Preliminary Physico–Phytochemical and Phyto–Cognostical Evaluation of the Leaves of *Acacia nilotica (L.)*

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ABSTRACT

Acacia nilotica (Family Leguminosae) are broadly used in traditional system of medicine throughout different part of India, Africa & America. It is used in the treatment of diarrhea, dysentery, cough, tuberculosis and leprosy. It is very important to standardize the plant part pharmacognostically for its utilization in different formulation. The current study deals with the determination of morphological character, determination of their physical values like total ash, acid insoluble ash, water soluble ash, loss on drying, foaming index, swelling index. Also determine the presence or absence of phytochemicals such as alkaloids, flavonoids, saponons, tannins.

Keywords: Acacia nilotica, Leguminosae, Babool, fluorescence and tannins.

INTRODUCTION

Herbal plants are wonderful origin of traditional & modern medicine, useful for primary health care system. Herbal plants have ability for the formation of secondary metabolites such as steroids, phenolic substances, flavonoids, alkaloids, etc. These secondary metabolites are used to treatment of many diseases. *Acacia nilotica* belonging to the family Leguminosae brought its importance for its different traditional uses throughout India. There are about 1200 species found in tropical and subtropical region of Asia, South America, Africa and Australia. It is used in the treatment of various diseases such as colds, diarrhea, dysentery, bleeding piles and bronchitis. *Acacia nilotica* contains many chemical constituents like- gallic acid, arabic acid, chlorogenic acid[1]. *Acacia nilotica* is also useful against multidrug resistant of bacteria and fungus causing nosocomial and community acquired infections. Phytochemical analysis of different parts of *Acacia nilotica* shows different classes of secondary metabolites which have therapeutic potential[2]. It is known as Babool, Kikar (Hindi), Babul (Marathi & Bengali), Babaria (Gujrati), Babli (Kannada) Nalla tumma (Telugu). It is small to medium sized tree. Its bark has dark brown to almost black. Leaves are evergreen with 4-8 pinnate and flowers in spherical heads on the new growth. Root part used in treatment of tuberculosis, it is also used in cancerous tumour of (eye & ear). Leaf part used to treat diarrhea & alzheimer's disease, it is also used as emulsifying agent, suspending agent. Stem part is used as antioxidant, astringent & emollient. Bark contains tannins, saponins, terpenoids, gallic acid, and leaf part contain cresol (antiseptic). The other chemical constituent of Acacia is arabic acid which on hydrolysis gives L-arabinose, L-rhamnose, D-galactose, D-glucuronic acid. Others species of babool are *Vachellia nilotica, Acacia arabica*[3].

Standardization of herbal drugs are difficult because generally mixture of constituents and the active constituent in most cases is unknown. The aim of the current study deal the standardize leaves parts of *Acacia nilotica* (L.)

MATERIALS AND METHODS

Fresh leaves parts of *Acacia nilotica* (L.) Delile were collected from fields of Chandeshwar, district of Azamgarh, Uttar Pradesh, India in the month of January 2018 and authenticated by Prof N.K Dubey, Taxonomist, Department of Botany Banaras Hindu University, Varanasi-221005, Uttar Pradesh, India. A voucher specimen has been preserved in Department of Natural Product, Pharmacy college, Azamgarh, Uttar Pradesh, India for future reference (Vouchers pecimen no.Mimosa.2018/3). The leaves parts were dried under shade and powdered(40 mesh size) and stored in airtight containers. The macroscopic characters were studies as per given procedure in WHO guidelines on quality control methods for medicinal plants materials[4]. Fluorescence analysis of powdered

leaves carried out according to these method Kokoski et al.[5] and Pratt& Chase[6].

MACROSCOPICAL STUDIES

The leaves of the plant were studied for their macroscopic characters such as color, odour, taste, shape and size of the leaf.

POWDER MICROSCOPY

Powder microscopy study was done with the powdered leaves[7].

PHYSICOCHEMICAL STUDIES

The ash values (total ash, acid insoluble ash, water soluble ash),the loss of drying[8,10], extractive values (petroleum ether 60-80^{0}C, chloroform, benzene, aqueous)were determined according to the official methods of ayurvedic pharmacopoeia of india[9,11-13]., Foaming index[14]., swelling index[15], were performed according to the official methods prescibed in Indian Herbal Pharmacopeia[16]. and the WHO guidelines[4].

EXTRACTION METHOD AND PRELIMINARY PHYTOCHEMICAL SCREENING

For the phytochemical screening, the powdered leaves were extracted with petroleum ether (40^{0}C), chloroform, benzene, aqueous respectively in a series using cold maceration technique. All extract were concentrated in a rotary vacuum evaporator below 40^{0}c and subsequently dried in high vacuum to get solid crude petroleum ether extract (PEAN), chloroform (CEAN), benzene (BEAN), aqueous (AEAN) respectively. Phytochemical screening of the various extract of *Acacia nilotica* leaves was performed for the detection of various phytoconstituents such as tannins, flavonoids, alkaloids and saponins as per standard procedure[17-19].

RESULT AND DISCUSSION

In literature survey it was found that the plant possesses several traditional and pharmacological uses. The macroscopical study of the leaves of *Acacia nilotica* (L.) was done. The leaves were ever green in colour with 4-8 pinnate, bipinnate, average 4-20 mm long, 1.3- 3.8 cm long leaflets & 10-20 pairs, Astringent in taste (Table-1).

Pharmacognostical standardization was essential tool for proper utilization of the plant for pharmaceutical uses. The values of the physical constant like ash values, loss on drying, extractive value were determined. Extractive value and color of extract was investigated (Table-2). Preliminary qualitative phytochemical screening shown that presence of alkaloids, tannins, flavonoids and saponins showed the leaves are rich sources of secondary metabolites responsible for different pharmacological activities. (Table-3). Swelling index contain powered drug 0.95cm. Fluorescence nature of the powder drug with different chemicals was analyze using short light wavelength and longer light wavelength and the observation were reported in table no-4. The height of the foam in every test tube was less than 1cm, the foaming index were less than 100(<100). (table-6). *Acacia nilotica* (L.) Leaves powder microscopy showed trichome.

CONCLUSION

Preliminary physico-phytochemical study of the *Acacia nilotica* (L.) Leaves study concluded to macroscopic, other physical values and parameters will help to identify the species of plant, phytochemical screening will help the presence of secondary metabolites, Microscopy is an important tool in the evaluation of crude drugs which is applicable at various levels such as the authentication of the crude drugs, study of powdered drugs, which is responsible for the medicinal and pharmacological importance of the plant. *Acacia nilotica* (L.) Leaves is known as wide range of medicinal value, it helps to identification, authentication and standardization. It also require to research on phytochemical and pharmacological aspect. However research going on it would be easier to develop new drugs.

Table 1: Macroscopical evaluation of *Acacia nilotica* (L.) leaves

S. No.	Feature	Observation
1.	Color	Green
2.	Odour	Characteristics
3.	Taste	Astringent
4.	Size	Av. 4-20 mm long

Table 2: Physiochemical Analysis
of *Acacia nilotica* (L.) Leaves

S. No.	Solvent	Wt. of Plant material (gm)	%age of yield	Color of extract
1.	Chloroform	4	5%	Greenish Brown
2.	Pet. Ether	4	1.80%	Greenish Brown
3.	Benzene	4	7.5%	Pale green
4.	Aqueous	4	4.75%	Yellowish brown

Table 3: Phytochemical screening
of *Acacia nilotica* (L.) Leaves

S. No.	Test	Chloroform	Pet. Ether	Aqueous
1.	Alkaloids	+	−	−
2.	Flavonoids	−	−	+
3.	Tannins	+	+	+
4.	Glycosides	−	−	−
5.	Saponins	−	−	+

(+)- present, (-)-absent

Table 4: Fluoroscence Analysis of *Acacia nilotica* (L.) leaves powder

S. No.	Treatment	Normal light	U.V. light (S. length)	U.V. light (L. length)
1.	Powder + Dil. HCl	Pale green	Light green	Dark green
2.	Powder + Con. HCl	Yellowish green	Grayish green	Dark grayish green
3.	Powder + Dil.H2SO4	Green	Light green	Green
4.	Powder + Iodine	Light green	Pale green	Dark blackish green
5.	Powder + Fecl3	Yellowish green	Pale green	Dark grayish green
6.	Powder + Dist. H2O	Green	Light green	Light green

Table 5: Data showing the Physio- chemical
standard values of *Acacia nilotica* (L.) Leaves

S. No.	Parameters	Values
1.	Tatal ash(mg/gm)	4.05
2.	Acid insoluble ash(mg/gm)	0.49
3.	Water soluble ash(mg/gm)	1.34
4.	Loss on drying(mg/gm)	6.1
5.	Swelling index(cm)	0.95

Table 6: Foaming index of *Acacia nilotica* (L.) leaves Extract

Treatment	sample number of the test tube									
	1	2	3	4	5	6	7	8	9	10
dilutions(drug extract + water)	1:9	2:8	3:7	4:6	5:5	6:4	7:3	8:2	9:1	10:0
height of foam(cm)	0.21	0.2	0.31	0.1	0.39	0.28	0.13	0.32	0.20	0.25
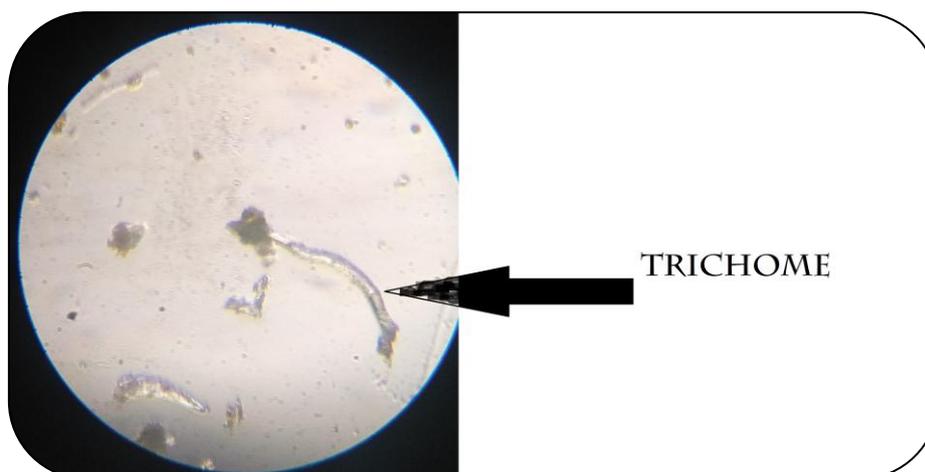
Fig: powder microscopy of *Acacia nilotica* (L.) Leaves
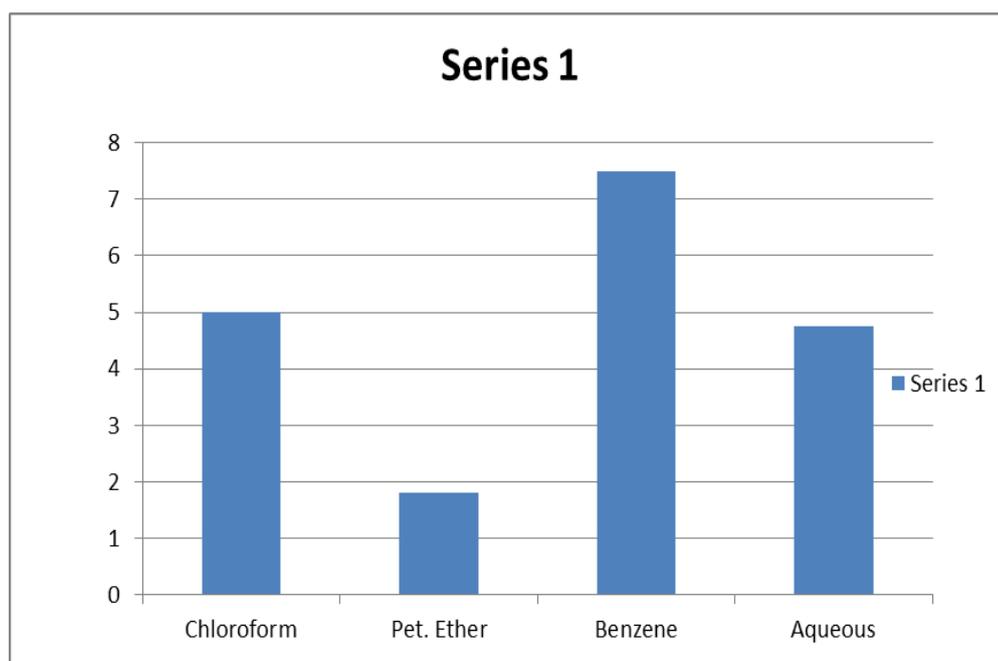
Fig: Extractive value(%) different extract of *Acacia nilotica* (L.) Leaves

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