

## Summary

Car air conditioning provides travel comfort, reduces fatigue and improves concentration, but it can be harmful to the human body. If it is not regularly disinfected, unwanted bacteria and fungi get into the cabin along with the air, producing an unpleasant odor. Desinfection fights unwanted microbes and can be carried out in several ways: with an aerosol, an ultrasonic device, an ozone generator or a fumigator.

Fumigation disinfection consists in fogging rooms with a micro-spray mist containing a disinfecting preparation using a mobile fumigation device. Due to its safety and high efficiency, fumigation is widely used in various areas, both medical and non-medical. The most common fumigation products are peracetic acid, hydrogen peroxide and didecyldimethylammonium chloride.

The aim of this study was to assess the antimicrobial effect of medical air disinfectants in new areas of application, such as car cabin surfaces; comparison of the effectiveness of the three agents in the gas phase towards microorganisms on the surfaces of car cabins; testing the effect of disinfectants on microbiological contamination of the air flowing from the car air conditioning system; comparison of the effectiveness of the action of three agents towards microorganisms in the air flowing out of the car air conditioning system.

The study was conducted on 34 air-conditioned vehicles. The vehicles were randomly selected and tested during the summer periods of 2018-2020 in Białystok.

The obtained results were statistically analyzed using non-parametric Wilcoxon tests to compare the microbial contamination of the air before and after disinfection. The Kruskal-Wallis analysis of variance and a post-hoc test were used to compare the effectiveness of three disinfectants.

Our research confirmed the effectiveness of disinfecting car cabins with peracetic acid stabilized with hydrogen peroxide applied with a fumigator and a mixture of didecyldimethylammonium chloride, 2-phenoxyethanol in combination with cinnamaldehyde applied with an atomizer. The preparation based on peracetic acid is an effective disinfectant, but requires the use of a specialized device, is corrosive to metal surfaces and leaves an intense vinegar smell. The preparation based on didecyldimethylammonium chloride with the addition of cinnamaldehyde is also effective and has the additional advantage of not requiring additional spraying devices. Also, it leaves a cinnamon smell.

The obtained results allow for their applicability. MEDILAB Sp. z o.o will introduce a new area of application of the disinfectant preparation by air based on

didecyldimethylammonium chloride with the addition of cinnamaldehyde. A new area of its application will be the disinfection of air flowing from car air-conditioning systems and cabin surfaces.