



FORAMS 2006

Benthic foraminifers and thecamoebians from Guaratuba Bay (Paraná, Brazil): Spatial distribution and trophic interactions with carbon sources

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Guaratuba Bay is located in the coastal plain of Paraná State. It is a small estuarine system with 50 km² of water surface area, maximum depth of 27 m at the mouth, and extensive mangrove and salt marsh ecosystems bordering its northern edge. Foraminiferal and thecamoebian assemblages were studied from eighteen surface sediment samples collected with a van Veen grab, in seven sampling stations located along the east-west axis and two located in the meandering zone of northern edge of the bay in July 2002. Samples (50 cm³) for foraminiferal and thecamoebian analysis were preserved in 4% buffered formaldehyde solution and stained with Bengal Rose. Routine water column oceanographic measurements (temperature, salinity, Secchi disk depth, pH, seston weight, dissolved oxygen), sediment analysis (grain size, total organic carbon, total carbonate content and Chlorophyll *a* concentration) and microbiological analysis of sediment (total heterotrophic bacteria, bacterial biomass, total coliform bacteria and *Escherichia coli*) were performed. The results allowed the identification of three distinct zones:

- marine biofacies characterized by the presence of calcareous species common in the adjacent inner shelf;
- estuarine biofacies characterized by the presence of euryhaline calcareous foraminifers and dominance of agglutinated foraminifers and thecamoebians, and;
- riverine biofacies characterized by the absence of both groups, higher coliform (*E. coli*) densities and sandy sediments with low organic content.

These three different biofacies characterize distinct environments within the bay and can be applied in regional studies of paleoenvironmental reconstruction. Simple correlation analysis of living foraminifers and thecamoebians *versus* potential sources of particulate organic carbon was performed. Significant correlation was obtained. The result suggest that bacteriobentos and total organic carbon are the main carbon source for these organisms. Some species are less selective (*e.g. Centropyxis constricta, Miliammina fusca* and *Polysaccamina ipohalina*) presenting significant positive correlation with organic matter, chlorophyll *a* and bacterial biomass, whereas others seem to be extremely selective (*e. g. Miliammina earlandi*) presenting positive significant correlation with bacterial biomass. The role of bacteria and organic matter is still underestimated as nutritional sources in marine marginal environments, especially in those with high turbidity and eutrofication. Both are important nutritional items for many agglutinated foraminifers and thecamoebian species. Foraminiferal and thecamoebian standing stock did not show significant correlation with total coliform bacteria and *Escherichia coli* in Guaratuba Bay.