1. Introduction
Neuropathic pain as defined by the International Association for the Study of Pain (IASP) is “Pain initiated or caused by a primary lesion or dysfunction in the nervous system”. Neuropathic pain is produced by damage to the neurons in the peripheral and central nervous systems, and involves sensitization of these systems (Attal et al., 2006). In peripheral sensitization, there is an increase in the stimulation of peripheral nociceptors, which amplify pain signals to the central nervous system. In central sensitization, neurons of the dorsal horn of the spinal cord become hyper-stimulated and increase transmission of pain signals to the brain, thereby stimulating pain sensation (Backonja and Serra, 2004; Jaggi and Singh, 2011a; 2012).

Neuropathic pain is frequently observed in patients with cancer, AIDS, long standing diabetes, lumbar disc syndrome, herpetic, leprotic infections, traumatic spinal cord injury, multiple sclerosis, stroke cancer chemotherapy, HIV therapy, protein abnormalities, toxic chemicals, nutritional deficiencies and kidney failure. Moreover, post-thoracotomy, post-herniorrhaphy, post-mastectomy, and post-sternotomy are also associated with neuropathic pain (Alston and Pechon, 2005; Muthuraman et al., 2008; Jaggi and Singh, 2012). Nerve damage induced neuropathy may represent in the form of polyneuropathy, mononeuropathy, autonomic neuropathy and mononeuritis multiplex (Ayse et al., 2007; Jaggi et al., 2011; Jaggi and Singh, 2011a). Common examples of peripheral neuropathic pain include post-herpetic neuralgia (PHN), HIV sensory neuropathy, carpal tunnel syndrome, complex regional pain syndromes, reflex sympathetic dystrophy syndrome (RDSs, causalgia) and phantom limb pain (Pramod, 2006; Tesfaye and Selvarajah et al., 2012). Central neuropathic pain is associated with CNS lesions i.e., lumbar or cervical radiculopathy, stroke and spinal cord injury (Moseley and Flor, 2012).

Many therapies have been explored for the treatment of neuropathic pain with varying degrees of success including anticonvulsants (gabapentin, pregabalin, phenytoin, carbamezapine, oxcarbazepine topiramate and tiagabine), tricyclic antidepressants (amitriptyline, nortriptyline, venlafaxine), selective serotonin reuptake inhibitors (paroxetine and citalopram), acetaminophen/opioid combination products and other agents like mexilitine, baclofen, clonidine, tramadol etc (Ansari, 2000; Jensen and Fennerup, 2007; Jaggi and Singh, 2011a). In addition some alternative approaches include local anaesthetic blocks, epidural administration of steroids and neurosurgical lesions, but all of these therapies & approaches are of limited benefit and are associated with significant drawbacks. Because of limited therapeutic modalities and the side effects associated with
them the focus, now has been directed towards the herbal/natural drugs. Several recent studies have implicated the potential of *Butea monosperma* (Thiagarajan et al., 2012), *Cannabis sativa* (Comelli et al., 2008), *Nigella sativa* (Kanter, 2008), *Ocimum sanctum* (Muthuraman et al., 2008), *Aconiti tuber* (Xu et al., 2006), *Lindera angustifolia* (Zhao et al., 2006), *Teucrium polium* (Baluchnejadmojarad et al., 2005), *Phyllanthus amarus*, *Phyllanthus emblica* (Kassuya et al., 2003), *Vochysia divergens* (Bortalanza et al., 2002) etc in different type of neuropathic pain.

*Acorus calamus* belongs to the family of Araceae, commonly known as Vacha, has been indicated in the Indian system of medicine. Four types of *Acorus calamus* have been characterized: diploid (North America), triploid (Europe), tetraploid (East Asia, India and Japan) and hexaploid (Kashmir) (Duke, 1985; Martis et al., 1991; Muthuraman et al., 2011). The plant is a perennial herb growing throughout India, Europe, Asia and America. *Acorus calamus* contains glycosides, tannins, mucilage, volatile oil and bitter principles. The main chemical components of *Acorus calamus* are hydrocarbon, asarone, acorenone, calamendiol, α-selinene, α-calacorene, calamusenone, camphone and shyobunone. The essential oil has been shown to contain monoterpene, sequestrine calamenol, calamene, calamenone, methyleugenol and very small quantities of palmitic, heptylic and butylic acids. Moreover, sesquiterpenic ketones and alcohols are also present. Further, two bitter principles i.e., acorin and acoretin, have also been identified in this plant (Duke, 1985).

*Acorus calamus* has a very long history of medicinal use in many herbal traditions. This plant is mentioned by many of the great classical writers on medicine, like Hippocrates (460-377 BC) and Theophrastus (371-287 BC). According to Dioscorides, the smoke of *Acorus calamus* (if taken orally through a funnel) relieves cough. For centuries, many native American tribes were familiar with calamus and it had been used as folk medicine. The unpeeled, dried rhizome was listed in the U.S. Pharmacopoeia until 1916 and in the National Formulary until 1950, for medicinal use on humans. As per Indian Ayurveda it has high value as a rejuvenator for the brain & nervous system and also used for digestive disorders, toothache and headaches (Chevallier, 1996). In Indian and Chinese traditional medicines, roots and rhizomes of *Acorus calamus* have been used for the improvement of age-dependent learning performances, and as carminative, expectorant, antifungal, hallucinogenic, hypotensive and sedative (Hazra et al., 2007; Ghosh, 2006).

The ethanolic extract of *Acorus calamus* has been shown to prevent gastro-duodenal ulcers, whereas aqueous & hydroalcoholic extract express the hypolipidemic and neuropharmacological activities (Rafatullah et al., 1994; Parap and Mengi, 2003). *Acorus
calamus also used in the treatment of digestive complaints, bronchitis, sinusitis etc. Several recent studies have also explored its potential usefulness in anorexia nervosa (Phillips and Foy, 1990; Kim et al., 2009), skin eruption, rheumatic pain, neuralgia (Tippani et al., 2008), epilepsy (Hazra et al., 2007; Yang et al., 2008) as well as neuroprotective against ischemic and acrylamide induced neuronal insult (Shukla et al., 2002; Shukla et al., 2006). Pharmacologically, it has been reported to possess peroxisome proliferator activated receptor (PPAR) agonistic action (Rau et al., 2006), acetylcholinesterase inhibition (Mukherjee et al., 2007) and free radical scavenging activity (Manikandan et al., 2005). However, its potential in peripheral neuropathy is yet to be explored.