Electronic Supplementary Material (ESI) for RSC Advances.
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Supplementary Information

Methods

Antibacterial Evaluation

Six experimental groups (0, 0.01, 0.05, 0.1, 0.5 and 1.0 wt% quercetin/ethanol solutions) were selected for antibacterial evaluation. The Live/dead bacterial staining (viewed by CLSM) and MTT assay were performed following the procedures described in Sections 2.7, 2.8 and 2.9 in the main manuscript.

FESEM observation

Biofilm-coated specimens from six experimental groups were prepared for FESEM observation. The specimens were first fixed in 2.5% glutaraldehyde at 4 °C for 4 h, then the specimens were dehydrated under a series of ethanol solutions (30%, 50%, 70%, 80%, 90% for 20 min, respectively, and 100% for 20 min twice). The prepared specimens were mounted, dehydrated, sputter-coated with gold, and then observed *via* FESEM.

Results

Antibacterial Evaluation

As shown in Fig. S1, the CLSM images revealed that the intensity of green fluorescence in the 0.01 wt% and 0.05 wt% groups did not decrease as dramatically as in the 0.5 wt% and 1.0 wt% groups, and little differences could be found of the 0.01 wt% and 0.05 wt% groups with the control group.

The results of the MTT assay are shown in Fig. S2. The bacteria derived from the 0.5 and 1.0 wt% groups showed significantly lower biological activity than that from the control group, while the 0.01 wt% and 0.05 wt% groups showed no significant differences compared with the control group.

FESEM Observation

FESEM images (Fig. S3) showed that, after 24 h of incubation, bacteria accumulated on all the

specimens. However, a much more densely packed biofilm was observed on the surface of the control group than on that of the 1.0 wt% group. Meanwhile, many holes and a coarse surface were observed in the 1.0 wt% group, which demonstrated the ability of quercetin to hinder the maturation of biofilm.

Figures and legends

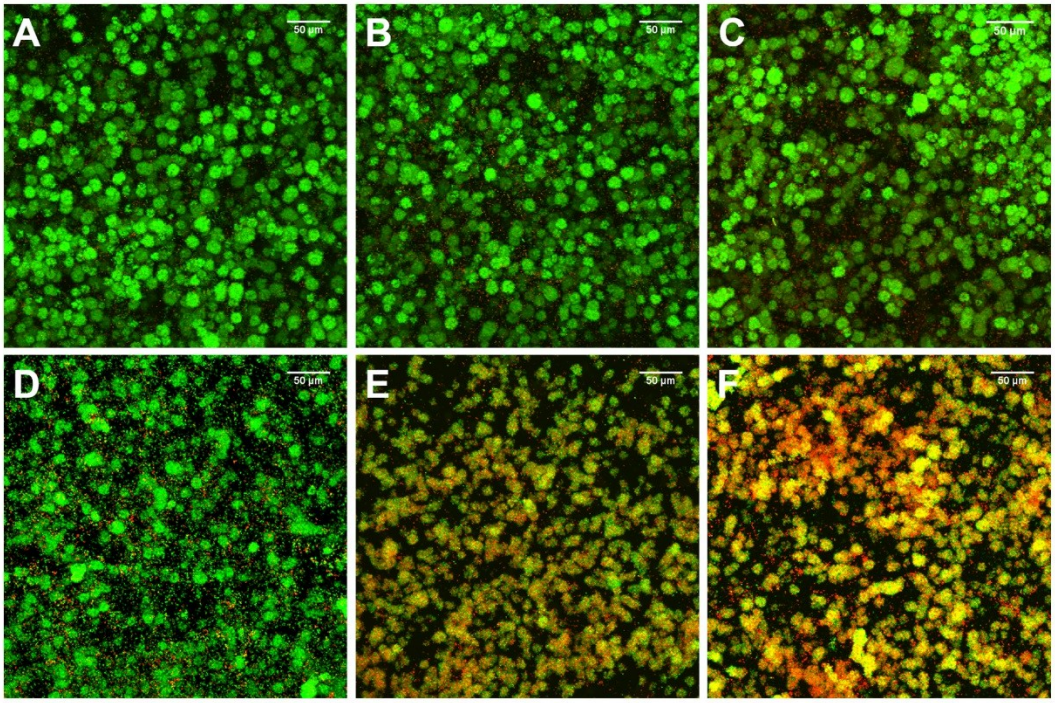

Fig. S1-CLSM images (2D overlay projections) of *S. mutans* biofilms (green-live; red-dead) after 24 h of incubation on dentin disks pretreated by different concentrations of quercetin. (A: the control group, B: the 0.01 wt% group, C: the 0.05 wt% group, D: the 0.1 wt% group, E: the 0.5 wt% group, F: the 1.0 wt% group)

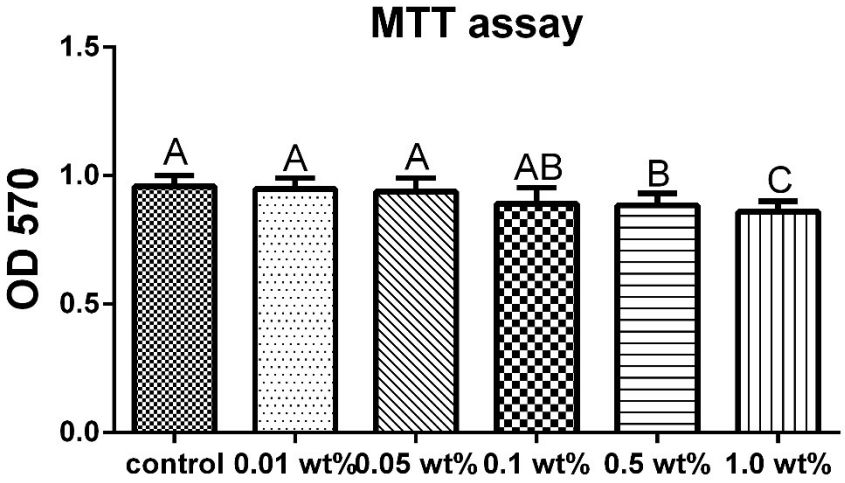

Fig. S2-The results of MTT assay after 24 h incubation of *S. mutans* on dentin disks pretreated by different concentrations of quercetin. Groups with the same letters are not statistically different ($p > 0.05$).

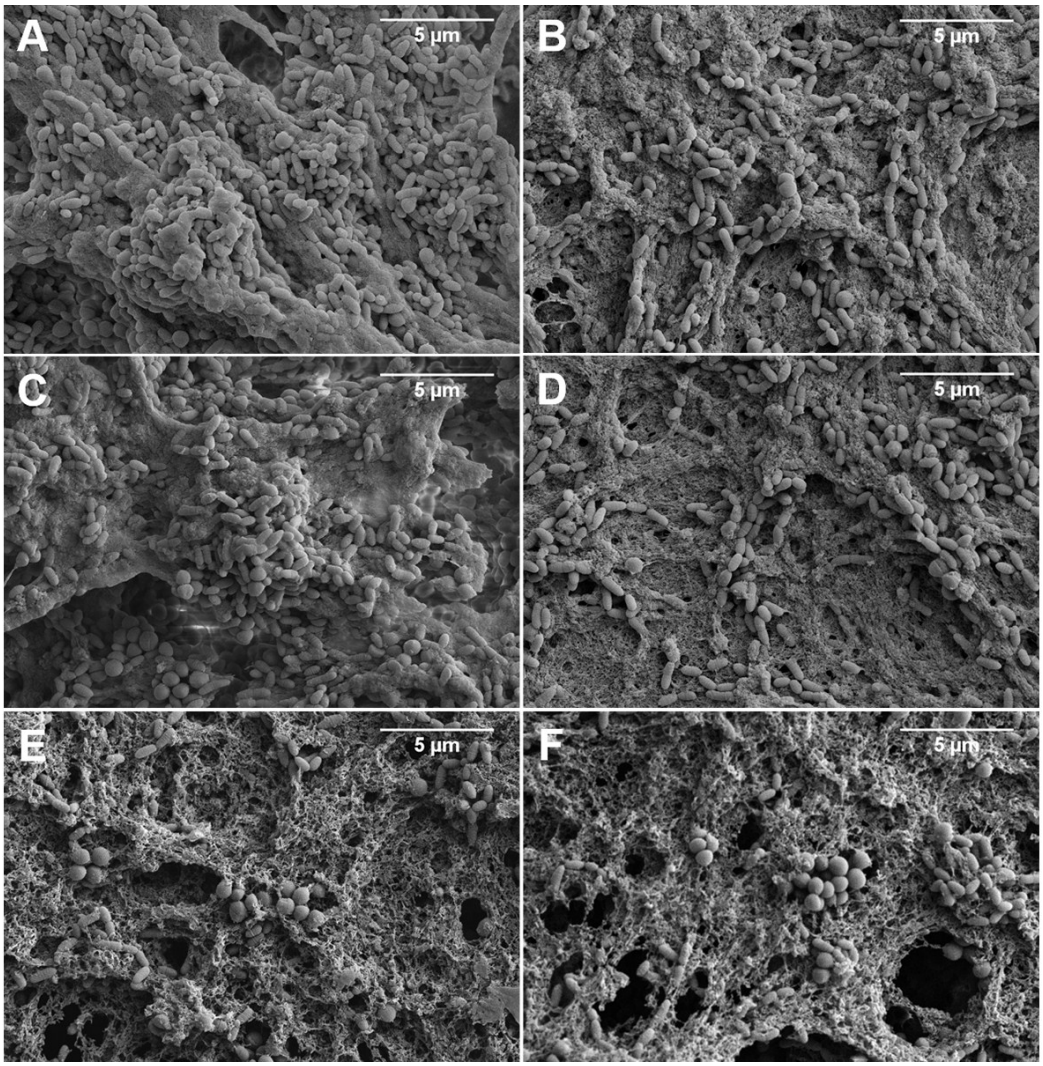

Fig. S3- Representative FESEM images (5000×) of *S. mutans* biofilms after 24 h of incubation on dentin disks pretreated by different concentrations of quercetin. (A: the control group, B: the 0.01 wt% group, C: the 0.05 wt% group, D: the 0.1 wt% group, E: the 0.5 wt% group, F: the 1.0 wt% group)