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Effect of *Fraxinus angustifolia* (Oleacea) leaf and bark extracts on acute and chronic inflammation: Enhanced activity of nanovesicle-trapped extracts

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In the present study, hydroalcoholic extracts of leaves and barks of *Fraxinus angustifolia*, a medicinal plant widely used as anti-inflammatory in folk Algerian medicine were studied using several *in vitro* models and on acute and chronic inflammation. In the carrageenan-induced mouse paw edema test, barks and leaves extracts (150 mg/kg) showed a marked inhibitory effect on edema. Furthermore, both extracts significantly reduced edema (66% and 81%, respectively) and subchronic inflammation (47 and 51%, respectively) induced by 12-O-tetradecanoylphorbol 13-acetate (TPA) (1 mg/ear). In addition, both extracts inhibited the activity of the pro-inflammatory enzyme, myeloperoxidase (MPO) (54% and 69%, respectively) and NO production (78 and 94%, respectively) in lipopolysaccharide (LPS)-stimulated RAW 264.7 macrophages, with no apparent toxicity. Moreover, the extracts demonstrated a considerable hypo-uricemic effect in mice, with an appreciable inhibition of xanthine oxidase activity. *F. angustifolia* leaf and bark extracts trapped in nanovesicles significantly enhanced healing of TPA-induced skin lesions in mice, protected human keratinocytes against H₂O₂-induced oxidative damage and exhibited an outstanding antioxidant activity against DPPH and ABTS. The presence of quercetin, catechin, rutin and tannic acid in *F. angustifolia* extracts may account for the observed activities which justify the use of this plant in traditional medicine against pathologies associated with oxidative stress and inflammation.

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