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Studies on Qualitative Analysis of Some Phytochemicals of Terminalia Catappa L from Dapoli Tahsil

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Abstract: *Terminalia catappa L. is a large tree able to tolerate strong winds, salt spray and salinity in the root zone. In India, it is used as cardiac stimulant. Nutritional value, biological activity of the kernel of Terminalia catappa exhibit very good digestibility, antioxidant activity, anti- HIV, anti-asthma, anti-inflammatory, anticarcinogenic, antibacterial and hepatoprotective properties. The Qualitative test is very essential to identify the phytochemical constituents present in medicinal plants. The important of medicinal value is due to the presence of particular bioactive constituents in that plant..Alkaloids, flavonoids, phenolic, tannins, saponin, steroids, glycosides, terpenes etc. are some of the important phytochemical with diverse biological activities. Currently, phytochemical are determined from Terminalia catappa L by using the traditional qualitative tests.*

Keywords: Medicinal plants, phytoconstituents, qualitative test, *Terminalia catappa* L

I. INTRODUCTION

The term of medicinal plants include a various types of plants. Medicinal plants consider as a rich resources of ingredients which can be used in drug development and synthesis. Besides that these plants play a critical role in the development of human cultures around the whole world

Terminalia catappa L is used as cardiac stimulant. Nutritional value, biological activity of the kernel of Terminaliacatappa exhibit very good digestibility, antioxidant activity, anti- HIV, anti-asthma, anti-inflammatory, anticarcinogenic, antibacterial and hepatoprotective properties. 1-8 Daily consumption of fruits and vegetable supplies macronutrients, micro nutrients, non nutrient compounds that have protective role against human diseases. The vegetable and fruit peels normal. In the present invstigation some qualitative test were taken such as Alkaloids, flavonoids, phenolic, tannins, saponin, steroids, glycosides, terpenes etc.

II. MATERIAL AND METHODS

2.1 Terminalia catappa.

Terminalia catappa is a large tropical tree in the Leadwood tree family, Combretaceae, the tree grows to 35 m (115 ft) tall, with an upright, symmetrical crown and horizontal branches. *Terminalia catappa* has corky, light fruit that are dispersed by water. The seed within the fruit is edible when fully ripe, tasting almost like almond. The leaves are large, long and broad, ovoid, glossy dark green, and leathery.

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2.2 Methods

A. Qualitative Analysis of Phytochemicals

1) Test for Alkaloids

1. **Mayer' S Test:** To a few ml of plant sample extract, two drops of Mayer's reagent are added along the sides of test tube. Appearance of white creamy precipitate indicates the presence of alkaloids.[6]
2. **Wagner's Test:** A few drops of Wagner's reagent are added to few ml of plant extract along the sides of test tube. A reddish- Brown precipitate confirms the test as positive.[7]

2) Test for Amino acids

The extract (100 mg) is dissolved in 10 ml of distilled water and filtered through Whatmann No. 1 filter paper and the filtrate is subjected to test for Amino acids.

1. **Ninhydrin Test:** Two drops of ninhydrin solution (10 mg of ninhydrin in 200 ml of acetone) are added to 2 ml of aqueous filtrate. Appearance of purple colour indicates the presence of amino acids. [8]

3) Test for Carbohydrates

1. **Molish' s Test:** To 2 ml of plant sample extract, two drops of alcoholic solution of α- naphthol are added. The mixture is shaken well and few drops of concentrated sulphuric acid is added slowly along the sides of test tube. A violet ring indicates the presence of carbohydrates.
2. **Benedict' S Test:** To 0.5 ml of filtrate, 0.5 ml of Benedic's reagent is added. The mixture is heated on a boiling water bath for 2 minutes. A characteristic coloured precipitate indicates the presence of sugar.

4) Test for Fixed oils and Fats

1. **Spot Test:** A small quantity of extract is pressed between two filter papers. Oil stain on the paper indicates the presence of fixed oils.
2. **Saponification Test:** A few drops of 0.5 N alcoholic potassium hydroxide solution is added to a small quantity of extract along with a drop of phenolphthalein. The mixture is heated on a water bath for 2 hours. Formation of soap or partial neutralization of alkali indicates the presence of fixed oils and fats.

5) Test for Glycosides

For 50 mg of extract is hydrolysed with concentrated hydrochloric acid for 2 hours on a water bath, filtered and the hydrolysate is subjected to the following tests.

1. **Borntrager's Test:** To 2 ml of filtered hydrolysate, 3 ml of choloroform is added and shaken, choloroform layer is separated and 10% ammomia solution is added to it. Pink colour indicates presence of glycosides.
2. **Legal's Test:** 50 mg of extract is dissolved in pyridine, sodium nitroprusside solution is added and made alkaline using 10% NaOH. Presence of glycoside is indicated by pink colour.

6) Test for Phenolic compounds and Tannins

1. **Ferric Chloride Test:** The extract (50 mg) is dissolved in 5 ml of distilled water. To this few drops of neutral 5% ferric chloride solution are added. A dark green colour indicates the presence of phenolic compound.
2. **Gelatin Test:** The extract (50 mg) is dissolved in 5 ml of distilled water and 2 ml of 1% solution of Gelatin containing 10% NaCl is added to it. White precipitate indicates the presence of phenolic compounds.
3. **Lead Acetate Test:** The extract (50 mg) is dissolved in of distilled water and to this 3 ml of 10% lead acetate solution is added. A bulky white precipitate indicates the presence of phenolic compounds.
4. **Alkaline Reagent Test:** An aqueous solution of the extract is treated with 10% ammonium hydroxide solution. Yellow fluorescence indicates the presence of flavonoids

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7) Test for Phytosterols

1. **Libermann-Burchard's Test:** The extract (50 mg) is dissolved in of 2 ml acetic anhydride. To this, 1 or 2 drops of concentrated sulphuric acid are added slowly along the sides of the test tube. An array of colour change shows the presence of phytosterols.

8) Test for Proteins

The extract (100 mg) is dissolved in 10 ml of distilled water and filtered through Whatmann No. 1 filter paper and the filtrate is subjected to test for proteins.

1. **Millon's Test:** To 2 ml of filtrate few drops of Millon"s reagent are added. A white precipitate indicates the presence of proteins.
2. **Biuret Test:** 2 ml of filtrate is treated with 1 drop of 2% copper sulphate solution. To this 1 ml of ethanol (95%) is added, followed by excess of potassium hydroxide pellets. Pink colourethanolic layer indicates the presence of protein.

9) Test for Saponins

The extract (50 mg) is diluted with distilled water and made up to 20 ml. The suspension is shaken in a graduated cylinder for 15 minutes. A two cm layer of foam indicates the presence of saponins.

10) Test for gum and Mucilages

The extract (100 mg) is dissolved in 10 ml of distilled water and to this 2 ml of absolute alcohol is added with constant stirring. White or cloudy precipitate indicates the presence of Gums and Mucilages. General Techniques Involved in Phytochemical Analysis International Journal of Advanced Research in Chemical Science (IJARCS)

11) Test for volatile oil

For volatile oil estimation 50 mg of powdered material (crude drug) is taken and subjected to hydro- distillation. The distillate is collected in graduate tube of the assembly, wherein the aqueous portion automatically separated out from the volatile oil.

III. OBSERVATION

Test	Observations	Inference
1. **Test for Alkaloids**		
a. Mayer' s test	Positive	Alkaloids is present
b. Wagner's test A few drops of Wagner's reagent are added to few ml of plant extract along the sides of test tube.	Positive	
2. Test for Amino acids		
Ninhydrin test	Nigative	Amino Acid Absent
3. Test for Carbohydrates		
a. Molish Test	Positive	Carbohydrate Present
b.**Benedict' s test**	Positive	Sugar Present
4. Test for Fixed oils and Fats		
a. Spot test	Positive	Fixed Oil is Present
b. Saponification test	Positive	Fixed Oil and Fats is Present
5. Test for Glycosides		
a. Borntrager'sTest	Negative	Glycoside is absent
b. Legal's Test	Negative	Glycoside is absent

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6.Test for Phenolic compounds and Tannins		
a. Ferric Chloride Test	Negative	Phenolic compound absent
b. Gelatin Test	Negative	Phenolic compound absent
c. Lead acetate test	Negative	Phenolic compound absent
d. Alkaline reagent test	Positive	Flavonoids is present
Test for phytosterols		
Libermann-Burchard's test	Positive	Phytosterol is present
8. Test for Proteins		
Millon's test	Positive	Protein is present
Biuret test	Positive	
9. Test for Saponins	Positive	Saponins is present
10. Test for gum and Mucilages	Positive	Gums and mucilages is Present
11. Test for volatile oil	Negative	Volatile oil is absent

IV. RESULT

There is *Terminalia catappa* L test for amino acids, Alkaloids, Carbohydrates, Fixed oils and fats, phonolic compounds and Tannins, Phytosterols, Proteins, Saponins , Gum and mucilages are presents.There is *Terminalia catappa* L test for Glycosides and volatile oil is absent.

V. CONCLUSION

Plants naturally able to synthesize secondary metabolites according to the climatic condition they grow and also various other environmental factors. Hence, studying partsof the plant from a particular place is a must to ensure its specific properties. In the present study, stronger reactions were observed for alkaloid, flavonoid, protein, phytosteroid with fruit flesh, nut. Higher carbohydrate content was higher with flesh. Among the Terminaliacatappa fruit flesh, nut, shell studied, except shell the other two showed significant phytochemicals, nutrients. Hence, this nutritious fruit, nut containing secondary metabolites must be used for herbal drug preparation after clinical trials.

REFERENCES

[1]. Farzaneh V, Carvalho IS. A review of the health benefits potentials of herbal plant infusions and their mechanism of actions. Industrial Crops and Products. 2015; 65 (0):247-58.

[2]. Asase A, Kadera ML. Herbal medicines for child healthcare from Ghana. Journal of Herbal Medicine. 2014;4 (1):24-36.

[3].de Souza Silva JE, Santos Souza CA, da Silva TB, Gomes IA, Brito GdC, de Souza Araújo AA, et al. Use of herbal medicines by elderly patients: A systematic review. Archives of Gerontology and Geriatrics. 2014;59 (2):227-33.

[4]. Hashemzadeh-Cigari F, Ghorbani GR, Khorvash M, Riasi A, Taghizadeh A, Zebeli Q. Supplementation of herbal plants differently modulated metabolic profile, insulin sensitivity, and oxidative stress in transition dairy cows fed various extruded oil seeds. Preventive Veterinary Medicine. 2015; 118 (1):45-55.

[5]. Ishola IO, Oreagba IA, Adeneye AA, Adirije C, Oshikoya KA, Ogunleye OO. Ethnopharmacological survey of herbal treatment of malaria in Lagos, Southwest Nigeria. Journal of Herbal Medicine. 2014;4 (4):224-34.

[6]. Chen J-R, Yang Z-Q, Hu T-J, Yan Z-T, Niu T-X, Wang L, et al. Immunomodulatory activity in vitro and in vivo of polysaccharide from Potentilla anserina. Fitoterapia. 2010;81 (8):1117-24.

[7]. Obón C, Rivera D, Alcaraz F, Attieh L. Beverage and culture. "Zhourat", a multivariate analysis of the globalization of a herbal tea from the Middle East. Appetite. 2014;79 (0):1-10.

[8]. Keating L, Hayes J, Moane S, Lehane M, O'Doherty S, Kingston R, et al. The effect of simulated gastrointestinal conditions on the antioxidant activity of herbal preparations made from native Irish hawthorn. Journal of Herbal Medicine. 2014;4 (3):127-33.

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[9]. Heng MY, Tan SN, Yong JWH, Ong ES. Emerging green technologies for the chemical standardization of botanicals and herbal preparations. TrAC Trends in Analytical Chemistry. 2013;50 (0):1-10.

[10]. Ahmad MS, Ahmad S, Arshad M, Rai KB, Afzal M. Terminalia catappa, an anticlastogenic agent against MMS induced genotoxicity in the human lymphocyte culture and in bone marrow cells of Albino mice. Egyptian Journal of Medical Human Genetics. 2014;15 (3):227-33.

[11]. Baratelli TdG, Candido Gomes AC, Wessjohann LA, Kuster RM, Simas NK. Phytochemical and allelopathic studies of Terminalia catappa L. (Combretaceae).

[12]. Pinheiro Silva L, Damacena de Angelis C, Bonamin F, Kushima H, José Mininel F, Campaner dos Santos L, et al. Terminalia catappa L.: A medicinal plant from the Caribbean pharmacopeia with anti-Helicobacter pylori and antiulcer action in experimental rodent models. Journal of Ethnopharmacology. 2015;159 (0):285-95.

[13]. Ramakul P, Yanachawakul Y, Leepipatpiboon N, Sunsandee N. Biosorption of palladium (II) and platinum (IV) from aqueous solution using tannin from Indian almond (Terminalia catappa L.) leaf biomass: Kinetic and equilibrium studies. Chemical Engineering Journal. 2012; 193–194 (0):102-11.

[14]. Bahmani M, Rafieian-Kopaei M, Hassanzadazar H, Saki K, Karamati SA, Delfan B. A review on most important herbal and synthetic antihelmintic drugs. Asian Pacific Journalof Tropical Medicine. 2014;7, Supplement 1 (0):S29-S33.

[15]. Bezerra Carvalho AC, Ramalho LS, de Oliveira Marques RF, Silvério Perfeito JP. Regulation of herbal medicines in Brazil. Journal of Ethnopharmacology. 2014; 158, PartB (0):503-6.

[16]. Chyau C-C, Tsai S-Y, Ko P-T, Mau J-L. Antioxidant properties of solvent extractsfrom Terminalia catappa leaves. Food Chemistry. 2002; 78 (4):483-8.

[17]. Kadam PV, Yadav KN, Narappanawar NS, Shivatare RS, Bhusnar HU, Patil MJ. Development of Quality Standards of Terminalia catappa Leaves. Pharmacognosy Journal. 2011; 3 (26):19-24.