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Plant phenolics as new therapeutic agents in the treatment of diabetes and inflammation

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Phytochemicals, including phenolic compounds present in many plants have received much attention in recent years due to their health benefits. This study was conducted to investigate the anti-diabetic and anti-inflammatory activities of *Pistacia* and *Fraxinus angustifolia*, two plants traditionally used in Algerian folk medicine. The results indicated that *P. lentiscus* and *F. angustifolia* extracts, exhibited a promising anti-diabetic activity in streptozotocin (STZ)-induced diabetic rats, by a significant reduction (55%) of blood glucose level, a result confirmed by the inhibition of alpha-amylase activity (65%). The results of the anti-inflammatory activity of *P. lentiscus* and *F. angustifolia* showed significant reduction of the paw edema induced by carrageenan. Furthermore, *P. lentiscus* extracts showed a significant reduction of pro-inflammatory cytokines (IL-1β) in activated macrophages. Moreover, the extracts of *F. angustifolia*, significantly inhibited ear edema induced by single and multiple doses of 12-O-tetradecanoylphorbol 13-acetate (TPA) and suppressed the cellular infiltration. *In vivo*, the vesicles loaded with the crude extract of *F. angustifolia* and especially penetration enhancer-containing vesicles (PEV) inhibited oxidative stress in human keratinocytes against H_2O_2 and attenuated edema and leukocyte infiltration by stimulating the repair of TPA-induced skin damage. Chromatographic and spectroscopic analyses allowed the identification of known and new phenolic compounds, some of which are endowed with biological activities.

Recent Publications

1. Karima Ayouni, Meriem Berboucha-Rahmani, Hye Kyong Kim, Djebbar Atmani, Rob Verpoort, et al. (2016) Industrial Crops and Products 88:65–77.
2. Chafiaâ Mehenni, Dina Atmani-Kilani, Stéphane Dumarçay, Dominique Perrin, Philippe Gérardin, et al. Hepatoprotective and antidiabetic effects of Pistacia lentiscus leaf and fruit extracts (2016) Journal of Food and Drug Analysis. 24(3): 653-669.
3. Zineb Medjahed, Dina Atmani-Kilani, Marie-Laure Fauconnier, Gaëtan Richard, Djebbar Atmani (2016) Hepatoprotective and antidiabetic activities of Fraxinus angustifolia Vahl extracts in animal models: Characterization by high performance liquid chromatography analysis. Turkish Journal of Medical Sciences 46(3):910-920
4. Remila S, Atmani-Kilani D, Delemasure S, Connat J L, Richard T and Atmani D (2015) Antioxidant, cytoprotective, anti-inflammatory and anticancer activities of Pistacia lentiscus (Anacardiaceae) leaf and fruit extracts. European Journal of Integrative Medicine. 7:274–286.
5. Moulaoui K, Caddeo C, Manca M L, Castangia I, Valenti D, Escribano E, Atmani D, Fadda A M and Manconi M (2015) Identification and nanoentrapment of polyphenolic phytocomplex from Fraxinus angustifolia: *In vitro* and *in vivo* wound healing. European Journal of Medicinal Chemistry. 89:179-188.

Biography

Djebbar Atmani is a Senior Lecturer at the Faculty of Nature and Life Sciences, University of Bejaia (Algeria). He obtained his Master of Science Degree from California State University, Los Angeles (USA) in 1987 and his PhD from the University of Sétif (Algeria) in 2004. His research interest lies in natural products from medicinal plants. He has published more than 30 papers in high impact scientific journals, attended several seminars and symposia worldwide and supervised many Doctoral theses besides reviewing many high impact journals.

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