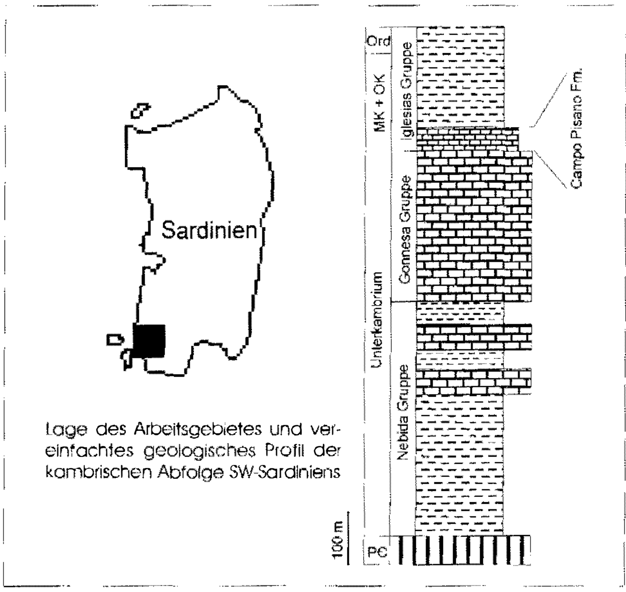


Lage des Arbeitsgebietes und vereinfachtes geologisches Profil der kambrischen Abfolge SW-Sardiniens

Campo Pisano Fm. allein für detaillierte Schlussfolgerungen zur bthymetrischen Entwicklung des Sedimentationsraumes unzureichend. Die bifazielle Charakteristik der verschiedenen Lithotypen dagegen belegt unteschiedliche Phasen des Plattformniedergangs, die darin sowohl regional korrlierbar als auch mit den reliktisch erhaltenen deutschen und anderen karbonatischen Kambriumvorkommen vergleichbar sind.

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## Quarternary climate changes and tectonic driven sedimentation on the SE-ern part of the Pannonian-Basin , Hungary

Nádor, A., Lantos, M., Kercsmár, Z., Thamó-Bozsó, E., Müller, P., Tóth-Makk, Á. Jámbor, Á. & Bulla, J.

Geological Institute of Hungary, Stefánia 14, H-1143 Budapest, Hungary, kercsmar@mafi. hu

During the Late Neogene, especially in the Plio-Pleistocene, the Pannonian Basin was an intramontane basin out of any marine influence. Therefore climate, source area uplift, tectonic activity and basin subsidence were the main allogenic controls determining the fluvial architecture, and eustasy can be neglected in sequence stratigraphic interpretations.

By integrated tectonical, sedimentological and stratigraphic methods (core and well-log evaluations, high-resolution stratigraphy, magnetostratigraphy and biostratigraphy) we have studied the cyclic Pleistocene fluvial sediments.

The starting point of our research are two cored boreholes (Dévaványa and Vésztő) in the Körös-subbasin at the eastern part of the Pannonian Basin. These boreholes exposed the fluviolacustrine, cyclic Pliocene yellow-grey mottled clay, silt and fine-grained sandstone sequences of 670 and 800 m thickness respectively, overlain by 410-500 m thick Pleistocene sediments with a similar lithology. Magnetostratigraphic measurements were previously carried out which revealed sedimentation from 0 to 4,2 Ma. The Plio/Pleistocene boundary is marked out at the Matuyama/Gauss boundary (2.58 Ma) at 416 m at Dévaványa and 482 m at Vésztő.

The identification of the Pleistocene sedimentary cycles in the studied boreholes was based on a very detailed grain size distribution analyses, of which data statistically filtered sand distribution curves were produced. It was revealed that the quasi-cyclic variation of the sand distribution is 100 ky above 1.2 Ma, and 40 ky below it which data shows an orbitally forced control on the sedimentary cycles, correspondinc to 5[th] order Milankovich cycles.

Tectonic processes are the other major feature which has been driving sedimentation on the basin. Tectonic or/and isostatic uplift of source area (most important terrain is the Apusen Mts.) determined composition and grain size of sediments. This tectonic megacycle which connected subduction activity of Eastern Carpathian has given the base process since Late Badenian. Uplift of Apusen Mts. combined the climatic cycles and basin subsidence resulted the differential sedimentation on the Körös Basin between Early Pleistocene and Late Pleistocene.

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## Die Genese Oligo-Miozäner zirkumalpiner Karbonate und deren klimagekoppelte Steuerung

Nebelsick, J.H.

Inst. für Geologie und Paläontologie, Sigwartstr. 10, D-72076 Tübingen

Oligo-Miozäne Karbonate im zirkumalpinen Raum zeigen große Unterschiede bezüglich ihrer Komponentenzusammensetzung, Faziesverteilung sowie räumlicher und stratigraphischer Verbreitung. Im Rahmen des Sonderforschungbereichs 275 in Tübingen wurden diese Karbonate untersucht um mögliche klimagekoppelte Steuerungsprozesse in deren Bildung zu erkennen. Diese Ergebnisse werden mit Klimaproxies aus anderen Bearbeitungsmethoden verglichen. Das Untersuchungsgebiet ist von besonderem Interesse, da es am Schnittpunkt von verschiedenen paläogeographischen Gebieten liegt (z. B. im Oligozän zwischen der Tethys, Paratethys und borealen Bereich). Zwei Ereignisse von globaler Bedeutung sollten theoretisch hierbei erfaßbar werden: Die Klimaverschlechterung an der Eozän/Oligozän-Grenze, welche den Übergang von einem Greenhouse- zum Icehouse-Klima bezeichnet, sowie der Schließung der Tethys im Untermiozän.

Von den weniger bekannten und bis jetzt kaum erforschten Karbonatvorkommen wurden, unter Beteiligung von mehreren Mitarbeitern, detaillierte mikrofazielle Analysen durchgeführt. Dazu gehören die Unteroligozänen Karbonatvorkommen in Slovenien und im Unterinntaltertiär, Oberoligozäne Karbonate von Norditalien und der Molassezone nördlich der Alpen sowie Untermiozäne Kalke in Norditalien. Zur vergleichenden Gesamtbetrachtung wurden andere, bereits publizierte, Karbonatvorkommen herangezogen. Aussagen bezüglich der Oberflächenwassertemperaturen können jedoch nicht unabhängig von weiteren paläoökologischen Faktoren bewertet werden. Außerdem ergeben sich Probleme bezüglich der stratigraphische Parallelisierung disjunkter Karbonatvorkommen. Die Genauigkeit der klimatischen Aussagen ist auf grobe biogeographische Faziesverteilungen (z. B. tropisch/warm temperiert) beschränkt. In einem geringen Ausmaß können die Temperaturansprüche rezenter Organismen (z. B. kälteste Wintertemperaturen) herangezogen werden.

Die Unteroligozänen Vorkommen nördlich und südlich der Alpen sind unterschiedlich bezüglich der Corallinaceen-Diversität und dem Vorkommen von Bryozoen (im Inntaltertiär), Grünalgen (im Slovenien) und Großforaminiferen (unterschiedliche Formen); Korallen sind in beiden Gebieten vertreten. Großforaminiferen und Corallinaceen charakterisieren Oberoligozäne Karbonate wobei der direkte Vergleich durch sehr unterschiedliche Ablagerungsverhältnisse beschwert wird. Im Untermiozän sind Corallinaceen dominierte Kalke südlich der Alpen und Bryozoen dominierte Karbonate im nördlich der Alpen bekannt.

## The Aka'sai basin, an active peripheral foreland basin to the Altyn orogen, China?

NEUBAUER, F.*, GENSER, J.*, LIU, Y.*,** & GE, X.**

*Inst. of Geology and Paleontology, University of Salzburg, Hellbrunner Str. 34, A-5020 Salzburg, Austria, **College of Earth Sciences, Changchun University of Sciences and Technology, China

The ca. 50-60 km wide Aka'sai basin is located along the northern margin of eastern Altyn Mountains. The Altyn Mountains are considered to represent a major zone of transpression where India-Asia convergence is partitioned into northward growth of the Tibetan-Qaidam plateau and predominant sinistral strike-slip along the Altyn fault (e.g. MÉTIVIER et al. 1998, WITTLINGER et al. 1998). The northern boundary of the Aka'sai basin is formed by the Tarim basin and, in the east, by the Sanwei Shan which is separated from the Neogene to Quaternary Dunhuang basin adjacent to the N by a steep reverse fault. The filling of Aka'sai basin is represented by Neogene, gently S-dipping lake sediments (northern part of the basin) and recent pediments forming a frontal clastic wedge to the Altyn Mountains. Recent GPS measurements suggest present-day convergence of ca. 3 mm/year between the Tarim/Dunhuang basins and the central Altyn Mountains, and surface uplift of a similar order in the southern Aka'sai basin and at the northern slope of Altyn Mountains (BENDICK et al. 2000).
We interpret the gently S-dipping Neogene sediments of the Aka'sai basin as the result of flexure of the foreland lithosphere under the load of the Altyn Mountains, and the Sanwei Shan as a disrupted peripheral bulge to the Altyn orogen. The filling of the Aka'sai basin and its relations to the uplifting Altyn Mountains indicate rapid, ongoing surface uplift of Altyn Mountains supplying much material. These relations also suggest the presence of an active thrust fault along northern margins of the Altyn Mountains.
Consequently, the filling of the Aka'sai basin is governed by active tectonics, high relief, semiarid climate, high sediment supply and transport capacity. The filling represents a specific sort of an active, terrestrial, underfilled peripheral foreland basin. The clastic wedge along the Altyn Mountain front has an unusual regular slope along strike of the basin, with a regular inclination and comprises alluvial fans/braided rivers fed from the mountains and by cannibalization of the sediments eroded from southern sectors of the uplifting clastic wedge. The front of the clastic wedge forms the deepest depression, which also includes basin-parallel drainage and little remnant lakes. The northern area is characterized by non-deposition of sediments (except some local dunes). In comparison with other foreland basins (e.g., EINSELE 1992, SINCLAIR 1997) sedimentological features characterize the Aka'sai basin as a new sort of underfilled peripheral foreland basin within a semiarid climate where overall uplift exceeds subsidence in the foreland basin.

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## Detrital mode of sandstones and $^{40}Ar/^{39}Ar$ ages of detrital mica from the Rhenodanubian Flysch Zone, Eastern Alps: Significance for Alpine paleogeography

NEUBAUER, F., HANDLER, R., FRIEDL, G., GENSER, J. & TOPA, D.

Institut für Geologie und Paläontologie der Paris-Lodron-Universität Salzburg, Hellbrunner Str. 34, A-5020 Salzburg, Austria

Detrital mode (using the Dickinson-Gazzi approach) of all sandstone formations and $^{40}Ar/^{39}Ar$ mica ages of Lower Cretaceous to Eocene sequences constrain the tectonic and paleogeographic evolution of the central Rhenodanubian Flysch Zone (RFZ; Salzburg section), Eastern Alps. Furthermore, the Walserberg Zone (early Late Cretaceous) displays no difference to the RFZ constraining a common paleogeographic origin of both zones. Abundant monocrystalline quartz, remnants of sillimanite-bearing gneisses, and chemically unzoned minerals like garnet indicate a high-grade metamorphic terrain as the principal source for the flysch zone. However, a major proportion of carbonate clasts and carbonate cement are common in all, Early Cretaceous to Eocene, formations. There is only a subordinate variation in composition through time suggesting a rather stable hinterland over the period of deposition. Together, the detrital mode is representative for collisional orogenic belts. Mafic/intermediate volcanic clasts are more abundant in the Lower Cretaceous Tristel Formation, whereas some acidic volcanic clasts occur within younger formations. Decimetre-thick altered tuff layers of primary mafic composition are common in early Cretaceous, late Campanian/Maastrichtian, and Paleogene formations. The alternation of sandstone-rich formations with sequences dominated by pelagic sediments, mainly marls, suggests that sandstone-rich formations may be interpreted as low-stand clastic wedges. The area of deposition was largely above the carbonate compensation depth.
$^{40}Ar/^{39}Ar$ ages (single grains) of detrital white mica from together four sandstones samples (together ca. 80 grains) of the Walserberg, Reiselsberg and Altlengbach Formations indicate predominant (> 70 percent) Variscan sources with ages between 330 and 299 Ma. Subordinate clusters include Cadomian (670 - 547 Ma), early Variscan (c. 360 Ma), late Permian to Triassic (240 - 224 Ma), Jurassic (192 - 154 Ma), early Cretaceous (c. 145 - 135 Ma) and late Cretaceous ages (c. 110 Ma).
The ca. 2500 meters thick section of flysch sediments was deposited within a period of ca. 80 million years. This indicates a rather long-term stability of the depositional realm which is not usual in accretionary wedges and convergent plate margins. A regular change between clastic wedges which are dominated by sandstone/graywacke and marl section appears to represent an important feature of the RFZ. The change may indicate changes in clastic input or eustatic sea level changes. Low-stand sea level may result in low-stand clastic wedges at the continental toe. At least for the Cretaceous portion of the section, the regular change appears to reflect third-order sea level changes.
The new data from the Rhenodanubian hinterland constrain the presence of a relatively stable, metamorphic/magmatic hinterland which persisted from Lower Cretaceous until Eocene. The main modulation is the variation in volcanic clasts which are more dominant in the Lower Cretaceous Tristel Formation. The composition of the hinterland can be reconstructed from $^{40}Ar/^{39}Ar$ mica