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An Experimental Study on Protective Effects of Morroniside from *Cornus officinalis* Sieb. et Zucc. on Osteoporosis in Ovariectomized Rats

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***SUMMARY*. This study investigated the effects of morroniside on osteoporosis in ovariectomized rats. Sixty female SD rats were randomly divided into sham-operated, model group, and low-, middle- and high-dose morroniside groups. In later 4 groups, the osteoporosis of rats was induced by ovariectomy. The low-, middle-, and high-dose morroniside groups were intragastrically administrated with morroniside, with dose of 100, 200, and 400 mg/kg, respectively. After treatment for 3 months, compared with model group, in high-dose morroniside group the femur bone mineral density, maximum load and stiffness, serum calcium, estradiol and superoxide dismutase levels and femur collagen type I (COL I) protein expression level were increased, and the serum phosphorus, alkaline phosphatase and malondialdehyde levels and femur cathepsin K (Cath K) protein expression level were decreased (all $P < 0.05$). Morroniside has protective effects osteoporosis in ovariectomized rats, which may be related their resistance of oxidative stress and regulation of COL I and Cath K expressions.**

RESUMEN. Este estudio investigó los efectos del morronisido sobre la osteoporosis en ratas ovariectomizadas. Sesenta ratas SD hembras se dividieron aleatoriamente en grupos de morronisido operados de forma simulada, de grupo modelo y de dosis baja, media y alta. En los últimos 4 grupos, la osteoporosis de ratas se indujo mediante ovariectomía. Los grupos de morronisido en dosis baja, media y alta se administraron por vía intragástrica con morronisido, en dosis de 100, 200 y 400 mg/kg, respectivamente. Después del tratamiento durante 3 meses, en comparación con el grupo modelo, en el grupo de morronisido en dosis altas, la densidad mineral ósea del fémur, la carga máxima y la rigidez, los niveles séricos de calcio, estradiol y superóxido dismutasa y el nivel de expresión de la proteína de colágeno tipo I (COL I) aumentaron, en tanto que los niveles de fósforo, fosfatasa alcalina y malondialdehído en suero y el nivel de expresión de la proteína de catepsina K (Cath K) del fémur disminuyeron (todo $P < 0.05$). Morronisido tiene efectos protectores de la osteoporosis en ratas ovariectomizadas, que pueden estar relacionados con su resistencia al estrés oxidativo y la regulación de las expresiones de COL I y Cath K.

KEY WORDS: osteoporosis, morroniside, rats, collagen type I, cathepsin K

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