

Evaluation of the antibacterial activity of *Camellia sinensis* (green tea) extract against *Streptococcus mutans*.

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Introduction and Objectives: *Streptococcus mutans* is a common oral commensal responsible for dental caries and systemic infections in compromised patients. Green tea (*Camellia sinensis*) is a popular beverage which contains catechins with antibacterial properties. The aim of this study was to evaluate the antibacterial activity of green tea extract against *S. mutans* isolated from dental caries.

Methods: *Camellia sinensis* powder (gun powder 1) was obtained from a tea factory in the Central Province, Sri Lanka. Ethanolic extract of *C. sinensis* was prepared and used to screen the antibacterial activity. A total of 85 isolates of *S. mutans* were used in the study. This included 84 isolates collected from caries lesions of patients attending the dental clinic, Teaching Hospital, Jaffna between September to October 2023 and the standard strain of *S. mutans* (ATCC 700610). There were 18 erythromycin resistant and 14 clindamycin resistant *S. mutans* isolates within the 84 clinical isolates. Erythromycin (15 µg) and distilled water were used as positive and negative controls. The well diffusion method was used to check the antibacterial activity. Accordingly, after inoculation of *S. mutans* onto mitis salivarius agar medium, 9cm wells were cut, loaded with tea extract (2.5 mg/mL) and controls before incubating at 37 °C in a 5-10% CO₂ incubator. The diameter of the zone of inhibition (ZOI) was measured after 24 hours incubation.

Results: Ethanolic green tea extract demonstrated a 13.08% yield and inhibited all 84 clinical isolates with the ZOI diameter ranging from 19±3.2 mm to 32.67±3.2 mm, demonstrating antibacterial potential. The mean ZOI against the standard *S. mutans* strain (ATCC 700610) was 29±0.3 mm. Erythromycin and clindamycin resistant isolates were also inhibited by green tea extract with mean ZOI diameters of 21.92±3.27 mm and 22.12±3.61 mm respectively.

Conclusions: Sri Lankan green tea showed anti-bacterial activity against *S. mutans* including the isolates resistant to erythromycin and clindamycin in-vitro. Hence, the green tea extract could serve as a potential ingredient in the formulation of oral hygiene products after some subsequent investigations.

Keywords: Dental caries, *Streptococcus mutans*, green tea

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