Bacopa monnieri (L.) Wettst. a member of the family Scrophulariaceae has been used in traditional Ayurvedic Indian medicine for over 3000 years. This herbal remedy is also known as, Brahmi. The name Brahmi is derived from the word “Brama” the mythical “creator” in the Hindu pantheon. It was used as a brain tonic to enhance memory and learning, in both adults and children. The plant is used in the Ayurvedic system of medicine as a brain tonic, memory enhancer, improvement of intellect and revitalize of sensory organs (Garai et al., 1996). It is also used as an anti-inflammatory. It works well to ease chronic joint and muscle pain. It has also been used as a successful treatment for epilepsy, tumors, and leprosy. Besides it is also claimed to be useful in the treatment of cardiac, respiratory (Nadkarni, 1988) and neuropharmacological disorders like insomnia, insanity, depression, psychosis, epilepsy and stress. It is reported to possess anti-inflammatory, analgesic, antipyretic, sedative (Russo and Borrelli, 2005; Kishore and Singh, 2005), free radical scavenging and lipid peroxidative activities (Ambraesi et al., 2005).

Chemical constituents
The plant is rich in saponins. The name ‘saponin’ is derived from the Latin word sapo, which means ‘soap’, because saponin molecules form soap-like foams when shaken with water. They are structurally diverse molecules that are chemically referred to as triterpene and steroid glycosides. Saponins are generally known as non-volatile, surface-active compounds that are widely distributed in nature. They consist of non-polar aglycones coupled with one or more monosaccharide moieties. This combination of polar and non-polar structural elements in their molecules explains their soap-like behavior in aqueous solutions.

Nutraceuticals
Several pharmacological (Singh et al., 1988, 1997) and clinical studies (Nathan et al., 2001 and Stough et al., 2001) on the extracts of B. monnieri standardized to the bacosides A and B have been published. B. monnieri extracts are widely available with label claims on the content of bacosides A and B in the international nutraceutical market. Bacopa also provides neural nutrients. Bacopa affects the release of serotonin and dopamine, two neurochemicals responsible for mental calm and clarity, in addition to elevated mood.

Bioactive compounds
The major chemical constituents isolated and characterized from B. monnieri are dammarane type triterpenoid saponins with jujubogenin or pseudojjubogenin moieties as aglycones. The pharmacological effects of B. monnieri are mainly attributed to these saponins especially Bacoside A and Bacoside B, which are therefore, considered as bio-active.
marker compounds for this species (Deepak and Amit, 2004). The composition of Bacoside A and Bacoside B have been established very recently as a mixture of four triglycosidic and four diglycosidic saponins, respectively (Bacoside A is a mixture of Bacoside A3, Bacopaside II, jujubogenin, and Bacopa- saponin C and bacoside B is a mixture of bacopaside: N1, bacopaside N2, bacopaside-IV and bacopasid-V) (Chakravarty et al., 2001; Deepak et al., 2004, 2005; Sivaramakrishna et al., 2005).

Other compounds include phenylethanoid glycosides, flavonoids and alkaloids such as brahmine and herpestine (Russo and Borrelli, 2005; Bhandari 2007).

Curcubitacins
Bhandari et al., (2007) reported new cucurbitacins together with known phenylethanoid glycosides from B. monnieri possess inhibitory effects on the growth of human colon, breast, lung and central nervous system cancer cell lines (Jayaprakasam et al., 2003). Cucurbitacin E has recently been reported to possess inhibitory effects on the growth of human colon, breast, lung and central nervous system cancer cell lines (Jayaprakasam et al., 2003).

Pharmacological studies
Recent pharmacological studies indeed confirmed the activity of brahmi as described in Ayurvedic medicines (Singh et al., 1988). It was also confirmed that the activity was due to the saponins present in the alcoholic extract of the plant (Chakravarty et al., 2001).

Genetic transformation
Majumdar et al., (2011) have developed an efficient transformation system for Bacopa monnieri, an important Indian medicinal plant, using Agrobacterium rhizogenes. Transformed calli showed the presence of rol AB or rol A, TR and ags genes and showed morphological features typically seen in transgenic plants produced by A. rhizogenes. In pRi A4-transformed plants, the content of bacopasaponin D, bacopasaponin F, bacopaside II and bacopaside V was enhanced significantly as compared to Wild Type (WT) plants of similar age while bacoside A3 and bacopasaponin C content was comparable with that of WT plants. Genetic transformation of the Indian medicinal plant, Bacopa monnieri, using a gene encoding cryptogen, a proteinaceous elicitor, via Ri and Ti plasmids, were established and induced bio production of bacopasaponins in crypt-transgenic plants were obtained (Majumdar et al., 2012).

DISCUSSION
Brahmi has been used in traditional Indian medicine for over 3000 years. Bacopa monnieri, has been used as neurotonic in the Ayurvedic system of medicine for centuries. Bacopa is a great neurotonic, immuno-modulator, adaptogen, tranquilizing, memory and learning enhancing, cerebral activator, anti- ulcer, antispasmodic, anti-asthmatic Ayurvedic herb. It has been recognized for its brain and memory enhancement characteristics. Brahmi is not Gotu Kola (Centella asiatica). Some reference books say that gotu kola is called brahmi in Sanskrit. Both are esteemed Ayurvedic herbs and different. They look nothing alike besides mental functioning; it is useful in skin diseases, ulcer, asthma, leucoderma, dyspepsia, epilepsy, anxiety. Bacopa is prescribed as anti-depressants, sedatives, or thyroid medication. Other benefits are anti-allergic, free radicals scavenging effect and as herbal supplement in Epilepsy, anxiety and depression. Know its beneficial actions on brain, memory, mental deficiency, Alzheimer's disease, learning skills, anxiety, depression, stress, epilepsy and ADHD children. In a study on this its effects on children, it showed significant improvement in exploratory drive, improved perceptual image of patterns and increased perceptual organization and reasoning ability. Bacopa monnieri is known as an adaptogen that is it has the ability to alleviate both the subjective impressions of stress and its physical repercussions. Next, Bacopa monnieri boost synaptogenesis, or the rate of communication between neurons along synapses. It is believed to amplify the electrical impulses that the neurons use to communicate. Healthy and vibrant minds have trillions of such structures, constantly sending information back and forth across elaborate pathways. Bacopa also boosts production of Tryptophan Hydroxylase (TPH2), another synapse support enzyme. The natural Bacopa ingredient Bacoside A makes this communication more efficient, while making receptors better able to receive and process messages, especially in the hippocampus. This is the region of the brain that is intimately involved in processing memories for storage or recall. Bacoside A that assists in the release of nitric oxide allowing relaxation of the aorta and veins and blood to flow more smoothly through the body and aids circulation; and Bacoside B, a protein valued for nourishing nerve cells in the brain. Research is also being done on the use of nitric oxide to treat stroke and Alzheimer’s sufferers. Triterpenoidsaponins and Bacosides of B. monnieri play key role for enhancing nerve impulse transmission. Bacosides support the repair of damaged neurons by enhancing kinase activity, neuronal synthesis, restoration and regeneration of synaptic activity resulting in nerve impulse transmission. These effects make it a wonderful nerve tonic or nerve nourishing agent as against the neuroleptic drugs that modulate the behavior. A recent scientific study showed that brahmi has potent antioxidant properties. Along with the more familiar antioxidants, beta sitosterol, a powerful fatty acid in brahmi, acts to relieve many degenerative conditions. It is not clear how B. monnieri produced this effect of increasing serotonin content. But in future as the understanding of these neurochemicals would grow, B. monnieri might emerge as the standard and natural treatment for anxiety and depression. Bacopa also relieves anxiety and its anxiolytic properties as among its best effects. It can thwart anxiety attacks before they happen. Thus there can be a connection between anti-anxiety support and better cognition and mere absence of anxious thoughts allows many to think clearly and more coherently. This enables the user to sustain a longer attention span without being distracted by negative thoughts. Comparative clinical and experimental studies, conducted on these two drugs also indicated that both
these drugs possess varying degrees of psychotropic effects. However *B. monnieri* is relatively more potent drug as compared to *C. asiatica*. Recent research has focused on bio prospecting and genetic engineering of this plant. The results of the studies on Bacopa’s cognitive enhancing effects, specifically memory, learning, and concentration support the traditional ayurvedic claims (Mukherjee and Dey, 1996). Different studies have been propounded to explain its method of working. According to one it does this on the chemical level by decreasing environmental stressor response biomarkers like HSP70. The result is that the user fails to perceive stress. For people who are prone to anxiety attacks, this function can help keep them feeling balanced and confident under stressful conditions. However, recent interest has focus on *Bacopa monnieri*’s cognitive enhancements. The triterpenoidsapponins and their bacoids are responsible for Bacopa’s ability to enhance nerve impulse transmission. The bacoids act in repair of damaged neurons by enhancing kinase activity, neuronal synthesis and restoration of synaptic activity and ultimately nerve impulse transmission.

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