

Pre-Alpine and Alpine evolution of the Seckau crystalline basement (Seckau mountains, Eastern Alps)

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The massif of the Seckau mountains (Seckauer Tauern) is mainly built up of granitoids, overprinted by Eoalpine (Cretaceous) deformation during nappe stacking and subsequent extension, and greenschist facies metamorphism. Whole rock Rb-Sr age data of ca. 432 Ma and 350 Ma were assumed to indicate the protolith ages (SCHARBERT, 1981). In this study, a suite of granitoids 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 diagram a clear distinction between S- and I-Type granitoids can be established. The S- type granites are mainly part of the structurally uppermost sections and are covered by Permian to Lower Triassic metasedimentary sequences of the Rannach Formation.

Within the AFM diagram all granitoids are characterized by a calcalkaline trend. This suggests formation of the melts during a subduction process. Within the R1-R2 diagram, 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.

Biotites separated from the granitoids yield Rb-Sr age data between 83 and 87 Ma, and 80 to 76 Ma. These ages are assumed to represent cooling ages related to the exhumation of the Seckau massif subsequent to Eo-Alpine greenschist facies metamorphism.

SCHARBERT, S. (1981): Untersuchungen zum Alter des Seckauer Kristallins. - Mitt. Ges. Geol. Bergbaustud. Österr., 27: 173-188.

Jurassic and Lower Cretaceous tectonics of the Western Carpathians: coupled vs. uncoupled hinterland shortening and foreland stretching

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During Jurassic and Early Cretaceous, tectonic evolution of the Western Carpathians was governed by two competing, but mutually related processes – hinterland collision and prograding nappe stacking after closure of the Neotethys-related Meliatic oceanic domain, while the external zones underwent lithospheric stretching that graded into opening of the Atlantic-related Penninic oceanic zones. This contribution attempts at interpretation of these processes from the point of view of crust dynamics as revealed by deep-seated structural-metamorphic and surface sedimentary records.

Opening and ensuing spreading of the Meliatic branch of Neotethys was initiated in early Middle Triassic and lasted until Late Triassic (245–210 Ma) while overall distensional tectonic regime acted on its broad northern European passive margin. The geodynamic situation