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# Investigation of antifungal activity of new *N*-mono- and *N,N*-dialkylated imidazole derivatives

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## Abstract

One of the actual problems of modern organic chemistry is the development of experimental methods that allow carrying out the directed synthesis of certain structures and clusters with required biological activity. For example, there is the regioselective *N*-alkylation of imidazole derivatives. This kind of reactions helps to obtain the compounds with expressed fungicidal and bactericidal effects. Previously, we have described the synthesis of *N*-mono- and *N,N*-dialkylated derivatives of 2-methyl-, 2-ethyl- and 4-nitro-imidazoles based on (adamantyl-1)bromometylketone. Additionally, the results of elemental analysis of above-mentioned *N*-mono- and *N,N*-dialkylated imidazole derivatives were presented in this article.

The main goal of this investigation was to study the antifungal activity of the received compounds on the *Aspergillus* soil molds. The experiment was carried out in Sabouraud medium by using disc-diffusion method. Clotrimazole®, Ketoconazole®, and Miconazole® were used as comparison standards. The disc-diffusion method was selected as a test of the antibiotic sensitivity of fungi.

Biological investigations have identified 6 compounds with expressed antifungal properties. 1-(Adamantoyl-1)methyl-2-methylimidazole, 1-(adamantoyl-1)methyl-2-ethyl-imidazole and 1-(adamantoyl-1)methyl-4-nitroimi-dazole, as well as 1,3-bis[(adamantoyl-1)methyl]-2-methylimidazolium bromide, 1,3-bis[(adamantoyl-1)methyl]-2-ethylimida-zolium bromide and 1,3-bis[(adamantoyl-1)methyl]-4-nitroimidazolium bromide showed a fungicidal effect comparable to antifungal drugs Clotrimazole® Ketoconazole® and Miconazole®. This activity was demonstrated by measuring the diameters of the lysis zones around the disks with these compounds.

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