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### Key Words

Caries  
Polyphenol-containing milk  
Dental plaque

## Anti-caries Effect of Polyphenol Containing Milk

### ABSTRACT

**Background.** Dental caries is a multifactorial disease with dental plaque being the most important for this disease. Some polyphenols from green tea were investigated and proved to inhibit dental plaque in vitro and in animal studies, but not in human studies

**Objective.** This study investigated the pH level, plaque quality, and the amount of *Streptococcus mutans* in the mouth after consuming polyphenol-containing milk.

**Materials and Methods.** In this study, the anti-caries effect, plaque weight, pH value and amount of *Streptococcus mutans* of a 0.02% polyphenol containing milk were evaluated after 70 volunteers drank the milk for 4 weeks.

**Results.** The results showed that 0.02% polyphenol-containing milk decreased plaque weight, increased plaque pH values, and reduced the amount of streptococci in the plaque.

**Conclusion.** Drinking 0.02% polyphenol-containing milk demonstrated anticaries effects in this human study. (N. Taipei J. Med. 2002;4:261-266)

### INTRODUCTION

For over 5000 years, tea has been a popular drink among Asians. According to descriptions in traditional Chinese texts, tea is good for digestion, sedation, and refreshment. Recently, several reports have shown that green tea and green tea extracts have antimicrobial effects.

Dental caries is a multifactorial disease. Current understanding supports that the etiology of caries includes the 4 factors of microorganisms, substrate, host, and time. Caries occur when all these factors operate together. A large body of in vitro and in vivo data supports the belief that caries only occur in the presence of microorganisms. Microorganisms ex-

ist in our mouth in the form of dental plaque. Dental plaque is defined as bacterial aggregations which are attached to the teeth or other solid oral structures. Dental plaque consists primarily of proliferating microorganisms along with some scattered epithelial cells, leukocytes, and macrophages. One cubic millimeter of dental plaque weighing about 1 mg contains more than  $10^8$  bacteria. The primary etiologic organism for caries is *Streptococcus mutans*.

In 1989, Sakanaka et al. reported that components of Japanese green tea consisting of polyphenol extracts, especially gallic acid (GC), epigallocatechin (EGC), and epigallocatechin gallate (EGCg), demonstrated antibacterial effects.<sup>1</sup> Otaka et al. also found that EGCg- and EG-containing foods and

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