279: Biological Activity of Diosgenyl 2-Amino-2-Deoxy-β-D-Glucopyranoside Hydrochloride and its *N,N*-Dialkyl Derivatives

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Diosgenyl glycosides are steroid saponins isolated from a variety of plants, for example *Costus*, *Dioscorea*, *Paris*, *Solanum*, *Trillium*, *Yucca*. Some of them exhibit a wide spectrum of biological activities including antifungal, antibacterial and anticancer properties. The carbohydrate residue is covalently attached to the diosgenin backbone. Usually, in natural diosgenyl glycosides the first sugar connected to diosgenin is β-D-glucopyranose.

We have synthesized a diosgenyl glycosides containing D-glucosamine derivatives as a carbohydrate residue. Some of them were tested for their antifungal and antibacterial activity. (Fig. 1)

Antimicrobial activity against reference strains of bacteria and fungi (*Bacillus subtilis* ATCC 6633, *Enterococcus faecalis* ATCC 29212, *Rhodococcus equi* ATCC 6939, *Staphylococcus aureus* ATCC 25923, *Staphylococcus epidermidis* PCM 2118, *Escherichia coli* ATCC 25922, *Klebsiella pneumoniae* ATCC 700603, *Proteus mirabilis* PCM 543 *Proteus vulgaris* PCM 2668 i *Pseudomonas aeruginosa* ATCC 9027; *Candida albicans* ATCC 10231, *Candida tropicalis* PCM 2681, *Candida lipolytica* PCM 2680, *Aspergillus niger* ATCC 16404) was studied.

Gram negative bacteria turned out to be resistant to the compounds at tested concentrations (0.5−1,024 mg/L), while the growth of gram positive strains and fungi was inhibited at concentrations 0.5−128 mg/L. Strains of *Candida sp*. were the most susceptible to saponins. Therefore MIC assay was performed for clinical isolates (*C. glabrata, C. krusei, C. tropicalis, C. parapsilosis*). The test was carried out also for conventional antifungal agents (amphotericin B, clotrimazole, fluconazole, itraconazole, natamycin, nystatin).

Among clinical strains of *C. krusei* and *C. tropicalis* we have identified numerous isolates resistant to tested compounds at applied concentrations (0.025−512 μg/mL). The saponins presented very strong activity towards clinical isolates of *C. glabrata* and *C. parapsilosis* comparable or stronger than conventional antimicrobials.

Afterwards the most active compounds were tested according to their hemolytic activity. Obtained glycosides were did not exhibit hemolytic activity towards human erythrocytes while applied at their microbiogically active concentrations. Results of presented study suggest potential application of saponins as future antifungal agents.

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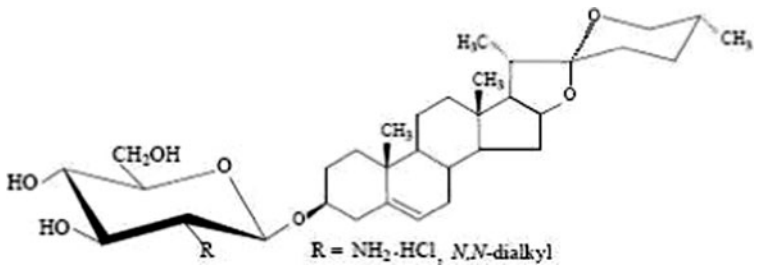

Fig. 1