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Low-latitude terrestrial climate cooling event in the Late Triassic (Norian-Rhaetian): palaeobotanical evidence from the Sichuan Basin, southern China

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Fossil wood is one of the significant proxies for palaeoclimate and palaeogeographical reconstruction in earth history. Rich and diversified Mesozoic fossil woods are well recorded in China; however, Triassic fossil wood is very scarce. The Sichuan Basin is one of the largest inland basins in the low latitude region of southern China. The Upper Triassic deposits are terrestrial origin and well developed and in the basin. However, the climate conditions of the Late Triassic were poorly understood for a long time. Here, we report a new fossil wood from the Late Triassic Xujiahe Formation (Norian to Rhaetian) in Guangyuan of northern Sichuan Basin, southwestern China. The fossil wood material consists of two well-preserved specimens yielding secondary xylem with distinct growth rings. Bordered pits on the radial tracheid walls are mostly contiguous, biseriate alternate, locally uniseriate and strongly flattened. Cross-fields show a large window-like pore. This anatomy is typical for the important fossil wood morphogenus *Xenoxylon* Gothan, and thus a new species, *Xenoxylon guangyuanensis* sp. nov. is recognized. The finding of this new fossil wood taxon contributes to a better understanding of the yet poorly documented *Xenoxylon* early radiation during the Late Triassic, as well as of the origin of *Xenoxylon meisteri* group, a peculiar endemic group which diversified in Far-East Asia from the Triassic to the Early Cretaceous. *Xenoxylon* is a palaeobiogeographically significant genus, being bound to cooler and/or wetter climates of Northern Hemisphere throughout its Late Triassic-Late Cretaceous range. The occurrence of *Xenoxylon* in the Sichuan Basin of southern China may indicate a short-term cooling event, sandwiched within a period during which warm and wet climate condition largely prevailed over lower latitude regions of the Northern Hemisphere. Such a cooling event is suggested to be indirectly influenced by the temporary onset of a megamonsoon phenomenon during the Late Triassic.

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