

# Effectiveness of selected disinfectants on *Malassezia pachydermatis*

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## Abstract

The present study investigated the effectiveness of three different disinfectants: preparation H1 (two-component preparation based on hydrogen peroxide); Padox (multi-component preparation based on peroxyacetic acid) and Savo hypochlorite preparation) against *Malassezia pachydermatis*. The antifungal activity of disinfectants was tested by quantitative suspension method according to STN EN 1650. The results confirmed 100% effectiveness of these disinfectants at all concentrations and exposure times tested.

**Key words:** *Malassezia pachydermatis*, disinfection, disinfectants

## Introduction

*Malassezia (M.) pachydermatis* is a commensal, lipophylic, basidiomycete of ovoid or ellipsoid shape with thick wall, without formation of pseudomycelium (Mason and Evans 1991). The effective therapy of malassezia, minimizing risk of recurrence, is based on both selection of suitable antimycotic and decontamination of the environment by suitable disinfectants. Increasing interest has been raised recently by the mixture of hydrogen peroxide and peracetic acid being considered harmless to the environment. Chlorine preparations which belong to the group of oxidants also show a very good disinfectant effect (Rodgers et al. 2001).

The aim of the study was to compare and evaluate effectiveness of three commercial preparations which, according to manufacturers, are sufficiently effective against microscopic fungi and yeasts including the yeast *M. pachydermatis*.

## Material and Methods

The antifungal activity of disinfectants was tested by the standard method STN EN 1650 (2008). Three disinfectants were tested: H1 (two-component preparation, based on hydrogen peroxide, at concentrations 100%, 10% and 5%); Padox (multi-component preparation based on peracetic acid, at concentrations 3%, 1% and 0.5%) and Savo (hypochlorite preparation, at concentrations 100%, 50% and 10%).

The effectiveness of disinfectants was tested on 10 isolates of *M. pachydermatis*, obtained from animals with confirmed mycotic infection, and on reference strain *M. pachydermatis* 1879 (CBS, Utrecht, The Netherlands). The quality control of the testing method was assessed by means of the yeast *Candida albicans* CCM 8215/ATTC 10231 (Czech Collection of Micro-organisms, Brno, Czech Republic). The reference strains were tested in duplicate.

Suspensions containing  $10^6$  CFU/ml of saline solution with 0.1% Tween 80 added were adjusted to the 1.0 (*M. pachydermatis*) or 0.5 (*Candida albicans*) McFarland turbidity standard. These suspensions were used to prepare  $10^6 - 10^1$  CFU/ml dilutions to which individual disinfectants in specified concentrations were added. Dilutions without disinfectants added were used as a negative control. After 5, 10, and 15 min exposure the 0.1 ml aliquots of suspension from each test-tube were inoculated on Sabouraud agar with chloramphenicol (HiMedia Laboratories Pvt. Ltd., Mumbai, India). The plates were incubated for 72 h at 32°C and then compared with the controls.

## Results and Discussion

All the three preparations (H1, Padox and Savo) showed 100% antifungal activity against 10 clinical isolates of *M. pachydermatis*, the standard strain of *M. pachydermatis* (CBS 1879) and *Candida albicans* (ATCC 10231) at each concentration tested.

Only several papers were devoted to the effectiveness of disinfectants on micromycetes (Moriello et al. 2002, Duarte and Hamdan 2006). The antifungal activity of three commercial disinfectants was tested in this study. Padox is a mixture of water, hydrogen peroxide and peracetic acid. It acts more rapidly than hydrogen peroxide and shows bactericidal, sporocidal, virocidal and fungicidal activity (Bernstein 1990, Dostalová 2006). The main advantage of hydrogen peroxide as a disinfectant agent is that it leaves no residues as is decomposed to water and oxygen under the action of enzyme catalase (Ölmez et al. 2009). Hydrogen peroxide, as the principal ingredient of preparation H1, may be effective against a broad spectrum of micro-organisms including bacteria, yeasts, moulds and viruses (Votava et al. 2005) and also against parasites (Laciak et al. 2008). Hypochlorites are the most frequently used forms of active chlorine and among them sodium hypochlorite is used most widely. The manufacturer of Savo states that this preparation is effective against micro-

scopic mycelial fungi, algae and lichens, and it also shows excellent bactericidal effects. The results of this study also confirmed the effectiveness of Savo against *M. pachydermatis*.

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