

**Multitasking: An integrative high resolution project
(Southern Alps, Northern Italy)**

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A new Cretaceous project will start on the 1st January of 2008 with a duration of 3 years. 22 scientists of 7 Nations will work together. It is a cooperation project between the National History Museum Vienna and the Naturmuseum of South Tyrol in Bozen. It is funded by the Austrian Science Fund under the number FWF-Project P20018-N10.

The Mediterranean palaeogeographic domain is characterized by microplates located in the middle of the Tethyan oceanic corridor between the African and European landmasses. The Southern Alps are a Northern Italian chain that emerged during the deformation of the passive continental margin of the Adriatic. Lower Cretaceous deposits form an important element of the Southern Alps and especially of the Dolomites. Surprisingly, one of the most complete, most fossiliferous and best outcropping Lower Cretaceous localities of Europe has not yet been studied sufficiently. We would like to take the opportunity to extract information from this exciting, unique section by using modern integrative methods. The main, starting locality within the herein proposed project is located in huge outcrops located at the southern margin of the Puez Plateau. It is located within the area of the Puez-Geisler Nature park in the northern part of the Dolomites (Trentino – Alto Adige; South Tyrol).

The main investigation topics of the submitted project within the above-described framework are the biostratigraphic, palaeoecological, palaeobiogeographic, lithostratigraphic, cyclostratigraphic and magnetostratigraphic development of the Early Cretaceous of the Puez area. This area is meant to have the potential to become a key section within the Dolomites and has a connecting and intermediate position on the Alpine-Carpathian microcontinent and furthermore an intercessional position in the European Tethyan Realm. Further topics of investigation are the original position and environmental conditions of the sedimentation area. This raises the question of whether the ammonite levels are autochthonous or allochthonous. The answers we expect are essential to reach geodynamic, palaeoceanographic and palaeobiological conclusions. This further leads to the question of the original water depths during the formation of the sediments. Finally, a new understanding about the habitat and the palaeobiology of Alpine Cretaceous ammonites is expected. As a multitasking project, one aim is to underline a crucial fact in working within Lower Cretaceous sediments worldwide: interdisciplinary collaboration with other scientists is essential. Producing major results with a broad impact requires using tools such as isotopes, magnetostratigraphy, cyclostratigraphy along with specific macrofossil groups like ammonites, belemnites, brachiopods, microfossil groups like radiolarians and foraminiferans, as well as nanofossils. This combination will provide a picture of the Lower Cretaceous sea level changes, allow conclusions to be drawn on palaeoclimate and yield results on the biostratigraphic age coupled with more stable, exact ages resulting from the well-established techniques of magnetostratigraphy. In line with the integrative starting point of the proposed project, the ultimate aim is to establish a new European key section for Cretaceous workers through the full range of interdisciplinary fields of palaeontology in the heart of Europe.

We will combine investigations on different fossil groups within fields of isotopic, magnetostratigraphic, cyclostratigraphic and geochemical analysis to extract the Early Cretaceous history of environmental changes as displayed by the sea level and climate; they combined this with calibrating ammonite biostratigraphy

and magnetostratigraphy through isotopes.

**Nutzhof - A new key section for the Jurassic -
Cretaceous boundary (Klippenbelt, Lower Austria)**

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The Nutzhof section, 5 km north of Hainfeld, comprises an 18 metre long succession of strongly tilted, inverse, well-bedded intercalation of marls and limestone. At the base marls and marly limestone bands dominate, being replaced by increasingly pure limestones towards the top. The deposition of the limestones, marly limestones and marls in this interval occurred during depositional unstable conditions.

The Austrian Klippenbelt is in this area a small band of Upper Jurassic to Lower Cretaceous sediments from 200-500 m breadth. It is surrounded by mighty sediments of the Rhenodanubian Flysch Zone. Tectonically, the outcrop is situated only 5 km north of the main border of the Rhenodanubian Flysch Zone and the more southern Northern Calcareous Alps. The log at Nutzhof contains 18 m of inverse, cm to dm beds showing at meter 7 (NU 7.0) the Jurassic-Cretaceous boundary. The stratigraphic investigation of the micro- and nanofauna revealed that the Nutzhof section comprises sedimentary sequence of Early Tithonian to Middle Berriasian in age. The ammonites from the lower part strengthen these results. The upper part shows only aptychi but is barren of ammonites. The fact that the Jurassic-Cretaceous boundary is detected in this outcrop and the detailed biostratigraphy makes a magnetostratigraphic study reasonable.

The sediments, marls to limestones, studied at the Nutzhof section in the Klippenbelt of are mainly wackestones, packstones or mudstones in their structures. Fine-grained micrite with pelagic microfossils (calpionellids, calcareous dinoflagellates, radiolarians and nanofossils) are common in open-marine environments. Rare skeletal debris derived from fragmented and disintegrated shells of invertebrates (benthic foraminifers, echinoderms, molluscs) derived from shallower environments. Microfacies are typical for basal settings which could be situated also in tectonically influenced subsiding shelf areas. The stratigraphic investigation of the micro- and nanofauna revealed that the Nutzhof section comprises sedimentary sequence of Early Tithonian to Middle Berriasian in age. The main and most important dinoflagellate and calpionellid associations and zones could be detected by their index fossils.

Additionally ammonites were collected at the Nutzhof locality in the eastern part of the Austrian Klippenbelt. The cephalopod fauna correlated with micro- and nanofossil data from the marl-limestone succession indicates Early Tithonian to Middle Berriasian age (*Hybonotoceras hybonotum* Zone up to the *Subthurmannia occitanica* Zone).

The ammonite fauna comprises 6 different genera, each apparently represented by a single species. The occurrence at the Nutzhof section is dominated by ammonites of the perisphinctid-type. Ammonitina are the most frequent component represented by *Subplanites* and *Haploceras*, followed by the lytoceratids represented by *Lytoceras* and *Leptotetragonites*, and the phylloceratids represented by *Ptychophylloceras* and *Phylloceras*. The cephalopod fauna consists only of Mediterranean elements.