PHYTOCHEMICAL INVESTIGATION ON THE STEM OF *ABUTILON INDICUM*

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Abstract: Bioactive components play a vital role in curing medical ailments. Medicinal plants harbour more number of bioactive components. *Abutilon indicum* is one of the renowned medicinal plants which contain numerous bioactive components. The whole plant is used to treat many diseases. The present study aims to determine the phytocomponents by qualitative and quantitative analysis of stem of *Abutilon indicum* in different solvenrts like methanol, ethanol, chloroform, petroleum ether and aqueous. The qualitative analysis of the stem showed the presence of alkaloids, steroids, flavonoids, saponins, phenols, tannins, aminoacids, carbohydrates and reducing sugar. The quantification of the compounds like alkaloids, flavonoids and phenols were estimated. The result confirms that the stem of *Abutilon indicum* contain essential bioactive components which are helpful in the preparation of medicinal drugs.

Key words- *Abutilon indicum*, Medicinal plant, Stem, Phytochemical screening, Bio-active components.

I. INTRODUCTION

Plants have been used as a rich source of biologically active drugs and have numerous traditional uses to serve mankind (Krithika and Basu, 1999). Medicinal plants contain numerous biologically active compounds which are helpful in the treatment of various diseases and improving the health (Samy, *et. al.*, 2008). Plant medicines are used worldwide in the traditional treatment for many diseases (Vyas, *et. al.*, 2011). Phyto constituents are the natural bioactive compounds found in plants (Amrit pal singh, 2005). Medicinal plants possess various properties like antioxidant, anti inflammatory, anti cancer, anti diabetic, anti helminthic etc. One such traditionally used plant is *Abutilon indicum.*

Abutilon indicum is a perennial woody shrub found commonly in tropical regions (Archana sharma, *et. al.*, 2013). It is an herbaceous weed belonging to the family Malvaceae (Saini, *et. al.*, 2015). It is used as medicinal plant since ancient times. The whole plant is used to cure many human ailments. The stem is used as laxative and alexeteric. It is also used as febrifuge, anti helminthic and astringent (Singh, *et. al.*, 2002). It possesses more amount of diuretic activity (Singh, *et. al.*, 2002). It is also used as pulmonary sedative and in the treatment of fever (Khadabadi and Bhajipali, 2010). The stem also contains amino acids such as aspartic acid, histidine, threonine, serine, and leucine (Archana sharma, *et. al.*, 2013). Galactose, glucose, and fructose are commonly present in the stem (Gaind and Chopra, 1976).

The present study aims with the identification of the bioactive components of stems of *Abutilon indicum* in different solvents like methanol, ethanol, petroleum ether, chloroform and aqueous by qualitative and quantitative phytochemical screening.

II. MATERIALS AND METHODS

2.1 Collection of plant sample

The stem was collected from Trichy district, Tamil Nadu, India.

2.2 Preparation of the extract

The stem of *Abutilon indicum* was 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 (Libermann 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 shaked 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 extrct, 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 quater 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).

2 RESULTS AND DISCUSSION

The qualitative phytochemical analysis of the stems of *Abutilon indicum* is summarized in the Table 1. The quantification of important phytocompounds of the stems of *Abutilon indicum* is summarized in Table 2. The methanolic extract of stems shows the presence of high number of phytocompounds when compared with other solvents like ethanol, petroleum ether, chloroform and aqueous. It shows the presence of alkaloids, steroids, terpenoids, phenols, tannins, saponins, proteins and amino acids. Phytochemicals such as saponins, terpenoids, and alkaloids have hypoglycemic activities (Cherian and Augusti, 1995). The stems show the presence of tannins and they play a major role in the treatment of intestinal disorders like diarrhoea and dysentery (Akinpelu and Onakoya, 2006). The stems also have terpenoids 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 phytocomponents for pharmacological studies.

Table 1. Results of qualitative analysis of the stem 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. Results of quantitative analysis of the stem of *Abutilon indicum*.

TESTS	METHANOL	ETHANOL	PETROLEUM ETHER	CHLOROFORM	AQUEOUS
Alkaloid	11.48 ± 1.18	9.596 ± 0.20	3.25 ± 1.67	2.52 ± 0.30	8.35 ± 1.03
Flavonoid	2.43 ± 0.12	1.01 ± 1.54	1.085 ± 0.14	1.09 ± 0.12	8.15 ± 1.18
Phenols	12.33 ± 0.25	2.25 ± 1.3	2.09 ± 1.92	10.09 ± 0.12	1.72 ± 0.32

3 CONCLUSION

The qualitative and quantitative analysis shows that the stems of *Abutilon indicum* contain important bioactive components such as alkaloids, steroids, terpenoids, phenols, tannins, proteins, amino acids and saponins. The methanolic extracts are rich in phytoconstituents when compared with other extracts. Thus, the study reveals the presence of various medicinally valued bioactive components of *Abutilon indicum*. Further studies are being undertaken to isolate the bioactive components and to identify its properties in the field of medicine.

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