

**DATING ECLOGITES IN THE EASTERN ALPS:
APPROACHES, RESULTS, INTERPRETATIONS**

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In the Eastern Alps, eclogites occur at different levels:

(i) In the structurally lower part of the orogen (the Pennine unit as exposed in the *Tauern window*) eclogites (ca. 2 GPa / ≤ 630 °C) formed as a result of subduction of the Piemont-Liguria ocean below the Austroalpine domain. ⁴⁰Ar - ³⁹Ar ages from phengite favour an Eocene (50 - 40 Ma), rather than a Late Cretaceous / Early Cenozoic age for this high-P metamorphism.

(ii) Variscan, partly MORB-type eclogites, forming constituents of the N Apulian (Austroalpine) crust, occur in the central *Ötztal basement* (2.7 GPa / 730 °C, mean Sm-Nd age: 347 \pm 11 Ma), the eastern *Silvretta* (ca. 350 Ma), and the *Ulten* high-grade crystalline (336 - 332 Ma).

(iii) In the southern Austroalpine units, metabasic eclogites and high-P metapelites are known from the *Texel complex* (1.3 GPa / ca. 520 - 600 °C), the *Schober / Kreuzeck* areas (1.8 GPa / ≤ 690 °C), and the *Saualpe-Koralpe-Pohorje* region (2 - 2.5 GPa / ≥ 700 °C). The latter originate from Permian MORB-type gabbros and basalts, whereas the Schober and Texel eclogite protoliths probably represent elements of the pre-Permian crust. The similar tectonic position and near-identical ages suggest a common subduction-exhumation history for this „eo-Alpine high-pressure belt“ (THÖNI & JAGOUTZ, 1993). It resulted from burial of the distal passive Neotethyan Meliata margin and, further west, pre-Alpine Austroalpine crust, along a continent-to-ocean subduction zone during Late Mesozoic Apulia-Europe convergence. Peak metamorphism and initial decompression / exhumation is dated by the Sm-Nd, Lu-Hf, U-Pb and Rb-Sr systems as close to 90 Ma, with uplift rates in the range of 3 - 4 km / Ma for the time 90-80 Ma B.P

Reference

THÖNI, M. & JAGOUTZ, E. (1993): Isotopic constraints for eo-Alpine high-P metamorphism in the Austroalpine nappes of the Eastern Alps: bearing on Alpine orogenesis. *Schweiz. Mineral. Petrogr. Mitt.*, 73, 177-189.