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Antioxidant and antimicrobial effects of polyherbal toothpaste against oral pathogens *Porphyromonas gingivalis, Streptococcus mutans,* and *Candida albicans*

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Maintaining oral health is essential for preventing dental plaque, and toothpaste is a primary tool for supporting oral hygiene. Herbal-based toothpaste is considered a safer alternative due to its natural bioactive compounds, which have antimicrobial and antioxidant properties. This study was conducted to assess the antioxidant and antimicrobial activities of a toothpaste formulation containing royal jelly, black cumin, ginger, and cinnamon extracts. Antioxidant activity was assessed using DPPH, ABTS, H_2O_2, and NO scavenging assays, while antimicrobial activity was evaluated by the disk diffusion method against *Porphyromonas gingivalis, Streptococcus mutans,* and *Candida albicans*. The polyherbal toothpaste mix exhibited the highest scavenging activity in the DPPH (50.89%), ABTS (15.71%), NO (33.97%), and H_2O_2 (23.04%) assays, and showed significant antimicrobial activity against three representative oral pathogens at 100% concentration. The polyherbal toothpaste mix demonstrated significant antioxidant and antimicrobial properties, supporting its potential application as a natural dental care product.

Keywords: Antimicrobial, Antioxidant, Herbal, Oral Pathogens, Toothpaste

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