

Constructing comprehensive rock history of metamorphic rocks in Taiwan orogen: implications on wedge kinematics

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Deep tectonic processes are key integral components in the evolution of mountain belts, while observations of their development are generally obscured by thermal resetting, retrograde alteration and structural overprinting. Here integrated rock temperature-time-deformation histories are constructed (particularly Ar/Ar and U-Pb dates, and RSCM temperatures), for both slate in the pro- and schist in the retro-wedge parts of the active Taiwan arc-continent collision, from sedimentation/formation through cleavage-forming and peak states to its final exhumation. Taking into account of deposition record in neighboring basins, it is evident that arrival of molasse sedimentations were coeval with onset of fast metamorphic rock exhumation and associated upper-crustal extension, following a longer orographically-dormant prograde to peak-state stage. Such dramatic secular change in orogenic wedge tectonics might be reflecting changes in lithospheric and/or deeper wedge configurations, shedding light on rheological evolution of rapidly-thickening continental crust in young orogenic belts.

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