

Original

## Protective Effect of Apple Polyphenols on Rampant Caries in Hamsters

Fumio MATSUDAIRA, José Geraldo de Oliveira CORDEIRO,  
Hidenori YAMADA and Akio YANAGIDA\*

**Abstract:** The effect of apple polyphenols (APP) on rampant caries was investigated in hamsters. Sixty male hamsters were divided into 3 groups and all orally infected with *Streptococcus mutans*. For a 12-week period, all animals received the cariogenic diet 2000 (56% of sucrose). At the age of 42 days, two groups received a supplement of powdered APP obtained from immature apples at low (0.05% APP) and high (0.2% APP) concentrations, and one group served as a control (SU group). Plaque extent and caries destructiveness were assessed using a 0-5 scoring reference. In all molar surfaces, an increasing caries protection was found in the APP groups. The score distribution for plaque and caries per hamster was most significantly reduced in the 0.2% APP group. Categorically, significant differences in plaque scores and in caries scores existed between the 0.05% APP and SU groups ( $p = 0.003$ ), and the 0.2% APP and SU groups ( $p < 0.001$ ), but not between the two APP groups. During the animal experiment, the numbers of mutans streptococci in colony forming units (CFU)/ml and their relationships with the numbers of caries score 5 per hamster were determined in three bacterial recoveries: MS Recovery-1 (prior to treatment with APP), MS Recovery-2 (in the middle of the experiment with APP) and MS Recovery-3 (prior to sacrifices). At MS Recovery-2, positive associations were found in the SU group ( $r = 0.67$ ;  $p < 0.001$ ), in the 0.05% APP group ( $r = 0.59$ ;  $p < 0.01$ ) and a negative association existed in the 0.2% APP group ( $r = -0.18$ ; ns). At MS Recovery-3, decreasing positive associations were found in the SU ( $r = 0.76$ ;  $p < 0.001$ ), 0.05% APP ( $r = 0.30$ ; ns) and 0.2% APP ( $r = 0.17$ ; ns) groups. The results suggest that APP affected the numbers of mutans streptococci in CFU/ml, controlled plaque formation and prevented extensive caries destruction.

**Key words:** Apple polyphenols, Mutans streptococci, Dental plaque, Rampant caries, Prevention

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