

## Along-axis variations of magmatism: implication from the V1 volcanic rocks in the northern Oman ophiolite

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Overlapping spreading centers and small offsets, devals, mark the boundaries of the magma supply systems in spreading centers [Langmuir et al., 1986] and it appears as compositional variations between each segment. For example, MORBs recovered from the EPR (11 20 N and 9 30 N) have relatively a small geochemical variation whereas lavas from 10 30 N have a great range in composition, including evolved and less-evolved [Batiza et al., 1996]. On the other hand, digitized profiles of the ridge axis show deeper depth, narrower axial summit and deeper melt lens beneath the ridge axis in the segment margin than shallower and inflated segment center [Scheirer and Macdonald, 1993]. It indicates that magmatisms are changed along a ridge segment. Based on the segment structure proposed by Miyashita et al. [2003], we studied along-axis variations of upper crustal section in the Oman ophiolite and discovered systematic changes of extrusive sequence due to the segment structure.

Comparing eight geologic sections spanning 70 km, the along-axis volcanic system is reconstructed. Representative area of the segment center and margin is Bani Ghayth and Wadi Fizh, respectively. The total thickness of on-axis lava section decreases from the segment center (603 m thick) to the margin (410 m thick). Predominant appearance of pillow lavas around the segment margin indicates more ragged seafloor topography than the center where pahoehoe flows dominate. Their lava compositions are also varied systematically. Homogenized mildly-evolved lavas characterize the segment center. The larger melt lens and the higher ability of melt concentration below the segment center would produce the thick and comparatively homogenized lava sequence. On the other hand, both evolved and less-evolved lavas showing lower degrees of partial melting occur in the segment margin. Smaller melt lenses would promote highly evolved and less-evolved lavas. Although thinner on-axis lava sequences occur at the segment margins, total thickness of lava section is relatively fixed because of off ridge volcanisms. Occurrences of the fissure vent or dikes intruding into the extrusives imply the volcanisms after on-ridge magmatism. Such vigorous off-axis volcanisms are recognized around the second- and third-order segment margins along the EPR. They might be rooted at less-evolved melts from depths avoiding the focus into the melt lens beneath the axis area.

Keywords: MORB, Segment structure, Volcanology, Bulk rock composition, Oman ophiolite