Central to many behavioural functions, attention is one of the oldest and most pivotal issues in psychological sciences. To behave adaptively in this complex world, even an animal must select the information that is most relevant at any point in time, from the wealth of information available to it. This information is then evaluated in working memory, where it can be analyzed in details, decisions about that information can be made, and plans for action can be elaborated. The mechanisms of attention are responsible for selecting the information that gains access to working memory (Knudsen, 2007). Attention is not only just noticing the incoming stimuli, rather it involves a number of processes including filtering out perceptions, balancing multiple perceptions, and attaching emotional significance to these perceptions (Ratey, 2001). It is the first step in the learning process. One cannot understand, learn, or remember what one does not first attend to. As already discussed in chapter – I, attention is the heart of all cognitive processes. It is the gateway to all other higher order mental functions. Without attention abilities, there would be no learning, no perception, no intellectual functioning, and no development of language. Attention enables the individual to gain these experiences, and is therefore, an important concern.

Recent years have seen a sudden surge in an array of cognitive dysfunctions such as decline in memory, distraction in attention, and attention related disorders. Stressful lifestyle in this competitive world may be the root cause. Today’s world is changing rapidly and dramatically over the past decades. The ability to tune out distractions and focus on what is important is getting more difficult in this modern world. People are busier than ever, always trying to do two or more things at the same time. Due to their increased workloads many times they are mentally absent from the situations in which they actually are at that time. This multitasking and being somewhere else are creating troubles in focusing attention and shutting out irrelevant information, thus leading to more stress. Even after the multitasking ends, fractured thinking and lack of focus
persist. The increasing use of technology and multimedia devices is making the young, developing brains to become habituated to distractions and to switch tasks, and less able to sustain attention. An inattention “epidemic” seems to have spread all over the human population on the planet earth. Research in the area of attention, specifically from the viewpoint of improving it, has thus become important and essential. As already discussed, attention stands at the forefront of cognition, it is the ability that make humans perceive, conceive, distinguish, and remember more effectively and is needed to carry out any task from the simplest to the most complex. Any improvement in attentional processes e.g. ability to sustain and focus attention for longer periods or better shifting of attention and such other attentional processes would have its implications in improving all other cognitive abilities.

Allopathic psychoactive drugs have been the main stay of treating attention related problems in India and the world wide. However, experiences with these drugs have always not been satisfying (Kumar, Sapna, and Ravi, 2007). In spite of having higher therapeutic ratios and neuroprotection, the use of these CNS acting drugs is often accompanied by side effects like insomnia, mood change, dizziness, respiratory depression, irritability, nausea, rash, and clumsiness etc. Along with these side effects, the cost of these drugs is very high, and also it will take almost a decade to develop a new drug. Further, these drugs need to be taken regularly and if stopped abruptly, have potential danger of triggering the recurrence of the disease (Sharma, Sahu, Khemani, and Kaur, 2013). Therefore, the whole world is looking towards ancient science of Ayurveda to explore safe, alternative, cost effective treatment as well as reliable cure with no or minimal side effects. Ayurveda largely uses plants as raw material for the manufacture of drugs. The plant based drugs have long history of use and better patient tolerance as well as public acceptance. They are easily available at low cost as compared with modern drugs. Also, phytoconstituents isolated from them may act as a lead compound for new pharmaceuticals (Dhamija, Parashar, and Singh, 2011). The World Health Organization (WHO) has estimated that 80% of the earth’s (6 billion) inhabitants rely upon traditional medicine for their primary health care needs and major part of this therapy involves the use of plant extracts or their active principles (Farnsworth, 1994). In today’s world, 30% of the pharmaceuticals preparations are manufactured from various parts of the plants such as roots, stems, bark, gum, leaves,
fruits, seeds, and flowers etc. It is noted that same plant has been used in a number of different ways (Khan, Ashfaq, and Ali, 1979). In Ayurveda, 314 plants are listed, which are used as medicines in India (Subhose, Srinivas, and Narayana, 2005).

In Ayurveda, cognitive dysfunctions may be prevented by the use of psychotropic drugs, highlighted as “Medhya Rasayanas”. These rasayanas are a group of medicinal plants with multi-fold benefits, specifically to improve memory and intellect by Prabhava (specific action). Medha means intellect and/or retention and Rasayanas means therapeutic procedure or preparation that on regular practice will boost nourishment, health, memory, intellect, immunity, and hence longevity. Such rasayanas retard brain aging and help in regeneration of neural tissues besides producing antistress, adaptogenic, and memory enhancing effect. Medhya Rasayana is a group of 4 medicinal plants that can be used singly or in combinations. They are Mandukaparni, Yastimadhu, Guduchi, and Shankhapushpi (Kulkarni, Girish, and Kumar, 2012). Among all these plants, Shankhapushpi is believed to be the only herb that is capable of enhancing all the aspects related to the brain power, such as learning, memory, and the ability to recall. Whole plant is used to treat various brain disorders like insomnia, loss of memory, mental as well as physical fatigue, anxiety, stress, and neurodegenerative disorders (Kulkarni, 1999).

The literature review chapter clearly indicates that although there are many studies conducted on Shankhapushpi, but most of them are related to its hypotensive (Chaturvedi, Sharma, and Sen, 1966; Mudgal and Udupa, 1977; Shukla, 1979), antianxiety (Sethiya, Thakore, and Mishra, 2009; Nahata, Patil, and Dixit, 2009; Sharma, Arora, Rana, and Bhatnagar, 2009), anticonvulsant (Ahmad, Zafar, and Sahid, 2007; Ratha and Mishra, 2012), antidepressant (Dhingra and Valecha, 2007; Indurwade and Biyani, 2000; Bhargava and Khan, 2012), antioxidant (Joshi, Kamat, Mohan, Chintalwar, and Chattopadhyay, 2003; Verma, Sinha, Kumar, Amin, Jain, and Tanwar, 2012; Dhuna, Dhuna, Bhatia, Singh, and Kamboj, 2012), antidiabetic (Patel, Chandola, Baghel, and Joshi, 2012; Agarwal, Sharma, Jain, Fatima, and Alok, 2014), antiulcerogenic (Sairam, Rao, and Goel, 2001), antiobesity (Sharma, Verma, Yashwant, and Prasad, 2013) activities. Hardly any work has been done on this plant in relation to cognitive abilities except memory (Priyanka and Batra, 2003; Priyanka and Batra, 2004;
Kapse and Nesari, 2005; Batra, 2008; Batra, Kumar, Rawat, and Batra, 2008; Sharma, Bhatnagar, and Kulkarni, 2010; Rawat and Kothiyal, 2010; Kothiyal and Rawat, 2011; Shweta and Batra, 2012). Earlier work conducted on this plant in department of Psychology, M.D.U, Rohtak by Priyanka and Batra (2004) clear-cut indicates the memory enhancing potential of Shankhapushpi plant. The different tasks undertaken in these earlier studies indicated that encoding, retention, and recognition are all affected by Shankhapushpi. The question that remains unanswered is, about the role of attention in improvement of memory. Therefore, to continue the previous work and to deeply probe the mechanism of action of this plant, attention has been specifically chosen in this study as dependent variable. Since attention is also a cognitive function, it is expected that Shankhapushpi may help improving it. In other words, it can be inferred from the memory enhancing potential of this plant that if this plant can enhance memory, it is quite possible that attention also must be getting affected by it.

There is not even a single study on this plant which refers directly to the area of attention. Further, most of the earlier studies conducted on this plant have used animal models. Very few studies reported its effect directly on human beings. Moreover, in many studies, Shankhapushpi has been studied as an ingredient of a herbal formulation. Studies reported the effects of this plant alone are very few. This makes it important to conduct the studies using only Shankhapushpi on human beings as an independent variable in order to get clearer picture of its effects.

Keeping in mind all these limitations of previous researches and wide implications of benefiting in the widespread problems of inattention, it was thought worthwhile to investigate the following problem.
PROBLEM

To study the effect of Shankhapushpi (Convolvulus pluricaulis) on attentional processes.

OBJECTIVES

1. To assess the effect of Shankhapushpi on attentional processes.
2. To compare the relative efficacy of Shankhapushpi on various measures of attention.
3. To assess the duration dependent effect of Shankhapushpi on various measures of attention.
4. To verify the residual effect of Shankhapushpi on attentional processes.

HYPOTHESES

Following hypotheses were formulated in the light of the above discussion and the studies reviewed earlier:

1. The Shankhapushpi would enhance the attentional processes.
2. Longer the duration of administration of Shankhapushpi, more the enhancement of attentional processes.
3. There would be a linear relationship between the attentional processes enhancement and duration of administration of Shankhapushpi.
4. The longer the duration of administration of Shankhapushpi, more would be the residual effect.