



## **Subduction of Indian continent beneath southern Tibet in the latest Eocene (~ 35 Ma): insights from the Quguosha gabbros in southern Lhasa block**

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Geophysical data illustrate that the Indian continental lithosphere has northward subducted beneath the Tibet Plateau. However, when the Indian continental lithosphere started to subduct remain unclear. Here we report new results from the Quguosha gabbros of southern Lhasa block, southern Tibet. LA-ICP-MS zircon U–Pb dating of two samples gives a ca. 35 Ma formation age (i.e., the latest Eocene) for the Quguosha gabbros, which are within a magmatism gap of the Lhasa block. The Quguosha gabbros samples exhibit Sr–Nd isotopic compositions ( $[^{87}\text{Sr}/^{86}\text{Sr}]_{\text{initial}} = 0.7056\text{--}0.7058$  and  $\varepsilon\text{Nd}(t) = -2.2 \text{--} -3.6$ ) different from those of the Jurassic–Eocene magmatic rocks with depleted Sr–Nd isotopic characteristics, but somewhat similar to those of Oligocene–Miocene K–rich magmatic rocks with enriched Sr–Nd isotopic characteristics. We interpret the Quguosha mafic magmas to have been generated by partial melting of lithospheric mantle metasomatized by subducted continental sediments, which entered continental subduction channel(s) and then probably accreted or underplated into the overlying mantle during the northward subduction of the Indian continent. Our data also suggest that the Indian continental crust has started to be underthrust beneath the mantle lithosphere of the southern Lhasa sub-block by at least ca. 35 Ma.