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TAXONOMICAL STUDY OF *ACACIA NILOTICA* (LINN) WILD (A DYE YIELDING PLANT) IN CHURU DISTRICT

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ABSTRACT

The genus *Acacia* belongs to family Mimosaceae. *Acacia* Wild is a very large genus containing trees, shrubs and climbers. *Acacia nilotica* (linn), Wild is known in India as babul, kikar, babur (Hindi). It is a moderate sized tree with a spreading crown. It is indigenous to the Indian Sub-continent as also in Tropical Africa, Burma, Sri Lanka, Saudi Arabia, Egypt and in West and East Sudan. In India, natural babul forests are generally found in Maharashtra, Gujarat, Andhra Pradesh, Rajesthan, Haryana and Karnataka. *A. nilotica* is truly a multipurpose tree. Its timber is valued by rural folks, its leaves and pod are used as fodder and gum has a number of uses. It tolerates extremes of temperature and moisture. It is suited for planting on marginal lands and can survive both drought and flooded conditions.This article briefly reviews the Taxonomical as well as economic importance of *Acacia nilotica* with plant description.

KEYWORDS: Ethnomedicinal Plant, *Acacia Nilotica* (Linn.).

INTRODUCTION

Acacia is a genus of shrubs and trees belonging to the subfamily Mimosoideae[12,15], of the family Fabaceae or Leguminosae,[13,03] first described by the Swedish botanist Carl Linnaeus (1773). They are pod-bearing, with sap and leaves typically bearing large amounts of tannins and condensed tannins that historically in many species found use as pharmaceuticals and preservatives. This name derives from the Greek word for its characteristic thorns, ἀκίς (*akis*, thorn). The generic name derives from ἀκακία (*akakia*), the name given by early Greek botanist-physician Pedanius Dioscorides (ca. 40-90) to the medicinal tree *A. nilotica* in his book Materia Medica. The species name *nilotica* was given by Linnaeus from this tree's best-

known range along the Nile river. The genus *Acacia* previously contained roughly 1300 species, about 960 of them native to Australia, with the remainder spread around the tropical to warm temperate regions of both hemispheres, including Europe, Africa, southern Asia, and the America. The extract of pods or legumes is known as *Aqaqia* in Unani system of medicine. When it is obtained from unripe fruit then called as *Qurz.*[19,1,17,8,9] It is Native to Egypt, seen throughout the greater part of India, Ceylon, Baluchistan, Waziristan, Arabia, Egypt and tropical Africa.[10] The synonyms are *Acacia arabica* (Lam.) Willd, *Acacia scorpioides* W.Wight, *Mimosa arabica* Lam., *Mimosa nilotica* L., and *Mimosa scorpioides* L.

Acacia nilotica know as babul is the most important tree of the dried parts of India. Almost all its parts are used in different aspect including root, bark, leaves, flower, gum, pods etc.[17,5] The bark of babul tree contains tannin made up of strong and astringent acid (gallic acid) and used in tanning and dyeing, inks and pharmaceuticals.[8,15]

Study Area

As we know that the area under district i.e. Churu district belongs to the State of Rajasthan, the State of Rajasthan is located in north-western India . The district of Churu lies in the north-east of Rajasthan State at an altitude of 286.207 metres above the mean sea level. From geographical spread point of view has extension from 27°24' to 29° north latitudes and 73°40' to 75°41' east longitudes. It is bounded by Hanumangarh in north, Bikaner in west, Nagaur in south and Sikar, Jhunjhunu districts and boundaries of Haryana State in the east. It covers six tehsils namely: Taranagar, Rajgarh, Churu, Sardarshahr, Ratangarh and Sujangarh.

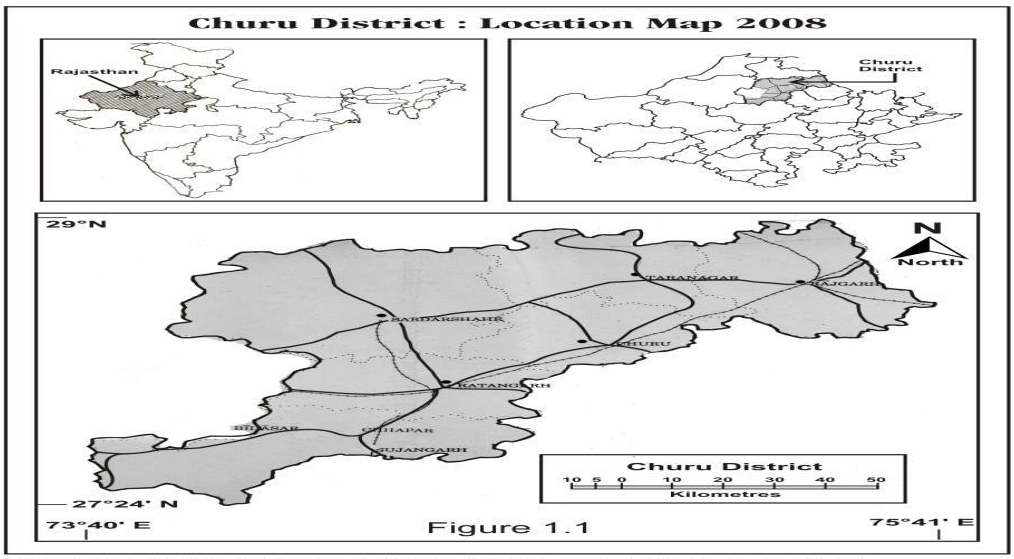

Figure 1.1

Source : Based on Survey of India Map with The Permission of the Surveyor General of India

The area under research work was studied by following botanists and time to time viz; first of all the Sekhawati region was touched from vegetational study point of view by Mulay and Ratnam (1950), Bikaner and pilani neighbourhood areas by joshi (1956 and 1958), vegetation of chirawa by Nair (1956), again Nair and Joshi for Pilani and neighbourhood areas (1957), vegetation of harsh nath in aravalli's hills was studied by Nair and Nathawat (1957), vegetation of Jhunjhunu, Manderella and neighbourhood by Nair (1961), vegetation of ajit sagar dam by Nair and Kanodia (1959); Nair, Kandodia and Thomas (1961) studied the vegetation of Khetri town and neghbourhood areas and vegetation of Lohargal and it's neighbourhood areas of Sikar district by Nair and Malhotra (1961). After the work of Nair and Malhotra (1961), i.e. four decades ago. the area was again left for any sort of further research work in the field of applied Botany. A significant, very authentic taxonomic work was contributed in the field of botany by Bhandari with the publcation of a book Flora of the Indian desert (1990).

MATERIAL AND METHODS

Plant specimens were collected from the all parts of Churu district. All the apparatus required to carry out botanical explorations *viz.*, study area map, plant cutter, field note, pencil, pen, thread, water can, blotting sheet, polythene bag, vasculum, camera, field arrangement and identification keys published literature for identification. The herbarium studies were supplemented by extensive observations in the field.

Detailed survey has made in gathering information regarding uses has been documented. Usually, the survey in each locality started with the interview of elderly and experienced members, locally known as Hakims. Besides, this the common people of the surveyed localities who themselves have used these plant for different aspect were interviewed to proove veracity of the curative features of plants. Medicinal uses and data about the treatment of various alignments based on the information gathered by using questionnaires are given subsequently. The plant specimens were identified by consulting different Floras and literatures, viz, and by comparing with the herbarium specimens available at the Herbarium, Department of Botany, S.P.C Govt. College, Ajmer and M.D.S. University, Ajmer.

The main objectives of the present study are to explore, identify, medicinal aspects and document the *Acacia nilotica* of churu district, Rajasthan.

Taxonomical Study of *Acacia nilotica* (Linn.) Babul

Botanical Classification

Kingdom-Plantae.

Class- Dicotyledonae.

Sub-class-Polypetalae.

Series- Calyciflorae.

Order-Rosales.

Family-Mimosaceae.

Genus- Acacia.

Species- *Acacia nilotica* (Linn.) Babul.

Botanical Name

Acacia nilotica (Linn.) Babul

Common Name

Unani Tibbi: Aqaqia.[17,7,2]

English: Indian gum arabic, Black babool.[13,10]

Arabic: Ummughilan[10], Usare qurz[9,2]

Persian: Kharemughilan[17,9,10]

Urdu: Babul, Kikar[17,10]

Hindi: Kikar[1,9,10]

Sanskrit: Babbula[10]

Kannada: Jaali, Gobbli[2,1]

Tamil: Karuvelam[10]

Telugu: Nallatumma[1,10]

Sinhala: Babbulae[4]

Distribution

Acacia nilotica is naturally widespread in the drier areas of Africa, from Senegal to Egypt and down to South Africa, and in Asia from Arabia eastward to India, Burma and Sri Lanka. The largest tracts are found in Sind. It is distributed throughout the greater part of India in forest areas, roadsides, farmlands, tank foreshores, agricultural fields, village grazing lands, wastelands, bunds, along the national highways and railway lines. Mostly it occurs as an isolated tree and rarely found in patches to a limited extent in forests. It has been widely planted on farms throughout the plains of the Indian subcontinent.

In Rajasthan, this species occurs in most part of the state but it avoids extreme arid conditions. The species is abundant in northern Rajasthan, particularly in the districts of Jaipur, Bikaner, Siker, Jhunjhunu, Churu, Bharatpur, Alwar, Sawai Madhopur, Dausa, Kota and Bundi and adjoining areas, where rainfall is comparatively better.

Botanical Description

It is an ever green tree, growing upto 10 meters in height. It is a small tree with dark brown or black longitudinally fissured bark; branch lets slender, terete and pubescent when young.[10] The tree generally attains a height of 15 m and girth of 1.2 m, though trees up to a height of 30 m with a girth of 3 m have also been recorded.[1] The leaves are 2-pinnate, 5-10 cm long; main rachis downy, often furnished with glands; petioles are 2.5-5 cm long; stipular spines very variable, 0.6-5cm long, and smooth.[13] The leaflets are opposite in 10 to 20 pairs crowded, sessile, linear-oblong, obtuse or acute, rigid, greyish green about 1/6 inch long.[10] The flowers are yellow, golden–yellow, fragrant, crowded in longstalked, globed heads, 1.5 cm in diameter, forming axillary clusters of 2-5 heads,[1] and pubescent; bracteoles 2, calyx campanulate, 1.25 mm long; teeth very short. Corolla 3 mm long; lobes short, triangular.[10] Pod shortly stalked, 3 or 4 inches long by about ¾ wide, more or less constricted between the 2-6 seeds, flat except over the seeds, smooth, pale membranous, with a strong fibrous marginal rib and fainter transverse reticulating veins. Seeds with a long funicle slightly dilated at the hilum, roundish in outline[10] and persistently grey downy.[1] It is very bitter to taste.[5,17,7] The gum exudes from the cuts in the bark in form of ovoid tears. The tears are glossy and marked with minute fissures and are brittle in nature. The colour of the gum varies from pale yellow to black. It is soluble in water.[13,17]

Economic Importance

Acacias are established as very important economic plants since early times as source of tannins, gums, timber, fuel and fodder. They have significant pharmacological and toxicological effects In Africa and the Indian subcontinent; *Acacia nilotica* is extensively used as a browse, timber and firewood species.[6,12,15] The bark and seeds are used as a source of tannins[20,15] The species is also used for medicinal purposes.

Timber

The wood is widely used for construction as posts, rafters, beams and in door frames. It is one of the most favoured timbers for all types of agricultural implements like ploughs, harrows, crushers and rice pounders, and is extensively used in card building, for yokes, shafts, wheels

and body work.Babul wood is also recommended for certain types of sports and athletic goods like clubs, wall bars, parallel bars, etc.

Fuel wood

As a fuelwood, it is an excellent material and is also made into charcoal. Its charcoal is considered to be superior to charcoal from other species.

Pulp and Paper

The wood from Acacias is good for paper and pulp making. It is reported that, rayon and paper pulp properties from *A. nilotica* compare favourably with those of *Dendrocalamus strictus* and *Eucalyptus hybrid*. However, since babul wood is highly valued for agricultural implements and house construction it is rarely available for pulp making.

Tanning Material

Bark: The bark is obtained mainly as a by-product when trees are felled for timber or fuel. It is separated by beating the logs with wooden mallets and the strips obtained are dried in the open chipped into smaller pieces and sent to tanneries without grading. The proportion of bark to wood is roughly 1:5 by weight. A 15 year old plantation of about 620 trees per hectare may yield about 5 tonnes of bark per hectare.

Pods: The whole pod of babul contains about 12-19 per cent tannin and that removed of seeds 18-27 per cent tannin.

Gum

The gum obtained from *A. nilotica* is known as "Indian Gum Arabic". It is generally considered inferior to the true Gum Arabic obtained from *A. senegal* in medicinal properties.

Medicinal Uses

The leaves, bark, gum and pods of *A. nilotica* are used for medicinal purposes. The tender growing tops and leaves are used as a douche in cases of gonorrhoea, dropsy and leucorrhea. Pulp of leaves, decoction of bark and the gum are prescribed in diarrhoea, dysentery and diabetes. A paste made of the burnt leaves with coconut oil makes a very efficacious ointment in cases of itch. The leaves and the gum are used for gargling for relaxing sore throat and spongy gums. Decoction of leaves is also used as wash for bleeding ulcers and wounds.

Food

The seed of babul are eaten roasted or raw in time of acute scarcity in Rajasthan. Air dry seeds contain moisture 8.83%; crude protein 26.4%; eather extract 3.3% and free extract 62.9%; crude fibre 2.7%; total ash 4.7%. The other elements in seed are calcium 673.0; phosphorus, 420.0; iron 4.9; Niacin, 3.17; ascorbic acid 4.51; Thiamin 0.24, mg/100 gm.

Dye Stuffs

Dye stuffs from *A. nilotica* is prepared by boiling the pods, leaves, bark in varying proportion and occasional additions of wood extract. Variety of colours from yellow to black through brown can be obtained by varying proportion of leaves, pods, bark and wood extract.

Fencing Material

Thorny branches of babul are useful as fencing material. The spines are also used as fishing hooks and as a substitute for pin. The trees are also planted closely along the field boundary as live fence.

Avenue Tree

Babul is useful as a hardy avenue tree, where selection of species is difficult. It is also used as a live-hedge fence round circular trenches for planting other important avenue trees. Perhaps, there is no single Indian tree as useful to the largest proportion of rural population in multifarious ways. Due to its sparse crown it casts a very light shade and is not detrimental to crops grown under it. It is also a known nitrogen fixer. This is the reason why in dry hot parts of India, it is grown on the embankments of fields. It has an important role to play in social forestry of future.

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