

Response of shallow-marine ecosystem in the Sea of Japan to Milankovitch cycle

Akihisa Kitamura[1]

[1] Insti, Geo, Shizuoka Univ

Major changes occurred in the benthic molluscan fauna of the Sea of Japan continental shelf during the transition from Pleistocene glacial to interglacial stages, owing to rapid warming associated with the inflow of the warm Tsushima Current. Molluscan associations representing this transition occur in the lower Pleistocene Omma Formation in central Japan and suggest that there were two patterns of faunal change. The first was when warm-water species migrated into the Sea of Japan and lived along with cold-water species, accompanied by a northward shift in species ranges. The second pattern involved the migration of warm-water mollusks shortly after the local extinction of cold-water species. In the latter, it is possible that benthic molluscan communities with very low diversity and density extended a few km laterally and a few tens of meters vertically on the southern Sea of Japan inner- to outer-shelf. Such environment may have temporarily prevailed at least three times during early Pleistocene deglacial periods. These deglaciations corresponded to the three highest peaks of July solar insolation at 65N during oxygen isotope stages from 50 to 28. This anomalously high seasonality forced by orbital insolation cycles is likely to have played an important role in establishing non-analogous benthic mollusk communities with very low density and diversity in the early Pleistocene Sea of Japan.