

community. Plant species and their derivatives have offered plenty of choices to alter the progression and symptoms of AD. A variety of plants produce alkaloids, flavonoids, lignans, polyphenols, sterols, tannins, and triterpenes and these phytochemicals manifest antioxidant, antiamyloidogenic, anticholinesterase, anti-inflammatory and hypolipidemic properties (Howes et al. 2003; Kumar 2006; Kelley and Knopman 2008; Kennedy and Wightman 2011). In humans, plant derivatives as food supplements have been proven to possess an inherent ability to enhance cognitive function and prevent neurodegeneration (Spencer 2007). Chapter 9 discusses the plants that offer potential therapeutics for AD and are identified in Table 9.1.

*B. monnieri* is a nerve tonic which improves memory and intelligence and is used in the treatment of mental and neurological disorders in aging (Morgan and Stevens 2010). *B. monnieri* has the potential to interact with the monoaminergic neurotransmitter system of the central nervous system (Sheikh et al. 2007). *Bacopa* recuperated the lost memory during the AD treatment by reducing the AChE activity and enhanced learning and memory processes (Joshi and Parle 2006). Along with Alzheimer's and dementia, their potential to treat neuritis was proved in a clinical study on humans (Bhalla et al. 2008). In a rat AD model, *B. monnieri* inhibited degeneration of cholinergic system and enhanced cognitive effect (Uabundit et al. 2010) whereas the A $\beta$  levels diminished in AD mouse models (Holcomb et al. 2006). The extracts of *B. monnieri* prevented neuronal cell death induced by A $\beta$  and suppressed AChE activity (Limpeanchob et al. 2008). The antioxidant activity of *B. monnieri* extract was well-evidenced from decreased ROS in neurons (Bhattacharya et al. 2000). *B. monnieri* was observed to increase the efficacy of memory and attention disorders and was established in many clinical studies (Pravina et al. 2007).

### 9.3.1 CATHARANTHUS ROSEUS

*C. roseus* has an important alkaloid constituent: vinpocetine from its leaves. Vinpocetine has a tendency to improve cerebral blood flow and thereby offer neuroprotective effects (Dézsi et al. 2002). Due to these inherent properties, vinpocetine is utilized in memory impairments (Szatmari and Whitehouse 2003). The wide use of vinpocetine in the treatment of cognitive decline dates back to 1970 in Japan and Europe. Vinpocetine enhances glucose metabolism and cerebral blood flow in different lobes of the brain (Szilágyi et al. 2005). Vinpocetine inhibited A $\beta$  triggered cytokine production and inflammation (Liu et al. 2014). Several clinical studies have shown the beneficial effects of vinpocetine in patients with mild to moderate dementia (Peruzza et al. 1986). The leaf extracts have shown to possess AChE inhibitory potential and low cholinergic receptor affinity (Pereira et al. 2010). The components of *C. roseus* (ajmalicine, cathranthine, serpentine, tabersonine and vindoline) possessed anti-inflammatory properties, since inflammation is the primary feature in AD (Manigandan et al. 2014).

### 9.3.2 CELASTRUS PANICULATUS

Besides its many pharmacological properties, *C. paniculatus* is used for the treatment of brain-related diseases. The seeds produce Jyothismati oil, which promotes