

Transcontinental sediment swings in Early Paleozoic eastern peri-Gondwana as response to supercontinental evolution

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Peripheral terranes generally share detrital zircon sources with their neighboring continents. The elongated peri-Gondwana terrane, Sibumasu, display two distinct detrital zircon signatures. Constrained by limited detrital zircon data, past studies often oversimplified its geology, portraying it as two separate outlying terranes near India or Australia. This simplification ignores the underlying complex source-sink dynamic; thus, a more refined interpretation is necessary. A section of East Sibumasu, West Malaya Paleozoic strata detrital case study reveals that both India and Australia detrital influence are present in the Cambrian strata. However, in mid-Paleozoic, 1.0-0.7 Ga zircon from India dominates the strata to the north, while the south contains significant older 1.3-1.0 Ga zircon from Australia. Volcaniclastic sediments exhibiting detrital zircon of Early Ordovician magmatic provenance (~480-460 Ma) are located within the stratigraphic interval separating the two detrital patterns. Rather than proposing structural heterogeneity or geomorphological changes on Sibumasu, we hypothesize a progressive change in Gondwana tectonic and climate from the Cambrian to the Early Carboniferous affected the sediment transport from Australia and India, resulting in this detrital zircon provenance switch.

