

Displacement of geologic bodies induced from detrital-zircon stratigraphy of three geologic belts in SW Japan

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Stratigraphical change of age-distribution of detrital zircons from some pre-Permian to Jurassic geologic units of the Maizuru, Akiyoshi, and Renge belts in SW Japan revealed the displacements of geologic bodies.

GEOLOGIC SETTING

Maizuru Belt: The sedimentary units of the belt consist of the Permian Maizuru Group (Gp.), and unconformably covering Lower-Middle Triassic Yakuno and Upper Triassic Nabae Gps. (Hayasaka et al., 1996). We sampled the sandstone of the three groups.

Akiyoshi Belt: The belt consists mainly of Middle-Late Permian accretionary complex (AC), which has unconformably been covered by Late Triassic terrestrial to shallow marine beds such as the Mine Gp. (Hase, 1950). We collected a sandstone sample from the Ota Gp. (AC) and two sandstone samples from the Mine Gp.

Renge Belt: The belt consists mainly of high-P/T metamorphic rocks of 300 Ma (K-Ar age), which has unconformably been covered by Early Jurassic shallow marine beds with ammonoid horizons such as the Toyora Gp. (Kobayashi, 1931). We collected samples of the Renge psammitic schist, and the Early Jurassic Higuchi Gp. and Yamaoku Formation (Fm.).

RESULTS The results listed below are presented in the following order: the shape of the probability density plot (peak ages +/- width (Ma); main peaks are in bold letters), percentage of Precambrian zircons (%Pc), the youngest concordia age with the 2SD error (YZ).

Maizuru Belt (1. Maizuru Gp., 2. Yakuno Gp., 3. Nabae Gp.)

1. quasi-unimodal (**260 +190/-30 Ma**, 430 Ma, 2080 Ma), %Pc = 4.1, YZ = 254.0 +/- 6.9 Ma

2. quasi-bimodal (**260 +120/-20 Ma**, **500 +20/-70 Ma**, 910 Ma, 1855 Ma), %Pc = 8.3, YZ = 244.6 +/- 6.1 Ma

3. multimodal (**250 +120/-40 Ma**, **510 +90/-80 Ma**, **900 +70/-100 Ma**, 1090 Ma, 1260 Ma), %Pc = 14.5, YZ = 222.3 +/- 6.1 Ma

Akiyoshi Belt (4. Ota Gp., 5-6. Mine Gp.)

4. unimodal (**270 +/- 30 Ma**), %Pc = 0, YZ = 254.0 +/- 6.8 Ma

5. bimodal (**270 +45/-65 Ma**, **1855 +415/-145 Ma**), %Pc = 73.2, YZ = 213.1 +/- 5.3 Ma

6. bimodal (**230 +40/-20 Ma**, **1850 +730/-160 Ma**), %Pc = 93.5, YZ = 220.6 +/- 6.7 Ma

Renge Belt (7. psammitic schist, 8. Higuchi Gp., 9. Yamaoku Fm.)

7. quasi-unimodal (**473 +200/-85 Ma**, small peaks >700), %Pc = 31.3, YZ = 417.1 +/- 10.7 Ma

8. bimodal (**250 +45/-60 Ma**, **1940 +940/-400 Ma**), %Pc = 85.6, YZ = 199.2 +/- 4.9 Ma

9. bimodal (**190 +85/-30 Ma**, **1845 +600/-160 Ma**), %Pc = 26.9, YZ = 170.5 +/- 5.5 Ma

DISPLACEMENT OF THE MAIZURU ISLAND ARC The quasi-unimodal age distribution and low %Pc (4.1) of the Upper Permian Maizuru Gp. indicate that it was deposited in an island-arc environment with little Precambrian basement rock. The Triassic cover, however, shows multimodal age distributions having common peaks with those of the Paleozoic sandstone on or near Gondwana-derived blocks in East Asia (e.g. Tarim block; Rojas-Agramonte et al., 2011), suggesting that the Maizuru island arc was amalgamated with such a block.

FORMATION AND DISPLACEMENT OF THE AKIYOSHI AC The Ota sandstone of the Akiyoshi AC shows a unimodal age distribution with %Pc=0, indicating its deposition along an oceanic island arc. The overlying Mine Gp., on the other hand, shows bimodal age distribution with a prominent peak at ca. 1900 Ma. 1900 Ma is the age of suture zones in the North China Block (NCB) (Zhao et al., 2005), and the zircons of this age have abundantly been supplied to the Permian Pyeongan Supergroup on the NCB in South Korea (Lee et al., 2012). The Akiyoshi AC, accreted to a Middle-Late Permian oceanic island arc, must have shifted in Early-Middle Triassic to the margin of the NCB.

FORMATION AND DISPLACEMENT OF THE RENGE METAMORPHIC ROCKS The psammitic schist in the Renge Belt shows similar age distribution with Paleozoic sandstone on and near Gondwana-derived blocks (Kouchi et al., 2013). The Early Jurassic cover, on the other hand, shows similar bimodal age distributions with the Mine Gp. The protoliths of the Renge metamorphic rocks were likely accreted to the Gondwana margin before Permian, and the rifted margin may have been amalgamated with the NCB.

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