

## Hot and ephemeral subduction zone magmatisms in the Oman Ophiolite

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Subduction zone is initiated by descending oceanic plate at the plate boundary and a counter flow of the mantle advances growth of the wedge mantle in the Izu-Ogasawara-Mariana arc (e.g. Stern, 2004). But it is questioned that do initial arc always develop a long-survived subduction zone? We present detailed volcanostratigraphy, petrology and geochemistry of short-lived juvenile arc tholeiite and subsequent boninite magmatism from the northern Oman ophiolite.

The Oman ophiolite belonging to the Tethys ophiolite belt is one of the best places to investigate magmatic and volcanic developing processes of an infant arc. The Ophiolite had formed on a spreading axis and followed by subduction stage magmatism at approximately 100 Ma. The V2 sequence was constructed by initial arc magmatism begun <2 m.y. after the spreading ridge stage (e.g. Hacker et al., 1996). Based on the radiolarian fossil age, the V2 volcanism ceased 2-3 m.y. after the ridge stage (Kurihara and Hara, 2012), therefore, it seems to record short-spanned island arc magmatism.

An 1110 m thick V2 sequence is divided into the lower 970 m (LV2) and upper 140 m (UV2) thick subsequences by a 1.0 m thick sedimentary layer in Wadi Bidi. Pahoehoe flows dominate in the lower part of the LV2, while the upper part consists mainly of sheet flows with intervened few pelagic sediments, a fissure vent and a cylindrical plug. In addition to the presence of feeder conduits, the flow-dominant lithofacies with a few thin sedimentary interbeds in the LV2 indicates that the study area was the center of a monogenetic volcano grown in a short period. The LV2 consist of arc tholeiite with orthopyroxene phenocrysts increasing in amount upward. The UV2 is composed of sheet flows overlain by a 2.0 m thick subaqueous pyroclastic fall deposit. They are boninite containing olivine and two-pyroxene phenocrysts with plagioclase in the groundmass. Successive orthopyroxene-bearing arc tholeiitic volcanism in the LV2 followed by a relatively small amount of boninite lavas in the UV2 overlain by thick pelagic sediments suggests that the infant arc volcanism was short lived and terminated long before the ophiolite obduction.

Keywords: High-T subduction zone, Initial arc magmatism, Boninite, Oman Ophiolite