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Carvacrol, a component of essential oils, present a strong antimicrobial activity against CoNS planktonic and biofilm cells

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Coagulase-negative staphylococci (CoNS) are a group of bacteria that inhabit healthy human skin and mucosae, and hence, have long been considered non-pathogenic. However CoNS are currently recognized as important etiological agents of healthcare-associated infections, being particularly associated with patients with indwelling medical devices, due to their ability to form biofilms on the surface of such devices. Along with the overuse of antibiotics that resulted in a dramatic increase in resistant bacteria, CoNS bacteria within biofilms are intrinsically more tolerant to antimicrobial agents than their planktonic counterparts. As a consequence, biofilms are frequently associated with the development of persistent infections. Hence, the search for new prophylactic and therapeutic strategies for the management of CoNS biofilm-associated infections is essential. Herein, we studied the susceptibility of CoNS planktonic and biofilms cells to carvacrol, one of the most common components of essential oils found in aromatic plants. Carvacrol showed a significant effect on the viability of both planktonic and biofilm cells even after a short period of interaction. Low concentrations of carvacrol, such as 2 μM , were sufficient to reduce up to 3 Log_{10} of the initial challenge. Importantly, the antimicrobial effect of carvacrol on CoNS planktonic cells was greater than the one observed with vancomycin, one of the most frequently used antibiotics to treat staphylococcal infections. Overall, these results showed that carvacrol is a potential antimicrobial agent, which may be used in the future for the prevention and/or treatment of CoNS-associated infections.