

3.5193 before and 3.4885 after consuming water; while in the experimental group, it was 3.4904 before and 3.7048 after consuming polyphenol-containing milk. Plaque pH showed an increasing tendency with a significant difference ($p < 0.01$) in the experimental group. A significant difference was shown in comparison with the control group. ($p < 0.01$) (Fig. 3).

Amount of *Streptococcus mutans*

The average amounts of *S. mutans* in the control group were 4.59% before and 1.81% after consuming water. In the experimental group, the average amounts of *S. mutans* were 7.34% before and 0.37% after consuming polyphenol-containing milk.

According to the statistical analysis, a significant difference was shown in the amount of *S. mutans* between the control and experimental groups. The experimental group showed lower amounts of *S. mutans* (SM/total %) than did the control group ($p < 0.01$) (Fig. 4).

DISCUSSION

No method for achieving the complete prevention

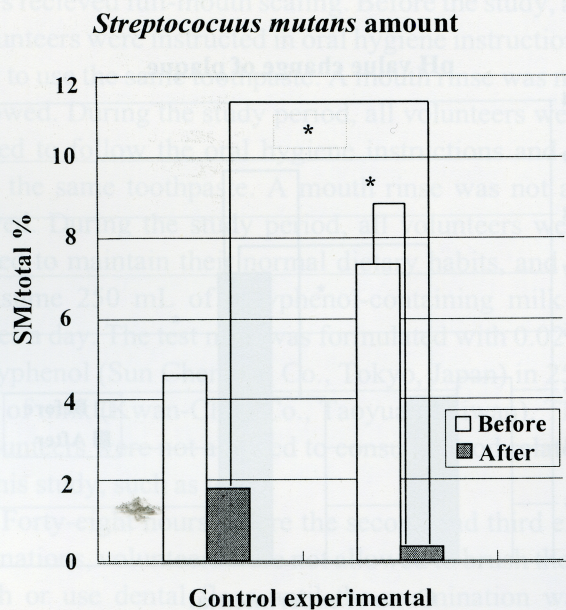


Fig. 4. Change in *Streptococcus mutans* (SM) amount. (* $p < 0.05$).

of dental caries has yet been established. This is because many interrelated factors are associated with caries initiation and progression. Therefore, methods which provide individuals with multiple preventive measures against the various respective factors may be the most effective. These may include substances which exert inhibitory activity against *S. mutans*, the major causal bacterium for caries, and its cariogenic factors.^{4,6} The present study investigated the effect of polyphenol, which contains tannin-like compounds extracted from Japanese green tea, on preventing caries in a rat model. Tannins exist naturally in plants, and they possess potentially valuable anticariogenic activities, including inhibition of bacterial growth,^{5,6} aggregation,⁷ and glucan synthesis,⁸⁻¹³ and they have been shown to caries development in animals.¹⁵⁻¹⁷ In this study we provide evidence that polyphenols is a strong anticariogenic compound. Although it is difficult to compare the exact level of the anticariogenic effect of polyphenol with other tannins, our findings are in agreement with results of other studies.⁸

Kaneko et al. reported that the anti-plaque effect of rinsing the mouth with 20 mL of a 0.25% solution of tea catechin persisted for up to 90 min. In this study, 250 mL of 0.02% polyphenol-containing milk was consumed 3 times a day for 14 days in the experimental group. Data showed an 80.37% decrease in dental plaque weight, an increase in plaque pH of from 3.4904 to 3.7028, and a 94.9% decrease in *S. mutans* amounts.

Elvin-Lewis and Steelman showed significantly lower plaque scores in children who drank 1-3 cups of tea per day than those who drank 1-2 cups per week. In this study, data also showed significantly lower plaque scores in volunteers drinking 750 mL/day of polyphenol-containing milk.

Because plaque which is more highly acidic can induce a greater number of caries in the human oral cavity, increasing plaque pH will reduce the opportunity for caries. In this study, the plaque pH of the control group decreased from 3.5193 to 3.4885, while that of the experimental group significantly increased from 3.4904 to 3.7048. The data prove that consumption of 0.02% polyphenol-containing milk can raise the plaque