

**11th Central European Congress on
Food and Nutrition**

CEFood Congress Book

“Food, technology and nutrition for
healthy people in a healthy environment“

Editors:

Peter Raspor, Irena Vovk, Andrej Ovca, Sonja
Smole Možina, Bojan Butinar, Mojca Jevšnik

Ljubljana, 2022

11th Central European Congress on Food and Nutrition
"Food, technology and nutrition for healthy people in a healthy environment"

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ADHESION OF BACTERIA *ESCHERICHIA COLI*, *PSEUDOMONAS AERUGINOSA*, *STAPHYLOCOCCUS AUREUS* AND YEAST *PICHIA MEMBRANIFACIENS* TO WOODEN SURFACES

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Microbial adhesion and biofilm formation on wooden surfaces is present in many different environments. In the food industry, biofilms can be a source of contaminations, causing food spoilage and reducing quality of products. Therefore, the aim of this study was to evaluate the potential of bacteria *Escherichia coli* ATCC 35218, *Pseudomonas aeruginosa* ATCC 27853, *Staphylococcus aureus* ATCC 25923 and yeast *Pichia membranifaciens* ZIM 2417 to adhere to wooden surfaces such as poplar (*Populus sp.*), Norway spruce (*Picea abies*), European beech (*Fagus sylvatica*) as well as European beech coated with commercial Belinka oil food contact and disinfectant P3-oxonia active 150. In order to better define the factors that could influence the adhesion of bacteria and yeast to European beech surfaces, temperature (10°C, 20°C, 27°C/37°C) and relative humidity (RH; 65%, 75%, 85%, 98%) were also examined. Adhesion was determined by the number of colony-forming units per mm² of sample (CFU/mm²). The results showed that gram-negative bacteria *E. coli* and *P. aeruginosa* exhibited a much better ability for adherence to wooden surfaces than gram-positive bacteria *S. aureus* and yeast *P. membranifaciens*. It was evident that adhesion of *S. aureus* and *P. membranifaciens* was lower on spruce compared to poplar and beech, indicating that this wooden species possesses substantially better hygienic characteristics. In addition, noteworthy is the fact that a drastic decrease in the number of adhered cells for *E. coli*, *S. aureus* and *P. membranifaciens* became apparent when the beech wood surfaces were coated with oil and disinfectant, while in the case of *P. aeruginosa* adhesion was significantly stimulated. Our data also indicated that the lowest relative humidity and temperature had a repressive effects on the adherence of all tested bacteria and yeast, suggesting that these findings offers a great potential applicability in food-processing industry for the purpose of controlling the possibility of biofilm formation.

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