



Latest Miocene and Pliocene paleoceanographic condition in the Southern Ocean based on silicoflagellate assemblage

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Integrated Ocean Drilling Program (IODP) Expedition 318 succeeded to recover the sediment cores near Wilkes Land in the East Antarctica during January-March 2010. Sediments of Site U1359A and U1359D on the Wilkes Land continental margin were deposited during the Pleistocene to mid-late Miocene. Detailed silicoflagellates records in these sediments reveal the evolution of the water condition changes during the latest Miocene and Pliocene. Dominant taxa were shifted step by step from “pseudofibula plexus” (*Distephanus speculum speculum* f. *pseudofibula*, *Ds. s.s. varians* and *Ds. s.s. notabilis*) in the latest Miocene to *Ds. speculum* with *Ds. crux* and following *Ds. speculum* in the early Pliocene. Distinct peaks in *Dictyocha* were observed in the early Pliocene. At present, genus *Dictyocha* is observed north of the Antarctic polar front (APF), whereas genus *Distephanus* is dominated south of the APF. Thus, these *Dictyocha* peaks reflect the surface water warming events as early Pliocene warm events. Based on *Dictyocha* / *Distephanus* ratio, Ciesielski and Weaver (1974)’s method, sea-surface temperatures were approximately 5 °C at the end of early Pliocene and approximately 3 °C in early Pliocene. Such silicoflagellate evolution pattern at these sites is almost consistent with the patterns of the silicoflagellate variation in the other areas (e.g., in the Kerguelen Plateau and Prydz Bay) of the Southern Ocean. Weakening of the thermal gradient across the Southern Ocean occurred at the early Pliocene warm events due to the high sea surface temperature along at least the entire East Antarctic. Widespread occurrence of the early Pliocene warm events was likely a response to weakening of the deep water circulation.