

## Geologic age of the Nishino-omote Formation in the Tanegashima Island based on radiolarians and calcareous nannofossils

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### <Introduction>

The Paleogene Kumage Group (Hanzawa, 1934) is widely distributed in the Tanegashima Island, Kagoshima Prefecture, southwest Japan. The Kumage Group is divided into the Kadokurazaki, Tateishi, and Nishino-omote Formations in ascending order (Okada, 1982). Because of the lack of detailed lithological distribution map and reliable chronological data of the formations, geological structures and ages of them are still unclear. In this study, detailed field observation of the northern part of the Tanegashima Island was carried out and we also examined radiolarians and calcareous nannofossils from the Nishino-omote Formation in order to clarify its geological age.

### <Materials and Methods>

A total of 110 mudstone were collected from mudstone dominant intervals of the Nishino-omote Formation and we examined radiolarians and calcareous nannofossils. To avoid collecting turbidite mudstone, monotonous, intensely bioturbated mudstones were selected. Fifty and 60 samples were used for analyses of radiolarians and calcareous nannofossils, respectively.

### <Results and discussion>

Detailed geological survey revealed that a lot of NNE-SSW trending fold structures and thrust faults were developed in the northern part of the Tanegashima Island and an interval of "trace fossils concentration beds" is repeatedly recognized as a key horizon in the studied area. Thus, total thickness of the Nishino-omote Formation by previous study is overestimated. Within the examined samples, 11 samples contain radiolarians fossils. Occurrences of *Artophrmis gracilis*, *Eucyritidium plesiodiaphanes*, *Theocyrtis setanios*, *Theocorys perforalvus* and *Lithocyclia angusta* are recognized in a single sample from the upper part of Nishino-omote Formation and the preservation of the radiolarian fauna in this sample is moderately. Co-occurrence of *E. plesiodiaphanes* and *T. setanios* coincides with the radiolarian zone RP20c to RP21a (Kamikuri et al., 2012) and its age is considered to be 31.1 to 28.5 Ma. Calcareous nannofossils are observed only in 3 samples in the lower part of Nishino-omote Formation. Paleogene species consistently occur even though preservation of specimens is not good. *Sphenolithus distentus* and *S. predistentus* are stratigraphically important and geologic age of samples are 30.00-26.8 Ma based on total range of *S. distentus*.

Our field observation and microfossil investigation indicate that the Nishino-omote Formation seems to be deposited during a short period between 31.1 and 26.8 Ma and the Nishino-omote Formation is characterized by repetition of simultaneous intervals associated with holds and thrusts.

Keywords: Nishino-omote Formation, Kumage Group, Tanegashima Island, radiolarian, calcareous nannofossil