

Provenance of pre-Aptian sandstones of Japan viewed from detrital zircon geochronology

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Age composition of detrital zircons from pre-Aptian sandstones (ss) is examined to clarify the tectonic development of the Japanese Islands. The results are as follows (%Pc: percentage of Precambrian zircons).

Hida Gaien Belt: Age-unknown Ashidani and Motodo ss show unimodal age distribution patterns at ca. 270 Ma. The Tetori group mostly shows bimodal distribution at 200 and 1900 Ma, with %Pc increasing upwards (40-84), with an exception of Oxfordian ss (%Pc = 8).

Sangun Belt: Ss of the **Renge Belt** shows multimodal (peaks up to 3000 Ma) patterns with the maximum peak at 450 Ma. The Lower Jurassic cover shows bimodal patterns at 230 and 1900 Ma. The **Suo Belt** has downward-younging polarity in the youngest zircon ages (270-160 Ma); %Pc (mainly of 2000 Ma zircons) gradually increases downwards.

Akiyoshi Belt: Permian ss of the accretionary complex (AC) shows a unimodal pattern at 270 Ma. The Upper Triassic cover shows bimodal patterns at 230 Ma and 1900 Ma (%Pc = 65-88).

Maizuru Belt: The Upper Permian shows a quasi-unimodal pattern at 270 Ma, with a very small peak at 2000 Ma. The Lower-Middle and Upper Triassic show multimodal patterns with the maximum peak at 250-270 Ma and older, and small peaks at 500 Ma, 900 Ma, etc.

Ultra-Tamba Belt: Ss of the belt shows quasi-unimodal patterns at 250 Ma. The Higashimata Formation in the eastern extension of the belt, however, shows a multimodal pattern with peaks at 450 Ma, 900 Ma, etc.

Tamba-Mino Belt: Upper Triassic AC shows a multimodal pattern with small peaks at 500 Ma, 800 Ma, 1500 Ma, etc. Lower-Middle Jurassic AC shows bimodal patterns at 170 Ma and 2000 Ma (%Pc = 54-62).

Northern Chichibu Belt: Upper Permian AC shows a unimodal pattern at 270 Ma. Lower-Middle Jurassic AC shows a bimodal pattern at 200 Ma and 2000 Ma, with %Pc increasing with the age of formation (18-33). Very few 1000 Ma zircons are also detected.

Kurosegawa Belt: Upper Permian shallow marine bed (Katsura ss) shows a unimodal pattern at 270 Ma. Upper Permian AC shows a quasi-unimodal pattern at 270 Ma, with a very small 1900 Ma peak.

Southern Chichibu Belt: Upper Permian AC, similar with that of the Kurosegawa Belt, was found to the north of Tokyo. Lower Jurassic AC shows a bimodal pattern at 200 Ma and 2000 Ma (%Pc = 18). Middle Jurassic AC and the Oxfordian cover show bimodal patterns at 200 Ma and 2000 Ma (%Pc = 47-86). Oxfordian AC, on the other hand, shows quasi-unimodal patterns with low %Pc values (4-16).

South Kitakami Belt: Silurian ss shows multimodal patterns with the maximum peak at 430 Ma, with smaller peaks up to 3000 Ma. Devonian ss also shows a similar pattern with the maximum peak at 410 Ma. Lower Carboniferous ss shows quasi-unimodal pattern with several 400+ Ma peaks (%Pc = 19). Lower-Middle Permian ss, by contrast, shows unimodal patterns at 275 Ma. Lower Triassic-Lower Jurassic ss also show unimodal patterns with %Pc = 0. Middle Jurassic-Lower Cretaceous ss shows bimodal patterns at 130-450 Ma and 2000 Ma (%Pc = 8-29).

Nedamo Belt: AC-forming Takinosawa ss is correlated in detrital zircon age pattern with the Lower Triassic of the South Kitakami Belt. They show a unimodal pattern at 250-300 Ma.

North Kitakami Belt: AC-forming Triassic Kamatsuda calcareous ss shows a quasi-unimodal pattern at 250 Ma (%Pc = 3). Upper Jurassic AC and Lower Cretaceous cover show bimodal patterns at 150-170 Ma and 2000 Ma, with %Pc of 60-90 and 40, respectively.

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