

Permian giant bivalve Alatoconchidae from Mid-Panthalassan Paleo-Atoll Complex in Kyushu

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Unique fossil assemblages containing large bivalve family Alatoconchidae were newly found from the Guadalupian (Middle Permian) shallow marine limestone in Kamura, Kyushu. The large bivalves occur in the Neoschwagerina Zone and Lepidolina Zone. This find clarifies that the biostratigraphic range of the family Alatoconchidae extends up to the top of the Lepidolina Zone (upper Capitanian of upper Guadalupian) i.e., to the end-Guadalupian extinction level. The largest Alatoconchidae in Kamura occurs in the Neoschwagerina Zone, of which size is up to 50 cm in length and 5 cm in thickness. Although details are still unknown, their morphology with wing-like side projection of their valves appears very similar to that of Alatoconchidae that includes well-known genus *Shikamaia* Ozaki. The bivalve-bearing Iwato Formation was derived from a mid-oceanic shallow marine carbonate buildup formed on a mid-oceanic paleo-seamount. The close association among Alatoconchidae, typical Tethyan fusulines (Verbeekinidae) and rugose corals (Waagenophyllidae), plus their common extinction pattern suggests that Alatoconchidae flourished in warm, shallow (photic) marine environments in low latitude areas in Panthalassa as well as Tethys. The extra-large size and double-layered shell with translucent outer layer composed of prismatic calcite suggests that these bivalves may have hosted abundant photosynthetic algal symbionts to support their large-body metabolism.