

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?

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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.

BENDICK, R., BILHAM, R., FREYMUILLER, J., LARSON, K. & YIN, G. (2000): Geodetic evidence for a low slip rate in the Altyn Tagh fault system. - *Nature*, **404**: 69-72.

EINSELE, G. (1992): *Sedimentary Basins. Evolution, Facies and Sediment Budget*. - 1-628, (Springer-Verlag) Berlin Heidelberg New York.

MÉTIVIER, F., GAUDEMER, Y., TAPPONNIER, P. & MEYER, P. (1998): Northeastward growth of the Tibet plateau deduced from balanced reconstruction of two depositional areas: The Qaidam and Hexi Corridor

basins, China. - *Tectonics*, **17**: 823-842.

SINCLAIR, D.H. (1997): Tectonostratigraphic model for underfilled peripheral foreland basins: an Alpine perspective. - *Bull. Geol. Soc. Amer.*, **109**: 324-346.

WITTLINGER, G., TAPPONNIER, P., POUPINET, G., MEI, J., DANIAN, S., HERQUEL, G. & MASSON, F. (1998): Tomographic Evidence for Localized Lithospheric Shear Along the Altyn Tagh Fault. - *Science*, **282**: 74-76.

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

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Detrital mode (using the Dickinson-Gazzi approach) of all sandstone formations and ⁴⁰Ar/³⁹Ar 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 Walsberg 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.

⁴⁰Ar/³⁹Ar ages (single grains) of detrital white mica from together four sandstones samples (together ca. 80 grains) of the Walsberg, Reischelsberg and Altengbach 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 ⁴⁰Ar/³⁹Ar mica