

Lithostratigraphy and internal structure of the Austroalpine units in the Niedere Tauern and northern Gurktal Alps (Eastern Alps, Austria)

Schuster, R.¹, Wegner, W.², Horschinegg, M.² & Kollmann, Ch.²

¹ Geological Survey of Austria, Neulinggasse 38, 1030 Vienna, Austria
(ralf.schuster@geologie.ac.at)

² Department of Lithospheric research, University of Vienna, Althanstraße 14, 1090 Vienna

South of Schladming, between the Enns and Liesing valley in the North and the Mur valley in the South the Niedere Tauern form an about 100 km long West-East orientated mountain chain with a rough morphology. Its peaks reach up to 2800 m in the West and drop down to about 2400 in the East. South of the Mur valley the Gurktal Alps are characterized by a smoother landscape and a lower altitude. The whole area is built up by nappes of the Austroalpine unit. Crystalline basement rocks are dominating, whereas metamorphosed Permomesozoic sedimentary sequences occur in some places. As indicated by fission track ages the break in morphology is due to Neogene south dipping normal faults including the Prebersee and Seetal fault (EDER & NEUBAUER, 2000). However, the position of the normal fault system and the internal structure and lithostratigraphy of the Austroalpine nappes was only locally known until now.

The tectonic lowermost Upper Austroalpine nappes in the area belong to the Silvretta Seckau nappe system. These nappes consist of Neoproterozoic to Ordovician paragneisses (partly magmatic), micaschists and amphibolites. Orthogneisses of presumably Ordovician and/or Carboniferous intrusion age occur and partly a post-Variscan cover including Permian metaconglomerates and metapelites and Lower Triassic quartzites is preserved. The medium to high grade imprint in the basement rocks occurred during the Variscan tectonometamorphic event, whereas only greenschist facies metamorphic conditions were reached during the Alpine event in the Cretaceous. Nappes of the Silvretta-Seckau nappe system built up antiformal structures in the West (Schladminger Tauern) and East (Seckauer Tauern) of the Niedere Tauern.

On top of the Silvretta Seckau nappe system several nappes of the Koralpe-Wölz nappe system occur. They consist of Neoproterozoic to Devonian sequences dominated by micaschists and paragneisses with intercalations of marbles, quartzites and amphibolites. From bottom to top the Ennstal phyllite, Wölz (including Gensgitsch Complex), Greim, Rappold and Radenthein Complex can be distinguished. A Permian upper greenschist facies imprint is proofed for the southern parts of the Wölz Complex, whereas amphibolite facies and the intrusion of pegmatites can be recognised in the Greim and Rappold Complexes. The Alpine metamorphic grade increases from lower greenschist facies at the base to amphibolite facies in the Rappold Complex, whereas the overlying Radenthein Complex shows again a greenschist facies imprint.

Good outcrops of the south dipping Neogene normal faults are scarce, but they can be localised by mapping the boundaries of the crystalline complexes. Between the southern slopes of the Niedere Tauern and the Mur valley they dissect the Cretaceous nappe pile and create a complex pattern in map view. One major fault continues from the "Lessach phyllonit lamella" along the northern boundary of the Rappold Complex until Schöder. Further to the East some of the faults are turning to Southeast and most probably continue into the Görtschitztal fault at the western margin of the Seetaler Alpen and Saualpe.

Rb-Sr biotite ages covering large parts of the area range from 60 to 87 Ma. They are interpreted to reflect cooling of the rocks below 300 °C. Their distribution is complex and can't be explained by the Neogene fragmentation alone.

EDER, N. & NEUBAUER, F. (2000): On the edge of the extruding wedge: Neogene kinematics and geomorphology along the southern Niedere Tauern, Eastern Alps. - *Eclogae geol. Helv.*, 93: 81-92.