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Neogene planktonic foraminiferal turnover in the Mediterranean area

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The Neogene Period is characterised by several oscillations in climate and related turns in fossils community, and planktonic Foraminifera represent an important tool to monitor these climatic changes.
In particular, the planktonic foraminiferal populations of the Mediterranean area show pronounced oscillations on a variety of temporal scales from Milankovitch timescale to million-year timescale. A re-analysis of planktonic foraminiferal literature data and species quantitative distribution datasets from 27 Mediterranean on land sections and 12 deep marine cores, calibrated vs the Geological Time Scale 2012, revealed the occurrence of important changes in planktonic foraminiferal assemblages possible related to the climate oscillations occurred during the last 23 Ma.
In particular, five main increases in planktonic foraminiferal turnover occurring during the Miocene, are centred at ∼21.8 Ma (Aquitanian turnover), ∼15 Ma (Middle Miocene turnover), ∼11.6 Ma (early Tortonian turnover), ∼7 Ma (early Messinian turnover) and ∼6.3 Ma (early Messinian turnover). Contrarily, the Plio-Pleistocene time interval is characterised by a general decreases in planktonic foraminiferal turnovers with three minima centred at ∼4.8 Ma (Zanclean turnover), ∼2.9 Ma (Piacenzian turnover) and at ∼1.2 Ma (Calabrian turnover).
Power spectral and wavelet analysis revealed the existence of turnover cycles in planktonic foraminifera linked to low-frequency modulation of Milankovitch oscillations and show that pulses of turnover occur at minima of the 2.4 Myr eccentricity cycle and nodes of the 1.2 Myr obliquity cycle.