



# Photocatalytic antifungal activity against *Candida albicans* by TiO<sub>2</sub> -containing acrylic denture base

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Acrylic dentures are an important predisposing factor for oral candidosis as these appliances, which are usually ill fitting and with suboptimal hygiene, act as reservoirs of infection. It thought that the ability of *C. albicans* to adhere to acrylic surfaces may be important in the pathogenesis of the disease as adherence is apparently the initial step in microbial colonization and subsequent invasion of host surfaces.

Despite the availability of a range of antifungal agents for the treatment of oropharyngeal candidosis, failure of therapy is not uncommon, as the efficacy of treatment is dependent upon many factors. Photocatalytic oxidation on surface of acrylic denture base containing TiO<sub>2</sub> might offer a possible alternative. This research aimed to design a new photoreactor and its application to sterilize selected pathogenic fungi, *Candida albicans*. The photocatalytic reaction was carried out with acrylic denture base containing various TiO<sub>2</sub> concentrations and Ultraviolet A (UVA) illumination time.

The powder of TiO<sub>2</sub> (Degussa P-25, Frankfurt, Germany) was admixed to pre-polymerized beads (VERTEX RS, DENTIMEX, Netherlands) with 0, 0.2, 0.4, 0.6, 0.8, and 1.0% by weight. Then, heat-polymerized acrylic resin sheets (35x35x3mm) were fabricated according to conventional prosthodontic techniques. 0% specimens served as control group to this study. The experiment was carried out transferring washed fungi cell ( $2.2 \times 10^4$  cell/ml) into the Petri dish (DI 90mm) containing 8ml of PBS. The UV lamp which emits Maximum 14 watts at 254 nm was set on the center of pyrex round glass cover and was irradiated to *C. albicans* for 25 min. In the presence of water and oxygen, highly reactive OH-radicals are generated by TiO<sub>2</sub> and mild UVA. Photocatalytic inactivation data was evaluated.