Synthetic 3-Arylideneflavanones as Inhibitors of the Initial Stages of Biofilm Formation by *Staphylococcus aureus* and *Enterococcus faecalis*

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The antimicrobial activity of twenty two synthetic flavonoids is reported. Among them three 3-arylideneflavanones, **2b**, **2c**, and **2i**, were shown to be highly active against *Staphylococcus aureus*, *S. epidermidis*, and *Enterococcus faecalis* reference strains, with MIC (minimal inhibitory concentration) values ranging from 4.68 μg/ml (14.3 μM) to 37.5 μg/ml (119.7 μM). The synergy of oxacillin and vancomycin with **2c**, evaluated as fractional inhibitory concentration index (FICI) was shown (against planktonic culture of *S. aureus* A3 and *E. faecium* 138/09 clinical strains). The presence of **2c** in the culture medium diminished the initial adhesion of bacteria to an abiotic surface. Such an effect resulted in a decrease in biofilm formation during prolonged culture. Unfortunately, **2c** failed to eradicate the *S. aureus* mature biofilm which was already preformed, however, decreased the number of live biofilm cells. The biofilm of *E. faecalis* was more susceptible to the action of 3-arylideneflavanone **2c** than the *S. aureus* biofilm. The finding that 3-arylideneflavanones are lipophilic, cause bacterial aggregation, and influence the integrity of membranes making them permeable to SYTO 9/propidium iodide dyes may implicate the cytoplasmic membrane as a target site for these compounds activity.

Key words: 3-Arylideneflavanones, Biofilm, *Staphylococcus*, *Enterococcus*