



## **Albian demise of the Tethyan biota in the Pacific: A possible causal link to the formation of the South Atlantic and Western Interior Seaway**

**Y. Iba** (1), S. Sano (2)

(1) Department of Earth and Planetary Science, Graduate School of Science, University of Tokyo, Tokyo 113-0033, Japan (iba@eps.s.u-tokyo.ac.jp) (2) Fukui Prefectural Dinosaur Museum, Fukui 911-8601, Japan

Mid-Cretaceous times are known as a typical greenhouse period when carbonate platforms were extensively distributed in the epicontinental shelves, island arcs, and guyots of the world oceans. The Tethyan biota (e.g., rudists and hermatypic corals) dwelled on tropical–subtropical shallow marine shelves and/or on carbonate platforms, and is an essential indicator of the Cretaceous tropical biotic realm and climate. The Pacific was the largest ocean of this time, and is thus an important region for studying the Cretaceous greenhouse Earth. This study aims at analyzing spatiotemporal changes in distribution of taxa constituting the Cretaceous Tethyan biota (e.g., rudists, nerineacean gastropods, and a non-rudist bivalve *Neithea*) in the equatorial–North Pacific (i.e., Japan and Russian Far East, northern California, Philippines, and Pacific guyots) in order to recognize new global biotic changes.

As a result of our analysis we recognized the following trends of temporal biotic changes in the equatorial–North Pacific: 1) Continuous distribution of the Tethyan biota during the Early Neocomian–early mid-Cretaceous, 2) Step-wise demise of the Tethyan biota during latest Aptian–Albian time and completed in the Late Albian, and 3) Long-term absence of the Tethyan biota and development of the North Pacific Biotic Province during the post-Late Albian Cretaceous. Mid-Cretaceous step-wise demise of the Tethyan biota in the NW Pacific might be summarized as follows: 1) All Mesogean key taxa (e.g., rudists), some Mesogean indicators (e.g., corals), and nerineaceans disappeared at the latest Aptian–Early Albian transition, 2) Other Mesogean indicators (e.g., orbitolinids) disappeared at the Early–middle Albian transition,

3) The Tethyan non-rudist bivalve *Neithea* disappeared in late Albian.

Such biotic turnover has not been recorded either in the Mediterranean or Caribbean, nor in any other regions of the Tethys. Therefore, it should be considered as an unique bio-event of the Pacific during the greenhouse Cretaceous. Almost simultaneously, the opposite scenario (i.e., expansion of the Tethyan biota distribution), has been recognized in the South Atlantic and the Western Interior Seaway. We link the demise event in the Pacific and expansion event in the South Atlantic and Western Interior Seaway to global changes in the ocean current system (especially a change in warm water circulation) and possibly in ocean heat transport triggered by the formation of the new large ocean gateway in the mid-Cretaceous.