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PHYTOCHEMICAL ANALYSIS & ANTI-INFLAMMATORYACTIVITY OF *TRIDAX PROCUMBENS L.*

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Abstract: The objectives of this study are to screen *Tridax procumben L.*'s phytochemical composition and determine whether it has anti-inflammatory properties. Phytochemical screening's primary goal is to establish the presence of cardiac glycosides and flavonoids for the evaluation of anti-inflammatory activity in a powder sample of leaves of *Tridax procumben L.*

Keywords: Herbal drugs, Tridax *procumvbens*, Extraction, Flavonoids, Pharmacological testing, Anti-inflammatory activity

I. INTRODUCTION:

The polyphenol family of phytonutrients includes flavonoids. Since ancient times, poly-phenols have been used in both the Chinese and Ayurvedic systems of treatment. According to the global healing center, they are connected to skin defense, cognitive function, blood sugar and blood pressure management, as well as anti-oxidant and anti-inflammatory actions. A new chemical was isolated in 1930 using oranges. It was designated vitamin P because, at the time, it was a member of a unique class of vitamins. Rutin, a molecule that was later identified as a flavonoid, is one of the more than 4000 different types of flavonoids that are currently known.

The *Tridax procumben L.* plant belongs to the Asteraceae family and has 50cm-long stems that are semi-prostrate, ascending, and annual or short-lived perennial. The plant produces three-toothed ray floret, yellow-centered, daisy-like white or yellow blooms. Entire years' worth of blooming.

Capitula with a diameter of 1 to 1.5 cm and 4mm rays. Simple, toothed leaves that are typically arrowhead-shaped and whole, very rarely pinnatisect. Very lengthy and strigose peduncle. With an acute leaf apex, acute leaf base, and coarsely serrated leaf margins, the leaf shape is lanceolate-ovate. Petiole of leaves up to 0.2 cm; oval lamina strigose pubescent on both sides; coarsely and profoundly dentate edge. Its fruit is a densely dentate, smooth, rigid turbinate achene. Its fruit is a firm turbinate achene with a feathery, plume-like white pappus at one end that is covered in stiff hairs and smooth or faintly ribbed. Fruit with light ascending hairs tSShat give the appearance of grayish-brown achene. Fruit is 1.5-2.5mm long, 0.5-1.4mm in diameter, and narrowly obconic to cylindrical, tapering to a blunt base.

There must be a huge number of flavonoids in all *Tridax procumbens* types. Chemicals called flavonoids are compounds obtained from plants and are present in different parts of plants. Flavonoids are essential for vegetables' health and growth as well as their defense against disease. They are low molecular weight phenolic compounds that are present in all plant species. They are among the most peculiar substances to be discovered in higher plants. Numerous flavonoids are readily recognizable as flower pigments in the majority of angiosperm groups. However, they are not just present in flowers. They are also present in other areas of plants.

II. Collection and Identification of plant:

Tridax procumben L. was collected from different villages of Sangli District, Maharashtra in February 2023. The plant was taxonomically authenticated by the Department of Botony of Smt. Kasturbai Walchand College (Art-Science), Sangli, Maharashtra. The leaves of plant were dried in shade for 4-5days and powdered by using a mixer.

III. Extraction:

For both phytochemical and pharmacological screening, the powder must be extracted using water. The maceration process is necessary for aqueous extraction. We were given 20gm of Tridax procumbens powdered leaves in a beaker. The addition of 200ml of distilled water. Carefully stirred thoroughly to prevent slugging. After thoroughly stirring, add 5ml of chloroform to prevent any fungus from growing. Use a muslin cloth to properly seal the beaker after that. For seven days, the beaker was thoroughly stirred every 2-3 hours. On the seventh day, the solution was filtered. By applying heat from outside, the filtrate will be evaporated. The filtrate was evaporated till the solid particle was obtained. In order to do a phytochemical and pharmacological screening, the solid particle should be collected and sufficiently diluted.

For ethanolic extraction by using the Soxhlet apparatus, we taken around 10gm of powdered leaves of *Tridax procumbens* into the Soxhlet apparatus. Added the powder sample in a porous bag or "thimble" made of strong filter paper or a muslin cloth, which is placed in chamber of the Soxhlet apparatus. Firstly taken a Chloroform for Soxhlet Extraction. Chloroform will remove fatty acids and chlorophyll present in the powder sample. Then added 250ml of Chloroform in apparatus and start the water supply. Started the heating mental and place at 60^0C and continued supply the heat till the drop of solvent from the siphon tube does not leave residue when evaporated. Stoped the heating supply and wait for cool the assembly. Collected the powder from porous bag or thimble and dry it properly at room temperature. After drying powder again added it in porous bag or thimble. Added the 250ml of Ethanol in the assembly and start the water supply. Started the heating mental and place at 60^0C. Continued supply the heat till the drop of solvent from the siphon tube does not leave residue when evaporated. Stop the heating supply and wait for cool the assembly. Taken solvent collected at round bottom flask and go for evaporation. Evaporated the solvent till we attain the solid particulate. Scratch and dilute it and go for phytochemical and pharmacological screening.

IV. Phytochemical Analysis:

Both the extracts i.e. aqueous and alcoholic were used for the phytochemical analysis. Dragondroff's test and Modified Dragondroff's test are generally used for the alkaloidal analysis. Baljet Test, Kedde test and Raymond test are employed for determination of the cardiac glycosides. Sulphuric acid test, lead acetate test and alkali test are used for screening of presence of flavonoids. 5% lead acetate test, $FeCl_3$ test and dilute iodine test are used for identification of tannins. The salkowaski test is used for detection of presence of terpenoids. Alkali test was we used for detection of coumarin glycosides; while the test for solubility was employed to find the presence of fatty acids.

V. Pharmacological Analysis:

Tridax procumben L. was tested for its in vitro anti-inflammatory properties using the following theory: **"Denaturation of protein is one of phenomenon that results in the disturbance of stability and structure of the protein. The chemistry of protein has always been important owing to the abundance of these biomolecule in the living system."**

The percentage inhibition of protein denaturation was calculated by using the following formula,

Absorbance of control-absorbance of test/absorbance of control*100 = % inhibition.

VI. Results:

Early phytochemical analysis of extracts of the sample plant *Tridax procumbens* was indicated the existence of Tannins, Flavonoids, and Cardiac Glycosides.

In vitro pharmacological testing of Tridax procumbens reveals that the Aqueous extract of Tridax procumbens shows more Anti-Inflammatory activity as compared to the Alcoholic extract.

Table1. Phytochemical testing of Aqueous extract & Alcoholic extract

Phytochemical Test	Aqueous Extract	Alcoholic Extract
Alkaloid	-ve	-ve
Cardiac Glycosides	+ve	+ve
Flavonoids	+ve	+ve
Tannins	+ve	+ve
Terpenoids	-ve	+ve
Coumarin Glycosides	-ve	+ve

Table 2 Pharmacological screening of Aqueous extract & Alcoholic extract

Compound	Con.	O.D.	Mean	% inhibition
Blank		1.50 1.45 1.48	1.47	
Standard (Diclofenac sodium)	1 mg/ml	0.13 0.14 0.15	0.14	90.47%
Sample: Aq.	1 mg/ml	0.23 0.26 0.28	0.25	82.99%
Sample: Alc.	1 mg/ml	0.35 0.36 0.34	0.35	76.19%

VII. Discussion:

T. procumbens at the 1mg/ml and 2mg/ml shows the anti-inflammatory activity when compared with diclofenac sodium as a standard drug. **Utilizing the protein denaturation inhibition assay at a dosage of 1 mg/ml, in vitro anti-inflammatory efficacy was tested on all samples of Tridax procumbens.** The all samples showed good anti-inflammatory activity as compared to standard drug (diclofenac sodium). Particularly the Aqueous extract of Tridax procumbens shows more Anti-Inflammatory activity as compared to the Alcoholic extract. Also the phytochemical screening of *Tridax procumbens* showed the presence of flavonoids which may present in the anti-inflammatory agents, specifically for inhibition of IL and TNF-α into the human being.

Thus, we were concluded that, aqueous extract having main phytoconstituents as Flavonoids, cardiac glycosides and tannins. Alcoholic extract also having main phytoconstituents as Flavonoids, cardiac glycosides and tannins. Aqueous extract is found to show more Anti-inflammatory activity as compared to alcoholic extract. Flavonoids are responsible for Anti-inflammatory activity. Thus the aqueous extract having more Flavonoid content than alcoholic extract.

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