

Acute effect of different extracts by *Capparis spinosa* roots on articular pain in the rat

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Rheumatoid arthritis and osteoarthritis are the most common rheumatic conditions in adults. The incidence of osteoarthritis rises with age affecting more than 10% of individuals over 65 years of age. On the other hand, rheumatoid arthritis suffers are typically younger than those who develop osteoarthritis with an incidence peaking between 35 and 50 years of age. Both diseases lead to joint degeneration and are extremely painful.

Capparis spinosa L. (Capparidaceae) is a plant originating from dry regions in west or central Asia and widespread in the Mediterranean basin. The traditional use of *Capparis spinosa* roots against different kind of pain in human is well known since the antiquity. Traditionally, caper infusion is considered to be beneficial for the treatment of rheumatism, gout and colicky pain as well as plant-derived pastes are used for topic applications to treat swollen joints, skin rashes and burns.

The present results show the pain reliever effect of different extracts by the roots of a Syrian cultivar of *Capparis spinosa* in two rat models of articular diseases. Powdered roots, decoction (DEC), and hydroalcoholic extracts were obtained; the latter was further separated in aqueous and CH₂Cl₂ fractions. The products were characterized in terms of drug extract ratio (DER) and content of typical alkaloids: capparispine and its analogues by HPLC/DAD/MS and stachydrine by NMR. The samples were characterized by different amount of free and glycosilated forms of capparispine and analogues with values from 0,5 % w/w for DEC up to 7,6 % w/w for CH₂Cl₂ fraction.

In rats, rheumatoid arthritis model was induced by a single administration (50 µL) of the Complete Freund's Adjuvant (CFA) in the rat knee joint whereas a single tibial-tarsal injection (25 µL) of monosodium iodoacetate (MIA) provided an unilateral osteoarthritis. On the 14th day from the CFA- or the MIA-injection, the different preparations of *Capparis spinosa* (3, 30, 100 and 300 mg kg⁻¹) were acutely administered *per os*. Decoction (100 mg kg⁻¹) as well as powdered roots (300 mg kg⁻¹) and hydro-alcoholic extract (300 mg kg⁻¹) significantly reduced mechanical hyperalgesia (Randall-Selitto analgesymeter) and spontaneous pain (Incapacitance test) in both models. The CH₂Cl₂ and the aqueous extract (30 mg kg⁻¹) were the most potent in reverting pain threshold alterations despite the different content of free alkaloids.

In conclusion, *Capparis spinosa* extracts relieved pain related to rheumatoid arthritis and osteoarthritis models after single administration. Further investigations are needed in order to identify the active compounds both in the polar and non-polar fractions.