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The Messinian - Pliocene boundary in the north Italy regions

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Four sections straddling the Messinian-Pliocene boundary were sampled in detail in North Italy. The section sampled in the northern part of the Marche region is the only one containing a complete basal Pliocene. As demonstrated by biostratigraphic and quantitative cyclostratigraphic data, in the sections sampled in the Romagna, Emily and Piedmont regions the local base of the Pliocene is younger than the base of the Pliocene as defined by its GSSP. In the Romagna and Piedmont sections the local base of the Pliocene correlates with small scale lithological cycle 3 (MPRC 504) of the Rossello composite section; in the section sampled in the Emily region the local base of the Pliocene coincides with small scale lithological cycle 8 (MPRC 492) (Lourens et al., 1966). Since the transition between the underling brackish water sediments and the overlying marine sediments is clearly continuous in all studied sections, we propose that brackish water environment was still present in these regions during the lowermost part of the Pliocene.

In the Gualdo section (Romagna region) the base of the Pliocene coincides with small scale lithological cycle 3, with an age of 5.28 MA. Therefore, the uppermost of the eight lithological cycle reported by Krijgman et al. (1999) for this section is Pliocene in age and only seven cycles are present in the upper Messinian sequence. They correlate well with the seven cycles outcropping in the same time interval at Eraclea Minoa section, where the brackish water environment recognized at the base of each cycle is followed above by marine sediments covered at the top by gypsum deposition, ascribed to a marine environment based of isotopic data. We, therefore, suggest that, between the top of the Lower Gypsum cycles, at 5.61 MA (isotopic stage TG18), and the base of the Pliocene, at 5.33 MA (isotopic stage TG5), the origin of the observed

seven cycles can be related to obliquity (41 kyr periodicity). Thus, obliquity, and not precession, could have been the forcing mechanism for the sea level fluctuations that allowed the marine Atlantic waters to spill seven times into the Mediterranean basin.

References

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