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EVALUATION OF PHARMACOLOGICAL ACTIVITY AND USES OF TRIBULUS TERRESTRIS

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ABSTRACT

It is a Mediterranean plant belongs to the family Zygophyllaceae, also known as puncture vein. It has been used mostly in India and Pakistan. Its parts such as root, leaf and fruits are commonly used by the people for the medicinal purpose. From the past many years it has been used by body builders, athletes and for other health problems like circulatory conditions, heart and issues in sexual conditions. It used for the treatment of angina, eczema, renal and vesicle calculi, eye problem and edema.

INTRODUCTION

Tribulus terrestris has been found in regions of subtropical places in India. Its roots (shown in fig. 2) and fruits (shown in fig.2) used for rheumatism, piles, renal and vesicles calculi and general weakness.[10] Leaves, fruits and flowers (shown in fig.3) are used as tonic and diuretics.[4] It contains chemical constituents like flavonoids, glycosides, alkaloids, tannins, furostanol saponin 1, spirostanol saponins 2 and 3, situterol glycoside, steroidal saponins which gives the antibacterial, cytotoxic, antihyperlipidimic effect.[6] It also increases the secretion of luteinizing hormone and testosterone.[5] Recent research has been conducted based on the study of photosensitivity of *Tribulus terrestris* in South African sheep for geeldikkop,[1] study of sexual effect of *Tribulus terrestris* punctureveín extract using rat model,[2] study of *Tribulus terrestris* saponin less toxic to normal call than cancer cell (influence on apoptosis and proliferation).[3]

Discription

Tribulus terrestris stems has diameter grows from 10 cm to over 1 m, with branching. They are usually form flat patches. Leaves are pinnately compound. Its Hairy leaflets are opposite and has length up to 3 mm long. The flowers are 4–10 mm wide, lemon-yellow colored five petals, ten stamens and five sepals. Its fruit develops that falls apart into five burs. The burs are hard and have two to four spines, 10 mm long and 4–6 mm broad.

Figure 1 (Roots)

Figure 2 (Fruits)

Figure 2 (Leaves and Flovers)

Pharmacological activity

- Due to presence of large amount of essential oils and nitrates and increase in potassium salts in cause **diuretic effect**.
- It also acts as **antihypertensive agent.**
- It causes relaxation of acetyl choline and electrical field stimulation gives **aphrodisiac activity.**
- It inhibits nucleation and growth of calcium oxalate crystals leads to **antiurolithic activity**.
- Inhibition of damage to NRK52E renal cells causing **cytoprotective activity**.

- Inhibition of gluconeogenesis which leads to **hypoglycemic activity.** it also enhance the absorption of **metformin hydrochloride**
- It decreases cholesterol, LDL, VLDL and TG and also increases the HDL level gives **hypolipidemic activity.**
- It is used to **treat cardiac disorders** like coronary disease, myocardial infarction, cerebral arthrosclerosis, CAD and sequel of cerebral thrombosis.
- It has **immunomodulatory activity** by dose dependent increase phagocytosis.
- It effectively inhibits COX-2 and INOS in lippopolysachride induced RAW264.7 cells causing **anti inflammatory activity**.
- Only the fruit and leaf of Indian plant has **antibacterial activity** effectively against E.coli and S.aureus.

Mechanism of action

- **Diuretic effect:** *Tribulus terrestris* has large amount of nitrates, essential oils in fruits and leaves, it also has increased potassium salt which causes diuretic effect along with this it increases smooth muscle tonicity.
- **Aphrodisiac activity:** *Tribulus terrestris* increases nitrous oxide in nitergic nerve endings and endothelium causing aphrodisiac activity. It helps in increasing testosterone secretion through inhibiting testosterone cadmium induced damage in testicular.
- **Antiurolithic activity:** GOX causes oxalate synthesis which gives glycoxalate from glycolate due to oxidation causes urolithiasis. *Tribulus terrestris* inhibits GOX enzyme.
- **Hypoglycemic property:** *Tribulus terrestris* decreases serum glues, serum triglycerides, serum cholesterol and decreases SOD activity, which also inhibits gluconeogenesis leads to hypoglycemia
- **Hypolipidemic effect:** Due to presence of phenolic compound in *Tribulus terrestris* leads to increase in lipoprotein lipase in muscle. It decrease cholesterol induced hyperlipidemia in the body.
- **Immunomodulatory activity:** *Tribulus terrestris* stimulate the nonspecific immune response. Increases specific immune response by raising humeral antibody delayed hypersensitivity response.
- **Activity in cardiac disorder:** *Tribulus terrestris* decreases biomarkers like malondialdehyde, aspartate transaminase, creatinine kinase, LDH activity and myocardial apoptosis rate.

- **Anti inflammatory activity:** suppressing the proinflammatory cytokines such as IL-4 and tumor necrosis factor alpha in macrophage cell line causing the anti inflammatory activity.

Recommended dose

Fruit - 3-6g as powder,

20-30g as decoction.

Root - 20-30g as decoction.

Sexual disorder - 250-1500mg/day orally.

Diabetes- 1000mg/ day.

Side effects

Side effects are mild and uncommon

Some side effects include stomach pain, cramping, diarrhea, nausea, vomiting, constipation, excitation, difficulty sleeping, or heavy menstrual bleeding.

Very rare cases shows, reports of kidney damage have been connecting to taking tribulus.

CONCLUSION

Tribulus terrestris is used traditionally by the ancestors for the sexual disorder. It also used for the treatment of rheumatic pain and as analgesic. It is concluded that the root, stem, flower, fruit and leaf of *Tribulus terrestris* gives the antiurolithic property, hypoglycemic property, aphrodisiac activity, hypolipidimic activity, activity in cardiac disorder and anti inflammatory activity through using it in the form of powder or decoction in recommended doses.

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