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Preliminary Physico-Phytochemical Study of the bark of *Acacia nilotica*

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ABSTRACT

Acacia nilotica L. is plant of family Mimosaceae and has a great medicinal potential. It is used for the treatment of various diseases and aliments because of its antimalarial, anti-dysenteric, properties. In present study were carried out the characterization of morphological features, determination of physical constant such as the total ash value, acid insoluble ash value and water soluble ash value were 2.19%, 0.66% and 1.53% respectively. Loss of weight on drying was 7.65%, the percent yield for ethanol 8.16% and water 8.05%., preliminary phytochemical screening and TLC profiling of different extracts of *Acacia nilotica* bark.

Keywords: *Acacia nilotica*, Mimosaceae, Flavonoids, Alkaloids and Glycosides.

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INTRODUCTION

Acacia nilotica (Mimosaceae) commonly called Babul. Acacia is the most significant genus of family Leguminosae firstly described by Linnaeus in 1773. The plant is a tree with yellow mimosa-like flowers and long grey pods constricted between seeds. The barks and branches bear spikes about 2cm long. The leaves are five and densely hairy with 3-6 pairs of pinnae consisting of 10-20 pairs of leaflets that narrow with parallel margins that are a rounded at the apex and with a central midrib closely crowded. The inflorescences consist of bright yellow flowers in auxiliary head on stalk that half way up. The flowering period of the plant is between November and March [1]. *Acacia nilotica* has been proved as effective medicine in treatment of malaria, sore throat (aerial part) and toothache (bark) [2, 3]. The powdered bark of the plant with little salt is used for treating acute diarrhea [4]. Standardization is difficult because herbal drug are usually mixture of constituents and the active principal in most cases is unknown. Therefore the present study was designed to standardize bark of *Acacia nilotica*.

MATERIAL AND METHODS

Plant Material

The bark of the plant *Acacia nilotica* was collected from the local area of District Vidisha M.P., India. It was authenticated by the botany department of the Institute and a voucher specimen was preserved in the herbarium record in Pest Control and Ayurvedic Drug Research Laboratory, Vidisha (M.P.) for further reference. The bark was stored under the normal environmental condition and the macroscopic characters were studies as per the produce given in WHO guidelines [5].

Physicochemical Studies

The loss of drying, ash value (total ash, acid insoluble ash, water soluble ash) [6], extractive value (petroleum ether, benzene, chloroform, ethanol, and water), were determined according to the official methods of Ayurvedic Pharmacopoeia of India [7].

Extraction Method

The extraction was performed according to the method given by Harborny [8]. The barks of the plant were washed with water, shade dried and ground into powder by using pestle and mortar. The powder of the plant material was extracted in Soxlet apparatus using different solvents of increasing polarity. The extraction was done for 48 hrs. duration and up to 8 cycles of extraction. The crude extracts were concentrated in a rotavapour below 40 ºC. After that, the crude extracts were evaporated on a water both to get dryness. The extracts obtained with solvents were weighed and their percentages were calculated as compared to the initial weight of the plant material to get the extractive values. The extracts were subjected to qualitative phytochemical investigation and thin layer chromatography for the preliminary identification of

the phytoconstituents [9]. TLC plates were first viewed in day light then in UV chamber before keeping in iodine chamber and R_f of all were noted. Different solvent systems were found to be effective to get maximum no. of spots for various extracts.

RESULTS AND DISCUSSION

The macroscopical study of the bark of A. nilotica was done. For the study, the barks were kept in the natural environment. The barks were found to be dark brown in colour, rough and often longitudinally fissured, variable shape and bitter in taste (Table-1). The values of the physical constants like ash values, extractive values and loss on drying were determined. These values can be used for further investigation (Table-2). Preliminary qualitative phytochemical screening revealed the presence of alkaloid, flavonoids, steroids and tannins (Table-3). Chromatography is used for the separation and identification of various components and R_f value of developed spot of different extracts were calculated with colour (Table-4)

Table 1: Macroscopical Evaluation of *Acacia nilotica* bark

S. No.	Features	Observations
1	Colour	Dark brown
2	Odour	Characteristic pungency
3	Taste	Bitter
4	Shape	Variable

Table 2: Physicochemical analysis of *Acacia nilotica* bark

SNo.	Solvent	Weight of plant material (gm)	Percentage of Yield (%)	Colors of extracts
1	Pet. Ether	200	5.16	Dark brown
2	Benzene	200	6.42	Brown
3	Chloroform	200	6.52	Yellowish
4	Ethanol	200	8.16	Brown
5	Water	200	8.05	Reddish brown

CONCLUSION

Present study may be concluded to supplement information in respect of macroscopic and other physical values and parameters will help to identify the species of plant, phytochemical study will reveal the presence of the compounds, which play major role in the medicinal value of this plant. Since A. nilotica bark is known for its wide range of medicinal properties, the study may be useful in respect to its identification, authentication and standardization.

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Table 3: Phytochemical screening *Acacia nilotica* bark

Group	Name of the Test	Observation	Inference
Alkaloid	(a) Dragendorff's test (b) Mayer's test	Reddish brown precipitate Cream colour precipitate	**+** +
Flavonoids	(a) Alkaline reagent test (b) Ferric chloride test	Yellow colour turn colorless Green precipitate	+ +
Sterols	(a) Sulfuric acid test	Cream colour instead of brownish precipitate	+
Glycoside	(a) Modified Borntagers	Changed violet to pink precipitate	-
Saponin	(a) Froth formation test Tannins (b) Ferric chloride test Amino acid (c) Ninhydrine test	No stable froth Blue colour precipitate Violet colour precipitate	- + +
Protein	(a) Xanthoprotein test (b) Heat test	Orange colour precipitate No coagulation	- -
Carbohydrate	(a) Barfoeds test (b) Fehling solution test	Red precipitate Red colour formed	- -

+ Present, - Absent

Table 4: Observations of thin layer chromatographic studies of A. nilotica barks

Extracts	Mobile phase	No. of spots	R_f values	Visible light color
Pet. Ether	Methanol: Chloroform (8:2)	3	0.55	Light brown
			0.46	Brown
			0.75	Brown
Benzene	Methanol: Ethyl acetate: Water (2:7:1)	4	0.18	Brown
			0.3	Dark brown
			0.39	Yellowish
			0.81	Yellow
Ethanol	Methanol: Chloroform (8:2)	2	0.13	Yellow
			0.21	Brown
Water	Methanol: Chloroform: Water (2:8:1)	2	0.21	Brown
			0.31	Brown

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