



New integrated data (isotopes, lithology, geochemistry, ammonites etc.) from the Lower Cretaceous Puez key-section in the Dolomites (Southern Alps; N-Italy; FWF project P20018-N10)

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Investigations on different fossil groups within fields of isotopic, magneto- and cyclo-stratigraphic and geochemical analysis are combined to extract the Early Cretaceous history of environmental changes as displayed by the sea level and climate. This results in calibrating ammonite biostratigraphy and magnetostratigraphy through isotope data. 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.

The main locality within the 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). Lower Cretaceous ammonoids ($n = 640$) were collected at the Puez locality in the Dolomites of Southern Tyrol (Lukeneder and Aspmaier 2006). The cephalopod fauna from the marly limestones to marls here indicates Late Valanginian to Late Albian age. The underlying Biancone Formation (Maiolica Formation) is of Early to Late Valanginian.

The ammonoid fauna comprises 48 different genera, each apparently represented by one to three species. The complete occurrence at the Puez section is dominated by the Phylloceratina (30%) and the Ammonitina (34%). Phyllopacyceras (17%) and Phylloceras (13%) from the Phylloceratina are the most frequent components, followed by Lytoceras (12%) from the Lytoceratina, and Barremites (10%) and Melchiorites (8%) from the Ammonitina. The following index ammonites could be detected so far: the latest Valanginian *Criosarasinella furcillata* (*C. furcillata* Zone and Subzone), for the middle Early Hauterivian *Olcostephanus* (*Jeannoticeras*) *jeannoti* (*O.*(*J.*) *jeannoti* Subzone), and *Toxancyloceras vandenheckii* for the early Late Barremian (*T. vandenheckii* Zone). The ammonoid fauna contains only descendants of the Mediterranean Province (Tethyan Realm). Most affinities of the cephalopod fauna are observed with faunas from the adjacent areas of Italy (Lessini Mountains, Belluno, southern Trento Plateau), the Northern Calcareous Alps and the Bakony, Geresce and Mecsek Mountains of Hungary. This is explained by the neighbouring position of the latter areas during the Early Cretaceous on the Apulian/Adria block and the Alpine-Carpathian microplate. Lower Cretaceous (Valanginian-Albian) deposits of the Puez locality in yield remarkable amounts of specimens of different ammonoid taxa showing unique epifaunal encrustations by the scleractinian, ahermatypic solitary coral *Cycloseris Lamarck*, 1801 (Lukeneder 2008). The pattern of infestation clearly documents a preference of the adherent taxa for the outer shell surface of the ammonoids, whereas the inner surface remains barren. The exact stratigraphically dating of the ammonoid fauna allows synchronously to clear the age of the infested corals and the autecological history of this new ammonoid/coral palaeocommunity. The symbiotic ammonoid-coral relation from the Dolomites exists from the Valanginian to Albian times.

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 Southern Tyrol ‘Naturmuseum Südtirol’ in Bozen. 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 nannofossils. 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.

Lukeneder A. 2008. The ecological significance of solitary coral and bivalve epibionts on Lower Cretaceous (Valanginian-Aptian) ammonoids from the Italian Dolomites. *Acta Geologica Polonica*, 58/4, 425-436.

Lukeneder, A., Aspöck, C. 2006. Stratigraphic implication of a new Lower Cretaceous ammonoid fauna from the Puez area (Valanginian - Aptian, Dolomites, Southern Alps, Italy). *Geo.Alp*, 3, 55-91.