

# *Tridax Procumbens* Linn: An Important Traditional Medicinal Herb with Multiple Curative Properties

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**Abstract:** Gel is the semisolid dosage form of at least two constituents, consisting of a condensed mass enclosing and interpenetrated by a liquid. It has an easy application, easy removable property. It is widely accepted dosage form, and it has more patient compliance. *Tridax procumbens* is an anti-bacterial drug, it also has wound healing activity for such activity it has been used in traditional medicinal systems in India, the rural parts of country still has a wide use of this plant. When it comes to its use in combination with certain modern dosage forms, gel seems to be a good option. The present study reveals information on antiseptic activity on the *tridax procumbens* L. (Asteraceae) medicinal plant. The present study on phytochemical analysis on the plant is essential. Herbal gel is used in many years. Initially dried powder of *tridax procumbens* was extracted in ethanol and tested for presence of different phytochemical. The present research has been undertaken with the aim to formulate and evaluate the herbal gel containing *Tridax procumbens* leaves extract

**Keywords:** *Tridax procumbens*, Weed, Leaf constant, antioxidant, anticancer.

## I. INTRODUCTION

Traditional medicines has importance in India since hundreds of years and it has potential action on various diseases and disorders therefore it is an impactful way of treatment. As we are aware about importance of traditional medicines but it also has certain drawbacks, like lack of research, limited literature, and low patient compliance. As per reports of certain print media houses 77% of households in India uses ayurvedic herbal products<sup>1</sup>. Plants which have medicinal properties can be seen in variety in India. After thorough research plants can be an alternative to synthetic drugs. Use of these plant for the treatment of certain bacterial infections which are caused due to *Escherichia coli*, *Staphylococcus aureus* and *Pseudomonas aeruginosa* has shown a desired effect<sup>1</sup>. *Tridax procumbens* is a plant belongs to family Asteraceae and genus *Tridax*; it is also called as *Tridax* daisy. This plant is found easily in all parts of country either tropical or subtropical. Rural part of Maharashtra has variety of uses of this plant, mainly in farmers, workers and other people related with farming profession<sup>2</sup>. Ayurveda with its focus on healthy lifestyle practices and regular consumption of adaptogenic herbs. Of all the herbs used within Ayurveda, *Tridax procumbens*, is now confirming its beneficial effects<sup>2</sup>. The topical drug delivery system has the advantage of negotiating the first pass Metabolism<sup>2</sup>. It also helps to avoid the risk and Inconvenience of IV route therapy. Topical formulations are prepared in different consistency Such as solid, semisolid, and liquid. The topical delivery System is failed in the administration of hydrophobic Drug. In each formulation with the active ingredients Many excipients are used. *Tridax procumbens* is used in various diseases or it has been used in Indian traditional medicine for wound healing, antifungal, antibacterial, insect repellent.<sup>3</sup> The further study on phytochemical analysis on this plant is essential and may be very much useful for the development the subject in this field<sup>4</sup>. Gel has several advantages over other dosage form gels are semisolid system consisting of dispersion of small or large molecule in an aqueous liquid vehicle rendered jelly like by the addition of gelling agent. Gelling agent which are used in formulation of gel are synthetic macro molecules like carbolpol 940, triethanolamine. Advantages of gel dosage form over other dosage forms are less irritancy. soften the skin, easily removable<sup>5</sup>. herbal gel is used on topical and herbal gel in used ethanolic extract of leaves of *tridax procumbens*. The present study is formulated and evaluate the herbal gel.

## II. TAXONOMY

**Kingdom** - Plantae - Plants  
**Subkingdom** - Tracheobionta - Vascular plants  
**Superdivision** - Spermatophyta - Seed plants  
**Division** - Magnoliophyta - Flowering plants  
**Class** - Magnoliopsida - Dicotyledons  
**Subclass** - Asteridae  
**Order** - Asterales  
**Family** - Asteraceae  
**Genus** - *Tridax* L. - tridaxP  
**Species** - *Tridax procumbens* L.

## III. PLANT DESCRIPTION

The plant bears daisy-like yellow-centered white or yellow flowers with three-toothed ray florets. The leaves are toothed and generally arrowhead-shaped. Calyx is represented by scales or reduced to pappus. Its fruit is a hard achene covered with stiff hairs and having a feathery, plumelike white pappus at one end. The plant is invasive in part because it produces so many of these achenes, up to 1500 per plant, and each achene can catch the wind in its pappus and be carried some distance. This plant can be found in fields, meadows, croplands, disturbed areas, lawns, and roadsides in areas with tropical or semi-tropical climates.<sup>[citation needed]</sup> It is listed in the United States as a Noxious Weed and regulated under the Federal Noxious Weed Act.<sup>[citation needed]</sup>



**USES** -Traditionally, *Tridax procumbens* has been in use in India for wound healing and as an anticoagulant, antifungal, and insect repellent<sup>7</sup>. *Tridax procumbens* is also used as treatment for boils, blisters, and cuts by local healers in parts of India<sup>8</sup>.

## IV. CHEMICAL CONSTITUENTS

The flavonoid procumbentin has been isolated from the aerial parts of *tridax procumbens*. Other chemical compound isolated from the plant include alkyl esters, sterols<sup>9</sup>, pentacyclic triterpens<sup>10</sup>, fatty acids<sup>11</sup>, and polysaccharides<sup>12</sup>. Several main active chemical compound were found to be present. But toxicological knowledge is scarce and more research described to be needed on this plant.

## OVERVIEW

**APPEARANCE** - *Tridax procumbens* is a perennial herb that has a creeping stem which can reach from to 8-30 inches (20-75 cm) long.

**FOLIAGE** - The leaves of *Tridax procumbens* are opposite, pinnate, oblong to ovate, and 1-2 inches (2.5-5 cm) long with cuneate bases, coarsely serrate margins, and acute apices.

**FLOWERS** - *Tridax procumbens* flowers have white rays and yellow disk flowers. They are about 0.4-0.6 inches (1-1.5 cm) wide, and held on a 4-12 inches (10-30 cm) long stalk. Flowering occurs in spring.

**FRUIT** - Fruits are achenes that are dark brown to black in color, oblong, and 0.08 inches (2 mm) long, each with a head of pappus bristles that vary from 0.12-0.24 inches (3-6 mm) long.

## V. PHARMACOLOGICAL REVIEW

### Hepatoprotective Activity

The hepatoprotective activity of aerial parts of *Tridax* shows significant protection in alleviation of D-Galactosamine/Lipopolysaccharide (D- GalN/LPS) induced hepatocellular injury<sup>13</sup>. D- GalN/LPS have been proposed to be hepatotoxic due to its ability to destruct liver cells. The multifocal necrosis produced by D-GalN and the lesion of viral hepatitis in humans are similar. This amino sugar is known to selectively block the transcription and indirectly hepatic protein synthesis and as a consequence of endotoxin toxicity, it causes fulminant hepatitis within 8 hr after administration.

### Immunomodulatory Activity

Ethanol extracts of leaves of *Tridax* have immunomodulatory effect on Albino rats dosed with *Pseudomonas aeruginosa* also inhibits proliferation of same<sup>14</sup>. Also a significant increase in phagocytic index, leukocyte count and splenic antibody secreting cells has been reported to ethanol insoluble fraction of aqueous extract of *Tridax*. Stimulation of humoral immune response was also observed along with elevation in hemagglutination antibody titer. Study also reveals that *Tridax* influences both humoral as well as cell mediated immune system<sup>15</sup>.

### Wound Healing Activity

Wound healing involves a complex interaction between epidermal and dermal cells, the extra cellular matrix, controlled angiogenesis and plasma-derived proteins all coordinated by an array of cytokines and growth factors<sup>16</sup>. *Tridax* antagonized anti- epithelization and tensile strength depressing effect of dexamethasone (a known healing suppressant agent) without affecting anticontraction and antigranulation action of dexamethasone. Aqueous extract was also effective in increasing lysyl oxidase but to a lesser degree than whole plant extract. Further it has been shown that extract of leaves of this plant also promotes wound healing in both normal and immunocompromised (steroid treated) rats in dead space wound healing model. The plant increase not only lysyl oxidase but also, protein and nucleic acid content in the granulation tissue, probably as a result of increase in glycosamino glycan content<sup>17</sup>.

### Antidiabetic Activity

The knowledge of diabetes mellitus, as the history reveals, existed with the Indians since from prehistoric age. Madhumeha another name of diabetes in which a patient passes sweet urine and exhibits sweetness all over the body in the form of sugar, Le., in sweat, mucus, urine blood, etc. from ancient time various herbs were practically used for lowering of blood glucose level as such or in juices form. Aqueous and alcoholic extract of leaves of *Tridax* showed a significant decrease in the blood glucose level in the model of alloxan- induced diabetes in rats<sup>18</sup>.

### Antiobesity activity

In atherogenic diet induced obesity model, the rat receiving treatment with *Tridax procumbens* showed significant reduction in total cholesterol, triglycerides total protein, free fatty acids and elevation of high density lipoprotein cholesterol. *Tridax procumbens* was found to possess significant antiobesity activity<sup>19</sup>.

### Antimicrobial Activity

Whole plant of *Tridax* has reported for its antimicrobial activity on various species of bacteria. A whole plant is squeezed between the palms of hands to obtain juice. Fresh plant juice is applied twice a day for 3-4 days to cure cuts and wounds. The extract of whole plant of *Tridax* showed antibacterial activity only against *Pseudomonas aeruginosa*. The disk diffusion method was used to test the antibacterial activity. Four strains of bacteria employed in test were two-gram positive *Bacillus subtilis*, *Staphylococcus aureus* and two gram negative *Escherichia coli* and *Pseudomonas aeruginosa*<sup>20</sup>.

### Anti Inflammatory and Analgesic Activity

The analgesic activity is evaluated by two analgesic and one inflammatory in vivo pain Models, male C57 BL6J mice (25-30g) and male Sprague-Dawley rats (150-230g) was selected for this study. In the formalin test, late phase of moderate pain, which starts about 20 min after formalin injection and lasts about 40 min to 60 min, appears to be caused by tissue and functional changes in the dorsal horn of the spinal cord, Administration of extract demonstrated significant inhibition in late phase Similarly. In the acetic acid induced abdominal constriction test, T.P extract dose

dependently and significantly reduced the abdominal writhing. In CFA Induced Hyperanalgesia Oral administration of T.P extract significantly reduced mechanical hyper analgesia in CFA injected rats. So, it has been observed that Tridax procumbens has marked beneficial effects against centrally, peripherally and inflammatory pain models. This protective action may be attributed towards the presence of flavanoid and sterol indicates that the extract of Tridax procumbens may be used as an effective analgesic<sup>21</sup>.

#### **Anticancer Activity**

The effect of anti-cancer activity of traditional plant Tridax procumbens flower crude aqueous and acetone extract was tested on Prostate epithelial cancerous cells PC 3 was determined by measuring cell viability by MTT assay. Experiment consists of cleavage of the soluble yellow coloured tetrazolium salt MTT [3-(4, 5- dimethyl -thiazole-2-yl)-2, 5-diphenyl tetrazolium bromide] to a blue coloured formazan by the mitochondrial succinate dehydrogenase. The assay is based on the capacity of mitochondrial enzymes of viable cells to reduce the yellow soluble salt MTT to purple blue insoluble formazan precipitate which is than quantified spectrophotometrically at 570nm. The results of this analysis revealed the fact that flower crude extract has anti-cancer activity<sup>22</sup>.

#### **Antioxidant activity**

The free radicals scavenging activity of the Tridax procumbens fractions and Ascorbic acid was measured in terms of hydrogen donating or radical-scavenging ability using the stable radical 20-23 DPPH<sup>23-26</sup> 0.1 mM solution of DPPH in methanol was prepared and 1.0 ml of this solution was added to 3.0 ml of extract solution in water at different concentrations (10-100 l/ml). Thirty minutes later, the absorbance was measured at 517 nm. Lower absorbance of the reaction mixture indicates higher free radical scavenging activity. The capability to scavenge the DPPH radical was calculated by using following equation: Scavenging Effect (%)= [1-Abs. of Sample/Abs.of Control] x 100. The antioxidant activity of the fractions was expressed as IC50. The IC50 value was defined as the concentration (in g/ml) of methanolic extract fractions that indicates the formation of DPPH radicals by 50%<sup>24</sup>.

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