

Anti-Collagenolytic Activity of Proanthocyanidin

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Background: Resin-dentine bond has been shown to be less durable due to collagen degradation within hybrid layer by matrix metalloproteinases (MMPs) and cysteine cathepsins.

Objective: This study evaluated the anti-protease effect of proanthocyanidin (PA) on soluble and matrix-bound MMPs and cysteine cathepsins.

Methods: The effects of PA on soluble MMPs were evaluated using fluorimetric assay kits. The effects of PA on soluble cathepsins were evaluated using activity assay kits. Chlorhexidine was the positive control. The effect of PA on endogenous matrix-bound proteases was examined by determining loss of dry mass and solubilized collagen peptides.

Results: Over 90% of MMPs and around 75–90% of cathepsins were inhibited by PA, which were significantly higher than chlorhexidine ($p < 0.05$). The loss of dry mass and collagen breakdown were significantly reduced in PA-treated groups than chlorhexidine-treated group ($p < 0.05$).

Conclusion: PA exhibited higher MMP and cysteine cathepsins inhibition in dentine than chlorhexidine.