A041 Superoxide scavenging properties and modulatory activity of mangiferin on inducible nitric-oxide synthase, TNF-α and TGF-β gene expression

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In the present study, we have investigated for the first time the potential effects of mangiferin (MA), a natural polyphenolic compound, on superoxide anions (O_2^-) production, xanthine oxidase (XO) activity, vascular contractility and mRNA expression of inducible nitric-oxide synthase (iNOS), tumour necrosis factor-alfa (TNF-α) and tumour growth factor-beta (TGF-β). O_2^- were generated by the hypoxanthine (HX)/XO and NADH/phenazine methosulphate (PMS) systems (1). XO enzymatic activity was determined by measurement of uric acid production from xanthine (2). Vascular contraction experiments were performed in intact rat aortic rings (3). iNOS, TNF-α and TGF-β gene expression in rat leucocytes *in vivo* pre-stimulated with thioglycollate (3% w/v) and *in vitro* incubated with 10 µg/ml lipopolysaccharide and 10 U/ml of interferon-gamma was evaluated by retrotranscriptase-polymerase chain reaction (RT-PCR). MA (1-100 µM), like SOD (1 U/ml), scavenged O_2^- produced by the HX/XO and NADH/PMS systems. MA (1-100 µM), unlike allopurinol (10 µM), was unable to inhibit XO activity. MA (1-100 µM) did not modify the resting tone and the contractile response elicited by L-phenylephrine (1 µM) or phorbol 12-myristate 13-acetate (1 µM) in rat aorta. MA (1-100 µM), like dexamethasone (100 µM), decreased iNOS induction in activated leucocytes. At 100 µM, MA also inhibited TNF-α gene expression and, however, increased the mRNA expression of TGF-β. Taking into account the scavenging properties and the inhibitory effects of MA on iNOS and TNF-α gene expression above described, it can be concluded that this polyphenol may have interest in the therapy of inflammation and/or neurodegenerative disorders (4). In addition, the finding that MA enhances the mRNA expression of TGF-β suggests that this natural compound may be also useful in the prevention of cancer, autoimmunity, atherosclerosis and coronary heart disease (5).

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A042 Investigations on the antiinflammatory activity of *Avena sativa* L.

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Aqueous preparations of oat straw (Stramentum Avenae) such as medicated baths and herbal teas have been traditionally used in folk medicine as remedies against inflammatory diseases (rheumatism, goat etc.) (1). For this reason the suggested antiinflammatory activity of an aqueous oat straw extract was examined by three different models of inflammation: the carrageenan induced rat paw edema, the croton oil induced mouse ear erythema and the influence on the release of radiolabelled PGE_2, PGI_2 and PGD_2 (2). In all three models the extract showed high inhibitory effects even at low concentrations. Bioassay guided fractionation of this extract over Sephadex G 15 and further cleanup by elution over polyamide led to a fraction which showed the same inhibitory activity on carrageenan induced rat paw edema as the whole extract (45% inhibition at a concentration according to 250 mg drug/kg p.o.). Additionally an aqueous oat fruit extract was examined for its inhibitory activity on carrageenan induced rat paw edema. This extract also showed a remarkable inhibitory effect (40% inhibition at a concentration according to 1.0 g drug/kg p.o.). The extract was ultrafiltrated to remove starch (filter cut-off: 100.000 Da) and then fractionated over Sephadex G 25, which led to two active fractions, the first one with a low elution volume (V_e) and the second one with a high V_e. The first one depressed the formation of edema to an extent of 30%, the latter one to an extent of 41% at a concentration according to 1.5 g drug/kg p.o. (significance of results was assessed by Student´s t- test; significance level: $p<0.05$; $n=5$ for all pharmacological testings). These results lead to the conclusion that aqueous oat straw extracts contain at least one, and oat fruit extracts at least two compounds which show an inhibitory activity on carrageenan induced rat paw edema. To isolate these compounds, further bioassay guided separation steps and phytochemical investigations of the active fractions are in progress.

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