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BS Thorat
Ph.D. (Scholar), Dr. BSKKV.,
Dapoli, Maharashtra, India

TA Bagkar
Technical Assistant, Dr. SKKV.,
Dapoli, Maharashtra, India

RR Patil
Senior Research Fellow, Dr.
BSKKV, Dapoli, Maharashtra,
India

“Brahmi” The memory booster medicinal herb

BS Thorat, TA Bagkar and RR Patil

Abstract

Bacopa is a medicinal herb used in Ayurveda, where it is also known as "Brahmi", after Brahma, the creator God of the Hindu pantheon. With the scientific name of *Bacopa monnieri*, this creeping, perennial herb has been praised in Ayurvedic and traditional medicines across the world for generations. It's difficult to pinpoint an exact native for this wetland-growing herb and most experts agree that it has been growing in the wetlands of southern and Eastern India, Australia, Europe, Africa, Asia, and North and South America for hundreds of thousands of years. The best characterized compounds in *Bacopa monnieri* are dammarane-type triterpenoid saponins known as bacosides, with jujubogenin or pseudo-jujubogenin moieties as aglycone units. Other saponins called bacosides I–XII have been identified more recently. The alkaloids brahmine, nicotine, and herpestine have been catalogued, along with D-mannitol, apigenin, hersaponin, monnierasides I –III, cucurbitacin and plantainoside B. The constituent most studied has been bacoside A, which was found to be a blend of bacoside A3, bacoside II, bacosaponin C, and a jujubogenin isomer of bacosaponin C. Brahmi contains bacoside I (5.37%), bacoside A3 (5.59%), bacoside II (6.9%), bacosaponin C isomer (7.08%), and bacosaponin C (4.18%). It is commonly used fresh as a salad ingredient, but the herb can also be dried and ground and used with other herbs. *Bacopa monnieri* was initially described around the 6th century A.D. in texts such as the Charaka Samhita, Atharva-Veda, and Susrut Samhita as a medhya rasayana –class herb taken to sharpen intellect and attenuate mental deficits. The herb was allegedly used by ancient Vedic scholars to memorize lengthy sacred hymns and scriptures. The leaves (2-3 per day) are often chewed by people as a general tonic, almost like a vitamin supplement. The flavor is relatively mild, but the real reason for using brahmi is for the impact that it has on human health.

Keywords: *Bacopa monnieri*, bacosides, jujubogenin, brahmine, herpestine and apigenin

Introduction

Bacopa monnieri (IUCN) (waterhyssop, brahmi, thyme-leafed gratiola, water hyssop, herb of grace, Indian pennywort) is a perennial, creeping herb has been praised in Ayurvedic and traditional medicines across the world for generations (Khare, 2003) [9]. It's difficult to pinpoint an exact native for this wetland-growing herb and most experts agree that it has been growing in the wetlands of southern and Eastern India, Australia, Europe, Africa, Asia, and North and South America for hundreds of thousands of years (Warrier *et. al.*, 1996) [17]. *Bacopa* is a medicinal herb used in Ayurveda (Dhanasekaran *et. al.*, 2007) [6], where it is also known as "Brahmi", after Brahma, the creator God of the Hindu pantheon. *Bacopa monnieri* was initially described around the 6th century A.D. in texts such as the Charaka Samhita, Atharva-Veda, and Susrut Samhita as a medhya rasayana–class herb taken to sharpen intellect and attenuate mental deficits. The herb was allegedly used by ancient Vedic scholars to memorize lengthy sacred hymns and scriptures (Chatterji *et. al.*, 1965) [2].

Botanical Discription

It is a non-aromatic herb. The leaves of this plant are succulent, oblong and 4–6 mm (0.16–0.24 in) thick. Leaves are oblanceolate and are arranged oppositely (opposite decussate) on the stem. The flowers are small, actinomorphic and white, with four to five petals. Its ability to grow in water makes it a popular aquarium plant. It can even grow in slightly brackish conditions. Propagation is often achieved through cuttings.

Correspondence
BS Thorat
Ph.D. (Scholar), Dr. BSKKV.,
Dapoli, Maharashtra, India



Fig 1: Leaves of *Bacopa monnieri*

Chemical Constituents

There are certain valuable alkaloids and triterpene saponins found in brahmi that have strong effects on the body, in addition to many other organic compounds and volatile constituents (Daniel, 2005) ^[4]. The best characterized compounds in *Bacopa monnieri* are dammarane-type triterpenoid saponins known as bacosides (Garai *et al.*, 2009) ^[7], with jujubogenin or pseudo-jujubogenin moieties as aglycone units. Bacosides comprise a family of 12 known analogs. Other saponins called bacopasides I–XII have been identified more recently (Chakravarty *et al.*, 2003) ^[1]. The alkaloids brahmine, nicotine, and herpestine have been catalogued, along with D-mannitol, apigenin, hersaponin, monnierasides I–III, cucurbitacin and plantainoside B (Chakravarty *et al.*, 2008) ^[3]. The constituent most studied has been bacoside A, which was found to be a blend of bacoside A3, bacopacide II, bacopasaponin C, and a jujubogenin isomer of bacopasaponin C (Singh and Dhawan, 1997) ^[15]. These assays have been conducted using whole plant extract, and bacoside concentrations may vary depending upon the part from which they are extracted (Deepak *et al.*, 2005) ^[5]. In one *Bacopa monnieri* sample, Rastogi *et al.* found this bacoside profile—bacopaside I (5.37%), bacoside A3 (5.59%), bacopaside II (6.9%), bacopasaponin C isomer (7.08%), and bacopasaponin C (4.18%) (Sivaramakrishna *et al.*, 2005) ^[16].

Health Benefits of Brahmi

The leaves brahmi (2-3 per day) are often chewed by people as a general tonic, almost like a vitamin supplement (Pase *et al.*, 2012) ^[10]. The flavor is relatively mild, but the real reason for using brahmi is for the impact that it has on human health (Warrier *et al.*, 1996) ^[17].

Let's take a closer look at the unique health benefits of this amazing Ayurvedic herb.

1. Boosts Cognition

One of the most prized benefits of brahmi is its ability to stimulate the mind, particularly in terms of memory and concentration. It has long been used in Ayurvedic medicine to increase focus and retention. Some of the organic compounds in brahmi stimulate cognitive pathways in the brain to boost cognitive ability (Singh and Dhawan, 1997) ^[15].

2. Treats Cognitive Disorders

Closely related to that first benefit of brahmi is the second – its ability to reduce the onset of cognitive disorders as we age,

such as dementia and Alzheimer's disease. Research has shown it to be an effective way of stimulating the creation of new neural pathways and lowering oxidative stress in the brain, which keeps our minds sharp well into our old age (Russo and Borrelli, 2005) ^[14].

3. Reduces Anxiety & Stress

The leaves of the brahmi plant can be chewed (only 2-3 at a time) in order to relieve stress and anxiety. The active ingredients in this herb can affect hormonal balance in the body and positively impact the balance of stress hormones in our body, thereby inducing a calm, relaxed state in a natural way, avoiding the side effects of traditional pharmaceutical options for stress and anxiety relief (Pravina *et al.*, 2007) ^[11].

4. Anti-inflammatory Capacity

When the leaves of the brahmi plant are rubbed topically on affected parts of the body, the compounds released can reduce swelling and eliminate irritation, as well as inflammation inside the body as well. This is ideal for people suffering from arthritis, gout, and other inflammatory conditions (Singh and Dhawan, 1997) ^[15].

5. Antioxidant Content

The antioxidants contained in brahmi are essential for promoting a healthy lifestyle. Antioxidants can eliminate free radicals, the dangerous byproducts of cellular metabolism that can cause cells to undergo apoptosis (cell death) or mutate into cancerous cells. These free radicals affect everything from our skin to our cardiovascular system, so a regular dose of brahmi in a daily or weekly diet can help to maintain a high quality of life and a healthy metabolism. Antioxidants also prevent certain types of cancer; research is ongoing into the direct pathways that brahmi's components take to prevent or slow the spread of cancer. There is one particularly dangerous toxin, called acrylamide, which brahmi has specifically shown resistance to; acrylamide is connected to neurodegenerative diseases, so this can add to brahmi's list of benefits as well (Singh and Dhawan, 1997) ^[15].

6. Improves Respiratory Health

When brahmi is brewed in a tea or chewed as normal leaves, it can boost your respiratory health. It has been used in Ayurvedic treatments for bronchitis, congestion, chest colds, and blocked sinuses. It can clear out excess phlegm and mucus and relieve the inflammation in the throat and respiratory tracts to provide you with rapid relief (Rastogi *et al.*, 2012) ^[13].

7. Boosts Immunity

When consumed in any form, tea, leaves, or otherwise, brahmi can give the immune system a necessary boost. The nutrients are supplemented by the antioxidant compounds to increase the response time of our immune system against pathogens, viruses or bacterial infection (Rastogi *et al.*, 2012) ^[13].

8. Treats Epilepsy

The leaves of brahmi have been used as a treatment for epilepsy for thousands of years. This is thought to be due to the effect brahmi has on neural pathways. It helps to prevent epileptic fits, as well as other forms of mental disease, including bipolar disorder and neuralgia (Rastogi *et al.*, 2012) ^[13].

9. Skin Care

If you want to speed up wound healing and disinfect the skin at the same time, spread brahmi juice or oil on the affected area. It can reduce the appearance of scarring and leave you with smooth, healthy skin enriched with its natural essential oils (Rastogi *et. al.*, 2012)^[13].

10. Reduces Blood Sugar

In research studies, brahmi has been linked to increased blood sugar levels, so depending on your symptoms of diabetes, it may be able to help improve your hypoglycemia and allow you to live a normal, healthy life (Rastogi *et. al.*, 2012)^[13].

11. Treats Digestive Issues

Brahmi is a sedative and soothing herb, as well as anti-inflammatory and may help in providing relief from gastrointestinal conditions such as ulcers etc. (Rastogi *et. al.*, 2012)^[13].

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