A197 Bio-transformed flavonoids and their antimicrobial activity

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Chrysoeriol-7-O-β-D-(3´´-*E*-*p*-coumaroyl)-glucopyranoside and chrysoeriol-7-[6´´´-O-acetyl-*β*-D-allosyl-(1→2)-*β*-D-glucopyranoside] were previously isolated from the aerial parts of two greek endemic plants: *Stachys swainsonii* ssp. *argolica* (Boiss.) Phitos and Damboldt and *Stachys swainsonii* ssp. *swainsonii*, respectively (1, 2). In order to change the hydrophobic/hydrophilic balance of these flavonoids the enzymatic esterification of each compound was performed with vinyl-laurate using immobilized *Candida antarctica* lipase (Novozyme) in anhydrous *tert*-butanol at 55ºC. The enzymatic acylation was followed by measuring the formation of flavonoids-esters by reversed-phase HPLC. The mixture of each natural flavonoid and its derivative was separated by prep. TLC. The antibacterial activity of the natural products as well as of their derivatives was evaluated against two Gram-positive strains: *Staphylococcus aureus* ATCC 25923 and *Bacillus subtilis* BBL 12084, and two Gram-negative strains: *Escherichia coli* ATCC 35218 and *Pseudomonas aeuroginosa* ATCC 27853, using the dilution method (3). According to the results, the derivatives show an enhanced antibacterial activity probably due to their higher lipophilicity compared to the isolated compounds.

References: 1. Persson, D. (1981) Biosystematics of *Stachys swainsonii* Benth. (Lamiaceae) and its relations to some other chasmophytic *Stachys species*. Ph.D. thesis. University of Lund, Lund, Sweden. **2.** Georgakopoulos, P. (2001) Chemosystematic investigation of the group of *Stachys swainsoni* Benth. (Lamiaceae) based on flavonoids. Ms. S., University of Athens, Athens, Greece. **3.** Janssen, A.M. et al. (1987) Planta Med., 53 (5): 395-398.

A198 Enzymic production of acidic xylo-oligosaccharides with antimicrobial activity

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Neutral and acidic oligosaccharides were obtained from Birchwood xylan (commercial product by Sigma Chemical Co.) by treatment with a *Thermoascus aurantiacus* family 10 and a *Sporotrichum thermophile* family 11 endoxylanases. The main difference between the products liberated by xylanases of family 10 and 11 concerned the length of the products containing 4-*O*-methyl-D-glucuronic acid. The xylanase from *T. aurantiacus* liberate from glucuronoxylan an aldotetrauronic acid as the shortest acidic fragment in contrast with the enzyme from *S. thermophile* which liberated an aldopentauronic acid. Acidic xylooligosaccharides were separated from the hydrolysate by anion-exchange and size-exclusion chromatography (SEC) and the primary structure was determined by ^{13}C NMR spectroscopy.

The compounds were tested against *Helicobacter pylori*. Ten randomly selected clinical strains from gastric biopsies and one reference strain (ATCC 43504) were used for this study. The HP of approximately 5 x 10^5 CFU were inoculated into brain-heart infusion broth (bioMerieux 51009) and the tests were performed on 96-well dishes cultured microaerobically for 3 days at 37ºC in an anaerobic jar. The MIC was taken as the lowest concentration of each compound that inhibited visible growth. One of the tested compounds proved to have a moderate activity.