

Pour Me Some Polyphenols

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Research Question

Does a diet containing high amounts of polyphenols reduce the amount of caries in adults compared to adults who do not have a diet high in polyphenols?

Abstract

Polyphenols have a positive impact on the overall health of the oral cavity. They can be found in different drinks that are plant-based such as tea, coffee or products containing cocoa. They can be found in plant-based foods like fruits and vegetables. Polyphenols are able to reduce the cariogenic process is what makes them have such an importance in oral health. They play a role in systemic health. The studies provided evidence that polyphenols are able to reduce caries in individuals who are frequently consuming them.

Introduction

- Many different plant-based foods like fruits and vegetables, and beverages such as coffee and tea contain polyphenols.¹
- Since polyphenols are secondary metabolites, they have the ability to have a positive and large impact on systemic health for people who are consuming them often.²
- Some health benefit characteristics that polyphenols can provide are antimicrobial, antibacterial, antioxidant, anti-inflammatory, and antihypertensive.²
- The antibacterial characteristic of polyphenols is the most important because it is what provides the anticariogenic process.³

Review of Literature

- There 5 main groups of polyphenols are flavonoids, phenolic acids, phenolic alcohols, lignans and stilbenes illustrated in Figure 1.⁴
- The flavonoid group was shown to have the main role in preventing dental caries seen in Figure 2.^{3,6}
- *Streptococcus mutans* (S.mutans) and *S. sobrinus* are normally the most abundant bacteria that are found in the mouth contributing to the production of dental caries, but there are other forms of bacteria that are involved as well.³
- Biofilm, acid, *Streptococcus mutans* and *S. sanguinis* were all found in lower amounts from the use of the polyphenols that are in cocoa.³
- Exopolysaccharides (EPS) are a type of bacteria also involved in the biofilm and caries formation process.⁴
- The polyphenols proved to work in a mixed biofilm environment with the bacteria present and the EPS present.⁴
- The flavonoid most important to the dental hygiene field would be flavan-3-ol which is an antibacterial and is most sensitive organism's like *S. mutans* and *P. gingivalis*.²

Figure 1. Groups of Polyphenols

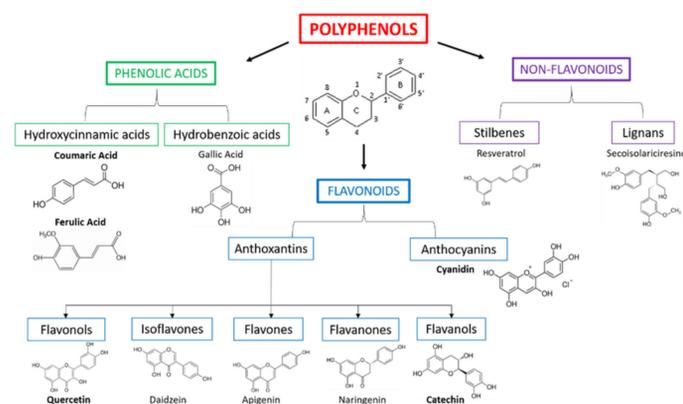


Figure 1: Schematic classification of polyphenols and examples of chemical structures.⁵ From *Foods*.⁵

Discussion

- The antimicrobial, antibacterial, antioxidant, anti-inflammatory, and antihypertensive characteristics that polyphenols are important in the overall systemic health.²
- A person with a diet containing high amounts of polyphenols would have a decreased risk of caries and periodontal disease as opposed to someone who does not include a high amount of polyphenols in their diet.³

Limitations: There is a need to conduct more controlled studies on the discovering the exact amount of polyphenols that is needed to be consumed daily to decrease the risk of caries. There are invitro studies, but there is a need for more studies involving participants.

Figure 2. Polyphenol Tooth Surface

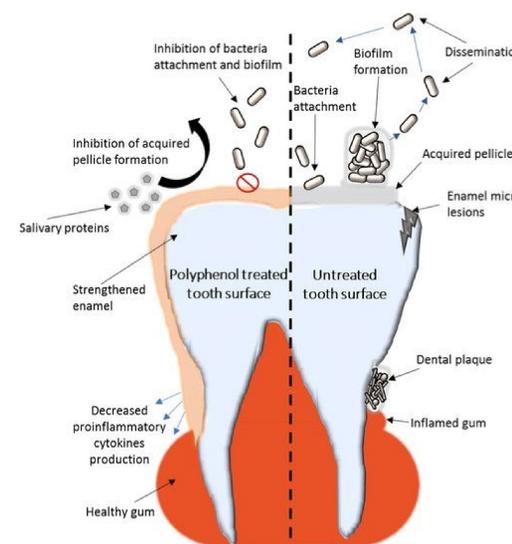


Figure 2: Representation of the known mechanisms of honeybee-derived polyphenols to inhibit dental plaque biofilm formation and dental caries.⁶ From *Antibiotics*.⁶

Conclusion

Evidence suggest that polyphenols are effective in reducing caries, whether it is consumed in food or in medications. All studies show reliable evidence that polyphenols are able to reduce the process of caries formation. They have shown to have antibacterial agents that inhibit carcinogenic bacteria found in biofilm. Knowing the factors that contribute to dental caries is important in understanding how to best take care of our teeth. Understanding that polyphenols help reduce the rate of caries could play an essential role in preventing caries from occurring. Polyphenols can serve as an additional aid in reducing the rate of caries when added to a patient's diet.

References

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