Biodestruction of polyurethane by Staphylococcus aureus (an investigation by SEM, TEM and FIB)

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An experiment is presented and discussed whose aim is to assess biodestruction of polyurethane, a material commonly used for prosthesis in odontostomatology under the influence of Staphylococcus aureus. Electron microscopy (scanning and transmission) and FIB were used in the investigation. It is established that bacteria realize the adhesion to the polyurethane surface by means of extracellular polymeric substances of polysaccharidic nature, they form microcolonies and the permanent bonding result in a biofilm on a surface of the polymer. The electron and ion microscopy provide detailed information about biofilm characteristics and about the whole process leading to polymer destruction.

Keywords FIB, SEM, EDS, polyurethane, biodestruction, S. aureus, odontostomatology, biofilm