basanitic rock. Zircons occur in agglutinates of lower crater facies of a scoria cone. The related lava flows are almost free of zircons and their Zr contents reaches up to 900 ppm. There is a good correlation between Ar/Ar data of the basanites (30 to 31 Ma) and the zircon U/Pb data which show ages about 30.5 Ma.

A further known locality of zircon mega-crystals is the so called Seufzergründel placer in Elbsandsteingebirge / Saxon Switzerland (eastern Germany). There are observed zircon mega-crystals up to 9 mm in size. Their host rock is a lapilli bearing volcanic breccia, implying here a polyphase explosive volcanism. The age data of zircons have various values; while the Pb/Pb crystallization-ages range by 54±6 Ma the U/Pb dating gets about 35 Ma.

Furthermore zircon mega-crystals were sampled from placers and residual soil of basanitic and nephelinitic as well as phonolitic rocks from different localities via heavy mineral separation techniques. The crystals show an intensive magmatic corrosion in alkalibasaltic rocks (including nephelinites), while zircons out of phonolites are mostly euhedral.

Thus the zircon mega-crystals were carried by alkali basaltic magmas but were not in equilibrium with these melts. Basaltic host rocks of the mega-crystals are developed of primitive mantle melts, implying a short residence time for zircons in the melt. The solution rates of zircon in such melts are possibly high which could be seen in the intense magmatic corrosion. Therefore zircon mega-crystals occur mostly in pyroclastic rocks and are scarce or absent in massive lava flows. The latter have a much longer cooling time.

Another possibility for enrichment of mega-crystals in pyroclastic rocks should be that the ascending bubbles in the vent carry away the solid parts, like xenocrystals or phenocrystals of the magma column. This could be the reason for lacking of in situ proofs of zircons in massive basalts.

The age data of the zircons in relation to that of the host rocks imply a cogenetic development of both.

Geology and tectonics of the Vršatec Klippen area (Pieniny Klippen Belt, Western Slovakia)

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The Pieniny Klippen Belt (PKB) is a narrow (merely several km), but lengthy (up to 600 km) zone dominated by Late Oligocene – Miocene wrench tectonics. It separates the Cenozoic accretionary complex of the External Western Carpathians from the Cretaceous nappe system of the Central Western Carpathians. Our investigation was focused on the tectonic structure and evolution of the Vršatec klippen area in the western Púchov sector of the PKB. The studied area includes the Oravic (Czorsztyn, Kysuca, Orava and Transitional Units) and the "non-Oravic" tectonic units (Klape and Drietoma Units). Detailed geological mapping and systematic field structural research of meso-scale deformational structures revealed the record of multistage tectonic evolution during Senonian-Pliocene times. The oldest recognized stage resulted in formation of the Mesoalpine fold-nappe system of the PKB due to subduction and closure of the Vahic Ocean during the Senonian – Early Eocene times. This compressive stage was accompanied by thrusting of the presently most external Kysuca Unit over the Czorsztyn and transitional units and by formation of macroscopic folds with the NNE-SSW to NE-SW trending fold axes. The main compression was oriented perpendicularly to the strike of the PKB recently trending in the SW-NE direction. The thrusting and folding were followed by several brittle deformation stages. The oldest stages (E-W to NW-SE oriented maximum compression) produced the NE-SW trending dextral positive flower structure along the western boundary of the PKB and resulted in the final morphostructural character of klippen with long axes oriented in the NE-SW direction. The dextral transpression was a result of the continuing shortening and relative counterclockwise rotation of the ALCAPA block in the Late Oligocene – Early Miocene. The younger N-S oriented compression (Early – Middle Miocene) produced mainly sinistral faults roughly parallel to the strike of the belt in the sinistral transpression regime. The apparent shift of the main compression to the N-S direction was an effect of a rigid counterclockwise rotation of the ALCAPA block during the Early Miocene. Mostly strike-slip and normal faults were formed during the next two tectonic events (Middle to Late Miocene) as a product of the transtensive tectonic regime with NNE-SSW to NE-SW trending compression. Active clockwise rotation of the main compressional stress axis from N-S to NE-SW direction, and inversion from the older transpression to the younger sinistral transtension resulted from NE-ward translation of the ALCAPA block. The NE-SW trending normal faults were generated by the NW-SE extension during the final deformational phase under the extensional tectonic regime (Pontian-Pliocene).

Development of Lower Cretaceous deposits from Bihor-Pădurea Craiului unit (Apuseni Mountains, Romania): Comparisons with Villany region in Hungary

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The Lower Cretaceous deposits from Bihor-Pădurea Craiului unit follow a sedimentary gap due to the uplift of the region at the end of the Late Jurassic, when bauxitic rocks were formed. The succession consists of the following lithostratigraphic units: (1) Blid Formation, comprising two members: (1a) Dobreşti Member (Valanginian-Hauterivian) known in the old literature as "Limestone with characeans and gastropods"), and (1b) Coposeni Member (Barremian), the old "Lower Pachyodont limestone"; (2) Ecleja Formation, consisting mainly of marls, but containing also two lithologically different members: (2a) Gugu Breccia Member (Upper Barremian), and (2b) Valea Bobdei Limestone Member (Lower Bedoulian), corresponding partly to the old "Middle Pachyodont limestone"; (3) Valea Măgurii Limestone Formation (Upper Bedoulian), also corresponding partly to the old "Middle Pachiodont limestone", and (4) Vârciorog Formation (mainly marls and sandstones, with limestone intercalations) (Gargasian-Albian) that correspond to the old "Formation of glauconitic sandstones and Upper Pachyodont limestone". Of these lithostratigraphic units Dobreşti Member and Ecleja Marls have been often a subject of controversy. The age of Dobreşti Member proved to be Valanginian-Hauterivian. Regarding the Ecleja Marls, recent researches revealed that the succession of the startotype is younger as considered before (Late Aptian-Albian, instead of Late Barremian-Early Aptian). Other recent researches have shown the development of a large pile of Upper Aptian-Albian platform limestones, equivalent of limestone intercalations within the Vârciorog Formation. These new data change our understanding of the Bihor-Pădurea Craiului basin evolution during the Aptian-Albian time interval. At the biginning of Aptian, a deeper basin was formed. On local highs within the basin isolated carbonate platforms developed (Valea Bobdei, Valea Magurii, and Subpiatra Limestones). Material from these platforms can be found as debris flows (allodapic limestones) intercalated in the terrigenous succession of the basin.

Within the Villany Hills (Hungary) the Nagyharsány Limestone formed also on the Upper Jurassic Szársomlyó Limestone Fm revealing bauxite lenses (Harsányhegy Bauxite Fm) at its base. The age of the Nagyharsany Limestone wich consists of four lithologic (calcareaous) members is considered as Valanginian-Early Albian. It is covered by the Bisse Marls of Late Albian-Cenomanian age. No other marl intercalations were reported from the Nagyharsany Limestone.