

CRETACEOUS EMPLACEMENT OF THE AUSTROALPINE SCHNEEBERG COMPLEX?

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The Schneeberg complex (SC) is located in the SE part of the Austroalpine Ötztal-Stubai basement complex (ÖSC) and is regarded as a separate unit within the ÖSC based on lithological constraints. The age of deformation and metamorphism in the SC has always been a subject of discussion. New garnet Sm/Nd crystallization ages (mineral-whole rock ages of 93.1 ± 4.7 Ma and 90.9 ± 4.1 Ma) and Biotite Rb/Sr cooling ages (mineral-whole rock ages between 84–73 Ma) from the SC indicate an eo-Alpine age for the tectono-metamorphic evolution.

Based on field mapping and structural data, as well as thin section analysis and first microprobe investigations, two ductile deformation phases (D1-D2) can be differentiated. Deformation phase D1 defines a mylonitic foliation (metamorphic layering) with a well developed stretching lineation (L1) trending to NW-WSW. The monocline symmetry of some clasts points to a strong non-coaxial component of deformation. Isoclinal folds (F1) with fold axes strictly parallel to the stretching lineation L1 are related to D1, the axial plane of F1 corresponds to S1.

D2 is characterized by S-vergent fold trains with W-E oriented fold axes, forming the major synforms of the Schneeberg complex (“Schneeberger Hauptmulde”). The D1-deformation can be correlated with the pressure peak at (maximum time span 98–86 Ma; interpreted as main period of garnet crystallization). Amphibolite facies conditions outlasted deformation and led to static mineral growth, which has variously overprinted all ductile structures related to D1 and D2.

Concluding, the rocks of the SC record a poly-phase ductile deformation history during one sin-

gle eo-Alpine metamorphic event. The microstructural relationships and Sm/Nd ages of garnet document that both ductile deformation phases (D1, D2) are an integral part of one, rather short-lived tectono-metamorphic sequence. Permo-Mesozoic rocks (Brenner Mesozoic), exposed at the northern border of the SC show the same structures (D1 and D2) and an eo-Alpine medium-grade metamorphic imprint (DIETRICH 1983), thus providing a further evidence for the eo-Alpine age of the main tectono-metamorphic evolution in this area.

Considering the absence of pre-Alpine structures or relic minerals in the whole SC, the clear change in the microstructural pattern at the western contact between SC and ÖSC, the different tectonic history of SC and ÖSC farther NW, might best be explained with an Alpine emplacement of the SC at medium grade conditions, together with some basement rocks to the SE of the SC, i.e. the eo-Alpine eclogites, showing rather similar structural, petrological and geochronological patterns.

References

- DIETRICH H. 1983; Zur Petrologie und Metamorphose des Brennermesozoikums (Stubai Alpen, Tirol). – *Tschermaks Min. Petrol. Mitt.*, 31, 235–257.

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