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Modern dinocyst assemblages from the Gulf of Mexico: importance of the basin as potential refuge for late Cenozoic species

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Surface sediment samples (0-1 cm) from 44 sites of the Gulf of Mexico and adjacent lagoonal bodies were analyzed for their palynological content in order to document the relationship between organic-walled dinoflagellates cysts (dinocysts) and sea-surface conditions (temperature, salinity, productivity). The analyses also aimed at identifying tracers of toxic algal blooms from sedimentary records. According to redundancy analyses (RDA), the distance to the coast and winter temperature are the most important factors that control cyst distribution in sediment from the study area. They explain respectively 53.2 and 18.6% of the total variance. Our results also demonstrate the richness and thermophilic character of the modern dinocyst assemblages from the Gulf of Mexico. They include taxa typical of tropical and subtropical environments, two potentially toxic species (Polysphaeridium zoharyi and Lingulodinium machaerophorum) as well as species that disappeared from the dinocyst flora of the mid-latitudes of the North Atlantic since the Pliocene period. Worth of mention is the presence of Melitasphaeridium choanophorum as a minor component of assemblages from the north and southwestern Gulf of Mexico, although it was considered extinct by the end of the Pleistocene (> 0.011 Ma). This would imply that this species is currently still living in the study area, and suggest that the basin probably acts as sheltered environment fostering the persistence of endemic species.