STUDIES ON PHYSICOCHEMICAL EVALUATION OF LEAVES OF *ABUTILON MUTICUM* DC

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Abstract
Abutilon muticum DC. (Malvaceae) are traditional medicinal herb used for analgesic, anthelmintic, hepatoprotective, and hypoglycemic properties. The present paper deals with the physicochemical evaluation of leaf of the plants. In this study various physicochemical studies such as ash value, LOD, FOM, extractive values are reported.

Keywords: Physicochemical evaluation, *Abutilon muticum*, Leaf.

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Introduction

Medicinal plants are used in the treatment of much life threatening disease. In almost all the traditional system of medicine, the quality control aspect has been considered from its inspection. However, in modern concept it require necessary changes in their approach by that way concrete method of quality control in terms development of modern methodologies. Thus, today quality assurance is thrust area for the evaluation of traditional used medicinal plants and herbal formulation[1].

A. muticum DC is a hairy herb commonly belonging to family Malvaceae. It is found abundantly in the hotter parts of India but it occurs throughout the tropica, subtropica, and Ceylon. It grows as weed and found abundantly in wastelands from seashores 1,200 meters high in India and in sub Himalayan tracts. It is herbaceous, or shrubby, softly tomentose plant, stem is round, often tinged with purple color. The leaves are 9 by 5 cm up to petiolate, ovate to orbocular –cordate, acuminate, and toothed. Flowers are borne solitary in long jointed and axilary pedicels. Calex lobes divided in the middle and apiculate. Corolla is yellow or orange yellow opens in the evening. Carpels are 15-20 in number. Fruits are hispid, scarcely longer than the calyx and awns are erect. Seeds are 3 -5, ovoid, kidney shaped, dark brown black, tuberceled or with minutely stelleate hairs. Tap roots, fairly long with a number of lateral branches: 1.5-2 cm in diameter, light brown, outer surface smooth with dot like lenticels. Bark thin and can easily peel off, it has feeble odor, astringent and bitter tastes[2].

The present work was undertaken to evaluate the physicochemical evaluation of the selected plant.

Material and Methods

Selection, collection and authentication of plant material

The plants *Abutilon muticu*m chosen for the present investigation was collected in the months of July 2010- Nov. 2010, from the farmers and tribals of Madhya Pradesh and were identified and authenticated by Dr. S. N. Dwivedi, Prof. and Head, Department of Botany, Janata PG College, APS, University, Rewa, M.P-India and a voucher specimen AM/10/001was deposited in our department. The selected parts were later air-dried and stored in an air-tight container for further use.

Physico-chemical evaluation[3-4]

The dried parts (Leaves) was subjected to standard procedure for the determination of various physicochemical parameters.

(i) Determination of ash values

The determination of ash values is meant for detecting low-grade products, exhausted drugs and sandy or earthy matter. It can also be utilized as a mean of detecting the chemical constituents by making use of water-soluble ash and acid insoluble ash.

Total ash value

Accurately about 3 gms of air dried powder was weighed in a tared silica crucible and incinerated at a temperature not exceeding 450^0C until free from carbon, cooled and weighed and then the percentage of total ash with reference to the air dried powdered drug was calculated. The percentage of total ash with reference to the air-dried drug was calculated.

Acid insoluble ash

The ash obtained in the above method was boiled for 5 minutes with 25ml of dilute HCl. The residue was collected on ash less filter paper and washed with hot water, ignited and weighed. The percentage of acid insoluble ash was calculated with reference to the air dried drug.

Water soluble ash

The ash obtained in total ash was boiled for 5 minutes with 25 ml of water. The insoluble matter was collected on an ash less filter paper, washed with hot water and ignited to constant weight at a low temperature. The weight of insoluble matter was subtracted from the weight of the ash. The difference in weights represents the water soluble ash. The percentage of water soluble ash with reference to the air dried drug was calculated.

(ii) Determination of moisture content (Loss on drying)

Place about 10 g of drug (without preliminary drying) after accurately weighing in a tared evaporating dish and kept in oven at 105^0 C for 5 hours and weigh. The percentage loss on drying with reference to the air dried drug was calculated.

(iii) Determination of foreign organic matter

Accurately weighed 100 g of the drug sample and spread it out in a thin layer. The foreign matter should be detected by inspection with the unaided eye or by the use of a lens (6X). Separate and weigh it and the percentage present was calculate.

(iv) Determination of swelling index

Swelling index is determined for the presence of mucilage. Accurately weigh 1 g of the powdered plant part and placed in 150 ml measuring cylinder, add 50 ml of distilled water and kept aside for 24 hours with occasional shaking. The volume occupied by the seeds after 24 hours of wetting was measured.

(v) Determination of extractive values

a) Alcohol soluble extractive
b) Water soluble extractive

c) Ether soluble extractive

a) Alcohol Soluble Extractive

5 gm of coarsely powdered air dried drug was macerated with 100 ml of alcohol in a closed flask for 24 hour, shaking frequently for six hours and allowed to stand for eighteen hours. It was then filtered rapidly taking precaution against loss of alcohol. 25 ml of the filtrate was evaporated to dryness in tared flat bottomed shallow dish, dried at 105^0c and weighed. The percentage of alcohol soluble extractive was calculated with reference to the air dried drug.

b) Water Soluble Extractive

5 gm of coarsely powdered air dried drug was macerated with 100 ml of chloroform water in a closed flask for 24 hours, shaking frequently for six hours and allowed to stand for eighteen hours. It was then filtered rapidly taking precautions against loss of chloroform water. 25 ml of the filtrate was
evaporated to dryness in tared flat bottomed dish dried at 105^0c
and weighed. The percentage of water soluble extractive was calculated with reference to air dried drug.

c) Ether soluble extractive

100 gm of coarsely powdered air dried drug was extracted in soxhlet apparatus with solvent ether for six hours. The extract is filtered into a tared evaporating dish and evaporates off the solvent on a water bath. The residue is dried at 105^0C to constant weight. The percentage of ether extractive was calculated with reference to air dried drug

Extraction and phytochemical screening[5]

Extraction

Preparation of extract

The already prepared coarse powder drug of selected plant was used for the preparation of different extracts.

Chemicals

Methanol (80%)
Distilled water with chloroform (2.5%)

Extraction procedure

The dried powder was extracted with methanol (80%) in a soxhlet apparatus. Aqueous extract was prepared by cold maceration process by using separate quantity of powder. The solvents were removed by distillation under reduced pressure and the resulting semisolid mass was vacuum dried using rotary flash evaporator. The percentage yields are presented in table.

Results

In the present investigation the physic-chemical evaluation of both the plants were carried out. In this study Ash value, FOM, moisture content and swelling index were determined and are presented in table 1. The extractive value obtained was given in table 2. The percentage yield and color of aqueous and methanolic extract are given in table 3.

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Table No. 1. Physico-chemical evaluation of Leaves of *Abutilon muticu*m

Parameters (% w/w)	**Values obtained**
	AML
Total ash (TA)	6.5
Water soluble ash (WSA)	2.4
Acid insoluble ash (AIA)	1.2
Moisture content (MC)	6.2
Swelling index (SI)	-
Foreign organic matters (FOM)	2.1

All reading are average of three values, n=3**, Abbr.:** AML=*Abutilon muticu*m (Leaves)

Table No. 2. Extractive values of Leaves of *Abutilon muticu*m

Solvents	**Values obtained**
	AML
Alcohol soluble extractive value	12.7
Water soluble extractive value	16.2
Ether soluble extractive value	19.3

All reading are average of three values, n=3**, Abbr.:** AML=*Abutilon muticu*m (Leaves)

Table No. 3. Percentage yield value of various extracts of Leaves of *Abutilon muticu*m

S./No.	**Extract**	**Estimated percentage (%w/w)**	**Color of extract**
		AML	AML
1.	Aqueous	15.1	b
2.	Methanol	16.3	db

Abbr.: AML=*Abutilon muticu*m (Leaves)*,* b=brown, db=dark brown,

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