No distinct nitrogen cycle and redox condition changes during the end-Permian mass extincton in the Southern Neo-Tethys

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Previous study presented large perturbation of the nitrogen cycle during the end-Permian mass extinction (EPME) in the eastern Paleotethys and the northwestern margin of Pangea. However, the different nitrogen isotope profiles demonstrate that the contemporaneous nitrogen cycles are controlled by varied redox conditions in different regions. The relationship between the nitrogen cycle perturbations/redox conditions and the mass extinction remains debates. In this study, we analyzed the bulk organic carbon and nitrogen isotopes of the Tulong and Xiukang sections (South Tibet, Southern Neo-Tethys) from the Late Permian to Middle Triassic. The $\delta^{13}C_{org}$ composition show the typical negative excursion during the Permian-Triassic boundary. However, the new $\delta^{15}N_{bulk}$ values (~5±0.5‰) are similar with modern ocean compositions and do not show any changes during the EPME. This implies that there is no enhanced nitrogen fixation or denitrification events in the southern Neo-Tethys. Furthermore, the Lower Triassic $\delta^{13}C_{org}$ curve at Xiukang section presented the typical global excursions. The $\delta^{15}N_{bulk}$ decrease to -0.5 ‰ in the Griesbachian-Dienerian and sustain at the low value through into the Early Anisian, which imply the enhanced nitrogen fixation and nutrient gap in the Early Triassic. Our new $\delta^{15}N_{bulk}$ demonstrated that the redox conditions of South Tibet area sustained stable during the EPME interval which can not account for the mass extinction. We suppose that the other factor(s) (e.g. temperature rise) might be the cause(s) of the EPME, which need further investigation.