

Tridax Procumbens: A Medicinal Gift of Nature for Healing Diabetic wound

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ABSTRACT

Tridax procumbens (L), commonly known as Tridax daisy, is a species of flowering plant in the daisy family. It is best known as a widespread weed. Tridax procumbens (L.) is a spreading annual herb found throughout India but unfortunately it is one of the neglected plants. Hence, the present work aims to open new avenues for the improvement of medicinal use of Tridax procumbens (Compositae) for various ailments and to bring the anti-diabetic medicinal plant to the scientists' notice, and raise awareness and add value to the resource. Traditionally, Tridax procumbens has been in use in India for wound healing. Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural resources. The essential values and uses of some plants have been worked out and published, but many of them remain unexplored to date. Therefore, there is a necessity to explore their uses and to conduct pharmacognostic and pharmacological studies to discover their medicinal properties. Hence, Present work deals with phytochemical analysis of Tridax procumbens for the improvement of medicinal use of Tridax procumbens (Compositae) for various ailments and raise awareness and add value to the resource.

Keywords: Tridax procumbens (L.), phytochemicals, diabetes.

Introduction

Diabetes is a chronic condition that can cause a number of serious complications. Problems with the feet are one of the most common. The purpose of this work is to provide information on what you need to know about feet and diabetes and what sort of help you should seek. The plants also find their use as medicine in human healthcare. Several traditional systems have evolved in the world, which use plants to cater to the needs of healthcare and they are still in practice around the world. The use of plants and natural products received a fillip when World Health Organization recognized plant and natural products based medicinal systems as alternative and complimentary therapy in the year 2002 [1]. The use of medicinal plants for human healthcare is well documented in India, China, Egypt and Arab world [2]. The utility of plants and natural products was realized in India since Vedic times that resulted in the development of system of medicine the Ayurveda, that describes various uses of botanicals and other natural products in the treatment of several diseases and this knowledge has been compiled as several samhitas. [3]. It is also well known that there are several chronic diseases which cannot still be treated by

the modern system of medicine and humans are left with no choice except to rely on the age old system of traditional medicine. Although pharmacological industries had produced considerable number of commercial antibiotics time to time but resistance in pathogens towards these drugs too has increased at high rate and multi drug resistant microorganisms have exacerbated the situation [Nino J, Navaez DM, Mosquera OM]. In the present scenario, there is an urgent and continuous need of exploration and development of cheaper, effective new plant based drugs with better bioactive potential and least side effects. Hence, recent attention has been paid to biologically active extracts and compounds from plant species used in herbal medicines [4]. The plants synthesize several non-nutritive phytochemicals for different purposes and these have been reported to be beneficial as they possess various medicinal activities in humans [5]. *Tridax procumbens*, commonly known as coat buttons or tridax daisy, is a species of flowering plant in the **daisy family**. It is best known as a widespread **weed** and pest plant. It is native to the tropical Americas but it has been introduced to tropical, subtropical, and mild temperate regions worldwide. *Tridax procumbens* Linn. (Family: Asteraceae) is a common plant. It is found in tropical areas, growing primarily during rainy season' and popularly called 'coat buttons'[6] [7]. *Tridax procumbens* is reported to have hepatoprotective activity (Ravikumar et al 1995). It also possesses anti-inflammatory, immunomodulator, anti-diabetic activity, and in vitro activity against promastigotes, haemostatic, antioxidant, anti-hepatotoxic, antipyretic and antibacterial activity[8][9]. The leaves are reported as antidiarrheal, antidysentric and found to be useful in bronchial catarrh[10] (The juice of leaves control bleeding wounds. In addition, *Tridax procumbens* is also utilized to manage hypertension, in treatment of fever, typhoid fever, cough, asthma and epilepsy [11]. It possesses Anti diabetic [12](Durgacharan et.al 2008), Anti-bacterial[13], Anti plasmodial [14], Anti hepatotoxic, Anti-oxidant[15] and Antimicrobial properties[16]. A number of Phytochemical constituents were reported from the plant *Tridax procumbens* viz: alkaloids, flavonoids, carotenoids, β -sitosterol, n-hexane, fumaric acid, luteolin, quercetin, oxoester, lauric acid, myristic, palmitic, arachidic, linoleic acid and tannin etc. Diabetic foot is the major Diabetic serious illness for Diabetic patients. India has been known to be rich repository of medicinal plants like Tradax procumbens.

Diabetics foot disease

Tridax procumbens, a Flavonoids Plant. Commonly used in Indian traditional medicine as anticoagulant, hair tonic, antifungal and insect repellent, in bronchial catarrh, diarrhoea, dysentery, and wound healing. *Tridax procumbens* is known for several potential therapeutic activities like antiviral, anti oxidant antibiotic efficacies, wound healing activity insecticidal and anti-inflammatory activity. Some reports from tribal areas in India state that the leaf juice can be used to cure fresh wounds, to stop bleeding, as a hair tonic.



Traditionally, *Tridax procumbens* has been in use in India for wound healing, may be due to presence of phytochemicals present in it as well as anticoagulant, antifungal and insect repellent. A study had found anti-cancer properties of *Tridax procumbens* against human prostate epithelial cancer cell line PC 3 (Priya et al., 2011) and anti-microbial properties. (Cushnie TPT, Lamb AJ (2005).

Material and Method

To investigate the phytochemical screening of aqueous, ether, chloroform and ethanolic extracts of *Tridax procumbens* (T. *procumbens*), present study deals with the study of Phytochemical constituents from the *Tridax procumbens*.

Chemicals and reagents

All the chemicals and solvents were of Analytical grade procured from S.K.Enterprises, Pune India.

Collection and identification of plants

The plant *Tridax procumbens* were collected during winter season from Pune. The species collected were authenticated by the Department of Botany, Baburaoji Gholap College, Sangvi. The plant samples were washed with clean water, shade-dried and ground in to uniform fine powder using mixer grinder.

Preparation of extracts

Ten grams (10 g) each of the plant powder was weighed and transferred into a beaker containing 200 ml of distilled water. The mixture was heated on a hot plate with continuous stirring at 60°C for 30 minutes. The water extract was filtered through filter paper and the filtrate was used for the phytochemical analysis. The aqueous extracts were kept in refrigerator at 4°C until use.

Phytochemical analysis

The aqueous extract of the plant were subjected to different phytochemical tests using standard procedures to identify the phytochemical constituents qualitatively as described earlier [Doughari JH (2012), Harborne JB (1998)].

Phytochemical study for ether, chloroform and ethanol extracts. The crude products obtained in soxhlet extraction technique were subjected to qualitative chemical evaluation of Carbohydrates & Glycoside, proteins and free amino acids, saponins, phytosterols, tannins, flavanoids etc. [Harborne J C. and Evans WC, Trease GE].

Carbohydrates: Molisch's test: To 2 ml of the extract, add 1 ml of α -naphthol solution, add concentrated sulphuric acid through the sides of the test tube. Purple or reddish violet color at the junction of the two liquids reveals the presence of carbohydrates.

Cardial Glycosides -Keller-Killani Test: Plant extract treated with 2 ml glacial acetic acid containing a drop of FeCl_3 . A brown colour ring indicates the presence of Cardial Glycosides.

Proteins Xanthoproteic test: Extract was treated with few drops of concentrated HNO_3 formation of yellow indicates the presence of proteins.

Flavonoid

a) NH_4OH test: 3 ml of extract were 10 % NH_4OH solution development of yellow fluorescence indicates positive test.

b) Alkaline reagent test: Extract was treated with 10 % NaOH solution, formation of intense yellow colour indicates presence of Flavonoid.

Diterpenes Copper acetate test: Extract were dissolved in water and treated with 5 drops of copper acetate solution, formation of emerald green colour indicates presence of diterpenes.

Phytosterol Salkowski's test: Extract was treated with chloroform and filtered. The filtrate was treated with few drops of concentrated H₂SO₄ and shakes, allow standing, appearance of golden red indicates the positive test.

Tannin a) 2ml extract was added to 1% lead acetate a yellowish precipitate indicates the presence of tannins. b) 4ml extract was treated with 4 ml FeCl₃ formation of green colour indicates that presence of condensed tannin.

Steroid 1ml extract was dissolved in 10 ml of chloroform & equal volume of concentrated H₂SO₄ acid was added from the side of test tube. The upper layer turns red and H₂SO₄ layer showed yellow with green fluorescence .This indicates the presence of steroid.

Saponin 5 ml extract was mixed with 20 ml of distilled water then agitated in graduated cylinder for 15 min formation of foam indicates Saponin.

Alkaloids A quantity (3 ml) of concentrated extract was taken into a test tube and 1 ml HCl was added the mixture was heated gently for 15 min cooled and filter, the filtrate was used for following test.

Wagner's test: To the 1 ml of extract, add 2 ml of Wagner's reagent (iodine in potassium iodide).Reddish brown colored precipitate indicates the presence of alkaloids.

Results and Discussion

The medicinal properties of different parts of *Tridax procumbens* are listed in Table 1 and Phytochemical constituents of *Tridax procumbens* plants are listed in Table 2.

Plant	Pharmacological activity
Whole plant	Antimicrobial activity anticoagulant, hair tonic, antifungal and insect repellent, in bronchial catarrh, diarrhea, dysentery, and wound healing
Flowers, Leaves	Anti septic, Insecticidal, Parasitocidal, Anti-Cancer Activity infectious skin diseases , antidiabetic properties (Pareek et al., 2009).
Aerial parts	Hepatoprotective
Leaves	Wound Healing ,Antidiabetic activity, Dysentery, Diarrhea, Against conjunctivitis, Hemorrhage from cuts, bruises and wound. liver disorders or hepato-protective nature , gastritis and heart burn (Wani et al., 2010).

Table 1: Medicinal properties of *Tridax procumbens*

Sr.No	Phytoconstituents	Ether	Chloroform	Methanol
1	Carbohydrates	+	+	+
2	Cardial Glycosides Kellar-Killiani Test	-	-	-
3	Proteins Xanthoproteic Test	+	+	+
4	Flavanoids, Alkaline reagent test NH ₄ OH	+ -	+ +	+ +

5	Diterpinoid	+	+	+
6	Phytosterol Salkowski Test	-	-	-
7	Tannins	-	-	-
8	Steroids	+	+	+
9	Saponins	-	-	-
10	Alkaloids Wagner and Hager Test	+	+	+

Table 2: Phytochemical composition of various extracts of *Tridax procumbens*.

Present study deals with qualitative analysis of leaves extract of *Tridax procumbens* Linn. Table No.2 shows the results of phytochemical analysis of leaves of *Tridax procumbens* Linn. Chloroform extract of leaves of *Tridax procumbens* Linn shows the presence of Steroid, Saponin, Coumarins, Alkaloids, Amino acids, Diterpenes, Phenol and Flavonoids whereas Tannin, Anthocyanin, Emodins, Proteins, Phytosterol, Phlobatannin and Cardial Glycosides were absent. All extracts of leaves of *Tridax procumbens* Linn shows the presence of Steroid and Tannin, Saponin were absent in all extracts .Anthocyanin was present in only in methanol and ethanoic extracts while Alkaloids, Diterpenoids, Phenol and Flavonoids are present whereas Emodins, Amino acids, Phytosterol, Phlobatannin, Leucoanthocyanin and Cardial Glycosides were absent.

The bioactivity of plant extracts is attributed to phytochemical constituents. In order to extract the important phytochemical categories such as alkaloids, glycosides, proteins, terpenoids, steroids, flavonoids, etc., effectively, we were employed this three different solvents with varying polarity. The presence of carbohydrates, proteins, tannins, steroids, alkaloids in the different leaf extracts were established by phytochemical. The results in the present study suggest that *T. procumbens* leaves can be used for treating diabetic wounds.

Conclusions

The diabetic wound healing properties may be due to the phytochemicals present in the *Tridax procumbens*. It need to protect its valuable property of healing serious wounds of diabetic patients so need to concentrate the wound healing property for research work. The results in the present study suggest that *T. procumbens* leaves can be used for treating diabetic wounds.

The phytochemical characters of *Tridax procumbens* were studied and found to be in agreement with the reported characters in literature

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