

Analysis of trace elements in endogenously pigmented deciduous teeth by PIXE

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Abstract

There are a number of unknown factors causing endogenous pigmentation of deciduous teeth, though some of them, including bile pigment, hemoglobin and tetracycline, are well established. Using five endogenously colored deciduous teeth of known origin, which were obtained from five cases and kept in our department, and 10 normal deciduous teeth, we analyzed trace elements in enamel and dentin by application of PIXE, and measured color tone on a light-guided colorimeter. Then, we studied the correlation between the detected elements and the coloration. In all the endogenously pigmented deciduous teeth, Ti was detected along with a very minute amount of Rb, V, Nb and Ga. From the results, we assumed that these elements would enter hydroxyapatite crystals and cause the change in color tone. The study of the reason for the presence of Ti seemed to be particularly important in view of the progress of reconstructive medicine in future.