PHYTOCHEMICALS

NPARR 5(4), 2014-0353 Glucosyl terpenates from the dried fruits of Prunus domestica L.

The chemical structures of 9 compounds isolated from the dried fruits of Prunus domestica L. were elucidated on the basis of NMR and MS analyses. Each isolated compound was determined to be scopolin (1), (3-O-cis-p-coumaroyl-β-d-fructofuranosyl)-(2→1)-α-d-glucopyranoside (2), 1S-(4-β-d-glucopyranosyl-3-methoxyphenyl)-2R-[4-(3-hydroxypropyl)-2-methoxyphenoxy]-1,3-propanediol (3), β-d-glucopyranosyl 9-carboxy-8-hydroxy-2,7-dimethyl-2E,4E-nonadienate (4), β-d-glucopyranosyl 7-carboxy-2-methyl-2E,4E-octadienate (5), 8-hydroxy-2,7-dimethyl-2E,4E-decadienedioic acid 1-β-d-glucopyranosyl ester 10-methyl ester (6), (3-O-trans-p-coumaroyl-β-d-fructofuranosyl)-(2→1)-α-d-glucopyranoside (7), β-d-glucopyranosyl cinnamate (8), and 2,7-dimethyl-2E,4E-octadienedioic acid (9), respectively. Compounds 2, 3, 4, 7, 8, and 9 were isolated from P. domestica L. for the first time, and compounds 5 and 6 were novel glucosyl terpenates [Shin-ichi Kayano, Hiroe Kikuzaki, Sachiko Hashimoto, Kumi Kasamatsu, Takao Ikami and Nobuji Nakatani, Phytochemistry Letters, 2014, 8, 132–136].

NPARR 5(4), 2014-0354 Anti-ulcerogenic activity and isolation of the active principles from Sambucus ebulus L. leaves

Sambucus ebulus L. has a very prominent place in Turkish folk medicine. Leaves of the plant are practiced externally to relieve rheumatic pain, to treat abscess, for wound healing and internally against hemorrhoids and stomachache. In a previous work, aqueous extract of the leaves was shown to possess potent antiulcerogenic activity on water immersion and immobilization-induced stress ulcer model in rats. This study aims to investigate the antiulcerogenic activity profile of the plant on various in vivo peptic ulcer models and gastric biochemical parameters and through bioassay-guided processing to isolate the active constituent (s) and to elucidate its structure.

Among the subextracts obtained by successive solvent extractions from the MeOH extract of the leaves, the butanol subextract exerted significant antiulcerogenic activity against water-immersion and immobilization-induced stress ulcer model in rats as the bioassay model. This subextract was then subjected to successive chemical separation techniques (precipitation, column chromatography based on ion-exchange, silica gel and sephadex) and the activity of each fraction/subfraction was tested using the same bioassay model. After determination of active principles, further studies were performed on the active subextract by using various in vivo test models (ethanol-, serotonin-, pyloric ligation-induced ulcerogenesis) in rats as well as biochemical methods for the evaluation of antiulcerogenic potential.

Bioassay-guided fractionation procedures yielded two flavonol glycosides as the active antiulcerogenic principles. The structures of these compounds were elucidated as isorhamnetin-3-O-monoglycoside and quercetin-3-O-monoglycoside by using 1H, 13C-NMR, and FAB-MS techniques.

This study has proven the folkloric use of Sambucus ebulus leaves for the treatment of gastric ailments in Turkish folk medicine. The antiulcerogenic activity of the two flavonol glycosides isolated in the present study was not previously reported elsewhere [Erdem Yesilada*, İlhan Gürbüz and Gülşin Toker (Yeditepe University, Faculty of Pharmacy, 34755 Atasehir, Istanbul, Turkey), Journal of Ethnopharmacology, 2014, 153(2), 478–483].

NPARR 5(4), 2014-0355 Aeromonas hydrophila by treating Ixora coccinea active principles

Herbals such as Ixora coccinea, Daemia extensa and Tridax procumbens were selected to screen in vitro antibacterial and immunostimulant activity against the freshwater fish pathogen.
Aeromonas hydrophila using different organic polar and non-polar solvents. Initial screening results revealed that, ethyl acetate extracts and its purified fraction of I. coccinea was able to suppress the A. hydrophila strains at more than 15 mm of zone of inhibition and positive immunostimulant activity. The purified active fraction, which eluted from H40: EA60 mobile phase was structurally characterized by GC–MS analysis. Two compounds such as Diethyl Phthalate (1,2-Benzene dicarboxylic acid, monobutyl ester) and Dibutyl Phthalate were characterized using NIST database search. In order to study the in vivo immunostimulant influence of the compounds, the crude extracts (ICE) and purified fractions (ICF) were incorporated to the artificial diets at the concentration of 400 mg kg\(^{-1}\) and fed to the ornamental gold fish Carassius auratus for 30 days. After termination of feeding experiment, they were challenged with highly virulent A. hydrophila AHV-1 which was isolated from infected gold fish and studied the survival, specific bacterial load reduction, serum biochemistry, haematology, immunology and histological parameters. The control diet fed fishes succumbed to death within five days at 100% mortality whereas ICE and ICF fed groups survived 60 and 80% respectively after 10 days. The diets also helped to decrease the Aeromonas load after challenge and significantly \((P \leq 0.01)\) improved the serum albumin, globulin and protein. The diets also helped to increase the RBC and haemoglobin level significantly \((P \leq 0.05)\) from the control group. Surprisingly the immunological parameters like phagocytic activity, serum bactericidal activity and lysozyme activity were significantly increased \((P \leq 0.001)\) in the experimental diets. Macrophages and erythrocytes were abundantly expressed in the treated groups and the present work concluded that, the Phthalate derivatives from I. coccinea helps to stimulate the immune system against A. hydrophila challenge in C. auratus.[Paulraj Anusha, Vijayaragavan Thangaviji, Subramanian Velmurugan, Mariavinct Michaelbabu and Thavasimuthu Citarasu* (Centre for Marine Science and Technology, Manonmaniam Sundaranar University, Rajakkamangalam, Kanyakumari, 629502 Tamilnadu, India), *Fish & Shellfish Immunology, 2014, 36(2), 485–493].

NPARR 5(4), 2014-0356 Isolation and molecular recognition of 6-prenyl apigenin towards MAO-A as the active principle of seeds of Achyranthes aspera

The present study was undertaken to isolate the bioactive flavonoid compound from the seeds of Achyranthes aspera and establish its molecular interaction towards monoamine oxidase-A enzyme. The structure of the isolated flavonoid was ascertained by UV, \(^1\)H NMR, \(^13\)C NMR, DEPT 90, DEPT 135 and ESI-MS. Molecular level interaction was studied through molecular docking simulation carried out with AutoDock 4.2 in the catalytic portion of MAO-A. 5, 7-dihydroxy-2-(4-hydroxyphenyl)-6-(3-methylbut-2-en-1-yl)-6\(^H\)-chromen-4-one was isolated by chromatographic techniques. The docking study revealed that the structure of the isolated flavonoid showed to be a potent monoamine oxidase-A inhibitor with a docking score of −8.06 and calculated inhibition constant of about 1.23 µM.

On the basis of molecular docking study, we propose that isolated flavonoid can successfully dock into the inhibitor-binding pocket of human monoamine oxidase-A isoform with appreciable predicted affinity. The results therefore suggest that 6-prenyl apigenin can be a promising lead for developing novel monoamine oxidase-A inhibitors [Shoban Janet Beula, V. Bhaskar Anada Raj and Bijo Mathew* (Division of drug design and Medicinal chemistry research lab, Department of Pharmaceutical Chemistry, Grace College of Pharmacy, 678004 Palakkad, Kerala, India), *Biomedicine & Preventive Nutrition, 2014, 4(3), 379-382].