



**TO STUDY ANTIOXIDANT ACTIVITY OF 70% METHANOLIC EXTRACT OF
TRIUMFETTA RHOMBOIDEA BY DPPH RADICAL SCAVENGING METHOD.**

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ABSTRACT

In this study Anti-oxidant activity was performed by Diphenylpicrylhydrazyl (DPPH) for methanolic extract of *Triumfetta rhomboidea* (Family: Tiliaceae). Test solutions of various concentrations were prepared by mixing methanolic extract of TR and DPPH solution and compared by taking absorbance of ascorbic acid as a reference standard solution. The reaction was carried out in triplicate and the decrease in absorbance was measured at 517nm. The methanol extract of TR shows better Antioxidant potential as compare to standard by DPPH radical scavenging method. Methanolic extract of *Triumfetta rhomboidea* at 100 µg/ml showed maximum 90.71±0.93 inhibition. Ascorbic acid from 5-200 µg/ml shows more than 96.89 % inhibition. IC 50 for TR and ascorbic acid was found to be 18 µg/ml and 8 µg/ml respectively. Antioxidant activity was found to be due to presence of flavonoids and phenols, however decrease in activity beyond 100 µg/ml dose.

KEYWORDS: *Triumfetta rhomboidea*, Antioxidant activity, % Inhibition, DPPH Radical scavenging method, flavonoids.

1. INTRODUCTION

Antioxidant is defined as an any agents (which may be natural or chemical) that inhibit the process of oxidation or neutralizes the oxidant effect of free radicals and other substances.^[1] Generally only red colored food like tomato, carrots, red peppers is considered to be antioxidant but Food like garlic, onions, pumpkin, corn etc. leafy green vegetables like spinach. Drinks like tea, Red wine, Milk, green tea. Fruits like grapes, berries, mangoes, citrus foods, watermelon etc seafood, lean meat, whole grains etc are very rich in antioxidants.^[2] These contains Allium sulphur compounds, Anthocyanins, β carotene, catechins, copper, zinc, cryptoxanthins, flavonoids, indoles, lignans, lutein, lycopene, manganese, polyphenols, selenium, vitamin C & E like compounds which are responsible for the antioxidant activity. Antioxidants plays important role in supporting immune function, improving cardiovascular health, protection of eyes, reducing inflammation from all causes (arthritis, asthma), stabilization of blood sugar, protection from sunburn, reducing DNA damage etc. It is also used in treatment of cancer^[3], Acute central nervous system injury therapy^[3], Alzheimer's,

Hemorrhoids. Parkinson's, Rheumatism, AIDS, Cataract, Stroke, Stress, Varicose veins.^[4] These reduces oxidation by interfering the process of free radical.^[5] Presence of free radicals in body almost reacts with every biological molecule in their respective locality and which causes destruction of protein. Which results in breakdown of DNA strands and damage. But this damage is protected by defense mechanism of antioxidant against free radical.^[4] This study is based on the DPPH radical scavenging method.

DPPH is 1,1 diphenyl-2-picryl hydrazyl. This is a stable free radical.^[6] When antioxidants reacts with DPPH Which is in free radical form it reduces to DPPHH because of presence of hydrogen donor which can be called as free radical scavenging process which results in protection of cells from damaging.^[7]

The plant *Triumfetta rhomboidea* Jacq (Family: Tiliaceae) is also can be used as a antioxidant. Which is commonly known as **chinese bur or Zinjurdi**.^[8] This is found in shrub form especially in tropical and subtropical regions of India, Ceylon, Malay Peninsula, China, Africa

and in America. Which contains flavonoids, alkaloid glycosides, phytosterol, steroids, tannin, carbohydrate glycosides, polyphenols & phenolic compounds.^[9] fruit, flower, leaves, bark and root of the plant are used for medicinal purpose. For the treatment of galactagogue, aphrodisiac, dysentery, diuresis root, bark and fresh leaves of this plant are used.^[10] Fruits, flowers and leaves of this plant is used as cooling agent, demulcent and astringent. It is also helps to reduce burning & promote parturition.

Various extracts of *Triumfetta rhomboidea* Jacq shows good antibacterial activity^{[11][12]}, Antioxidant activity^[13], Antimicrobial activity^[10], Anti-inflammatory effect^[16], Antitumor activity.^{[14][15]}

2. MATERIALS AND METHODS

2.1 Plant material

The leaves of *Triumfetta rhomboidea* (Family: Tiliaceae) were collected in the month of Dec 2013 from the outskirts of college, Maharashtra, India. The plant material was taxonomically identified by Dr. R.V. Bhagat, Anatrao Pawar College, Pirangut, Pune, India and the Authentication No. was APCP/27/2013-14.

2.2 Preparation of extract

The dried powdered leaves of plant *Triumfetta rhomboidea* was weighed and extracted by Methanol (70%) in a soxhlet extraction apparatus after defatted with petroleum ether. The solvent was removed under reduced pressure and semisolid mass was obtained and vacuum dried to yield a solid residue.

2.3 Drug and chemicals

Diphenylpicrylhydrazyl (DPPH) solution was used as a standard solution. All other chemicals were of analytical grade obtained commercially. Double distilled water was used throughout the study.

2.4 DPPH radical scavenging method^[17]

The antioxidant activity of the extract was measured by DPPH Radical Scavenging method. 1ml of 0.1 mM DPPH solution in methanol was mixed with 1 ml of plant extract solution of varying concentration 5, 10, 25, 50, 100, 250 & 500 µg/ml. Ascorbic acid having concentration 1-100 µg/ml was used as a reference standard solution. Mixture of 1ml methanol and 1ml DPPH solution was used as control solution. The reaction was carried out in triplicates and the decrease in absorbance was measured at 517nm by using UV- visible spectrophotometer.

The % inhibition was calculated using the following formula.

$$\text{Inhibition \%} = \frac{A_0 - A_1}{A_0} \times 100$$

Where,

A_0 : absorbance of the control

A_1 : absorbance of the Test or standard

3. RESULT

The table shows the antioxidant activity of methanolic extract of plant. 5-200 µg/ml of methanolic extract produced moderate to high DPPH scavenging activity. TR showed better antioxidant potential as compare to standard by DPPH radical scavenging method by taking absorbance at 517nm by UV visible spectrophotometer. Methanolic extract of *Triumfetta rhomboidea* at 100 µg/ml showed maximum 90.71 ± 0.93 inhibition however there is a fall in antioxidant activity after increasing further dose. Ascorbic acid from 5-200 µg/ml shows more than 96.89% inhibition. IC 50 for TR & Ascorbic acid was found to be 18 µg/ml and 8 µg/ml respectively.

Table 1: DPPH scavenging activities of methanolic extract of *Triumfetta rhomboidea* and Ascorbic acid (values represents means $\pm$ S.D, n=3)

Conc µg/ml	Ascorbic Acid % inhibition	<i>Triumfetta rhomboidea</i> % inhibition
5	31.12 $\pm$ 1.4287	3.220 $\pm$ 2.0575
10	59.60 $\pm$ 1.2312	23.663 $\pm$ 4.0814
25	90.31 $\pm$ 0.8100	72.860 $\pm$ 2.700
50	94.90 $\pm$ 1.0707	85.820 $\pm$ 1.5071
100	96.68 $\pm$ 0.8523	90.710 $\pm$ 0.9374
200	96.89 $\pm$ 0.7997	88.230 $\pm$ 1.7849

4. DISCUSSION

Several studies suggest that herbs or plants having high phenolic contents showed antioxidant, anti-inflammatory and anti-carcinogenic activities and playing vital role in preventing many human diseases. The antioxidative activity observed can be due to different mechanisms exhibited by different polyphenolic compounds like tocopherols, flavonoids and other organic acids and the synergistic effects of different compounds.^[17]

Many studies have revealed that many polyphenols subsidize significantly to the antioxidant activity.^[18,19] They act as highly effective free radical scavengers because of their redox properties, which adsorb and neutralise free radicals, quenching singlet and triplet oxygen or decomposing peroxides.^[20]

The preliminary phytochemical investigation revealed *Triumfetta rhomboidae* leaves consists of alkaloids, saponin, tannins, gums, phenolic compounds and flavonoids hence results showed potential antioxidant activity.

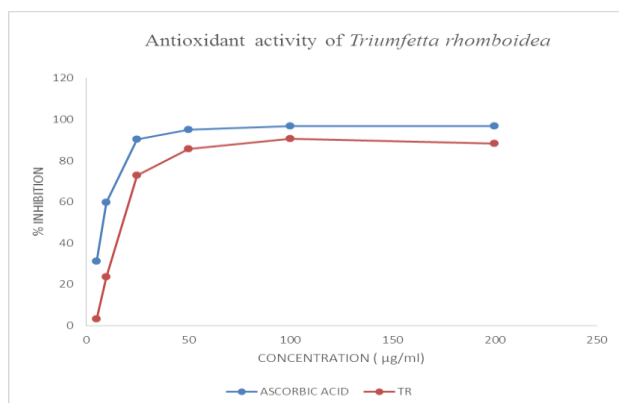


Fig 1: % inhibition of methanolic extract of *Triumfetta rhomboidea* and Ascorbic acid in different concentrations.

CONCLUSION

From the above result it is observed that the 70% methanolic extract of *Triumfetta rhomboidea* plant shows maximum antioxidant activity at 100 µg/ml hence there is a need to screen in that range, which can be useful to find out exact potential dose.

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