

Jurassic to Eocene tectonic history of the Untersberg region within the Northern Calcareous Alps: on terrestrial erosional phases, basin formation and destruction

Julian Kessler, Franz Neubauer

University of Salzburg, Dept. Geography and Geology, Salzburg, Austria

Although of high explanatory value for the tectonic evolution of Northern Calcareous Alps (NCA), the tectonic history of the Untersberg region SW of Salzburg city got less attention. This region belongs to the Upper Juvavic nappe and includes mainly uppermost Permian to Lower Jurassic strata, unconformably overlain by Upper Jurassic Plassen Limestone, which is again overlain, after an angular unconformity, by Upper Cretaceous shallow marine mainly, and Eocene deep marine strata. Our study is focused on the tectonic significance of these major breaks between these sedimentary units and brought the following preliminary results.

The Lower Jurassic Hierlatz Limestone is overlain by a monomictic breccia with either purely Hierlatz Limestone components or by polymictic breccia beds with various limestone clasts and marls with an intercalated potential paleo-soil, whereas other section include conglomerates with boulder-sized clasts. The observed brecciation gives a hint for a phase of emergence of the carbonate platform above sea level and erosion in Mid Jurassic times. This development contrasts the Middle-Upper Jurassic development of other Austroalpine units, except the purely investigated Oberalm Basal Conglomerate of the Tirolic Osterhorn nappe, exposed to the southeast of the Untersberg. This phase underlines the importance of a Middle/early Late Jurassic tectonic phase within the NCA.

Separated by an angular unconformity and bauxite lenses, the Upper Jurassic Plassen Limestone is again overlain by Upper Cretaceous strata of the Gosau Group. These relationships indicate a significant pre-Gosau northward tilting of Jurassic strata and a terrestrial erosional phase, following the Austrian tectonic phase. Furthermore, sedimentary structures like Neptunian dykes and structural evidence argue for ca. N-S extension during the initial stage of the Gosau basin subsidence. Upper Cretaceous Gosau strata are dominated by carbonate detritus derived from underlying Mesozoic strata. During the Paleogene, a significant clastic input with metamorphic components, including a detrital white mica with Cretaceous ages indicates an Austroalpine basement source. Transport indicators in siliciclastic turbiditic sandstones argue for SW-directed sediment transport during Eocene, which would also indicate a halfgraben-like tilting of Eocene strata to the SW, towards the Triassic and Jurassic strata and the presence of a normal fault in between. Interestingly, although very close to the northern margin of the NCA thrust front, the internal deformation of the Gosau strata is very weak.

Finally, the weakly deformed Gosau stratigraphic units overlie a fluvial Nagelfluh-like conglomerate, where high-grade metamorphic clasts dominate. Their clastic composition is similar with the Ramsau Conglomerate in the SW of the Untersberg. We assume, therefore, deposition from the same river, which drained a distant source like Silvretta/Ötztal basement source.