A descriptive study and in-vitro antioxidant activity of leaves extracts of *Tridax procumbens* linn

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**ABSTRACT**

*Tridax Procumbens* Linn is a member of the Asteraceae family. *Tridax Procumbens* has to be utilized because native medication intended for a number of complaints and problems in humans and animals for thousands of years. It is used widely in Indian conventional remedies for healing of wounds, like anticoagulants, in fungal infection, in diarrhea and dysentery, as an antioxidant, antimicrobial, anti-inflammatory, and immunomodulators. In folk medicine, certain communicable skin diseases are treated by using leaves extract. It's also known as 'Bhringraj,' an ayurvedic drug used to treat liver problems. At least 12,000 people have been separated from their families. These compounds protect plants from pathogens, insects, and herbivores by acting as defensive mechanisms. The aim of the test is to establish the antioxidant potential of the leaves of *Tridax Procumbens*. The current research is aimed at identifying novel plant directions, and antioxidant activity has been chosen for that reason. Using the maceration procedure, the power of the plant's shade dried leaves was extracted with chloroform water and ethanol. The antioxidant activities of the resulting extracts were evaluated using 2 techniques: nitric oxide scavenging activity and ferric chloride reductive ability. The alcoholic extract in 600 mg/ml and 800 mg/ml and 1000 mg/ml concentration has demonstrated antioxidant activity higher than ascorbic acid (20 mg) by nitric oxide scavenging method. By using a ferric chloride scavenging model, the aqueous and alcoholic extracts at 400 g/ml and 600 g/ml concentrations revealed antioxidant activity near to that of ascorbic acid (20 g).

**Keywords:** *Tridax Procumbens*, Antioxidant, Asteraceae, Immunomodulators.

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**INTRODUCTION**

It is a blossoming plant that belongs to the family asteraceae as well as is mainly powerful of the thirty varieties. It is most recognized for being a common wild plant and nuisance plant. It is a tropical American native, however it is now found in tropical, subtropical, and mild temperate climates all over the world. *T. Procumbens* classified as a poisonous wild plant and a pest in US. *T. angustifolia, T. serboana, T. bicolor, T. accedens, T. dubia, T. erecta, and T. rosea* are some of the medicinally significant Tridax species. *Tridax Procumbens*, often known as tridax daisy or coat buttons, is a blooming plant in the daisy family. It is most recognized for being a common wild plant as well as nuisance plant. *Tridax Procumbens* has been used for healing of lesion in India for generations also as an anticoagulant, antifungal, and insect repellant. Diarrhoea and dysentery are treated with it. In folk medicine, its leaf extracts were used to cure infectious skin problems. Apart from gastritis and heartburn, it is a recognized for hepatoprotective properties. A study was conducted to verify reports that indigenous people in Rajasthan's Udaipur district were utilizing the plant to cure diabetes. The results were determined to be equivalent to the Glibenclamide reference standard, and the flower extract *T. Procumbens* was found to have anti-diabetic characteristics. [1, 2, 3]
locations, fields, waste areas, meadows, and dunes. It is an annual creeper herb that's semi-prostrate.[4]

**Biology**

The perennial herb reproduces by seed and grows best in full sunlight. The herb tolerates drought, heat and humidity, pollution, the seashore, slope, and wind.[5]

**Chemical constituents**

Flavonoids, carotenoids, alkaloids, tannins, and saponins were found in the phytochemical analysis. The plant is high in salt, potassium, and calcium, as shown in the adjacent profile. Proteins, fibre, carbohydrates, and calcium oxide are the primary components of Tridax Procumbens leaf. The plant has also been shown to contain fumaric acid, which was determined to be a possible hypoglycemic drug. [8] Alkaloids, flavonoids, carotenoids, fumaric acid, lauric acid, tannins, and other chemical constituents of the plant have been documented. The therapeutic value of plants is determined by the presence of particular chemical compounds (secondary metabolites) involved in the creation of various effects on the human body. Some molecules are responsible for giving plants their distinct scents, while others are responsible for giving plants their various colours. [9]

**Pharmacological activity**

1. Wound Healing[10]
3. Immunomodulator[12]
4. Antidiabetic Activity[13]
5. Antimicrobial Activity[14]
6. Antineoplastic Activity[15]
7. Anthelmintic Activity[15]
8. Hypotensive[16]
9. Repellency Activity[17, 18]
10. Anti-Urolithiatic Activity[19]
11. Hypoglycemic Activity[20]

**MATERIALS AND METHODS**

**Plant material**

Dr. S. K. Tayade, Dept. of Botany, A.S.C. College, Shahada, Dist. Nandurbar, and authenticated Tridax Procumbens (L.) leaves obtained from the College site.

**Preparation of extracts**

Maceration was used to create crude plant extracts. The following is a description of the protocol:

**Preparation of alcoholic extract**

In an electric grinder, freshly dried and healthy plant leaves were ground into coarse powder. Desiccators were used to keep the powder. For 24 hours, 200 gm of the powder was allowed to macerate in 95 percent ethanol (100 % ethanol was less efficient to extract low molecular weight phenolic compounds with high antioxidant capacity as compared to 80 % or 95 % ethanol). The mother liquor (rough ethanolic extract) was filtered away, and the remaining plant material was macerated in 95 percent ethanol for a whole day hours at room temp. To produce the highest yield of ethanolic extracts, the operation is done four times. Under reduced pressure, the obtained Extract was evaporated to dryness at 50°C.

**Preparation of aqueous extract**

Water is used as a solvent because plant material may contain a polar compound (such as phenolic or tannins) which is soluble in water. The shade dried plant material (200 gm) is pulverized to a coarse powder, and extracted with chloroform water IP (as plain water may allow bacterial growth during the process of extraction, to avoid microbial growth it is a standard practice to use chloroform water IP) and kept at room temperature for 72 hours. On a water bath, the resulting filtrate was evaporated to dryness. The process of dryness results in formation of dried aqueous extract which is utilized for further study.

**METHODOLOGY**

**Antioxidant activity**

Two methods were used to measure antioxidant activity; [22]

**Nitric Oxide Scavenging Activity**

Different concentrations of both extracts were made, including 100 µg/ml, 200 µg/ml, 400 µg/ml, 600 µg/ml, 800 µg/ml, and 1000 µg/ml. 1 ml of each was taken in separate tubes. 2.0 ml sodium nitroprusside (10 mm) in phosphate buffer was added to each tube. For 150 minutes, the solution was incubated at room temperature. For ethanolic and aqueous extracts, the technique was repeated with ethanol and distilled water as blanks, respectively. Ascorbic acid (20 µg/ml of ethanol) was taken as standard the similar procedure was repeated. After the incubation 5 ml of Gries’s reagent (1%Sulphanilamide, 2gm O - Phosphoric acid and 0.1 % NEDA) was added to each tube, as well as blank and standard. On a UV spectrophotometer, the absorbance of the chromophore produced was measured at 546 nm. Data of the result was reported as mean of triplicate reading with Standard deviation (S.D.)

**Ferric chloride reductive ability**

The antioxidants' ability to create a colored complex with potassium ferricyanide, TCA and FeCl3 was used to measure the test extract's reducing power. Different concentrations viz. 100 µg/ml, 200 µg/ml, 400 µg/ml, 600 µg/ml, 800 µg/ml and 1000 µg/ml of the both extracts were prepared and 1 ml of each was taken in separate tubes. To each test tube 2.5 ml potassium ferricyanide (1 %) & 2.5 ml phosphate buffer (pH 6.6) was added. For 20 minutes, the mixture was incubated at 50°C. After that, 2.5 ml TCA (10%) was added to each tube and centrifuged for 10 minutes at 3000 rpm. For each test tube, 2.5 ml of supernatant was combined with 2.5 ml water and 0.5 ml FeCl3 (0.1 %) and measured at 700 nm. Ascorbic acid (20 µg/ml of ethanol) was taken as standard and the similar procedure was...
repeated. Data of the result was reported as mean of triplicate reading with Standard deviation (S.D.)

Table 1: Antioxidant activity of aqueous and alcoholic extracts of *Tridax Procumbens* leaves by Nitric Oxide Scavenging method

<table>
<thead>
<tr>
<th>Conc. (µg/ml)</th>
<th>Aqueous Mean Absorbance of extracts ± S.E.M. at 546 nm</th>
<th>Alcoholic Mean Absorbance of extracts ± S.E.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>0.094 ± 0.001</td>
<td>0.066 ± 0.001</td>
</tr>
<tr>
<td>200</td>
<td>0.046 ± 0.002</td>
<td>0.056 ± 0.002</td>
</tr>
<tr>
<td>400</td>
<td>0.33 ± 0.004</td>
<td>0.198 ± 0.003</td>
</tr>
<tr>
<td>600</td>
<td>0.242 ± 0.001</td>
<td>0.274 ± 0.001</td>
</tr>
<tr>
<td>800</td>
<td>0.316 ± 0.001</td>
<td>0.382 ± 0.004</td>
</tr>
<tr>
<td>1000</td>
<td>0.302 ± 0.002</td>
<td>0.360 ± 0.001</td>
</tr>
<tr>
<td>Std</td>
<td>0.172 ± 0.004</td>
<td>0.164 ± 0.002</td>
</tr>
</tbody>
</table>

Table 2: Antioxidant activity of aqueous and alcoholic extracts of *Tridax Procumbens* leaves by Ferric chloride reducing method

<table>
<thead>
<tr>
<th>Conc. (µg/ml)</th>
<th>Aqueous Mean Absorbance of extracts ± S.E.M. at 700 nm</th>
<th>Alcoholic Mean Absorbance of extracts ± S.E.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>0.384 ± 0.002</td>
<td>0.376 ± 0.001</td>
</tr>
<tr>
<td>200</td>
<td>1.63 ± 0.01</td>
<td>0.244 ± 0.002</td>
</tr>
<tr>
<td>400</td>
<td>1.71 ± 0.04</td>
<td>0.742 ± 0.004</td>
</tr>
<tr>
<td>600</td>
<td>1.82 ± 0.02</td>
<td>0.860 ± 0.003</td>
</tr>
<tr>
<td>800</td>
<td>1.28 ± 0.03</td>
<td>0.548 ± 0.001</td>
</tr>
<tr>
<td>1000</td>
<td>1.16 ± 0.02</td>
<td>0.614 ± 0.02</td>
</tr>
<tr>
<td>Std</td>
<td>1.89 ± 0.04</td>
<td>1.872 ± 0.04</td>
</tr>
</tbody>
</table>

**RESULTS AND DISCUSSION**

Two separate models were used to test the antioxidant activity of alcoholic and aqueous extracts of *Tridax Procumbens* i.e. nitric oxide scavenging method and ferric chloride method. It was observed that free radical scavenged by both alcoholic as well as aqueous extracts by both methods.

The alcoholic extract in 600 µg/ml and 800 µg/ml and 1000 µg/ml concentration has demonstrated antioxidant activity higher than ascorbic acid (20 µg) by nitric oxide scavenging method. The aqueous and alcoholic extract in 400 µg/ml and 600 µg/ml concentration has demonstrated antioxidant activity near to ascorbic acid (20 µg) by ferric chloride scavenging model. The lowest concentration which demonstrated activity in present study is 100 µg/ml. The result has revealed that the plant possess the antioxidant potential, further research is required to identify the component responsible for the activity.

**CONCLUSION**

Although molecular oxygen is necessary for all living creatures, any aerobic species exposed to a concentration of more than 21% will be injured. [8] Proteins, lipids, lipoproteins, and DNA, among other macromolecules, are attacked by free radicals, which cause oxidative damage. Herbal medications and formulations have been found to be effective in the treatment of such instances. The current study is likewise aimed at proving the aforesaid; it has shown that *Tridax procumbens* has anti-oxidant properties in vitro. The aqueous and alcoholic extract of the plant in 600 µg/ml and 400 µg/ml concentration was effectively active compared to ascorbic acid by ferric chloride scavenging model and nitric oxide scavenging model respectively.

**ACKNOWLEDGEMENT**

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**CONFLICT OF INTEREST**

The author declares no conflict of interest.

**REFERENCES**


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