

ABSTRACT

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Title of Diploma thesis: Biofilms and human body

Subtitle: The occurrence of biofilm producers on central venous catheters and the effect of xanthohumol on the biofilm of selected clinical isolates

Background: The aim of the work was to show the frequency of appearance of biofilm on the catheters, which leads to serious health complications. In the second part of the thesis we investigated the biofilm resistance of common biofilm agents such as *Staphylococcus aureus* and *Enterococcus faecalis* to natural substances, namely xanthohumol.

Methods: Part of the thesis which monitors the occurrence of biofilm producers on catheters was processed using tables and charts in Microsoft Excel. To testing xanthohumol were used laboratory techniques such biofilm staining with crystal violet in microtiter plate, the minimal inhibitory concentrations of xanthohumol were determined using the broth microdilution method, the minimal bactericidal concentrations were determined on Columbia blood agar, inhibition of bacterial release from biofilm was monitored in microtiter plates with xanthohumol using a twofold dilution system.

Results: During the monitored five years the number of biofilm producers on catheters decreases. We also monitor the decreasing diversity of microorganisms capable of forming biofilm. The most common producer on central venous catheters is *Staphylococcus aureus*. Xanthohumol inhibits the growth of planktonic bacteria and the release of planktonic bacteria from biofilm. The concentration influencing the biofilm is higher than the concentration suppressing planktonic bacteria. Enterococci exhibit higher unpredictability than staphylococci under the influence of xanthohumol.

Conclusions: Bacteria producing biofilms are a frequent complication of human health, however, it seems that improving health care is successful in suppressing the occurrence of these complications. Xanthohumol inhibits the growth of pathogenic microorganisms at low concentrations. At higher concentrations it affects the release of bacteria from the biofilm, which can reduce the spread of pathogens in the organism.