Introduction
Osteoporosis is a systemic skeletal disease affecting millions of people. Low bone mass, microarchitectural deterioration, increase in bone fragility and susceptibility to fracture are the hallmarks of osteoporosis. Bone remodeling, the coupled bone resorption and formation, is impaired with excessive bone resorption in these patients (Weinreb et al., 1989; Roodman, 1996). A rapid bone loss occurs in the early post menopausal year which is believed to average approximately 2% to 3% over the following 5 to 10 years (Susan, 2003). Prolonged amenorrhea, low calcium (Ca) diet, lack of exercise and vitamin D (vit D) deficiency apart from family history of anorexia and osteoporosis are probable causative factors for fragility fractures in 50% of women over 50 years in their lifetime (Harvey et al., 2006; Indumati et al., 2007; Shoback, 2007). More than 60% of bone mass variance is determined by genetic factors. Environmental factors account for the non-genetic influences, such as nutritional intake and lifestyle habits (Rizzoli, 2008).

Several medications have been reported to be effective for treating osteoporosis. The pharmacological agents used to manage osteoporosis include hormones [estrogen, parathyroid hormone (PTH), calcitonin (CT)], bisphosphonates and selective estrogen receptor modulators (SERMs) such as raloxifene and droloxifene (Genant et al., 1989). Although these therapeutic agents have effectively prevented post-menopausal bone loss and reduced fracture risks, safety is the major concern due to their undesirable side effects (Taylor, 1997). As an alternative to these synthetic drugs, there is an increasing demand for ‘traditional system of medicine’ which could be healthier and safer for the treatment of osteoporosis.

Many plant products are used in the treatment of various bone disorders including osteoporosis. Cissus quadrangularis (C.quadrangularis) is one of the
important plants that has been used in the traditional system of medicine. *C. quadrangularis*, is a rambling shrub characterized by a thick quadrangular fleshy stem. It is an edible plant found in hotter parts of India, Sri Lanka, Malaysia and West Africa (Udupa *et al.*, 1970). *C. quadrangularis* is reported to induce early ossification and to hasten the process of fracture healing through increased uptake of minerals such as calcium, sulfur and strontium by the osteoblasts (Udupa and Prasad, 1964). Commonly known as “bone setter”, the plant is referred to as “Asthisamdhani” in Sanskrit because of its ability to join bones (Sivarajan and Balachandran, 1994). The plant has been documented in Ayurveda for its medicinal use in gout, syphilis, veneral disease and leucorrhoea in the siddha system of medicine (Yoganarsimhan, 2000). Phytoestrogens present in *C. quadrangularis* have been suggested to its anti-osteoporotic and fracture healing activities (Bahram *et al.*, 1996). However, the molecular mechanism behind these activities of *C. quadrangularis* is not well understood. The present study was performed to delineate the same using adult female Sprague-Dawley rats.