eck-Formation als Hauptquelle für die akkumulierten Molasseöle aus, wobei eine Verzerrung des Gesamtöl-Datenclusters als Beitrag der Dynow-Formation interpretiert wird.
Generell sind die Unterschiede in den Ölzu-sammensetzungen gering, dies weist auf ein gemeinsames Muttergestein (Schöneck-Formation) sowie eine Homogenisierung während der lateralen Migration hin. Dennoch ermöglichen Biomarkerdaten eine regionale Unterteilung in verschiedene Ölgruppen.

- Die westliche Gruppe (K, Ktg, R) ist charakterisiert durch eine relativ geringe Reife (geringe MPI und Ts/Tm Werte), hohe Hopan/Moretan Verhältnisse sowie hohe C_{29}-Steran und Schwefelgehalte. Die Einheit „b" der Schöneck Formation bildet hier wahr-scheinlich das Muttergestein.
- Die Trattnach Öle sind schwerer (>30° API) und entstammen einem Muttergestein hoher Reife (~0,9%Rr).
- Die Öle aus dem Feld Voitsdorf und der zentralen Gruppe zeigen eine Zunahme der Reife gegen Norden (MPI Werte). Unterschiede im Ts/Tm- sowie im Diasteran/Steran-Verhältnis deuten Faziesänderungen (Tongehalt) im Muttergestein an.
- Die Öle der östlichen Gruppe zeigen ebenfalls einen Anstieg der Reife gegen Norden.

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Integrated Facies-Analysis in the Oligo-Miocene of the North Alpine Foreland Basin

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Micropaleontology has always been a highly effective tool in hydrocarbon exploration. It provides information on biostratigraphy and thus helps interpreting seismic images by correlating sediments from different wells. Additionally, micropaleontology offers information about facies distribution, depositional environment, paleogeography and paleoceanography. Thus, having this source of information available is crucial for detecting potential source and reservoir rocks.
Currently, the Rohöl-Aufsuchungs AG (RAG) is facing new ventures of exploration in the southern North Alpine Foreland Basin (NAFB) comprising the Foreland, the Imbricated and the Overthrusted Molasse. This area adjacent and below the Alps is heavily tectonised and imbricated. To assure efficient drilling, exploration will have to rely on the means of micropaleontology to unravel the relations between these highly deformed and dislocated deposits and their connection to the undisturbed northern part of the basin.
Micropaleontology offers various reliable tools to face these problems. By faunal, floral and geochemical analyses it helps to reveal information on biostratigraphic and isotopic correlation between wells, facies distribution and change, paleogeographical conditions and paleoceanographic parameters like productivity, water column stratification, salinity and water temperature. Thus, it seems useful to apply these tools to the NAFB.
A project co-funded by the RAG and the Comission for the Paleontological and Stratigraphical Research of Austria intends to provide a high-resolution biostratigraphy for the Late Oligocene - Early Miocene of three selected wells in the NAFB. These wells will be analysed in terms of geochemistry based on stable isotopes ($\delta^{18}O$, $\delta^{13}C$), trace elements (Mg/Ca) and total organic carbon (TOC) measurements. Several reference wells along a N-S-oriented transect in the Upper Austrian NAFB will be integrated and compared with the high-resolution patterns. Additionally, analyses of foraminiferal and dinoflagellate assemblages will provide information on facies distribution and past productivity. The expected results will lead to the establishment of standard curves for the Upper Oligocene and Lower Miocene deposits which in turn will allow a new reconstruction of the paleoceanographic and paleogeographic setting in the NAFB.

Integrated biostratigraphy and geochemistry of the Ottnangian stratotype section

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The stratotype section for the regional Central Paratethys stage of the Ottnangian (Early Miocene, mid-late Burdigalian) is located at Ottnang-Schanze in the North Alpine Foreland Basin of Upper Austria. About 10m of silty clays with layers of fine sand („Schlier") are exposed with two faults running through the succession. A new study on the section combines biostratigraphic information from dinoflagellates, foraminifers and calcareous nannoplankton as well as geochemical data ($\delta^{18}O$, $\delta^{13}C$, TOC, S, $CaCO_3$ content).
The studied samples revealed 70 species of dinoflagellate cysts including several biostratigraphic markers characterizing the Burdigalian (e.g. *Exochosphaeridium insignia*, *Nematosphaeropsis downiei*, *Sumatradinium soucouyantiae*, *Sumatradinium druggii*, *Hystrichokolpoma reductum* and *Cerebrocysta poulsenii*). The recorded assemblages are equivalent to the dinocyst zone Ein of Jiménez-Moreno et al. (2006) and range within dinoflagellate zones DN3 of de Verteuil and Norris (1996) and D17a of Lourens et al. (2005).
Investigations of foraminifers >125ìm revealed well preserved assemblages with a significant increase in total numbers of specimens up-section. Benthic foraminifers include high numbers of *Lenticulina inornata-melvilli* together with the lower Ottnangian index taxa *Amphicoryna ottnangiensis* and *Sigmoilopsis ottnangiensis*. Planktic foraminifers are dominated by globigerinids, e.g. *Globigerina praebulloides*.
The samples are rich in well preserved calcareous nannoplankton with high amounts of *Coccolithus pelagicus* (Wallich) Schiller. The frequent occurrence of *Helicosphaera ampliaperta* Bramlette & Wilcoxon and the absence of *Sphenolithus heteromorphus* Deflandre suggest a stratigraphic correlation with upper NN2-NN3 nannoplankton zones (Martini 1971).
Geochemical measurements on bulk samples revealed $\delta^{18}O$ values from -5.31‰ to -4.42‰, $\delta^{13}C$-values range from –0.25‰ to +0.69‰. Both isotopic signals show no clear trend. TOC values vary within a very narrow range between 0.31% and 0.45%, the carbonate content ranges from 26-35%. Sulfur data range from 0.06% to 0.49% showing a slight trend towards higher values up-section.
Further studies on the samples with respect to stratigraphy, geochemistry and palecology will lead to an integrated description of the Ottnangian stratotype section. The results will contribute

to a better understanding of the last transgressive phase of the Central Paratethys in the western North Alpine Foreland Basin.

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Tectonic boundaries in the southern Ötztal-Stubai-Complex: Kinematics, PT-conditions and timing of deformation

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The recognition of a significant Cretaceous metamorphic imprint in large parts of the Austroalpine crystalline basement had revolutionized the view on the tectonometamorphic evolution of the Eastern Alps 20 years ago (Purtscheller et al. 1987; Thöni & Hoinkes 1987). Whereas the earliest concepts regarded the Cretaceous event as a „static“ process of heating and re-equilibration, later studies also showed a significant deformational imprint (Sölva et al. 2005). These results suppose the subdivision of tectonic units within the Austroalpine crystalline complexes. However, the spatial position, metamorphic conditions, kinematics and age of tectonic activity at supposed boundaries are matter of discussion and need further investigation.

The Cretaceous tectonic boundary between i) the predominantly pre-Cretaceous metamorphic Ötztal-Stubai-Complex (OSC) and ii) the Cretaceous amphibolite to eclogite facies metamorphic Texel Complex (TC) has been clearly characterized in the central portion of the Schneeberg-Monteneve Unit (SC) (Sölva et al. 2005), but becomes ambiguous in its lateral SW and NE continuation. In order to constrain Cretaceous deformation processes in the hanging wall of the TC, three sections were investigated. In the i) Ferwalltal area structural and mineral compositional data document the interference of a predominant NW dipping amphibolite facies mylonitic foliation with a later N-dipping, strongly partitioned greenschist facies mylonitic foliation. Both indicate Top W shear deformation. In contrast, at the ii) Timmelsjoch mainly fold interference patterns were observed, which show only localized shear zones parallel to fold axial planes. In order to add relative age constraints, the deformational imprint of diabase dikes of presumed Permian-Triassic age (Purtscheller & Rammlmair 1982) has key importance. Due to strain partitioning, they may occur either discordantly cutting predominant earlier deformation structures, or as mylonites. Heterogeneity in deformation intensity also characterizes the iii) Matsch Unit W of the TC. Here, pegmatite-intrusions of Permian age - as constrained by Sm-Nd-garnet data - provide an excellent marker for pre- and post-Permian deformation. Multi-stage Cretaceous deformation covers folding by E-W trending axes and contemporaneous Top W shearing at lowermost amphibolite facies grade, followed by folding by NNE-SSW trending axes and again Top-W shearing at lowermost greenschist facies conditions.

The regional distribution of the described structural features in correlation with petrological and geochronological data allows identification of tectonic boundaries within the OSC, supposedly related with the exhumation of the Cretaceous eclogite facies rocks from the TC.

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New geochronological data of Kfs augengneiss in Ötztal - Stubai -Crystalline Complex, Reschenpass (Italy)

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In the S of the border triangle Switzerland - Austria - Italy, beneath the Mesozoic series of Piz Lad (2808 m) an exposed Kfs augengneiss [Qtz + Kfs + Pl + Ms + Grt + Ser + Ap + Zrn ± Bt ± Chl ± Ill ± Rt ± opaque ± Cal ± Gr] was sampled for both U/Pb (zircon) and Rb/Sr (white mica) age dating. It is one of numerous occurring augengneisses in the Ötztal – Stubai Crystalline Complex (ÖSC) and is intercalated in Ky - St - mica - schist/paragneiss.

The CL image of separated zircons illustrates magmatic crystallization, due to existing oscillatory zonings. Some of them feature recrystallisation. 29 in situ analyses of 23 zircons plot concordantly and define several zircon age ‘groups’, with the youngest zircon group yielding an age of 573 ± 10 Ma. This age is regarded as the crystallisation age of the protolith, with older zircons representing inherited xenocrysts. Altogether six zircon groups could be classified in this rock: [I] 573 ± 10 Ma (MSWD = 0.76; n = 6); [II] 677.8 ± 7.3 Ma (MSWD 1.60; n = 7); [III] 703.5 ± 9.8 Ma (MSWD 0.44, n = 2); [IV] 749 ± 19 Ma (MSWD = 4.9; n = 5), [V] 839 ± 12 Ma (MSWD = 0.13; n = 2) and [VI] 1960 ± 48 Ma (MSWD = 25; n = 3)

All age groups fit well into the regional age pattern as known from published data for the ÖSC, though this sample yields the oldest crystallization age known so far from all dated augengneisses/ orthogneisses. On the assumption that the 573 ± 10 Ma age dates the magmatic crystallization of the rock it implies that the metasedimentary rocks have a minimum Late Precambrian depositional age.

The Rb/Sr Ms-WR age of the orthogneiss is 328 ± 6 Ma (WR-Kfs-Ms1-Ms2) and confirms regionally known age data. Rb/Sr Ap-Fsp and the Rb/Sr Ap-whole rock regression reveals much younger ‘ages’ of 201.9 ± 2.2 Ma and of 241.7 ± 0.3, respectively, indicating either slow cooling or partial re-opening of the Rb/Sr isotope system in the augengneiss subsequently to Hercynian cooling.