

Pharmacognostic and Pharmacological Review of *Tricholepis glaberrima* DC

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Abstract:

Since ancient times, crude drugs have been used as medicines and are of great importance for human beings. However, traditional knowledge about the use of medicinal plants is eroding day by day, and there was a need to document the everyday experience of these indigenous medicinal plants. Ayurveda describes the medicinal values and uses of plants for healthcare. By the course of time, various new plants got added to Ayurvedic material medica, Dravyaguna Vigyan. *Tricholepis glaberrima* (Brahmadandi) is one of them. This plant has great importance due to its nutritive value and a significant source of medicines as they have been found throughout human history. This plant is mostly used for its aphrodisiac property, but several unknown activities need to be taken seriously. This mini-review paper encompasses the Ayurvedic aspects as well as the phytochemistry structure and pharmacological activities of the Brahmadandi plant. The current review focuses on the updated information from various scientific studies and reports available in the context of the phytoconstituents and pharmacology of this plant. This review also provides adequate information about the use of this plant in an Indian system of medicine, Ayurveda.

Tricholepis glaberrima

Tricholepis glaberrima DC belonging to family Asteraceae, is popularly known as “Brahmanandi” in Indian System of Medicine and is claimed to be effective in the treatment of various ailments, viz. neurological disorders, hepatic disorders, sexual dysfunction, skin diseases etc. Plants have the ability to synthesize secondary metabolites known as phytochemical compounds. In order to treat various acute and chronic inflammatory disorders Plant have a great potential for producing new drugs used in traditional medicine. Due to fewer side effects, the uses of herbal medications are increased now a day. *Tricholepis glaberrima* commonly known as “Brahmadandi” belongs to family Asteraceae. It is prominently used by traditional healers as an aphrodisiac. It is somewhat termed with a phrase “poor man’s sex tonic” by many traditional healers.



Fig: Brahmanandi Plant

Botanical Classification:

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Asterales

Genus: *Tricholepis*

Species: *glaberrima*

Taxonomy and Nomenclature:

Family: Asteraceae

Synonyms:

Gurati : Fusiyaaroon

Farasi : Baadaavarda.

Marathi : Bothamore, Dahan

Bangla : Chhaagaldandi

Kannada : Brahmadandi

English : Thistle, Smooth Trichole

Common Name: Brahmadandi

Distribution: It is found around West Rajputana, mount abu, Central india Konkan, Deccan,

Western ghat in Bombay presidency, Hills of Mysore. Mahabaleshwar. It often grows on cultivated fields rocky soil of grasslands.

Description of *Tricholepisglaberrima*: It is a stout annual erect herb quite smooth, grayish, with purple, bracts erect, motabor.

- **Leaves:** sessile, 2.5-6.3 cm by 3-6 mm, linear oblong or lanceolate, acute entire, spinous, bristle toothed or spinous serrate, punctate, base of cauline leaves not or rarely uricled midrib and nerves very prominent beneath.
- **Heads:** 6.8 mm long, ovoid, glabrous.
- **Flowers:** small and slender, more or less penciled, florets few purple in terminal head. *Corollas* 1.25-1.4 cm long purple. Style-arms slender, with a ring of hairs at the base of the lobes.
- **Fruit:** shorter than the achenes, copious, yellowish brown, rigid, sub paleaceous. Achenes oblong, faintly ribbed.

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Traditional Uses: It is believed to be a nervine tonic and an aphrodisiac and it is used in seminal debility. The herb is believed to possess antiseptic properties and is employed in the disease of skin. The root bark is stated to be employed in urinary trouble and cough. It is an aromatic bitter plant which cures Hysteria. It is used for sore throat, inflammation. Root paste used as antidote against snakebite, powdered plant for the treatment of leprosy. Also used as an antipyretic.

Chemical Constituent: The aerial part contains sesquiterpene, lactones, cyneropier in and dihydro desacylcynaropicrin. Cyclo art enol derivatives-sterols isolated from the plant sources that contain conjugated ketone or allylic alcohol features in the sterol side chain. Only the $\Delta^{23-3\beta}$, 25-diol was found in *Tricholepisglaberrima*. The plant is rich in many pharmaceutical active ingredients like flavonoids, triterpenoids, saponin glycosides and sterols.

Antifungal activity

The antifungal activity of the acetone soluble fraction of compound 1 from extract of *Tricholepisglaberrima* was observed. It was tested against various fungi at various concentrations. For observation of this activity the Petri dishes were placed on "Sabouraud's broth media" with (4 %) agar. The zone of inhibition was recorded in terms of diameter at $27 \pm 1^\circ\text{C}$ after 48 h. it was found that the antifungal activity of compound 1 was good against *Trichoderma viride* followed by *Aspergillus niger*. As a standard antifungal agent the Griseofulvin was used. The compound 1 was further identified as 7, 3'-dihydroxy-6, 4'-dimethoxy flavones.

Hepatoprotective activity

In order to assess the role of *Tricholepisglaberrima* in hepatotoxicity induced by rifampicin and Bacillus Calmette-Guerin/lipopolysaccharides (BCG/LPS) in rats a study was performed by Gound et al (2015). it was also attempted to understand its probable mechanism of actions. For inducing hepatotoxicity in rats the rifampicin was administered for 30 days and in

another experiment BCG on day 1 and LPS on day 11. The parameters for assessment of hepatotoxicity were alteration in level of total proteins, serum marker enzymes, , MDA and NO formation, cytokines mainly IL-6 and TNF- α and histoarchitecture alterations in both the experiments. ELISA method was applied for determination of IL-6 and TNF- α level in liver homogenates.

Antioxidant activity

The FTC (ferric thiocyanate)and TBA(thiobarbituric acid) methods were applied for evaluation of antioxidant activity of three different extracts of aerial parts of *Tricholepis glaberrima* DC . The study was carried out on aqueous, chloroform and methanol extracts of the aerial parts of plant. Free radicals hamper healthy cells, causing genetic damage and mutations as well as tearing the cell membranes. They give rise to atheromatous plaques while react with serum lipoprotein (LDL). Also cause peroxidation of polyunsaturated fatty acids and generating further free radicals when react with the cell membranes lipid . So, there is need of antioxidants in the different body compartments such central nervous system and across the blood brain barrier as well as in the circulating system inside the cells . At the primary stage of linoleic acid peroxidation the FTC method was implied to measure the amount of peroxide formed. In this method the concentration of peroxide remains inversely proportion to the antioxidant activity. when compared with the standard vit C the aqueous extract possessed significant antioxidant activity. Where as in comparison to chloroform and aqueous extract the methanolic one was found to have high antioxidant activity as suggested by analysis of outcomes of FTC and TBA method. The study indicate about natural antioxidant potentiality of the plant *Tricho lepis glaberrima* DC.

Aphrodisiac activity

Because infusion of its aerial parts are prescribed traditionally in seminal debility and impotence So, in order to investigate this claim a study was performed to document the effect of methanolic extract of the aerial parts in sexually active male rats by Padashetty et al (2007) In addition, the effect of the extract on the activity of two antioxidant enzymes, viz. catalase and superoxide dismutase in testicular homogenate as well as on the testicular histology were also assessed. The methanolic extract of aerial partss of *Tricholepis glaberrima* DC was administered at the dose of 200mg/kg b.w for 28 days which altered the various components of the sexual behavior study significantly. It increased the intromission latency (IL) and mounting latency (ML) significantly and with a significant reduction in intromission frequency (IF), post-ejaculatory interval (PEI) and mounting frequency (MF).The testicular histology suggested that the extract enhances proliferation of seminiferous epithelium which in turn favors spermatogenesis.

Neuropharmacological activity

Increase in muscle relaxation, discrimination index as well as potentiation in haloperidol induced catalepsy and increament in reaction time in analgesic activity was exhibited by CHE, MHE and AQE. at two dose levels (100 and 300 mg/kg) of extract . The improvement in discrimination index as well as improvement in memory in absence cognitive deficit stands a major criteria of nootropic activity. Between time intervals of 15-60 min a significantly potantiation in haloperidol- induced catalepsy observed at the dose level of 100 and 300 mg/kg. It did not produce any significant anxiolytic activity when tested on EPM and double unit mirror chamber too. CHE extract shows better analgesic activity than other extract. The anticonvulsant effect in MES model couldnotbe found. Also the extracts failed to decrease the effect of sodium nitrite which indicates that extracts did not increase the cholinergic transmission in the CNS. It is thus apparent that different extract of *Tricholepis glaberrima* plant exhibited improvement in the discrimination index, potentiation of haloperidol induced catalepsy, and increase in reaction time in analgesic activity and muscle relaxant activity.as a conclusive remark it can be suggested that due to presence of terpenoids and phenolic like

phytoconstituents the aforesaid dopaminergic transmission is facilitated by the different extracts of *Tricholepisglaberrima*.

Anti inflammatory activity

In order to assess the anti-inflammatory activity of the Methanolic and aqueous extract of aerial part of *Tricholepisglaberrima* extracts Veena et al (2017) administered them at the dose of 100mg/kg, 200mg/kg and 400mg/kg, per orally in carrageenan induced right hind rat paw odema method in albino rats. At different time intervals the difference in paw oedema thickness were calculated in each control, test, standard and toxic groups. It was found that the animals treated with toxicant carrageenan (0.1ml of 1%) were getting a significant increase in paw thickness at the end of 24th hr than the initial paw thickness. Whereas Significant reduction in the thickness of paw was observed when the animals were treated with different doses of methanolic and aqueous extract of *Tricholepisglaberrima*. It reversed the carrageenan induced toxicity in the terms of paw thickness drastically and was less than that of control animals at different hours.

Antibacterial activity

In order to assess the antibacterial activity of several plant extracts which were being utilized for cure of different diseases the methanolic and acetone extracts of *Tricholepisglaberrima* was also taken into account against seven different bacterial strains by Noreen et al (2012). It was done through diffusion method and micro dilution method. Plant extract (20 mg/mL) was used to evaluate antibacterial activities. The methanolic extract showed more activity than the acetone extract against tested organisms. Using atomic absorption spectrophotometer the elemental composition of plant was also explored in order to know natural sources of essential element that can be utilized for medicinal purposes. The results of antimicrobial activity of crude extracts (methanol and acetone) of the plant *T. glaberimma* showed good antimicrobial activity against almost all the strains of selected bacteria as judged by zones of inhibition as compared favorably with the standard antibiotic ciprofloxacin and methicillin .plant extract exhibited a broad spectrum of activity.

Antidepressant activity

The main objective of this research work was to evaluate the antidepressant activity of *Tricholepisglaberrima* in rats. The study was undertaken to evaluate the possible antidepressant effect of *Tricholepisglaberrima* aerial parts using forced swimming test and tail suspension test models of depression. Imipramine was taken as a standard drug with a dose of 10mg/kg, Group 3, 4 and 5 received METG at the doses of 200, 400 and 600mg/kg respectively. Methanolic extract of aerial parts of *Tricholepisglaberrima* produced significant antidepressant like effect at the dose of 600mg/kg in both models of FST and TST which indicated reduction in immobility time. The efficacy of METG at 600mg/kg found to be comparable to that of standard drug Imipramine at 10mg/kg. The results of study indicated that methanolic extract of aerial parts of *Tricholepisglaberrima* possesses significant antidepressant activity compared to that of standard drug imipramine. Depression is a heterogeneous, life threatening illness which is characterized by negative mood, decreased physical activity and feelings of helplessness and is caused by decreased levels of Monoamines like noradrenaline, dopamine and serotonin in brain.

Conclusion:

Different phytochemical and pharmacological examinations of one plant have been accounted for. In any case, there is as yet a shortage of data on other natural properties of this plant. As far as we could possibly know, inhibitory activity against chemicals related with constant illnesses has not been concentrated to date. This survey gives precise data about the concerned plant, which may end up being valuable for scientists and the advancement of the conventional information on therapeutic plants.

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