



IDENTIFICATION OF *BRAHMI* (*BACOPA MONNIERI* LINN.) AND IT'S MORPHOLOGICAL AND PHYTOCHEMICAL STUDY WITH RESPECT TO *MEDHYA KARMA*.

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Abstract:

Brahmi (*Bacopa monnieri* Linn.) is important distinct *Medhya* (Nootropic) *dravya* mentioned in Indian system of medicine, lack of morphological description and attribution of similar chemical properties among many plants leads towards confusion in identity of this plant.

Pharmacopoeias suggest macroscopic characterization and chemical profiling of botanical material forms a pilot step in drug standardization.

Hence the detailed morphological description along with phytochemical documentation of this plant is planned in the present study which helps to identify the plant more precisely and to use this plant in medicinal use.

Key words: Identification, *Brahmi*, *Bacopa*, *Monnieri*, Morphological, Phytochemical, *Medhya Karma*.

Introduction:

Ayurveda the science of life, considered as *upaveda* or *upanga* of *Rigveda*, in fact originated prior to *Vedas*. *Rigveda* which is one of the oldest book in the library of man, supplies more information on the subject. From it we came to know that Indo Aryans used the *Soma* as a medicinal agent. Whereas the plant is not yet satisfactorily identified, the knowledge of medicinal plants must have been accumulated in the course of many centuries.

We know that there are many plants mentioned by ancient Indian medical authors which are not procurable now, the extinction of valuable medicinal plants of ancient India is well explained by Mr. J. L Stingel in American journal of Pharmacy for 1912, that 'with the progress of civilization the plant has diminished,. He says 'the scarcity of this valuable drug cannot be entirely attributed to lack of plants or due to extinction, but to other conditions, which tend to prevent identification at the time of collection.

According to *Aacharya Charaka*, as he mentioned the *Endri* and *Brahmi* in *Prajasthapak Mahakashaya*, now a day we know that *Endri* is *Bacopa monnieri* Linn. and in *Dravyaguna-Vijnana* by Prof. P.V.Sharma described the *Endri* is *Brahmi*, as per this, we can conclude that, *Brahmi* is *Medhya Dravya* as per Ancient Science of Ayurveda.

According to Prof. P.V. Sharma, *Medhya karma* (Intellect-promoting) is divided in three categories *Dhee* (Power of acquisition), *Dhruti* (Power of retention) and *Smruti* (Power of recollection).

Medha is the *karma* of *Pitta*, as per mentioned by *Aacharya Charaka*

Morphological Study-

Main features:

A creeper which grows in marshy area, it is considered to be a sacred plant. It is indigenous and found all over India. It is used by sages It improves intelligence and memory power. It is a small creeping, marshy herbs with branches 20cm or more long.

Leaves:

Leaves sessile, 6-25 leaves on each branch, length is around 2.5-10mm, obovate, oblong or spatulate, rather fleshy, dotted black specks, very obtuse.

Flowers:

Axillary, solitary, bracteoles 5mm long, linear pedicels- 0.6-3.2cm long and slender. Calyx-glabrous, divided into the base, upper sepal 6 by 3.5cm, long slender other 4 sepals slightly shorter than the upper. Corolla- pale, blue or almost white, 8 mm long, lobes-nearly equal. Anther-bluish purple.

Fruits:

Capsules-5 mm long, ovoid, acute, pointed with style, base-glabrous.

Seeds:

About 0.85 mm long, oblong, pale.

Useful Parts:

Whole plant

Kingdom	Plantae
Sub-kingdom	Tracheobionta
Super division	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida_
Sub class	Rosidae
Family	Apiaceae

Taxonomical Classification

Genus	Centella
Species	Centella asiatica

Vernacular Names:

Sanskrit	<i>Brahmi</i>
Bengali	<i>Brahmi sak, Jalnimba</i>
English	<i>Thyme leaved gratiol</i>
Hindi	<i>Brahmi, Jalanim</i>
Kannada	<i>Nirubrahmi</i>
Malyalam	<i>Nirbrahmi</i>
Marathi	<i>Brahmi, Nirbrahmi</i>
Tamil	<i>Nirpirami</i>
Telugu	<i>Sambrani chettu</i>

Ayurveda View: (according to *Sodhala Nighatu*)

<i>Rasa</i>	<i>Guna</i>	<i>Virya</i>	<i>Vipaka</i>	<i>Prabhava</i>
<i>Tikta</i>	<i>Laghu</i>	<i>Ushna</i>	<i>Katu</i>	<i>Medhya</i>

Doshakarma:Kafa-Vata shamakOther karma:

Shothahara, Vedanasthapaka, Vishaghna, Medhya, Aakshepahara, Dipana, Pachana, Raktashodhaka, Kanthya, Mutral, Aartavjanaka, Swedajanana, Kandughna, etc.

Prayojya Anga:*Panchanga***Phytochemical Study:**

Photochemistry (phyto=plant) is a branch of chemistry deals with the chemical nature of the plant or plant products. (Chemistry of the natural products).plants contains many chemical constituents which are therapeutically active or inactive. The one which are active is called active principle or active constituents (tannins, alkaloids, Flavonoids etc.).The inactive ones are called inert chemical constituents though they possess minimum pharmacological or therapeutic activity, are essential for the normal physiological activity.

To do phytochemical study of Plants, it is recommended to Perform HPLC (High-performance liquid chromatography). High-performance liquid chromatography (HPLC), formerly referred to as high-pressure liquid chromatography, is a technique in analytical chemistry used to separate, identify, and quantify each component in a mixture.

HPLC Report of Brahmi (Whole Plant):

<u>TEST FOR DETERMINATION</u>	<u>NUMBER OF COMPONENTS</u>	<u>CONTRIBUTION%</u>	<u>ANY REMARKS</u>
Aliphatic/ Phenolic/ Polyphenolic Acids	2	2%	
Phytoamines/Alkaloids	6	32%	Brahmin
Polyphenols/Flavonoids/Antioxidants	10	22-25%	Apigenin, rutin, myricetin etc
Glycosides/Sugar-Terpinoids			
Terpinoids/Tocopherols	6	5-6.5%	Bacoside derivatives
Phytosterols/Steroids			
Miscellaneous Category			

Phenolic Acids:

Phenolic acids, readily absorbed through intestinal tract walls, are beneficial to human health due to their potential antioxidants and avert the damage of cells resulted from free-radical oxidation reactions. On regular eating, phenolic acids also promote the anti-inflammation capacity of human beings

Bacosides:

Are significant components of *Bacopa monnieri* and play essential roles in Mental Health. It also protects the cytotoxicity and DNA damage of neurons implicated in Alzheimer's disease (AD) and repaired the impaired neurons by enhancing kinase activity and neuronal synthesis. It helps to reduce stress and anxiety by reducing levels of cortisol, a hormone that is closely linked to stress levels

Antioxidants:

Free radicals are molecules produced when your body breaks down food or when you're exposed to tobacco smoke or radiation, they can increase the risk of inflammation and various health issues. Antioxidants are substances that may protect your cells against free radicals, which may play a role in heart disease, cancer and other diseases. Antioxidants can prevent oxidative stress to brain cells. This is particularly important, as the adult brain virtually stops replacing dead or dying neurons.

Terpinoids:

Terpenoids Exert Neuroprotective Effects by Restoring Blood Brain Barrier Permeability. The blood brain barrier (BBB) is the primary metabolic interface between the peripheral blood supply and neural tissues or their fluid spaces.

Conclusion:

The Morphological study of *Brahmi* (*Bacopa monnieri* Linn.) helps in Identification of Plant in wet form. Phytochemical study revealed presence of Aliphatic Acids, Alkaloids (i.e. Brahmin), Antioxidants (i.e. Apigenin, Rutin, Myricetin) and Terpinoids (i.e. Bacoside derivatives) It can be suggested that, *Brahmi* (*Bacopa monnieri* Linn.) have anti-convulsant properties and can be used in management of stress and stress related side effects, it can be used in Alzheimer's disease (AD). It can also prevent oxidative stress to brain cells. *Brahmi* can increase *Dhee*, (Power of acquisition) and *Smruti* (Power of recollection) by its *Ushna Virya* property. So in this way we can prove that *Brahmi* (*Bacopa monnieri* Linn.) can do *Medhya karma*.

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