Health Series

Traditional Family Medicine

Isabgol, Gokhru and Brahmi

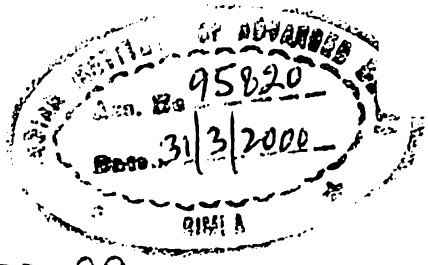
HEALTH SERIES :
TRADITIONAL FAMILY MEDICINE

Isabgol, Gokhru and Brahmi

K.H. KRISHNAMURTHY

BOOKS FOR ALL
Delhi-110052

The information contained in these pages has been culled from various sources. This information is solely meant to create an interest about the wondrous qualities of our medicinal plants. On no account should this be utilised in a lay manner. Help of a trained physician is necessary.



Published by
BOOKS FOR ALL,
C-2/9, 3rd floor, Ashok Vihar,
Phase-II, Community Centre,
Delhi-110052.

Typeset by
ABC *for* **DTP**
6, Rajdhani Enclave, Delhi-34.

Printed at
D.K.Fine Art Press,
Delhi-110052

PRINTED IN INDIA

INTRODUCTION

The plants to be discussed here are three: Isabgol, Gokhru and Brahmi. They are all herbs, very well known and highly effective in their respective areas and much used even now. Isabgol is an exotic introduction of recent times from the Middle East to Ayurveda but it has become very well established here. Unlike most other plants that carry out their medicinal activity directly and chemically due to certain chemical principles they contain, the seeds of isabgol that are the latter's most useful part act by the slimy mucilage that they form when soaked in water. The action is almost wholly physical and highly salutary to the health of the digestive system and healing the lesions and the infections all the way. One of the *gokhrus* viz. the Bigger or the Bade Gokhru also

acts physically by the slimy mucilage or jelly that it creates in combination with water. Brahmi on the contrary acts in the usual way viz. by the chemical activity whose details are not much known still and its field of action is the human brain and the mental health and vigour. In this area it is extolled so much that there are specific proprietary preparations or yogas like *brahmi rasayana* meant for improving mental facilities in many significant ways. Both of these Gokhru or *gokshura* as it is called in Sanskrit and *brahmi* are wholly the contributions from India to the Medical World. Both are indigenous to our country and the medicinal efficacies of both were discovered here and utilised amply. Extensive references do occur for these two drugs in ancient works in Sanskrit on Ayurveda.

A. ISABGOL OR ISPAGHULA

This drug which is also known as psyllium and technically *Plantago* has been an obscure drug in the world Market till recently. Now however it is one of the foremost commercial plant of medicinal value. This came to India also only along with the Islam. India at present however holds a near monopoly in world trade of this highly valued drug. It was no doubt used locally in Europe for sometime, still, it has been slow in entering World trade. It is now cultivated in France, Spain and India. French psyllium comes from *Plantago indica*, the Spanish, from *P.psyllium* while the most famous blond psyllium from India is from *P.ovata*.

Two crops are raised every year. Psyllium seed contains a tasteless mucilaginous substance which acts as a mild laxative and is comparable to agar and mineral oil for use in chronic constipation. This mucilage is extracted and used in cosmetics and to stiffen the fabrics.

The genus *Plantago* consists of 50 different species; of these, ten are native to India. For centuries together a number of them have been used in our indigenous medicine. The herb is found growing in plains of Punjab and Sindh and the low hills from river Sutlej west ward. It is also cultivated in many parts, Bengal and Karnataka (old Mysore area) and the Coramandal coast.

The seed of this herb which is the drug material is boat shaped about 1/8th inch long and less than 1/16 the broad. The seeds are translucent or pinkish grey but the colour varies from brown or white with a pinkish tinge which is what is most preferred. The concave side of the seed is covered with a thin white membrane. When soaked in water the seeds become enormously swollen with an abundance of mucilage that is tasteless and odourless, the value of the seeds is because of this mucilage.

The seeds of many species of the genus have similar properties. *P. amplexicaul* is from Punjab, Malwa and Sindh extending to southern Europe. This yields the brown isabgol often sold in the Indian bazaars, the seeds here are larger. *P. major* known as *luhuriya* in Hindi, and *bartang* or

barhang in Persian is a large herb of the Alpine Himalayas from Peshawar to Kashmir to Bhutan of 2,000 to 8,000 ft. altitude or in Tibet of 10,000-12,000 feet and in Sudan. The seeds are long and brown. This plant was used in the ancient Greek and Roman medicine. They are now used largely in dysentery.

P.ovata, the seeds of isabgol are not mentioned by the authors of the ancient Indian medicine. They as well as the seeds of several other *Plantago* were very frequently mentioned by Arabian and Persian Writers as excellent drugs. Persian physician Athervi of 10th Century refers to it and so also the famous Avicenna. Ever since Islam brought these seeds to India, they have become a popular remedy for chronic dysentery and intestinal fluxes or discharges. Even now they are most extensively used for intestinal upsets. It is a popular household remedy for any kind of diarrhoea specially when acccompanied with blood or mucus.

The seeds contain a fatty oil, an albuminous matter and mucilage so abundantly that 1 part of the seeds in 10 parts of water forms a tasteless jelly in a very short time.

The Several Species of Plantago

Since the genus is large and contains many species that have similar properties and uses it becomes necessary to have a comparative idea of them. This is what is given below.

Medicinally the members of the genus *Plantago* are considered to be emollient (softening the region where applied as a poultice or a fomentation), expectorant (ejecting phlegm from the throat by coughing) and vulnerary (useful iln curing and healing the wounds).

The following are the Indian species and their key botanical features for differentiation.

A. Leaves radical, all being grouped at the ground level:

I. Corolla smooth, not hairy. Fruit is dry and dehescent breaking open at maturity to expose the seeds, or, a capsule. The capsule has 2 compartments or cells, each with 1-2 seeds.

Seeds are angular in shape

a. *P.asiatica* Linn (which was previously called *P. major* Linn)

II. Corolla hairless. Capsule 2 celled, each with 1-2 seeds.

a. Leaves have short stalks; shape, lanceolate (long and lance like); margin, entire or sometimes toothed and they have 3-5 prominent ribs. *P.lanceolata* linn.

b. Leaves are long, very narrowly lanceolate; tip, finely acuminate or drawn into an elongated pointed projection and they have 5 prominent ribs. *P. amplexicaulis* cav.

c. Leaves are narrow-linear (almost line like) or filiform (elongated like a thin filament or a thread); tip, finely acuminate; and they have 3-nerves. *P.ovata* Forsk.

d. Leaves are narrowly linear-lanceolate; attenuate or very thinned at the base; tip, acute; and the leaves have only one nerve. *P. lagocephala* Bunge.

III. Corolla lobes, with stiff hairs; capsule, 2 celled, each with 1 seed. *P. ciliata* Dest.

B. Stem, erect, much branched and with leaves borne on this and not radically at the ground level. On the stem, leaves occur in pairs opposite to one another. *P.psyllium* Linn.

In popular language almost all of them are likely to be regarded as *isabgol* or some "Varieties" of it; that is why the above key will be found useful in differentiating among them by morphological or characters of shape of the different organs of the plant. Everyone of them however does posses many desirable medicinal properties as gien below. A few more morphological features other than the above which are critical and differentiating are also given. Of this, *P.lagocephala* is found mainly in Baluchistan and Turkey (called isufgol in Urdu and used in gripes, constipation, leucorrhoea and boils); hence, omitted below:

1. ***P.asiatica*** Linn. the Asiatic Plantago.

Names

It is called *lahuriya* in Hindi; *bartang* in Bombay and Indian Bazaar; *gul, isafghol* in Kashmiri and *ghuzbe, gul, isafgol, karet* in Punjabi.

Botany

This is a perennial herb with an erect stout root stock. Leaves are alternate, radical, ovate or ovate oblong; tip, acute or subacute; margin, entire or toothed, nearly hairless; base tapering to the stalks which are usually longer than the leafblade, which has commonly 5 prominent nerves. Flowers are scattered or crowded in long, slender, rather loose spikes. Capsules are ovoid, hairless and break open at maturity horizontally like a box exposing the seeds which are 4-8 per fruit, angular in shape, finely wrinkled on the surface and dull black.

The plant occurs mainly in temperate and alpine Himalayas and also Western ghats, in Nilgiris. The seeds are common in Indian Bazaars.

Medicinal Properties

Yunani physicians consider the plant as useful in rheumatism and griping pains of the bowels. They employ the leaves and roots as astringent and use them also in fever. The seeds are used as beneficial in dysentery.

The seeds are considered as stimulant, warm and tonic and a very efficient remedy in dysentery.

In fact, they are used as a good substitute for the seeds of *P.ovata*.

In Lahoul Spiti, of the Himalayan valleys the leaves are applied to cure bruises. In Europe, along the Mediterranean countries, the leaves are considered as cooling, alterative (capable of bringing about desirable alterations in the vital functions of the body) and diuretic, provoking profuse urination. Fresh leaves are rubbed on parts of the body stung by insects, nettle plants, caterpillars and the like to afford good and quick relief. This will also stop bleeding in cases of minor wounds. They are also used in diarrhoea and piles. The rural folk of England apply these leaves to open sores, lesions and wounds or use them in making poultice for application or give a fomentation with a hot decoction of them. Gargling with this decoction is helpful in common cold. For the rustics of Switzerland, this plant is a reputed remedy, for tooth ache, the root or the leaves being applied against the ear of the affected side.

The expressed fresh juice of the plant has proved to be a good remedy in tubercular consumptions that are accompanied with spitting of blood. The root and leaves are much used against intermittent fever. In Baluchistan, the seeds are used for coughs and also as purgative for children.

A bunch of leaves made hot and applied to the foot is presumed to be good enough to draw out the thorn or the splinter within. The Zulus of Africa

squeeze the leaf juice into the mouth and the ears or give a decoction of the root in the form of an enema to clean the intestinal tract of new born infants. Fresh leaf juice is much reputed in malaria; its intake is followed by much sweating.

2. ***Plantago lanceolata*** (with lanceolate leaves) linn.

Names

In Hindi, it is called *battanga*, in Bengali, *baltung, bartung.*

Botany

Leaves are lanceolate, 3-5 ribbed; margin, nearly or quite entire, tapering down into a short stalk. Flowers are arranged in spikes which are ovoid or shortly cylindrical. Capsules contain 2-4 oblong seeds, black in colour.

This is a perennial herb of the Western Himalayas from Kashmir to Simla at an altitude of 500 ft. to 8,000 ft. *P.lanceolaria* is a much variable species morphologically and is mostly European. The Indian plant is considered to be a variety of it called *P. lanceolaria* var *mediterranea* (kerner) Pilger. This is cultivated for its medicinally valuable leaves.

Medicinal Properties

The leaves are applied externally as curative to wounds, lesions, inflammed surfaces and sores.

The seeds are employed along with sugar as a drastic purgative.

In Europe the leaves are considered efficiently astringent (constrictive to living tissues and hence, useful in healing) and employed in healing the sores and dressing up of the wounds. The powdered root is used in curing burning fevers. In South Africa, the plant is used in much the same way as *P. assiatica* viz. like the true isaphgul

P. ovata.

3. ***Plantago amplexicaulis*** (sheathing around the stem).

Names

In Punjabi this is called *gajpipali* (the elephant sized *pippali* or *piper), isafghol;* it is *ispaghul* in Urdu.

Botany

This is an annual or perennial, more or less hairy herb which does not have any prominent stem at all or has a short stem, often branched above. Leaves are narrowly lanceolate, acuminate, 5 nerved, narrowed and sheathing at the base around the stem (hence called *amplexi*-around, *caulis* stem); margin, entire or very distantly toothed. Flowers are white and arranged in ovoid spikes. Capsules are-2-seeded, ovoid, pale brown, smooth, with the top breaking off as a conical lid. Seeds are oblong, boat shaped and brown or nearly black.

The plant is widely distributed in the Mediterranean region but occurs in the plains of Punjab and occasionally Rajasthan. The Indian plant is considered to be a variety called *P.amplexicaulis* var. *bauphula* (Edgew) Pilger. *P.amplexicaulis* is presumed to be the source of the brown isabgol seeds of the Indian Bazaars. Seeds here are larger that those of *P.ovata* but possess equally good demulcent (i.e. cooling and soothing) properties. The mucilaginous matter is contained mainly in the seed coat which also has some tannin, another medically useful, healing substance. The endosperm (a fatty mass within the seed) contains protein and also a fatty oil.

Medicinal Properties

Yunani physicians consider that the properties are just the same as in *P.ovata*.

The herb is considered astringent and also useful in fever. It is highly valued in pulmonary (lung) affections. Seeds are astringent and used in intermittent fever like malaria and is also employed in opthalmia as an application over the eyes.

In Baluchistan, a juice of the seeds is prepared and taken in hot summer as a cooling, refreshing and delectable drink.

4. ***Plantago ovata*** (referring to its ovoid seeds, the officinal or the recognised medicinally useful portion of the plant) Forsk. The *isabgul* or *ispaghola* of the commerce.

Names

There are quite a few significant names for this plant in Sanskrit. They are *ishadgola* (somewhat spherical i.e. ovoid), referring to the seed shape which is what the botanical nomenclature also takes up to name the plant. In all probability it is this term of Sanskrit that has become currupted into its modern name in many languages of the World viz. isaphgul which does not mean anything literally in any of these languages. This is somewhat similar to what we find in another famous medicinal plant given from India to the World, namely turpeth drug or *Ipomea turpethum*, (a well known purgative recognised by all as originally coming from India viz. the *trivrit* of Charaka and other classical authors), *shlakshna jiraka* (the slippery viz. mucilaginous cumin like seeds), *snigdha bija* (viscous cumin).

In English, it is Ispaghulla or spogel seeds.

Its names in regional languages are mostly related to this corrupt from *isapgol*. It is called *eshopgol* in Bengali, *isabgul,ispaghul* in Marathi, *ispaghul, isabghul ispaghul, issufgul* in Hindi; *ispaghol, isparzah* in Persian, *ismogul* in Kashmiri; *ispaghul* in Urdu, *isabgul* in Uriya, *isabagolu* in Kannada, *ispagala vittulu* (seeds) in Telugu and *ishaphukol virai* (seeds) in Tamil.

Botany

This is a stemless or nearly stemless softly hairy or wooly herb. Leaves are narrowly linear or

filiform (thread like), finely acuminate (i.e. drawn out at the tip); margin, entire or distantly toothed, very thin at the base, usually with 3 prominent ribs. Flowers are arranged in ovoid or cylindrical spikes. Capsules are ellipsoid, obtuse, the upper half coming off at maturity as a blunt conical lid, membranous and hairless. Seeds are ovoid-oblong, boat shaped, smooth and yellowish brown.

The plant is a native of the Mediterranean region and West Asia, extending upto Sutlej river and Sind, and the plains of Punjab. But it is now cultivated in many places elsewhere also.

Medicinal Properties

The seeds are sweet, acrid or pungent in taste, mucilaginous, astringent (healing) to the bowels and a tonic. It is useful in correcting *kapha* disorders, billiousness, dysentery and also leprosy. It causes flatulence i.e. gas collection.

Yunani physicians regard the seeds as cooling and demulcent (soothing and refreshing). These are useful in inflammatory and bilious disorders of the digestive tract and good and very beneficial in dysentery and irritation of the intestinal tract. They are applied as a poultice to rheumatic and gouty swellings. Their decoction cures cough and chronic diarrhoea.

Seeds are demulcent and slightly astringent. They are useful in feverish states, common cold and kidney troubles. But their most and justly reputed use is in diarrhoea and dysentery. When

moistened with water, they form excellent emollient viz. drugs that soften the area and thus aid in healing. Soaked in water they become highly slimy and form a cooling demulcent drink which is a very good prescriptive wherever emollient action is needed as in intestinal injury. A moderate healing renders it to be tonic, astringent and therefore healing, because of which reason, this is used as a favourite remedy in Europe to cure chronic diarrhoea whenever all other modes of treatment fail.

The crushed seeds are made into poultice and applied with vinegar and oil to the swellings of rheumatism and gout. Their mucilage is a good lotion for headache. Two to three drachms of it mixed with sugar are given in dysentery and irritation of the intestinal canal to produce an easy stool. Their decoction is prescribed in cough, and the roasted seeds are quite astringent and heal the irritation of the bowels in children and in dysentery.

The demulcent and diuretic properties of the seeds enable them to be used in all inflammatory conditions of gastro-intestinal and genito-urinary tracts. Administered usually in tender coconut water, they are exceeding effective.

The *isabgul* seeds are highly beneficial in chronic dysenteries, of both the kinds viz. due to amoebae or bacillus, the bacteria-called amebic and bacillary dysentery respectively and also in chronic diarrhoea due to irritative conditions of the stomach and the intestinal tract.

A glucoside called aucubin has been found in the seeds but this is physiologically inactive. The tannins that are present quite adequately here do not have any action on either amoeba or the bacteria. The mode of action of the drug is purely mechanical and is due to the large amount of mucilage present in the outer layes of the seed. Importantly, this mucilage has been shown to be not acted upon at all by the digestive enzymes and therefore passes through the intestinal canal as such and unhindered. Here it lines the mucous membrane of the inner walls of the intestine and due to its demulcent activity gives it a protective and sedative cover. Intestinal bacteria have been also shown to have no action whatsoever on this mucilage of *isabgol*. Almost the whole of what has been given to start with thus clears out of the alimentary tract within 12 to 24 hours. During this passage, it coats the inflammed and ulcerated mucosa or the lining layer of the region and protects it from being further irritated by the fluids and the gases, which represent the products of the gastro intestinal and bacterial digestion. All this enables the lesions to heal up quickly. Whatever toxins or poisonous substances are present in the gut are further absorbed by this abundant mucilage and their absorption into the body's system itself is thus prevented. Moreover, the seeds are taken in large quantities and as such they swell up in contact with water and increase the sheer physical bulk of the very contents of the intestine. Chronic constipation is relieved in this

way by mere mechanical stimulation of the intestinal peristalsis—the involuntary and regular stream of alternate contraction and expansion of the intestinal walls which is what moves the food in alimentary tract further on. This mucilage acts thus very much like the liquid paraftin but is much cheaper and is further free from the usual injurious effects produced by a habitual use of paraftin such as malignant diseases of the colon, eczema of the anus, paraffin pains and so on.

5. ***Plantago ciliata*** (referring to the silky dense hairs on the plant, all over) Desf.

Names

In Baluchistan and Punjab, it is called *isabghol.*

Botany

This is an annual or a perennial herb which is often dwarf. It is stemless or with very short stem but is always densely silky or wooly (hence called ciliata, cilia being the Latin term for dense minute hairs). Leaves are usually oblanceolate (lance like, but the pointed end is at the base, near the stalk); tip, has a sharp point or it is mucronate with densely silky hairs; margin is entire or irregularly toothed. Flowers are arranged in ovoid or cylindrical spikes. Even the corolla is silkily hairy beneath.

This is found in the hills of Punjab, Sind and Baluchistan.

Medicinal Use

In Baluchistan, the plant is used as a cure of dysentery.

6. *Plantago psyllium* Linn.

Names

In English, it is called Black psyllium.

In Hindi, it is *kala isabgol* (the black isabgul).

Botany

This is an erect much branched annual herb. Leaves are opposite, linear (thin and line like) or linear-lanceolate, flat, tip, obtuse. Flowers are rosy pink and clustered in ovoid spikes. Fruits are smooth, non-hairy. Seeds are small, boat shaped, yellowish brown, non-hairy and very glossy.

The is a native of the Mediterranean region (specially South France) and is cultivated in Gujarat. The seeds of this plant (called Psllium seed, Plantain seed or Flea seed) are the source of the French and Spanish Psyllium of commerce and are popular mostly in Europe. But they are regarded as inferior to the seeds of *P.ovata* because of their much lower mucilage content.

The seeds are a favourite aperient (laxative) drug in Southern Europe. In France, they are much prevalent as a laxative instead of the laxative mineral water; the dose is one teaspoonful. They act after being soaked for a few hours in cold water

by their mucilage and *after* being taken in, because of a laxative oil released within the intestine. The seeds are commonly dispensed by the druggist shops of London.

7. *Plantago ovata*

We shall now consider in some detail the medicinal and other uses of P.*ovata*,the most famous of the several species.

General Actions of the Drug

Seeds are cooling, demulcent (soothing; allaying down irritation), mildly astringent (contractive of tissues and hence healing), emollient, laxative and diuretic (promoting urination). On getting dried to some extent and browned, seeds increase in their astringent and tonic properties. The mucilage of the seeds is neutral in reaction, and is not altered by adding or precipitated by boiling with alcohol or changed by iodine, borax or iron perchloride. It dissolves only sparingly in water. The important point is that the large quantities of the seed's mucilage that is jelly like is acted on only very little by the digestive enzymes of the alimentary tract, so that this valuable physical medium of healing jelly is left free to confer its beneficial action on the inner tissues in an undisturbed way. It has been tested that even after 24 hours of exposing of this mucilage to salivary enzymes, pepsin and hydrochloric acid, there was very little of its digestion. It thus passes through the small intestine unchanged, acting as a demulcent and a

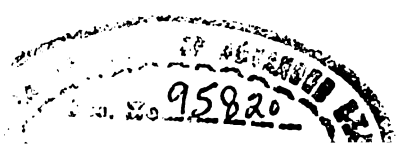
lubricant to all the lining tissues. Even the bacteria of the large intestine do not act on it. Actually its presence there inhibit the bacterial growth.

Experiments on animals have shown that this jelly forms a coating over the surface of the ulcers thus protecting the injured mucosal lining from the irritating products of the alimentary tract and thus aids miraculously in healing. It would also engulf the motile bacteria in its own meshes and neutralisc them.

More importantly, this jelly being colloidal, absorbs remarkably the bacterial and other toxic materials. In addition it acts much like a liquid paraflin relieving constipatory effects and acting as a lubricant. Being a vegetable product besides, it does not have the deleterious effect of the liquid paraffin, a mineral susbtance that may cause malignant cancer of the colon, eczema in the anus, paraffin pains and so on. Over and above all these, it is a much cheaper material than the liquid paraffin.

Administration of the Seeds

The seeds are well cleaned from the impurities which are usually present, strained through a mosquito netting and quickly washed once or twice on a cupful of water. The normal dosage is 2-4 drachms but this may also be as large as 1-2 ounces. 2-3 spoonfuls of seeds may be given 2-3 times a day; they do not have any toxic principles



and most of them would pass out of the gut within 6-12 hours. In case constipation is present, the dosage has to be greater; for, their action is both by the lubrication effect of the mucilage and the increase in the bulk of the intestinal contents which in turn stimulates peristalsis or progressive and alternate expansion and contraction of the wall. The following methods of intake are advised.

(a) The seeds are placed in a cupful of water and 1-2 spoonfuls of sugar added, if desired. The resulting mixture of mucilage is stirred and taken along with the seeds.

(b) The seeds are allowed to stand in the cupful of water for 20-30 minutes till all the mucilage comes out. Sugar is added and the mucilaginous mass swallowed.

(c) Seeds are boiled in a large quantity of water till the water is reduced to half its original amount to produce a mucilaginous decoction. 2-4 ounces of this are taken every 2-3 hours.

(d) The mucilage containing cover of the seeds is separated by crushing the latter and winnowing. 1-2 teaspoonfuls of it are given in a cup of water with little sugar. Many indigenous practitioners prefer this mode instead of the whole seeds, specially if the intestinal trouble is acute.

Experimental trails have however shown that the digestive enzymes have a weaker action on the mucilage when it is on the seeds. That is why taking the whole seeds is more advantageous. But

in cases of subacute dysenteries both due to protozoa or bacteria, giving the decoction or the mucilage covering alone is preferable. An advantage of the drug is that it is tasteless. With sugar therefore, it is a pleasant drink specially for the children. 2-3 spoonfuls at bed time has the same laxative effect as that of the paraffin.

Medicinal Uses of Isabgol

Isabgol seeds are used in a variety of conditions of discharge such as catarrh (running nose), chronic dysentery, intestinal fluxes, diarrhoea and mucus discharge. They are also useful in the affections of bladder and kidney, inflammation and other derangements of digestive system and feverish states. Spoonful doses of the whole seeds soaked for 15-20 minutes in water and thus made gelly like are recommended in chronic dysentery. Seeds are also given then in tender coconut water. Another remedy is to use 1 drachm of the seed powder with half a drachm each of aniseed and sugar.

For gonorrhoea, the venereal disease, a drachm of the seeds is powdered and mixed with 10 grains of potassium nitrate and 15 grains of cubeb powder. This is a good remedy. A decoction of these seeds is very beneficial in doses of 2-3 drachms with or without sugar in gonorrhoea, dysentery, diarrhoea, inflammation of the stomach, ulcers of the stomach and the duodenum, and also the affliction of kidneys and the bladder. This is

also curative in coughs and colds and other pharyngeal disorders specially of the children. A *tola* each of the seeds and sugarcandy 2-4 times a day is effective in slimy dysentery.

For the complaints of nose bleeding, heat in the body and syphilitic troubles, 2-4 *tolas* of the seeds are kept soaked over night in water, rubbed well in the next morning and mixed with 2 *tolas* of sugar candy and given as a nice and welcome morning drink.

If the whole seeds cause an intestinal irritation, a *conjee* made like that of arrowroot of the mucilaginous shells (*isphagulka chilka* as it is called) may be given frequently.

This cures the protracted diarrhoea of children.

Yunani Physicians and Isabgol

The term 'isabgol' is traced to Persian term 'aspagol' meaning the ear of a horse to which the seeds resemble in shape. The name of this plant in all other languages including that in Sanskrit is mostly after this original Persian term. As stated above it is bascially a drug of Egypt, Persia and the like and was brought to India during the times of the Mughals. There is no mention of this drug in ancient Ayurvedic classics and not even in the later Nighantus or the Lexicons. Its first ayurvedic reference occurs on a small book "Vaidyamrita" under the chapter on *jwaratisara* by one Ayurvedic physician Moreshwara written about just 300 years back.

Yunani physicians consider it as 3° cold and 2° unctuous *(tar)*. Its activities are: dissolution of the oedemas, palliation and quenching of thirst. It removes acute fever, spreads well in the body and is intensely mucilaginous. Roasted seeds however are astringent. Its main use is in dysentery and diarrhoea. Because of its sliminess it makes way against constipation and also heals up any injuries on the way. It is again due to this jelly like nature that it is used beneficially in cases of dry cough, roughness and inflammation in the tongue and the pharynx respectively and also in the sores of the mouth. The jelly is given as a drink to reduce the tense heat of fever and also quench the excessive thirst at that time. For the constipations that are chiefly due to roughness of the intestines this is an ideal remedy.

An external application of the seeds is seen to be beneficial in erysipeals *(visaspa*, a highly painful irregular reddening of the skin), eruptions and painful boils and "hot" as well as paining abscess. Other areas where the hakims advise the use of *isphagol* are: thinness of the semen, nocturnal emission and defective retention among the male; chronic constipation, leucorrhoea or the whites among the ladies and dysentery. In all these cases isabgol is a gentle but an effective and sure remedy.

A deleterious effect of the use are: that it is debilitating to the nerves and destroys hunger. Lemon water mixed with honey (*sikanjabin asali*) is its counteracting agent.

It has been written in Yunani Texts and also advised by the hakims that if the seeds of isabgol are pounded and given internally, it may have some toxic effects. They do not therefore advise its use after pounding. The seeds can instead be soaked, strained or shelled or husked and utilised.

Some simple and further remedies are as below :

Bleeding piles: Soak the seeds in cold water, strain the mucilage and administer as a drink. This proves quite beneficial.

Burning at the time of urination: Drinking the mucilage along with the husks of the seeds will calm down the burnings.

Hard abscesses: A poultice of the seeds tied on the region will soften and cure.

Bleeding at the Nose: Grind the seeds in vinegar and apply a thin layer of the paste at the temples.

Asthmatic breathing: Taking the seeds for six months or an year regularly and twice a day will set right any type of breathing troubles.

Insanity due to biliousness (pitta): Secure one *tola* of the mucilage add *boora* or unrefined yellowish sugar and administer as a drink.

Modern Work

The work of the modern scientists has largely confirmed the beneficial effects of this seed, originally discovered by the Arabian and the Persian authors. This effect was noticed by the

early Western Practitioners of India and as such the drug entered into the official Indian Pharmacopoea as early as 1868. Since then extensive trials have been carried out confirming that they are useful in chronic dysentery and diarrhoea. Some clinicians have employed it usefully along with treatment by another famous plant drug ipecacuanha. These seeds are useful in all inflammatory affections of the mucous mebrane lining the alimentay tract.

The following are the specific conditions where these seeds have given excellent results.

1. Chronic Dysentery Due to a Bacterium viz. Bacillus

This is always associated with the presence of mucus in the stools. Besides, the bowel generally has ulcers and the toxins absorbed from them diminuishes the tone of the involuntary muscle of the gut and a generalised state of toxaemic (or blood poison) conditions prevail. Chronic diarrhoea with painful peristalsis (or the involuntary movement of the gut) prevails for long period and this may alternate with a period of constipation. The seeds of *isabgula* are highly beneficial here.

2. Chronic Dysentery Due to an Ameba

The patients here also have constipation or irregular bowels. They mostly show mucus in the stools and also ulceration of the walls of varying

intensity. Two types of patients are seen here: the lean, thin individuals who have habitual constipation alterating with diarrhoea. The other is the fat, jovial type who suffer from chronic morning diarrhoea. Isabgol is useful for both.

3. Chronic Constipation with Self Intoxication

In the two conditions above, the beneficial action of the seeds is solely due to the mechanical action of the mucilage. They do not have any toxic principle acting on either the bacteria or the ameba; here also it is the mucilage that acts therapeutically. Their action however may be beneficially altered by giving a small amount of saline purgative.

4. Hill Diarrhoea

This is a situation often met with in people who go to mountainous regions from the plains where they habitually live. The patient passes several stools in the morning and this is also associated with much intestinal discharge. *Isabgol* seeds are particularly effective in the early stages of this malady. The irritated mucous membrane is soothed and protected by their jelly and fermentation is inhibited and the stools become more solid.

5. Chronic Diarrhoea in Children

This is mostly due to irritation of the gut because of bacterial toxins. Isabgol jelly acts by removing this irritation.

In fine, the action of isabgol is much like the various preparations of liquid paraffin with all the disadvantages and risks of the latter, removed.

B. GOKHRU OR GOKSHURA

The word *gokhru* in Hindi which is derived from the Sanskrit term *gokhsura*, means cow's hoof. It refers to a plant structure that has very strong, stiff and pointed thorns and presumed to resemble the hoof of a cow. By this term *gokhru* in Hindi three totally different plants are meant. These belong moreover to three separate families of plants botanically; they do not resemble one another in either their botanical features or their medicinal properties. The only point of similarity is that all of them have stong horned structures (that are of medicinal value) resembling in a way, the stiff hooves of a cow and hence named *gokhru*. Of these three the plant that is most commonly meant as gokhru is *Tribulus terrestris* which produces small fruits that have stiff paired spines like the cow's hoof. The propagation of the plant is carried out through the agency of cows and other grazing animals to which the spines get stuck at the hoof region and thus get distributed to different regions. Hindi distinguishes this plant as *chote gokhru*, the smaller *gokhru*. The next plant to be called as *gokhru* and distinguished as *bade gokhru*, the bigger *gokhru* is botanically known as *Pedalium murex*. This plant also bears small sized fruits that bear paired stiff spines like the cow's hooves and the propagation of the plant is by these fruits that

hook themselves to the hoof regions of the grazing animals. The third plant referred as *gokhru* in Hindi is quite different. This is *Astercantha longifolia*, a plant that is medicinal and has a star like cluster of stiff paired thorns at every node and occurring in the midst of the leaves.

We shall discuss all three of them separately below:

1. *Chote Gokhru*

Names

Sanskrit calls this plant as *gokhsura, laghu gokshura, svadu kantaka* (sweet thorned), *shva damshtra* (like the teeth of a dog), *shadanga* (with six organs), *ikshugandha* (having the smell of a sugarcane).

This is known as *gokhru, chota gokhru* in Hindi, *gokhari* in Bengali; *nhana gokhru, betha gokhru* in Gujarati; *kharate, lahan gokhru* in Marathi; *bhakhada, kurkundai* in Punjabi; *palleru mullu* in Telugu; *chiru nerinji, nerinji* in Tamil; *neggalu mullu* in Kannada; *nerunji,nerinni* in Malayalam; *trimen, sambu nerinchi* in Sindhi and *khara khusk* in Arabic and Persian.

In English, this is known as Small Caltrops. Botanically this is called *Tribulus* (trouble) *terrestris* (of the earth) Linn in reference to the spiny fruits that lie on the ground level and constitute a source of trouble to any man or animal walking about as they hook themselves

then. The plant belongs to a family known as Zygophyllaceae to which another famous medicinal plant *dhanvayasa* or *dhamasa* or *Fagonia arabica* belongs.

Botanical Aspects

The plant is a spreading herb of the open waste fields, annual or perennial. It grows chiefly prostrate on the ground to an extent of 4-6 feet all around a central root. The herb comes out in abundance specially after the rains along with the fresh grass of the season. From the root 4-5 small and tender branches sprout out lying flat on the ground and are rather hairy. The leaves are alternate, compound with many small leaflets arranged like feathers on a central rachis and looking very much like the leaves of the gram or *chana* (*Cicer arietinam*) in their general appearance. The individual leaflets are nearly circular, their margins are uncut and entire; they occur in 5-6 pairs. Flowers are small, very symmetrical axially (i.e. all around a central axis) and have stalks that are small. They are yellow and quite attractive as they lie mostly flat on the ground level. Sepals are five, free. Petals are also five free and yellow; each petal has a narrow base and a broad outer end which is rather depressed at the end. Fruits are some. what spherical, slightly flattenned above and 5 angled and much like the fruit of *jhadber* (*Zizyphus nummularia*). They are spiny, hairy and made up of 5 segments, each segment has two big and two small spines. On ripening the segments become separated, each

bearing four sharp spines on the outside and 1 or 2 four horned seeds within. The mature segments are called cocci and each coccus is rather yellow and has a wedge shape with one end narrow and the other end broad and armed with the spines. These cocci are best suited for dispersal by means of grazing animals. The seeds are oily and have a very hard coat. Fruits do not have any special smell or taste but the seeds are slightly bitter because of the presence of an alkaloid. It is these fruits that are sold in the bazaars as the drug material.

This trailing herb is a common weed of the sandy soil throughout India (growing in regions upto 11,000 feet in Kashmir) and Sri Lanka, as well as in many other tropical countries such as Iran. It is a plant of waste and jungle regions. It is in abundance in Uttar Pradesh and Southern India. The mature cocci which are the propagating structures of the plant very much resemble the cloven hoof of the cow; that is why the plant is called *gokshura*—the cow's hoof.

Parts of the plant that are uses in medicine variously are: fruit (mostly), root or even the entire plant.

Constituents

Extract of the powdered root contains an alkaloid, a resin, fat and mineral matter to 14 per cent. The fruit is said to contain a substance that has an aromatic smell; because of this reason

probably, it gives off a fragrant odour when burnt. These fruits contain an alkaloid in just some traces (0.001 per cent), a fixed oil (3.5 per cent) consisting of mainly unsaturated acids, an essential oil in very small quantities, resins and a fair amount of nitrates.

Medicinal Importance

Gokshura is one of the very much referred and much reputed plants of Ayurveda. Even now it is a popular and common bazaar medicine.

The whole herb and also the dried spiny fruits are much esteemed as cooling, demulcent (i.e. soothing and mitigative) and diuretic drugs (promoting profuse urination) that are in addition tonic to the general health and aphrodisiac as well, stimulating the urge of sex. The commendable diuretic efficacy of the drug is traced to the presence of large quantities of the nitrates as well as the essential oil that occurs in the seeds. Stem is considered as an effective astringent material that brings about a contraction of the live tissues and hence aids in healing. Its action on the mucous membranes of the urinary tract and the healing therein closely resembles that of the much acclaimed *buchu* and *uva ursi* flowers. This plant and its medicative action was also known to the Greek physicians; it is used now in Southern Europe as an aperient (or laxative) and a diuretic drug.

Ayurveda and Siddha regard *gokshura* as sweet in taste, cold in virility, and sweet in post-assimilation. It is efficiently diuretic, aphrodisiac, stimulative, strengthening, and nourishing. It is beneficial in the following conditions: urinary stones, urinary troubles (*prameha*), difficult urination and also in piles, difficulties in breathing and diseases of the heart.

Very importantly the plant is used effectively in many urinogenital complaints as below:

An infusion or a decoction of the whole plant or the dried spiny fruit is employed as rather a specific medicine in several complaints of urinary function such as spermatorrhoea (passing of sperms in urine), phosphaturia (passing of phosphate crystals in urine), dysuria (absence of urination), non-retention or incontinence in urine or stones in the urinary tract and also in gleet or slimy discharge from any mucous membrane.

The decoction is effective also in gout and impotence in man; and, it is equally effective in curing uterine disorders following child birth and also to ensure fecundity in woman. Water gets mucilaginous when this plant is steeped in it and this mucilagenous water is drunk as a remedy for impotency. An infusion of the stem is administered to the patient of the dreadful veneral disease of gohorrhoea. In inflammatory conditions of the urinary tract this is given along with *Hyoscyamus (khurasani ajwan)* and opium. Chakradatta, a reputed classical Ayurvedic author recommends a

decoction of the fruits to be given along with impure carbonate of potash in cases of painful urination. *Gokshura* forms one of the ten important ingredient of a much reputed proprietary drug called *dashamula kvatha* (a decoction of the ten roots) commonly referred in many Sanskrit Texts. This decoction is given beneficially for correcting urinary disorders of many types and also in obviating impotence in man.

Yunani physicians also utilise this plant abundantly it is the fruits and the roots that they mostly employ. Hakims of Delhi regard it as hot and dry while the hakims of Lucknow regard it as of mixed virility while Ayurveda distinctly calls this as of cold virility. The three areas of action that the Yunani system recognises for this plant are: it is a promoter of urine and menstrual flow, a destructive of calculus or stones in kidney and bladder and a stimulator of the urge of sex or it is aphrodisac.

To regulate or even commence menstrual flow, its decoction or syrup is employed. These same preparations are beneficial in cases of difficult urination or obstructed urination and in addition they rupture and expel the stones in the bladder and the kidney. This is abundantly employed by them in cases of gonorrhoea because it acts at the very commencement of urination and thus proves highly beneficial in this painful and contagious affliction. Its value in this specific regard is highly acclaimed. For aphrodisiac purposes its powder is

added to special sweet meats (*majun*) and eaten, or, powder alone is consumed as such.

Its use is contraindicated in cases of headache. The counteracting agent here is almond oil or sesame or til oil.

Modern medicine regards this plant, specially the fruit, as oleaginous or oily, analgasic (or pain killing), promotive of urination, astringent and therefore healing, strengthening, cooling and stimulative to kidney. When taken in great doses it acts as a laxative and renders the bowels clean. This is advised to be given in cases of *prameha*, gonorrhoea, swellings and inflammation of the bladder. However as the pain killing property is not adequate in the cases of severely painful condition, opium and—or *khurasani* ajowan are added along with it to overcome the drawback. For persons who have too little an amount of urine, *Tribulus* decoction is given in combination with an admixture of *javakshar*.

If in cases of inflammations of kidney, the urine is alkaline, foul smelling and turbid, an addition of *shilajit* is made to this decoction of *Tribulus*.

Equal amounts of *gokhuru* and *til* powder are advised for cases of impotence due to masturbation.

Gokhru is administered to clean the uterus and overcome barreness in women.

References from the Classics

As noted above, *gokshura* is one of the much referred and ancient drugs of Ayurveda. As an illustration, a few such specific references are given below from some selected classical authors.

Charaka: In cases of painful passing of urine, prepare a ghee from out of 1/4 *ser* of milk, 1/4 *ser* of water and one *tola* of *gokshura*, and administer as a drink. This proves greatly beneficial.

In stones in the urinary tract, prepare a ghee from fresh juice, extracted from the five organs (root, stem, leaves, flowers and fruit) of *gokshura*. This ghee is to be taken in eight times the quantity of milk.

Sushruta: To break the urinary stones, administer the powder of *gokshura* in honey as an electuary or *lehya* to be licked up and follow this with a drink of goat's milk. The stones will break down within seven days.

Chakradatta: In stoppage of stools and urine, administer, a decoction of *gokshura* in which *yavakshara* or nitrate of potash is added.

In *amavata* (or torpor of the bowels with flatulence or bloating of the belly due to morbid gas collection), the patient should drink daily in the morning a decoction of *gokshura* and dry ginger. This will destroy the pains at the waist, shooting pains anywhere and in addition it will augment digestive capacity.

Shodala: As an *aphroaisiac*, drinking of even *gokshura* alone in milk after boiling the latter is advised. This will be effective even for old people.

Raja martanda: In pulmonary consumption or *shosha*, fine powders of *gokshura* and *ashwagandha* are mixed together along with honey and licked up as an electuary. This will overcome the consumption and also remove the distressing general debility that accompanies consumptive attacks.

Vrinda: Plethora or *rakta pitta* can be cured by boiling *gokshura* in milk and drinking.

Sharngadhara: In cases of difficult urination and burning at urination prepare a decoction of the five organs of *gokshura* and administer this as a drink adding sugar candy and honey.

For baldness, take equal quantities of *gokshura* and the flowers of *til* or seasame, make a paste and apply over the head. This will promote the growth of hairs on the head.

Some Proprietary Preparations or Yogas

As it is natural with many famous medicinal plants, there occur several important and often quite popular combinations of several drugs or *yogas* with *gokshura* as their principle ingredient. They are prepared in stipulated and specific ways and are also well utilised even now. A few such yogas are as follows:

Gokshuradi churnam: Powder of *gokshura* and the like.

This is popular in all types of urinary disease. To prepare this, take 9 *tolas** of *gokshura*, and 3 *tolas* each of cubebs (*Piper cubeba*), *nagakesar* (*Mesua ferea*), Rhei radix and potassium nitrate. Powder all of them and mix. This is to be given in a dosage of 10 to 20 grains.

This same drug was tried on several cases of Bright's disease with dropsy or collection of morbid waters. In all trials it has benefited the patients unfailingly. This was combined with bdellium or *guggul* (*Commiphora wightii*) for a patient suffering from gonorrheal rheumatism accompanied with cystitis. The recovery was definitely observed.

Gokshuradi avaleha: A confection prepared with *gokshura* and the like.

This is an electuary or a drug to be taken by licking, much recommended by Bhavamishra, a reputed Ayurvedic author, of the medievel times. This is meant for painful urination, suppression of urine, urination with blood or stones in urine and kidney. Its preparation is carried out thus: take

---

* Modern equivalents of the traditional units and measurements indicated in the text henceforth are as follows:

1 *ratti* = 1 *gunza* (the weight of one seed of *gunza* plant or *Abrus precatorius*); 8 *gunzas* = 1 *masha*; 10 *mashas* = 1 *tola*; 24 *tolas*; 1 *ser*; 1 *pav* = 1/4 *ser*; 1 *tola* = 10 grams.

12-1/2 *sers* of the entire plant of *Tribulus terrestris*, 64 *sers* of water, boil together till the latter is reduced to one fourth of its initial quantity. Strain this decoction and add 6-1/2 *sers* of sugar and again boil till the stuff gets a consistency suitable to an *avaleha* or confection. When this is about to become ready add the following ingredients, all in the form of fine powder: ginger, long pepper, black pepper, cinnamon bark (*dalchini*), cardamoms, flower of *nagakesar* (*Messua ferrea*), *tej pat* leaves, nutmeg, bark of *arjun* tree (*Terminalia arjuna*) and cucumber seeds - every one of them of 16 *tolas* and half a *ser* of *vamsha lochana* or bamboo manna.

The dosage advised is 2 *tolas*.

Gokshuradi guggula: A *guggul* preparation with *gokshura* and the like.

This is prescribed for albumenuria (presence of albumen in urine as it happens in a diabetic patient), dysuria (absence of urination), urinary stones, gonorrhoea and rheumatism. Its chief contents are *gokshura*, *guggul*, *trikatu* (the three pungents viz. long pepper, black pepper and ginger) and *triphala* (*harda*, *baheda* and *amalaki* - the three myrobalans).

The dosage advised is 1-4 pills of 6 grains each and three times a day.

This drug was also tried on patients of gonorrheal rheumatism and gleet (a slimy discharge from mucous membranes). The results were satisfactory.

Gokshuradi quatha: A decoction made up of *gokshura* and the like. This is used as a cooling and soothing aphrodisiac in cases of impotence resulting from gonorrhoea and accompanied with painful urination.

For preparing this, take *gokshura* 10 parts, *trikatu* 5, cinnamon 4, cardamoms 4, saffron or *kesar* 1, *tejpat* 2, nutmeg 2, lettuce 3, bonduc nut 4 and bamboo manna 5 parts. Mix together and prepare a decoction.

The dosage advised is 2-6 drachms.

2. *Van Gokhru - The Wild Gokhru*

This is considered to be but a "Variety" of *chote gokhru*. Botanically this is a different species of the same genus and is called *Tribulus alatus* (Winged) Delile.

Names

In Hindi this is known as *van gokhru* (the forest variety), *bakhra, gokhuri kalan, latak, hasak*. In Marathi, it is called *trikundri*. In English it is known as Winged Caltrops.

Botany

The herb resembles *Tribulus terrestris or chote gokhru* in most ways. The chief difference is in the fruits. The fruit is big on one side and constricted on the other side where it is winged as well. The fruits or rather the individual coca contains two

seeds; these are thorny as in the former and hairy.

This is seen in Western India - in Sindh, Cutch, Punjab, Baluchistan, Western Marwad and the desert areas around, as well as in Iran, Arabia, Syria and Egypt.

Medicinal Uses

The properties and uses are the same as those or *T.terrestris.*

This is a regulatory (*anulonana*), anti-constipative and hunger promoting drug. It regulates menstural disorders and alleviates burning sensation.

An infusion or decoction of the fruits of this plant is given to ladies after child birth. Many of the disorders of uterus are overcome thereby.

Leaves are similar but much bigger and very hairy; margins of the leaves are spiny. The branches may sometimes stand erect or they may be prostrate on the ground as in the *chote gokhru.*

Arab and Yunani lexicographers on medicinal drugs speak of two varieties of *gokhru*, one of the jungle or the wild variety and the other, of the garden variety. For the garden variety they specify the presence of fine hair like structures occurring in clusters on the stem surface. Such a variety of *gokhru* however, is not found to be growing in India.

It is interesting to note that the current botanical name of the plant viz. *Tribulus* is traceable to the term *tribolia* of the modern Greek and *tribolos* of the great Greek herbalist *Dioscorides* and *tribulus* of the ancient Roman history as of Pliny. This is an indication of the continued usage of this plant as a medicinal plant from ancient times.

3. *Bade Gukhru - The Bigger Gokru*

This is how the distinction between the smaller and the bigger *gokhru* is made by the Ayurvedic authors. In case of the smaller variety it is the fruit that is to be taken in order to use it in powder form; if a decoction is needed, take the root or the whole plant along with the root. The smaller *gokhru* is famous for its diuretic property because of which reason it is extensively recommended for urino - genital complaints as seen above. The bigger *gokhru* is excellent as a *rasayana* or an elixirising drug. It is however preferable that all the five organs (root, leaf, flower and fruit) of the plant is employed medicinally in connection with both the varieties. Only fruits as it is the common practice may not yield the full result.

Botanically however the two are entirely different plants though they do have something in common. The fruit here also has strong spines like the cow's hoof which enable them to be stuck to the grazing animals and get dispersed in that manner. It is this fact that justifies the name of *gokshura* - cow's hoof.

Names

Sanskrit calls this as *gajadamshtri* (with teeth like those of the elephant's tusk while the *chote gokhru* is *shwa damstra* with teeth like those of the dog, naturally smaller); *tikta* (pungent) *gokshura, vana shringata, brihad gokshura.*

In Hindi, this is called *farid buti, vilayati gokhru, hastichinghad, bada gokru;* in Uriya, as *gokshura;* in Arabic, *askhaske kabir;* in Marathi as *mote gokhru, karonta, ubha gokhru* (the erect *gokhru* as opposed to the trailing *chote gokhru*); in Gujarati as *kadva* (the bitter) *gokhru, mothan gokhru;* in Telugu as *pedda palleru;* in Tamil, as *peru nerungi;* in Malayalam as *katu* (forest) *nerungi;* in Kannada, as *ane* (elephant) *neggulu, dodda* (the bigger) *neggulu;* in Punjabi as *gokru kalan, bada bakhada.*

Its botanical name is *Pedalium murex* linn of the family Pedaliaceae.

Botanical Aspects

This is an erect succulent herb of waste places. The plant and its branches do not spread about lying on the ground; instead, they are borne aloft as in any other erect herb. Branches are short, 6-18 inches in length. Leaves are also fleshy; in fact the entire plant including the unripe fruits are uniformly fleshy and somewhat mucilagenous throughout.

Both the stem and the branches are slightly rough with scaly glands. Leaves are simple,

opposite, ovate in shape, the apex is slightly depressed while the margins are broadly wavy and teeth like. They are shiningly green, smooth above; lower side is covered with minute scales. Flowers are yellow and they arise singly in the axil of the leaves, borne on a stalk that is shorter than that of the leaf. These stalks have characteristic glands at the base. Fruits hang down and are rather quadrangular or bluntly 4 angled with stout sharp conical horizontal spines from the angles, 1-3-3 centimetre long, narrowed at the base and pyramidal ovoid above the spines. The unripe fruit is green and fleshy, it becomes yellow on ripening and mud coloured when dry. It is hard, indehiscent and 2 celled. There are 2 long and constricted seeds in each cell. The seeds taste mucilaginous but with no smell.

The whole herb when fresh has a musk like odour which however is not pleasant. The entire surface of the plant is covered with infinite number of minute crystalline glands so that the tender branches, the stalk of the leaves, the undersurface of the leaf and the unripe fruits - all of them appear as if dusted with sand particles. If the fresh green branches of the plant are just briskly stirred in water without even bruising them, the water becomes slimy and thick like the white of the egg. The source of this mucilage are the numerous glands. If the hands are just bruished against the underside of the leaves and then dipped in water, there will be an immediate development of

mucilage. The taste of the mucilage is indistinct and of a unique type but not unpleasant.There is no colour in it, nor any smell. What is available in the market as *bada gokhru* are the dried fruits of this plant.

This is a much praised drug plant specially by the Yunani physicians. The other name *farid-buti* to this plant is believed to be due to the fact that Hazrat Shiekh Fariduddin Shakargaz Rahtamullah Aleh lived for a long time sustaining himself only on the dense slimy water secured by agitating the leaves of this plant in water.Or, he had considered it as very useful and had also employed it against many diseases.

The herb occurs commonly in South India specially along the seacoast and also in Kathiawar and the tropical coastland of Africa.

This belongs to a family called Pedaliaceae, a family of mostly herbs that bear mucilaginous leaves that are used to form a demulcent (i.e. soothing) drink and also for preparing thin emollient (softening) ointments. The ohter plants belonging to this family are: *Sesamum indicum* or *til* and *Martynia diandra* which in English is called Tiger's claw or Devil's claw and in Hindi as Bichu or Scorpion because the fruits here have very strong hooked spines that can pain severely.

Medicinal and Other Importance

The properties and the uses are much similar to those of *Tribulus terestris* or the smaller Gokhru

The fruit contains a light green fatty matter, slight quantity of resin, alkaloid and ash.

The parts of the plant used are: Leaves, fruit and the entire plant. Yunani physicians consider it as cold and dry. Ayurveda regards it as of cold virility and of unctuous or oily nature.

The other properties as per Ayurveda are that the drug is strengthening, diuretic (promoting urination), sweet in post assimilation, stimulating, aphrodisiac and nourishing. The afflictions where this proves beneficial are: urinary stones, *prameha*, cough and breathing difficulty, piles, difficult urination and heart as well as *vata* diseases. This is specifically efficacious in diabetes, urinary stones, piles and characteristically in elixirising preparations.

Yunani physicians praise this drug as unctuous (and thus healing), palliative, diuretic, menstruation promoting, destructive of urinary stones, strengthening and aphrodisiac. The mucilage secured by its fresh leaves, stems and fruits, either in water or milk reduces the increased burnings and heat in urination, Obstructed urination, difficult urination, or passing urine in drops, profuse urination (*hastimeha*). gonorrhoea, spermatorhoea and also nocturnal emission or quick emission - these are the other urinary afflictions where this mucilage proves beneficial. In all these cases taking in of dried powder of the fruits will also prove effective.

Because of its diuretic efficiency, the drug is beneficial in ascitis (*jalodara*) where water gets collected in the belly also.

In cases of enlargements of liver and spleen, a decoction of the five organs of the plant or their freshly extracted juice is employed.

As it is an emmenagogue or regulatory to menstrual cycle, it is used in irregular menses, or in cases of child birth when there is a need to promote lochial discharge. Either the fresh juice or decoction of the fruits is employed in these circumstances.

A very elixirising preparation that will render the body strong and long lived is the following: mix in its powder, clove, cardamom, both powdered and sugar as well as ghee. This is to be taken along with milk.

Taking a decoction of this *gokhru* and ginger daily proves very beneficial in *amavata* or torpor due to indigestion.

The leaf juice is employed as a local application in the sores in the mouth of children. The leaves are much used as ready remedies to dry the wounds and also to heal them up quickly.

The fruit, the leaves and the stems render water or milk mucilaginous when stirred with or steeped in them; it is because of this property they are much recommended for gonorrhoea. An infusion or an extract thus prepared or of the fresh leaves and

stem in cold water is demulcent (soothing) and promotive of urination. This is a highly prized remedy in South India for gonorrhoea and dysuria. This is useful in many disorders of urine. It is generally sweetened with sugar and given. In gonorrhea, half a pint of this infusion taken every morning for ten days continuously will relieve the burning sensation during the passing of urine, that is characteristic of this disease. This also cures nocturnal emission and impotency. As it increases urine flow, it cures some forms of dropsy or morbid collection of water within the body.

Powdered leaves are given in 2 drachms with milk and sugar in gonorrhoea and gonorrheal rheumatism.

Decoction of the dried fruits is used when fresh plants are not available. In spermatorrhoea, nocturnal emission and impotency, about a pint of the infusion (1 in 20) of the seeds is given daily. It is important to note that the water rendered mucilaginous by this drug soon regains its previous fluidity. Therefore, the infusions should be prepared fresh each time it is given.

Leaves are used very largely as a healing application to ulcers. They are also used as curry in rectifying splenic enlargements.

Fresh leaves and young shoots dipped and kept for a few minutes in boiling milk will give it a bitter taste and also render it mucilaginous. Such a milk is prescribed as an aphrodisiac and advised in cases of seminal debility.

Powdered root of this plant taken in milk with ghee, sugar and spices is a very nourishing and strengthening viz. *paushtic* preparation.

The plant is considered non-salutary to persons of cold constitution.

Modern practices advice giving freshly prepared cold or icicle forms from out of the fresh five organs of the herb, in cases of new gonorrhoea. If a decoction of the fruit is to be secured, it is more effective if *mulethi* (*Glycirrhiza* or liquorice root) and the *nagar motha* (*Cyperus rotundus*) are added. In diseases after child birth as well as those of spleen, a *fanta* of the fruit of it is prepared and given or the fresh juice of the herb. *Fanta* is prepared thus: take 2-1/2 *tolas* of the fruit powder, drop it in 25 *tolas* of boiling water, close the lid for an hour, strain and administer throughout the day in little quantities.

4. *Another Gokshura - Asteracantha Longifolia Ness*

This is a plant totally different from all the three plants discussed above but still referred to as *gokshura* in Hindi, probably because of the presence of clusters of strong spines at the nodes of the plant. This is botanically known as *Astera cantha* (with star like spines) *longifolia* (and, long leaves, at whose axils the spines occur) Ness. This belongs to a family called Acanthaceae, a very large group of plants to which many familiar plants belong, such as *vasaka* (*Adhatoda vasaka*) the

famous medicinal plant and the pretty garden flower *Crossandra undulaefoila or kanakambaram* belong.

It is interesting to note that most members of this family have mucilaginous properties (somewhat similar to Pedaliaceae to which *bada gokhru* belongs) and are more or less bitter. Besides in the botanical order of classification, the family of Acanthaceae comes next to that of Pedaliaceae.

Names

Sanskrit offers a long list of names to this much acclaimed medicinal plant.

They are *ikshugandha, ikshuraka* (smelling like sugarcane), *ikshuvalika, kakekshu* (a crow i.e. an inferior sugarcane), *kandekshu* (stem like the sugarcane); *kokilaksha; kshura, kshuraka* (hoof like); *picchila* (mucilage yeilding); *shrigala ghanti; shrigali; trikshura* (with three hooves); *vajra vajrakantaka, vajrasthi* (with diamond hard spines).

In Hindi, this is known as *gokshura, goksura kanta, talamkhana;* in Bengali, as *kantakalika* (flowers buds in the middle of the thorns), *kulaka, shula mardana* (pounding out shooting pains); in Gujarati, as *gokhru, ekharo;* in Marathi, as *kolsundara, talimkhana;* in Punjabi and Kashmiri, (the seeds are called) *talimkhana;* in Kannada, as *kolavanke,* or *neer gobli* (a marshy thorn); in

Telugu as *neeru gobli*; in Tamil, as *neer malli* (a watery i.e. marshy jasmine); in Malayalam, as *vayalculli, batel supulli*; in Urdu as *talimkhana*.

Botanical Aspects

This is a stout herb with numerous usually unbranched erect stems that occur in bundles and thickened at the nodes. It inhabits marshy swamps looking in general aspect somewhat like sugarcane clumps (hence the Sanskrit names, *ikshuraka, kandekshu* and so on). The stem is more or less roughly hairy, specially below the nodes, where the hairs are particularly long. Leaves are sparsely hairy on both the sides, tapering at the base and almost stalkless. They occur in whorls of 6 at a node, the outer 2 leaves are quite long, nearly 18 by 1.3-3.2 centimetres; they are oblong and lance like. The 4 inner ones are about 3.8 centimetres. Everyone of these 6 leaves have in the axil a nearly straight sharp yellow thorn, 2.5—4.5 centimetre long. It is this characteristic nodal clustering of the thorns that entitle it to be called *gokshura*, cow's hoof. Flowers occur in whorls in the midst of these thorns (*kantakalika*) at the nodes. They are quite attractive with purple blue corolla which has two lips; with a tube that is abruptly swollen at the top. Fruit is a capsule i.e. dry and breaking at maturity to disperse its 4-8 seeds that constitute the drug of some medicinal value.

The herb occurs throughout India, Sri Lanka and tropical Africa. This is quite common in moist

places on the banks of tanks, ditches, canals, paddy fields and other marshy places. Seeds and dried root are sold in bazaars very commonly.

Medicinal and Other Importance

This is a common bazaar medicine all over India and much referred in the Texts as well. Occurrence of names in almost all regional languages is another sign of its popularity. The parts used are the whole plant, the seeds, the roots, the leaves and even the ashes of the plant. Its properties and uses have much similarities with those of *chota gokshura;* in fact the latter was once called *Hygrophylla terrestris*, botanically.

This is sweet and pungent in taste, unctuous or oily in quality, cold in virility and sweet in post-assimilation. It is used to remove swellings, and as a diuretic tonic, augmentive (*brimhana*) aphrodisiac, regualtory (*anulomana*) and in the disease of *vata rakta* and of the eyes.

Seeds are glutinous (sticky) and mucilaginous. They contain nirtogen 5 per cent, traces of an alkaloid, and a pale yellow fixed semi drying oil 21-23 per cent. This oil has a sweet taste like an edible oil and is free from nitrogen and sulphur. It is worth exploring whether this can be utilised as a cooking oil, specially so, because the plant is abundantly available throughout India.

Root is cooling, diuretic (promoting of urination), demulcent (soothing) and refrigerant (refreshingly cooling) and also a bitter tonic. Seeds are diuretic

while the leaves are demulcent and diuretic and the ashes as well as the decoction of the roots are also diuretic.

The whole herb, the roots and the seeds are used because of their diuretic efficacy in treating dropsy (collection of morbid water), jaundice, rheumatism, anasarca (or diffuse oedema or swelling all over the body) and also in dysentery and the disease of the urinogenital tract. Leaves are used in cough and also applied externally in gout, lumbago and joint pains.

A decoction of the root is prepared by boiling 2 ounces of root in a pint of water for 20 to 30 minutes in a closed vessel. This is given in a dosage of 1-2 ounces, 2 to 3 times daily in rheumatism, stones in urine, gonorrhoea and other disease of the genito urinary tract, and also jaundice and anasarca. Root is considered as a specific drug in dropsy. Leaves and seeds are also useful in jaundice and anasarca. A much recommended recipe is as follows: macerate (i.e. soak and soften) 2 ounces of freshly dried leaves for 3 days in 10-16 ounces of distilled vinegar, press and then strain. This is given in doses of 1-3 tablespoonfuls thrice a day. An infusion of the leaves macerated for 3 days and strained is also useful. Ashes of the whole plant are also used in dropsy and urinary stones. Tincture of the whole plant prepared by having 1 part of the plant in 3 parts of the alcohol is particularly useful in painful passing of urine or dysuria.

Seeds are given by hakims with sugar, milk or wine in doses of 1-3 drachm for impotence gonorrhoea and spermatorrhoea or passing of semen along with urine. Combined with *chota gokshura* and *shatavari* (*Asparagus adscendens*) the seeds are given in powder with cow's milk and sugar for general debility. A confection of the seeds containing a large number of other aphrodisiac, demulcent, nutrictive and aromatic stimulant substances has been in popular use for rectifying impotence and also seminal as well as other kinds of debilities. It is because of these reasons, the seeds are called *talim khana* (affording strength and ability).

Even for asthmatic complaints a powder of these seeds is given in a mixture of ghee and sugar. For diarrhoea the seeds are ground into a paste and given in butter milk or whey. This always proves very beneficial.

Yunani physicians consider this as hot 1°. They regard the seeds as aphrodisiac and nutritive, while the leaves are diuretic and applied externally in cases of lumbago and rheumatism. The seeds nourish man's virility, they help in seminal retention and are aphrodisiac and augmentive. They are mostly given to be eaten in cases of nocturnal emission or fluidy semen. It is given alone by itself or in powder form along with milk or mixed with other useful ingredients and then given for this purpose.

A drawback in the use of this drug is that it may lead to constipation and the drug itself is not easily digested. Counteracting agents for this are sugar candy, honey and milk.

When the seeds are placed in the mouth they become easily coated with a large quantity of externally tenacious mucilage which will now adhere to the tongue and the palate; moreover, this is of a rather agreeable flavour. These seeds are tasteless by themselves but they are much fattening.

In the Gold Coast of Africa (now Ghana) the seeds are sometimes boiled in water and a bath is taken in this water so as to get rid of fever.

C. BRAHMI

Brahmi is one of the very famous and ancient drugs of Ayurveda. The term *brahmi* means that it is what is great and is named after the Great Brahma, the Lod of Creation. This is extolled much as it is connected with the promotion of mental brilliance *(medha)* and vigour and as being one of the principal *medhajanana* plants. Botanically however two plants have been contended to be representing this *brahmi* drug of Ayurveda and these belong to two different families of plants altogether: *Bacopa monniera* Wettst of Srophulariaceae and *Centella asiatica* urban of Umbelliferae. As both of these plants are of

considerable medicinal value and are actually employed even now, we shall consider them both below.

1. *Bacopa Monniera Wettst*

Names

Sanskrit offers a number of significant names, such as *brahmi, svayambhuvi* (another name of the Lord Brahma), *sura shreshta* (excellent among the gods), *sureshta* (liked by the Gods), divya (divine) *saraswati, sharada, bharati* (after the name of the Goddess for learning); *vayastha* (an elixirising drug, arresting age), *maksyakshi* (fish eyed), *surama* (very charming), *brahma charini, somavallari, saumya lata, soma mahaushadhi* (a great medicine), *medhya* (good for mental brilliance).

This is known as *brahmi, safed chamani* in Hindi; *brahmi sak, adbirani, dhup chamani* in Bengali; *brahmi, vidya brahmi* in Gujarati; *brahmi* in Marathi; *neeru brahmi* in Kannada; *brahmi, neerbrahmi* in Tamil; *samrani chettu* in Telugu.

In English it is known as Thymeleaved Gratiola.

The plant belongs to a large family of plants called Scrophulariaceae to which many other famous plants also belong such as *Digitalis* the well known medicinal plant for heart diseases and the Ayurvedic drug *katurohini* or *Picrorrhiza kurroa.*

Botanical Aspects

This is a smooth, hairless, somewhat fleshy and creeping herb on the wet lands around the tanks, ponds and paddy fields. The plant trails on the ground with tender stems that are of 10.30 centimetres long, rooting at the nodes. Branches are numerous and they tend to go upward i.e. they are ascending, at the tips. Leaves are simple, stalkless, opposite to each other and decussate viz. the consecutive leaf pairs are arranged in a cross like manner with reference to each other. They are 6.25 by 2.5 milimetre in size, obovate (egg shaped with the broader end, outwards)—oblong or spoonshaped. They are rather fleshy, dotted with black spots, very obtuse at the apex and the margin is completely entire and the nerves are very obscure. Flowers are axillary, solitary, pretty looking with pale blue or almost white corolla whose lobes are nearly equal, rounded and spangled with shining dots while fresh. Fruit is a capsule viz. dry and breaking out at maturity to release the small seeds within that are oblong, striate (i.e. with longitudinal lines on the surface) and pale coloured.

This herb is available in wet places throughout India, Sri Lanka and all warm countries. It is frequently mistaken for the other *brahmi* viz. *Centella asiatica* that has a similar habitat or place of occurrence and also the habit i.e. it is also a creeper rooting at nodes. However a little further examination will reveal the large number of differences such as the fleshyness of the leaves

here and the characteristically kidney shaped leaf of the latter and so on.

Parts used are : whole plant, leaf stalks and leaves.

Medicinal and Other Importance

The plant contains a trace of an oily substance soluble in alcohol, two types of resins (one being soluble in ether), on organic acid, a tannin and an alkaloid called brahmine, that occurs in a very small percentage in the leaves and also another active principle called herpestine.

Though the herb is available all over India specially along the water reservoirs, it is abundantly available along the route from Haridwar to Badrinath in the Himalayas. Brahmi of this region is of excellent nature.

Ayurveda considers Brahmi as cold, quickly spreading in its effects within the body *(i.e. saraka)*, light in digestion, promotive of intelligence, astringent in taste (and contractive of living tissues and hence healing), also sweet in taste and sweet in its post assimilation effect. It augments the span of life, improves the quality of the voice and increases the power of memory. It is useful in the following diseases : leprosy and skin disease, anaemia or blood-lessness, disorders of blood, and also in cough, poison and fever.

Lexicons praise this plant much further. Besides being bitter, astringent and cooling, this

confers intelligence, promotes longevity, purifies throat, does good (i.e. is salutary) to heart, augments remembrance and is elixirising in all ways. It is useful in cases of poisoning, cures ulcers and proves beneficial in tastelessness in food; and rectifies cough, breathing trouble and consumption, billious complaints and splenic enlargements; and overcomes the aggravations of *kapha* and *vata*.

The principal action of *brahmi* in the body is on the brain and the nerves. It offers a peacefulness to the mind and also nourishes and strengthens it. It is because of this reason, *brahmi* is specially used in cerebral and neural diseases. When there is an excessive mental strain due to fatigue or even psychological tension and this is followed by disoriented behavior, administering any preparation of *brahmi* will quieten down the upset. Brain will get a rest as well as a nourishment thereby and it will soon regain its normal tempo of activity. This is so even in cases of insanity and epilepsy as well as their attacks. Brahmi preparations are salutary to these conditions also. But, it is important to note that it is not advisable to give *brahmi* in fresh and violent cases of these disturbances; for, *brahmi* contains an excitatory principle acting on brain that will agravate the situation if it is already violent. Therefore in cases of fresh and violent insanity, it should be first treated with some purgatives and then with palliative or mitigative drugs like *khurasani ajowan* (*Hyoscyamus albus* or henbane seeds). When

insanity and epilepsy grow chronic, brain needs two types of actions: a stimulation on the one hand as well as a nourishment on the other. *Brahmi* is ideal in such circumstances, as it carries out both of these functions in ample proportions.

Brahmi also contains a certain amount of constipative principle. That is why it is best to associate a mild laxative along with its administration. In ancient Texts it is advised that *shankhapushpi (Evolvulus alsinoides)* should be given along with *brahmi.*

In cases of nervous debility, *brahmi* should be given along with the juice of *kut* or Orris root or of *pethe* or Ash Gourd *(Benincasa cerelfera).* Another drawback of *brahmi* is that it lessens hunger. That is why some digestion stimulative drug is also given along with it to overcome this drawback. Ancient authors advise givintg *vacha* (*Acorus Calamus*) with it.

For just lassitude or listlessness of a person and also the hoarseness or loss of voice due to excessive talking *brahmi* is employed as a beneficial drug.

There is an essential or a volatice oil in *brahmi* which is its active principle. As this evaporates even by little heat, the parts of this plant should not be dried in the open sun and used. It is also advisible that *brahmi* preparations secured without using fire are always more preferable to those that need an agency of fire.

The juice of the leaves is mixed with petrol and employed as a massaging material. This is always attended with good results.

Giving a spoonful of the fresh juice of the leaves is very good for children's running nose and cold, bronchitis or inflammation of the wind pipe, vomiting and hard bowels.

In Pondicherry area this is considered as an aphrodisiac, stimulating the urge of sex. In Sri Lanka this is prescribed in fever and is also used (the whole plant) as a mild purgative in children as well as in giving fomentation to erysepelas or *visarpa* (a painful irregular reddening of the skin specially in the facial regions) and also in elephantiasis.

The leaves of the plant contain an alkaloid brahmine, which produces poisonous reaction much like that of strychnine of the seeds of *Strychnos nux vomica* (Poison-nut or *jahar* or *kuchla* in Hindi). This alkaloid raises blood pressure by constricting the cavity of the blood vessels and a simultaneous stimulation of the heart muscles. It also stimulates respiration invariably. Even very small doses or the alkaloid brahmine are very active along these lines; these can also kill a frog within two minutes and rats in 24 hours.

The powders of the dried leaves of *brahmi* have been very successfully employed in cases of weak functioning of the heart, laxness in nerves and

their debility i.e. as a nerve tonic and also in weak brains. It is put forward that using this alkaloid will not be accompanied with burning sensations and other adverse reactions that are attended when strychnine is used medicatively for long periods of time. In addition to all this, *brahmi* has a direct stimulative action on the heart, while the effect of strychnine on heart is rather inferior. These are some of the recent findings of the action of *brahmi* on mental functions. They only point out how further and more analytical studies would reveal the still more nuances of the action that *brahmi* and its alkaloid brahmine will have an brain and nerves.

We shall now see some specific medicinal uses of *brahmi* and also a few important compound preparations or yogas of it that have proved very famous.

Some Specific Medicinal Uses

In general, for internal administration, it is the powder, the fluid extract and the syrup (*brahmi rasayana*) that are suitable. For external application however, *brahmi* is used in the form of powders, juice, plaster, ointment or bath.

In elephantiasis of the scrotum and the legs etc. and aflections of the cellular tissues; over bruises, inflamed and swollen parts; and on rheumatic swellings-in all of these cases, ointment prepared from the plant or its freshly extracted juice is applied with excellent results. Internally 1-2 drops

of this liquid will offer a peacefulness to the mind. This also nourishes and strengthens the latter. It is because of these reasons, *brahmi* is specially used in cerebral and neural diseases.

Yunani physicians consider this as second degree hot and dry. Its principle actions are purification of blood, expulsion of vitiations, diuresis (or urine promotion) and strengthening of brain and the nerves. If taken along with oil it is beneficial in itching and eczema. Take fresh juice of the plant and mix it in equal quantity of *til* oil, boil till the oil alone remains. This is excellently beneficial in dry eczema and also in baldness of the head. Taking even a *tola* of its fresh leaf juice will ensure clear bowels. Or, take a *ser* of this juice, place it in a big vessel and go on pounding it with feet for an hour and till you get a taste of bitterness thereby in the mouth. This will get red of the eczema in the foot. *Brahmi* is useful in fever, freckles of the skin, rectal prolapse and also goitre. Take 3 *tolas* of this fresh juice, add 6 *mashas* of cumin seed *(jeeraka)* powder, and one *tola* of sugar. If this is taken for three days and a diet devoid of salt is maintained during this period, all types of lesions and wounds at the penis and the bladder will disapper.

Brahmi is beneficial in brain and nerve complaints, such as insanity and epilepsy, cough and breathing difficulties and hoarseness of voice. A drawback in its use is that it is likely to cause lesions; the counteracting agent is an oil. The dosage advised is 9 grams or 9 *mashas*.

In insanity, epilepsy and biliousness half a *tola* of the fresh juice of these leaves boiled with ghee and formed into a *ghrita* or medicated ghee is mixed with *kut* or *Sauseria lappa* root *(pushkara mul)* and honey, and then given.

In hoarseness, leaves are fried in ghee to get rid of this complaint.

In stoppage of urine, leaves and stalks are particularly useful.

For bronchitis and other coughs of children a poultice made up of the boiled whole plant is applied over the chest.

In diarrhoea of children, juice of the leaves is given. An ointment of these leaves is beneficial in swellings.

Some Compound Preparations or Yogas

Brahmi ghrita - a medicated ghee of *brahmi.*

Take 20 *tolas* of the powders of *vacha (Acorus calamus), kut (Sausscria lappa)* and the root of *shankhahuli (Convolvulus pluricaulis)* - all together, and 60 *tolas* of water. Mix them all, cook on mild fire till water is fully evaporated and the ghee alone remains, remove from the fire, cool down and strain.

This is to be given in a dosage of 1-2 *tolas* along with milk, morning and evening. This will remove all types of insanity, epileptic complaints and hoarseness of voice.

Sarasvata ghrita - medicated ghee by the name of Sarasvati, the Goddess of Learning.

Remove the whole plant alongwith the root, wash well, pound with a wooden mortar and extract 256 *tolas* of juice. Add in this 64 *tolas* of cow's ghee; turmeric, *malati* flower *(Jasminum arborescens)*, *kut*, *nishoth (Ipomea turpethum)* and *harad* (Chebulic myrobalan) - 4 *tolas* of all of them powdered together and also *vaya vidanga (Embelia ribes)*, *saindhav* salt, sugar and vach *(Acorus calamus)* 2 *tolas* of these powdered together. Cook this mixture on a mild fire till the ghee portion alone remains and the juice portion is fully evaporated, remove from fire, cool down, strain and store.

A reputed classical work called Rasaratnakara declairs that if one continues to drink 1-2 *tolas* of this ghee in milk daily, the voice will become sweet like those of the *kinnaras*. And, the power of memory of such a person will be so strong that he can learn up any difficult *shastra* by reading it even once. All types of his skin troubles will disappear and he will attain a lustre like that of moon. All types of piles, five types of gas troubles and the five types of coughs will all disappear. A barren woman would become fecund by this medication and the feeble sexual power of a person will become virile. Even general strength and digestive capacity will be increased by this ghee.

Saraswatarishta a spirituous liquour by the name of Saraswati.

Get up in the morning before sunrise and on a day when *pushya* star is on the ascendency, remove 80 *tolas* of the *brahmi* plant along with the root, wash with water.

Take the root of *shatavari (Asparagus ilicifolius), vidarikand*, fresh ginger and *sowa -20 tolas* of them together. Pound all of them together and cook in 1020 *tolas* of water. When the water quantity gets reduced to 256 *tolas* only, remove from the fire, stir well, cool down and strain. Add in this decoction 40 *tolas* of old honey, 100 *tolas* of sugar, 20 *tolas* of the flowers of *dhavadi (Anogeissus latifolia)*, the seeds of *nirgundi (Vitex nigundo)*, root of *nishoth*, small pepper, cloves, *vacha, kut, aswagandha, beheda, giloy*, cardamoms, *vayavidang* and *tejpat*—1-2 *tolas* of all of them ground together and powdered. Fill a porcelain container with this medicament, add a *tola* of thin gold foil, close the lid and keep aside for a month. Strain this through a thin cloth afterwards and store in bottles.

A well known Text called Bhaishajya Ratnavali points out that this Saraswatarishta was first prepared by Dhanwantari for the sake of some of his dull disciples. Taking one *tola* of this medicine daily thrice and along with water would assure a long life, clean semen, augmented memory power, intelligence, and also bodily strength and lustre. His speech becomes pure and the heart gets strengthened. His *ojas* gets a powerful stimulus. Women will get rid of their *raja dosha* by its taking and man will get rid of his seminal vititiation.

For those persons whose memory power has failed or has become weakened by too much of reading or singing or talking, this medicine will prove specially beneficial. A person would be free from untimely death by its use. This will also obviate insanity, epilepsy and other brain affections.

Brahmi Rasayana - an elixir of *brahmi*

Take 5 *tolas* each of powdered *brahmi* plant dried in shade, liquorice (*mulethi*) root, *shankhahuli and giloy*. Take also half a *tola* of gold ash. Grind them all together into a powder.

This is to be taken in a dose of 1-3 *mashas* along with honey and ghee.

It improves memory power to a great extent.

Brahmi ghrita - a medicated ghee of *brahmi* - another recipe.

Take 4 *sers* of old ghee, 4 *sers* of fresh *brahmi* juice, *vacha*, any *pachak* or digestive root, and the root of *Canscora decussata* (*shankhini*) all in equal parts and in all, 32 *tolas* of them, make a paste and boil together till the watery portion is fully evaporated.

This ghee is given in a dose of half a *tola* twice a day with milk.

This is useful in insanity, neurasthenia (nervous weakness), aphonia (loss of voice) and hoarseness.

The ghee has been tried very successfully in cases of hysteria and epilepsy.

An oil is also prepared with *brahmi* and this is used beneficially in cases of habitual headaches and to relieve brain fagging.

Modern Work on Brahmi

Another species of *Bacopa* known as *B. floribunda* is found to occur in India. This is an erect herb (not trailing like *B.Monniera*, the typical *briahmi*) with somewhat four angled stem which is often branched. Leaves are almost stalkless and opposite. Flowers occur in the axil of every leaf. It is likely that this may form an additional *brahmi*, that can be explored further with all hopes.

Modern medicine also agrees that *brahmi* is a nervine tonic, useful in epilepsy and insanity. It is also useful in asthma and is a good diuretic besides being a mild laxative. Stem and leaves are reputed to be used in snake bite.

Analysis of the leaves of *B.monniera* yields alkaloids brahmine and herpestine and also a mixture of three other alkaloids. An extract of the whole plant yielded bitulic acid and a crystalline saponin.

In order to assess the attributed actions of ayurvedic medicinal plants more definitively and on modern lines extracts from the plant - in ether, alcohol or even water have been experimentally tested for their action on whole test animals like mice, rats, frogs and dogs or their individual organs separated out from the body and kept alive artificially.

The crude alcoholic extracts of *B.monniera* thus tried has a sedative effect on frogs and dogs in a dosage of 10-200 miligram per 100 gram body weight. This extract has also shown cardiotonic (toning heart muscles), vaso constrictor (constricting blood vessels) and neuro-muscular blocking action in frogs. A glycoside (saponin) fraction isolated in pure form has been also shown to be cardiotonic in normal as well as underfunctioning frog's heart. Sedative action has been seen in guinea pigs and rats. The saponin fraction has shown a spasmodic (i.e. involuntary contraction - expansion) action on the ileum of guinea pig and the uterus of rat.

An alcoholic extract of the whole plant in a dose of 50 miligram per kg. body weight given by an intra peritoneal injection has shown tranquilising effect in albino rats. The same effect was shown in dogs when this dose was given intravenously. This extract relaxed the smooth muscles of the rat's illium. Even an aqueous extract showed the same effect but to a lesser degree.

The total alkaloid fractions from the plant was given intravenously in a dose of 0.2-20 miligram per kilogram body weight for dog; this developed an initial fall in blood pressure followed by a rise. Similarly an initial stimulation of respiration was followed by a slight depression. *Tachyphylaxis* or absence of the effect of drug was seen when the drug was given repeatedly at intervals of 2.5 minutes. The alkaloidal fraction had a spamodic

effect on isolated illum or the terminal point of the small intestine of rabbit. It produced rigidity and convulsions in mice.

A comparative study of the effect of alcoholic extract of *brahmi*, reputed to increase memory power and chlorpromazine, a synthetic drug known to have such an activity was undertaken. This was carried out in the process of bearing motor skills by rats. A dose of 10 miligram per kilogram body weight was seen to have resulted in improved performance! However, the tranquilising or the calming down ability (the other action for which *brahmi* is much reputed) of the extract was found to be weaker than that of chlorpromazine. The total extract and the alkaloid fraction of *brahmi* was seen to inhibit the respiration of rat's brain tissue to a varying degree.

Hersaponin, a glycoside saponin isolated from this plant was shown to have a mild inhibitory action. But this hersaponin showed a sedative effect on mice. It did not however protect rats against electroshock and mice against metrazol seizures or chemically induced convulsions. It potentiated or increased the hypnois produced by several drugs such as he a barbital, pento barbitol and ethanol in mice and also produced hypothermia or subnormal temperature. It delayed the rate of disappearance of blood pentobarbitol sodium in dogs, or it increases hypnotic effect.

Hersaponin was also found to deplete the rat brain of its noradrenatine and 5 - HT content. This action is similar to that of the famous reserpine, another Ayurvedic plant from *Raulfia serpentina* or *sarpagandha* well acclaimed all the world over for its definite action in lowering the blood pressure and thereby calming down those that have nervores lesions and also those that are insane.

Another important discovery has been that the alcoholic extract of the entire *brahmi* plant has been found to have anticancer activity against what is called Walker Carcinoma 256 (intra-muscular) in rat.

2. ***Centella asiatica*** Urban (previously called *Hydrocotyl asiatica Linn.*)

Names

Sanskrit calls this also as *brahmi, manduka parni* (leaves like the frogs), *brahma manduki* .

This is known as *thankuni, thulkudi, tholkuri* in Bengali; *khulakudi, brahmamanduki, bengsag* (in Bihar) *kotyali* (near Haridwar) in Hindi; *khad brahmi* in Gujarati; *brahma buti* in Kashmiri; *karivuna, undri karinga* in Marathi; *saraswati alku, brahmana chettu, manduka, brahma kuraku* in Telugu; *ondelaga, ilikivi* (rats ear in reference to the shape of the leaf), *saraswati soppu, brahmi soppu* in Kannada; *vellarai* in Tamil.

In English this is called the Indian pennywort.

It can be easily seen that there is much overlapping even in names in the regional languages between *Centella asiatica* and *Bacopa monniera*. This is understandable because of much similarity in the habitat and the habit of the two plants and more importantly in their medicinal properties and uses as we shall see presently. The existing confusion by which both the plants are being sometimes called *brahmi* rather indiscriminately is quite understandable on all these accounts.

The herb occurs all over India abundantly - in the wet places, along water reservoirs, along the Gangetic plains in Haridwar, Nepal even to an altitude of 2000 feet and also in Sri Lanka.

Botanical Aspects

This is a herb spreading prostrate on the ground and rooting all along at the nodes. Every node has one single leaf (and the flowers in its axil) above and a root below. The leaf has a stalk and the blade is characteristically kidney shaped, or it resembles the ear of a mouse (hence called *under kanni* in Gujerati and *ili kivi* in Kannada). On the leaf blade there occur seven faint veins starting from the base and going outwards. If the leaves are crushed, a fragrance gets emitted and the taste of the leaf is not unpleasant. Both the smell and the taste disappear when the leaf dries. The botanical difference between this *mandukaparni*

and *brahmi* are quite many. The leaves of the latter are smooth, sticky and somewhat fleshy and they occur in groups viz. 5-7 of them spring from a node, while *manduka parni* has thin kidney shaped leaves that are invariably single at a node. More importantly the characteristic action of *brahmi* is on brain and nerves while that of *manduka parni* it is on skin- some reputed modern ayurvedic scholars for e.g. Yadavji Trikrimaji Acharya seek to make such a distinction. Such a distinction however is not universally accepted. All that is clear now is that there is no doubt as regards the fact that there are two plants here, that are both reputed, ancient and medically valuable. For instance Sushruta, an ancient Acharya refers to both *brahmi* and *mandukarparni* in a single chapter; it is clear therefore that he did not regard them as being the same. It is likely however that there may be some over lapping in medicinal uses which is why a confusion regarding this identity has crept in. It is best to discuss them separately as *brahmi* (*Bacopa monniera)* discussed above and *manduka parni* (*Centella asiatica)* discussed below.

Centella asiatica is an edible herb used as a culinary herb in many places even now.

Medicinal and Other Importance

The whole plant (leaves, fruits, roots, twigs and seeds) is used. Roots are the most active part.

The active principle of the leaves is an oily white crystalline substance called *vellarin;* these also

contain a resin, some fatty aromatic body, gum, sugar, tannin, albuminous matter and salts that are mostly alkaline sulphates. Vellarin has the characteristic odour and taste of the fresh plant; it is soluble in spirit, ether, caustic ammonia and partially in hydrochloric acid. These leaves are dried in shade so as to conserve the contents, powered and kept in well close bottles.

General action of the plant are as follows. This is an alterative drug capable of bringing about alterations in vital functions of the body. It is diuretic and a local stimulant specially to the skin and also a bitter substitute. It has a special influence in the genito urinary tract; it sets up urinary and ovarian irritation and an itching over the whole body. It also has an emmenagogue action, regulating menstrual errors. In large dose it acts as a stupefying narcotic drug that would produce headache, giddiness and with some persons even a tendency to coma or complete loss of consciousness. When the powder is given internally, it is an alterative and a tonic drug material.

Mandukaparni is used in many forms as follows:

Powder of the leaves. For this, leaves are carefully separated from the plant, spread on a mat in one layer and dried in shade. When throughly dried they are powdered and kept in well stoppered bottle. Dosage advised is 5-10 grains three times daily.

Plaster or poultice is prepared from the fresh leaves bruised into a paste in cold water.

Syrup is prepared from 90 grams of powder, boiled in a quart of water till reduced to a pint adding 2 pounds of sugar, and thoroughly mixed at 31° C till a syrupy consistency is obtained. Dose advised is 1 drachm but this is often gradually increased.

Fluid extract squezed from the fresh plant. Dose advised is 1-5 minims, again gradually increased to 15 minims.

Ointment: This is secured by mixing 1 part of the liquid extract of the powder in 8 parts of vaseline or lanoline.

Decoction: This is secured by boiling the entire plant in a proportion of 1 part in 20 parts of water boiled for about 15 minutes. The dose advised is 1-2 ounces.

Bath: For this, the water is prepared by adding 1500 gramms of the fresh plant in a tubful of hot water. This is excellent for skin diseases.

Ayurveda considers its taste as pungent, astringent and sweet, quality, as light and excellently spreading *(sara)* in the body; virility as cold and post assimilation product as sweet. Its actions are regarded as promoting intelligence, promoting longevity, being good for voice, helpful in memory; stimulative of digestive fire, good for heart and colourative to skin. This is used as

destructive to *pitta* and blood disorders, skin diseases and leprosy, as well as itching. It is beneficial in urinary affections, fever, breathing difficulties, cough, tastelessness in food, poison and oedema as well as swellings in general.

The herb has been found useful in diseases of the skin, nerves and blood. Leaves are utilised as a tonic and to improve memory. They are also beneficial in syphilitic skin diseases and are given internally or applied externally.

Physicians of the Indian system employ this herb internally or externally mainly in various skin diseases, ulceration of all types that are chronic, callous, scrofulous and syphilitic with gummatous infiltration (as is seen in secondary and tertiary syphilis), in chronic and obstinate eczema, psoriasis and leprosy. The plant is also useful in fever, malarial or even ordinary, and also in epilepsy and insanity. For enlarged glands, abscesses and chronic rheumatism it is used as an ointment; dusting them with its powder also proves very useful.

Some Specific Medicinal Uses

In general, for internal adminstration, it is the powder, the fluid extract and the syrup (particularly, the *brahmi rasayana)* that are suitable. For external application however, this is used in the form of powders, plaster, ointment or bath.

In *elephantiasis* of the scrotum and the legs etc. and affections of the cellular tissues, over bruises, inflammed and swollen parts, rheumatic swellings - in all of these cases, an ointment prepared from the plant or freshly extracted juice is applied with excellent results. Internally, 1-2 drops of this liquid given simultaneously will check the fever associated with the affections.

In leprosy and also scrofulous and syphilitic affections and ulcerations, the powder of *brahmi* is given thrice daily in a dosage of 3-5 grains. Simultaneously this same powder is sprinkled over the ulcers or more preferably poultices or fresh leaves are applied as the best measure. It has been seen specially that the leprous patient very definitely improves by this treatment. If after some continued use, there appears an excessive itching on the skin all over the body, it should then be discontinued for a week. Some aperients or laxative may be given meanwhile and the medicine resumed as before, after this interval. When this drug is administered to the leprous, a sensation of warmth and provoking in the skin, specially of the hands and feet appears at first. This is followed by a general sensation of warmth, sometimes almost to an unbearable degree. The blood circulation in the fine vessels of the body is accelerated and the appetite improves after a week and in time the skin becomes softer, throws off the thickened epidermis or the outer layer and recovers its evaporative function and becomes hale and healthy, and finely sensitive again.

In cases of bowel complaints and dysentery in children, 3-4 leaves are given with cumin seeds (*jeeraka*) and sugar and the pounded leaves are also applied to the navel.

In bowel complaints as well as fever in children an infusion of the leaves is given along with *methi* or fenugruk seeds, dose being about half a tea cupful.

For stuttering, 1-2 leaves are given every morning to cure it.

For skin eruptions, due to "heated blood", juice of the plant and the leaves is applied as an ointment combined with the bark of *kadamba (Anthocephalus cadamba)*, ghee and black cumin (or *krishna jeeraka*).

For skin diseases, as well as those of blood, and nervous system in children and to cure gonorrhoea and jaundice, fresh juice of the leaves is recommended to be given with milk and liquorice or *mulethi*.

For *mental weakness* and to *improve memory*, powder of the dried leaves is given in small doses and along with milk.

In fever of various types remittent, intermittent, continued, chronic and malarial, pills made of this drug with basil or *tulasi* leaves and black pepper all in equal quantities and ground into a paste, are given morning and evening. The pills are to be of 3 grains in measure and the treatment is very beneficial.

In hoarseness of voice during pthises or consumption, a decoction made up of *brahmi, vacha (Acorus calamus) harada* (chebulic myrobalan), long pepper and honey in equal parts is useful.

In nervousness and hypochondria (or irrational anxiety for health), pills made up of *brahmi* in 5 parts, *pushkaramul (Saussurea lappa)* 4 parts and honey 6 parts is useful and given in doses of 3-5 grains as a nervine tonic.

This is a stimulant to healthy mucous secretion in *diarrhoea* in children and also in setting right *ozonea* or foul nasal secretion (*peenas* in Hindi).

It is not contended that *mandukaparni* is a sure remedy for leprosy. But it is undoubtedly true that administration of this drug will destroy many of the symptoms associated with leprosy and the patient does regain normal health to a great extent.

Another alkaloid called hydrocotyline has been isolated from this herb.

A definitively accelerating effect has been noticed with *manduka parni* on blood circulation. Its beneficial effect is observed on the whole of the circulatory system of the skin and the mucous membranes. In greater doses however, it acts as a narcotic and an intoxicating drug. In some patients this may result in headache, mental confusion and even swooning.

Successful uses have been carried out in Africa on leprosy. A glycoside called asiaticoside has been isolated and this has been employed effectively. The nodules of leprosy was seen there to particularly disappear with its treatment. It will be advisable to adopt this procedure even in India. Besides such a disappearance of nodules, the glycoside is attributed to bring about a return of sensation to the desensitised parts of the leprous.

Ancient References on Brahmi and Manduka Parni

Since both are much referred in ancient classics, it will be relevant to look at the references on them in some selected ancient authors. A few are given below; it is necessary to note that in these references of the two plants, overlapping medicinal properties have been mentioned with either of them. Though the two plants are quite different morphologically they do share some common medicinal actions and uses and, hence, the so called "confusion" in identity.

Charka: For epilepsy, it is advisable to take freshly extracted juice of *brahmi* along with milk.

As an *elixer* or *rasayana* it is beneficial to daily drink the freshly extracted juice of *mandukaparni* along with milk.

For strength, long span of life, and improved health, a proprietory preparation called *mandukaparni kalpa* is to be taken in the prescribed manner.

For stomach diseases, cook *nishoth* or *Ipomea turpethum* and *Centella asiatica (mandukaparni)* in their own juices. Nothing sour, salt, pepper or even oil should be added. Only this boiled vegetable mix should be taken. In case there is even an urge of thirst, fresh juice of these two plants alone should be consumed. A procedure of this nature continued for a month would cure even severe stomach upsets.

Sushruta: He prescribes two elaborate procedure of elixirisation or *rasayana* to secure mental brilliance and also long span of life - *medha ayushkamiya* . One of it is based on *brahmi* and the other on *mandukaparni.*

Brahmi rasayana: The prospective patient should first get rid of his vitiations existing in the body, give up normal food of rice and the like, enter into a specially constructed hut *(kuti)* and then take freshly extracted juice of *brahmi* plant purified one thousand times and do so in as much quantity of it as he can conveniently digest as per his own strength. On the second day, when the medicine is fully digested, he should then drink an *yavagu* or gruel prepared without any salt. If he prefers milk, he is advised to prepare this *yavagu* in milk and consume.

By adopting this procedure for seven days, he will secure the lustre of a knower of *brahma (brahma varchasvi)* and becomes brilliant in his mental faculties. In case he can continue this treatment for another seven days, he can compose

books as he desires. In case he has forgotten any thing, the whole of it will come back to his memory. He will become alert in his mind. If he continues in a third course like this, he can recollect anything by just hearing about it once. In case he completes the full course of 21 days this way, he will become the very goddess Saraswati.

Manduka Parni Rasayana: The prospective patient should first get rid of his existing vitiations, give up his normal food of rice and the like, enter into a specially constructed hut and then take freshly extracted juice of *manduka parni* purified one thousand times and drink it along with milk as much as his strength can sustain. When the medicine is digested, he should consume barley rice *(yava)* along with milk. Or, the barley rice should be taken along with *til* or sesame. This procedure should be continued for three months. When this barley rice is digested, he can take a diet of milk, ghee and rice.

A person adopting this regimen for three months, will have *brahmia varchas*, mental brilliance, retentive power for the *shrutis* (the Vedas) and all that he hears and will also live for a hundred year.

A *kalka* or a paste of *manduka parni* taken in a dose of 4 *tolas* in milk for ten days, will also confer brilliance of mind and longevity of hundred years.

A *kalka* or a paste of *manduka parni* taken in a dose of 4 *tolas* in milk for ten days, will also confer

This ghee is curative of many grave diseases such as leprosy, typhoid fever, epilepsy, insanity, poisoning, seizure by the spirits and others.

(ii) **Brahmi rasayana**

Take a clean mortar made up of *palasha* or jack fruit wood. Pound within it enough fresh leaves of *brahmi* to secure 256 *tolas* of the juice. Add with it 64 *tolas* of cow's ghee. Then prepare a *kalka* or paste of *patha (Cissampelos pareira), amalaki,* turmeric and *trivrita (Ipomea turpethum).* Mix them with the former, cook and prepare a ghee.

This is to be administered in any required dose. This should always be followed by an *anupana* or after drink of a powder of *vayavidanga, pippali, saindhav salt and jatamansi.*

The period of intake is seven days, fifteen days or one month.

This is an excellent elixir or *rasayana.*

(iii) **Brahmi svarasa rasayana:** (an elixir of the fresh *brahmi* juice).

This is advised to be taken as a special elixirising medication along the lines of many other famous *rasayanas* of this type for example, the *rasayana* of *amalaki.*

First cleanse your own body well by proper and the requisite measures and then enter into the special hut where you would be required to stay for the full duration of the regimen.

Carry out one thousand oblations or *homas* chanting *sahasra sampata mantras* of Rigveda, when you have started eating normal routine food after such a preliminary clean sing. And, then take as much of the *rasayana* as you can afford as per your strength. When this elixir is fully digested, drink a gruel without salt. If milk is compatible to you, drink this gruel along with milk.

If you carry out this regimen for seven days you will glow with a *brahma teja* and your intellect will increase.

If you carry this out for another seven days, you can compose technical treatises (*shastras*) as you desire; whatever you have forgotten, will come back to you.

If you complete one more course of seven days, your memory power will increase so much that you will remember hundreds of informations after hearing them just two times.

Such a course of 21 days (a full *mandala* or circle as it is called) will destroy poverty, the very Goddess of Learning of Saraswati will enter in you, you will find that all the Vedas will be at the finger tips. One will live for five hundred years with full memory intact !

Vangasena: In small pox, fresh juice of *brahmi* is to be drunk along with honey.

Shodala: In *boils, eruptions and pustules* sprinking the juice of *mandukarparni* would prove beneficial.

Modern Work

Acceleration of blood circulation in connection with all disorders of skin and thereby bringing about a salutary effect has been seen to be the invaluable contribution of *mandukaparni* or *Centella asiatica*. Because of this reason, the drug is specially employed medicinally. Effect of this action does confer a benefit even in syphilis and *vatarakta*. It was presumed first that beneficial effect was observable in every case of *vata rakta*, but later on it was conferred that it was only in the initial stages of the disease that good results were seen and not in advanced cases. However, appreciable advantage is seen by its use in old, chronic, and obstinate skin diseases of eczema, specially localised exzema which is often very serious and resistant.

Similarly the efficacy of this drug has become well proven in dysentery, ozonaea (*peenas* or foul smelling exudation from the nose), abnormal nasal and salivary discharge; in goitre, its nodules and other glandular swellings; and in swellings as well as in old rheumatic complaints.

Wherever any lesions or wounds and the like occur anywhere in the body, a drinking of a preparation of this plant is advised best, and, its use simultaneously as a poultice or as an ointment is also desirable. In many countries all over the world, these several benefits of the herb are getting proved and appreciated increasingly. As such a

demand for its greater and greater use is always seen to be there.

A short account of its experimental trials in recent times is as below:

Its alcoholic extract produced tranquilising effect on rats. This was found to be non toxic upon a dose of 350 milligram per kg body weight of the rat and given intraperitonically. The alcoholic and water extract counteracted spasm (involuntary muscular contraction - expansion) in ileum of rat induced artificially by treating it with barium. It also reduced spontaneous contraction and in addition caused a relaxation of muscles.

The alcoholic extract showed a depressing action on rats when given in toxic doses. And, the glycosidal faction of the drug had a sedative effect on rats. Even in anaesthetised dogs it produced slight respiratory stimulation, hypotension and bradycardia.

Brahmotides, the glucosides, were seen to possess sedative action in rats equal in degree to that of a mild tranquiliser.

Interestingly, an alcoholic extract of the entire plant was found to possess an anti-protozoal effect against *Entamoeba histolytica* that causes amoebic dysentery.

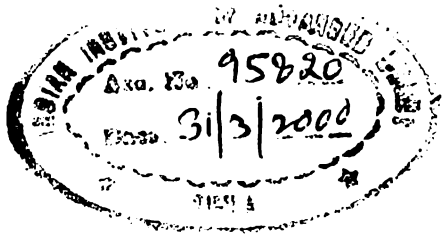
The effect of the whole plant powder on growth pattern and some biochemical constituents of blood and tissues was studied on albino rats fed on

low protein diet purposefully. This drug was then seen to prevent death rate due to gross protein deficiency. Simultaneously it increased the blood protein nitrogen and also prevented the fatty infiltration of the liver tissues.

A fool proof clinical trial was conducted on 43 normal adult humans to ascertain whether the drug does really have the *rasayana* or the elixirising effect as claimed much by the ayurvedic authors. This *was* shown to increase the mean level of red blood corpuscles, and also blood sugar, serum chlosterol, vital capacity and total protein - all of which are good signs of increased anabolic (i.e. synthetic) functions. The increase in haemoglobin (the red pigment portion in blood) percentage was quite high and statistically significant. This naturally increases the oxygenation of the tissues and the general health. The drug also decreased the mean blood urea level and effected a moderate decrease in serum acid phosphatase.

Similarly, careful clilnical trials were caried out on 30 mentally retarded children who were free from epilepsy and other undesirable neurological conditions, in order to study the much claimed salutary effect of the drug on general mental ability. The results indicated a significant improvement in both general ability and behavioural pattern of these unfortunate and handicapped children, even when the drug was administered for a short period of just twelve weeks !

An interesting and significant information is that as reported by Indian Council of Medical Research, alcoholic extracts of the entire plant of *brahmi* has been found to have anticancer activity against a type of cancer called Walker's Carcinosarcoma 56 (intramuscular) as seen in rats.



Rs. 25 Each

- Haraḍ and Baheda
- Gourds and Pumpkins
- Amalaka and Bhumi Amalaka
- Onion and Garlic
- Neem and its Relatives
- Banyan and Peepul
- Khas, Kesar, Nagakesar and Khaskhas
- Coconut, Supari, Kikar and Catha
- Bael, Wood Apple, Lemons and Castor
- Ginger and Turmeric
- Salts, Sugar, Jaggery and Honey
- Spices
- Isabgol, Gokhru and Brahmi
- Seasoning Herbs
- Fragrant Herbs
- Milk and Milk Products
- Leafy Vegetables
- Ve
- Karkatas
  Nausada

BOOKS FOR ALL