

## A Furaneol-Containing Glass-Ionomer Cement for Enhanced Antibacterial Activity

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**Abstract :** Secondary caries is found to be one of the main reasons to the restoration failure of dental restoratives. To prevent secondary caries formation, dental restoratives ought to be made antibacterial. In this study, a natural fruit component furaneol was tethered onto polyacid, the formed polyacid was used to formulate the light-curable glass-ionomer cements, and then the effect of this new antibacterial compound on compressive strength (CS) and antibacterial activity of the formed cement was evaluated. Fuji II LC glass powders were used as fillers. Compressive strength (CS) and *S. mutans* viability were used to evaluate the mechanical strength and antibacterial activity of the formed cement. The experimental cement showed a significant antibacterial activity, accompanying with an initial CS reduction. Increasing the compound loading significantly decreased the *S. mutans* viability from 5 to 81% and also reduced the initial CS of the formed cements from 4 to 58%. The cement loading with 7% antibacterial polymer showed 168 MPa, 7.8 GPa, 243 MPa, 46 MPa, and 57 MPa in yield strength, modulus, CS, diametral tensile strength and flexural strength, respectively, as compared to 141, 6.9, 236, 42 and 53 for Fuji II LC. The cement also showed an antibacterial function to other bacteria. No human saliva effect was noticed. It is concluded that the experimental cement may potentially be developed to a permanent antibacterial cement.

**Keywords :** antibacterial, dental materials, strength, cell viability

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