Antimicrobial Synergy Between Cranberry and Manuka Honey Against Dental Caries Bacteria

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INTRODUCTION: Dental caries is caused by dental plaque, which is a community of microorganisms embedded in an extracellular polymer matrix as a biofilm on the tooth surface. Natural products that are widely accessible could be used as an alternative or adjunctive anti-caries therapy. Sometimes, when two products are used together, they yield a more powerful antimicrobial effect than the anticipated additive effect. These synergistic combinations are often better treatment options because individual agents may not have sufficient antimicrobial action to be effective when used alone. Moreover, the use of two agents simultaneously greatly reduces the development of bacterial resistance. Cranberries contain phenolic compounds like anthocyanidins that disrupt biofilm formation by oral bacteria. Manuka honey has high concentrations of bioactive agents like methylglyoxal, which are cariostatic. Because cranberries and manuka honey have varied modes of antimicrobial action, it is important to test them for possible synergistic effects when they are combined into one treatment.

PURPOSE: To determine antibiotic synergy between various bioactive agents in cranberries and Manuka honey against dental caries bacteria *Streptococcus mutans* and thus explore their potential as an alternative to traditional oral health care.

METHODS: Different cranberry extracts, Manuka honey and methylglyoxal were subjected to an agar well-diffusion assay. By comparing the zones of inhibition around the wells with individual extracts and the extracts in combination, the most synergistic combinations were determined. Serial dilutions of these extracts were then added to a 96-well plate in a so-called checkerboard assay. By finding the minimum inhibitory concentrations (MIC) and the fractional inhibitory concentrations (FIC) contributed by each agent, synergy was determined.

RESULTS: Synergy was demonstrated in two of the cranberry extracts tested with methylglyoxal, the bioactive agent in Manuka honey.

CONCLUSION: The synergistic combinations found in this research appear to be good candidates for fighting dental plaque and caries.