

## FROM EARLY CAMBRIAN ARC MAGMATISM TO JURASSIC RIFTING: TECTONIC EVOLUTION OF THE LOWER AUSTROALPINE SCHWARZHORN AMPHIBOLITE (EASTERN RÄTIKON, AUSTRIA)

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Lower Austroalpine, Jurassic rifting, pre-Alpine basement, U-Pb zircon geochronology, Rätikon

The geology of the Penninic-Austroalpine boundary in the eastern Rätikon is characterized by a north-dipping imbricate stack of very diverse rock units. The lowermost Middle Penninic Sulzfluh Nappe in the south is followed by the Upper Penninic Arosa Zone comprising flysch, mélange, ophiolite and serpentinite units. To the north, the serpentinite unit is overlain by a 4x1 km tectonic sliver of meta-diorite, known as the Schwarzhorn Amphibolite. Previous authors interpreted it either as a Penninic or an Austroalpine tectonic unit. Typical Austroalpine units with gneissic basement and Mesozoic sediment cover follow further to the North. The meta-diorite was deformed and metamorphosed in the amphibolite facies and is unconformably overlain by unmetamorphic Lower Triassic sandstone, indicating pre-Triassic metamorphism. The Lower Triassic sandstones and cataclastic fault zones in the meta-diorite are unconformably covered by Late Jurassic and Cretaceous post-rift sediments. Hence, the whole Schwarzhorn Unit represents a tilted fault block from the Jurassic rifted margin of the Austroalpine. A similar rift-related architecture is observed in the Lower Austroalpine Err and Bernina nappes further south. From lateral correlation of nappes, the Schwarzhorn Unit is most likely an extension of the Err Nappe. So far, the few geochronological data available for the basement protoliths of Lower Austroalpine units report Carboniferous and Permian intrusion ages.

Zircon dating of the Schwarzhorn Amphibolite using LA-ICP-MS gave a U-Pb age of 529<sup>+9</sup>–8 Ma, interpreted as the crystallization age of the protolith. Geochemical characteristics indicate formation of the magmatic protolith in a supra-subduction zone setting (Nilius et al. 2016). The Cambrian protolith age identifies the Schwarzhorn Amphibolite as a pre-Variscan element within the Austroalpine basement. Similar calc-alkaline igneous rocks of Late Neoproterozoic to Early Cambrian age are found in the Upper Austroalpine Silvretta Nappe nearby and in several other Variscan basement units of the Alps and are interpreted to have formed in a peri-Gondwanan active-margin or island-arc setting.

### References

Nilius, N.-P., Froitzheim, N., Nagel, T.J., Tomaschek, F. & Heuser, A. 2016: The Schwarzhorn Amphibolite (Eastern Rätikon, Austria): an Early Cambrian intrusion in the Lower Austroalpine basement. *Geologica Carpathica*, 67, 2, 121-132.