

Geoenvironmental evolution from Pliocene to Pleistocene in and around Teshio Plain, Northern Hokkaido, Japan

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The Teshio plain is one of the largest Cenozoic sedimentary basin in Hokkaido. Post-Neogene thick sediments are distributed in both the Teshio plain and the surrounding area. Koetoi, Yuchi, and Sarabetsu Formations are Plio-Pleistocene sedimentary layers that show shallowing upward successions deposited on deep sea-terrestrial environments in the latest stage of the sedimentary basin. On the basis of micro-biostratigraphy and fission track ages, the geological age of these formations in the western part are younger than the strata in the eastern part, and these show contemporaneous heterotopic facies. However, the geological age and sedimentary environment of the strata in the Teshio plain is unclear because thick alluvium covers the surface. We conducted a deep drilling survey at a study site located in the coastal zone of the Teshio plain, then conducted a laboratory analysis of the core. The results of this comprehensive geological analysis confirm the fact that these strata are in a relationship of contemporaneous heterotopic facies until the Teshio plain, as is widely accepted (Koshigai et al., 2012). Yasue et al. (2005) estimated that the transition of space and time showed westward depositional migration caused in response to the movements of depositional centers. They also reconstructed the status of geoenvironmental evolution, which showed an open sea area gradually retreating with westward expansion of the land area. Conversely, the sedimentary environment of the Yuchi and Sarabetsu Formations clearly shows shallowing upward successions deposited on shallow-sea to lagoon environments from the results of sedimentary facies analysis and CNS elemental analysis of a core obtained from the borehole at the coastal zone of the Teshio plain. Moreover, Takashimizu (2009) analyzed the sedimentary facies of the Sarabetsu Formation at the eastern hilly area of Teshio plain and reconstructed two depositional systems composed of barrier-lagoon and beach-shoreface systems. Therefore, the geoenvironmental evolution from Pliocene to Pleistocene in and around the Teshio plain changed from an open sea to the unsociable sea environment that allowed for the spread lagoons in conjunction with the westward expansion of the land area.

Keywords: Yuchi Formation, Sarabetsu Formation, Pliocene, Pleistocene, Sedimentary facies analysis, CNS elemental analysis