

Orbital chronology of the Pliensbachian – Toarcian transition from the Central High Atlas Basin (Morocco)

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The Pliensbachian – Toarcian transition is a period of dramatic changes in climate, sea level and paleobiodiversity. These changes cause important fluctuations in sedimentary patterns, including facies and sedimentation rates, so that a series of condensation and hiatal surfaces affects the sedimentary series of the Northern Tethyan margin. The recurrence of condensation in the studied sections makes uncertain the previous orbital calibration at the Pliensbachian – Toarcian transition. The Central High Atlas Basin experienced in the early Jurassic high subsidence and sedimentation rates. $\delta^{13}\text{C}$ and CaCO_3 have been measured at a high resolution and spectral analyses were performed using the multi-taper method and the evolutive fast Fourier transform. Significant cycles are observed at 16 m, 1.7 m and 0.9 m, and are respectively related to the 405-kyr eccentricity, the main obliquity and the precession cycles. The orbital calibration of the Fom Tillicht section, correlable to the orbital calibration of the Peniche section shows that the Tenuicostatum/Polymorphum Zone has a duration of 0.9 – 1.0 myr. The FO of *C. superbus* in the Tethyan occurs ~ 0.55 myr above the base of the Tenuicostatum/Polymorphum Zone. Finally, the duration of the P-To event, a carbon-isotope excursion, has a duration ranging from 0.18 to 0.27 myr. Correlations of the astrochronological frameworks between the Fom Tillicht and the Peniche sections shows that the Peniche is condensed at the P-To event, while the Fom Tillicht section is affected by a 0.2-0.3-myr-long hiatus at the Polymorphum – Levisoni transition. These condensed and hiatal intervals are correlated to the main condensation phases observed in the Tethyan realm at the Pliensbachian – Toarcian transition. We finally explore the potential of the Central High Atlas basin to provide a refined time scale for the upper Pliensbachian.