Abstract

Medical devices are often colonized by bacteria which may cause severe infections. The aim of this work was to evaluate biofilm formation by S. maltophilia isolates from device-associated nosocomial infections. The 13 local isolates exhibited different capacities of biofilm formation on hydrophilic and hydrophobic surfaces. All isolates formed strong biofilms in polystyrene microplates, while strong, moderate or weak biofilms were detected in borosilicate (BS) or polypropylene (PP) tubes. The proficiency of biofilm formation was better evaluated by the level of crystal violet staining expressed relative to the final culture density. The microscopic analysis of biofilms formed on glass coverslips revealed the presence of a matrix of exopolysaccharides and microcolonies typical of biofilm architecture. Isolates with increased adhesion to BS showed larger microcolonies. According to our results, twitching correlated well with attachment to the three abiotic surfaces tested, while swimming only showed a slight correlation with biofilm formation on PP. Poor correlation was observed between cell surface hydrophobicity and biofilm formation. One of the highest biofilm-producing isolates adhered to urethral catheters of different materials, and exhibited an increased resistance to oxidative stress, one of the common stresses encountered by bacteria during the infection process due to the immune response.

Keywords

Stenotrophomonas maltophilia, Biofilms, Swimming, Twitching, Hydrophobicity, Stress oxidative.