

## Antimicrobial Effect of *Lignosus rhinocerus* Extracts Against *Streptococcus mutans*

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### Structured Abstract

**Background:** Dental caries, a widespread dental health problem, is primarily caused by the *Streptococcus mutans*. The prevalence of dental caries remains a worldwide health concern, causing pain and tooth decay. Today's treatment relies mainly on antibiotics, however overuse of antibiotics has contributed to the development of antibiotic-resistant strains of bacteria, causing several common treatments ineffective. This expanding challenge needs the urgent exploration of alternative antimicrobial medicines to facilitate successful prevention of dental caries. This research project investigates the antimicrobial activity of *Lignosus rhinocerus* against *S. mutans*. *L. rhinocerus* or commonly known as tiger milk mushroom is a medicinal mushroom with an extensive tradition of usage in Southeast Asia for its medicinal properties. The purposes of this study were to produce *L. rhinocerus* extracts using water and ethanol, determine the minimum inhibitory concentration (MIC), and evaluate inhibitory activity using the disc diffusion assay.

**Methods:** The extraction involved maceration techniques using solvents (water and ethanol) to obtain the extracts. The MIC was determined by preparing a series of microdilutions of the extracts and adding them to a culture of *S. mutans*. For the disc diffusion assay, paper discs soaked in the extracts were placed on agar plates inoculated with *S. mutans* to measure the inhibition zones.

**Results:** The findings obtained show that both water and ethanol extracts of *L. rhinocerus* have substantial antimicrobial properties. Notably, the ethanol extract (LR-EE) exhibited a higher yield and efficiency than the cold-water extract (LR-CWE). The results from MIC determination revealed that both extracts effectively inhibited *S. mutans* at varying concentration, with LR-EE having a higher percentage inhibition, indicating stronger antimicrobial activity. The disc diffusion testing confirmed these findings, with LR-EE producing wider inhibition zones than LR-CWE.

**Conclusion:** These findings emphasise the significance of investigating natural resources with strong antimicrobial properties such as *Lignosus rhinocerus* for medicinal uses, particularly in combating the oral pathogen and the antibiotic-resistant bacteria. Furthermore, this research offers the groundwork for future research on *L. rhinocerus* and its incorporation into oral healthcare products. Future studies should focus on improving extraction techniques and performing clinical trials to evaluate *L. rhinocerus*' effectiveness and safety in dental applications.

**Keywords:** *Lignosus rhinocerus*, MIC, Dental Caries, *Streptococcus mutans*

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