Inside the Gurktal nappes – A modified tectonic and lithostratigraphic concept

Iglseder, C. & Schuster, R.

Department of Hard-Rock Geology, Geological Survey of Austria, Neulinggasse 38, A-1030 Vienna, Austria
(christoph.iglseder@geologie.ac.at; ralf.schuster@geologie.ac.at)

The Gurktal nappes represent a part of the Austro-Alpine superunit. They extend over the geographic region of the Gurktal Alps, located in the southern part of Austria (Styria, Carinthia) and form an area of around 4000 sqkm. Historically the Gurktal nappes are a key area in understanding of Alpine tectonics where nappe-stacking has been early mentioned (HOLDHAUS, 1921). Studies of several authors followed during the 1920s to 1950´s (e.g. SCHWINNER, THURNER, STOWASSER, TOLLMANN, BECK-MANNAGETTA) giving base-descriptions of rock types and lithological units. During the 1970´s to 1990´s (e.g. PISTOTNIK, VAN GOSEN, NEUBAUER, FRIMMEL, LÖSCHKE, KRAINER) the view on the Gurktal nappes was expanded by works on lithostratigraphy, tectonics (NEUBAUER & PISTOTNIK, 1984), petrology, geochronology and structural geology. Hitherto a synthesis is missing.

Tectonically the Gurktal nappes are part of the Drauzug-Gurktal nappe system (Thesaurus-Redaktionsteam/GBA, 2013) and represent the uppermost/top tectonic unit of the Upper Austro-Alpine nappes, underlain by the Ötztal-Bundschuh nappe system to the W and by the Koralpe-Wölz nappe system to the N, E and SW. The lithologies are composed of Palaeozoic metavulcanites and metasediments as well as mica-schists and gneisses, transgressively overlain by Carbono-Permo-Mesozoic (meta-) sediments. Based on new comments on the Lithostratigraphic Chart of Austria (Volume 1 – Palaeozoic Era (them) – HUBMANN et al., 2013) a lithostratigraphic model for the Gurktal nappes can be shown. In this context we discuss the conceptional idea of a classification in lithodems and complexes (lithodemic units). Comments on the Geological Map of Salzburg 1:200.000 (PESTAL et al., 2009) and the succession of tectonic units in the Gurktal nappes (Thesaurus-Redaktionsteam/GBA, 2013) give evidences for a modified tectonic model. From substratum to top, indicated by metamorphic grade, age and rock characteristics six nappes can be divided: a group of basal mica-schist nappes, the Murau nappe, the Phyllonite zone, the Pfannock nappe, the Stolzalpe nappe and on top the Ackerl nappe. The geologic/tectonic evolution can be divided in two main events: A Variscan event during Carboniferous indicated by white mica Ar/Ar-cooling ages, followed by an Eoalpine event during Cretaceous times. Several data in the Gurktal nappes and surrounding areas show that this part of the Alpine orogen formed the upper plate during nappe-stacking in an orogenic wedge during Eoalpine subduction with a normal metamorphic gradient and maximum conditions at (upper-)greenschist-facies.

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