

Detrital zircon chronology of Mesozoic sediments from Khabarovsk area, Russian Far East, and SW Japan

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Mesozoic formations are widely distributed in the southern part of Primorye, Far East Russia. A part of them is suggested as a Jurassic accretionary complex named the Khabarovsk-Nadanhada-Samarka Terrane. Because of their lithological similarity, ages, radiolarian assemblages and geologic structure, this Terrane has been thought to be the eastern extension of the Tamba-Mino-Ashio Terrane in the Inner Zone of SW Japan, though they are separated by Japan Sea (Kojima, 1991). To restore the primary continuation and reconstruct the geological structure around them, we compared their provenance detected by the detrital zircon U-Pb chronology. Sandstones were corrected from the Triassic to Cretaceous Khabarovsk, Amur and Bureya Groups around Khabarovsk City, and the Tamba-Mino-Ashio Terrane as a Jurassic accretionary complex distributed in the Inner Zone of SW Japan. Separated detrital zircons were analyzed using LA-ICP-MS (80-120 grains for each sample). They show space and temporal change of their provenance reflecting the tectonic event during their deposition. Sample KHB-1 is pale greenish gray sandstone corrected from the chart-shale melange in the Jurassic Khabarovsk complex at the Amur riverside in Khabarovsk City. Sample KHB-5 is pale greenish gray sandstone corrected from the Pioneer Formation as a Cretaceous fore arc basin deposit at the Petropavlovka lake side ca. 35 km NE of Khabarovsk City. Sample BRB-1 is light gray sandstone corrected from the Cretaceous non-marine Bureya Basin at ca. 370 km NNW of Khabarovsk City. Sample DLM-3 is dark gray sand fine-grained sandstone corrected from the Early Cretaceous marine Assikaevka Formation at ca. 120 km SSE of Khabarovsk City. This Formation rests on the Nadanhada Terrane unconformity. Sample ASI-1 is grey sandstone corrected from the Hakonoguchi Formation, Ashio Terrane, at Oguni-Cho, Yamagata Prefecture. Sample INY-1 is medium grained sandstone corrected from the Kamiaso section of the Mino Terrane at Inuyama City, Gifu Prefecture.

U-Pb ages are analyzed on over 800 zircon grains. The samples from Khabarovsk area and SW Japan show their depositional ages as Triassic to Middle Cretaceous and early to middle Jurassic, respectively. Despite the diversity of depositional ages and tectonic settings, all Khabarovsk samples show the similar age population consisting the age clusters at around 230-280 Ma and 420-490 Ma. This chronological feature can be also found in the Bureya Basin sample and they can be correlated to the Khanka, Jamsui and Bureya massive as their provenance. On the other hands, zircons of all samples corrected from Tamba-Mino-Ashio Terrane of SW Japan show the age clusters at around 190-280 Ma and 1.8 Ga. And they don't contain the middle Proterozoic to early Paleozoic zircons at all. Such the age population shows that the provenance of the Tamba-Mino-Ashio Terrane can be correlated to the North China Craton. On the other hand, the age population of detrital zircons from Khabarovsk area is quite similar to that of the Lower Triassic Moribu Formation of the Hida Terrane, and the Upper Triassic Nabae Group and Lower Triassic Miharayama Formation of the Maizuru Terrane (Nakama et al., 2010). This suggests that the Maizuru Terrane was located near the Khanka-Jamusi-Bureya massif at the Triassic time. And this agree with the assumption by Fujii et al. (2008), that the Northern zone of the Maizuru Terrane was displaced by dextral strike-slip fault split from Khanka Massif. This might have been lead the change of provenance for the Inner Zone of SW Japan during Late Triassic to Early Jurassic time.

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