# Ankaramite-andesite-basalt (ANANBA) model of arc evolution

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Primitive and phenocryst-rich ankaramitic basalts were recovered from the old submarine knolls near Nishinoshima (Tamura et al., 2019), Doyo seamount 50 km north of Nishinoshima, and Kibblewhite volcano in the Kermadec arc (Hirai, 2020 PhD thesis). We suggested that lithospheric mantle was thicker before the development of andesite volcano like Nishinoshima. Primary basaltic magmas could have been generated at depth beneath the thicker lithospheric lid, and these magmas might have interacted with the lithospheric uppermost mantle during their ascent and have resulted in the unique ankaramite magmas. The temperature of the upper part of the mantle wedge increases with frequent passage of magmas through it, and continuous subduction beneath it will drench the whole mantle wedge, thus, the thickness of the lithosphere will decrease and approach the thickness of the curst in mature arcs. Doyo Seamount could represent the early stage of Nishinoshima volcano, and thus, ankaramite magma is deemed to be a precursor of andesitic magmas.
Olivine-bearing phenocryst-poor andesites found in older submarine lavas from the flanks of the volcano have been used to develop a model for the genesis of andesitic lavas from Nishinoshima (Tamura et al., 2019). Primary andesite magmas originate directly from the mantle as a result of shallow and hydrous melting of plagioclase peridotites. Andesites erupted from Nishinoshima that were produced in the recent history of the volcano have been generated by olivine fractionation of primary andesitic magmas (Tamura *et al.*, 2019).
When crust becomes thicker than 30 km like northern parts of the Izu-Ogasawara arc (Izu-Oshima volcano, Miyake-jima volcano etc), only basalt magmas are produced in the mantle wedge of subduction zones.We present here the evolution model of oceanic arc volcanoes, which start from ankaramites through andesites to basalts (ANANBA model).

Keywords: ankaramite, andesite, basalt

 