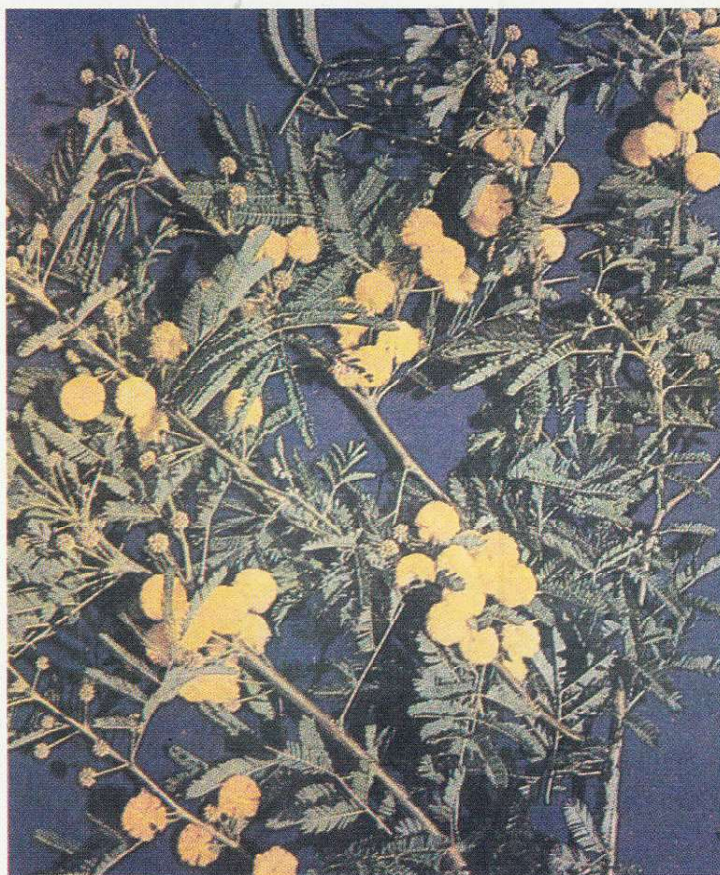


## ACACIA NILOTICA

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<b>Botanical name</b>	<i>Acacia nilotica</i> (Linn.) Willd. ex Delile. subsp. <i>indica</i> (Benth.) Brenan.	<b>Unani</b>	Aqaqia, Kikar, Acacia, Babul, Mughilan
<b>Synonyms</b>	<i>Acacia arabica</i> (Lamk.) Willd. var <i>indica</i> Benth.. <i>Mimosa arabica</i> Lamk.	<b>Homoeopathy</b>	<i>Acacia arabica</i>
<b>Family</b>	Leguminosae, Mimosaceae	<b>Local name</b>	Kikar, Babul
<b>Classical names as adopted in various traditional systems of medicine viz. Ayurveda, Siddha, Unani, Homoeopathy etc.</b>		<b>Trade name</b>	Babul, Gum arabic, Babla
<b>Ayurveda</b>	Babboola	<b>Vernacular names</b>	

### Vernacular names

Assamese: *Torua kadam*; Bengali: *Babla*, *Babul gachh*; Gujarati: *Kalo bavala*, *Babula gonda (gum)*, *Kikra-gond*; Hindi: *Babula*, *Babla*, *Babur*, *Kikar*; Kannada: *Karijali*; Konkan: *Babulzhadd*; Malayalam: *Babula*; Tamil: *Karuvelum*, *Karuvel*, *Karuveylam*; Marathi: *Babhul(a)*, *Bablicha-jhada*, *Babhula*; Oriya: *Baburi*; Punjabi: *Kikkar*, *Sak*; Telegu: *Nellatamma*, *Suma*; Sanskrit: *Vaboula*,

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*Babbula, Abha, Barbura, Kinkerata, Yugmakanta, Dridaaruha, Sookshmapatra, Peetapushpa, Kashaaya, Maalaphala*; English: *Indian gum arabic tree, Babul, Babul acacia*.

### Botanical description

A moderately sized spiny tree with dark-brown or black, longitudinally fissured bark; branches slender, terete, pubescent when young. Leaves 2-pinnate, 5-10 cm long, main rachis downy, often furnished with glands; petioles 2.5-5 cm long; stipular spines very variable, 0.6-5 cm long, smooth, usually whitish, straight, sharp, often absent; pinnae 4-9 pairs, 2.5 cm long, shortly stalked; leaflets 10-25 pairs, 3-6 by 1.2-2 mm long, linear, glabrous. Flowers yellow, in globose heads; peduncles axillary, in fascicles of 2-6, terete, pubescent; calyx cup shaped, 1.25 mm long; corolla twice the length of the calyx. Pods solitary, stalked, straight, sub-indehiscent, moniliform, 7.5-15 by 1.3-1.6 cm, rather fleshy, deeply indented between the seeds, densely grey-downy. Seeds 8-12.

### Distribution

Indigenous to the plains of Andhra Pradesh and Maharashtra and is cultivated or found self sown throughout the drier parts of India, ascending to an altitude of 900 m.

### Availability (Abundant/rare/threatened/ endangered etc.)

Abundant

### Part used

Gum ( in Homoeopathy);  
Gum, Pod, Bark, Leaves  
(in Ayurveda and Unani).

### Action and uses

#### Traditional system

Different parts are used in hair fall, earache, syphilis, cholera, dysentery, leprosy and rinderpest. *Bark*: cooling, astringent, demulcent, anthelmintic, cures skin diseases, bleeding piles, used in asthma and bronchitis, its decoction is used in leucorrhoea; *Gum*: in sore throat, given with latex of *Calotropis procera* to cure asthma, stops bleeding, urinary and vaginal discharges, useful in diabetes; *Leaf*: bruised leaves are applied to eye sores

in children; eaten in throat infection; *Paste of burnt leaf*; on itch; *Flower, pod and gum resin*: used in diarrhoea and dysentery; *Pod*: in impotence and urino-genital disorders.

### Ayurvedic system

वव्वुलः कफनुद् ग्राही कुष्ठक्रिमिविषापह।  
वव्वुलस्य तु निर्यासः ग्राही पित्तनिलापहः॥  
रक्ततिसारपित्तास्त्रामेहप्रदरनाशनः।  
भगनसन्धायकः शीतः शोणितस्त्रूतिवारणः॥  
(द्रव्यगुण)

vavvula: kaphnud grahi kushthakrimivisapaha: .  
vavvulasya tu niryyasa: grahi pittanilapaha: ..  
raktatisarapittasramehapranasana: .  
bhagnasandhayaka: sita: sonitasrutivarana: ..  
(Dravyaguna)

The bark is a powerful astringent and its decoction is used as a gargle in spongy gums, sore throat, stomatitis, chronic dysentery, diarrhoea and for cleansing in haemorrhagic ulcers and wounds. Burnt bark mixed with burnt almond and salt are used as a tooth powder. The juice of the tender leaves is dropped into the eyes for epiphora and conjunctivitis. The powder of the tender pods is astringent, demulcent and has a beneficial influence in diarrhoea and dysentery. The pods are used in cough. Gum is emollient and demulcent and is used in diarrhoea, dysentery, leucorrhoea and as a styptic. A paste made from the gum with the white of an egg is used as an application to burns and scalds.

### Unani system

Acacia is used to control bleeding in enteritis, dysenteric diarrhoea as well as haemorrhage from any organ. It is also effective in spermatorrhoea, nocturnal emissions and leucorrhoea. A paste made from this drug is used over hot inflammations and conjunctivitis to prevent pus formation. In stomatitis and rectal prolapse, powder of this drug is sprinkled over the affected part. In case of burn, acacia is used with egg white. It is also used for blackening hair.

### Homoeopathic system

The drug is mentioned in Bradford's *Homoeopathic Provings*. The gum is used to control diarrhoea.



### Modern system

In pharmacy, gum acacia is used in preparing emulsions, tablets, pills, etc. It is useful in diarrhoea, dysentery, diabetes mellitus, sore throat etc. Decoction of bark is used for gargles.

## Pharmacognostic

### Macroscopic

#### Gum

*Acacia arabica* gum is obtained by making incisions into the bark. It occurs in irregular and broken tears of varying sizes, brown or red to light-straw in colour. The thick pieces are opaque, the thin ones are translucent. Each tear is about 1.5 cm in diameter. The gum is very brittle; the fractured surface is glassy and occasionally iridescent; odourless, and bland mucilaginous taste. *Gum powder*: brown or light-straw, microscopic fragments containing traces of starch or vegetable tissue, almost entirely soluble in twice its weight of water yielding a very viscous, slightly acid solution which is slightly glairy and when diluted with more water and allowed to stand, yields a very small amount of gummy deposit; insoluble in alcohol (90%). A 10% w/v aqueous solution is slightly dextrorotatory.

#### Bark

Hard, dark brown or black, deeply fissured transversely and longitudinally; inner surface, reddish brown, longitudinally striated and fibrous, breaks with difficulty and exhibits a fibrous fracture; taste astringent.

### Microscopic

#### Bark

Transverse section of mature bark shows 15-25 layered, thin-walled, slightly flattened, mostly rectangular, brown coloured cork cells; a few lenticels formed by rupturing of cork cells; secondary cortex of ovate to elongated cells; many tanniferous stone cells, variable in shape and size present in large groups; secondary phloem stratified, consisting of alternate band of phloem fibers and phloem parenchyma separated by medullary rays and consists of sieve tubes, companion cells, fibres, crystal fibres and phloem parenchyma; phloem tissue filled with reddish or brown content, crystal fibres thick-walled, elongated, divided by transverse septa into segments,

each contains a prismatic crystal of calcium oxalate; medullary rays uni to multiseriate, run almost straight; ray cells elongated to polygonal, 20-24 cells high and 2-5 cells wide; crystals of calcium oxalate found scattered amongst the stone cells, cells of secondary cortex and phloem parenchyma.

#### Powder

*Powder of bark* as such is reddish brown coloured; under microscope many prismatic crystals of calcium oxalate; stone cells, both with narrow and wide lumen and crystal fibres were seen.

### Standards and tests

*Identification* : A flocculent precipitate is produced when 0.2 ml of dilute lead subacetate solution is added to 10 ml of a 2% cold aqueous solution of acacia.

<i>Total ash</i>	Not more than 4%.
<i>Acid insoluble ash</i>	Not more than 0.5 %
<i>Moisture</i>	Not more than 15 %.
<i>Optical rotation</i>	A 10% aqueous solution is slightly dextrorotatory .

*Residue*: Mixture of 5 g of acacia, 100 ml of distilled water and 10 ml of dilute hydrochloric acid, boiled gently for 15 minutes, yields a residue not exceeding 50 mg.

*Starch or Dextrin* : A 2 per cent aqueous solution of acacia, previously boiled and cooled, does not give a bluish or reddish colour with iodine test solution.

*Tannin-bearing Gums*: No bluish-black colouration or precipitate is produced when 0.1 ml. solution of ferric chloride is added to 10 ml of a 2 percent aqueous solution of acacia.

*Storage*: It should be stored in a dry place. Powdered acacia should be stored in well-closed container which prevent access to moisture.

### Chemical constituents

*Flowers* contain stearic acid, kaempferol 3-glucoside, isoquercetin, leucocyanidin. *Bark* yields several polyphenolic compounds, (+) - catechin, (-)-epicatechin, (+)- decatechin, epigallocatechin,



quercetin, gallic acid, (+)-leucocyanidin gallate, sucrose and tannin. *Pods* have been reported to contain gallic acid and methyl esters, *m*-digallic acid and chlorogenic acid, galloylated flavan-3, 4-diol, and 7,3', 4',5'- tetrahydroxyflavan -3,4-diol and two condensed tannins. *Gum* contains galactose, L-rhamnose, L-arabinose and its derivatives alongwith four aldobiouronic acids. *Seeds* contain amino acids, fatty acids, thiamine, niacin and ascorbic acid alongwith tannin as the major constituent.

## Pharmacology

It was reported that *A. nilotica* subsp. *indica* was likely to cause pollen allergy. The bark is astringent and demulcent and shows anti-viral properties. An extract of bark completely inhibited the propagation of potato virus X.

## Toxicology

Highly mucilaginous powdered form should not be administered directly with or without medicines. Gum acacia is incompatible with alcohol, borax, bismuth subnitrate, calomel, ferric salts, lead subacetate and strong acids.

## Information related to therapeutic evaluation

### Dose

Homoeopathy - 2x and higher .  
Ayurveda - Decoction of stem bark- 6-12 ml  
Fruit powder- 2-4 g.  
Gum - 3-6 g.

## Formulations and preparations

### A. Homoeopathic trituration 1x

Drug strength	1/10
Acacia arabica gum in powder form	100 g.
Saccharum Lactis	900 g

To make one kilogram of the trituration.

#### (i) Potencies

2x and higher to be triturated, 6x may be converted to liquid 8x.

## B. Ayurvedic preparations

Mritasanjivani sura, Babbularista, Lavangadi vati.

## C. Unani preparations

Akakia, Davaga Jaryan Kohana, Sunun Post Muglia, Kurs Akakia

## Trade and commerce

*Wood*: used for charcoal; timber used for agricultural implements; *leaves* are used in India for smoking opium; *gum* is used commercially as gum arabic; the gum is extensively used by calico-printers and dyers; the *bark* is used in tanning in India; the lac insect is found on this tree; the *Pods* yield a useful black dye. It is also a useful plant for afforestation in dry and arid zones. The bark is sold in the market at the rate of Rs.8-10 per Kg.

## Substitutes and adulterants

Many dark coloured varieties of gum arabic occur in commerce and are used for various industrial purposes. Gums from *A. horrida* (Cape gum) and *A. dealbata* (Australian gum) are of an inferior quality. Acacia gum is often adulterated with the gum from various species of *Albizzia*, *Sterculia*, *Lagerstroemia*, etc. and is often contaminated with sand due to faulty collection. Rarely flour or other starchy matter is fraudulently added to the powder. Amritsar gum (*Acacia modesta*), Cape gum (*Acacia farnesiana* Willd and *Acacia leucophaea* Willd) are also used.

## Agrotechniques

Can be raised through seeds. Seedlings can be planted as roadside avenue, wind breaks and shelterbelts as well as biofence in field borders. Babul is characteristic of the dry regions, but does not thrive without irrigation if the climate is too arid. In region where it is indigenous or has become naturalized, the absolute maximum shade temperature varies from 40 to 50°C and the absolute minimum from -1 to 15°C, and the normal rainfall from 7.5 to 125 cm. The tree is frost-tender, but is drought-resistant so long as the sub-soil moisture holds out, it is not fire-resistant. Babul thrives best on riverain alluvium subject to inundation, and on black cotton soil. It is also found on alluvial loam in the plains of north



ern India, on loamy soil in the peninsula and in tank beds in Tamil Nadu. It survives even on *usar* (saline) soils. Direct sowing, either in lines or on ridges, has proved successful for afforestation. Choice of a suitable site, treatment of the soil, preparation of seed, weeding and thinning at regular intervals are essential for obtaining good results. Within a year or two the new plants attain a height of 1.5-2.0 m. Afforestation studies carried out in different arid habitats of Rajasthan showed that babul was able to grow well in shallow alluvial soils overlying hard calcareous pans within the 300-400 mm isohye.

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“Homoeopathy knows that a cure can only take place by the reaction of vital force against the rightly chosen remedy that has been ingested, and that the cure will be certain and rapid in proportion to the strength with which the vital force still prevails in the patients.”

“Organon,” Preface to the 6th Edition.

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