



## **Dinoflagellate cysts as indicators of millennial scale climatic and oceanographic variability in Guaymas Basin, Gulf of California (Mexico) during the Late Quaternary**

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A high-resolution record of organic-walled dinoflagellate cyst production in Guaymas Basin, Gulf of California (Mexico) reveals a complex paleoceanographic history over the last ~40 ka. Guaymas Basin is an excellent location to perform high resolution studies of changes in Late Quaternary climate and paleo-productivity because it is characterized by high primary productivity, high sedimentation rates, and low oxygen bottom waters. These factors contribute to the deposition and preservation of laminated sediments throughout large portions of core MD02-2515.

This is one of the first studies in the Northeast Pacific to document dinoflagellate cyst production at a centennial to millennial scale throughout the Late Quaternary. Based on the cyst assemblages three major dinoflagellate cyst zones were established, and roughly correspond to Marine Isotope Stages 1 to 3. The most dominant dinoflagellate cyst taxa found throughout the core were *Brigantedinium* spp. and *Operculodinium centrocarpum*. Dansgaard-Oeschger event 8 is observed in the dinoflagellate cyst record, and is characterized by an increase in warm water taxa such as *Spiniferites pachydermus*. Other intervals of interest are the Younger Dryas where cooler sea-surface conditions are not recorded, and the Holocene which is characterized by the consistent presence of warm water species *Stelladinium reidii*, *Tuberculodinium vancampoae*, *Bitectatodinium spongium* and an increase in *Quinquecuspis concreta*. Changes in cyst assemblages, concentrations and species diversity, along with geochemical data reflect major orbital to millennial-scale climatic and oceanographic changes.

**Keywords:** Dansgaard-Oeschger events; dinoflagellate cyst; Gulf of California; late Quaternary climate change; upwelling; Younger Dryas.