



PHARMACOGNOSTICAL AND PHYTOCHEMICAL SCREENING ON *ABUTILON INDICUM* (L.) MALVACEAE

R.Ramasubramania raja^{1*} and P.Shanmuga Pandiyan²

¹Research scholar, PRIST University, Thanjavur, Tamilnadu, India.

²Principal, Rao's College of Pharmacy, Nellore, Andhra Pradesh, India.

ABSTRACT

Abutilon indicum is a small shrub in the malvaceae family, it is commonly available plant, it is a ornamental plant also. This plant name tamil - thuthi, Sanskrit –atibala, telugu -duvvena kayalu, duvvena benda, kannada- tu th thi gida. This plant is used in siddha medicine in tamilnadu. The plant is used in inflammation, gonorrhoea, aphorodisiac, anti-diabetic, nervine tonic, skin diseases, cough, piles, anthelmintic, ulcer healing property, diuretic and etc. This plant leaf pharmacognostical characters like macroscopy, microscopy, fluorescent analysis, plant cell inclusion, and phytochemical evaluation extraction and chemical test (Colour reaction base) are made and reported.

Key words: *Abutilon indicum*, Macroscopy, Microscopy, Fluorescent, Phytochemical, Extraction.

INTRODUCTION

Abutilon is a perennial shrub that grows upto the height of 1.25 to 2 m. the leaves are oblong, smooth, toothed and often found to be hairy. The flowers of this plant are 2.5 in diameter and yellow in colour. The fruit is round having edges on the circumference. The seeds of the plant are three to five, kidney shaped, dark brown in colour and having fair hairs. *Abutilon indicum* is cultivated in many parts of India and neighbouring countries. It often grows as weed abundantly in wastelands and seashore to 1200 m high in India. The roots of *Abutilon indicum* are used to extract oil which is used as an ayurvedic medicine to treat various ailments. The plant is found to have several properties such as diuretic, anti-inflammatory, astringent, laxative, analgesic and expectorant. The oil is usually used to treat swollen joints and to alleviate pain. Whole of the plant is taken in the form of decoction and powder for several diseases.

This plant is useful in gout, tuberculosis, ulcers, bleeding disorders, and worms. It cures burning sensation. Decoction used in toothache and tender gums. Leaves are locally applied to boils and ulcers. Roots are used in fever, chest affection and urethrities. So the various ailments in the plant of *Abutilon indicum* was documented, we tried to focused the pharmacognostical and phytochemical evaluation and reported.

MATERIALS AND METHODS

Plant material

The plant of *Abutilon indicum* was collected from Thirumalaisamudram 7km away from Thanjavur (Tamil Nadu) in the month of December 2010. The plants was identified by local people of that village and authenticated by Dr. N.Ravichandran, Asst. Professor, Drug Testing Laboratory, CARISM, SASTRA University Thanjavur, and the Voucher specimen is preserved in laboratory for future reference.

Chemicals

All the reagents used were of analytical grade obtained from S.D. fine chemicals, Ltd, and Hi Media, Mumbai.

Corresponding Author

R.Ramasubramania raja

Email: rsmr.raj1979@gmail.com

Pharmacognostical Screening of Plants

Macroscopic Characters and Physiochemical Parameters of *Abutilon indicum* leaf and leaf powder: The Macroscopic evaluation was carried out for shape, size, colour, odour, taste and fracture of the drug. Different physiochemical values such as Ash value, extractive values, loss on drying, foreign organic matter, Crude fiber content, were determined and reported on Table No:1

Preparation of extract from *Abutilon indicum* leaf powder

The leaves were dried under shade, powdered and passed through 40meshes and stored in closed vessel for further use. The dried powder material (150g) was subjected to soxhelt extraction with ethanol for continuous hot extraction for 24 hours. The extracts were concentrated under reduced pressure to obtain the extracts solid residues. The percentage value of extract was 29 (%w/w).

Phytochemical evaluation of ethanolic leaf extracts of *Abutilon indicum*

The Ethanolic Extract of *Abutilon indicum* (Leaf) was subjected to preliminary Phytochemical tests followed by the methods of Harbone (1998), and Trease and Evans (1983) and the phyto constituents reported in table 2 (Trease GE and Evans WC, 1983; Harborne JB, 1998; Matlwaska, 2002).

Fluorescence analysis study of *Abutilon indicum* leaves powder

Fluorescence analysis study of powdered drug material with different reagents was carried out to observe the colour reactions reported on the table 3.

Study of Plant cell inclusions

Plant cell inclusions study of powdered drug material with different reagents was carried out to observe the colour reactions reported on table 4.

General chemical and Micro chemical Tests

General chemical and Micro chemical tests of powdered drug material with different reagents were

carried out to observe the colour reactions to identify the compound reported on the table 5 (Kokate CK, 2009).

Leaf constants

Vein Islet number, vein termination number, stomatal number and stomatal index was carried out to observe microscopically reported on table 6 (Khandelwal KR, 2002).

RESULTS

Macroscopic Characters of *Abutilon indicum* (Linn) Sweet leaf

Margin: Acuminate and toothed, Apex: Pointed, Base: Symmetrical, Venations: Reticulate, Taste: Sweet to characteristic, Odour: Odourless, Surface: Smooth on both the surfaces.

Transverse section of *Abutilon indicum* leaf

T.S. of *Abutilon* leaf consists of midrib and lamina. The midrib consists of single row ovoid short cells the outer cell wall contains cuticle and three different types of trichomes (stellate type, uniseriate multicellular and multicellular multiseriate glandular trichome). The cortex is several cell rows parenchymatous cells in abaxial side of the midrib but in adaxial side the cortex cells are consists of 3-4 rows of angular collenchyma and 2-3 rows of parenchyma cells. The parenchyma cells are containing druce type of calcium oxalate crystals. The vascular bundle consist of phloem and xylem the xylem surrounded by phloem. Phloem cell are several rows with phloem fibres. Phloem parenchyma cell also contains druce type calcium oxalate crystals. Each rows of xylem cells are differentiated with xylem parenchyma. Xylem parenchyma cells containing, simple ovoid starch grains.

Physiochemical Parameters

The extractive value was highest in water and was recorded to be 15.2%w/w, and methanol soluble extractive value was about 10.4 %w/w .The different ash values and the different physiochemical parameters were screened and are presented in the table 1.

Table 1. Physiochemical Parameters of *Abutilon indicum* (L)

S.No	Parameters	<i>Abutilon indicum</i> (Linn) Sweet
1.	Hexane Soluble extractive	4%
2.	Pet ether Soluble extractive	3.2%
3.	Chloroform Soluble extractive	6.4%
4.	Acetone soluble extractive	4%
5.	Ethanol soluble extractive	12.8%
6.	Ethyl acetate soluble extractive	11.2%
7.	Methanol soluble extractive	10.4%
8.	Water soluble extractive	15.2%
9.	Foreign organic matter	3.5%

10.	Loss on drying	6%
11.	Crude fibre content	41%
12.	Total Ash	5%
13.	Acid insoluble ash	2%
14.	Sulphated ash	3.6%
15.	Water Soluble ash	2.5%

Table 2. Preliminary Phyto chemical Analysis of ethanolic leaf extracts of *Abutilon indicum* (Linn) Sweet,

S.No	Phytoconstituents	<i>Abutilon indicum</i>
1.	Alkaloids	+
2.	Amino acids	-
3.	Anthraquinones	-
4.	Carbohydrates	+
5.	Flavonoids	+
6.	Phenolic groups	+
7.	Saponins	+
8.	Steroids	-
9.	Tannins	+

+ = Present - = Absent

Table 3. Fluorescence analysis study of *Abutilon indicum* leaves powder

S.No	Sample	Colour in Day light	Colour in UV
1.	Powder	Pale Green	Green
2.	Powder + 0.1N Sodium Hydroxide	Green	Dark green
3.	Powder + Acetic anhydride	Pale green	Dark green
4.	Powder + acetic acid	Green	Brownish green
5.	Powder + 0.1N Hydrochloric acid	Pale grey	Dark green
6.	Powder + water	Slight Yellowish green	Green

Table 4. Study of Plant cell inclusions

S.No	Test	Result	Colour
1.	Cellulose	+	Pale yellow
2.	Lignin	+	Deep blue
3.	Suberin	+	Deep yellow
4.	Chitin	+	Violet
5.	Starch	+	Blue
6.	Mucilage	+	Pink
7.	Proteins	+	Yellow
8.	Alkaloids	+	Reddish brown
9.	Tannins	+	Bluish black
10.	Calcium oxalate	+	Needle shaped crystals
11.	Calcium carbonate	+	Needle shaped crystals

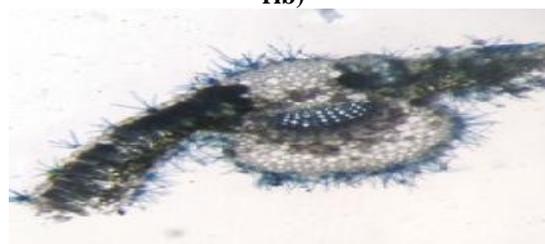
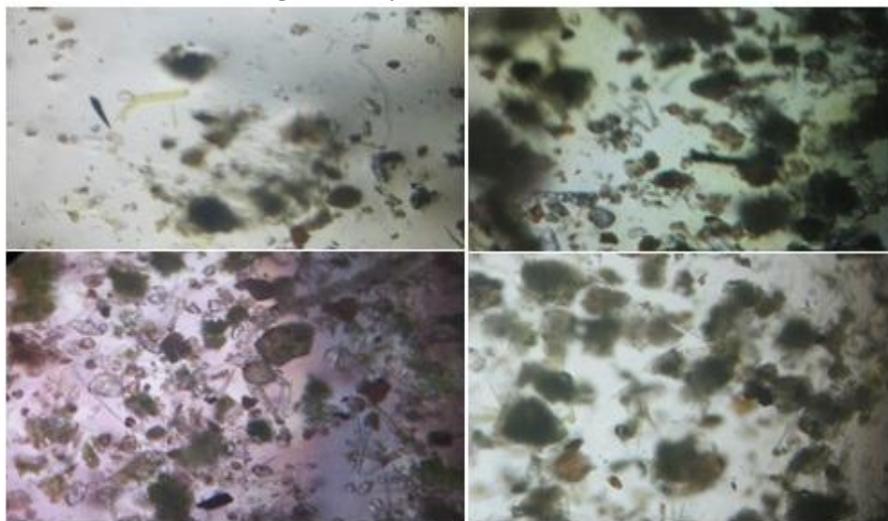
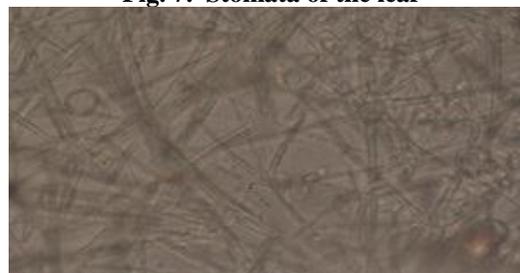
Table 5. General Chemical and Micro chemical tests for Leaf powder of *Abutilon indicum*

S.No	Test	Results
1.	Test with water /aqueous extract	+
2.	Test For Tannins	+
3.	Test for Anthra quinine	-
4.	Test for Mucilage	+
5.	Test for Carbohydrate	+
6.	Test for alkaloids	+

+ Present - Absent

Table 6. Leaf constants of *Abutilon indicum*

S.No	Parameters	Results
1.	Vein islets number	72 ± 4.36
2.	Vein termination number	78 ± 2.46
3.	Stomatal number	26 ± 1.27
4.	Stomatal index	22 ± 0.84

Fig. 1. *Abutilon indicum***Fig. 2. *Abutilon indicum* (Flower)****Fig. 3. *Abutilon indicum* leaf****Fig. 4. Transverse section of *Abutilon indicum* leaf (Midrib)****Fig. 5. Study of Plant cell inclusions****Fig. 6. Veins of the leaf****Fig. 7. Stomata of the leaf**

DISCUSSION

The plant was screened for its Macroscopic, Microscopic, Physiochemical parameter, Florescence analysis, General and microchemical analysis for crude powder and Plant cell inclusions showed that they all within limit. Extraction was carried out by using soxhlet apparatus. The extractive values are determined by using the chemicals in order of polarity wise. The extractive value was highest in water and was recorded to be 15.2%w/w, and methanol soluble extractive value was about 10.4 %w/w. The lowest value non polar solvent pet ether 3.2%w/w, and hexane like 4%w/w. The different ash values like total ash 5%w/w, Acid insoluble ash 2%w/w, and sulphated ash 3.6%ww/w. The *Abutilon indicum* leaf powder reported the potential fluorescent property with different chemical reagents. Carbohydrates, mucilage, alkaloids, and tannins identified the general chemical and micro chemical analysis. Ethanolic extract was made by using soxhlet apparatus; finally get the

ethanolic extract was tested with chemical reagents colour reaction based. The presence showed the alkaloids, flavonoids, carbohydrates, phenolic compounds, and saponins.

CONCLUSION

The plant was screened for its Macroscopic, Microscopic, Physiochemical parameter, Florescence analysis, General and micro chemical analysis for crude powder and Plant cell inclusions and leaf constants showed that they all within limit. The presence showed the alkaloids, flavonoids, carbohydrates, phenolic compounds, and saponins. This work is valuable for further continue the research doing persons.

ACKNOWLEDGEMENT: None

CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

REFERENCES

- Harborne JB. A Guide to Modern techniques of plant Analysis. USA: Kluwer Academic Publishers, 1998.
- Khandelwal KR. Practical Pharmacognosy, 19th Edition, 2002, 24-25, 163-164.
- Kokate CK, Practical Pharmacognosy 19th Edition, 2009, 115-121.
- Matlwaska. Flavonoid compounds in the flowers of *Abutilon indicum* (Linn.) Sweet. *Acia Poloniac Pharmaceutic – Drug Research*, 59(3), 2002, 227-229.
- Trease GE, Evans WC. Pharmacognosy, London; Bailiere Tindal, 1983.