

Stratigraphic correlation of the middle and lower part of the Cretaceous Yezo Group by U-Pb geochronology of tuffaceous rocks, Hokkaido, northern Japan

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The Cretaceous sediments, which is called "Yezo Group", are distributed widely in the axial area, between the north and the south of Hokkaido Island, northern Japan. This group was traditionally divided into three members as, the lower, middle and upper members (ex. Matsumoto, 1942). However, it was pointed out that stratigraphic horizon of the boundary between the lower and middle members of Yezo Group are different in each region. Meanwhile, it was also reported that a key layer consisting of felsic tuff and volcanic clastic sandstone, which are named "Maruyama Formation (Matsumoto, 1942; Motoyama *et al.*, 1991)" in central Hokkaido, can be traced in the whole distribution of the Yezo Group. Though the depositional age of this key layer is considered to be useful for broad stratigraphic correlation of the Yezo Group, the sporadic occurrence of index fossils makes insufficient correlation in northern and southern marginal parts of the Yezo Group including Teshionakagawa and Shunbetsu area. In addition, no correlated layer to the Maruyama Formation are found in both areas. In order to specify the depositional age in above mentioned barren horizon, the detrital zircon geochronology is applied for tuff layers distributed in the Teshionakagawa and Shunbetsugawa areas. Then, the broad stratigraphic correlation of the lower to middle parts of the Yezo Group is carried out. In this study, we used LA-ICP-MS (Agilent 7500a ICP-MS and New Wave UP213 Laser Ablation System) for U-Pb geochronology in Niigata University.

As a result by zircon U-Pb dating, the tuff layers, in the Shirataki Formation, in Teshionakagawa area show the youngest graphical age peaks of 96.3-103.4 Ma. On the other hand, the youngest age peak of 98.5 ± 0.5 Ma are obtained from the tuff layer, in Shunbetsu area. Additionally, the petrological characteristics of these tuff and tuffaceous sandstone show felsic. In nature, it is reported that the depositional age of the Maruyama Formation is 102-105 Ma by previous studies using planktonic foraminifera (Takashima *et al.*, 1997b). In addition, sanidine Ar-Ar radiometric age of 98.98 ± 0.38 Ma, 99.16 ± 0.37 Ma were reported from the tuff layer in the Hikagenosawa Formation, in the Middle Yezo Group in the central Hokkaido (Obradovich *et al.*, 2002). Therefore, we concluded that the dated tuff layers in Teshionakagawa and Shunbetsu areas are comparable to these Formations, because of the similarity of these depositional ages and petrological characteristics. It is concluded that the granitic rocks yielding 96-127 Ma K-Ar ages (ex. Shibata and Yamada, 1978), distributed in the Oshima Belt, and the volcanic rocks showing 100.6 ± 3.3 Ma Ar-Ar age (ex. Takigami, 1984) in the Rebun-Kabato Belt are potentially related to source of these tuff layers because of similarity of the radiometric ages and petrological characteristics.

Keywords: Cretaceous, Yezo Group, U-Pb geochronology