Comparison of the Antimicrobial Effects of Eugenol, Indol-3-Carbinol and Carvone with Triclosan

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Today, one of the major public health problems in the world, Europe and Slovenia represent hospital-acquired infections. We are struggling against them with increased hand-hygiene and with the use of biocides, which can have dangerous side effects for both; patients and healthcare workers. The active antimicrobial surfaces which are currently in use are not effective against all microorganisms and have other deficiencies. In order to effectively combat the development of microbes that develop resistance to antibiotics, new biocide solutions are required. In the research, we were trying to find a less dangerous alternative, which were representing three natural substances, eugenol, indole-3-carbinol and carvone. We compared their antimicrobial and antioxidant with currently, in healthcare, widely used biocide, triclosan. We found out that eugenol has a comparable antimicrobial efficiency as triclosan, in addtion it is an extremely potent antioxidant. We studied the efficiency of two concentrations of eugenol, namely 0,5% and 5% (individually and in a mixture with carvone and indole-3-carbinol), and found out that eugenol could, yet in 0,5%, present an effective antimicrobial protection on stainless steel surfaces, as well as increase the antimicrobial effect of copper. Due to the intense smell of eugenol and its enzyme inhibition capabilities, we propose that it is considered as an antimicrobial agent in the form of an appropiate polymer application, which will prevent direct contact with a patient/health care worker, and at the same time disable the growth and reproduction of microorganisms.

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