Geochemistry of Granitoids in the eastern part of the Seckau Mountains (Eastern Alps, Austria)

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The massif of the Seckau mountains (Seckauer Tauern) is mainly built up of Granitoids as part of a batholith with a Variscan protolith age, overprinted by Eoalpine (Cretaceous) deformation during nappe stacking and subsequent extension, and greenschist facies metamorphism. In this study, a suite of granitods was geochemically analysed by X-ray fluorescence (Bruker Pioneer S4) in order to derive the processes of magmatic evolution and differentiation. In general, three types of magmatites can be distinguished: granites, granodiorites and quartz-monzodiorites. The first two form the majority, whereas the intermediate quartz-monzodiorites are only locally exposed.
Following the A/CNK discrimination diagramm a clear distinction beween S- and I- Type granitoids can be established. The S- type granites are mainly localised along structurally the higher parts of the massif and are covered by Permisn to Mesozoic metasedimentary sequences of the Rannach Formation.
Within the AFM diagram all granitodis are characterized by a calcalcaline trend. This suggests that the related melts were formed during a subduction process. Within the R1-R2 digram, the granitoids are related to both pre-plate collision, syn-collision and post-collision uplift settings.
We therefore suggest that the granitoids of the eastern Seckau massif are part of an intrusion sequence during distinct stages of a plate tectonic cycle, i.e. from pre- to post collision, and that the related magmas differentiated from intermediate (quartz-monzodiorites) I-type to acidic (granites, granodiorites) S-type.

Characterization of a fault network in a Miocene oyster reef (Korneuburg Basin, Austria)

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The oyster reef excavated at the “Fossilienwelt Stetten” in the Korneuburg Basin is affected by a network of normal faults. The mass occurrence of Crassostrea gryphoides is embedded in a succession of sandstone and clay layers. The outcrop is particularly impressive by its size (300 m2), by the size of the oysters (up to 80 cm in length) and the high quantity of faults registered. The oysters serve as ideal linear markers for the determination of displacement vectors and indicate normal displacements along the NW-SE striking faults. The faults are 10 to 20 m long but they do not show large displacements: vertically about 5 cm and up to 18 cm and in some areas additional sinistral displacement of max. 7 cm. The relation between the length and maximal displacement for these faults indicates that the brittle deformation is confined in the sand layer containing the oyster horizon and more distributed in the underlying and overlying clay and silt layers. The faults are not continuous, but show frequent linkage between initial fault segments and relay zones to neighboring faults. Moreover the long faults are composed of several smaller segments on which we notice different degree of linkage.

Koralmtunnel lots KAT1 and KAT2: The Neogene of the Styrian Basin

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The easternmost part of the Koralmtunnel (KAT) crosses for a length of approximately 4.0 km the Neogene sediments of the Western Styrian Basin. These sedimentary units are assigned to the Badenian -Florianer Beds, which are commonly regarded as stratified lagoonal deposits (“Bay of St. Florian”). The westernmost boundary of those sedimentary rocks is formed by methamorphic rocks of the Koralpe. The alignment of the KAT (lots KAT1 and eastern part KAT2) is dominated by partly carbonatic siltstone with intercalated sandstone and by poorly cemented sandstone to well compacted sand, all of which are predominantly free of macro-fossils. Prior to excavation single faults were known for lot KAT2 from the exploratory tunnel Leibenfeld, but none for lot KAT1.