

Lower crustal section of the Oman Ophiolite drilled in Hole GT1A, ICDP Oman Drilling Project

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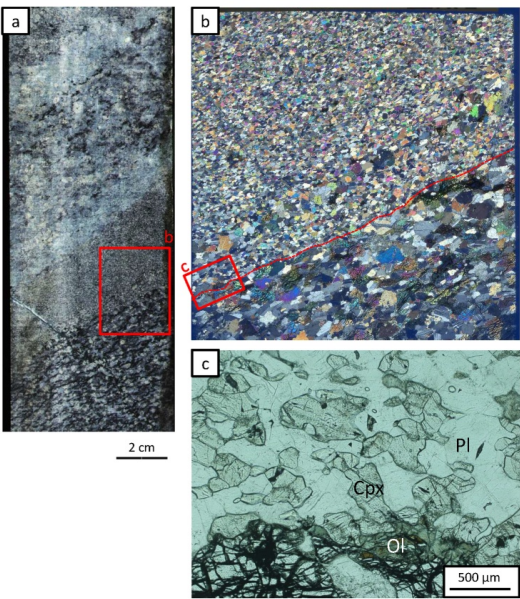
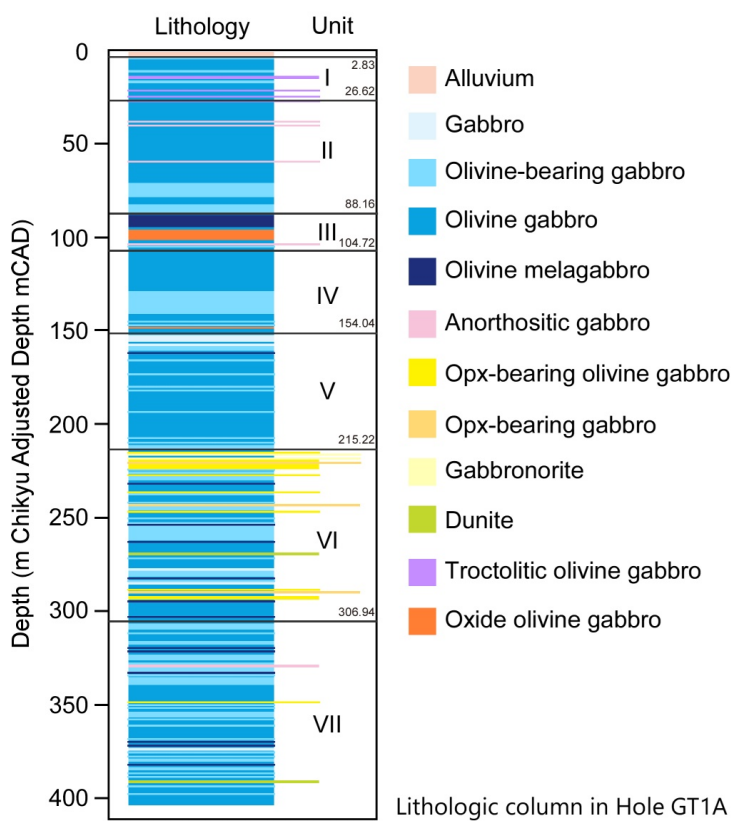
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Hole GT1A (22° 53.535'N, 58° 30.904'E) was drilled by the Oman Drilling Project (OmDP) into GT1A of the Samail ophiolite, Oman. OmDP is an international collaboration supported by the International Continental Scientific Drilling Program, the Deep Carbon Observatory, NSF, IODP, JAMSTEC, and the European, Japanese, German and Swiss Science Foundations, with in-kind support in Oman from the Ministry of Regional Municipalities and Water Resources, Public Authority of Mining, Sultan Qaboos University, and the German University of Technology. Hole GT1A was diamond cored in 22 Jan to 08 Feb 2017 to a total depth of 403.05 m. The outer surfaces of the cores were imaged and described on site before being curated, boxed and shipped to the IODP drill ship Chikyu, where they underwent comprehensive visual and instrumental analysis.

Hole GT1A drilled the lower crustal section in the southern Oman Ophiolite and recovered 401.52 m of total cores (99.6% recovery). The main lithology is dominated by olivine gabbro (65.9%), followed in abundance by olivine-bearing gabbro (21.5%) and olivine melagabbro (3.9%). Minor rock types are orthopyroxene-bearing olivine gabbro (2.4%), oxide-bearing olivine gabbro (1.5%), gabbro (1.1%), anorthositic gabbro (1%), troctolitic gabbro (0.8%); orthopyroxene-bearing gabbro (0.5%), gabbronorite (0.3%); and dunite (0.3%).

These rocks are divided into Lithologic Unit I to VII at 26.62 m, 88.16 m, 104.72 m, 154.04 m, 215.22 m, 306.94 m in Chikyu Curated Depth in descending order; Unit I and II consist of medium-grained olivine gabbro with lower olivine abundance in Unit II. Unit III is medium-grained olivine melagabbros, marked by an increase in olivine. Unit IV is relatively homogenous medium-grained olivine gabbros with granular textures. Unit V is identified by the appearance of fine-grained gabbros, but the major rocktypes are medium grained olivine gabbros. Unit VI is medium-grained olivine gabbro, marked by appearance of orthopyroxene. Unit VII is of fine- to medium-grained olivine gabbros with less olivine.

Keywords: Oman Ophiolite, fast-spreading axis, oceanic crust accretion, layered gabbro, foliated gabbro



GT1A_45Z1_59-75. A fine-grained gabbroic layer (brownish part) interbedded into medium-grained layered gabbros.