WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 9, Issue 1, 1255-1260. Research Article ISSN 2277– 7105

PHYTOCHEMICAL AND ANTIOXIDANT SCREENING OF TERMINALIA CATAPPA. LINN.

Jabeena Begum P.*

*Assistant Professor, Department of Plant Biology and Plant Biotechnology, JBAS College, Chennai.

Article Received on
28 Oct. 2019,
Revised on 18 Nov. 2019,
Accepted on 08 Dec. 2019,
DOI: 10.20959/wjpr20201-16413

***Corresponding Author**
Jabeena Begum P.
Assistant Professor,
Department of Plant Biology and Plant Biotechnology,
JBAS College, Chennai.

ABSTRACT

Objective: Terminalia catappa Linn. belonging to the family Combretaceae, is also known as country-almond, Indian-almond, Malabar-almond, sea-almond, and tropical-almond and false kamani. The leaves and the bark of the tree seem to possess several flavonoids, tannins, saponins and phytosterols and is highly recommended for its nutritional value and medicinal benefits. In India and the Philippines, its leaves were used to treat hepatitis and bark for treating dysentery. T.catappa leaf extract has been recognized for its phytoconstituents such as Kaempferol or quercetin, punicalin or tercatin for its anticlastogenic, antiparasitic and antihepatic properties. **Methods:** With all these proven facts, ethanolic leaf extract of T.catappa is yet to prove its antioxidant property with 2,2- Diphenyl-1-Picryl-Hydrazyl (DPPH) which increases leaf maturity. **Results**: **Conclusions:** Thus, T.catappa proves to have high Pharmacognosical activity.

KEYWORD: T.catappa, Combretaceae, DPPH, Phytochemistry, Almonds.

INTRODUCTION

The chemicals derived from plants are phytochemicals and its study are called Phytochemistry. These phytochemicals especially fall into four major classes like alkaloids, glycosides, polyphenols & terpenes which are synthesized to protect themselves against insect attacks and plant diseases. The Phytochemistry's applications can be used for pharmacognosy or the discovery of new drugs.[1] Nearly 80% of the population have been estimated by WHO to use traditional medicine for their primary health care needs. They are

effective than allopathic medicine for its minimal toxicity, cost effectiveness, pharmacologically active and providing easy remedy.[2,3]

The generic Latin name “terminalis” referring to the leaves teeming to the shoot is a native of southeast Asia. This is a well-recognized ayurvedic plant growing upto a height of 35mm with large leaves 15-25cm long, 10-14cm broad and 1cm in diameter ovoid, dark green leathery leaves. The fruit is a yellow drupe and ripens red with a single seed which is edible when fully ripened.[4] The juice or extract of the leaves is proven to be good medicinal lotion for leprosy and scabies and internally for stomach and head aches.[5] To add on this pharmacological action antioxidants, play a pivotal role.

The anti-oxidants as free radicals acts as a defense in our body and this antioxidant testing on plants promises benefits of therapies for life threatening diseases. A molecule that inhibits the oxidation is a chemical reaction with other molecules that can produce free radicals, leading to the chain reactions that can cause damage to cells. Thus, in this antioxidant property determination of free radical scavenging activity using DPPH in the Ethanolic leaf extract are tested against the extracts of Terminalia catappa.

MATERIALS AND METHODS

COLLECTION & PREPARATION OF LEAF EXTRACT

Fresh leaves of Terminalia catappa were collected at Justice Basheer Ahmed Sayeed College Campus Chennai, Tamil nadu. The leaves were dried at room temperature under shade. The dried leaves were powdered and 30gms of it was subjected to 70ml of Ethanolic solvent + 30ml of Distilled water in Soxhlet Apparatus for 24 hours. The obtained Ethanolic leaf extract of T.catappa were evaporated to dryness for a day.

PHYTO-CHEMICAL SCREENING

Extract Preparation: 5 mg of the dried ethanolic plant extract were taken and dissolved in 5 ml of ethanol to make a drug solution.

TEST FOR CARBOHYDRATE: 200µl of the plant extract were taken and 100µl of molisch reagent + few drops of sulphuric acid were added. Presence of purple color or reddish color indicates the presence of carbohydrates.

TEST FOR SAPONINS: 200µl of plant extract, 200µl of distilled water were added and shaken well. The foam formation indicates the presence of saponins.

TEST FOR TANNINS: With 100µl of plant extract, 200µl of 5% Ferric chloride was added. Formation of dark blue or greenish black indicates the presence of tannins.

TEST FOR FLAVANOIDS: With 200µl of plant extract, 100µl of 2N NaOH was added. Presence of yellow color indicates presence of flavanoids.

TEST FOR ALKALOIDS: To the 200µl of plant extract, 100µl of Concentrated Hcl and few drops of mayers reagent were added. Presence of green color or white precipitate indicates the presence of alkaloids.

TEST FOR QUINONES: With 100µl of plant extract, 100µl of Concentrated sulphuric acid was added. Formation of red color indicates the presence of quinones.

TEST FOR GLYCOSIDES: To 200µl of plant extract, 300µl of chloroform and 10% of ammonia solution were added. Formation of pink color indicates the presence of glycosides.

TEST FOR TERPENOIDS: To 150µl of the plant extract, 200µl of chloroform and Concentrated sulphuric acid was added. Formation of red brown color at the interface indicates the presence of tepenoids.

TEST FOR TRITERPENOIDS: To 150µl of plant extract, 100µl of chloroform was added and shaken well with Concentrated sulphuric acid. Lower layer turns yellow on standing indicates the presence of tritepenoids.

TEST FOR PHENOLS: To 100µl of plant extract, 200µl of distilled water was added followed by 10% Ferric chloride. Formation of blue or green color indicates the presence of phenols.

TEST FOR COUMARINES: To 200µl of plant extract, 100µl of 10% NaOH was added. Formation of yellow color indicates the presence of coumarins.

TEST FOR STEROIDS & PHYTO STEROIDS: To 100µl of plant extract, equal volumes of chloroform was added and subjected to few drops of Concentrated sulphuric acid. Appearance of brown ring indicates the presence of steroids and appearance of bluish brown ring indicates the presence of phytosteroids.

TEST FOR PHLOBATANNINS: To 200µl of plant extract, few drops of 2% Hcl was added. Appearance of red color precipitate indicates the presence of phlobatannins.

TEST FOR ANTHRAQUINONES: 200µl of plant extract, few drops of 10% Ammonia solution was added. Appearance of pink color precipitate indicates the presence of anthraquinones.

ANTIOXIDANT ACTITIVY

PRINCIPLE

DPPH (2, 2-diphenyl picrylhydrazyl) is a commercially available stable free radical, which is purple in colour. The antioxidant molecules present in the herbal extracts, when incubated, react with DPPH and convert it into di-phenyl picryl hydrazine, which is yellow in colour. The degree of discoloration of purple to yellow was measured at 520 nm, which is a measure of scavenging potential of plant extracts. The standard 0.1g of L ascorbic acid were dissolved in oxalic acid (0.05M) solution freshly prepared and make up the volume to 100ml. The different volumes of stock solution were made with oxalic acid making concentrations of 20, 40, 60, 80 and 100mg/100ml respectively.

PROCEDURE

10 µl of plant extract was added to 100 µl of DPPH solution (0.2mM DPPH in methanol) in a microtitre plate. The mixture was serial diluted. The reaction mixture was incubated at 25 ºC for 5 minutes, after that the absorbance was measured at 520 nm.

Control: The DPPH with corresponding solvents (without plant material)

Test: The methanol is used with respective plant extracts

Standard Curve: 0.1 g of L-ascorbic acid The DPPH radical scavenging activity of the plant extract was calculated as the percentage inhibition.

% Inhibition = [(Control – Test)/ Control] * 100

RESULTS AND DISCUSSION

Phytochemical Profiling: The present study was carried on aqueous extracts of T. catappa to investigate the presence of medicinally important phytochemical s in the leaves. The extracts revealed the presence of various phytochemicals such as carbohydrates, tannins, flavonoids, glycosides, triterpenoids, phenols and accessions while saponins, alkaloid, quinone, terpenoids, coumarins, steroids phlobatannins and anthocyanins were absent (Table no.1).

Antioxidant Property: The superoxide radical is a major biological source for reactive oxygen species, even though it's a weak oxidant it's a powerful and dangerous hydroxyl radicals which adds to oxidative stress. Thus, when this radical scavenging effect reduces (96.8% inhibition at 5mg/ml) the oxidative stress is retrieved and body becomes fresh and active as the immune response are enhanced (figure no.1).

TABLES AND FIGURES

Table no. 1: Quantitative Phytochemical Test.

Phytochemical Test	Results
Carbohydrates	+
Saponins	-
Tannin	++
Flavonoid	++
Alkaloid	-
Quinone	-
Glycosides	+
Terpenoids	-
Triterpenoids	+
Phenol	+
Coumarins	-
Steroids & Phytosteroids	-
Phlobatannins	-
Anthraquinones	-

+ Shows positive ++ shows strong positive – shows negative

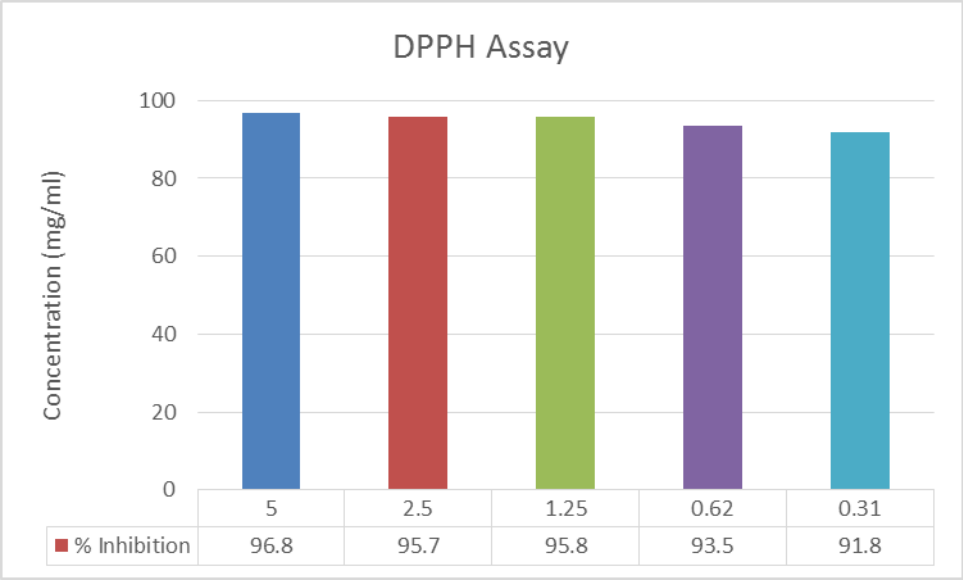

Figure no. 1: Antioxidant activity – DPPH assay.

- **96.8% inhibition for ethanolic extract for 5mg/ml concentration by using formula, and also calculated by standard regression equation of ascorbic acid.**

CONCLUSION

Even though several pharmacological activities are proved, antioxidant property inhibits all the oxidative stress thereby preventing the disease to progress. Thus, T. catappa will be a good replacement for synthetic antioxidants and support high value for good human health.

ACKNOWLEDGEMENT

I Thank management and department of JBAS college, Chennai for providing lab space to carried out the current work.

REFERENCES

1. John T. Arnason; Rachel Mata; John T. Romeo (2013-11-11). Phytochemistry of Medicinal Plants. Springer Science & Business Media.
2. G. Vines, "Herbal harvests with a future: towards sustainable sources for medicinal plants," 2004, Plant life International, http://www.plantlife.org.uk/.
3. B. L. Saet, H. C. Kwang, N. K. Su et al., "The antimicrobial activity of essential oil from Dracocephalum foetidum against pathogenic microorganisms," Journal of Microbiology, 2007; 45(1): 53–57.
4. Dukes. Phytochemical and Ethnobotanical Database, 2008; 11.
5. Arumugam Vijaya Anand, Natarajan Divya,1 and Pannerselvam Punniya Kotti An updated review of *Terminalia catappa* Pharmacogn Rev, 2015 Jul-Dec; 9(18): 93–98.