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Assessment of the antibacterial activity of tea tree oil using the European EN 1276 and EN 12054 standard suspension tests.

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The activity of tea tree oil (TTO) and TTO-containing products was investigated according to the EN 1276 and EN 12054 European suspension methods. The activity of different concentrations of TTO, a hygienic skin wash (HSW), an alcoholic hygienic skin wash (AHSW) and an alcoholic hand rub (AHR) was investigated. These formulations were assessed in perfect conditions with the EN 12054 test, and in perfect conditions as well as in the presence of interfering substances with the EN 1276 test, against Staphylococcus aureus, Acinetobacter baumannii, Escherichia coli and Pseudomonas aeruginosa. With the latter test, the activity of the same formulations without TTO was also assessed as a control. With the EN 1276 test, the AHR achieved a >10(5)-fold reduction against all four test organisms within a 1-min contact time. The AHSW achieved a >or=10(5)-fold reduction against A. baumannii after a 1-min contact time and against S. aureus, E. coli and P. aeruginosa after a 5-min contact time. The efficacy of TTO appeared to be dependent on the formulation and the concentration tested, the concentration of interfering substances and, lastly, the organism tested. Nevertheless, 5% TTO achieved a >10(4)-fold reduction in P. aeruginosa cell numbers after a 5-min contact time in perfect conditions. TTO (5%) in 0.001% Tween 80 was significantly more active against E. coli and P. aeruginosa than against S. aureus and A. baumannii. With the EN 12054 test, after a 1-min contact time, 5% TTO in 0.001% Tween 80 and the AHSW achieved a >10(4)-fold reduction in E. coli and A. baumannii cell numbers, respectively, and the AHR achieved a >4 log10 reduction against all organisms tested. The formulations used in this study are now being tested using a novel ex vivo method as well as the in vivo European standard handwashing method EN 1499.

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