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Qualitative and Quantitative Phytochemical Analysis of *Talinum Fruticosum* Plant Leafs in Various Extract

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***Abstract*: Talinum fruticosum is an important medicinal plant. The present study deals with the analysis of phytochemical constituents by qualitative and quantitative analysis of Talinum fruticosum leafs was done using aqueous, ethanol, chloroform, acetone extract. Alkaloids, flavonoids, terpenoids, carbohydrates, Xanthoproteins, tannis, saponins, anthraquinone, triterpenoids, glycosides, coumarin, reducing sugar protein, phytosterols and amino acids were analysed.**

***Keywords*: Phytochemical analysis, Qualitative analysis, Quantitative analysis, Talinum fruticosum analysis.**

1. Introduction

A. Phytochemistry

Phytochemistry is the study of phytochemicals, which are chemicals derived from plants. Those studying phytochemistry strive to describe the structures of the large number of secondary metabolic compounds found in plants, the functions of these compounds in human and plant biology, and the biosynthesis of these compounds. Plants synthesize phytochemicals for many reasons, including protecting themselves against insect attacks and plant diseases. Phytochemicals in food plants are often active in human biology, and in many cases have health benefits. The compounds found in plants are of many kinds, but most are in four major biochemical classes, the alkaloids, glycosides, polyphenols, and terpenes. Phytochemistry can be considered sub-fields of botany or chemistry. Activities can be led in botanical gardens or in the wild with the aid of ethnobotany. The applications of the discipline can be for pharmacognosy, or the discovery of new drugs, or as an aid for physiology studies. Techniques commonly used in the field of photochemistry are extraction, isolation, and structural elucidation of natural products, as well as various chromatography techniques. The list of simple elements of which plants are primarily constructed- carbon, oxygen, hydrogen, calcium, phosphorus, etc. is not different from similar lists for animals, fungi, or even bacteria. The fundamental atomic components of plants are the same as for all life, only the details of the way in which they are assembled differ.

Phytochemistry is widely used in the field of Chinese medicine especially in the field of herbal medicine. Phytochemical technique mainly applies to the quality control of Chinese medicine, Ayurveda medicine (Indian traditional medicine) or herbal medicine of various chemical components such as saponins, alkaloids, volatile oils, flavonoids and anthraquinones. In the development of rapid and reproducible analytical techniques, the combination of HPLC with different detectors, such as diode array detector(DAD), refractive index detector (RID), (ELSD) and mass spectrometric detector (MSD) has been widely developed. In most cases, biologically active compounds in Chinese medicine, Ayurveda or herbal medicine have not been determined. Therefore, it is important to use the phytochemical methods to screen and analyze bioactive components, not only for the quality control of crude drugs but also for the elucidation of their therapeutic mechanisms. Modern pharmacological studies indicate that binding to receptors or ion channels on cell membranes is the first step of some drug action. A new method in photochemistry called bio chromatography has been developed. This method combines human red cell membrane extraction and high performance liquid chromatography to screen potential active components in Chinese medicine.

2. Phytochemical analysis

Phytochemicals are the chemicals that present naturally in plants. Now days these phytochemicals become more popular due to their countless medicinal uses. Phytochemicals play a vital role against number of diseases such as asthma, arthritis, cancer etc. unlike pharmaceutical chemicals these phytochemicals do not have any side effects. Since the phytochemicals cure diseases without causing any harm to human beings these can also be considered as “man friendly medicines.” This paper mainly deals with collection extraction, qualitative and quantitative analysis of phytochemicals.

Phytochemistry deals with the chemistry of plant metabolites and their derivative. Primary and secondary metabolites can be classified on the basis of their chemical structure into much the same categories of chemical compounds: carbohydrates, amino

acids, proteins, enzymes derivatives. Phytochemicals are naturally occurring biologically active chemical compounds in plants. They act as a natural defense system for host plants and provide color, aroma and flavor. Phytochemicals like carotenoids, flavonoids and polyphenols, they possess antioxidant activity and protect our cells against oxidative damage and reduce the risk of developing certain types of cancer. The majority of active compounds are phenolic, vitamin c, vitamin E, tannins.

3. Materials and method

Exactly 5g of air dried powder sample was successfully extracted with petroleum ether, Ethanol, chloroform, and Water. The different extract was tested for xanthoproteins, tannins, flavonoids, saponins, phenol, alkaloids, steroids and terpenoids, salkowsky, phytosterols, proteins, amino acid, carbohydrates, coumarins, glycosides, and reducing sugar.

A. Test for Xanthoprotenis

Test solution+ con nitric acid +excess of ammonia. The appearance of reddish orange precipitate presence of xanthoprotenis.

B. Test for tannins

To 2ml of plant extract a few drops of 10% lead acetate were added. The appearance of white precipitate indicates the presence of tannins.

C. Test for saponins

a) About 0.5g of the sample was shaken with water in a test tube and warming. Frothing which persist on warming was taken as preliminary evidence. The presence of saponins.
b) To 1ml of extract taken in a measuring jar 9ml of distilled water was added and shaken vigorously for 15 seconds and extract were allowed to stand for 10 min. formation of stable foam (1cm) indicates the presence of saponins.

D. Test for anthraquinone

About 0.5g of sample was taken and 5ml of chloroform was added and shaken for 5 minutes. The extract was filtered and filtrate was shaken with equal volume of 10% ammonia solution. The pink violet or red color in ammonical layer indicates. The presence of anthraquinone.

E. Test for flavonoids:

About 0.5g of sample was treated with 2ml of 2% sodium hydroxide solution an intense yellow color turned to colorless on the drop wise addition of dilute acid. An intense yellow color turned to colorless. The presence of flavonoids.

F. Test for phenol

Equal amount of ferric chloride was added to the sample. Deep bluish green color indicates. The presence of phenol.

G. Test for alkaloids

A. 0.5g of plant extract (sample) was stirred with 5ml aqueous hydrochloric acid on steam bath and filtrate 1ml of each of the filtrate with few drops of Mayer's reagent, was taken. Precipitate was formed of the reagent. Presence of alkaloids.
B. 0.5g of plant extract (sample) was stirred with 5ml aqueous hydrochloric acid on steam bath and filtrate 1ml of each of the filtrate with few drops of dragendrof reagent was taken. Precipitate was formed of the reagent. Presence of alkaloids.

H. Test for steroids

About 200mg sample was boiled chloroform and mixture was filtrate was added 2ml of acetic anhydride and 2ml of conc. Sulphuric acid blue green ring indicates. Presence of steroids.

I. Test for triterpenoids

The test for triterpenoids is same as that for steroids the appearance of red, pink color at the junction indicates the presence of triterpenoids.

J. Salknowsky test

0.5g of sample was dissolved in 2ml concentrated sulphuric acid was carefully added to form a lower layer (chloroform layer). Reddish brown color at the interface indicates presence of salknowsky test.

K. Test for phytosterols

About 5g of sample was filtrate and add a few drops of acetic anhydride to filtrate then add conc. sulpuric acid. Through the walls of the test tube. The formation of the brown colored ring shows. The presence of phytosterols.

L. Test for proteins

To 2mg of the sample, 2ml millions reagent was added and observed for two minutes for the formation of white precipitate on gentle heating. White precipitate turned red indicates. The presence of proteins.

M. Test for amino acid

To 2mg of sample, 2ml of ninhydrin reagent was added. Violet color indicates. Presence of amino acid.

N. Test for reducing sugar

To 0.5ml of extract solution 1ml of water and 5-8 drops of Fehlings solution was added to the test tube hot and observed for brick red precipitate. Presence of reducing sugar.

O. Test for coumarins

For coumarine identified 1ml of 10% NaoH was added to 1ml of plant extract. Formation of yellow color indicates. The presence of coumarine.

P. Test for glycosides

For glycosides identification 3ml of chloroform and10% ammonium solution was added to 2ml of the plant extract.

Table 1
Qualytative Pytochemical Analysis of *Talinum Fruticosum* Extracted with Aqueous, Ethanol, Chloroform, Acetone

S.NO	EXPERIMENT	Aqueous	Ethanol	Chloroform	Acetone
1.	Test for Xanthoprotenis: Test solution+ con nitric acid + Excess of ammonia	_	_	_	_
2.	Test for tannis: Atwater soluble portion of the extract treated with basic lead acetate solution	+	_	_	_
3.	Test for saponins: About 0.5g of the sample was shaken with water in a test tube and warming.	+	_	_	_
4.	Test for anthraquinone: About 0.5g of sample was taken and 5ml of chloroform was added and shaken for 5 minutes. The extract was filtered and filtrate was shaken with equal volume of 10% ammonia solution	+	_	_	_
5.	Test for flavonoids: About 0.5g of sample was treated with 2ml of 2% sodium hydroxide solution an intense yellow color turned to colorless on the drop wise addition of dilute acid.	+	_	_	+
6.	Test for phenol: Equal amount of ferric chloride was added to the sample.	_	_	_	_
7.	Test for alkaloids: 0.5g of cyophilized algal extract (sample) was stirred with 5ml aqueous hydrochloric acid on steam bath and filtrate 1ml of each of the filtrate with few drops of Mayer's reagent, dragendrof's reagent was taken.	+	_	+	+
8.	Test for steroids: About 200 mg samples were boiled chloroform and mixture was filtrate was added 2ml of acetic anhydride and 2ml of conc. Sulphuric acid.	_	+	+	_
9.	Salknowsky test: 0.5g of sample was dissolved in 2ml concentrated sulphuric acid was carefully added to form a lower layer (chloroform layer)	+	_	+	+
10.	Test for phytosterols: About 5g of sample was filtrate and add a few drops of acetic anhydride to filtrate then add conc.sulpuricacid. through the walls of the test tube.	+	+	_	_
11	Test for proteins: To 2mg of the sample, 2ml millions reagent was added and observed for two minutes for the formation of white precipitate on gentle heating.	_	_	+	_
12.	Test for amino acid: To 2mg of sample, 2ml of ninhydrin reagent was added.	_	_	_	_
13.	Test for reducing sugar: To 0.5ml of extract solution 1ml of water and 5-8 drops of fehlings solution was added to the test tube hot and observed for brick red precipitate.	_	_	_	_
14.	Test for coumarins: For coumarine identified 1ml of 10% NaoH was added to 1ml of plant extract.	+	_	_	_
15.	Test for glycosides: For glycosides identification 3ml of chloroform and 10% ammonium solution was added to 2ml of the plant extract	_	+	_	+
16.	Test for triterpenoids: The test for triterpenoids is same as that for steroids the appearance of red, pink color at the junction indicates the presence of triterpenoids	+	_	_	_

Formation of pink color indicates. Presence of glycosides.

Table 2
Quantitative phytochemical analysis of *Talinum fruticosum*

Test	Amount
Alkaloids	2.598g
Flavonoids	4.688g
Total ash	22.58g
Sulphated ash	0.3725g

4. Conclusion

The phytochemical analysis showed that the talinum fruticosum plant extract contains a mixture of phytochemicals as tannins, saponins, anthraquinone, flavonoids, alkaloids, triterpenoids, salknowsky, phytosterols, and coumarins, are present in aqueous extract. Steroids, phytosterols, glycosides, are present in ethanol extract. Alkaloids, steroids, salknowsky, proteins, are present in chloroform extract. Anthraquinone, flavonoids, alkaloids, salknowsky, glycosides are present in acetone extract.

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