

**PRELIMINARY PHYTOCHEMICAL ANALYSIS OF *Tamarindus indica* L. AND *Phoenix dactylifera* L. SEEDS
IN DIFFERENT SOLVENT EXTRACTS**

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Abstract:- India is rich in medicinal herb, referred "Botanical Gardern of World". Plant products have been part of phytochemical since time immemorial. Phytochemicals are derived from many parts of the plants includes root, stem, bark, fruits and seeds. Phytochemicals from plants termed secondary metabolites. Richness of bioactive compounds in plants that possess many pharmaceutical properties like antioxidant, antitumor, anti-inflammatory, anti-atherosclerotic, anti mutagenic, anti-carcinogenic etc. Due to population growth, formation of new disease condition that result in search of new drugs in plant resources apart from medicinal plants. Hence the present study was under taken to find out the preliminary phytochemical analysis of *Tamarindus indica* L. and *Phoenix dactylifera* L. seeds in different solvents like petroleum ether, methanol, ethanol extracts to find out the phytochemicals such as alkaloids, anthroquinones, catechin, flavanoids, glycosides, phenolic groups, reducing sugars, saponins, tannins and terpenoids.

Key words: Phytochemicals, Pharmaceutical, Antioxidant, Anticarcinogenic.

INTRODUCTION

Many of the currently used drugs have been derived directly or indirectly from plants. Plants have always been an exemplary source of drugs. In developing countries such as India, it is still a far- reaching goal due to economic constraints for providing modern medical healthcare. Aspirin, quinine, taxol, digitoxin are the most important and commonly used drugs of modern medicine have been originated from plant sources. Less than 1% are screened pharmacognostically and pharmacologically, out of an estimated 250000 higher plants (Mishra and Ahmed, 2016). Phytochemical from plants referred as secondary metabolites derived from root, stem, bark, leaves and which includes alkaloids, steroids, flavonoids, terpenoids, glycoside, saponin, tannins, and phenolic compounds (Cragg and David 2001; Doss, 2009). Phytochemical bioactive compound possess antioxidant, antitumor, anti-inflammatory, anti-atherosclerotic, antimutagenic, anticarcinogenic, antibacterial, antiviral, and antiparasitic activities (Rice-Evans *et al.*, 1995; Ashok Kumar *et al.*, 2008). Phytochemical screening and antioxidant activity of various parts of the *Tamarindus indica* L. in different solvent extracts have been analyzed (Tsuda *et al.*, 1994; Selvi *et al.*, 2011; Shlini and Siddalinga Murthy 2015; Kumar and Sharma 2014; Nurhanani Razali *et al.*, 2015; Gomathi *et al.*, 2017; Neena Arora *et al.*, 2017). The preliminary analysis and antioxidant activity in different solvent extracts of some under-utilized seeds such as *Phoenix* spp. were analyzed (Hamada *et al.*, 2002; Delphin *et al.*, 2014; Mishra and Ahmed 2016).

KINGDOM: Plantae
DIVISION: Magnoliophyta
CLASS: Magnoliopsida
ORDER: Fabales
FAMILY: Fabaceae
GENUS: *Tamarindus*
SPECIES: *Tamarindus indica* L.

Tamarind (*Tamarindus indica* L.) is a perennial herb belongs to the dicotyledonous family of leguminosae (Fabaceae), is native to dry savanna of tropical Africa (Bhattacharya *et al.*, 1994). It is slow growing, but long lived with an average life span of 80-200 years (Shlini and Siddalinga Murthy, 2015).

KINGDOM: Plantae
DIVISION: Magnoliophyta
CLASS: Liliopsida
ORDER: Arecales
FAMILY: Arecaeae
GENUS: *Phoenix*
SPECIES: *Phoenix dactylifera* L.

Phoenix dactylifera L. belongs to the family Arecaeae is also known as date palm, cultivated for its edible sweet fruit. Date fruits are a good source of low cost food and are an integral part of Arabian diet. Date seed are also ground and used in the manner of coffee beans, or as an additive to coffee. Hence for the present study was aimed to screen the phytochemical analysis of *Tamarindus indica* L. and *Phoenix dactylifera* L. seeds.

MATERIALS AND METHODS

Collection of the material:

The selected sample Tamarind (*Tamarindus indica* L.) seeds were directly collected from farmhouses of Periyakarattupatti in Dindigul District, Tamil Nadu, India. *Phoenix dactylifera* L. fruits brought from pazha mudir nilayam of Oddanchatram in Dindigul District, Tamil Nadu, India, those seeds are separated from fruits and washed thoroughly with water. These samples were dried under shade. Dried samples were powdered and stored in screw-cap bottles at 4 °C until further use.

Preparation of Seed Extracts:

The powdered samples 30 gm were packed in Soxhlet apparatus and extracted with petroleum ether, methanol and ethanol for 8hr separately.

Phytochemical Screening:

Phytochemical examinations were carried out for all the extracts as per the standard methods (Harbone, 1998).

Test for Alkaloids: 1ml of 1% HCl was added to 2ml of extract in a test tube and was treated with few drops of Mayer's reagent. A creamy white precipitate indicated the presence of alkaloids.

Test for Anthraquinones : 2ml extract was mixed with benzene and 1ml 10% ammonia solution was added. Presence of a pink, red or violet color indicates the anthraquinones.

Test for catechin: 2ml extract was mixed with Enrich reagent and few drops of Conc. HCl. Formation of pink colour indicate presence of catechin.

Test for flavonoids: A few drops of 1% NH₃ solution was added to 2 ml of extract in a test tube. Presence of flavonoids was confirmed from yellow coloration.

Test for Glycosides: 2ml of 50% H₂SO₄ was added to the 2ml of extract in a boiling tube. Mixture was heated in boiling water bath for 5 min. 10ml of Fehling's solution was added and boiled. A brick red precipitate indicates presence of glycosides.

Test for phenolic groups: To 1ml extract, add 2ml distilled water followed by few drops of 10% Ferric chloride. The formation of blue or black colour indicates presence phenolic groups.

Test for reducing sugars: 5-8 drops Fehling's solution was added to 2ml extract. The mixture was heated in boiling water bath for 5 min. A red-brick precipitate shows presence of reducing sugars.

Test for Saponins: 2ml of extract was shaken vigorously with 5ml distilled water to obtain stable persistent foam. The formation of emulsion indicates presence of saponins.

Test for tannins: To 2ml extract, 1ml of distilled water and 1-2 drops of ferric chloride solution was added and observed for brownish green or a blue black coloration.

Test for terpenoids: 2ml extract was mixed with 2ml of CHCl₃ in a test tube. 3ml of Conc. H₂SO₄ was carefully added along wall of test tube to form a layer. An interface with a reddish brown coloration was confirmed the presence of terpenoids.

PLATE I

Entire plant - *Tamarindus indica* L.



Dry fruits of *Phoenix dactylifera* L.



Dried seeds of *Tamarindus indica* L.



Dried seeds of *Phoenix dactylifera* L.



Table 1: Preliminary phytochemical analysis of crude extract of *Tamarindus indica* L. and *Phoenix dactylifera* L. seeds

PHYTOCHEMICALS	<i>Tamarindus indica</i> L.			<i>Phoenix dactylifera</i> L.		
	Petroleum ether	Methanol	Ethanol	Petroleum ether	Methanol	Ethanol
Alkaloids	-	-	-	-	-	-
Anthraquinones	-	-	+	-	++	-
Catechin	-	+++	+++	-	+++	+++
Flavonoids	-	-	-	-	-	-
Glycosides	-	+++	+	-	+++	+++
Phenolic Groups	-	+++	+++	-	++	+
Reducing sugar	-	-	-	-	+++	-
Saponins	+++	+	+++	-	+++	+++
Tannins	-	+++	+++	-	+++	+++
Terpenoids	++	+++	+++	++	-	-

+ Slightly Present; ++ Moderately present; +++ Highly present; - Absent

RESULTS AND DISCUSSION

In the present study *Tamarindus indica* L. and *Phoenix dactylifera* L. seeds were tested for the following phytochemical such as alkaloids, anthraquinones, catechin, flavanoids, glycosides, phenolic groups, reducing sugars, saponins, tannins and terpenoids in petroleum ether, methanol and ethanol solvents represented in table 1.

In Petroleum ether extracts of *Tamarindus indica* L. were saponins are highly present and terpenoids were moderately present. In Methanol extract of *Tamarindus indica* L. catechin, glycosides, phenolic groups, tannins, terpenoids are highly present and saponins are slightly present. Ethanol extract of *Tamarindus indica* L. contains catechin, phenolic groups, saponins, tannins, terpenoids were highly present and anthraquinones, glycosides were slightly present. Phenol, tannin, saponin, terpenoids were present in ethanol extract of *Tamarindus indica* L. have been reported by (Kumar and Sharma, 2014) and saponin and tannin in ethanol extract of *Tamarindus indica* L. have been reported (Rana and Sharma ,2018); Tannin, Glycosides were present in ethanol extract of *Tamarindus indica* L. (Reena Gupta ,2016)

Most of the phytochemicals were present in *Tamarindus indica* L. methanol extract and ethanol extract. Petroleum ether extract of *Tamarindus indica* L. consists only few phytochemicals. Alkaloids, flavanoids and reducing sugars were absent in all the three extract. Alkaloids absent in petroleum ether extract of *Tamarindus indica* L. was reported by (Kumar and Sharma (2014); Rana and Sharma ,2018).

In petroleum ether extract of *Phoenix dactylifera* L. contains only one compound terpenoids were moderately present. Methanol extract of *Phoenix dactylifera* L. consists most of the chemical compound which includes catechin, glycosides, reducing sugars, saponins and tannin were highly present, anthraquinones and phenolic groups were found moderately. Ethanol extract of *Phoenix dactylifera* L. consist catechin, glycosides, saponins, tannin and phenolic groups were slightly present. Ethanolic extract of seeds of *Phoenix dactylifera* L. contains saponin, terpenoids, phenolic compounds and glycosides reported by (Delphin *et al.*, 2014; Mishra and Ahmed 2016).

Anthraquinones were slightly present in ethanol extract of *Tamarindus indica* L. and *Phoenix dactylifera* L. consists moderate amount in methanol extract. Anthraquinones constitute an important class of natural and synthetic compounds with a wide range of applications. Besides their utilization as colorants, anthraquinone derivatives have been used since centuries for medical applications, for example, as laxatives, anti-microbial, anti-inflammatory agents, constipation, arthritis, multiple sclerosis, and cancer reported (Malik and Muller, 2016).

Catchins were highly present in methanol and ethanol extract of *Tamarindus indica* L. and *Phoenix dactylifera* L. Catechins are polyphenolic phytochemicals that are widely distributed in food and medicinal plants, especially in all kinds of tea, and endow tea with various health benefits (Xiang *et al.*, 2016; Matsui,2015; Assuncao and Andrade, 2015). Catechins rich foods with the prevention of human chronic diseases, the potential preventive activity of cardiovascular disease (Pasrija and Anandharamakrishnan , 2015).

Glycosides were highly present in methanol extract of *Tamarindus indica* L. and slightly present in Ethanol extract of *Tamarindus indica* L. and both the extracts methanol, ethanol consist high amount in *Phoenix dactylifera* L. Glycosides are molecules in which a sugar is bound to a non-carbohydrate moiety, usually a small organic molecule. Glycosides can suppress and soothe irritant dry coughs. They have sedative and relaxant effect on the heart and muscles when taken in small doses. They are significantly diuretic (Veena Sharma *et al.*, 2011). Glycosides are known to lower the blood pressure (Nyarko and Addy, 1990).

Phenolic groups were highly present in both methanol,ethanol extract of *Tamarindus indica* L. and moderately present in methanol extract, slightly present in ethanol extract of *Phoenix dactylifera* L. Phenol possess biological properties such as anti apoptosis, anti aging, anti carcinogen, anti inflammation, anti atherosclerosis, cardiovascular protection and

improvement of endothelial function, as well as inhibition of angiogenesis and cell proliferation activities (Han *et al.*, 2007).

Saponins were present in all the three extract, highly present in both petroleum ether ethanol extract and slightly present methanol extract of *Tamarindus indica* L. and saponins highly present in both methanol, ethanol extract of *Phoenix dactylifera* L. Saponins extracted from plants show biological and pharmacological activities such as anti-inflammatory, anti-hepatotoxic, wound healing, veinotonic, expectorant, spasmolytic, hypoglycemic, antimicrobial and antiviral (Rahaman, 2010).

Reducing sugars were highly present only in methanol extract of *Phoenix dactylifera* L.

Tannins also highly present in both extract in the selected two samples methanol, ethanol extract of *Tamarindus indica* L. and *Phoenix dactylifera* L. Tannin compounds are inhibits the growth of many fungi, yeast, bacteria and viruses (Chung *et al.*, 1998). Tannins are attributed with analgesic and anti-inflammatory activities. Apart from this, tannins promote the healing of wounds and inflamed mucous membrane with the property of astringency (Okwu and Josiah, 1998; Veena Sharma *et al.*, 2011).

Terpenoids were present in all the three extract of *Tamarindus indica* L. moderately present in petroleum ether, methanol and ethanol extracts consists high amount of terpenoids. In *Phoenix dactylifera* L. terpenoids were moderately present in petroleum ether extract. Terpenoids are small molecular products synthesized by plants and are probably the most widespread group of natural products. Terpenoids show significant pharmacological activities, such as antiviral, antibacterial, antimalarial, anti-inflammatory, inhibition of cholesterol synthesis and anti-cancer activities (Mahato and Sen, 1997).

CONCLUSION

In the present study *Tamarindus indica* L. and *Phoenix dactylifera* L. Seeds contained significant bioactive compounds that make the potential as antimicrobial, anti inflammatory anti carcinogenic and can be applied other therapeutic properties. The activity of the plant seeds can be further proved by clinical studies and in-vitro studies.

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