

## Neogene $^{87}\text{Sr}/^{86}\text{Sr}$ record of rivers in the northeastern Tibetan Plateau

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$^{87}\text{Sr}/^{86}\text{Sr}$  ratio of authigenic carbonate in fluvial sequence is suitable to trace paleo-river  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios. Here we present  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios of bulk carbonates in three new fluvial sequences in the Xining and Linxia Basins in the northern Tibetan Plateau. Combined with two previously reported fluvial sections (both ranging from ~13 Ma to ~5 Ma) in the Xining and Linxia Basins, we have established three independent records of Neogene river  $^{87}\text{Sr}/^{86}\text{Sr}$  in the two basins. The two fluvial sections in the Xining Basin show distinct patterns of carbonate  $^{87}\text{Sr}/^{86}\text{Sr}$  between 25 Ma and ~17 Ma. The GJS section near the northern margin and the XJ section at the basin center share similar  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios around 0.7110 at ~25 Ma. Since then, the GJS shows a monotonous increase to ~0.7120 at ~17 Ma and the XJ section exhibits a relatively stable trend with a rapid increase to ~0.7120 around 17-16 Ma. Both sections share the relatively high  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios from ~17 Ma to 14 Ma. With the previously reported data in the nearby MJZ section in the Xining Basin, the river  $^{87}\text{Sr}/^{86}\text{Sr}$  display a slight decrease from 12.7 to 5 Ma in the Xining Basin. However, the carbonate  $^{87}\text{Sr}/^{86}\text{Sr}$  evolution in the HLD section near the southern margin of the Linxia Basin, 200 km to the southeast of the Xining Basin, displays less variable but relatively low values of 0.7100-0.7105 from ~23 Ma to 8-9 Ma, and a remarkable increase to ~0.7112 since then. The distinct  $^{87}\text{Sr}/^{86}\text{Sr}$  evolution of the two basins reflect changes of dissolved Sr input from the Qilian mountain and West Qinlin Mountain by river or wind, which were closely linked to the outgrowth and uplift of east segment of the northeastern Tibetan Plateau and the related drainage reorganization during the Neogene.