

南中国朝天セクションのP-T境界層におけるN同位体層序
Nitrogen isotope chemostratigraphy across the Permian-Triassic boundary at Chaotian,
Sichuan, South China.

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Nitrogen isotopic compositions of upper Permian to lowermost Triassic rocks were analyzed at Chaotian in northern Sichuan, South China, in order to clarify changes in the oceanic nitrogen cycle during the Changhsingian (Late Late Permian) prior to the end-Permian extinction. The analyzed interval across the Permian-Triassic boundary (P-TB) at Chaotian consists of three stratigraphic units: the upper Wujiaping Formation, the Dalong Formation, and the lowermost Feixianguan Formation, in ascending order. The upper Wujiaping Formation is mainly composed of dark gray limestone with diverse shallow-marine fossils deposited on the shallow shelf. In contrast, the overlying Dalong Formation is mainly composed of thinly bedded laminated black mudstone and black siliceous mudstone containing abundant radiolarians, deposited on the relatively deep slope/basin under anoxic condition. The lowermost Feixianguan Formation is composed of thinly bedded gray marl and micritic limestone with minor fossils deposited on the shallow shelf. $\delta^{15}\text{N}$ values are in positive values in the upper Wujiaping Formation implying denitrification and/or anammox in the ocean. $\delta^{15}\text{N}$ values gradually decrease in the lower Dalong Formation and are consistently low in the middle Dalong to lowermost Feixianguan Formation. In particular, no clear $\delta^{15}\text{N}$ shift is recognized across the extinction horizon. The consistently low $\delta^{15}\text{N}$ values at Chaotian suggest the enhanced nitrogen fixation in the ocean during the entire Changhsingian to early Induan (Early Early Triassic), accompanied with the emergence of anoxic condition. The $\delta^{15}\text{N}$ trend at Chaotian was possibly a regional isotopic signature in northwestern South China and not a global one, because the composite $\delta^{15}\text{N}$ profiles document that no $\delta^{15}\text{N}$ trend similar to that at Chaotian is observed in other P-TB sections around the world. Nonetheless, the protracted oceanic nitrogen depletion during the Changhsingian suggested by the present results at Chaotian may have acted as a stress to shallow-marine biota.