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Evaluation of pinus plant species from north western himalayas for osteoporosis

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Osteoporosis is a skeletal disorder associated with low bone mass and strength leading to bone fractures. It is highly prevalent especially in geriatric populations. For several years' estrogen therapy was used clinically for treatment and management of osteoporosis, however them prolong use are associated with various side effects including breast cancer and cardiovascular diseases. The aim of the present study has been designed to evaluate the pharmacological activity of stem bark of Pinus plants extracts and fractions in surgically induced osteoporosis in female rats. The bioactive fraction was further developed into a tablet formulation. The plant extracts and fractions are subjected for the phytochemical screening. The presence of gallic acid, quercetin, ascorbic acid, tannic acid, caffeic acid and catechin was quantified in plant extracts and in potent bioactive fraction using HPLC and HPTLC study. The three Pinus extracts Pinus roxburghii, Pinus wallichiana, Pinus gerardiana and further their four fractions prepared by using the solvents of graded polarity was subjected for antioxidant activity using DPPH, nitric oxide and hydrogen peroxide radical's assays. Anti-inflammatory activity was carried out using albumin denaturation and HRBC membrane stabilization assays. In-vitro osteoblastic proliferation was assessed on UMR-106 cell lines. Acute toxicity study of prepared extracts was conducted as per OECD423 guidelines. In vivo antiosteoporotic activity was done on ovariectomized female rats. The most active fraction was then formulated into tablet. The findings from present investigation may conclude that the Pinus plant species has efficacy to ameliorate the pathological state of osteoporosis via modulation of estrogen, RANK and cathepsin signaling. This effect may be due to the presence of quercetin, gallic acid, ascorbic acid, catechin, caffeic acid and tannic acid phytoconstituents.

Keywords: Osteoporosis, Pinus roxburghii, Pinus wallichiana, Pinus gerardiana, Bone, HPLC, HPTLC

Biography

Aditi Sharma is an Assistant Professor of Pharmacology at the Faculty of Pharmaceutical Sciences, Shoolini University. With a Ph.D. in Pharmaceutical Sciences and over ten years of teaching and research experience, her expertise lies in postmenopausal osteoporosis, neurological disorders, and bioactive lead isolation from Pinus.