

**A comparison of geochemical
 $^{40}\text{Ar}/^{39}\text{Ar}$ and U-Pb data for
detrital muscovite and zircon in
late Cenozoic sediments in the
Jiangnan Basin: Implications
for sediment source and
evolution of the Yangtze River**

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The geometry and evolution of rivers originating from the Tibetan plateau is influenced by topography and climate changes during the India-Asian collision. The Yangtze River is the largest among these rivers and is assembled by amalgamation of many rivers in the eastern Tibetan Plateau. The timing of these capture events is still controversial. Here we use geochemistry and $^{40}\text{Ar}/^{39}\text{Ar}$ dating of detrital muscovites and detrital zircon U-Pb ages to constrain the provenance of late Cenozoic sediments in the Jiangnan Basin, which represents the middle reaches of the Yangtze river. The combined data suggest that most of the late Pliocene sediments (3.5-2.6 Ma) were derived from the peripheral mountains of the Jiangnan Basin. The most eastern part of the upper Yangtze reaches is embodied by the Qingyi, East Min and Jiangling rivers upstream of the Three Gorges and becomes the dominant sediment source to the Jiangnan Basin during the early Quaternary (~2.6-2.1 Ma). This implies that the Three Gorges must have formed before the Quaternary (>2.6Ma). Sediments from the upper Dadu River appeared in the Jiangnan Basin somewhere between 2.1 and 1.2 Ma and suggest that the originally south flowing upper Dadu River was captured by the rivers in the Sichuan Basin around that time. This capture event is closely linked to the tectonism of the eastern Tibetan Plateau and suggests that the paleo Red River lost part of its tributaries (Dadu river) at that time.