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Development of New Software as a Convenient Analysis Method for Dental Microradiography

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Abstract:
To the end of developing a convenient research tool to calculate the mineralization status of teeth in detail, a new program was developed using Visual Basic for Applications combined with Microsoft Excel 2004. To demonstrate the usefulness of this program, it was used to analyze tooth enamel mineralization after acid exposure. Transverse microradiography images (TMR) of specimens were digitalized with a charge-coupled device camera with a microscope (CCD camera) and a digital film scanner (FS). Subsequently, the mineral content profile of each specimen after de- and remineralization studies were calculated using the Angmar's formula. The newly developed program was applied to calculating the mineral loss (ΔZ), lesion depth (Ld), surface zone depth (SZd), and lesion body depth (LBd) of tooth specimens. In addition, the outer surface zone (OSZ), inner lesion body (ILB), and sandwich area (SA) between OSZ and ILB—which together constituted ΔZ—were calculated by the newly developed program. Data obtained with the newly developed program were in good agreement for both CCD camera and FS, indicating that the program was reliable for tooth enamel mineralization research studies.

Key words:
Transverse microradiography, Digital image analysis, Measurement of tooth enamel mineralization

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