

Biogeography of Late Albian Dinoflagellate Cysts as Climatic and Stratigraphic Proxy

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The mid-Cretaceous is known as an interval of warm, equable climate with weak thermocline and absent or very discrete latitudinal bioprovinces. Biogeography and biostratigraphy cannot be decoupled. Biogeography provides a framework for the maximum precision in biochronologic determination and increases the potential utility of microfossil remains as stratigraphic proxies.

In modern time, dinoflagellate distribution defines five latitudinal constrained bioprovinces from equator to poles. Dinoflagellates are very sensitive to temperature and salinity conditions of water masses and useful for reconstructing quaternary palaeoceanographical and palaeoenvironmental conditions as climatic and salinity proxies.

In order to define accurately the strategies of life of species with significant relations with temperatures and salinity in the ocean climate system under greenhouse conditions distribution maps have been drawn using thirty five Late Albian index species. Fifty years of published data have been considered and synthesized using a database coupled with a GIS "ArcGis ESRI software". The data, the thousands of specimens studied from about one hundred fifty outcrops and deep sea drilling holes (ODP, DSDP), range from 75°N to 10°N. Biostratigraphy was the main topic of the sixty height publications encountered.

We recognized four dinoprovinces on the Northern Hemisphere by spatial distributions of dinocyst associations in their endemic and pandemic taxa. The dinoflagellate provinces boundaries are parallel or near parallel to latitudes. Mixing belts, which represented major palaeofrontal systems facing "warm" and "cooler" assemblages, were located at 40-45°N. In despite the flat Late Albian temperature gradient, dinoflagellate cysts provincialism seems well developed.

The maps also serve as a basis for understanding how and why the biostratigraphy of dinoflagellate cysts is affected by biogeography. All taxa do not occur in all environments simultaneously due to tolerances among species to inshore-offshore and latitudinal trends. The four assemblages which characterized the provinces increased the potential utility of dinoflagellate cysts as biostratigraphic proxies.

Key words : Cretaceous, provinces, dinoflagellates, stratigraphy