

# Refining the Mind

## Brahmi: An Herb Review

By Nicholas Sullivan

### Introduction

Described by Swami Sivananda as "... a brain tonic *par excellence*." and "... possessed of peerless therapeutic values," brahmi has been used for centuries to strengthen the mind, purify the body and even enhance communion with the divine. <sup>1,2</sup> Given the Latin name of *Bacopa monnieri*, the herb's Sanskrit title only further indicates its greatness, originating from the Sanskrit term *Brahman*. *Brahman* translates to "the totality of life" but the word also denotes a knowledge of that totality. Wendy Weissner describes it well when she states, "The reference to Brahma... suggests that this herb represents the creative energy of this universe, with the ability to facilitate divine consciousness." <sup>3</sup> Other translations of brahmi include "What gives knowledge of Brahman or Supreme Reality" and "That which expands consciousness." <sup>4</sup> Other names have been given to the esteemed plant as well, such as *Suresta* (liked by the gods), *Divy* (divine) and *Saraswati* (the goddess of learning). <sup>5</sup> While the ancient receivers of Ayurvedic knowledge understood the importance of this humble succulent, the Western scientific community is only beginning to scratch the surface with promising studies on its effectiveness in treatment of neurological disorders. <sup>6,7</sup>

### Physical Description and Ecology

Brahmi is a semi-aquatic, creeping, glabrous, succulent herb with no aromatic qualities. The leaves are small and oblong (0.6-2.5 cm long and 3-8 mm broad) and are arranged in opposing pairs along the stem (10-30 cm long and 1-2 mm thick.) The plant's flower is solitary and actinomorphic, blooming in-between stems and petals. The flower's color is most often white with shades of blue or purple and present with four to five petals. The fruit of the plant is an ovoid capsule found underneath the leaves. <sup>5,8</sup>

Globally, brahmi is found in tropic and sub-tropic regions such as India, Sri Lanka, China, Nepal, Taiwan, Pakistan, and Viet Nam. It's also distributed in moist southern regions of the United States such as Florida and Hawaii. <sup>9</sup> Brahmi naturally grows in water rich regions such as marshes, wetlands or alongside creeks and rivers. This water loving plant prefers soil with poor drainage where it will flourish and grow into dense, sprawling mats. However, the

plant is quite robust and will grow in varying conditions, even surviving slightly brackish waters.

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### **Bacopa monnieri vs Centella asiatica**

There has been quite a bit of confusion regarding the true identity of brahmi. The name has been used interchangeably to describe both *Centella Asiatica* (gotu kola, *mandukaparni*) and *Bacopa monnieri*.<sup>10</sup> While both of these plants are effective in their own right, Baba Hari Dass has called *Centella asiatica* the “weaker brahmi” and *Bacopa monnieri* the “stronger brahmi.” Regionally, *Centella* is used more in Northern India while *Bacopa* is more common in the South. Although these two plants were not well distinguished in the classical texts, their actions are in-fact distinct. Both of them primarily act on the nervous system however, *Centella* is slightly heavier with a stronger tonifying action and *Bacopa* is lighter and produces a gentle detoxifying effect. Rishi Charaka viewed both of these herbs as beneficial for cognitive function, though he indicated *Bacopa* as the most effective for treatment of mental disorders.<sup>11</sup>

### **Ayurvedic Perspective**

Brahmi is considered to be one of the most important nervines in all of Ayurvedic medicine. It has a powerful balancing and rejuvenating effect on pitta dosha and is seen as the best herb for treatment of this dosha, particularly when it has become vitiated in the mind.<sup>4</sup> However, brahmi is useful in the treatment kapha and vata dosha as well.<sup>14</sup> It strongly reduces kapha through its purifying and astringent qualities while grounding vata as a gentle nervine tonic and sedative.<sup>4,11</sup> Brahmi is a profoundly *sattvic* herb as it promotes tranquility and peace of mind.<sup>14</sup> It’s also a great friend of the Himalayan Yogis who eat the herb daily to improve meditation, rejuvenate the mind, balance the right and left hemispheres of the brain and awaken the crown chakra.<sup>4</sup>

### **Dravya Guna**

To fully understand any substance, be it food, herb, or *bhasma*, we must know its *dravya guna*. The word *dravya* translates to substance while *guna* means qualities. Taken as a whole, the term means the qualities of a substance. Dr. Marc Halpern states that “*Dravya Guna* is the foundational knowledge necessary for treating all imbalances in the body.” For further clarification it should be known that this term is often used interchangeably with the word pharmacology.<sup>16</sup> However, unlike allopathy, which traditionally views a substance’s action on

the molecular or physical level, Ayurveda recognizes actions on the subtle or energetic level as well. With this energy-centric view one need not get lost in the complex details of pharmacodynamics, allowing for greater attention to be given to the patient as a whole. Using the framework provided by the knowledge of *dravya guna*, the practitioner can better grasp both the qualities of the medicine and the condition of the patient. <sup>4</sup>

There are four different qualities considered in *dravya guna*. The first quality is *rasa* (essence) or the taste of a substance. There are 6 distinct tastes recognized in Ayurveda, each of which have their own subtle effects upon the nervous system and the body as a whole. The second factor is a substance's *virya* or potency. The *virya* either has a warming or cooling effect on the body.<sup>4</sup> Next is a substance's *vipaka*, also called the post-digestive effect. This is the final effect the substance has on the body once it has passed through all three stages of digestion. The last quality of a substance is the *prabhava*, or special potency. This is a broad category that includes any effects of a substance not included in the above three categories. In *The Yoga of Herbs*, Dr. David Frawley and Dr. Vasant Lad state that "*Prabhava* includes the occult properties of plants, their capacity to affect mind and psyche on a direct and subtle level... *Prabhava* includes auric action, astral effect, magnetic effect, and radiation." It is through this last quality that Brahmi truly shines as a *medhya*, or promotor of intellect. <sup>5,15</sup>

Now returning to the herb in question, Brahmi's *rasa* is both bitter (*tikta*) and astringent (*kashaaya*). <sup>11</sup> The bitter taste lends the herb a detoxifying quality, encouraging cleansing and removal of *ama* (toxins) from the tissues through a scrapping effect, while also stimulating digestion in small amounts. <sup>12,16</sup> Psychologically, the bitter tastes assists spiritual growth but due to its prana raising effect it can also lead to ungrounded emotions such as anxiety and over-excitement. <sup>16</sup> The astringent taste tones the *dhatu*s through its tightening and drying action. Psychologically, astringency reduces all three subtle doshas (*prana, tejas, and ojas*), resulting in a calming or sedative effect on the mind. These two tastes synergize to produce a greater detoxifying result. With the astringent quality drying up *ama*, the bitter taste is better able to scrape away at the affected region. <sup>12,16</sup> Brahmi's *virya* is cooling (*sita*) which reduces *pitta*, slows down metabolism, reduces inflammation and may help treat a fever. In the mind it produces a feeling of refreshment, calm and clarity. <sup>12</sup> The herb's *vipaka* is sweet (*madhura*). This means that once it is fully digested, Brahmi has a nourishing effect on the tissues.<sup>16</sup> This may seem contradictory to the bitter and pungent *rasa*, but the fact that brahmi can have an overall tonifying effect while simultaneously cleansing is an example of one of its many

*prabhavas*.<sup>13</sup> Other *prabhavas* of brahmi include its affinity for the *rakta* (red blood cells) and *majja* (nervous system) *dhatu*s, as well as its ability to heighten the intellect.<sup>4</sup>

## **Uses and Actions**

Brahmi has a myriad of uses owing to the fact that the herb affects six of the seven *dhatu*s.<sup>4,11</sup> While its power as a *medhya* and a *rasayana* are perhaps its primary uses, this magnificent plant is capable of treating a wide array of conditions. Below is a list of brahmi's actions within both traditional and modern Ayurvedic herbalism.

**Medhya**: This is an Ayurvedic classification of herbs which have the ability to promote clarity of thought, memory retention, self expression, concentration and overall cognitive power.<sup>3</sup> Other powerful *medhyas* include *Centella asiatica* (*Mandukaparni*), *Glycyrrhiza glabra* (*Yastimandu*), *Tinospora cordifolia* (*Gaduchi*), *Convolvulus pleuricaulis* (*Shankhapushpi*), *Benincasa hispida* (*Kushmanda*) and *Acorus calamus* (*Vacha*).<sup>31</sup> Classically, these herbs were often used in conjunction to enhance the desired effect in formulas such as *Brahmi Ghrta*, *Brahmi Rasayana*, and *Aindra Rasayana*.<sup>19, 20, 22</sup>

**Rasayana**: A category of medicine unique to the Ayurvedic tradition, these herbs have a nutritive and tonifying effect on all of the *dhatu*s.<sup>17</sup> These herbs are particularly valued because of their ability to raise one's *ojas*. This is a multifaceted but critical factor in a person's mental and physical wellbeing. Healthy reservoirs of *ojas* allow one to fight off pathogens and recover from bodily harm on a physical level, while also providing psychological stability, contentment and resistance to stress on a mental level.<sup>18</sup> These herbs are a cornerstone of traditional Ayurvedic therapy as they allow the user to keep their body young, stable and generally healthy.<sup>17</sup> It is important to note however, that while application of *rasayanas* can be profoundly beneficial they should only be used once the patient has been properly cleansed. Sage Susruta states "A wise physician should (invariably) prescribe some sort of tonic (*rasayana*) for his patients in their youth and middle age after having their systems (properly) cleansed by the applications of purifying remedies (emetics and purgatives). A person whose system has not been (previously) cleansed (*Sodhana*) with the proper purifying remedies should not, in any case, have recourse to such tonics inasmuch as they would fail to produce the wished-for results, just as application of a dye to a piece of dirty cloth will prove non-effective,"<sup>21</sup>

**Nervine Tonic**: These herbs strengthen the overall function of the nervous system. They also increase one's capacity to withstand stress. Nervine tonics are particularly helpful for constitutions predominant in *vata* and *pitta* dosha due to their heavy and grounding qualities,

however brahmi is an exception as its *guna* is light (*laghu*) and is consequentially beneficial for kapha dosha. <sup>17, 23</sup> Brahmi's tonifying effect on the nervous system has been well studied from a Western standpoint where it has been found to reduce oxidative stress on neurons and even potentiate the activity of the neurotransmitters dopamine, noradrenaline and serotonin. <sup>24</sup>

**Nervine Sedative**: These herbs have a relaxing effect on the nervous system through there activation of parasympathetic functions. They are particularly useful in treating anxiety, insomnia and anger. <sup>17</sup> Brahmi's anxiolytic action was studied at the Institute of Medical Sciences in India, where its effectiveness in the treatment of anxiety was found to be comparable to that of lorazepam (a common allopathic medication for anxiety.) However, unlike lorazepam brahmi did not cause a significant reduction in motor control. <sup>7</sup>

**Analgesic**: Herbs which fall under this category help to reduce pain and can also act as muscle relaxers. <sup>17</sup>

**Anthelmintic**: These are used to either kill or aid in the removal of parasites, yeast, and fungus. Anthelmintic can be used synonymously with the term anti-parasitic. <sup>17</sup>

**Alterative**: Also known as "blood cleansers", these herbs have a number of effects on the body. They help to remove toxins and *ama* from the blood stream and liver, heal sores and boils, and reduce fevers and inflammation. Alteratives often have anti-infectious and antibacterial properties as well. These herbs work through cooling the blood and are consequentially very useful in the treatment of pitta dosha. <sup>4</sup>

**Diuretic**: These herbs increase both the frequency and volume of urination. Like alteratives, they have a cleansing effect on the blood however their action is limited to the plasma or *rasa*. By stimulating the kidneys, diuretics cool the blood, reduce fever and remove excessive water from the system. <sup>17</sup>

**Astringent**: This is a broad category of herb with many possible uses, though in general, astringents have a drying and tightening effect on tissue. Through this, they help give tone to excessive or loose tissue, contract or restore lesions in the skin, and stop bleeding. <sup>17</sup>

**Purgative**: These herbs induce a forceful elimination of feces by stimulating the small or large intestine. This action helps the body to remove toxins accumulated in the digestive tract and greatly reduce pitta dosha. <sup>4</sup>

### **Classical Uses**

While the rishis of yore may not have used the same terminology we do today, they also placed great importance on brahmi's ability to enhance the functioning of both the body and

mind. For example, Rishi Charaka described Brahmi as a *divyausadhi* or “celestial drug”. These celestial drugs “... should be mixed with milk and taken for six months. By doing so, the person is endowed with excellent longevity, youth, freedom from disease, voice, complexion, nourishment, intellect, memory, and such other desirable benefits. These are the drugs with infallible efficacy.”<sup>22</sup> Furthermore, when describing the benefits of a specific formula called *Aindra Rasayana* (which contains brahmi), Rishi Charaka says “This prevents old age and diseases and promotes memory as well as intellect par excellence. It promotes longevity, nourishment, *dhana* (wealth), *svara* (voice), and *varna* (complexion). It is an excellent promoter of *ojas*... A person who takes this recipe cannot be victimized by *kriya* (black magic), *alaksmi* (inauspiciousness), *viya* (poison), and *ruk* (pain).”<sup>22</sup>

However, Rishi Charaka wasn't the only author to give such praise. Sage Sushruta describes the benefits received with consistent and long term use of the plant when he writes, “A continuous use of [brahmi juice] for a week improves the memory, leads to the expansion of the intellectual faculties, and imparts a celestial glow to the complexion. In the second week of its course it revives old and forgotten memories in the user and adds to his proficiency in the writing out of any book... In the third week it enables a man to reproduce from memory as many as one hundred words if twice heard or read (at a single sitting.) In the same manner a (further) use of the drug for twenty-one days removes all inauspicious features whether of the body or of the mind, the goddess of learning appears in an embodied form to the (mind of the) user, and all kinds of knowledge come rushing into his memory. A single hearing is enough to make him reproduce (verbatim from memory a discourse however lengthy), and he is enabled to live for five hundred years.”<sup>20</sup> While visions of the Goddess, divine revelation and near-immortality may not be within the scope of current scientific study or understanding, this passage allows us see the tremendous reverence once given to the herb in question.

### **Modes of Administration**

While brahmi may be taken by itself, the plant is often administered in combination with similar herbs to either potentiate or augment the desired action.<sup>3</sup> Also, the medium or *anupana* in which the herbs are taken can guide the medicine to specific dhatus allowing the administer to have greater control over the end result.<sup>4</sup> For example, when brahmi is taken as a tea the herb will have a specific effect on the *rasa dhatu* causing its diuretic and blood-clearing properties to be enhanced, resulting in an overall cleansing action. But if the herb is cooked into

milk, then it will affect all of the *dhatu*s, potentiating its role as a *rasayana* and producing an overall tonifying result. <sup>17</sup>

Dr. David Frawley and Dr. Vasant Lad describe many preparations of brahmi in their book *The Yoga of Herbs*. “A cup of *Brahmi* tea taken with honey before meditation is a great aid in the practice. As a milk decoction the herb is a good brain tonic, particularly if combined with *Ashwagandha*. Taken with basil and a little black pepper *Brahmi* is good for all kind of fevers. As a rejuvenative it is best prepared in *ghee*. *Brahmi ghee* is an important medicine for the mind and heart that should be kept in every home.” <sup>4</sup>

### **Classical Preparations**

*The Ayurvedic Pharmacopeia of India* states that the important formulas containing brahmi are *Brahmi Ghrta*, *Sarasvatarista*, *Ratnagiri Rasa*, *Rahmi Vati*, *Sarasvata Curna*, and *Smrtisagara Rasa* and suggest a dose of between one and three powdered grams. <sup>25</sup> Brahmi can be effectively prepared in a variety of ways depending on the constitution and afflicted *dhatu*s of the patient. <sup>17</sup> However, the primary classical texts (*Caraka Samhita*, *Sushrut Samhita* and *Astanga Hridayam*) focus on administering the medicine with *ghee*. In the case of *Brahmi Ghrta*, the herb is infused into the *ghee* through cooking, while formulas such as *Aindra Rasayana* involve only mixing the herb with *ghee*. <sup>20, 22</sup>

One of the classical preparations of *Brahmi Ghrta* is found in the *Astanga Hridayam*, where Vagbhata states “Medicated *ghee* [is] prepared with two *prastha* of fresh juice of brahmi, one *prastha* of *ghee* and paste of one *aksa* each of *vyosa*, *syama*, *trivrt*, *danti*, *shankjapuspi*, *nrapadruma*, *saptala*, and *krmihara* - administered in [the] dose of one *pala* increased at each succeeding *tay* till the maximum of four *pala* is reached. It cures insanity, leprosy and epilepsy, bestows sons to the barren woman, produces good speech, voice, memory and intelligence and is auspicious (beneficial).” <sup>19</sup> For better understanding it should be noted that *prastha* is a Saksrit unit for measuring volume and is equal to 48 handfuls, whereas a *pala* is a unit of mass which equates to about 27 grams. <sup>26, 27</sup>

Another formula by the name of *Sarasvatarista* is found in a later classical text from the 19th century called *Bhaishajya Ratnavali*. <sup>28, 29</sup> The main ingredient is Brahmi, however smaller doses of twenty other herbs including *Shatavari*, *Kudzu*, *Haritaki*, *Ginger*, *Fennel* and *Ashwagandha* are also added. *Sarasvatarista* is prepared in two phases. Initially, six of the twenty complementary herbs are decocted with the brahmi, followed by the the addition of honey, jaggery and the remaining herbs once the decoction has cooled. Gold is meant to be

added as well, as it is said to greatly increase the effectiveness of the formula, however this step is often skipped due to its high cost. The resulting formula is described as having a calming and strengthening effect on the mind, reducing symptoms of depression, stress, amnesia, irritability, insomnia, and even hypogonadism in both men and women. <sup>29</sup>

### **Western Perspective**

Although the modern scientific community's understanding of brahmi's therapeutic potential is still in its infancy, with the earliest studies being conducted around 1955, the last 20 years have produced some marvelous research into the plant's effectiveness. <sup>5, 24</sup> Many of these studies have observed brahmi's potential as an anti-convulsant, anti-depressant, anti-oxidant, analgesic, anti-inflammatory, anti-microbial, anti-ulcerogenic/anti-*H. pylori*, anxiolytic, adaptogenic, anti-neoplastic, hepatoprotective, immunostimulant, neuroprotectant and nootropic. <sup>24</sup>

### **Chemical Constituents**

While a complete bioassay of brahmi is still an ongoing effort, the plant's primary active compounds are thought to be identified. The constituents believed to be responsible for brahmi's nootropic and anxiolytic effects are called bacosides. These are a group of triterpenoid saponins with 12 known analogs, the most studied of which is called bacoside A which has itself been identified as a combination of bacoside A<sub>3</sub>, bacopacide II, bacopasaponin C and its isomer. Aside from the bacosides though, other alkaloids have been identified in the plant. These include brahmine, nicotine, herpestine, D-mannitol, apigenin, hersaponin, monnierasides I-III, cucurbitacins, and plantainoside B. <sup>24</sup> As anyone can see, the pharmacology of this plant is not at all straightforward and still needs time to be fully understood by the greater scientific community.

### **Study 1**

In a study done by Bhattacharya SK and Ghosal S., *Bacopa Monnieri's* anxiolytic action was analyzed and compared to the action of lorazepam, a commonly prescribed benzodiazepine medication used to treat anxiety, which also goes by the name of Ativan. The researchers used animal models which have been validated as experimental models of anxiety. The tests included open-field, elevated plusmaze, social interaction and novelty-suppressed feeding latency, all of which were conducted on rats. A standardized extract of *Bacopa monnieri's* constituent, bacoside A, was administered at three different doses of 5, 10, and 20 mg/kg. While the lorazepam was administered at a standard dose of .5 mg/kg. At all three doses

the extract of *Bacopa monniera* produced dose-related anxiolytic activity in all the test parameters. However the study states that only the higher two doses produced statistically significant results, comparable to that of lorazepam's. Additionally, the *Bacopa monnieri* extract (in all four doses) did not result in a reduction in motor function, as is common with lorazepam. The researchers also suggest one more advantage of bacoside A over lorazepam, comparing the amnesic action of the benzodiazepine to brahmi's cognitive enhancing qualities. <sup>7</sup>

### **Study 2**

Researchers conducted a randomized, double-blind, placebo-controlled clinical trial with the objective of evaluating *Bacopa monnieri's* cognitive modulating properties as well as its tolerability in healthy elderly participants. A whole plant standardized extract was used and given in daily doses of 300 mg. There were forty-eight participants who completed the study, all above the age of 64. The tests included a 6 week period where a placebo was given followed by a period of 12 weeks with administration of the extract. The study found that the participants who received the extract scored significantly higher on delayed word recall memory tests as apposed to the placebo group. The test group also produced higher scores on a test utilizing the Scoop effect, where participants were required to differentiate the color a word named from the color the word was written in. The researchers also studied *Bacopa monnieri's* affect on depression and anxiety, however their tests did not produce significant results in those areas. <sup>30</sup>

### **Study 3**

A study preformed in 2014 investigated whether *Bacopa monnieri* could be useful in the treatment of attention-deficit hyperactivity disorder (ADHD) in children between the ages of 6 and 12. The participants were given a dose of 225 mg per day over 6 months of a standardized extract of *Bacopa Monnieri*. The researchers found that the participants had significantly reduced subset scores of ADHD symptoms, except in social issue. Restlessness was reduced in 93% of participants, improvements in self-control were found in 89%, and symptoms of attention-deficit were reduced in 85% of children. In addition, symptoms of learning problems, impulsivity, and psychiatric issues were all found to be reduced in significant portions of the test group. It should also be noted that the standardized extract was well tolerated by all of the children. <sup>32</sup>

#### **Study 4**

Another research team conducted a 90 day double-blind placebo-controlled randomized trial with brahmi in 2008. The study was examining the nootropic effects of a special extract of *Bacopa monnieri* on 107 healthy participants at a dose of 2 x 150 mg/day. Although only 62 participants completed the study with an 80% compliance rate, the results were promising. The team utilized the Cognitive Drug Research cognitive assessment system both at baseline (before treatment) and following treatment. They found that the experimental group's performance on the 'Working Memory' factor was significantly increased, with the most emphasis on spacial working memory. In addition, the group also preformed better on the rapid visual information processing task, producing fewer false positives. While the researchers suggest that more studies should be preformed on *Bacopa monnieri*, the findings here did support results from two previous and similar studies.<sup>33</sup>

#### **Study 5**

A study was preformed in 2011 which assessed the immunostimulatory effects of brahmi, ashwagandha, and echinacea. The research team fed Sprague Dawley rats a diet of either 1% brahmi, ashwagandha, or echinacea for four weeks and then examined their blood serum levels. All three herbs produced a rise in immunoglobulin A, G and M in spleen lymphocytes. However brahmi was found to stimulate more secretions of immunoglobulin A and G than both ashwagandha and echinacea. Also, concentrations of both IFN- $\gamma$  and IL-2 (both modulating factors in the immune system) were significantly higher in the experimental group suggesting that the herbs might help regulate antibody production through the production of cytokines.

34

#### **Final Thoughts**

In an age where stress, anxiety, and mental blockage are an every day experience, brahmi offers a light at the end of a hazy tunnel. It helps us to build *ojas*, give up bad habits and addictions, remove accumulated toxins, and be at peace with ourselves and those around us.<sup>4</sup> Brahmi's therapeutic applications are so vast and well supported by both centuries of historical anecdote and modern scientific literature that it would be foolish to not incorporate it into a daily regime. However, this great plant's value is not only limited to recovery from illness. Perhaps most importantly is the fact that brahmi assist in the cultivation of *sattva*, allowing our

consciousness to return to its primordial state of sat-chi-ananda, ever existing, ever conscious bliss. <sup>4</sup> It's no wonder that this herb has been touted as one of the greatest mental *rasayanas* within the ancient science of Ayurveda. <sup>1</sup> It might be just what our modern world needs.

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