

Igneous activities of the Paleo-Kuril forearc induced by Izanagi-Pacific ridge

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The Late Cretaceous to Paleogene Nemuro Group, located in the easternmost of Hokkaido (Japan) is interpreted as a forearc basin deposit of the Paleo-Kuril Arc due to their W-E elongated shape and characteristic volcanoclastic sediments. The Nemuro Group contains different volcanic levels of adakitic and shoshonitic composition.. Shoshonitic magma generally erupts at active back-arcs and rarely at volcanic front, however and to our knowledge this is the first appearance of shoshonites in a forearc region. Because of the inconsistency between such geological setting and the petrological aspect, tectonics of the Paleo-Kuril arc-trench system are enigmatic. Here, we present the petrogenesis of those and a tectonic reconstruction of Paleo-Kuril arc based on the igneous rocks in Nemuro Group.

The shoshonitic associations occur as sills and pillow lavas. They can be divided into two groups in petrography and geochemistry. The Group 1 has higher Mg# ($Mg/[Mg+Fe]$) than the Group 2, which is in contrast relatively differentiated. The Group 1 mainly occurs as sills intruded into lower part of the Nemuro Group whereas the Group 2 occurs as pillow lavas and sills mainly into mid- to upper sequences of the Nemuro Group (70-54 Ma), some of which are erupted over unconsolidated sediments (i.e. interpillow sediments). It is possible to consider the Group 2 shoshonites are formed by fractional crystallization of phenocrysts in the Group 1. The adakitic association can be seen in the lowermost part of the Nemuro Group.

Here, we provide the new tectonic model for elucidating the forearc volcanism in the Paleo-Kuril Arc. Our model suggest that the adakitic igneous activity was caused by approaching of Izanagi-Pacific ridge to the Paleo-Kuril trench.