Iron Age copper smelting at Bayt Bin ‘Ātī in the Qattārah oasis (al-’Ain, UAE): A preliminary study

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Thilo Rehren, Dr.ing. Habil, Dr. Rer. Nat.; Martina Renzi; Timothy Power; Peter Sheehan

Corresponding author:
th.rehren@ucl.ac.uk
Ucl Qatar, Doha, Qatar

Abstract
The archaeological site, situated at the southwest edge of the Qattārah oasis, has been excavated recently by the Abu Dhabi Authority for Culture and Heritage (ADACH) as part of a redevelopment project of the area to create the Qattārah Community Art Centre on the rebuilt structures of the Bayt Bin ‘Ātī al-Darmaki complex. These excavations revealed that Bayt Bin ‘Ātī had a long occupational sequence, with a deep stratigraphy that covers from the Iron Age until the Late Islamic period. No monumental structures have been unearthed at the site so far. The main archaeological evidence found is constituted by pits, postholes and irrigation ditches associated to agricultural and industrial installations. Since the first occupation phase of the site, agriculture seemed to be the main economic activity at the site but, during the Iron Age II (aprox. 1100-600 BC), copper smelting also played an important role, as suggested by the find of more than 50 kg of metallurgical residues, such as slags, furnace walls, fragments of metallurgical vessels and some metal lumps. This debris was spread on a 10 cm-thick layer in the southeast corner of the Southern Baulk, which is located between the arts workshop area and the semi-subterranean energy centre of the complex. No metallurgical structures or furnaces had been identified in the area.

In this paper, we present the preliminary results of the analytical study of a small selection of this copper production debris, namely two fragments of tap slags, a fragment of a ceramic crucible and a large tongue-shaped metal lump. These samples have been examined by optical microscopy and scanning electron microscopy, and the results obtained indicate that sulphidic ores were exploited to produce copper. This kind of mineral deposits is commonly found in ophiolite rock, mined on a vast scale in the al-Hajar Mountains since the Bronze Age.

Bayt Bin ‘Ātī finds point at the continuation of those copper mining activities during the Iron Age, but only a more in-depth study of the metallurgical debris will allow us to obtain a better understanding of the patterns of ore exploitation and metal production on the territory during the Iron Age. In fact, it is worth mentioning that there are no mines known so far in the area of the Qattārah oasis. The closest mine is Wādī Jizzī in Oman, situated at approximately 60 km from Bayt Bin ‘Ātī. The reason why they were transporting minerals instead of producing metals closer to the mining area is still unknown. The need for fuel and water could have been important factors but a broader study of the region is needed to shed light on this topic.