

# Abstract

Charles University in Prague, Faculty of Pharmacy in Hradec Králové

Department of Biological and Medical Sciences

Title of thesis: Evaluation of activity of potential antimycotic substances through the use of microdilution broth method III

Autor of thesis: Alena Zavřelová

Supervisor: Mgr. Klára Konečná, Ph.D.

**Background:** The aim of this thesis, due to the growing incidence of fungal diseases and the growing incidence of resistance, was to determine the activity of potentially antimycotic active substances. We tested newly synthesized compounds, structurally based on the substance of pyrazinamide which is significant antituberculous.

**Methods:** Testing of substances was carried out using a broth microdilution method on eight strains of pathogenic fungi consisting of five yeast strains: *Candida albicans*, *Candida tropicalis*, *Candida krusei*, *Candida glabrata*, *Trichosporon asahii* and three strains of filamentous fungi: *Aspergillus fumigatus*, *Absidia corymbifera*, *Trichophyton mentagrophytes*.

**Results:** From the range of tested concentrations and from the total number of the thirty tested substances, the most noticeable antifungal activity was revealed in the substance of 5-methyl-6-(2-phenylhydrazinyl)pyrazine-2,3-dicarbonitrile. All strains, except *Trichophyton mentagrophytes* strain, showed a relatively promising sensitivity to the tested substances. Generally, the most sensitive strain was *Candida krusei* strain, in that the MIC (minimum inhibitory concentration) values of 3,9 µmol/l after 24 hours and 7,81 µmol/l after 48 hours of incubation were achieved.

**Conclusion:** Derivates of pyrazine-2-carboxamide and derivates of pyrazine-2,3-dicarbonitrile, especially 5-methyl-6-(2-phenylhydrazinyl)pyrazine-2,3-dicarbonitrile, seems to be very promising group of substances. Within our screening testing the antifungal activity of these compounds was revealed and at least for this reason these substances deserve to be the subject of further research.

Key words: fungal infections, antifungal agents, resistance, minimal inhibitory concentration, microdilution broth method