International Journal of Advance Research in Science and Engineering
Vol. No.6, Issue No. 05, May 2017
www.ijarse.com
IJARSE
ISSN (O) 2319 - 8354
ISSN (P) 2319 - 8346

EXTRACTION AND PRELIMINARY PHYTOCHEMICAL SCREENING OF TAMARINDUS INDICA L.LEAVES

Dr. NeenaArora[1] ,Dr. VarshaSaxena[2], KiranShandilya[3], Pooja Bhardwaj[4]

Department of Chemistry, Sri Sathya Sai College For Women, Bhopal,(India)

ABSTRACT

In ancient Indian system many plants have been used for their antiseptic, antioxidant and antibiotic properties. Tamarind is mostly found in southern India and its leaves, stem, fruit and pulp have been known to possess disease fighting properties. In the present study, leaves of tamarind were extracted with water and methanol and extract was subjected to phytochemical analysis. The presence of carbohydrates, alkaloids, glycoside, terpenoid, flavonoids, tannins, phenols, saponins and reducing sugars were detected.It was observed that more phytochemicals were extracted in methanol as compared to water. It can be attributed to more polar nature of methanol.

Keywords: tamarind, methanol, phytochemical analysis

I. INTRODUCTION

India is blessed with rich heritage of plant kingdom due to its tropical weather. Plants have always played a key role in the treatment of different ailmentsin human and animals from ancient times. Herbal medicine is an important part of both traditional and modern system of medicine[1].In developing countries more researchers are working on plant and plant product so recognition of natural product is growing.

Tamarind has been used for centuries as a medicinal plant. Many parts of tamarind plant have long been used in traditional medicines for the treatment of a wide variety of ailments and diseases such as jaundice, gonococci and gastrointestinal disorders[2-3]

In the Indian system of medicine, tamarind has wide therapeutic application including inflammation, diabetes, constipation, indigestion and flatulency[4]. Throughout Southeast Asia, the tamarind fruit poultice is applied to foreheads of fever sufferers[5]. The seeds of T. indica are reported to possess pharmacological activities such as antidiabetic and hypoglycemic, antioxidant, anti- ulcer, anti-venom, hepatoprotective, antibacterial, inhibition of nitric oxide production and serine proteinase inhibitor[6]. Fruits and leaves of T. indica are reported with antiasthamtic, hepatoprotective and antimicrobial activities[7].The leaves have a proven hepatoprotective activity associated with the presence of polyhydroxylated compounds, with many of them of a flavonolic nature.

Its fruits are the most valuable part whichhas often been reported as curative in several pharmacopoeias. Nevertheless, other plant parts have been less studied. Due to their antimicrobial, antifungal and antiseptic effects, tamarind leaves have an extensive ethno botanical use in many areas of Latin America such as Mexico, Puerto Rico, and Trinidad and Tobago, and in other continents like Asia and Africa[8,9]. The work reported here was carried out to validate the medicinal use of this plant in Bhopal.

IJARSE
ISSN (O) 2319 - 8354
ISSN (P) 2319 - 8346

II. MATERIAL & METHOD

2.1 Collection and processing of plant: Leaves of the plant were collected from Bhopal. Plant leaves were washed with tap water to remove soil and unwanted dust particles. Then they were shaded, dried, and then powdered by using mechanical blender and stored in air tight bottles.

2.2 Extraction: The powdered plant leaves were soaked with (10g/100ml) in different solvent i.e. water and methanol and extraction was done using traditional Soxhlet extraction unit. Solvent was recovered using Rota evaporator. Different extract were screened for phytochemical analysis.

2.3 Qualitative analysis of phytochemicals:All the extracts obtained were screened for the presence of alkaloids, saponins, tannins, glycosides, flavonoids, reducing sugar, carbohydrates and sterols using the standard methods[10,11,12] and are as follows :

2.4 Test for carbohydrates: Few drops of Molisch's reagent were added to an aqueous solution of each extract followed by vigorous shaking. Thereafter, 1.0 mL of conc. H2SO4 was added carefully by sliding down the walls of the tube gently to form two layers. The solution was examined for the appearance of brown ring separating the solution into two layers.

2.5 Test for alkaloids: To the extract, dilute hydrochloric acid was added, shake it well and filtered. With the filtrate, the following tests were performed.

- **Wagner's Test:**

To 1-2 ml of filtrate, few drops of Wagner's reagent were added in a test tube. Formation of reddish brown precipitate indicates the presence of alkaloids**Mayer's Test:**

To 2-3 ml of filtrate, few drops of Mayer's reagent were added along sides of tube. Formation of white or creamy precipitate indicates the presence of alkaloids.

- **Dragendroff's Test:**

To 1-2 ml of filtrate, few drops of Dragendroff's reagent were added in a test tube. Formation of red precipitate indicates the presence of alkaloids.

2.1.3.3 Test for glycosides:Tests for glycosides were performed as follows:

- **Borntrager's Test:**

To 3 ml of test solution, dilute sulphuric acid was added, boiled for 5 minutes and filtered. To the cold filtrate, equal volume of benzene or chloroform was added and shake it welled. The organic solvent layer was separated and ammonia was added to it. Formation of pink to red color in ammonical layer indicates presence of anthraquinone glycosides.

- **Keller-Killiani Test:**

To 2 ml of test solution, 3 ml of glacial acetic acid and 1 drop of 5% ferric chloride were added in a test tube. Add carefully 0.5 ml of concentrated sulphuric acid by the side of the test tube. Formation of blue color in the acetic acid layer indicates the presence of Cardiac glycosides.

2.6 Test for terpenoids: To 1 mL of crude extract add 1 ml of concentrated H_2SO_4 and heated for 2 minutes. A grayish colour indicates the presence of terpenoids.

IJARSE
ISSN (O) 2319 - 8354
ISSN (P) 2319 - 8346

2.7 Test for phenols: To 1 ml of crude extract added 1 ml of $FeCl_3$,a blue, green or black colour indicates the presence of phenols.

2.8 Test for reducing sugar: To 1 ml of extract added 1 mL of Fehling's A solution and 1 mL of Fehling's B solution. Formation of red colour indicates the presence of sugar.

2.9 Test for saponins: To 1 mL of extract added 2 mL of distilled water, shaken well and formation of 1 cm layer of foam indicates presence of saponins.

2.10 Test for flavonoids: **Shinodatest**:To 1 mL of extract added few fragments of magnesium ribbon and added few drops of concentrated HCl drop wise. Appearance of pink scarlet colour confirmed the presence of flavonoids.

III. RESULTS AND DISCUSSION

Phytochemical analysis indicated the presence of carbohydrates, alkaloids, glycoside,terpenoid, flavonoids, phenols, saponins and reducing sugars.

Table 1: Phytochemical Analysis of leaves of *Tamarindindica*

S No.	Phytoconstituent	Identification Test	Aqueous	Methanol
1	Carbohydrate	Molisch test	++	+
2	Alkaloid	Wagner test	-	+
		Maeyers test	-	+
		Dragandroff's test	-	+
3	Glycoside	Borntrager's test	-	+
		Keller- Killani test	-	-
4	Terpenoid		-	+
5	Flavanoids	Shinoda test	-	+
6	Phenols	Ferric Chloride test	+	++
7	Saponins	Foam test	+	++
8	Reducing Sugar		++	+

Both the solvents used in this investigation are polar in nature, methanol being more polar as compared to water. It is observed that more phytochemicals were obtained in methanol as compared to water which suggests that most of the phytochemicals were soluble in methanol. Carbohydrates, saponins, phenols and reducing sugars were present in both water and methanol (Table 1). The amount of reducing sugar andcarbohydrates was more in water as compared to methanol whereas the quantity of tannins and saponins was more in methanol.

Alkaloids, glycosides, terpenoids, flavonoids and phenols were only present in methanolic extract. Watt et al and Leven et al have reported antibacterial activity in the leaves of Tamarind which was attributed to the

IJARSE
ISSN (O) 2319 - 8354
ISSN (P) 2319 - 8346

presence of flavonoids, alkaloids, tannins, cyanogenic glycosides and anthroquinones[13, 14]. It has also been suggested that these phytochemicals and some other aromatic secondary metabolites may serve as natural agents that protect plants against microbial pathogens and insect predators[15]. The phytochemical screening demonstrated the presence of different types of compounds like alkaloids, flavonoids and steroids which could be responsible for the antibacterial activities.

IV. CONCLUSION

Tamarind leaves have known to possess many phytochemicals which play an important role in fighting against pathogens. The phytochemical screening demonstrated the presence of carbohydrates, alkaloids, glycoside, terpenoid, flavonoids, tannins, saponins and reducing sugars. More number of phytochemicals was present in methanol than water. Further studies are needed to strengthen the disease fighting ability of the leaves against microorganisms.

Acknowledgement: We greatly acknowledge the financial support under minor research project from UGC-CRO, Bhopal for conducting this work.

REFERENCES

[1.] Soni P, Siddiqui AA, Dwivedi J, Soni1 V.Pharmacological properties of Daturastramonium L. as a potential medicinal tree: An overview Asian Pac J Trop Biomed, 2012; 2(12): 1002-1008 .

[2.] Martinello F, Soares SM, Franco JJ, Santos AC, Sugohara A, Garcia SB, Curti C, Uyemura SA Hypolipemic and antioxidant activities from *Tamarindusindica*L. pulp fruit extract in hypercholesterolemic hamsters. Food Chem. Toxicol.,2006; 44: 810–818.

[3.] Gunasena HPM, Hughes A (2000). Tamarind. Southampton: International Centre for underutilised crops

[4.] Ghosh RM, Rahman AS, Fatema RA, Munmun M, Sharmin N, Mamun AA, Khatun A, Rahmatullah M.(2010) Evaluation of anti- hyperglycemic potential of Tamarindusindica L. (Fabaceae) fruits and seeds in glucose- induced hyperglycemic mice. Adv Natural ApplSci 2010; 4: 159-162.

[5.] Doughari JH. Antimicrobial Activity of Tamarindusindica. Trop J Pharma Res 2006; 5: 597–603.

[6.] Bhadoria SS, Ganeshpurkar A, Narwaria J, Rai G, Jain AP. Tamarindusindica: Extent of explored potential. Pharmacol Rev 2011; 5: 73-81.

[7.] Fabiyi JP, Kela SL, Tal KM, Istifanus WA. Traditional therapy of dracunculiasis in the state of Bauchi, Nigeria. Dakar Med 1993; 38:193–195.

[8.] Khare CP, editor. Ayurvedic and other traditional usage, Botany. 2nd ed. New Delhi: Springer Verlay; 2004. Encyclopaedia of Indian medicinal plant-Rational Western therapy.

[9.] Shankar EM, Subhadra N, Usha AR. The effect of methanolic extract of *Tamarindusindica* Linn.on the growth of clinical isolates of *Burkholderiapseudomallei*. Indian J Med Res. 2005;122:525–8.

[10.] Harbone, J.B. Phytochemical Methods: A Guide in Modern Techniques of Plant Analysis;

[11.] Trease, G.E.; Evans, W.C. Phytochemistry: Introduction and General Methods. In Pharmacognosy, 11th ed.; BailliereTindall: London, UK, 1978; pp. 227–247.

[12.] - Kokate C.K., Purohit A.P., and Gokhale S.B. **(2006)**Pharmacognosy; 23 ed., nirali prakashan,India,2006.

[13.] Watt, J.M.; Breyer-Brandwijk, M.G. Medicinal and Poisonous Plants of Southern and Eastern Africa; E. &

IJARSE
ISSN (O) 2319 - 8354
ISSN (P) 2319 - 8346

S. Livingstone: Edinburgh, UK, 1967.

[14.] Leven, M.D.; vanden-Berghe, D.A.; Marten, T.; Villentmick, A.; Lomweas, E.C. Screening higher plants for biological activity. Planta Med. 1979, 36, 311–312.

[15.] Marjorie, M.C. Plant products as antimicrobial agents. Clin. Microbiol. Rev. 1999, 12, 564–582.