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Effect of Streptococcus salivarius K12 on the in vitro growth of Candida albicans and its protective effect in an oral candidiasis model.

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Abstract

Oral candidiasis is often accompanied by severe inflammation, resulting in a decline in the quality of life of immunosuppressed individuals and elderly people. To develop a new **oral** therapeutic option for **candidiasis**, a nonpathogenic commensal **oral** probiotic microorganism, **Streptococcus salivarius K12**, was evaluated for its ability to modulate **Candida albicans** growth in **vitro**, and its therapeutic activity in an experimental **oral candidiasis model** was tested. In **vitro** inhibition of mycelial **growth** of **C. albicans** was determined by plate assay and fluorescence microscopy. Addition of **S. salivarius K12** to modified RPMI 1640 culture medium inhibited the adherence of **C. albicans** to the plastic petri dish in a dose-dependent manner. Preculture of **S. salivarius K12** potentiated its inhibitory activity for adherence of **C. albicans**. Interestingly, **S. salivarius K12** was not directly fungicidal but appeared to inhibit **Candida** adhesion to the substratum by preferentially binding to hyphae rather than yeast. To determine the potentially anti-infective attributes of **S. salivarius K12** in **oral candidiasis**, the probiotic was administered to mice with orally induced **candidiasis**. **Oral** treatment with **S. salivarius K12** significantly protected the mice from severe **candidiasis**. These findings suggest that **S. salivarius K12** may inhibit the process of invasion of **C. albicans** into mucous surfaces or its adhesion to denture acrylic resins by mechanisms not associated with the antimicrobial activity of the bacteriocin. **S. salivarius K12** may be useful as a probiotic as a **protective** tool for **oral** care, especially with regard to **candidiasis**.

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