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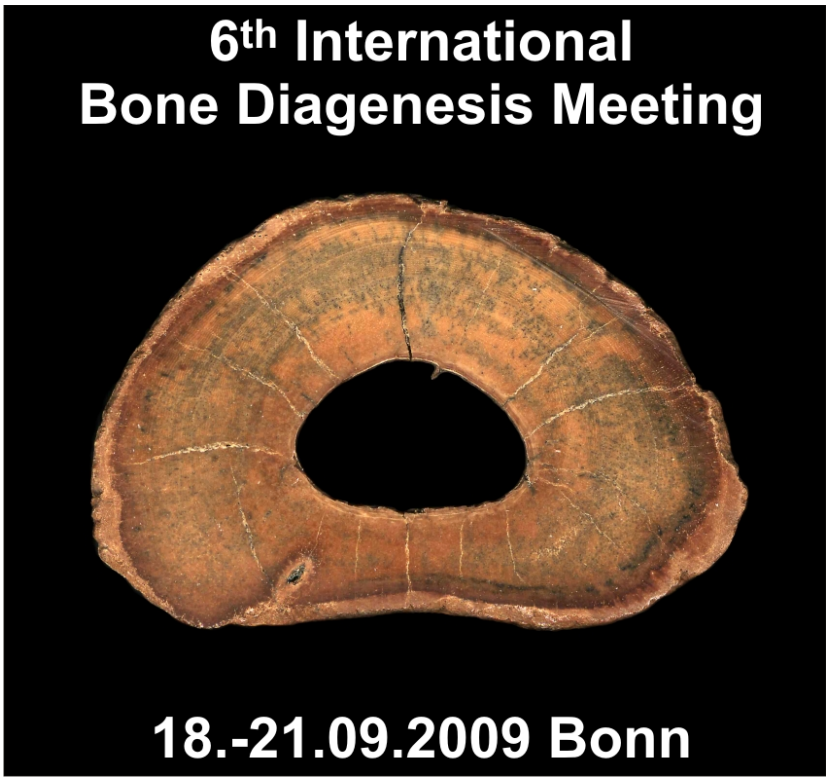

Abstracts

Oral presentations

in alphabetical order

Physical and chemical characteristics of mammal fossil bone remains and their relative age evaluation problem

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The main goal of present work was a multidisciplinary study of modern and fossil small mammal bone and teeth remains including chemical composition (by means of ICP-MS and EPMA), structure (TA, IR and ESR spectroscopy) and surface (SEM and AFM) investigations in order to reconstruct bone fossilization conditions and reveal chronological and space heterogeneity.

Investigated Late Quaternary material (180 samples) from different locations of Urals region consisted of various rodents bone remains (jaws and teeth) from different depth and age sites (from modern to ancient with tens of thousands years old) from zoogenic deposits in karstic cavities.

Bone inorganic phase conversion upon fossilization was examined: bone apatite crystallinity, degree of apatite P-O bond ionicity - covalency, carbonate-ion relative concentration and its inter-positional distribution; alterations in bone surface micro- and nanostructure took place. Dynamics of bone element composition were investigated; geochemical indices were calculated; rare earth elements and other high field strength elements seemed to be promising for relative age estimation by tissue accumulation degree.

Obtained by thermal analysis estimates of organic content in bone remains series of the same type and location or similar in taphonomic nature locations were used for revelation of different age admixtures and for chronological ranking inside large sample selections. ESR-signal provided by ion-radicals induced by thermo-chemical transformations of organic constituent was discovered in modern and ancient bone (tooth) tissues; ion-radical line shape and width parameters were analyzed and their age variations examined.

A number of diagrams connecting the results of different experimental methods were proposed as the basis for relative age and burial environment comparison and revelation of fossil bones chronological and space heterogeneity. Obtained results were applied to solving the problem about synchronization degree of Quaternary rodent bone remains from different subfossil and fossil burials of Urals region of Russia.

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