

**Benthic foraminiferal record of paleoenvironmental changes in the Langhian  
St. Peter's Pool section (Malta Island)**

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**Objectives:** Benthic foraminiferal assemblages were analyzed in order to reconstruct oxygen and productivity main changes at the sea-floor during the Langhian interval in St. Peter's Pool Section (South eastern Malta Island).

**Methods and Results:** Quantitative analysis of benthic foraminifera was carried out on a dataset of 139 samples. For each sample the fraction > 125 µm was divided with a microsplits to obtain unbiased aliquot with about 200-300 benthic foraminifera. Relative taxa abundance, expressed as percentage of the total number of benthic foraminifera per sample, was calculated. To illustrate the changes in oxygen contents at the sea-floor we applied and compared the Oxygen Index (OI) of Schmiedl et al. (2003) [(HO/(HO+LO)+DIV)\*0.5; HO=relative abundance of high oxygen indicators and LO=relative abundance of low oxygen indicators deep infaunal] and the Oxygen Transfer Function of Kouwenhoven and van der Zwaan (2006) [Oxygen content µMol/L= 7,9602+5,95 (% oxyphilic taxa)]. The abundances curves of four selected benthic species identify four main intervals, also highlighted by oxygen content estimates at the sea-floor.

**Interval A** (0 - 7 m): increasing trend of the oxic species *Siphonina reticulata* and decreasing trend of *Cibicidoides dutemplei-subhaidingerii*, oxic species with little tolerance of oxygen deficiency. Occurrence of the high productivity species *Uvigerina peregrina* and dysoxic species *Bolivina spathulata*.

**Interval B** (7 - 10 m): gradual decreasing trend of *S. reticulata* and two peaks of *C. dutemplei-subhaidingerii* of 47% (7.63 m) and 48% (9.69 m); increasing trend of both *U. peregrina* and *B. spathulata*.

**Interval C** (10 - 12 m): decreasing trend of *S. reticulata* and *C. dutemplei-subhaidingerii*; significant increasing trend of *U. peregrina* and *B. spathulata*, and significant peak of *Melonis barleeaanum*, a species controlled more by cold temperature than by food supply.

**Interval D** (12 - 31 m): increasing trend of *C. dutemplei-subhaidingerii* from the base to the top of the interval and of *S. reticulata* up to about 24 m; decreasing trend of *U. peregrina* and positive and negative peaks of *B. spathulata*.

**Conclusions:** The most important factors that control benthic foraminiferal distribution throughout the St. Peter's Pool section are mainly oxygenation and food supply, but also temperature of bottom sea waters. The benthic foraminiferal assemblages suggest alternating relatively more oligotrophic and oxic conditions (Intervals A and D) and more trophic (high productivity Intervals B and C) and cooler conditions (Interval C) at the seafloor.