

## PALEOGENE SEDIMENTATION AND SUBSIDENCE OF THE HELVETIC SHELF (AUSTRIA, BAVARIA)

Michael Rasser, Michael Wagneich & Werner E. Piller

The Paleogene Helvetic Shelf in Austria and Bavaria is characterized by a variety of siliciclastic and carbonate, pelagic and shallow water sediments. Especially the shallow water carbonates, which are characterized by ferrugination and glauconitization, are unique in the Eastern Alps. Carbonate particles are represented by coralline algae, nummulitid and orthophragminid foraminifera, ooids, and smaller foraminifera. The estimation of subsidence rates is based mainly on a correlation between the eustatic sea level chart and relative sea level changes, which are reconstructed from facies interpretations obtained from detailed carbonate facies analysis, paleoecological interpretations and literature data.

The Paleocene is characterized by pure siliciclastic Danian to Thanetian sediments, with first ferruginous particles occurring in the Thanetian. These sediments are overlain by massive Thanetian algal limestones, which are characterized by the presence of glauconitization and the absence of ferrugination; they can grade locally into planktonic foraminifera-bearing limestones. Heavy ferrugination started in the Ypresian. Main ferruginous particles are larger foraminifera and ooids. Glauconitization is particularly absent during the Ypresian. Only the Lutetian carbonate facies reveals a co-occurrence of glauconitization and ferrugination. The shallow water development is terminated by the end of the Lutetian. Pelagic sedimentation of the 'Stockletten' prevail during Bartonian to Priabonian time.

The described facies pattern can be related to tectonic events, sea-level changes and subsidence. The Paleocene of the Helvetic Zone in

Austria and Bavaria is characterized by a low subsidence rate and a relative sea-level fall until the Thanetian. From the Thanetian to the Early Ypresian, a relative sea-level rise occurred, but the subsidence rate is still as low as during the whole Paleocene. Tectonism at the Paleocene/Eocene boundary (known as 'Laramide 3') caused an angular unconformity between Paleocene algal limestones and Eocene ferruginous foraminiferal limestones. Some uplift is suggested by tectonic subsidence curves. During the Middle Ypresian, another relative sea-level fall and an increasing subsidence rate occurred. This regression is terminated at the Ypresian/Lutetian boundary, which corresponds to a major thrusting event within the Alpine orogen to the south. From the Lutetian to the Priabonian, the relative sea-level rose continuously, with a distinctly increasing subsidence rate starting at the Lutetian/Bartonian boundary. This subsidence event records the formation of a flexural foreland basin due to orogenic loading of the lithosphere.

*Authors' addresses:*

*Mag.Dr. Michael Rasser, Prof. Dr. Werner E. Piller, Institute of Geology and Paleontology, Heinrichstraße 26, A-8010 Graz, Austria; Dr. Michael Wagneich, Institute of Geology, University of Vienna, Althanstrasse 14, A-1090 Vienna, Austria*