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The impact of *Lacticaseibacillus paracasei* GMNL-143 toothpaste on gingivitis and oral microbiota in adults: a randomized, double-blind, crossover, placebo-controlled trial

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Abstract

Background This study examines the oral health benefits of heat-killed *Lacticaseibacillus paracasei* GMNL-143, particularly its potential in oral microbiota alterations and gingivitis improvement.

Methods We assessed GMNL-143's in vitro interactions with oral pathogens and its ability to prevent pathogen adherence to gingival cells. A randomized, double-blind, crossover clinical trial was performed on gingivitis patients using GMNL-143 toothpaste or placebo for four weeks, followed by a crossover after a washout.

Results GMNL-143 showed coaggregation with oral pathogens in vitro, linked to its surface layer protein. In patients, GMNL-143 toothpaste lowered the gingival index and reduced *Streptococcus mutans* in crevicular fluid. A positive relationship was found between *Aggregatibacter actinomycetemcomitans* and gingival index changes, and a negative one between *Campylobacter* and gingival index changes in plaque.

Conclusion GMNL-143 toothpaste may shift oral bacterial composition towards a healthier state, suggesting its potential in managing mild to moderate gingivitis.

Trial registration ID NCT04190485 (<https://clinicaltrials.gov/>); 09/12/2019, retrospective registration.

Keywords *Lacticaseibacillus paracasei*, Gingivitis, Probiotic toothpaste, Oral microbiota

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