THERAPEUTICS

NPARR, 6(1 & 2), 2015-82 Anti-diabetic and spasmolytic potential of Farsetia hamiltonii Royle from Cholistan desert

Folk herbal practitioners of the Cholistan desert claim Farsetia hamiltonii Royle (Brassicaceae) to treat diabetes, oxidative damages, diarrhea, fever, and abdominal cramps. The aim of this study was to scientifically find the potential of Farsetia hamiltonii in treating diabetes and gastrointestinal diseases. In vivo anti-diabetic activity of Farsetia hamiltonii was studied on alloxan induced diabetic rats to justify its traditional use. The in vitro antispasmodic activity on isolated tissues of rabbit jejunum was also evaluated. In addition, several enzyme inhibition studies (lipoxygenase, tyrosinase, acetylcholinesterase (AchE), carbonic II anhydrase and phosphodiesterase I) and antioxidant activity of plant extracts were also conducted. In vivo experiments, Farsetia hamiltonii methanol extract (300 mg/kg) significantly lowered the fasting blood glucose (107.6±1.249 mg/dL up to 4th day) comparable to positive control (Glibenclamide) throughout the study period. The in vitro antispasmodic activity on isolated tissues of rabbit jejunum showed concentration dependent (0.01–0.3 mg/ml) relaxation of spontaneous contractions with EC\textsubscript{50} value 0.011 μM and high K\textsuperscript{+} (80 mM) induced contraction (0.01–0.1 mg/ml) with EC\textsubscript{50} value 0.066 mg/ml. Farsetia hamiltonii DCM and methanol extracts exhibited some antilipoxygenase activities while tyrosinase, acetylcholinesterase (AchE), carbonic II anhydrase, phosphodiesterase I, and antioxidant activity of plant extracts were not significant. Our results validate the traditional use of Farsetia hamiltonii for the traditional therapeutic potential in treating diabetes and gastrointestinal diseases [Muhammad Munawar Hayat*, Sadia Sarwar, Shazia Anjum, Muhammad Uzair, Hafiz Muhammad Farhan Rasheed, Qaiser Jabeen, Bashir Ahmad Choudhary and Muhammad Ashraf (Faculty of Pharmacy, Bahauddin Zakariya University, Multan 60800, Pakistan), Journal of Ethnopharmacology, 2014, 156, 347-352].

NPARR, 6(1 & 2), 2015-83 Healing efficiency of oligosaccharides generated from almond gum (Prunus amygdalus) on dermal wounds of adult rats

Almond gum is a naturally occurring polymer produced by almond trees and shrubs. Its abundance, as well as its low cost production makes it a potential feedstock for use in food and pharmaceuticals. In this regard, almond gum oligosaccharides were enzymatically generated, purified and their monosaccharide composition assessed using gas chromatography-flame ionization detector. Oligosaccharide analyses show that the most prominent residues were galactose and arabinose with traces of xylose, rhamnose, glucose and mannose. The glycosyl linkage positions were analyzed using gas chromatography – mass spectrometry showing a main chain composed of galactose units [→3]-Gal-(1→] branched mainly with arabinose residues [Ara-(1→]. The potent role of the generated oligosaccharides on rats wound healing was investigated. They have been applied either alone or supplemented, as active substance, with cream formulation, on full-thickness wound created on the dorsum of the rats. The effect of oligosaccharides was assessed by measuring the wound closure percentage, reaching an average of around 100% when applied alone or supplemented to cream formulation. The healing percentage for the control group was only 74.3% at the same day. The histological evaluation of skin sections visualized by light microscopy revealed an improved collagen deposition and an increased fibroblast and vascular densities. [Fatma Bouaziz, Molka Ben Romdhane, Claire Boisset Helbert, Laurine Buon, Fatma Bhiri, Sana Bardaa, Dorra Driss, Mohamed Koubaa, Akram Fakhfakh, Zouhair Sahnoun, Fatma Kallel, Najiba Zghal and Semia Ellouz Chaabouni* (Enzyme Bioconversion Unit (04/UR/09-04), National School of...
Over the past few decades, microbial polysaccharides have been under intense investigation due to their advantageous physicochemical properties. A great structural diversity of these biomolecules has led to multiple applications in food industry, personal care products, pharmacy and medicine. Currently, one of the most widely studied and fully described member of this group is gellan. It is a linear polymer produced by *Sphingomonas elodea*. A polymer chain of gellan consists of a tetrasaccharide repeating unit of l-rhamnose, d-glucose and d-glucuronate. So far most of the studies have been focused on the application of gellan as a food ingredient. However, due to the unique structure and beneficial properties, gellan is currently described as a potent multifunctional additive for various pharmaceutical products. Specific gelling properties in different media led to the development of controlled release forms based on gellan. Various formulations have been studied including oral, ophthalmic, nasal and other. Recent reports suggest that gellan-based materials can also be used in regenerative medicine, stomatology or gene transfer technology.

Healing efficacy of sea buckthorn (*Hippophae rhamnoides* L.) seed oil in an ovine burn wound model

To investigate the efficacy of sea buckthorn (SBT) seed oil – a rich source of substances known to have anti-atherogenic and cardioprotective activity and to promote skin and mucosa epithelization – on burn wound healing, five adult sheep were subjected to 3rd degree flame burns. Two burn sites were made on the dorsum of the sheep and the eschar was excised down to the fascia. Split-thickness skin grafts were harvested, meshed, and fitted to the wounds. The autograft was placed on the fascia and SBT seed oil was topically applied to one recipient and one donor site, respectively, with the remaining sites treated with vehicle. The wound blood flow (LASER Doppler), and epithelization (ultrasound) were determined at 6, 14, and 21 days after injury. 14 days after grafting, the percentage of epithelization in the treated sites was greater (95 ± 2.2% vs. 83 ± 2.9%, *p* < 0.05) than in the untreated sites. Complete epithelization time was shorter in both treated recipient and donor sites (14.20 ± 0.48 vs. 19.60 ± 0.40 days, *p* < 0.05 and 13.40 ± 1.02 vs. 19.60 ± 0.50 days, *p* < 0.05, respectively) than in the untreated sites, confirmed by ultrasound. In conclusion, SBT seed oil has significant wound healing activity in full-thickness burns and split-thickness harvested wounds.[135]

*Hibiscus sabdariffa* L.–A phytochemical and pharmacological review

*Hibiscus sabdariffa* L. (Hs, roselle; Malvaceae) has been used traditionally as a food, in herbal drinks, in hot and cold beverages, as a flavouring agent in the food industry and as a herbal medicine. *In vitro* and *in vivo* studies as
well as some clinical trials provide some evidence mostly for phytochemically poorly characterised Hs extracts. Extracts showed antibacterial, anti-oxidant, nephro- and hepato-protective, renal/diuretic effect, effects on lipid metabolism (anti-cholesterol), anti-diabetic and anti-hypertensive effects among others. This might be linked to strong antioxidant activities, inhibition of $\alpha$-glucosidase and $\alpha$-amylase, inhibition of angiotensin-converting enzymes (ACE), and direct vasos-relaxant effect or calcium channel modulation. Phenolic acids (esp. protocatechuic acid), organic acid (hydroxycitric acid and hibiscus acid) and anthocyanins (delphinidin-3-sambubioside and cyanidin-3-sambubioside) are likely to contribute to the reported effects. More well designed controlled clinical trials are needed which use phytochemically characterised preparations. Hs has an excellent safety and tolerability record. [Inês Da-Costa-Rocha, Bernd Bonnlaender, Hartwig Sievers, Ivo Pischel and Michael Heinrich*) Centre for Pharmacognosy and Phytotherapy, UCL School of Pharmacy, University of London, 29-39 Brunswick Square, London WC1N 1AX, UK,) Food Chemistry, 2014, 165, 424-443].

NPARR, 6(1 & 2), 2015-87 A mixture of chamomile and star anise has anti-motility and antidiarrheal activities in mice

Diarrhea is a serious public health problem in Mexico and other countries. A widely used alternative in the treatment of diarrhea is the use of herbal medicines. Infusions of chamomile and star anise possess anti-inflammatory and antimotility properties that could help alleviate gastrointestinal disorders. The aim of this study was to determine the effect of the mixture of chamomile and star anise infusions on gastrointestinal activity in mice. A gastrointestinal assessment of the mixture of chamomile and star anise was carried out in mice, and the percentage of advance of administered activated carbon through the intestinal tract of the animals was measured. Furthermore, the diarrhea model was induced with castor oil. The infusions were prepared using a mix with a 50:50 ratio of the herbs, and were administered at Mix-10, 20, 40 and 80 (mg/kg) orally. The results indicate that Mix-40 and Mix-80 decreased the completion percentage of the activated carbon, delayed the appearance of diarrhea and decreased the number of evacuations in comparison with the control group. This suggests that the combination of chamomile and star anise can be used as an alternative antidiarrheal treatment [Alfonso Díaz, Izel Vargas-Perez, Lidia Aguilar-Cruz, Roberto Calva-Rodríguez, Samuel Treviño, Berenice Venegas and Irma Rosalía Contreras-Mora* (Departamento de Farmacia, Facultad de Ciencias Químicas, Benemérita Universidad Autónoma de Puebla, Puebla, México), Revista Brasileira de Farmacognosia, 2014, 24(4), 419-424].

NPARR, 6(1 & 2), 2015-88 Effect of volatile oil from Blumea Balsamifera (L.) DC. leaves on wound healing in mice

To assess the effectiveness of volatile oil from Blumea Balsamifera (L.) DC. leaves (BB oil) on wound healing in mice. Undiluted BB oil and its diluted solutions with olive oil to 1/5 and 1/10 to yield BB oil$_{1/5}$ and BB oil$_{1/10}$ were applied to the wounded skin before wound healing conditions were assessed by healing rate, histopathology, and contents of collagen, hydroxyproline, and Neuropeptide Substance P (SP). All above results were compared with the efficacies of the control, pure olive oil, basic fibroblast growth factor (BFGF), and cream of Jing Wan Hong (JWH).BB oil$_{1/5}$ and BB oil$_{1/10}$ improved wound contraction and closure. Histopathology study further confirmed a desirable histological organization of wound tissues. BB oil$_{1/5}$ and BB oil$_{1/10}$ reduced the number of inflammatory cells, increased wound-healing rates, and significantly increased the hydroxyproline content. Both BB oil$_{1/5}$ and BB oil$_{1/10}$ improved formation of collagen, and reduced the frequency of fibroblasts. Moreover, BB oil$_{1/5}$ and BB oil$_{1/10}$ markedly promoted SP
expression. However, undiluted BB oil may induce skin thickening and hardening, inhibit collagen synthesis and delay complete skin wound healing. The BB oil$_{1/5}$ and BB oil$_{1/10}$ promoted capillary regeneration, blood circulation, collagen deposition, granular tissue formation, epithelial deposition, and wound contraction. The mechanism underlying the action might be related to induction of SP secretion, and the proliferation and differentiation of mesenchymal cells [Yuxin Pang*, Dan Wang, Xuan Hu, Hui Wang, Wanjin Fu, Zuowang Fan, Xiaolu Chen and Fulai Yu (Laboratory of Tropical Medicinal Plants Resources, Tropical Crops Genetic Resources Institute, Chinese Academy of Tropical Agricultural Sciences, Danzhou 571731, China) *Journal of Traditional Chinese Medicine, 2014, 34(6), 716-724].