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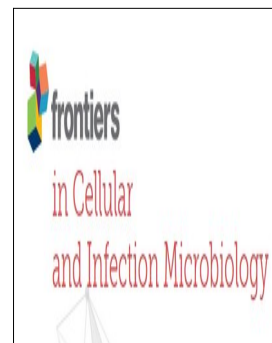
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Title: Impact of probiotic supplementation on salivary function, oral microbiota, and gut health: a systematic review

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Abstract: Introduction – Probiotics, which are classified as helpful living microorganisms, have demonstrated the ability to improve salivary function, inhibit pathogens like *Streptococcus mutans*, and modify the oral and gut microbiota. The aims of this systematic review were to assess their effects on salivary function, oral microbiota, and gut health. Methods – Literature search was done in PubMed, Scopus, Web of Science, Science Direct and Cochrane were performed. Randomized controlled trials were included which involved human subjects receiving probiotic supplementation. Outcomes assessed were salivary parameters (flow rate, buffering capacity, pH, biomarkers), oral microbiota changes, and gut health indicators. Study selection, data extraction, and risk of bias assessment (RoB 2.0) were performed independently by two reviewers. Due to heterogeneity, meta-analysis was not conducted. Results – A total of six systematic reviews were included in this review. Probiotic supplementation was associated with improvements in salivary parameters, including buffering capacity and plaque pH, and reductions in cariogenic bacteria such as *Streptococcus mutans*. Probiotics demonstrated beneficial effects on gut microbiota and gastrointestinal symptoms, supporting an oral–gut microbiota interaction. Risk of bias ranged from low to high across studies. Overall, evidence suggested beneficial effects, though heterogeneity and methodological limitations reduced certainty. Conclusions – Probiotics have been shown to provide modest, strain-specific benefits for modulating the oral microbiota and certain salivary parameters, with more precise molecular and clinical evidence for gut effects.



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