

pH and thus change the cariogenicity of dental plaque.

In 2000, Fine et al.¹⁸ reported an essential oil mouth rinse produced statistically significant reductions in total streptococci counts and in *S. mutans* counts. The data showed a 69.9% reduction in streptococci counts and a 75.4% reduction in *S. mutans* counts in interproximal plaque. In the present study, the mean amount of *S. mutans* showed a 94.9% reduction in the group consuming polyphenol-containing milk. Therefore, 0.02% polyphenol-containing milk has a stronger effect on diminishing the amount of *S. mutans*. In 1993, a study by Ooshima et al.¹⁹ showed results that the dietary consumption and drinking of Oolong tea extract produced a 25% reduction rate in the *S. mutans* count. Compared with the Toshiba study, local administration, as performed in this study, produced better effects than did systemic administration.

CONCLUSIONS

In summary, consumption of 0.02% polyphenol-containing milk decreased plaque weight, increased plaque pH values, and reduced the amount of streptococci in plaque. Through these effects, the properties of dental plaque will change, and its cariogenicity can be reduced.

REFERENCES

1. Sakanaka S, Shimura N, Aizawa M, et al. Antibacterial substances in Japanese green tea extract against *Streptococcus mutans*, a cariogenic bacterium. *Agric. Biol. Chem.* 1989;53:2307-11.
2. Otake S, Makimura M, Kuroki T, et al. Anticaries effects of polyphenolic compounds from Japanese green tea. *Caries Res.* 1991;25:438-43.
3. Sakanaka V, Shimura N, Aizawa M, et al. Preventive effect of green tea polyphenols against dental caries in conventional rats. *Biosci. Biotech. Biochem.* 1992;56:592-4.
4. Ymamoto T, Juneja LR, Chu DC, Kim M. Chemistry and application of green tea. New York: CRC Press, 1997.
5. Otake S, Makimura M, Kuroki T, et al. Anticaries effects of polyphenolic compounds from Japanese green tea. *Caries Res.* 1991;25:438-43.
6. Hamada S, Slade HD: Biology, immunology, and cariogenicity of *Streptococcus mutans*. *Microbiol. Rev.* 1980;44:331-84.
7. Loesche WJ. Role of *Streptococcus mutans* in human dental decay. *Microbiol. Rev.* 1986;50:353-80.
8. Elvin-Lewis M, Steelman R. The anticariogenic effects of tea drinking among Dallas schoolchildren. *J. Dent. Res.* 1986;65:198-9.
9. Wu-Yuan CD, Chen CY, Wu RT. Gallotannins inhibit growth, water-insoluble glucan synthesis, and aggregation of mutans streptococci. *J. Dent. Res.* 1988;67:51-5.
10. Sakanaka S, Kim M, Taniguchi M, et al. Antibacterial substances in Japanese green tea extracts against *Streptococcus mutans*, a cariogenic bacterium. *Agric. Biol. Chem.* 1989;53:2307-11.
11. Elvin-Lewis M, Vitale M, Kopjas T. Anticariogenic potential of commercial teas. *J. Prev. Dent.* 1980;6:273-84.
12. Paolino VJ, Kashket S, Sparagna CA. Inhibition of dextran synthesis by tannic acid. *J. Dent. Res.* 1980;56:389.
13. Kashket S, Paolino VJ, Lewis D, van Houte J. Glucosyltransferase inhibition by tannin-like constituents of beverages. *J. Dent. Res.* 1985;64:21 (Abstract).
14. Kakiuchi N, Hattori M, Nishizawa M, et al. Studies by on dental caries prevention by traditional medicines. VIII. Inhibitory effect of various tannins on glucan synthesis glucosyltransferase from *Streptococcus mutans*. *Chem. Pharm. Bull. (Tokyo)* 1986;34:720-5.
15. Stralfors A. Effect on hamster caries by purine derivatives vanillin and some tannin-containing materials. Caries in relation to food consumption and animal growth. *Arch. Oral Biol.* 1967;12:321-32.
16. Shyu K, Meng C, Sun J. The anticariogenic effect of Taiwan tea. *Chin. Med. J.* 1977;24:55-6.
17. Rosen S, Elvin-Lewis M, Beck FM, Beck EX. Anticariogenic effect of tea in rats. *J. Dent. Res.* 1984;63: