

INHIBITORY EFFECT OF CALCIUM CARBONATE EXTRACT FROM LAYER CHICKEN EGG SHELL WASTE (GALLUS SP.) ON THE GROWTH OF STREPTOCOCCUS MUTANS

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BACKGROUND: Oral and dental health continues to be a major public health concern in Indonesia, particularly among children. Streptococcus mutans, a commensal bacterium of the oral microbiota, plays a pivotal role in the pathogenesis of dental caries and mucosal inflammation. Brushing teeth twice daily with toothpaste containing calcium carbonate has been shown to be effective in preventing these conditions. In toothpaste formulations, calcium carbonate functions as an abrasive agent to remove stains and plaque, while also contributing to the viscosity of the paste. Eggshells, which contain approximately 94% calcium carbonate, represent a potential alternative raw material for toothpaste production. Objective: This study aimed to evaluate the inhibitory effect of calcium carbonate extract derived from layer chicken eggshell waste (Gallus sp.) at concentrations of 12.5%, 15%, 17.5%, and 20% on the growth of Streptococcus mutans.

MATERIALS AND METHOD: A true experimental design was employed, and statistical analysis was performed using Analysis of Variance (ANOVA). A total of 24 samples were analyzed.

RESULTS AND DISCUSSION: The One-Way ANOVA test produced a p-value of 0.000 ($p < 0.05$), indicating a statistically significant difference among the tested concentrations in inhibiting Streptococcus mutans. One of the primary objectives was to reduce eggshell waste, mitigate potential environmental pollution, and promote the principles of zero waste. This research applies the "Recycle" principle by repurposing waste into valuable materials.

CONCLUSION: Calcium carbonate extract from layer chicken eggshell waste effectively inhibits the growth of Streptococcus mutans, with the 20% concentration demonstrating the strongest inhibitory effect.

KEYWORDS: Layer chicken eggshell (Gallus sp.), Streptococcus mutans