

## Evolution of orogeny through Wilson Cycle

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Geotectonic history of Japanese islands is now revisited to make it clear, (1) timing of rifting Rodinia supercontinent, followed by (2) a change from passive to active margin, and (3) how many orogeny occurred thereafter. Moreover, (4) role of TTG in mantle, due to arc subduction, tectonic erosion, and sediment-trapped subduction will be discussed. Finally, a speculation on the orogeny through Wilson cycle will be given.

Ca. 800-750Ma is considered to be the timing of rifting of Rodinia, and formation of oceanic crust may be ca. 600Ma, because of age of oldest ophiolites around the circum-Pacific orogenic belts. Initiation of subduction could be ca. 530Ma in Japan, ca. 450Ma in California and 560Ma in Australia, by the presence of blueschist, eclogite and/or LILE-metasomatized rocks.

Underneath the Japanese islands, Izu-Mariana, Kyushu-Palau, Amami, Okino-Daito and Daito arcs, totally five arcs are being subducted without accretion to the hanging wall. Moreover, trench-fill turbidite would not remain as accretionary complex, instead ca. 80% would subduct into deep mantle. Fate of these sedimentary rocks is as follows. Density profile of TTG (Komabayashi et al., 2009; Kawai et al., 2009) clearly demonstrates that those TTG-dominated rocks would be stagnant at the bottom of mantle transition zone. The estimated amount of those TTG rocks reaches to 7 times more than that of surface continents (Rino et al., 2008). Those stagnant TTG materials make critical effects for orogeny, supercontinent-superplume cycle, and origin of superplume; the details will be discussed in the CMB symposium.

Process to make a supercontinent, is as follows. After the randomly oriented trenches among dispersed continents, if Y-shaped topology of trench appears, then it evolves to create a strong mantle down-flow which in turn makes a runaway growth to swallow all continents finally. The modern East Asia and western Pacific is underlain the Y-shaped position to make a future supercontinent Amasia at 250 m.y. afterward.

Summarizing orogenic growth along the Wilson Cycle, (1) extensional orogeny develops first during the rifting of supercontinent, (2) followed by the quiet stage of passive margin until subduction initiation, (3) followed by Pacific-type orogeny at least five times in Japan, and finally continent collision orogeny such as Australia collision 50 m.y. after the present. Final accumulates of these orogens between Paleo-Asia and Australia would make a unique unit in a supercontinent.