrence S. friedman, Marvin H.slessinger. gastrointestinal and liver disease. 7thedition. Philadelphia;2012
[7] Thomas D. Boyer, Michael P. Manns, Arun j sanyal. A textbook of liver disease, Zakim and Boyers Hepatology 6 th ed: association of clinical chemistry.2013
[8] Joshi. Liver disease. American Association of clinical chemistry.2013

