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Abstract

Octyl and dodecyl glycosides possessing 2-deoxy-arabino-hexopyranoside moieties belonging to the D-and L-series in their alpha- and beta-forms were synthesized by reaction of an acetyl protected glycal with octanol or dodecanol, catalyzed by triphenylphosphine hydrobromide, followed by deprotection. Their surface properties were studied and discussed in terms of the adsorption and aggregation parameters, pC(20), CMC, and gamma(CMC). The antimicrobial activities were assessed using the paper disk diffusion and broth dilution methods. Both the octyl and dodecyl 2-deoxy beta-D-glycosides inhibited significantly Enterococcus faecalis, a microbe also highly susceptible to dodecyl 2,6-dideoxy-alpha-L-arabino-hexopyranoside. This compound was particularly active against Bacillus cereus and Bacillus subtilis, presenting for both Bacillus species a minimal inhibitory concentration of the same order of magnitude and a minimal lethal concentration even smaller than that obtained for chloramphenicol, a bioactivity which remained unaltered after 1 year solution storage at 4 degrees C. In addition, activity over Listeria monocytogenes was also observed. Direct cytotoxicity and genotoxicity of the glycosides were determined by proliferative index (mitotic index) evaluation in peripheral human lymphocytes of healthy donors. All compounds induced acute toxicity effects, and the response was dose dependent for the alpha-anomer of both the alkyl 2-deoxy-arabino-hexopyranosides and for the corresponding dodecyl beta-anomer, what suggests that non-toxic but still bioactive concentrations may be found for these compounds.

Keywords: behavior; deoxy glycosides; synthesis; surface properties; antimicrobial activity; cytotoxicity