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# Microstructure, micromorphology, and fractal geometry of hard dental tissues: Evaluation of atomic force microscopy images

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## Abstract

Determining surface topography of different tissues of the molar tooth with novel analytical methods has opened new horizons in dental surface measurements which characterize tooth surface quality in dentistry. Studying surface topological measurements and comparing surface morphology of hard tissue of the molar tooth are the ultimate goals of the present study. Ten molar teeth have been chosen for investigating their surface characteristics through image processing techniques. The power spectral density (PSD) and fast Fourier transform algorithms of every molar tooth containing enamel, dentin, and cementum have determined that the characterization of surface profiles is possible. As can be seen, PSD along with fractal dimensions leads to good results for teeth surface topography. Moreover, PSD angular plot assures appropriate description of surface.

**Keywords:** Atomic force microscopy, Fractal features, Molar tooth, Power spectral density.