

## Abstract

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**Title:** Evaluation of antimicrobial effectiveness of new quaternary ammonium salt compounds

**Diploma thesis**

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**Study program:** Pharmacy

**Background:** The aim of the work was to evaluate antimicrobial activity of newly proposed and prepared quaternary ammonium salts.

**Methods:** Broth microdilution method was used to measure antimicrobial activity of 8 new substances divided into three structure groups on 8 bacteria strains: *Staphylococcus aureus*, methicillin-resistant *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Escherichia coli*, *Yersinia bercovieri*, *Klebsiella pneumoniae*, *Klebsiella pneumoniae* ESBL positive and multiresistant *Pseudomonas aeruginosa*.

**Results:** Out of the 3 structure groups, the highest antimicrobial potential was found with some methylmorpholine salts and benzylimidazole substituted salts. Generally, the substances were, as supposed, more efficient with the Gram-positive bacteria tribes than with the Gram-negative ones. No bactericidal effect of these substances in the concentration measured was found on the strain of multiresistant *Pseudomonas aeruginosa*.

**Conclusions:** The Gram-positive strains tested are more sensitive towards the tested substances than the Gram-negative ones. In comparison with some commercially introduced standards of benzalkonium salt types, no substances showed a higher efficacy over the whole range of the evaluated bacteria. However, with some individual bacterial strains, some substances show a comparable or even higher efficacy in comparison with the standards mentioned. Therefore, the substances could extend the disinfectant portfolio and be used as a potential suitable substitute in cases of acquired resistance to currently used substances.

**Key words:** antimicrobial efficacy testing, microdilution broth method, minimum inhibitory concentration, minimum bactericidal concentration, quaternary ammonium salts