

Zircon U-Pb ages of sedimentary complexes around the Hidaka mountain range: New age data on the northern and southern areas of the Nakanogawa Group, southern Hidaka Belt

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Recent reexamination of the Hidaka Supergroup (Hokkaido, Japan) has left several stratigraphic units undated, and their attribution as protoliths of the Hidaka Metamorphic Belt unclear. Furthermore, the Erimo Complex remains uncorrelated, precluding proper interpretation of the Horoizumi Shear Zone. We present detrital zircon U-Pb age dating of the sedimentary complexes around the Hidaka Mountains to clarify their tectonic history. The turbidite sandstone of the T-Unit (Horobetsugawa Complex, Idonnappu Zone; depositional age 64.1 (+1.5/-1.4) Ma, early Paleocene) is significantly older than the Nakagawa Group (Hidaka Belt). The turbidite sandstone of the Erimo Complex (depositional age 53.0 (+0.65/-0.4) Ma, early Eocene) is significantly younger than the T-Unit turbidite sandstone, and of similar age as the Kamitoyoni Formation (Nakanogawa Group, southern unit). We therefore correlate the Erimo Complex to the Kamitoyoni Formation based on their similar ages, lithofacies, and sandstone compositions. This correlation of the Erimo complex implies that the Horoizumi Shear Zone (between the Hidaka Metamorphic Belt and the Erimo Complex) is not a southern extension of the Hidaka Main Thrust, but a right-lateral slip fault or normal fault. Acidic tuff bed Gm-01, at the base of the turbidite facies of the Hiroo Complex (Nakanogawa Group, southern unit), dates to 63.5 (+1.2/-0.5) Ma, considered to be a lower age limit of the Hiroo Complex turbidite facies. Acidic tuff Ym-1 (Nakanogawa Group, northern unit) was deposited in a similar hemipelagic environment, but its depositional age (57.0 +1.3 /-0.5 Ma) is older than that of Gm-01. This difference suggests an age polarity between the northern and southern units of the Nakanogawa Group. Turbidite sandstone collected from the northeast extension of the previously undated Bisei Formation reveals a depositional age of 51.6 (+0.6/-0.3) Ma (early Eocene), representing the youngest age yet obtained for the Hidaka Supergroup, including the Nakanogawa Group.

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