

## Clay mineralogy of a 10 Ma interval in the NW Tethyan Upper Cretaceous (Postalm, Austria)

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In this study, the changes in clay mineralogy of Upper Cretaceous sediments of the Northern Calcareous Alps over a time span of 10 Ma were investigated. The Upper Santonian to Upper Campanian Postalm section (Gosau Group, Nierental Formation, Austria) comprises more than 180 m of alternating and cyclic pelagic limestones and marlstones with a distinct CORB (Cretaceous Oceanic red Beds) facies. The section was logged bed-by-bed, a total of 369 samples were taken for sedimentological and stratigraphical investigations. Selected samples were investigated for clay minerals as proxies for palaeoclimatic conditions. Chlorite and illite are interpreted as indicators for predominantly physical weathering during cooler palaeoclimate, whereas smectite and kaolinite are indicators for predominantly chemical weathering under more warm-humid climate.

The limestones and marlstones were treated with hydrogen peroxide and subsequently the clay fraction was separated by sedimentation. The clay fractions were further treated with different saturations (Mg-ions, K-ions, ethylene glycol and glycerol), analyzed with x-ray diffraction and quantified.

Results show that the clay fractions mainly consist of illite (54–76%), 10–31% smectite, 6–17% chlorite and 4–13% kaolinite. The amount of smectite increases towards the middle of the section, whereas kaolinite is decreasing. Up the section the amount of smectite decreases and kaolinite increases again. This mineralogical change could indicate a shift from a more humid climate (late Santonian–early Campanian) to a dryer climate in the middle part of the succession (middle Campanian) and then back again to a more humid climate (late Campanian).