Introduction to Science Theme 1A: gabbro traverse[1]

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Keywords: Oman Drilling Project, OmanDP, Samail ophiolite, Zihlmann-Muller Fault Zone, Wadi Gideah, Gabbro Traverse, Site GT1, Site GT2, Site GT3

Chapter contents

[1] Kelemen, P.B., Matter, J.M. Teagle, D.A.H., Coggon, J.A., and the Oman Drilling Project Science Team, 2020. Introduction to Science Theme 1A: gabbro traverse. *In* Kelemen, P.B., Matter, J.M., Teagle, D.A.H., Coggon, J.A., et al., *Proceedings of the Oman Drilling Project*: College Station, TX (International Ocean Discovery Program. https://doi.org/10.14379/OmanDP.proc.105.2020
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Gabbro Traverse

Wadi Gideah, in the Wadi Tayin Massif, is the best site for study of an intact crustal section in the Samail ophiolite (Fig. **F1**). The section is well mapped by the US Geological Survey, the Oman Geological Survey, the Nicolas group at the Université de Montpellier II, and Professor Tjerk Peters of the University of Bern, Switzerland (Fig. **F2**). Recently it has been the focus of renewed research activity including an extensive sampling program by Oman Drilling Project (Oman DP) investigators Koepke, Garbe-Schonberg, and Müller and hydrothermal research by Teagle, Kelemen, and Zihlmann, as well as other teams. Wadi Gideah drains southward from the Jabal Dimh drainage divide north of the crust–mantle transition. Around the wadi, the crustal section dips gently to the south, exposing deeper levels upstream to the north and shallower levels to the south, culminating with submarine lava flows in the "Ibra syncline." Two sites of the Gabbro Traverse were drilled within Wadi Gideah during Phase 1 of the OmanDP, Sites GT1 (layered gabbros) and GT2 (foliated gabbros). It was initially proposed to drill the dike–gabbro transition at the southern end of the Wadi Gideah where it opens out on to the Ibra Plain, but a suitable location could not be identified. Consequently, Site GT3 was relocated to Wadi Abda (23°06.845′N, 58°12.703′E) about 40 km northwest (see the **Site GT3** chapter).

References

Hopson, C.A. et al., 1981. Geologic section through the Samail ophiolite and associated rocks along a Muscat-Ibra transect, southeastern Oman Mountains. Journal of Geophysical Research, 86(B4):2527–2544. doi:10.1029/JB086iB04p02527

Nicolas, A, Boudier, F., Ildefonse, B., Ball, E., 2000. Accretion of Oman and United Arab Emirates ophiolite—Discussion of a new structural map. Marine Geophysical Researches, 21:147–180.

Figure F1. Geological map (after Nicolas et al., 2000) and ophiolite stratigraphic column showing the locations of all Oman Drilling Project boreholes.

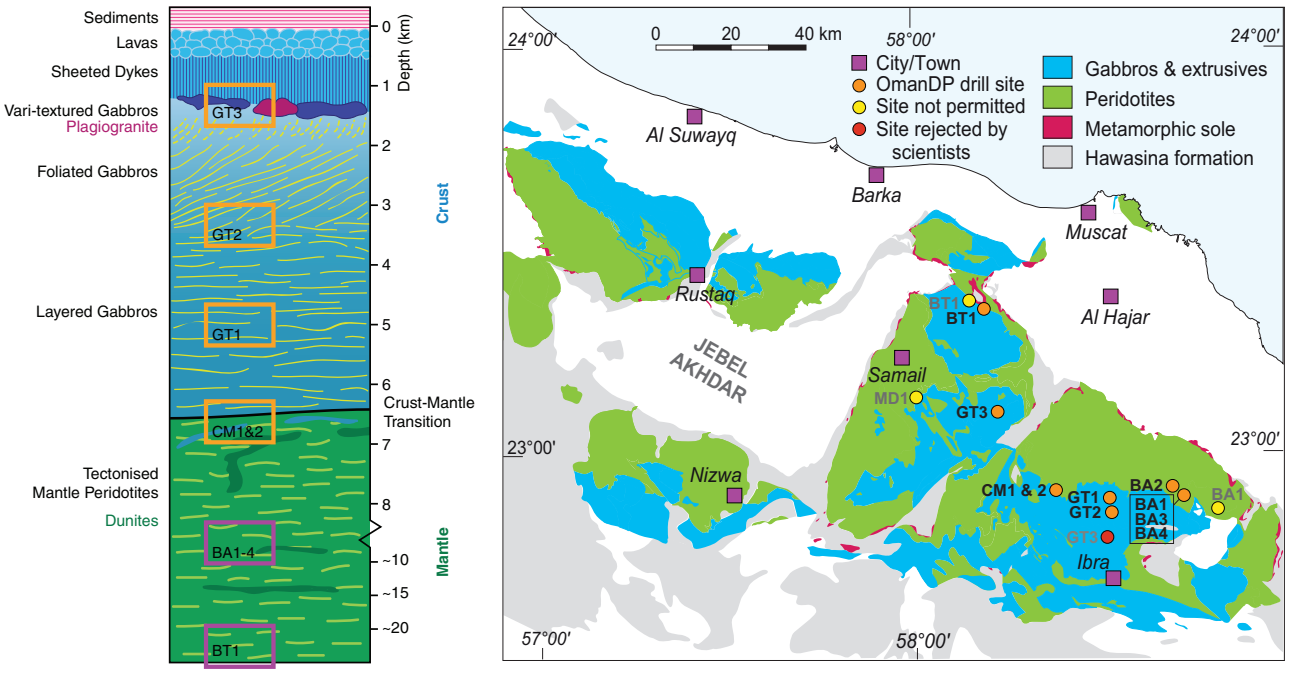

Figure F2. Geological cross-section from north (Muscat) to south (Ibra and the Wahiba Sands), showing the Ibra dome and Tayin Massif (marked on the section as Jabal Dimh) of the ophiolite (after Hopson et al., 1981).