

**ARE YOU HUNTING PRE-VARISCAN ROCKS SOMEWHERE BETWEEN  
SWITZERLAND AND BAVARIA ?  
TRY AUSTRIA 'S TAUERN WINDOW !**

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Until the 90's, the pre-Variscan evolution of the Tauern Window and its geotectonic setting have been a mystery due to missing or unreliable geochronological data. Concepts and models had to rely on petrological, geochemical and field data, only. Geotectonic and palaeogeographic conclusions were reduced to mere guesswork.

In recent years, the data situation improved significantly. Intense geochronological work led to the identification of Neoproterozoic to Ordovician relics of oceanic crust and subduction-related rocks in basement areas of all four Alpine domains (i.e. the Southalpine, Austroalpine, Penninic and External domains). A tentative reconstruction of the palaeogeographic situation before the Variscan orogeny puts these relics in a position at the northern Gondwana active margin [1].

High-quality zircon age data revealed a complex evolution at least in one of the four domains, the 'Habach terrane' [2] of the Penninic Tauern Window. SHRIMP data indicate geological events at 2.64–2.06 Ga, at ~830, 551–507, 496–482 and 422–414 Ma [3, 4]: The provenance region of the Archaean (2.64–2.06 Ga) zircons is assumed to be a terrane of Gondwana affinity, most probably the West African craton. The Habach terrane was formerly interpreted as a bottom-to-top sequence with the oldest at the bottom (Stubach Group), overlain by the Habach Group, consisting of the Basisschieferfolge, the Eruptivgesteinsfolge und the youngest unit, the Habach-phyllitsequenz. Nowadays, the "bottom-to-top" sequence is radically re-interpreted as a lateral and +/- coeval emplacement of all the units in an active continental margin with ensialic back arc development:

Radiometric and isotopic data revealed a subduction-induced magmatism in the Cambrian, between 551 and 507 Ma. Back-arc diorites and arc basalts were intruded by ultramafic sills and subsequently by small patches of mantle-dominated granitoids. Fore-arc (shales; Habach-phyllitsequenz) and back-arc (greywackes, cherts; Basisschieferfolge) basin sediments as well as arc (Eruptivgesteinsfolge) and back-arc (Stubach Group) magmatites were not only nappes stacked by the Caledonian compressional regime closing the presumably narrow oceanic back-arc basin and squeezing mafic to ultramafic cumulates out of high-level magma chambers (496–482 Ma). It also induced uplift and erosion of deeply rooted crystalline complexes and triggered development of a successor basin filled with predominantly clastic greywacke-arkosic sediments (also Basisschieferfolge).

The Habach terrane is seen as the 'missing link' between similar units of the more westerly positioned External domain (e.g. Aar, Aiguilles Rouges) and the Austroalpine domain to the east (Oetztal, Silvretta).

New U-Pb SHRIMP data from zircons of metamagmatites from the Bayerischer Wald (Germany) reveals a complex evolution of this section of the Moldanubian Zone exposed in the western Bohemian Massif [5]. In fact, geochronological data and geotectonic implications from the Bayerischer Wald are quite similar to the evolution of the Habach terrane (Tauern Window): Inherited zircon cores indicate a Palaeoproterozoic-Archaean (2.70, 2.02 Ga) source region, presumably of Gondwana affinity (West African craton), and document Cadomian magmatism (640 to 560 Ma). Magmatism at 555–549 Ma in the south-western part of the Bayerischer Wald probably took place at an active continental margin with ensialic back-arc development. Magmatism and anatexis at 480–486 Ma and 491–457 Ma, respectively, are documented in the north-eastern parts of the Bayerischer Wald and point to an active continental margin setting, possibly with some lateral variation (accretion/collision) in the Lower Ordovician. A tentative palaeogeographic reconstruction puts the "Bayerischer Wald" in a close relationship with the Habach terrane (Tauern Window), as the "eastern" prolongation of terranes of the northern Gondwana margin.

#### References

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