Hard Tissue and Bioarchaeology Research Group (HTBRG)

Members

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The HTBRG at the University of Hildesheim is undertaking research on mineralized dental and skeletal tissues of vertebrates, with a focus on humans and other mammals. In doing so, we attempt to contribute to a variety of topics including the development and structure-function relationships of mineralized tissues, the evolution and functional morphology of dental and skeletal structures, the reconstruction of living conditions of past human and animal populations, and the effects of pollutants and environmental perturbations on individuals and populations. Members of the group have a wide range in expertise in different fields, including biological anthropology, zoology, ecotoxicology, palaeoecology and palaeopathology as well as the preparation and analysis of skeletal and dental tissues. Methods used in these studies include different macroscopic, microscopic (analysis of thin sections in ordinary and polarized light, fluorescence microscopy, scanning electron microscopy) and radiographic (standard x-ray imaging, computed tomography) techniques, hardness testing, elemental analysis (including microprobing), and isotope analysis. Our work typically combines fieldwork and laboratory research and is mainly performed as part of several international research projects. Presently our research is mainly focused on the following topics:

- Microstructural correlates of growth rhythms in enamel and dentin of different mammalian species and reconstruction of patterns of tooth crown growth based on these incremental markings
- Enamel hypoplasia and structural abnormalities in enamel and dentin as records of growth perturbations caused by systemic stress events and the use of these markers for life history reconstruction
- Effects of excess fluoride on enamel and dentin formation and the use of dental fluorosis as a biomarker of excess fluoride exposure in free-ranging mammals
Studies on human skeletal assemblages from different geographical and temporal contexts including palaeopathological and palaeoepidemiological investigations as a means of reconstructing living conditions of past populations. Currently human archaeological remains from the Upper Paleolithic of Central Europe, the Bronze age of Syria and Germany, and early medieval sites in Germany are under investigation.

The structure and development of deer antlers, which constitute the fastest growing bony structures in vertebrates and the only bony organs in mammals that are capable of full regeneration.

A selection of recent papers by members of the HTBRG at the University of Hildesheim


