



## BENEFICIAL EFFECT OF AQUEOUS EXTRACT OF TRIBULUS TERRESTRIS ON SERUM GLUTAMATE PYRUVIC TRANSAMINASE IN ALBINO RAT

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### INTRODUCTION

In recent times focus on plant research has increased all over the world and a large number of evidences have collected to show immense potential of medicinal plant used in various traditional system. More than 1300 plants have been studied during last ten-years period (Solecki, 1975). Seven of these are medicinal plants still used throughout the herbal world (Bensky and Gamble, 1993). The ancient cultures people methodically and scientifically collect information on herbs and developed well-defined herbal pharmacopoeias. Indeed swell into 20<sup>th</sup> century much of the pharmacopoeia of scientific medicine was derived from the herbal lore of native people. Many drugs including strychnine, aspirin, taxol, curare and ergot are of herbal origin. About one quarter of the prescription drugs dispensed by community pharmacies in the United States contain at least one active ingredient derived from the plant material (Farnsworth *et al.*, 1985 and Acherknecht, 1973).

*Tribulus terrestris* has many medicinal uses. It has been a constituent in tonics in Indian ayurveda practice, where it is known by its Sanskrit name "gokshura". (MHFW, Government of India, 2001). It is also used as an aphrodisiac in Ayurveda. Some have compared the tonic properties of *Tribulus terrestris* to the effects of ginseng, but these occur due to entirely different mechanisms.

Serum Glutamate Pyruvic Transaminase (SGPT) is the member of the transaminase family of enzymes. Transaminase referred to as transaminase amino transferases; facilitate mainly in the liver, catalyses the transfer of amino groups between L-alanine and glutamate to meet physiological needs. SGPT is found in large amounts in the liver and small amounts of this enzyme are found in the heart, muscle and kidney. When the liver is injured or inflamed, the levels of in the blood usually rise; therefore, this test is performed to check for signs of liver diseases. When body tissue or an organ such as the heart or liver is damaged, additional SGPT is released into the blood stream. The amount of SGPT in the blood is directly related to the extent of the tissue damage (Nicholas and Strevens, 2003 and De Ritis *et al.*, 1972).

Therefore, the aim of this present work is to examine the effect of the oral administration of aqueous extract of *Tribulus terrestris* on Serum Glutamate Pyruvic Transaminase in Albino rat (*Rattus norvegicus*).

### MATERIALS AND METHODS

The present investigations have been made on acclimatized specimens of albino rats *Rattus norvegicus* (Berkenhout).

#### Collection of Experimental Animals

The present study was conducted on twenty male albino rats (*Rattus norvegicus*) of wistar strain weighing 140 to 170±25gms, All the rats were kept in four separate polypropylene coated iron made

cages whose size were 90cm x 60cm x 30cm. All the cages were disinfected properly, the rats were kept at temperature of  $27\pm 5^{\circ}\text{C}$ , humidity level was  $35\pm 10\%$ .

#### **Collection of Plant Materials**

In the present study, the *Tribulus terrestris* L. (Zygophyllaceae) was selected. The seeds were collected from the local rural area. It was cleaned out from more impurities. The seeds were pale yellowish in colour.

#### **Preparation of Extract:-**

The fruits of *Tribulus terrestris* were collected and dried in shade at room temp.  $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$ . The fruits were powdered in an electric mixer. This macerated was soaked in 1 litre of distilled water stirred intermittently and then left overnight. The macerated pulp was then filtered through muslin clothes and filtrate was dried at reduced temperature. This dry mass was serve as an aqueous extract of *Tribulus terrestris* for experimentation. To increase the shelf life and uniformity this extract was completely lyophilized.

#### **Selection of Dose**

The  $\text{LD}_{50}$  of *Tribulus terrestris* in albino rats, when it given orally is 200-250 mg/kg body weight; while minimum effective does ( $\text{ED}_{50}$ ) is 2.5 mg/kg body weight (Walid *et al.*, 2007) So the calculated therapeutic dose for the entire research was 6mg/kg body weight (Jagadeesan *et al.*, 2006) given to the experimental rats. The doses were given once in a day for 7, 15 and 30 days respectively.

#### **Route of Administration**

The route of administration of aqueous extract of *Tribulus terrestris* was orally with the help of gavage tube.

#### **Experimental Protocol**

All the rats were divided into four groups of five rats each. The albino rats of group A was treated as Placebo control group, then albino rats of groups B, C and D were treated with aqueous extract of *Tribulus terrestris*.

#### **Collection of Blood**

The blood samples were collected directly from ventricles of heart using 0.5 ml disposable syringe and 20 s.w.g. hypodermic needle and stored in sterilized plain vials after 7, 15, 30 days respectively treated with aqueous extract of *Tribulus terrestris*. To avoid any instant or temporary or immediate change in blood constituent like protein, glucose and urea etc. due to metabolic effect, feeding and dosing of these albino rats were fasted for approximately 12 hrs. The blood samples were analyzed individually for each control and treated group of animals.

#### **Separation of Serum**

The fresh blood was taken in sterilized centrifuge glass tubes and kept undisturbed in vertical position for about one hour at room temperature. When the blood starts clotting the centrifugation was done at 3000 rpm. For about 30 minutes. So as to ride the serum of any suspended erythrocyte. Now the supernatant serum was separated from cell debris by a fine rubber bulb glass pipette. The serum samples thus obtained were transferred to airtight glass vials and stored in refrigerator at below  $0^{\circ}\text{C}$  temperature.

#### **Biochemical Estimation of Blood**

The level of serum glutamate pyruvic transaminase (SGPT) was estimated by the method of Reitman and Frankel (1957).

**Statistical Calculations**

For each biochemical parameters a minimum of 5 replicates were done and the results were statistically analyzed by student's 't' test. The statistical formulae and tables were taken according to Fischer and Yates (1963).

**RESULT**

**i) Control groups:**

The serum glutamate pyruvic transaminase in placebo control groups after 7 days ranged from 40.43 to 45.26 with an average of 43.09 u/dl; while after 15 days ranged from 40.43 to 45.26 with an average of 43.09 u/dl and after 30 days ranged from 40.43 to 45.26 with an average of 43.09 u/dl.

**ii) Treated groups:**

The serum glutamate pyruvic transaminase in treated groups after 7 days ranged from 34.86 to 39.36 with an average of 37.25 u/dl; while after 15 days ranged from 28.66 to 35.22 with an average of 32.22 u/dl and after 30 days ranged from 22.78 to 30.24 with an average of 26.33 u/dl.

The decrease serum glutamate pyruvic transaminase level in the serum is significant ( $p < 0.05$ ) after 7 days; while highly significant ( $p < 0.01$ ) after 15 days and very highly significant ( $p < 0.001$ ) after 30 days of Tribulus terrestris aqueous extract treatment.

**Table and Fig. – 1**

Protective effect of aqueous extract of Tribulus terrestris on Serum Glutamate Pyruvic Transaminase (SGPT) in albino rat.

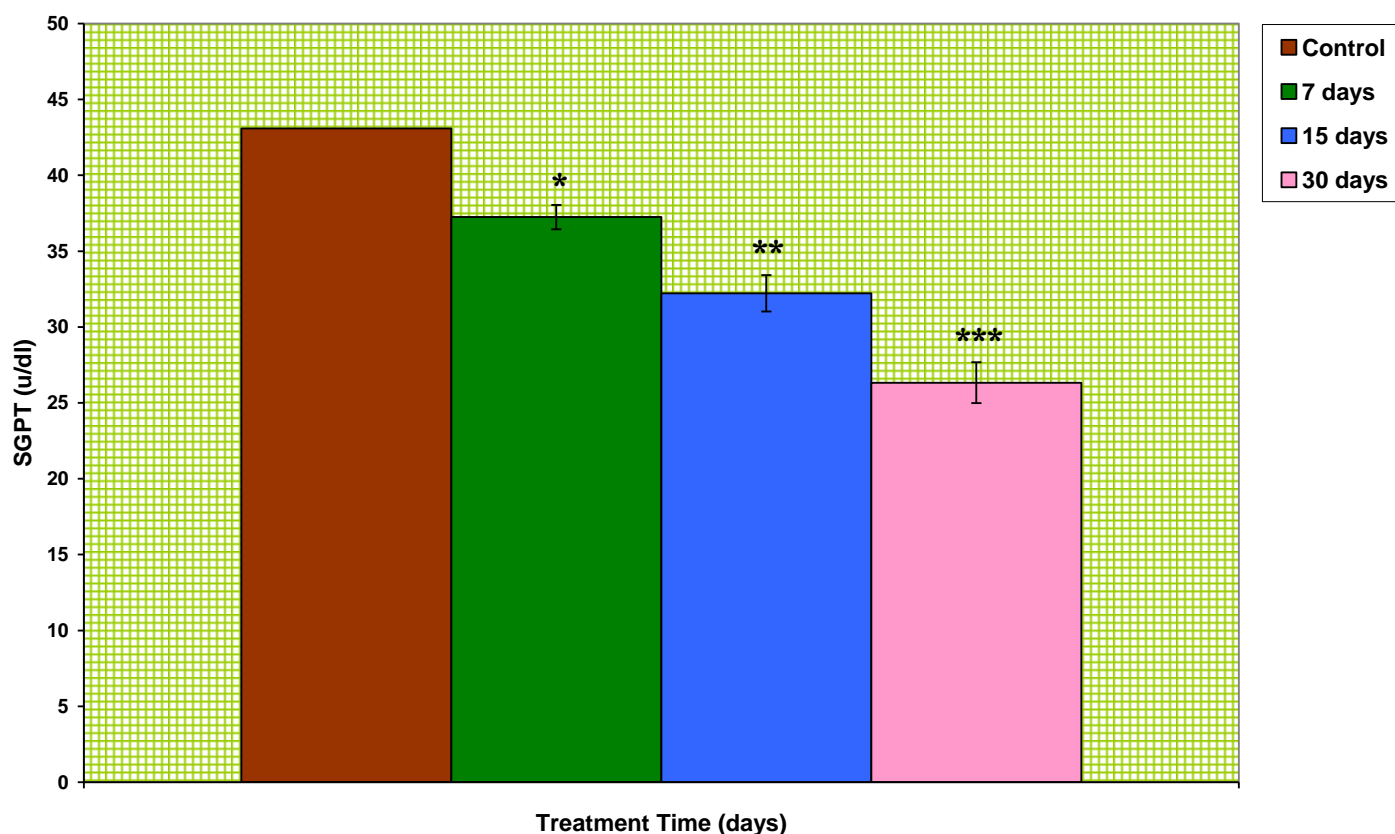
| S. No. | No. of Rats | Treatment time (in days) | SGPT $\mu$ /l  |                   |                |                     |
|--------|-------------|--------------------------|----------------|-------------------|----------------|---------------------|
|        |             |                          | Control Groups |                   | Treated Groups |                     |
|        |             |                          | Range          | Mean $\pm$ S.Em.  | Range          | Mean $\pm$ S.Em.    |
| 1.     | 5           | 7                        | 40.43 – 45.26  | 43.09 $\pm$ 0.833 | 34.86 – 39.36  | 37.25 $\pm$ 0.802*  |
| 2.     | 5           | 15                       | 40.43 – 45.26  | 43.09 $\pm$ 0.833 | 28.66 – 35.22  | 32.22 $\pm$ 1.198** |
| 3.     | 5           | 30                       | 40.43 – 45.26  | 43.09 $\pm$ 0.833 | 22.78 – 30.24  | 26.33 $\pm$ 1.34*** |

S.Em. = Standard error of mean

\*Significant ( $p < 0.05$ )

\*\*Highly significant ( $p < 0.01$ )

\*\*\*Very highly significant ( $p < 0.001$ )



## DISCUSSION

The natural products are believed to be an important source of new chemical substances with potential therapeutic applicability (Zargari, A. 1996; Elisabetsky and Castilhos 1990). *Tribulus terrestris* is a herb that is widely distributed in different parts of the world. It is extremely rich in substances having potential, biological significance including 'saponins', flavonoids, alkaloids and other nutrients (Wang *et al.*, 1997). The quantities and presence of these important metabolites depend upon the various part of the plant used. The root of *Tribulus terrestris* contains pharmacologically important metabolites such as phytosteroids, flavonoids, alkaloids and glycosides (Zhang *et al.*, 2005 and Wu *et al.*, 1996).

In the present study Serum glutamate pyruvate transaminase is decrease after oral administration of aqueous fruit extract of *Tribulus terrestris* due to its antioxidant and hepatoprotective effect by antioxidant enzyme cytochrome p-450. Almost similar results have also been reported by Jagadeesan and Kavitha (2006) in mice due to its hepatoprotective effect of *Tribulus terrestris* which caused decreased in the permeability of cell membrane resulting the decrease of the secretion of transaminase in blood stream (Vandenbergh, 1995), while Sharma *et al.* (2002) in rats due to beneficial effect of *Tribulus terrestris*; Margarat (2001) in rat due to beneficial effect of *Tribulus terrestris* which provide strength of body resistant, restoring normal function of body to consolidated the constituent and to promoted blood circulation and increased GSH level and finally to increase the antioxidant protection in the liver and Khandelwal *et al.* (2002) in rats due to beneficial effect of *Tribulus terrestris* and *Embllica officianalis* antioxidant plant.

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