

STRUCTURAL EVOLUTION OF THE SOUTHEASTERN NORTHERN CALCAREOUS ALPS: SIGNIFICANCE OF THE MELIATA/LOWER JUVAVIC NAPPE COMPLEX AND POST-GOSAU SOUTH-DIRECTED BACKTHRUSTING

Hilberg, Sylke, Neubauer, Franz

(Dept. of Geology and Paleontology, University of Salzburg, A-5020 Salzburg, Austria; sylke.hilberg@sbg.ac.at)

The structural evolution of the southeastern Northern Calcareous Alps (NCA) has been investigated in the area of Puchberg am Schneeberg and Neukirchen (Lower Austria). Here, the Upper Juvavic (Schneeberg) nappe overlies the combined Meliata/Lower Juvavic nappe complex and the Tirolic nappe complex. The Tirolic nappe complex is in primary contact to the Early Paleozoic basement exposed within the Grauwackenzone.

The present tectonic structure is the result of several stages of deformation which developed between early Late Cretaceous and Neogene. An early Late Cretaceous (pre-Gosau) stacking of the Schneeberg nappe onto the Meliata units, which include the Florianikogel and Geyerstein nappes, and over the Tirolic nappes occurred under semiductile deformational (deformation phases D1, D2) and low-grade metamorphic conditions. A flat-lying foliation parallel to nappe boundaries and W- to WNW-trending stretching lineations were formed. At least final stages (D2) resulted in ESE-directed extension of the assembled nappe complex. Formation of Gosau basins onto the assembled nappe stack occurred after Cretaceous metamorphism. No clear evidence was found for corresponding basin formation structures. However, post-Gosau deformation phases dominate the present-day structure. A structural succession includes, in part consistent with previous work in other sectors the Northern Calcareous Alps and with deformation within the Vienna basin:

D3 represents a phase of south-directed back-thrusting combined with N-S shortening which is characterised through south-directed backthrusts at the southern margin of the NCA and south-vergent E-W-trending folds with hinge zones in the Tirolic Hengst- and Edenhof-windows and in the Grünbach-Neue Welt syncline. We interpret the formation of the Hengst- and Edenhof windows as result of S-directed blind thrusting (Fig. 1). Slickenside data measured along the southern margin of the NCA are consistent with the south-directed movement. We interpret this phase of backthrusting to be related to N-directed emplacement of the NCA thrust wedge onto the European lithosphere, accomodating the critical angle of taper and forming a pop-up structure.

D4 is a N-S compressional phase which is shown in N-directed, S-dipping thrusts. It is followed by NW-SE-compression D5, represented by major NE-trending thrusts. D6 is a NE-SW-oriented compressional phase with NW-trending thrusts and N-striking dextral strike-slip faults.

A subsequent E-W-extensional stage represented through NW-trending normal faults has been identified as D7. The youngest deformation in the area is a pahse of ENE-WSW oriented compression which is shown in E-trending dextral strike-slip faults.

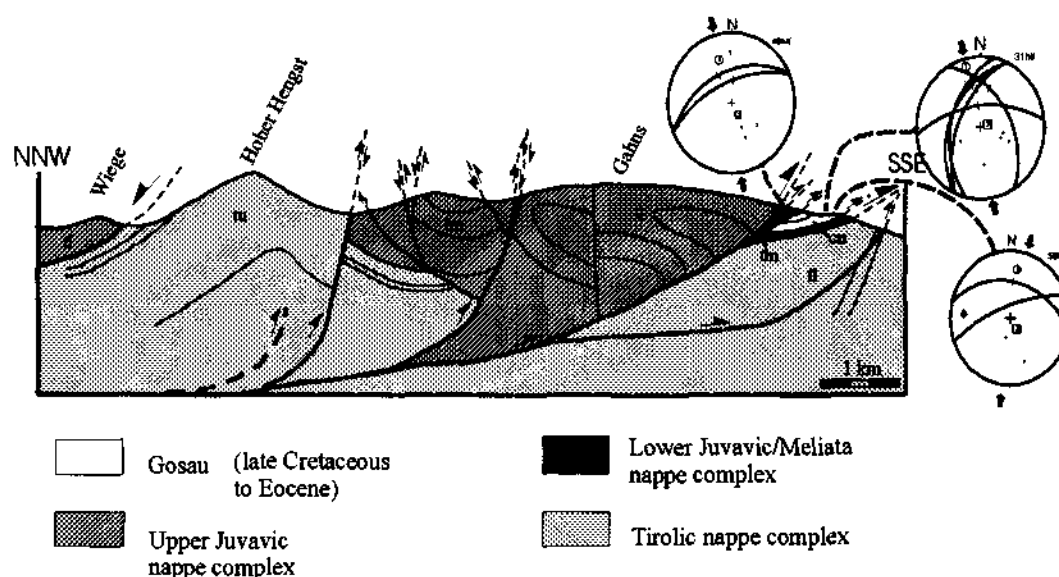


Fig. 1: Ca. N-S oriented cross-section through the southeastern Northern Calcareous Alps displaying structures related to S-directed back-thrusting and N-S shortening.