

# PHYTOCHEMICAL ANALYSIS OF THE SEEDS OF *ABUTILON INDICUM*

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**Abstract:** Medicinal plants are a boon to human health in recent days. They play a significant role in traditional medicine. *Abutilon indicum* is one of the renowned medicinal plant which is used to treat large number of ailments. The whole plant is used as curative for many diseases. The present study aims to determine the phytochemicals by qualitative and quantitative analysis of seeds of *Abutilon indicum* in different solvents like methanol, ethanol, chloroform, petroleum ether and aqueous. The qualitative analysis of the seeds showed the presence of alkaloids, steroids, flavonoids, saponins, phenols, tannins, amino acids, carbohydrates and reducing sugar. The quantification of the compounds like alkaloids, flavonoids and phenols were estimated. The result confirms that the seeds of *Abutilon indicum* contain essential phytochemicals which are helpful to prepare natural drugs in scientific research.

**Key words-** *Abutilon indicum*, Medicinal plant, Seeds, Phytochemical screening.

## I. INTRODUCTION

Medicinal plants are the potential resource of raw materials which are used in the manufacturing of many drugs (Abishek and Saini Avinash, 2013). They play a significant role in maintaining our human health. Plant medicines are used worldwide in the traditional treatment for many diseases (Vyas, *et. al.*, 2011). The medicinal plants are useful for healing as well as for curing human diseases due to the presence of the phyto constituents (Vijaya Packirisamy, *et. al.*, 2014). Medicinal plants are possessed to have various properties like antioxidant, anti inflammatory, anti cancer, anti diabetic, anti helminthic etc. One such traditionally used plant is *Abutilon indicum*.

*Abutilon indicum* is an erect woody shrub found commonly in tropical regions (Archana sharma, *et. al.*, 2013). It is an herbaceous weed belonging to the family Malvaceae and is known as "Country Mallow" in English (Saini, *et. al.*, 2015). It is used as medicinal plant since ancient times. The whole plant and different parts of the plant are used to cure many human ailments. The seeds are used as laxative in piles and in the treatment of cough (Nadakami, 1995). It is also used in the treatment of chronic cystitis (Chatterjee and Prakash, 1991). The seeds are also used to cure gonorrhoea (Saini, *et. al.*, 2015) and they are also used as expectorant (Nadakami 1995). Seeds of *Abutilon indicum* contain an important sugar molecule called raffinose (Badamani *et. al.*, 1975) and a huge number of amino acids like threonine, glycine, serine, glutamine, lysine, methionine, isoleucine, proline, alanine, cysteine, tyrosine, phenylalanine, leucine, asparagine, histidine, valine, arginine (Prakash *et. al.*, 1988).

The present study aims in the identification of the phytochemicals of seeds of *Abutilon indicum* by qualitative and quantitative analysis of the seeds of *Abutilon indicum* in different solvents like methanol, ethanol, petroleum ether, chloroform and aqueous.

## II. MATERIALS AND METHODS

### 2.1 Collection of plant sample

The seeds were collected from Trichy district, Tamil Nadu, India.

### 2.2 Preparation of the extract

The seeds of *Abutilon indicum* were washed thoroughly in tap water to remove dust particles. The leaves were then dried in shade at room temperature and coarsely powdered by a mechanical grinder. The dried powdered sample was soaked in different solvents like methanol, ethanol, chloroform and petroleum ether for 3 to 5 days. Aqueous extract of the leaves were also prepared by soaking the dried powder in distilled water. After 5 days, the extracts were filtered using No.1 Whatman filter paper and stored in air tight container for further analysis.

### 2.3 Qualitative analysis of phytochemicals

Preliminary phytochemical screening was carried out (Harborne, 1980) and (Karthiswaran, 2010).

#### 2.3.1 Test for alkaloids (Mayer's test)

To 1ml of extract, 1 ml of Mayer's reagent (Potassium iodide solution) was added. Formation of whitish yellow or cream coloured precipitate indicates the presence of alkaloids.

#### 2.3.2 Test for steroids (Liebermann Burchard test)

To 1ml of extract, 2ml of acetic anhydride and 2ml of concentrated sulphuric acid were added. Formation of violet to blue or green colour indicates the presence of steroids.

#### 2.3.3 Test for terpenoids (Salkowski test)

To 1 ml of extract, 2ml of chloroform and few drops of sulphuric acid were added. Formation of reddish brown ring indicates the presence of terpenoids.

#### 2.3.4 Test for flavanoids (Alkaline reagent test)

To 1 ml of extract, few drops of dilute ammonium solution and few drops of concentrated hydrochloric acid were added. A yellow colouration indicates the presence of flavanoids.

#### 2.3.5 Test for saponins (Froth test)

To 1 ml of extract, 5 ml of distilled water was added and shaken vigorously. Formation of froth indicates the presence of saponins.

#### 2.3.6 Test for phenols (Lead Acetate test)

To 1ml of extract, 1 ml of lead acetate solution was added. Formation of precipitate indicates the presence of phenols.

#### 2.3.7 Test for tannins (Lead acetate test)

To 1ml of extract, 1ml of lead acetate was added. A formation of white precipitate indicates the presence of tannins.

#### 2.3.8 Test for tannins (Ferric chloride test)

To 1ml of extract, 1ml of ferric chloride solution was added. Formation of blue, black or brownish green colour indicates the presence of tannins.

#### 2.3.9 Test for cardiac glycosides (Keller killiani test)

To 1ml of extract, 5ml of distilled water was added and evaporated to dryness. Then to the Sample 2ml of glacial acetic acid containing trace amount of ferric chloride solution was added. Then 1ml of concentrated sulphuric acid was added along the sides of the tube. Formation of brown ring underlayed with blue colour indicates presence of cardiac glycosides.

#### 2.3.10 Test for aminoacids (Ninhydrin test)

To the 1ml of sample, 3 to 4 drops of Ninhydrin solution was added and boiled in water bath for 10 minutes. Formation of purple or blue colour indicates the presence of amino acids.

#### 2.3.11 Test for proteins (Biuret test)

To the 1ml of extract, 1ml of 40% sodium hydroxide solution and 2 drops of 1% copper sulphate solution were added. Formation of violet colour indicates the presence of proteins.

#### 2.3.12 Test for carbohydrates (Barfoed test)

To the 2ml of extract, 1ml of Barfoed's reagent was added and boiled in water bath for few minutes. Formation of reddish brown precipitate indicates the presence of carbohydrates.

#### 2.3.13 Test for reducing sugars (Fehling's test)

To the 1ml of extract, equal quantities of Fehling solution A and B were added and heated. Formation of brick red precipitate indicates the presence of reducing sugars.

### 2.4 Quantitative estimation of phytochemicals

#### 2.4.1 Alkaloid determination

5 gm of sample was added to 200 ml of 10% acetic acid in ethanol in a beaker. The beaker was tightly covered and allowed to stand for 4 hours. This was filtered and the extract was concentrated on a water bath to one quarter of the original volume. The entire solution was precipitated by the drop wise addition of concentrated ammonium hydroxide solution. The

precipitate was collected and washed with dilute ammonium hydroxide and filtered. The residue is alkaloid, which was dried and weighed (Harborne, 1980).

#### 2.4.2 Flavanoid determination

10 gm of sample was added to 100 ml of 80% aqueous methanol in a beaker. The whole solution was filtered through Whatman filter paper No.42 (125mm). The filtrate was then evaporated to dryness and weighed (Harborne, 1980).

#### 2.4.3 Determination of total phenols

Few grams of sample were boiled with 50 ml of ether for 15 minutes for the extraction of phenols. To the 5ml of extract, 10 ml of distilled water, 2ml of ammonium hydroxide solution and 5ml of concentrated amyl alcohol were added. The samples were left for 30 minutes. This was measured at 505 nm (Harborne, 1980).

### III. RESULTS AND DISCUSSION

The qualitative phytochemical analysis of the seeds of *Abutilon indicum* is summarized in the Table 1. The quantification of important phytochemicals of this plant is summarized in Table 2. The methanolic extract of seeds shows the presence of high number of phytochemicals when compared with other solvents like ethanol, petroleum ether, chloroform and aqueous. It shows the presence of alkaloids, steroids, carbohydrates, flavonoids, phenols, tannins, saponins, cardiac glycosides, carbohydrates and amino acids. Phytochemicals such as saponins, terpenoids, flavonoids and alkaloids have hypoglycemic activities (Cherian and Augusti, 1995). The seeds show the presence of high amount of tannins and they play a major role in the treatment of intestinal disorders like diarrhoea and dysentery (Akinpelu and Onakoya, 2006). The seeds also have flavanoids which can act as antioxidants. Phytochemicals have highest therapeutic efficiency in pharmaceutical field (Thilagavathi, *et. al.*, 2015). It helps to undertake further studies on isolation and identification of specific phytochemicals for pharmacological studies.

Table 1. Qualitative analysis of the seed of *Abutilon indicum*

TESTS	METHANOL	ETHANOL	PETROLEUM ETHER	CHLOROFORM	AQUEOUS
Alkaloid	+	-	-	-	-
Steroids	+	+	+	+	+
Flavanoids	+	+	-	-	+
Terpenoids	-	-	-	-	-
Saponins	+	+	+	+	+
Phenols	+	+	+	+	+
Tannins	+	-	+	-	+
Cardiac glycosides	+	+	-	-	-
Aminoacids	+	+	-	+	+
Proteins	+	+	-	+	+
Carbohydrates	+	-	+	+	+
Reducing sugars	-	+	-	-	+

Table 2. Quantitative analysis of the seeds of *Abutilon indicum*

TESTS	METHANOL	ETHANOL	PETROLEUM ETHER	CHLOROFORM	AQUEOUS
Alkaloid	9.96 ± 0.08	2.90 ± 0.20	0.95 ± 0.07	1.32 ± 1.90	0.875 ± 2.23
Flavonoid	7.13 ± 1.02	6.91 ± 1.20	0.85 ± 0.04	1.99 ± 1.01	6.95 ± 1.08
Phenols	19.53 ± 2.35	17.25 ± 0.3	16.09 ± 1.9	14.09 ± 2.12	18.72 ± 2.32

#### IV. CONCLUSION

The qualitative and quantitative analysis shows that the seeds of *Abutilon indicum* contain important phytoconstituents such as alkaloids, steroids, terpenoids, flavanoids, phenols, tannins, proteins, amino acids, carbohydrates and cardiac glycosides. The methanolic extracts are rich in phytoconstituents when compared with other extracts. Thus, the study reveals the presence of various medicinally valued phytochemicals of *Abutilon indicum* which has many disease curing abilities. Further researches are going on to discover its biological activity and enhance the pharmacological activities of it in the field of medicine.

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