



**FACULTY OF ALLIED HEALTH SCIENCES
UNIVERSITY OF JAFFNA**

**Proceedings of the
6th Undergraduate Research Symposium 2024**

“Optimal Health to Enjoy the Longevity”

05th April 2024

Isolation of *Streptococcus mutans* from dental caries and *in-vitro* assessment of their antibiotic sensitivity pattern

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Introduction: Dental caries, primarily caused by *Streptococcus mutans*, poses a global oral health challenge. Early detection of antibiotic resistance patterns in *Streptococcus mutans* and implementation of effective prophylactic therapy is crucial for the prevention of systemic complications, including infective endocarditis.

Objective: To isolate *Streptococcus mutans* from dental caries in patients attending Dental clinic, Teaching Hospital, Jaffna and to evaluate their antibiotic sensitivity pattern.

Methodology: A study was conducted among 120 patients selected by systematic sampling method from the Dental clinic, Teaching Hospital, Jaffna during September-October 2023. Samples were collected and transported in Brain Heart Infusion broth to the laboratory within 1-2 hours and incubated at 37°C for 24 hours inside the 5-10% CO₂ incubator. Samples were plated on Mitis Salivarius agar with bacitracin 0.2U/mL and 20% sucrose. *Streptococcus mutans* strains were identified based on their characteristic colony morphology compared with standard strain (ATCC 700610) grown on the same medium. Selected colonies were confirmed by Gram staining and biochemical tests. Antibiotic susceptibility test was performed by using Amoxicillin (25µg), Co-amoxiclavulanic acid (30 µg), Erythromycin (15 µg) and Clindamycin (2 µg) by using CLSI guidelines.

Results: Among 109 positive cultures, *Streptococcus mutans* were isolated from 84 (70%) samples. The highest susceptibility was observed for Amoxicillin with a 33.96 ± 6.5 mm mean zone of inhibition followed by Co-amoxiclavulanic acid with a 32.32 ± 5.9 mm mean zone of inhibition. Also in our study, the antibiotic resistance rates for Erythromycin were 21.43% and Clindamycin was 16.67%.

Conclusions: *Streptococcus mutans* is a common pathogen associated with dental caries, with an isolation rate of 70% (84/120) in this study. Amoxicillin can be used as an effective antibacterial drug to treat caries. The findings will provide valuable insights into the microbiology of dental caries, informing preventive and therapeutic strategies.

Keywords: Dental caries, *Streptococcus mutans*, Antibacterial susceptibility test



6th Undergraduate Research Symposium 2024

Faculty of Allied Health Sciences

CERTIFICATE OF AUTHORSHIP

We hereby certify that

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For being the authors for the abstract titled

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presented at the 6th Undergraduate Research Symposium organized by Faculty of Allied Health

Sciences, University of Jaffna

on 05th April 2024

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