

A CRITICAL REVIEW ON BRAHMI**Ashalatha M¹,****L.N.Shenoy.^{2*}**¹ Professor and HOD; Department of Dravyaguna, Government Ayurveda Medical College, Bengaluru,^{2*} Ph.D Scholar, Department of Dravyaguna, Government Ayurveda medical college, Bengaluru, Karnataka, India**ABSTRACT**

Centella asiatica and *Bacopa monnieri* widely known as Brahmi are considered as ‘*Medhya rasayanas*’ (brain tonic). However, these plants are distinctly different. The name Brahmi, is assigned to *Bacopa monnieri* whereas “*Mandukaparni*”, often confused with Brahmi, refers to *Centella asiatica*. Brahmi is largely treasured as a revitalizing herb used by Ayurvedic medical practitioners for almost 3000 years. The herb has been mentioned in several Ayurvedic treatises including *Charaka Samhita* and *Sushruta Samhita*. In addition to being a well-known nootropic herb for centuries, it has also been used as an antispasmodic, astringent, cardio tonic, diuretic, anti-convulsant, anti-inflammatory, analgesic, antipyretic and antiepileptic agent. *Brahmi* is a well-known nootropic herb and its uses in neurological and psychiatric disorders are well recognized. Its efficacy and safety is supported by research and thousands of years of knowledge and experience. Despite being such an old medicine, its new benefits are constantly being studied. Brahmi is one of the most sattvic herbs known in Ayurvedic pharmacopeia since vedic times. Hence here is an attempt to compile all the classical references of Brahmi a wonder drug.

Keywords: Brahmi, *Bacopa monnieri*, nootropic, *medhya rasayana*

INTRODUCTION

In recent times, the use of herbal products has increased significantly. Brahmi is an important medicinal plant that has been widely used therapeutically in the orient and is becoming increasingly popular in the developing countries as well as in the west. Brahmi is a Sanskrit word derived from “Lord Brahma” or “Brahman”. Lord Brahma is the divinity responsible for all of the creative forces in the world and Brahman is the Hindu name given to the universal consciousness. Brahmi literally means the energy (“*Shakti*”) of Brahma. In India, Brahmi is largely treasured as a revitalizing herb used by Ayurvedic medical practitioners for

almost 3000 years. The herb has been mentioned in several Ayurvedic treatises including *Charaka Samhita* and *Sushruta Samhita*. In addition to being a well-known nootropic herb for centuries, it has also been used as an antispasmodic, astringent, cardio tonic, diuretic, anticonvulsant, anti-inflammatory, analgesic, antipyretic and antiepileptic agent. The ancient Ayurvedic sages, who were also great physicians, revealed Brahmi’s role in promoting *Medhya* (intellect), *Ayushya* (longevity), *Rasayana* (rejuvenation), *Hrdhya* (Heart), *Balya* (strength, especially mind), *Jivaniya* (life energy), *Nidrajanana* (sleep) etc. Over the centuries, the role of Brahmi in the treatment of

Kustha (leprosy/skin disorder), *Pandu* (anemia), *Meha* (diabetes), *Asra Vikara* (blood disorders), *Kasa* (cough), *Visa* (poison), *Sopha* (edema), *Jwara* (fever), *Unmada* (insanity), and *Manasavikara* (mental disorders) has been well described. *Bacopa monnieri* of Scrophulariaceae is the accepted source of Brahmi. It is a weak, creeping herbaceous plant common in marshes and is called Brahmi or Nirbarhmi in vernacular languages. The whole plant is used in a variety of preparations like Brahmighritam, Mishrakasneham etc. It commonly grows throughout India, Nepal, Sri Lanka, Pakistan, China, Taiwan, Vietnam & USA. Due to Brahmi's widespread availability across the globe, it is often recognized by different names in different regions and languages. Thus, Brahmi has a lot to offer to the medical world.

CLASSICAL REVIEW OF BRAHMI :

- A reference is found in Yajurveda about Brahmi, it has been described as Santhanothpadaka.
- Atharva parisista and other texts quote Brahmi as Medhya (A.P. 1/44/10)
- Mentioned in Kausika Sutra (82.26)

SAMHITA KALA:¹⁻³

- In Charaka Samhita it is explained under Prajastapana mahakashaya, Garbhasthapana dravya,

Aindriya Rasayana, Apasmara Chikitsa, Kushtha Chikitsa.

- Sushruta mentioned preparations of Brahmi ghrita and Brahmi rasayana.
- Acharya vagbhata in utara sthana quoted Brahmi as the best remedy for Apasmara.

NIGHANTU KALA^{5,9,10,11,17}

- According to *Shodhala Nighantu Brahmi* is superior to *Mandukaparni*
- According to *Bhavaprakasha Nighantu* Brahmi and *Mandukaparni* have the same properties.
- *Priya nighantu* mentions Brahmi in *Shatapusphadi varga*.
- *Nighantu adarsha* mentions Brahmi in *Tiktalonika varga*
- Botanically it is identified as *Bacopa monnieri* Linn./*Herpestis monniera* Linn.

PARYAYA PADAANI:

Brahmi : MEDHYA JANAKATWATH BRAHMI HITA.

The one which is intellect promoting is called as Brahmi .

Jalasaya - available in water sources

Toyavalli - grows abundantly in an around water

Tiktalonika - it is bitter type of lonika

Vayastha - rejuvenates individual

Somavalli - A creeper prefers marshy areas for its growth

Table 1: Showing Synonyms of Brahmi ^{4, 7, 8,6,5,9,10,11,24}

Synonyms	B.N	P.N	S.N	K.N	M.N	R.N	D.N	A.N	H.D	L.N
<i>Brahmi</i>	+	-	-	-	+	-	+	+	-	+
<i>Kapotavanka</i>	+	-	-	-	-	-	-	-	-	-
<i>Somavalli</i>	+	-	-	-	-	-	-	-	-	-
<i>Saraswathi</i>	+	-	-	-	+	-	-	-	-	+
<i>Satyavathi</i>	+	-	-	-	-	-	-	-	-	+
<i>Satyahva</i>	-	-	-	-	+	-	-	-	-	-

<i>Divyateja</i>	-	-	+	-	-	-	+	-	-	-
<i>Tiktalonika</i>	-	-	-	-	-	-	-	+	-	-
<i>Twastra</i>	-	-	+	-	-	-	+	-	-	-
<i>Mahashoudhi</i>	-	-	+	-	-	-	+	-	-	-
<i>Brahmacharini</i>	-	-	-	-	+	-	-	-	+	+
<i>Toyavalli</i>	-	-	-	-	-	-	-	+	-	-
<i>Jalashaya</i>	-	-	-	-	-	-	-	+	-	-
<i>Vaami</i>	-	-	-	-	-	-	-	+	-	-
<i>Brahmasuvarchala</i>	-	-	+	-	-	-	+	-	-	-
<i>Mastyakshi</i>	-	-	+	-	-	-	-	-	-	+
<i>Sustara</i>	-	-	+	-	-	-	-	-	-	-
<i>Soma</i>	-	-	+	-	+	-	-	-	-	-
<i>Medhya</i>	-	-	+	-	-	-	-	-	-	-
<i>Sowmya</i>	-	-	-	-	-	-	+	-	-	-
<i>Vinirdista</i>	-	-	-	-	-	-	+	-	-	-
<i>Lavani</i>	-	-	+	-	-	-	-	-	-	-
<i>Vayastha</i>	-	-	-	-	-	-	-	-	-	+
<i>Brahmani</i>	-	-	-	-	-	-	-	-	-	+
<i>Somavallari</i>	-	-	-	-	-	-	-	-	-	+
<i>Bharathi</i>	-	-	+	-	-	-	-	-	-	-
<i>Sharadhi</i>	-	-	+	-	-	-	-	-	-	-
<i>Smarani</i>	-	-	+	-	-	-	-	-	-	-
<i>Aindri</i>	-	+	-	-	-	-	-	-	-	-
<i>Suswara</i>	-	-	-	-	-	-	-	-	-	+
<i>Indravalli</i>	-	+	-	-	-	-	-	-	-	-
<i>Kathitendrapatni</i>	-	+	-	-	-	-	-	-	-	-
<i>Chendranishaka</i>	-	+	-	-	-	-	-	-	-	-
<i>Munibhi</i>	-	+	-	-	-	-	-	-	-	-
<i>Kupodaka</i>	-	+	-	-	-	-	-	-	-	-
<i>Lonidala</i>	-	+	-	-	-	-	-	-	-	-
<i>Ambunimba</i>	-	+	-	-	-	-	-	-	-	-

VERNACULAR NAMES¹⁷

Table 2: Showing Vernacular names of Brahmi

Arabic	<i>Zarazab</i>
Bengali	<i>Brahmi sak, Jalanimba, Vdhabini, Birmi</i>
Bombay	<i>Bama</i>
Chinese	<i>Pa-Chi-Tlien</i>
English	<i>Water Hyssop, Thyme leaved gratiola</i>
Hindi	<i>Brahmi, Jalnim, Barambhi</i>
Kannada	<i>Nirubrahmi, Kiru brahmi, Neeruppi gida</i>

Konkan	<i>Brahmi</i>
Malay	<i>Bremi</i>
Malayalam	<i>Brami, Nirbrahmi</i>
Marathi	<i>Nirbrahmi</i>
Persian	<i>Jaranab</i>
Sanskrit	<i>Aindri, Brahmi, Gundala, Indravalli, Jalasaya, Matyaksi,</i>
Tamil	<i>Nir pirami, Piramiye pundu, Vivitam campirani</i>
Telugu	<i>Sambrani Chettu, Neeri Sambraani mokka sambraani aaku</i>
Urdu	<i>Jalanim, nirabrahmi</i>

GANNA/VARGA: ^{1,2,4,5,6,7,8,9,24,26}

Table 3: Showing the classification according to various authors.

Classical Text	Gana /Varga
<i>Charaka samhita</i>	<i>prajasthapana gana,</i>
<i>Sushruta samhita</i>	<i>Veeratharvadi gana</i>
<i>Astanga sangraha</i>	-
Nighantu	Varga
<i>Bhavaprakasha Nighantu</i>	<i>Guduchyadi varga</i>
<i>Dhanwantari Nighantu</i>	<i>karaveeradi varga</i>
<i>Kaiyadeva Nighantu</i>	<i>Oshadi varga</i>
<i>Raja Nighantu</i>	<i>Parpatadi varga</i>
<i>Priya Nighantu</i>	<i>shatapushpa varga</i>
<i>Madanapala Nighantu</i>	<i>Abhayadi varga</i>
<i>Nighantu adarsha</i>	<i>Tikta lonikavarga</i>
<i>Shodala Nighantu</i>	<i>karaveeradi varga</i>
<i>Hrudaya deepika Nighantu</i>	<i>Dweepada varga</i>
<i>Saligrama nighantu</i>	<i>Guduchyadi varga</i>
<i>Dravyaguna vignana(P.V.sharma)</i>	<i>Medhyadi varga</i>

RASAPANCHAKA ^{9,8,4,7,10,5,6,11}

Table 4: Showing Rasa panchaka of Brahmi according to different authors

Rasapanchaka	B.N	K.N	D.N	R.N	P.N	M.N	S.N	N.A
<i>Rasa</i>								
<i>Tikta</i>	+	-	+	+	+	-	+	+
<i>Kashaya</i>	+	-	-	+	-	-	-	+
<i>Madhura</i>	+	-	-	-	-	+	-	-
<i>Guna</i>								
<i>Laghu</i>	+	+	-	-	+	+	-	-
<i>Sara</i>	+	+	-	-	+	+	+	-
<i>Hima</i>	+	-	-	+	-	+	-	-
<i>Picchila</i>	-	-	-	-	-	-	+	-
<i>Soumya</i>	-	-	+	-	-	-	-	-

Sheeta	-	-	-	-	+	-	-	-
Veerya								
Sheeta	+	+	+	-	+	-	-	-
Vipaka								
Madhura	+	+	+	-	+	+	+	-
Doshagnata								
Pittahara	+	+	+	+	-	+	+	-
Kaphahara	+	+	-	-	-	+	+	-

KARMAS ^{9,8,4,7,10,6,11}

Table 5: Showing Karmas of Brahmi

karmas	B.N	K.N	D.N	R.N	P.N	M.N	S.N	N.A
Medya	+	-	-	-	+	+	+	-
Shothahara	+	-	+	-	+	+	-	-
Rasayani	+	-	-	-	+	+	-	-
Vishagna	+	-	-	-	-	+	-	+
Balya	-	-	-	-	-	-	-	+
Hrudya	-	-	-	-	+	-	-	+
Kushtagna	+	-	+	-	+	+	-	-
Kandugna	-	-	+	-	-	-	-	-
Swarya	+	-	-	-	-	+	-	+
Mehagna	+	-	-	-	+	+	-	-
Smritiprada	+	-	-	-	-	+	-	-
Jwaragna	+	-	+	-	-	+	-	+
Ayushyavardaka	+	-	-	-	-	-	+	-
Deepana	-	-	+	-	-	-	-	-
Pandugna	-	-	+	-	+	+	-	-
Pleehagna	-	-	+	-	-	-	-	-
Vayasthapani	-	-	-	-	-	-	+	-

ROGAGHNATA ^{1,2,3,4,5,6,7,8,10,9,11}

Table 6: Showing Rogagnata of Brahmi according to various authors

Roghagnata	C.S	S.S	A.H	D.N	S.N	R.N	K.N	M.P	P.N	N.A	B.N
Unmada	-	-	-	-	+	-	-	-	-	-	-
Ajeerna	-	-	-	-	-	-	-	-	-	+	-
Kushta	-	+	-	+	-	-	-	+	+	-	+
Kandu	-	-	-	+	-	-	-	-	-	-	-
Jwara	-	+	-	+	-	-	-	+	+	+	+
Shopha	-	-	-	+	-	-	-	+	+	-	+
Aruchi	-	+	-	-	-	-	-	-	-	-	-
Shwasa	-	+	-	-	+	-	-	-	-	-	-
Kasa	-	+	-	-	-	-	-	+	-	+	+

<i>Pandu</i>	-	-	-	+	-	-	-	+	+	-	+
<i>Meha</i>	-	+	-	-	-	-	-	+	+	-	+
<i>Visha</i>	-	-	-	-	-	-	-	+	-	-	+
<i>Moha</i>	-	-	-	-	-	-	-	-	-	-	-
<i>Shleshmavikara</i>	-	-	-	-	+	-	-	-	-	-	-
<i>Raktpitta</i>	-	+	-	-	-	-	-	-	-	-	-

THERAUPEUTIC USES

MENTAL FUNCTIONS

- ❖ Brahmi swarasa mixed with kustha and honey removes insanity (VM 20.3; also SG 2.1.18)
- ❖ Old ghee processed with brahmi swarasa, vacha, kustha and sankhapuspi relieves insanity, epilepsy and sinful condition (CS.ci10.25)
- ❖ Panchagavya ghrita mixed with brahmi swarasa removes epilepsy (CS.ci 10/62)
- ❖ Brahmi given with honey for prolonged duration, to attain longevity, improve memory and intelligence.

PEDIATRIC MANAGEMENT

- ❖ Brahmi swarasa should be taken with honey and ghee for promoting intellect (KS P.5)

OTHERS

- ❖ Fresh juice of brahmi massaged on rheumatic joints relieves pain and swelling.
- ❖ Medicated milk of brahmi is used in dysuria and urinary calculi.
- ❖ In hoarseness of voice, brahmi with pippali, vasa and haritaki is chewed.
- ❖ Hot poultice of plant applied in acute bronchitis, cough, chest complaints.

IMPORTANT YOGAS OF BRAHMI^{1,27,31}

Table 7: Showing some of the Yogas of Brahmi

Yoga	Adhikara	References
<i>Aindri /andri rasayana</i>	<i>Rasayana</i>	<i>Cha.chi</i>
<i>Indrokta rasayana</i>	<i>Rasayana</i>	<i>Cha.chi</i>
<i>Matulungadi kwatha</i>	<i>Jwara</i>	<i>Chakradatta</i>
<i>Dvatrishanga kwatha</i>	<i>Jwara</i>	<i>Br.ni.ra</i>
<i>Kshudradi kwatha</i>	<i>Jwara</i>	<i>Bhavaprakasha</i>
<i>Brahmi vati</i>	<i>Jwara</i>	<i>B.R</i>
<i>Saraswatha gritha</i>	<i>Swarabheda</i>	<i>B.R</i>
<i>Brahmyadi yoga</i>	<i>Unmada</i>	<i>Chakradatta</i>
<i>Saraswatha churna</i>	<i>Unmada</i>	<i>Bhavaprakasha</i>
<i>Unmadagajakeshari rasa</i>	<i>Unmada</i>	<i>B.R</i>
<i>Mahapaishachaka gritha</i>	<i>Unmada</i>	<i>Chakradatta</i>
<i>Brahmi gritha</i>	<i>Apasmara</i>	<i>Bhavaprakasha</i>
<i>Saraswatharista</i>	<i>Rasayana</i>	<i>B.R</i>
<i>Smritisagara rasa</i>		<i>AS/ U/10/37</i>
<i>Saraswatha Ghrta</i>		<i>AS/ U/ 1/92</i>
<i>Astamangala Ghrta</i>		<i>Bp/ MK/ 8/37</i>

TAXONOMICAL POSITION²²

Kingdom - Plantae

Division - Magnoliophyta

Class - Magnoliopsida

Order - Lamiales

Family - Scrophulariaceae

Genus - Bacopa

Species - Monnieri

Latin Name - Bacopa Monnieri

BACOPA MONNIERI MORPHOLOGY¹⁷

***Bacopa monnieri* Linn.²²**

Synonyms for *Bacopa monnieri* Wettst.

1. *Bacopa monnieri* (L.) Pennell.yes
2. *Lysimachia monnieri* L. Cent.
3. *Gratiola monnieri* (L.) L.
4. *Monniera cuneifolia* Michaux
5. *Herpestis monniera* (L.) Kunth

ETYMOLOGY

Herpestis-creeping, ***monniera***- necklace

HABIT: It is small, glabrous succulent, creeping herb.with ascending branches 20 cm or more long. It spreads on ground.

STEM -10-30 cm long, rooting at the nodes, branches numerous, ascending.

LEAVES: Sessile, decussate, 6-25 by 2.5-10 mm, Obovate- Oblong or Spathulate, rather fleshy , dotted with black specks,very obtuse, quite entire; nerves obscure.

FLOWERS: Solitary, Axillary, Bracteoles 5 mm long, linear; pedicles 0.6-3.2 cm long,slender.

CALYX:Glabrous, divided to base; upper sepals 6 by 3-4mm, ovate,acute;the other 4 sepals slightly shorter than upper; the 2 inner lateral ones 1.5 mm wide, lanceolate, acute.

COROLLA:Pale blue or white, 8 mm long lobes nearly equal, rounded , strangled when fresh with shining dots.

ANTHERS – Bluish Purple; **POLLEN** – White

CAPSULE –5mm long, ovoid,acute,poined with the style-base,glabrous. **SEED** – Oblong, striate, pale, 0.85mm long.

DISTRIBUTION: It commonly grows in marshy areas throughout India, Nepal, Srilanka, China and is also found in Florida, Hawaii and other southern states of the USA.

CULTIVATION AND PROPAGATION¹⁵

It can easily be grown in damp areas on a variety of soils.The plant can be propagated by seeds and also vegetatively by cuttings,It requires wet and marshy soil.

Micropropagation

It can also be propagated in vitro through tissue culture technique by using node, internode and leaf explants on MS medium supplemented with BAP(1.5-2.0 mg/l)

Rooting is achieved on full or half strength MS medium with or without 0.5-1.0mg/l NAA or 0.5-1.0mg/lIBA callic derived from nodal explant cultured on MS medium +0.5 mg/l 2,4-D,when subcultured on MS+0.1 or 0.5 mg/lBAP or 0.2 mg/l 2,4 -D+0.1 or 0.5 mg/l kn,develop somatic embryos.

IDENTITY, PURITY AND STRENGTH¹⁴

Foreign matter: Not more than 2 per cent,

Total Ash: Not more than 18 per cent,.

Acid-insoluble ash: Not more than 6 per cent,

Alcohol-soluble extractive: Not less than 6 per cent,

Water-soluble extractive: Not less than 15 per cent

CHEMICAL CONSTITUENTS^{15,20}

The herb contains the alkaloids brahmine,herpestine($C_{34}H_{46}N_2 O_6$)and a mixture of three bases.

The herb also contains the saponins, monnierin ($C_{51}H_{82}O_{21}.3H_2O$); hersaponin . And

bacoside A [C₄₁H₆₈ O_{13.4} H₂O] and bacoside B [C₄₁H₆₈ O_{13.5} H₂O] other constituents present in the plant are D-mannitol, betulinic acid, stigmasterol and its esters, heptacosane, octacosane, nonacosane, triacontane, hentriacontane, dotriacontane, nicotine, 3-formyl-4-hydroxy-2H-pyran (C₆H₆O₃), luteolin, and its 7-glucoside.

The presence of L-alanine, aspartic acid, glutamic acid and serine is also reported.

The leaves contain sterol (C₂₆H₄₆ O. H₂O)

TOXICOLOGY¹⁵: LD₅₀ of total alkaloidal fraction was 8.5mg/100gm i.p in mice.

THERAPEUTIC EVALUATION¹⁵:

Clinical reports showed that this drug is an antianxiety agent having adaptogenic effect. It is a brain tonic, sedation is associated with therapeutic doses of the drug.

SUBSTITUTES AND ADULTERATION¹⁵

Brahmi is often substituted and confused with Centella asiatica as both the plants BRAHMI.

PHENOLOGY²² Flowering : April – June

Fruiting : June–December

PART USED¹⁶ Whole plant, leaves

POSOLOGY^{16>} Svarasa - 10-20ml

Churna - 500mg-1gm

RESEARCH WORKS:^{12, 22}

1. The crude alcoholic extract had sedative effect on frogs and dogs. The extract also possess cardiogenic, vaso constrictor and neuro-muscular blocking actions in frogs.
2. Saponin showed a sedative effect in mice. It did not protect rats against electric shock and mice against metrazol seizures (Malhotra et al., 1961)
3. The alcoholic extract of the whole plant was found to have anti-cancer activity

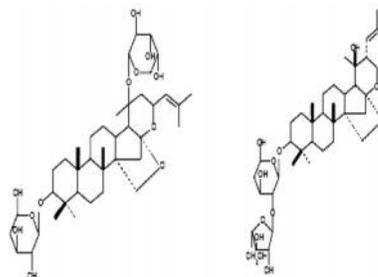
side B [C₄₁H₆₈ O_{13.5} H₂O] against carcinosarcoma in rat. (Bhakuni et.al., 1969)

4. **Phytochemical analysis and in vitro antioxidant activity from the extract of Bacopa monnieri penna – a multi-purpose medicinal plant.** B.Subashri and Y. Justin koilpilla Department of Biotechnology, Sathyabama University, Chennai, India. *Bacopa monnieri*, an important medicinal plant belonging to the family of Scrophulariaceae, which has been valued for centuries in Ayurvedic medicine, was extracted with ethyl acetate and methanol solvents for the purpose of preliminary screening. The different qualitative chemical tests were performed on the extracts to detect the various phyto constituents or antioxidants present in them. The photochemical screening reveals the presence of many therapeutically important compounds such as glycosides, alkaloids, saponins, phenols, proteins and carbohydrates. Since the phenolic compounds have remarkable antioxidant activities.

5. **Phytochemical analysis of leaf callus of Bacopa Monnieri** L Sunil Kumar Singh

Dept. of Biotechnology, Sathyabama University, Chennai - 600119, TN, India commonly known as “brahmi”. Used for different diseases such as- nervous disorder, respiratory problem, leprosy, splenomegaly, skin disease etc. In the present study, the ethanolic and aqueous extract of the leaf

callus of *Bacopa monnieri* was investigated for its



Bacosaponin A

Bacosaponin B

phytochemical analysis by modified Kirby-Bauer diffusion method. The finding of this study revealed that the extract of the leaf callus of *Bacopa monnieri* revealed the presence of Tannins, flavonoids, glycosides, terpenoids, saponins, and steroids and absence of Anthroquinone, Phenolic etc.

6. Annual variations in Bacoside content of *Bacopa monnieri* (L) plants. MUNISH SHARMA¹, RAVI KANT KHAJURIA² AND SHARADA MALLUBHOTLA *School of Biotechnology, Shri Mata Vaishno Devi University, Katra-182320, J&K, India CSIR-Indian Institute of Integrative Medicine, Jammu-180001, India*

ABSTRACT A study was conducted to evaluate bacoside (expressed as sum of bacoside A3 and A2) production on a monthly basis in net house grown plants of *Bacopa monnieri* (accession BM001) collected from Jammu region. Bacoside content differed during the course of the whole year. The whole herb is used commercially for extracting the memory enhancing molecule - bacosides from the plant. The study significantly points out that the maximum bacoside yield was obtained during August to October (monsoon period) which also coincides with the favourable period for plant growth and would be suitable for plant harvest. Amongst the various individual plant parts, the highest content was recorded in the leaves (6.06 mg g⁻¹ DW) followed by stem (5.13 mg g⁻¹ DW) and least in the roots (3.19 mg g⁻¹ DW).

DISCUSSION

The words Brahmi and Mandukaparni are available in the literatures of vedic period like *Atharva veda parishad* etc. where they are indicated as *medhya rasayana*. Brahmi and Mandukaparni are

mentioned in the Bruhatrayis. *Acharya Charaka* mentioned the drug *Brahmi* in the *prajasthapana gana* and *Mandukaparni* in *vayasthapana gana*. In *rasayana pada*, Brahmi is mentioned as one of the ingredients of *aindri rasayana* and *Mandukaparni* as one among the *medhya rasayana*. When we analyse classical references of Brahmi and *Mandukaparni* we can infer that most of the acharyas are of the opinion that both drugs are same because they have not been mentioned in the same instance. Hence conclude that they both are same with respect to their action. But the synonyms of the drugs, usage of Brahmi and *Mandukaparni* are seen extensively in many classical preparations. However taxonomy, chemical constituents are different hence both drugs were taken for the study.

Botanically identified Brahmi as *Bacopa monnieri* Linn, family *scrophularaceae* and *Mandukaparni* as *Centella asiatica*, family *Apiaceae*.

CONCLUSION

There is a huge surge in Ayurvedic plants and world over it has become a subject of intensive research for various aspects. There have also been substantial efforts to standardize the Ayurvedic crude drugs as well as finished Ayurvedic medicines. However, these initiatives would imperatively need establishing correct identity of the plant drug. The long history of safe usage of Ayurvedic medicines can be extrapolated only when the botanical identity of the plant going into those medicines is established and standardized. Hence proper nomenclature and establishing their exact botanical origin is a must. Thus further study to explore the traditionally claimed unexplored activities of Brahmi has to be carried out.



Brahmi plant



Brahmi leaves



Brahmi flowers

REFERENCES

1. Agnivesa, **Charaka Samhita**, Revised by Charaka and Drdhabala, Commentary by Pt.Kasinath Sastri and Dr.Gorakhanatha Chaturvedi, Re-print 2004, Varanasi, Chaukhamba Bharati Academy, Tpg-738.
2. Sushruta, **Sushruta Samhita**, with Nibandhasangraha commentary of Dalhanacharya and Nyayachandrika panjika of Gayadasacharya on Nidanasthana, Edited by jadavji Trikamji Acharya and Narayan Ram Acharya, re-print 2012, Varanasi, Chaukhamba Surbharati Prakashan, Tpg-824.
3. Acharya Vagbhata, **Astanga Sangraha**, Volume II, Translated by Prof.K.Srikanthamurthy, Second edition 1999, Varanasi, Chaukhamba Orientalia, Tpg-627.
4. Vagbhata, **Astanga Hridaya**, with commentaries of Arunadatta and Hemadri, Edited by Pt.Hari Sadasiva Sastri, Re-print 2011, Varanasi,

- Chaukhambha Surbharati Prakashan, Tpg-956.
5. Vaidyaacharya Keshava, **Siddhamantra**, Commented by Prakash, Edited by P.V.Sharma, First edition 1977, Varanasi, Chaukhamba Amarabharathi Prakashan, Tpg-113.
 6. Sharma Priya Vrat, **Priya Nighantu** along with the author's Hindi commentary entitled Padma, Edition 2004, Varanasi ; Chaukhamba Surabharathi Prakashana, Tpg 275.
 7. Pt.Tripathi Hariprasad, **Dhanwantari Nighantu**, with Hari hindi commentary, Re-print 2008, Varanasi, Chowkhambha Krishnadas Academy, Tpg-294.
 8. Sri Bhavamisra, **Bhavaprakasa Nighantu**, Commentary by Prof.K.C.Chunekar, Edited by Dr.G.S.Pandey, Revised edition-2010, Varanasi, Chaukhambha Bharati Academy, Tpg-960.
 9. Pandit Narahari, **Rajanighantu**, written by Dr.Indradev Tripathi, edited with Dravyagunaprakasha hindi commentary, Revised edition 2010, Varanasi, Chowkhambha Krishnadas Academy, Tpg-703.
 10. Acharya Kaiyadeva, **Kaiyadeva Nighantu** (Pathyapathya Vibhodhaka), edited by Prof.Priya Vrat Sharma, Dr.Guru Prasada Sharma, First edition 1979, Varanasi, Chaukhambha Orientalia, Tpg- 696.
 11. Nrupa Madanapala, **Madanapala nighantu**, edited by Gangavishnu srikrishnadasa, printed in 1961, Tpg-296
 12. Acharya Shodhala, **Shodhala Nighantu**, Commented by Prof.Gyanendra pandey, Edited by Prof. R.R. Dwivedi, First edition 2009, Varanasi, Chowkhambha Krishnadas Academy, Tpg-538.
 13. Candranandana, **Madanadi Nighantu**, edited by Astavaidya Vayaskara N.S.Mooss, First edition 1985, Kottayam, Vaidyasarathy press, Tpg-119.
 14. Acharya Vagbhata, **Ashtanga Nighantu**, edited by P.V.Sharma, 1973, Madras, The Kuppaswamy Sastri Research Institute, Tpg-52.
 15. Vopadeva, **Hrdaya dipaka nighantu**, Commented by Prakasa, Edited by Prof.P.V.Sharma, First edition 1977, Varanasi, Chaukhamba Amarabharathi Prakashan, Tpg-44.
 16. Madhavakara, **Paryayaratnamala**, edited by Dr.Tarapada Chowdhury, Volume II, Reprinted 1946, Patna, Patna University Journal, Tpg-60.
 17. Kirtikar.K.R. and Basu.B.D., **Indian Medicinal plants with Illustrations**, Revised by E.Blatter, J.F.Caius and K.S.Mhaskar, Second edition 2001, Oriental Enterprises, Tpg- 1724
 18. Saxena.N.B., Saxena Shamindra, **Plant Taxonomy**, Third edition 2001, Meerut, Pragati Prakashan, Tpg-628
 19. Dr. Vaidya Bapalal, **Some controversial drugs in Indian medicine**, Third edition 2010, Varanasi, Chaukhambha Orientalia, Tpg-571.
 20. Sarin.Y.K., **Illustrated manual of herbal drugs used in Ayurveda**, First edition 1996, New Delhi, Council of Scientific and Industrial Research and Indian Council of Medical research, Tpg-422.

21. Sharma Priya Vrat, **Dravyaguna Vijnana**, Volume V, Re-print 2011, Varanasi, Chaukhambha Bharati Academy, Tpg-438.
22. **Wealth of India, Raw Materials**, by National institute of Science Communication and Information Resources, Council of Scientific and Industrial Research, Reprinted 2005, New Delhi, NISCAIR Press,
23. Yoganarasimha, **Medicinal plants of India**, Volume I, Bangalore, Interline publishers, Tpg-644.
24. Sharma.P.C., M.B.Yelne, T.J.,Dennis, **Database on Medicinal Plants used in Ayurveda**, New Delhi, CCRAS Publications, 2001.
25. Vaidya Bapalal.G., **Nighantu Adarsha**, Volume I, Re-print 2007, Varanasi, Choukhambha Bharati Academy, Tpg-919.
26. Sharma Priya Vrat, **Dravyaguna Vijnana**, Volume II, Re-print 2011, Varanasi, Chaukhambha Bharati Academy, Tpg-832.
27. Kaviraj Sen Govindas, **Bhaishajya Ratnavali**, by Prof.Siddhi Nandan Mishra, Edited by Siddhiprada hindi commentary, First edition 2005, Varanasi, Chaukhambha Surbharati Prakashan, Tpg-1196.
28. **Chakradatta**, Edited and Translated by Priya Vrat Sharma, Second Edition 1998, Varanasi, Chukhambha publications, Tpg-731.
29. **Ayurvedic Pharmacopoeia of India**, Vol-111, Ministry of Health and Family Welfare, Govt of India, 1st Edition, Reprint 2001, Dept of Indian Science of Medicine and Homeopathy, New Delhi, Controller of Publication Civil Lines.
30. Vrddhajivaka, **Kashyapa Samhita**, redacted by Vatsya, edited by Prof P.V.Tiwari, Reprint 2002, Varanasi, Chaukhambha Visvabharati, Tpg-792.
31. Acharya Sharanghadhara, **Sharanghadhara Samhitha** with Dipika and Gudarthadipika Commentary , 2nd edition Bombay, Panduranga Jawaji Publications, 1931, T pg:398
32. Arya Vaidya Sala, P.S. Varier's Vaidyaratnam, **Indian Medicinal Plants- A Compendium of 500 Species-I**, Reprint , Kottakal, Orient Longman Limited, 1996, Tpg:420
33. Vanga Sena with Hindi commentary, commentator Hariharaprasad Tripathi, Reprint 2009, Chaukhambha Sanskrit Series Office, Varanasi.
34. William Charles Evans, Trease & Evans Pharmacognosy, 15th Edition, Publisher : Elsevier, 9th chapter, Pg No : 61-65.
35. Bhavamishra, **Bhavaprakasha**, Vidhyotini Hindi Vyakya, Shri Bhramashankar Shastri (Purvardha), 4th edition , Sirija, Varanasi, Chaukhamba Samskritha, 1961 Tpg:941

CORRESPONDING AUTHOR

Dr. L.N. Shenoy

Ph.D. Scholar, Department of Dravyaguna, Government Ayurveda medical college,

Bengaluru, Karnataka, India

Email: shenoynrhm@gmail.com

Source of support: Nil
Conflict of interest: None Declared