

U-Pb geochronology of detrital zircons from the Central Hokkaido, Japan

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INTRODUCTION

The Yezo and Saroma groups in central Hokkaido, NE Japan, consist of Cretaceous (to Paleogene?) forearc-basin sedimentary sequences. Previous litho- and biostratigraphic studies (e.g., Takashima et al., 2004; Kiminami and Kontani, 1983) implied that the two groups were deposited in different arc-trench systems. In this study, we will provide detrital-zircon age spectra of the two groups as basic data for the future discussion of provenance analysis and tectonics.

SAMPLES

We studied four samples of the Yezo Group and two samples of the Saroma Group. The samples of the Yezo Group were collected from the Tomitoi Formation (lower part of the Yezo Group), Hikagenosawa and Mikasa formations (middle part), and Hakobuchi Formation (uppermost part) in the Mikasa-Hatonosu and Ashibetsu-Yubari areas. The two samples of the Saroma Group were collected from the upper part of the group on the north of Lake Saroma-ko. All the samples were of medium to coarse grained sandstone.

RESULTS

Yezo Group: We found a broad tendency that the percentage of Precambrian zircons decreases towards the stratigraphic top: from 22-26% in the lower three samples to 3.3% in the Hakobuchi Formation. The Tomitoi Formation contained about 45% of Permian to Jurassic zircons, whereas the other formations contained abundant Cretaceous zircons (50-80%). The age of the youngest zircon (YZ) from the four samples was 126 Ma (Tomitoi), 96 Ma (Hikagenosawa), 83 Ma (Mikasa), and 70 Ma (Hakobuchi).
Saroma Group: The two samples of the Saroma Group, with the YZ of 71 and 69 Ma, contained some Cambrian to Carboniferous zircons that were absent in the coeval Hakobuchi Formation. The percentage of Precambrian zircons was 13% and 21%, whereas that of Cretaceous zircons was 35% and 49%.

DISCUSSION

The Cretaceous zircons in the Yezo Group may have supplied from the igneous arc to the west of the Yezo forearc basin; i.e., the igneous rocks in the Oshima and Rebun-Kabato belts. The provenance of the Precambrian zircons in the Tomitoi, Hikagenosawa, and Mikasa formations, however, must have been in the present-day East Asia, where Precambrian igneous rocks are widely exposed. The coeval Hakobuchi Formation and the Saroma Group likely had different hinterlands, judging from the difference in detrital-zircon-age spectra.

Keywords: U-Pb age, detrital zircon, LA-ICP-MS, Hokkaido