



Lower Cretaceous Puez key-section in the Dolomites – towards the mid-Cretaceous super-greenhouse

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Investigations on different fossil groups in addition to isotopic, paleomagnetic and geochemical analysis are combined to extract the Early Cretaceous history of environmental changes, as displayed by the sea level and climate changes. Results on biostratigraphy are integrated with other dating methods as magnetostratigraphy, correlation and cyclostratigraphy. The main investigation topics of the submitted project within the above-described framework are the biostratigraphic (Lukeneder and Aspmair, 2006, 2012), palaeoecological (Lukeneder, 2008, 2012), palaeobiogeographic, lithostratigraphic (Lukeneder, 2010, 2011), cyclostratigraphic and magnetostratigraphic development of the Early Cretaceous in the Puez area.

The main sections occur in expanded outcrops located on the southern margin of the Puez Plateau, within the area of the Puez-Geisler Natural Park, in the northern part of the Dolomites (South Tyrol, North Italy). The cephalopod, microfossil and nannofossil faunas and floras from the marly limestones to marls here indicates Hauterivian to Albian/Cenomanian age.

Oxygen isotope values from the Lower Cretaceous Puez Formation show a decreasing trend throughout the log, from -1.5‰ in the Hauterivian to -4.5‰ in the Albian/Cenomanian. The decreasing values mirror an increasing trend in palaeotemperatures from ~ 15-18°C in the Hauterivian up to ~25-30 °C in the Albian/Cenomanian. The trend probably indicates the positive shift in temperature induced by the well known Mid Cretaceous Ocean warming (e.g., Super-Greenhouse).

The cooperative project (FWF project P20018-N10; 22 international scientists): An integrative high resolution project. Macro- and microfossils, isotopes, litho-, cyclo-, magneto- and biostratigraphy as tools for investigating the Lower Cretaceous within the Dolomites (Southern Alps, Northern Italy) –The Puez area as a new key region of the Tethyan Realm), is on the way since 2008 by the Natural History Museum in Vienna and the 'Naturmuseum Südtirol' in Bozen, Southern Tyrol. Producing major results with a broad impact requires using tools such as facies analysis supported by lithological, sedimentological and chemical characteristics, isotope and magnetic properties as well as fossil record (ammonites, belemnites, brachiopods, echinoids, planktonic foraminifera, radiolarians, nannofossils, calcareous dinoflagellates, calpionellids). Foraminiferal study provides the zonal subdivision of the Puez section from Valanginian – Hauterivian gorbachikellids and praehedbergelids (*Hedbergella semielongata* Zone), Barremo-Aptian praehedbergelids (*Blesusciana kuznetzovi* Zone), Aptian hedbergelids of *occulta* – *aptiana* – *praetrocoidea* group, Early Late Aptian pseudo-planispiral foraminifera (*Praehedbergella luterbacheri* and *Globigerinelloides ferreolensis* Zones), important marker species of *Hedbergella trocoidea* and *Paraticinella bejaouaensis* for the Late Aptian zone, Early Albian microperforate hedbergelids (*Hedbergella planispira* Zone), Mid Albian ticinellids (*Ticinella primula* Zone), advanced ticinellids like *Ticinella roberti* etc. (*Biticinella breggiensis* Zone), Latest Albian rotalliporids (*Rotalipora appenninica* Zone) up to Early Cenomanian appearance of *Thalmaninella* (*Rotalipora*) *globotruncanoides*.

Results of this integrated study will be used for both, the precise biostratigraphy of the sequence studied as well as for the paleoenvironmental reconstruction.

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