

## **Catechin-rich oil palm leaf extract enhances bone calcium content of estrogen-deficient rats**

### **ABSTRACT**

**Objective:** Postmenopausal estrogen deficiency often causes bone density loss and osteoporosis. This study evaluated the effects of an oral administration of oil palm leaf extract (OPL) on bone calcium content and structure, bone density, ash weights, and serum total alkaline phosphatase (T-ALP) of estrogen-deficient ovariectomized (OVX) rats. **Methods:** Female Sprague-Dawley rats were divided into five experimental groups: 1) intact (normal control); 2) ovariectomized (OVX control), and OVX rats supplemented with 3) 2% (w/v) green tea (OVX + GT), 4) OPL 150 mg/kg of body weight, or 5) OPL 300 mg/kg of body weight in the drinking water. **Results:** After 3 mo, the OVX control rats had significantly decreased femur and tibia masses ( 5% and 3%, respectively), ash ( 15% and 10%), calcium content ( 0.5% and 2.7%), and bone density and T-ALP concentrations ( 40%) compared with intact rats. The catechin-rich OPL dose dependently increased the OVX bone density and structure, femur and tibia masses (by +8% and +12% respectively), ash (by +30% and +20% respectively), calcium (by +3% and +5%), and T-ALP concentrations (by +76%) compared with the OVX rats. The increases by OPL were higher than that in OVX + GT and control intact rats. **Conclusion:** The catechin-rich OPL increased the bone mass in estrogen-deficient rats by increasing osteoblast activities to higher levels than in normal rats and those supplemented with GT. This was shown by the modulation of serum T-ALP levels, bone calcium content, total mineral content, and bone histologic structure. The OPL is a potential inexpensive ingredient for protection against osteoporosis and influences bone metabolism by encouraging bone formation.

**Keyword:** Bone calcium content; Estrogen deficiency; Oil palm leaves; Osteoporosis; Polyphenols