Origin of the early Miocene potassic and ultrapotassic rocks in Xungba basin, southwestern Tibet

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Postcollisional potassic and ultrapotassic magmatism in southern Tibet is an index for the deep (delamination) and surface (uplift) processes of the Tibetan plateau. We studied the postcollisional ~23 Ma coeval potassic and ultrapotassic volcanic rocks in the Xungba basin, southwestern Tibet. The mantle-derived ultrapotassic rocks (Group 1) are latites, with both mantle and crustal geochemical signatures showing by other younger (19-10 Ma) ultrapotassic rocks previously studied in S. Tibet. The high Th/Yb ratios, low Ba/La and Hf/Sm ratios observed in Group 1 imply derivation from a metasomatized lithospheric mantle regions enriched by inputs of pelagic sediment and carbonate during previous Tethyan oceanic subduction, while their relatively high SiO_2 and Dy/Yb, low Ni/MgO and CaO/Al_2O_3, and convex upward Sr-O isotopic relationship suggest additional contributions of overthickened lower crust and ancient basement except for enriched mantle sources. The potassic rocks (Group 2), underlying Group 1 rocks, are intermediate to silicic, with adakitic geochemical features (high Sr/Y and La/Yb, and low Y and Yb). Such bimodal volcanic sequence in Xungba basin magmatism may further corroborate a delamination of lower part of over-thickened lithospheric mantle and a surface extension associated with Miocene plateau uplift.