



Phytochemical analysis of *Tinospora cordifolia* and *Adhatoda vasica*

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Abstract

For this study *Tinospora cordifolia* and *Adhatoda vasica* were selected and aimed to investigate the presence of phytochemicals screenings in leaf and stem. Aqueous, Acetone and Methanol Solvents were used for phytochemical analysis. Our findings provides evidence, that aqueous and organic solvent extracts of these plants contain medicinally important bioactive compounds.

Keywords: *Tinospora cordifolia*, *Adhatoda vasica*, Phytochemicals screening, Qualitative.

Introduction

The importance of plants is known to us well. The plant kingdom is treasure house of potential drugs and in the recent years there has been increasing awareness about the importance of medicinal plants. Drugs from the plants are easily available, less expensive, safe and efficient and rarely have side effects. The plants have been selected for medicinal use over thousands of years constitute the most obvious choice of examining the current search for therapeutically effective new drugs such as anticancer drug, antimicrobial drug, antihepatotoxic compounds. According to WHO medicinal plants would to be best source to obtain

variety of drugs. About 80% of has individual from developed countries use traditional medicines, which has compounds derived from medicinal plants. However, such plants should be investigated to better understand their properties, safely and efficiency.

Medicinal plants contain and these bioactive substance include alkaloid, tannis, saponins, flavonoids, phenol, terpenoids, amino acid, carbohydrate, glycoside. These are compounds synthesized by primary and secondary metabolism of living organism.

Plants product have been part of phytomedicines since time immemorial. This can be derived from barks, leaves, flowers, roots, fruit, seeds. Knowledge of the chemical constituents of plants is desirable because such information will be value for synthesis of complex chemical substances [1].

Medicinal plants contain some organic compounds which provide definite physiological action on the human body and these bioactive substances include tannins, alkaloids, carbohydrates, terpenoids, steroids and flavonoids [2-3]. These compounds are synthesized by primary or rather secondary metabolism of living organisms. Secondary metabolites are chemically and taxonomically extremely diverse compounds with obscure function. They are widely used in the human therapy, veterinary, agriculture, scientific research and countless other areas [4]. A large number of phytochemicals belonging to several chemical classes have been shown to have inhibitory effects on all types of microorganisms in vitro [5].

Plant products have been part of phytomedicines since time immemorial. This can be derived from barks, leaves, flowers, roots, fruits, seeds [6]. Knowledge of the chemical constituents of plants is desirable because such information will be value for synthesis of complex chemical substances [7-9].

The present study was undertaken to evaluate the phytochemical analysis of *Tinospora cordifolia* and *Adhatoda vasica*, stem and leaves.

Materials and Methods

Collection of plant material

Fresh plant material of *Tinospora cordifolia* and *Adhatoda vasica* were collected from different regions of Washim district, Maharashtra, India. It commonly occur in cultivated land, along with roadside, Shady & moist places. plant material washed under running tap Water 2-3 times to remove soil particles and dust. the plant material were shaded for 12 days. After drying plant

materials grinded into fine powder using mechanical blender and then transfer into airtight Container with proper labeling for further use.

Preparations of solvent Extracts

Stem and leaves of the plant samples were thoroughly washed with running tap water 2-3 times and then finally washed with distilled water followed by shade-dried for seven days and then dried in an oven below 50°C. The dried plant materials were then powdered using mixer and grinder. 30g of plant powder were extracted with 100ml of aqueous, acetone and methanol. After 24 hours, it was filtered through a filter paper, filtrate was collected. Test can be Conducted then and there itself after Collection or Can be stored in refrigerator for Conducting test later.

Phytochemical screening

Extracts of stem and leaves of *Tinospora cordifolia* and *Adhatoda vasica* using aqueous, acetone and methanol were subjected to various chemical tests in order to determine the secondary plant constituents: (10-14).

Test for Alkaloids

Mayer's test

A few drop of Mayer's reagents was added the Turbidity of the resulting precipitate indicates positive test for alkaloids.

Test for Tannins

A few chops of 0.1% ferric chloride was added and observed blackish-blue or brownish green Coloration indicates the Presence of Tannins.

Test for saponins

Extract was mixed with 5 ml of distilled Water in a test tube and then it was shaken vigorously, formation of stable foam indicates presence of Saponins.

Test for Flavonoids

Extract were treated with few drops of lead acetate solution yellow Coloration indicates. The presence of flavonoids.

Test for phenol

Crude Extract were treated with 3-4 drops of ferric chloride solution. bluish black or blue green colour indicate positive test for phenol.

Test for Terpenoids

(Salkowski test)

Extract was mixed in 2 ml of chloroform and concentrated H₂SO₄ (3ml) was carefully added to form a layer. A radish brow coloration of thin inter face was formed it indicates positive test for terpenoids.

Test for amino acids

Ninhydrin test

Crude extract when boiled With 2 ml of 0.2% Solution of Ninhydrin Violet color indicates the presence of amino acids.

Test for Carbohydrates

Benedict's test

2 ml of Benedict's reagent added and heated on boiling Water bath for 2 min. reddish brown

precipitate indicates the presence of Carbohydrates.

Test for Glycosides

To known volume of extract 1 ml of distilled Water added and aqueous solution of NaOH was added formation of yellow color indicates positive test for Glycosides.

Results and Discussion

Phytochemical analysis of aqueous Acetone and methanol extract of *Tinospora cordifolia* and *Adhatoda vasica* shows positive test for tannin and phenol were present in both plants. Protein and carbohydrates were absent in the extracts of both plants except aqueous extract of stem of *Adhatoda vasica*. Terpenoids were present In *Adhatoda vasica*, aqueous extract of stem. Aqueous, Acetone and Methanol extract of *Adhatoda vasica* stem Shows positive tests for flavonoids. The Water extract of *Tinospora cordifolia* contain Tannin, saponin, phenol and glycosides. Water extract of the Leaf of *Adhatoda vasica* shows presence of alkaloids, tannin, saponin, flavonoids, phenol, terpenoids and glycosides. Alkaloid were absent in all extracts of stem and leaf of *Tinospora codifolia*. The results of phytochemical contents stem and leaf in Aqueous, Acetone and Methanol of *Tinospora cordifolia* and *Adhatoda vasica* are reported in Table 1 (Fig. 1 to 3), Table-2(Fig. 4 to 6) and Table-3 (Fig. 7 to 9), Table 4 (Fig. 10 to 12), respectively.

Table 1: Phytochemical analysis of Aqueous, Acetone and Methanol extract of stem of *Tinospora cordifolia*

Test	Aqueous	Acetone	Methanol
Alkaloid	-	-	-
Tannin	+	+	+
Saponin	+	-	-
Flavonoid	-	+	+
Phenol	+	+	+
Terpenoids	-	-	-
Amino acid	-	-	-
Carbohydrate	-	-	-
Glycoside	+	+	-



Fig. 1 Phytochemical analysis of Aqueous extract of stem of *Tinospora cordifolia*



Fig. 2 Phytochemical analysis of Acetone extract of stem of *Tinospora cordifolia*



Fig. 3 Phytochemical analysis of Methanol extract of stem of *Tinospora cordifolia*

Table 2: Phytochemical analysis of Aqueous, Acetone and Methanol extract of leaf of *Tinospora cordifolia*

Test	Aqueous	Acetone	Methanol
Alkaloid	-	-	-
Tannin	+	+	+
Saponin	+	-	-
Flavonoid	+	+	-
Phenol	+	+	+
Terpenoids	-	-	-
Amino acid	-	-	-
Carbohydrate	-	-	-
Glycoside	+	-	+



Fig. 4 Phytochemical analysis of Aqueous extract of leaf of *Tinospora cordifolia*



Fig. 5 Phytochemical analysis of Acetone extract of leaf of *Tinospora cordifolia*



Fig. 6 Phytochemical analysis of Methanol extract of leaf of *Tinospora cordifolia*

Table 3: Phytochemical analysis of Aqueous, Acetone and Methanol extract of stem of *Adhatoda vasica*

Test	Aqueous	Acetone	Methanol
Alkaloid	+	-	-
Tannin	+	+	+
Saponin	+	+	-
Flavonoid	+	+	+
Phenol	+	+	+
Terpenoids	+	-	-
Amino acid	+	-	-
Carbohydrate	-	-	-
Glycoside	+	+	+

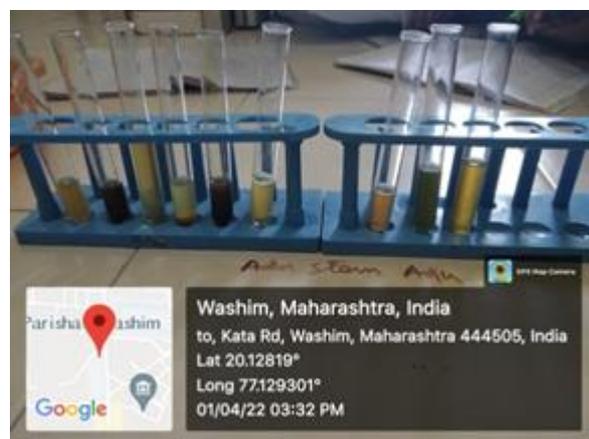


Fig. 7 Phytochemical analysis of Aqueous extract of stem of *Adhatoda vasica*



Fig. 8 Phytochemical analysis of Acetone extract of stem of *Adhatoda vasica*



Fig. 9 Phytochemical analysis of Methanol extract of stem of *Adhatoda vasica*

Table 4: Phytochemical analysis of Aqueous, Acetone and Methanol extract of leaf of *Adhatoda vasica*

Test	Aqueous	Acetone	Methanol
Alkaloid	+	-	-
Tannin	+	+	+
Saponin	+	+	-
Flavonoid	+	-	-
Phenol	+	+	+
Terpenoids	-	-	+
Amino acid	-	-	-
Carbohydrate	-	-	-
Glycoside	+	-	+



Fig. 10 Phytochemical analysis of Aqueous extract of leaf of *Adhatoda vasica*



Fig. 11 Phytochemical analysis of Acetone extract of leaf of *Adhatoda vasica*



Fig. 12 Phytochemical analysis of Methanol extract of leaf of *Adhatoda vasica*

Conclusion

The *Tinospora cordifolia* and *Adhatoda vasica* this plants are source of secondary metabolites and the solvent choice is very important for

extraction of Phytochemical from plants. Medicinal plants are helpful for discovering and Manufacturing of new drugs. The research on *Tinospora cordifolia* and *Adhatoda vasica* plants which can be medicinally important.

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