Short communication

Interactions between Clotrimazole and selected essential oils against *Malassezia pachydermatis* clinical isolates

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Abstract

The aim of this study was to investigate interactions between conventional antifungal drug and essential oils against isolates of *Malassezia pachydermatis*. Antifungal activity of *Cinnamomum cassia*, *Melaleuca alternifolia*, *Mentha piperita*, *Origanum vulgare* and *Syzygium aromaticum* essential oils were tested against 19 strains of *M. pachydermatis* isolated from healthy dogs and reference strain *M. pachydermatis* CBS 1879. The checkerboard assay was used to search for interactions. Synergism was observed for the combination of clotrimazole with *Melaleuca alternifolia* essential oil, *Mentha piperita* and *Origanum vulgare*. The combinations of *Cinnamomum cassia* and *Syzygium aromaticum* essential oils with clotrimazole showed indifferent effect. Additive antimicrobial activity was observed for the combination of clotrimazole with *Syzygium aromaticum* and *Melaleuca alternifolia* essential oils against reference strain. The obtained results showed synergistic interactions between essential oils and clotrimazole which could improve effectiveness of this antifungal drug.

Key words: antmyotic, antifungal, synergism, clotrimazole, essential oil, checkerboard

Introduction

*Malassezia* yeasts are lipophilic microorganisms known for more than a century as part of the natural skin microflora of humans and almost all domestic and wildlife animals. Since the 1980s these yeasts have been considered as potential agents of occasional systemic infections (Boekhout et al. 2010). The most common zoophilous species, often isolated in domestic animals, is *Malassezia pachydermatis*. This yeast is opportunistic and is often associated with inflammation of the external auditory canal and various types of dermatitis in domestic animals (Cabañes 2014). Many types of antymycotic drugs, characterized by different mechanisms of action, are used for treatment of yeast infections. Azole antmyotics are one of the most widely used antifungals in clinical practice. As well as in human medicine, in veterinary medicine fungal diseases may exhibit resistance to classic antmycotics, justifying the search for new alternative therapies and special interest is focused on the use of essential oils. They have a wide range of antifungal properties and are environmentally friendly (biodegradable and do not leave toxic residues) (Abdel-Kader et al. 2011).