The Paleocene-Eocene Boundary in Austria

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In the Eastern Alps (Austria) several marine successions, which were deposited ranging from shallow shelf to bathyal slope and abyssal basin, provide detailed records across the Paleocene/Eocene-boundary (P/E-boundary). The Frauengrube section (20 km to the north of Salzburg) originates from the **neritic northern shelf of the Penninic Basin** and exposes shallow water deposits. An erosional unconformity between an Upper Thanetian (calcareous nannoplankton Zone NP9) rhodolitic limestone and a calcareous sandstone (NP11-12) indicates a substantial break in sedimentation in the earliest Eocene, probably an effect of a major eustatic sea-level fall.

Only about 6 km to the south of the Frauengrube-section, the 250m thick Anthering-section (Rhenodanubian Flysch nappe) exposes turbidite deposits originating from the **abyssal Penninic Basin**. This section comprises Zones NP9 to NP11 and records several of the P/E-boundary events, including the $\delta^{13}C$ isotope excursion (CIE) and the acme of the dinoflagellate genus *Apectodinium (*including *A. augustum)*. During this short time a strong increase in the rate of hemipelagic sedimentation suggests enhanced continental run-off, probably an effect of both, a low sea-level and an increase in monsoonal activity. The increased influx of nutrients into the ocean caused acmes in the abundance of diatoms, radiolaria and dinoflagellates. Agglutinated foraminifera occur only sporadically during the CIE and consist primarily of the genus *Glomospira*. However, in contrast to the calcareous benthic foraminifera assemblages there was no major extinction of agglutinated taxa across the P/E-boundary. Consequently, the major turnover of benthic foraminifera at the onset of the Eocene shall be called Calcareous Benthic Foraminifera Extinction Event (CBFEE).

About 18km to the south of the Anthering-section, the 40m thick Untersberg section (Northern Calcareous Alps) spans the upper part of calcareous nannoplankton zone NP9 and the lower part of zone NP10 (sub-zone NP10a). The section was deposited at the **bathyal southern slope of the Penninic Basin** in a paleodepth of about 2000m. Within the dominantly marlstone sequence, a 5.5m thick intercalation of red and green shale and marly shale represents the CIE-interval. The CIE was associated with a shallowing of the calcite compensation depth by at least 1km. A 49% increase in detrital quartz and feldspar within the CIE-interval again suggests enhanced continental run-off. The increased terrestrially derived input is associated with abundant radiolarian casts indicating high primary productivity. The benthic foraminifera faunas of the samples rich in siliceous plankton are strongly dominated by *Glomospira spp*., *Nuttalides truempyii*, *Abyssamina poagi*, *Anomalinoides praeacutus*, *A. nobilis* and *Oridorsalis spp*. The calcareous nannoplankton assemblage of the CIE-interval is characterized by the first occurrences of the genus *Rhomboaster* and of *Discoaster araneus* and *Discoaster mahmoudii* whereas *Scapholithus apertus* became extinct at the P/E-boundary.

At the **neritic southern shelf**, a stratigraphic gap within the Gosau Group in the Krappfeld area (Carinthia) encompassess the Maastrichtian and Paleocene. After a sea-level rise in the lower part of zone NP12, nummulitic marlstone and limestone were deposited. This transgression is synchronous to the transgression at the northern shelf. Since the northern and southern shelves of the Penninic Basin belonged to different tectonic domains, with different potentials of crustal subsidence, the temporal similarity of sea-level changes on both shelves in the latest Paleocene and earliest Eocene suggests that these sea level fluctuations were mainly eustatic in origin. As a proxy for the onset of the sea-level fall, which caused the erosional unconformities on both shelves, the strong increase in the terrestrially-derived input into the Penninic Basin can be used, which occurred shortly before the P/E-boundary.