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Biocide susceptibility in Staphylococcus aureus CC1 and CC1660

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Human (n=64) and equine (n=29) *Staphylococcus aureus* isolates of the clonal complexes 1 and 1660 were investigated for their phenotypic biocide susceptibility, biocide resistance genes and efflux capacity. Broth microdilution was performed for benzalkonium chloride (BAC), octenidine, polyhexanide and chlorhexidine. Whole genome sequences were screened for *qac* genes, which were confirmed by PCR in 26 isolates. Increased efflux activity was determined by evaluating fluorescence emitted by ethidium bromide accumulated in the cells. For this, cartwheel assays were performed for the *qac* positive isolates and one *qac* negative control. Real time fluorometry was performed for eight isolates. Two control strains were included in both assays. Biocide susceptibility testing revealed unimodal distributions. For BAC, minimum inhibitory concentrations (MICs) of 1.25-5µg/mL were detected. Of the 24 isolates with a BAC MIC of 5 19 carried *qacA*, four *qacC* and one *qacC* S99L. Two of the 19 isolates with a MIC of 2.5 were *qacC* positive. The cartwheel assays showed increased efflux activity in 18 *qacA* and all seven *qacC* positive isolates. Real time fluorometry confirmed this for the selected isolates. Within the *qacC* positive isolates, the isolate carrying the *qacC* mutation S99L showed lower efflux activity for both methods. To investigate the effect of the efflux activity on the isolates' BAC susceptibility, susceptibility testing with efflux inhibitors will be performed.

Keywords

Biocide susceptibility, Efflux, Staphylococcus aureus

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Yes, I am a Junior Scientist.

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