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Physical Evidence of Vesicular Cylinders in Pahoehoe Lava Flow at Pataleshwar Temple, Pune, India

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Abstract

A prehistoric temple site at Pataleshwar exhibit physical evidence of numerous vertical as well as horizontal vesicular cylinders. The exposed basalts are found to be massive compound pahoehoe lava flows with an elevation of mean reduced level (MRL) as 564m from the mean sea level (MSL). The exposed excavation site is only 4.5m deep. More than 61vertical vesicular cylinders and 2 to 3 horizontal vesicular zones have been identified. The vertical vesicular cylinders vary from 10 to 270cm in height and circular to oval-shaped in transverse sections. These gas migrating channels are mostly vesicular to rarely amygdaloidal in nature. The diameter of gas vesicles and amygdales varies from 0.3cm at the top to about 1.1cm at the base. At places, the vertical gas channels end at the top of the flow forming 'T' junction, which spreads as an undulating and sub-horizontal vesicular zones.

During inflation and solidification the circular gas-channels might be generated at the lower vesicular crust below (?), and migrated upwards within the hot, molten core and ultimately accumulated below the visco-elastic crust as a horizontal to sub-horizontal gas channels. These observations at the excavation site indicate a large pahoehoe lava flow with an exposed part of central core and small part of the upper brittle crust of a typical three layer representation of a massive pahoehoe lava flow.

Keywords: Vertical and horizontal vesicular cylinders, Pahoehoe lava flow, Pataleshwar Temple, Pune