

TITLE: Biocide-tolerant coagulase positive staphylococci in Brazilian artisanal cheeses

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ABSTRACT:

Biocides with disinfectant and antiseptic activity are widely used in the prevention and control of the spread of pathogens in diverse environmental conditions. A concern about the extensive use of biocides is that it may promote selective pressure contributing to the emergence of susceptibility to biocides and potentially to cross-resistance between biocides and antibiotics. Selective pressure may still further promote co-resistance between these antimicrobial compounds, since plasmids having genes coding for Multi Drug Resistance (MDR) efflux pumps often carry other determinants of antibiotic resistance. Genes of the MDR complex are located in plasmids, so that horizontal transfer of these determinants between microorganisms can occur. The objective of this work was to determine the tolerance to biocides in coagulase positive staphylococci isolated from handmade cheese and to analyze the efflux mechanisms of tolerance. The tolerability phenotype profiles were analyzed by determining the Minimum Inhibitory Concentrations (MIC) for benzalkonium chloride, cetrimide, hexadecylpyridinium chloride, triclosan, chlorhexidine and hexachlorophene using the broth microdilution method in microtiter plates. The genotypic profiles were determined by PCR for the MDR efflux complex genes *qacA / B* and *smr* (*qacC*). Most Staphylococci tolerant biocides (53.5%) tolerated benzalkonium chloride, 25% tolerated hexadecylpyridinium chloride, 17.8% hexachlorophene and 7% was tolerant to chlorhexidine. One isolate presented double resistance to benzalkonium chloride and hexachlorophene. All biocidal tolerant isolates were positive for the efflux pump gene, and positivity for genes *smr* and *qacA / B* were 60.7% and 21.5% respectively. 17.8% of the strains were positive for both genes. Reduced susceptibility of staphylococci to biocides is a serious public health concern as it may be contributing to an increased risk of prevalence and resistance to antibiotics in the food chain.

Keywords: biocide-tolerant, staphylococci, artisanal cheese, efflux pumps

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