

The age of the Omma Formation based on wide-spread tephra correlation -Correlation between Omma O1 ash and Bando2 ash-

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The Plio-Pleistocene Hokuriku Group including the Omma Formation, distributed extensively in Kanazawa and Toyama areas, is composed of thick sand and mud deposits with many marine fossils. Kitamura and Kondo (1990) analyzed in detail the molluscan fossils and sedimentary facies of the Omma Formation at the type locality, where the Formation is exposed along Saikawa River. The result of this analysis suggests that a certain sea-level change can be reconstructed by the cyclic changes of sedimentary facies and of autochthonous molluscan fossil associations. And, these cyclic changes correspond to the changes of the contemporaneous oxygen isotope record measured from deep-sea cores. Consequently, Kitamura et al. (2001) concluded that cyclothem L-3, which contains O2 and O3 ashes, correlates with oxygen isotope stages 51-50 (about 1.5 Ma) and cyclothem L-1, which contains O1 ash, correlates with oxygen isotope stages 56-54 (1.65-1.60 Ma). In these studies, calcareous nannoplankton fossils and paleomagnetism have been used to determine the chronological horizon.

Tamura and Yamazaki (2002) examined the tephrae contained in the Omma Formation. In that study, the O2 and O3 ash layers interbedded at the middle part of the Omma Formation are correlated with the Ebs-Kd38 (1.70 Ma) and Omine-Kd25 (1.65 Ma) tephrae, which are distributed widely in central Japan.

In this study, O1 ash is correlated with the Bando2-Hara tephra (2 Ma), which is distributed in Tokai and Kinki area. The similarity of following features confirms the correlation between O1 and Bando2-Hara: mineral assemblage—especially contained Osumilite, refractive indices of the volcanic glass and orthopyroxene, and chemical composition of the volcanic glass.

Based on the tephra correlation, the age of the Omma Formation is older than the estimated age of previous works.