

Preliminary Phytochemical Studies on Some Ethnobotanically Important Medicinal Plants Used by Thottianaickans of Semmalai

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ABSTRACT

Objective: Plants play a vital role in human and domestic animals health care practices. Curing diseases using plants was practiced from ancient and primitive times and continued even now among the tribal's in various countries. It is widely confirmed that curative property of medicinal plant is mainly related to the presence of secondary metabolites in the plants. Hence, four ethnobotanically important plants were screened for their phytoconstituents.

Methods: Presence of Steroids, Glycosides, Cardiac glycosides, Steroids, Anthraquinones glycosides, Saponins glycosides, Alkaloids, Tannins, Phenolic compound, Flavonoids, Saponins and Terpenoids were screened following standard qualitative methods.

Results: All the selected medicinal plants were found to consist of Flavonoids, Steroids, Cardiac glycosides, Alkaloids, Tannins, and Terpenoids. And glycosides and phenolic compounds were absent in all plants. Anthraquinones glycosides are present only in *Curcuma longa*.

Conclusion: At the point of culmination, it is started that, *Justicia tranquebariensis*, *Curcuma longa*, *Tribulus terrestris* and *Aloe vera* are holding a vital therapeutically important compounds such as Alkaloids, Tannins, and Terpenoids.

Keywords- Medicinal plants, Phytochemical, Preliminary screening.

INTRODUCTION

Plants are the one of the key element sources of medicines. Plants make the basis of many traditional medicine systems in the world for thousands of years and make the

mankind with remedies. These plants find application cum process in the pharmaceutical, cosmetic, agricultural and food industry¹. The most vital bioactive constituents of economic importance are alkaloids, tannin, flavonoids and phenolic

compounds². The Correlation lies in between the phytoconstituents and the bioactivity of plant which is desirable to known for the synthesis of compounds to specific activities to treat various health ailments cum chronic diseases as well³.

Phytochemical studies have gained a lot of interest among the plant scientists due to the development of newer technology and sophisticated outcome. These techniques play a significant role in finding of important material for pharmaceutical industry⁴. Plants have substances that induce a great interest due to their versatile applications⁵. It is estimated that 14-18% of higher plant are used medicinally and related to 74% of pharmacologically active plant are discovered after following up on ethnomedicinal usage of the plants⁶.

Plants have rich variety of important secondary metabolite such as flavonoids, terpenoids, alkaloids and tannins, which have been proved to have anti microbial properties. The use of plant extracts and phytochemical elements with antimicrobial properties can be considered as great significance in therapeutic treatments for many purposes. In the recent past, a number of studies had been evaluated in different countries to state the efficiency⁷.

The significance in the above statement, preliminary phytochemical screening of medicinal plants is essential to discover and develop useful therapeutic agents with an improved efficacy. Numerous research groups have also reported such studies throughout the world⁸⁻¹².

Plant-based natural constituents can be derived from different parts of the plant like leaves, flowers, bark, roots, fruits, seeds, etc., these elements may contain active components sometimes with variable concentrations¹³.

Various herbal medicines derived from plant extracts were used to treat a wide range of clinical diseases, and known facts are very though little¹⁴. A multitude element

of plant and its compounds is readily available from suppliers and natural-food stores, and self-medication with these substances in commonplace¹⁵.

Thus, the present study aims at screening of phytochemical constituents of four medicinal plants viz., *Justicia tranquebariensis*, *Tribulus terrestris*, *Curcuma longa* and *Aloe vera*. All these plants have different bioactivities which were later correlated with of some specific phytoconstituents.

Leaf of *Justicia tranquebariensis* (Acanthaceae) are made as expectorant, in cold, cough and nasal disorders¹⁶. Juices of leaves are treated as cooling agent and aperients and also given to children to cure Small pox. Crushed leaves are applied to contusions¹⁷. Paste made of the leaves of *Justicia tranquebariensis*, is applied externally on the swelling area to reduce the pain. Root paste is applied for tooth to reduce the pain¹⁸. Leaf juice is administered orally and leaf paste externally applied on the sight of snake bite work as an antidote for Cobra bite¹⁹. Leaf juice is given orally administered to treat jaundice and leaf paste is applied over affected area to treat skin diseases²⁰.

Tribulus terrestris (Zygophyllaceae) is an herbaceous prostrate perennial plant and it is known for its use in the traditional medicine of many countries to treat the cardiac diseases, edema, eye trouble, skin itch and impotency²¹.

Curcuma longa (Zingiberaceae) is a perennial plant having a short stem with large oblong rhizomes, which are brownish yellow in colour²². Various experiments have been proved to hold the presence of bioactive compounds of Curcuma and show the antimicrobial, anti-inflammatory, anticancer and antiviral activities²³.

Aloe vera (Liliaceae) is an important medicinal plant with anti-inflammatory²⁴, wound-healing²⁵, antidiabetic²⁶, antimicrobial²⁷, antifungal²⁸, antioxidant²⁶,

anticancer²⁹, antineoplastic³⁰, and immune system enhancers³¹ qualities have attracted significant scientific interest.

MATERIALS AND METHODS

Plant material

Plant material Stem of *Justicia tranquebariensis* (Acanthaceae), stem, leaf of *Tribulus terrestris* (Zygophyllaceae), whole plant of *Aloe vera* (Liliaceae) and Rhizome of *Curcuma longa* (Zingiberaceae) were collected from Semmalai, shade dried, pulverized and stored for further use.

Preparation of extracts

30g of air dried fine powder of plant material were infused in ethanol (100ml), until complete exhaustion. The infusion was filtered with four layered muslin cloth and stored at 4°C.

Phytochemical tests

Screening of the four selected medicinal plants for various phytochemical constituents were analyzed as standard methods as described in Table 1.

RESULTS AND DISCUSSION

The observations and inferences made in phytochemical tests of four medicinal plants such as *Justicia tranquebariensis*, *Tribulus terrestris*, *Curcuma longa* and *Aloe vera* is tabulated (Table 2). These tests show the presence of various bioactive secondary metabolites which is responsible for medicinal attributes.

These secondary metabolites are significantly important and the biological activities of medicinal plants such as hypoglycemic, antidiabetic, antioxidant, antimicrobial, anti-inflammatory, anti-carcinogenic, antimalarial, anticholinergic, antileprosy activities etc³². All the four selected medicinal plants were found to possess Tannins. Tannins have amazing stringent properties. The ethanolic extract of

all the 4 plants showed the presence of medicinally active constituents such as cardiac glycosides, Alkaloids, Tannins and Terpenoids (Table 2).

The phytochemical compound as flavonoids present in the *Justicia tranquebariensis* and *Tribulus terrestris*. Anthraquinones glycosides were found only in *Aloe vera*. Steroids were present in *Justicia tranquebariensis*, and *Tribulus terrestris*, and *Curcuma longa*. Alkaloids, Tannins, Cardiac glycosides and Terpenoids are present in all plant extracts. Except *Curcuma longa* contain the phytochemical saponins. The glycosides are absent in all plant extracts.

The crude extracts of *Tribulus terrestris* plant studied were found to contain one or more of the following phytochemical compounds steroid, saponins, alkaloids, tannins, and flavonoids. This plant has been used for treatment of eye trouble, abdominal distention, emission, edema and veiling^{33,34}.

Phytoconstituents of rhizome of *Curcuma longa* includes Carbohydrates, proteins, starch, amino acids, steroids, glycosides, flavonoids, alkaloid, tannin and saponins³⁵⁻³⁷. The use of medicinal plants to cure diseases has been extensively applied by people. Traditionally dried rhizomes are for the treatment of fresh wounds as a counterirritant on insect stings to facilitate the scabbing process in chickenpox and smallpox. Turmeric powder mixed with the juice of *Aloe Vera* and the same used externally to treat the wounds. The powder mixed with *Murraya paniculata* paste is used externally for fractured bones³⁸.

Qualitative evolutions of phytochemical of *Aloe vera* show the presence of active constituents such as terpenoids, tannins, and saponins. The study shows that *Aloe vera* holds the presence of medicinally active constituents. *Aloe vera* juice is considered useful in many types of gastrointestinal irritation and juice products.

The concentrated extracts of dried aloe gel are used for laxative and in hemorrhoid treatment. The Aloe gel is the most widely recognized herbal remedy in country like United States and promote wound healing³⁹. In addition, research makes clear that *Aloe vera* has antimicrobial inhibitory activity and also can help the body's immune system²⁵.

CONCLUSION

According to the results of the present investigation screening of four selected medicinal plants clearly reveals that the maximum classes of phytoconstituents are present in *Justicia tranquebariensis*, and *Tribulus terrestris* ethanolic extract. Hence, the above plant extract could be explored for its highest therapeutic efficacy by pharmaceutical companies in order to develop safe for various ailments.

The presence of most general phytochemical might be responsible for their therapeutic effects. It further reflects a hope for the development of many more novel chemotherapeutic agents or templates from such plants which in further may serve for the production of synthetically improved therapeutic agents.

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Table 1. Qualitative tests for Phytoconstituents

S. No.	Experiment	Procedure	Observation
1.	Test for Steroids Salkowski test	Take 2ml of extract; add 2ml of chloroform and 2ml of Conc. H ₂ SO ₄ . Shake well.	Chloroform layer appears red and acid layer shows greenish yellow florescence.
2.	Test for Glycosides General test	Add 10ml of 50% HCl to the 2ml of the test solution. Heat on boiling water bath for 30min. Add 5ml of Fehling's solution and boil for 5min	Brick red precipitate forms
3.	Test for Cardiac Glycosides Legal's test	To the aqueous or alcoholic extract, add 1ml of pyridine and 1ml of sodium nitroprusside.	Pink to red color appears.
4.	Test for Anthraquinones Glycosides Borntrager's test	To 3ml of the extract, add dil. H ₂ SO ₄ . Boil and filter. To the cold filtrate add equal volume of benzene or chloroform. Shake well. Separate organic layer. Add equal volume of dil. Ammonia.	Ammoniacal layer turns pink or red.
5.	Test for Saponins Glycosides Foam test	Shake the drug extract or dry powder vigorously with water.	Persistent foam forms
6.	Test for Alkaloids Dragendroff's test	To 2-3 ml of the test solution add a few drops of Dragendroff's reagent.	Orange brown precipitate forms.
7.	Test for Tannins Lead acetate test	To 3-5 ml of the test solution, add a few drops of 1 % lead acetate.	Yellow or red precipitate forms.
8.	Test for Phenolic Compounds Ferric chloride test	To 1-2ml of test solution add 2ml of water and 10% aqueous ferric chloride solution.	Appearance of Blue or green color
9.	Test for Flavonoids Shinoda test	To the test solution, add 5ml of alcohol and a few drops of Conc. HCl and magnesium turnings.	Appearance of Pink color
10	Test for Terpenoids	To the test solution add 2ml of chloroform and 1ml of Conc. H ₂ SO ₄ .	Appearance of Reddish brown color.
11.	Test for Saponins Foam test	To the test solution add a drop of sodium bicarbonate. Gently shake the solution.	Honey comb like froth forms.

Table 2. Results of phytochemical analyses of the four medicinal plants

Variable	<i>Justicia tranquebariensis</i>	<i>Tribulus terrestris</i>	<i>Curcuma longa</i>	<i>Aloe Vera</i>
Steroids	+	+	+	-
Glycosides	-	-	-	-
Cardiac Glycosides	+	+	+	+
Anthraquinones Glycosides	-	-	-	+
Saponins Glycosides	+	+	+	-
Alkaloids	+	+	+	+
Tannins	+	+	+	+
Phenolic Compounds	--	-	-	-
Flavonoids	+	+	-	-
Terpenoids	+	+	+	+
Saponins	+	+	-	+