



## **Schists and Amphibolites of the Ankogel-Hochalm-Gruppe/ New Insights on the Variscan Basement in the eastern Tauern Window**

**L. Lerchbaumer** (1), U. Klötzli (1), G. Pestal (2)

(1) Center for Earth Sciences, University of Vienna, Austria

(2) Geological Survey of Austria, Vienna, Austria

(lindaler@yahoo.de)

In the eastern Tauern Window pre-Mesozoic units are well preserved. These units comprise Variscan meta-granitoids (the Zentralgneise) and its country rocks, the so-called “Altkristallin”, more precisely banded amphibolites, garnet-mica-schists, and biotite-schists, partly migmatized. The latest mapping of these basement rocks in the Kleinelendtal/Ankogel-Hochalm-Gruppe (Carinthia) dates back to the 1930s (Angel & Staber 1952). Recent investigations within these lithologic complexes provide new data concerning the age and genesis of these rocks and their relationships to similar lithologic units (“Basisamphibolit” and “Biotitporphyroblastenschiefer”) in the central Tauern Window.

The petrography, geochemical, and isotopic analyses of both the amphibolite and the biotite-schist show their source region:

The dispersion of the main and trace elements of the amphibolite shows a basaltic chemism. Due to this it is identified to be meta-magmatic. The initial  $^{87}\text{Sr}/^{86}\text{Sr}$ -ratio of 0.70525 and a calculated  $\varepsilon\text{Nd}_{(360\text{m.y.,CHUR})}$  of +5,3, plotting directly onto the mantle array, support this presumption.

The chemism of the biotite-schist is intermediate. It is a meta-sediment with quite

huge proportions of juvenile crust, a fact that is indicated by the  $\epsilon\text{Nd}_{(360\text{m.y.}, \text{CHUR})}$  of  $-1.8$ .

Detrital zircons from the biotite-schist were dated by U/Pb – LA-ICP-MS. The analysis yields a concordant maximum age of sedimentation of  $360 \pm 13$  m.y. for the host sediment, confirming that at least parts of the “Altkristallin” do not date back to pre-Variscan times or even later, but preceding the intrusion of the Zentralgneise, which took place at approximately 315 m.y. (Cliff 1981), only some tens of m.y.

According to field observations these rocks seem to be migmatites. In fact the pale “Schlieren” which resemble a neosome are folded veins of the youngest generation of the Zentralgneise, the Kölnbreinleukogranit, respectively. Only those parts of the biotite-schist and the amphibolite were slightly migmatized that had been close enough to be heated up by the intrusions of the Zentralgneise. This suggests that there are no in-situ migmatites within the “Altkristallin” of the Kleinellental.

In conclusion the age of the biotite-schist is in line with the ages generated by Kebede et al. (2005) in the Felber- and Amertal in the central Tauern Window. There the age of the Biotitporphyroblastenschiefer results in  $362 \pm 6$  m.y and  $368 \pm 17$  m.y. The amphibolites in the Kleinellental and the Basisamphibolit in the Felbertal show a similar geochemical (e.g. Frisch & Raab 1987, Gilg et al. 1989) and isotopic (Eichhorn 1995) pattern, thus these units are interpreted to be equal.

Ref.:

*Angel F, Staber R* (1952) Gesteinswelt und Bau der Hochalm-Ankogel-Gruppe. Wiss. Alpenvereinshefte 15. Univ. Verlag Wagner, Innsbruck

*Cliff R* (1981) Pre-Alpine History of the Pennine Zone in the Tauern Window, Austria: U-Pb and Rb-Sr Geochronology. Contr. Min. Pet. 77: 262-266

*Eichhorn R* (1995) Isotopengeochemische und geochronologische Untersuchungen an Gesteinen und Mineralen der Scheelit-Lagerstätt Felbertal (Land Salzburg, Oesterreich). Münchner Geol. Hefte 15

*Frisch W, Raab D* (1987) Early Paleozoic back-arc and island-arc settings in greenstone sequences of the central Tauern Window (Eastern Alps). Jb. Geol. B.-A. 129, 3-4: 545-566

*Gilg HA et al.* (1989) Die Basisschieferfolge in der Habachformation im Felber- und Amertal (Tauernfenster, Salzburg). Mitt. österr. geol. Ges. 81: 65-91

*Kebede T et al.* (2005) Understanding the pre-Variscan and Variscan basement components of the central Tauern Window, Eastern Alps (Austria): constraints from single

zircon U-Pb geochronology. *Int. J. Earth Sci.* 94: 336-353