

Geological age of Sarabetsu and Yuchi Formations in and around Teshio plain, Northern Hokkaido

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The Teshio plain is the largest Cenozoic sedimentary basin in Hokkaido, equal to the Ishikari Low-land. Post-Neogene thick sediments, which show shallowing upward successions deposited on environments ranging from shelf to terrestrial environments, are distributed in and around the Teshio plain. Further, these strata show westward depositional migration in response to the movements of depositional centers. Yuchi and Sarabetsu Formations are Plio-Pleistocene sedimentary layers deposited on shallow sea?terrestrial environments in the latest stage of the sedimentary basin. The geological ages of Yuchi and Sarabetsu Formations are defined on the basis of biostratigraphy (pollen and diatom fossils) and fission track ages. Both the strata in the western part beyond the Horonobe Fault are at least 1 million years younger than the strata in the eastern part, and both show contemporaneous heterotopic facies. However, the geological age of both the strata in the Teshio plain is unclear because thick alluvium covers the surface. We conducted the deep drilling survey at a depth of 1000 m in the study site at the coastal zone of the Teshio plain and the laboratory analysis of the core. From the results of the analysis, it is clear that the geology is composed of alluvium until a depth of 90 m, the Sarabetsu Formation at depths ranging between 90 m and 470 m, and the Yuchi Formation at depths ranging between 470 m and 1004 m. Palynological successions of the Yuchi and Sarabetsu Formation were divided into three pollen zones. Further, the Larix zone, which was formed after 1 Ma, has been confirmed at depths between 90 m and 220 m. Tephra, which is approximately 1.5 Ma, has been discovered at a depth of 930 m. The diatom zone has not been recognized because most diatom fossils are redeposited species; however, the presence of confirmed species is consistent with other analytical results. From the results of comprehensive geological analysis, the geological age of Yuchi and Sarabetsu Formation is estimated to be ranging from 0.8 to 1.5 Ma in the study site at depths ranging between 90 m and 1000 m. In addition, the fact that both the strata are in a relationship of contemporaneous heterotopic facies until the Teshio plain is widely accepted. Moreover, both the strata in the Teshio plain are at least 0.5 million years younger than the strata in eastern hilly areas.

Keywords: Geological age, Yuchi Formation, Sarabetsu Formation, Teshio plain, Deep all-core drilling, Coastal area