



Provenance of clay used in Garamantian ceramics from Jarma, Fazzan region (south-west Libya): A combined geochemical and microfossil analysis



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ABSTRACT

Geochemical (XRF) and microfossil analyses were applied to a sample of 1st millennium BCE and 1st millennium CE handmade pottery from Jarma, Fazzan region, Libya. The provenance of a particular group of painted ware has important implications for the production and distribution of this material. A parallel geochemical analysis of selected water-lain sediments in the region suggests a Saharan clay source for the material used in the pottery. Geochemical analysis identifies halite, gypsum and dolomite as components of the clay source, and this is consistent with the mineralogical content of local palaeolake sediments. Illite/kaolinite clay signatures are also consistent with a Saharan, as opposed to sub-Saharan, origin for the clay. Microfossil assemblages within some of the pottery comprise of thin-shelled, apparently monospecific ostracod assemblages together with possible fragments of gastropods, and are consistent with faunas of intra-continental Saharan lakes. Our analysis builds on previous assessments of the clay sources of Garamantian pottery that suggest that materials were sourced in palaeolake sediments fairly locally. The red on white painted ware with ostracods stands out from other material at Jarma and this suggests that the ware was the object of localised trade in the Sahara. The production of some versions of the painted ware in fabrics lacking ostracods also seems to indicate some local imitations at Jarma.

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1. Introduction

Recent research has transformed our knowledge of an ancient Saharan people known as the Garamantes, whose heartlands lay in the Wadi al-Ajal (Fazzan region, south-west Libya, see Figs. 1–3). This has revealed an unexpected level of trade contact with the Mediterranean, especially in the period from the 1st–4th centuries CE, attested by large quantities of imported Roman ceramics, mainly (but not exclusively) from North African and other parts of the Western Empire (Mattingly, 2013). In the late Roman period, such material diminished significantly. Roman pottery imports were, in part, replaced by a new range of hand-made forms with a lustrous white slip and over-painted fine red geometric patterns, hereafter defined as red on white painted ware (Mattingly, 2010; Leone, 2013). The decoration has parallels with a widespread but often poorly dated painted ‘Berber’ pottery tradition in North Africa (Camps, 1955), but the examples from Fazzan are distinctive and they are important as the finds come from well-dated

contexts. Finds from stratified contexts have enabled us to confirm that these wares date between the 4th and 11th centuries CE, though probably increasingly residual towards the end of that time frame (Leone, 2013; Mattingly, 2013, pp. 125–131). Although the only recorded finds of this ware have come from sites close to the Garamantian capital at Jarma, the production centre is not known. Although the pots were low fired and the fabrics were rather coarse, the painting is distinctive and refined in both design and in terms of quality. The forms also mark a departure from the much plainer common Garamantian handmade production (see Mattingly, 2007, 2010; Leone, 2013).

In the absence of identified parallels for the material elsewhere, a very local Garamantian production initially seemed the most likely explanation, with the first appearance of these wares correlating with the increasing scarcity of fine Roman material. It was decided to test the alternative hypotheses of local production or more distant provenance by close examination of the fabric of these pots and comparison with the typical local handmade fabrics. By employing a wide range of analytical techniques we sought to establish more exactly the composition of the sources of clay utilized and to try to shed light on actual provenance, whether close to Jarma, elsewhere in Fazzan or a more distant

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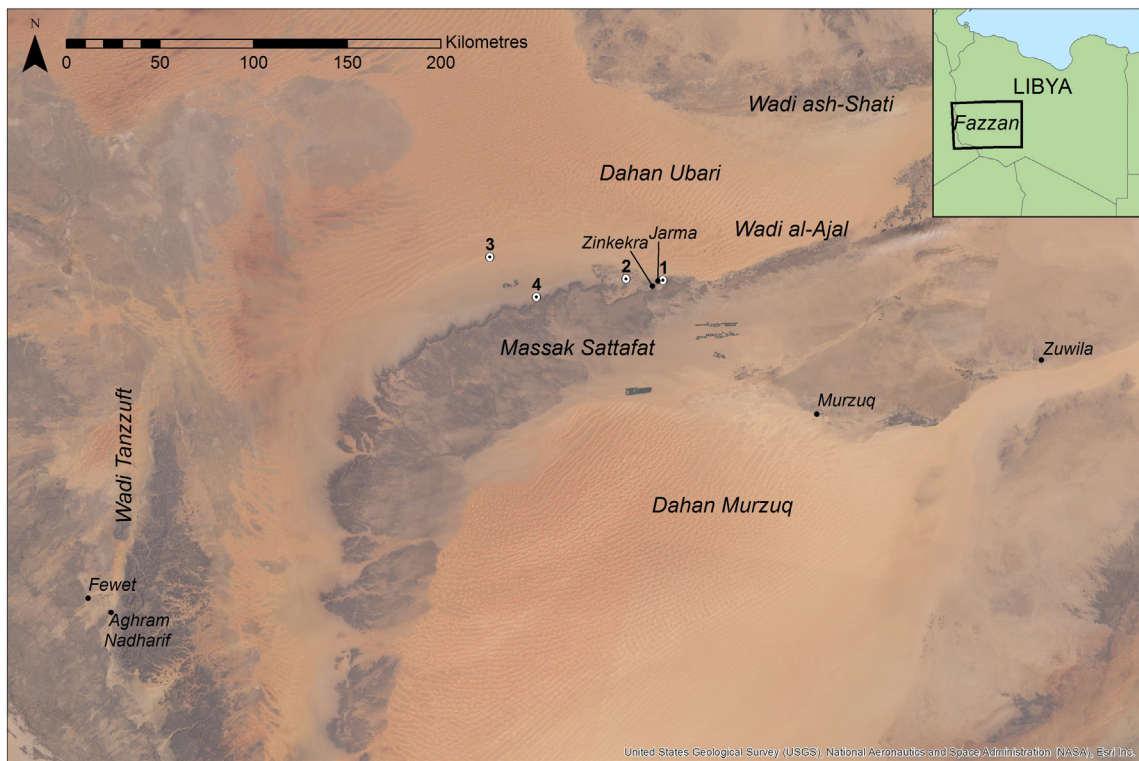


Fig. 1. The locality of Jarma, some of the other key Garamantian sites mentioned in the text, and sample locations 1–4 (for details see Table 3).

source in Northern Africa or Sub-Saharan Africa. This work is part of a wider programme of provenance work that is intended to create a new basis on which to assess the early development of Trans-Saharan and Saharan trade (see also Gliozzo et al., 2014 (carnelian and amazonite); Duckworth et al., 2015a,b (glass)).

A total of 20 potsherds were selected for analysis (see Appendices 1 and 2) out of a range of handmade pottery found in the Jarma area. Most of the material came from the site of Jarma itself (site GER001), but two sherds included for comparison relate to a nearby hill fort site of Zinkekra (site ZIN001–003) of 1st-millennium BCE date. The analysed

sherds are illustrated in Fig. 4 and described in Appendix 2. Most of the samples are painted handmade pottery, including some less finely painted products than the red on white ware. However, we also included some non-painted handmade wares (including the two sherds from the site of Zinkekra) that were almost certainly produced in close proximity to Jarma, to check against the fabrics of the painted handmade pottery (Appendix 2, samples 1–3, 6, 14–20). The red on white painted decoration occurs in at least two variant styles, one more refined than the other (Appendix 2, samples 4, 7–13), so we were also interested to see whether these were products of a single centre, or of one or

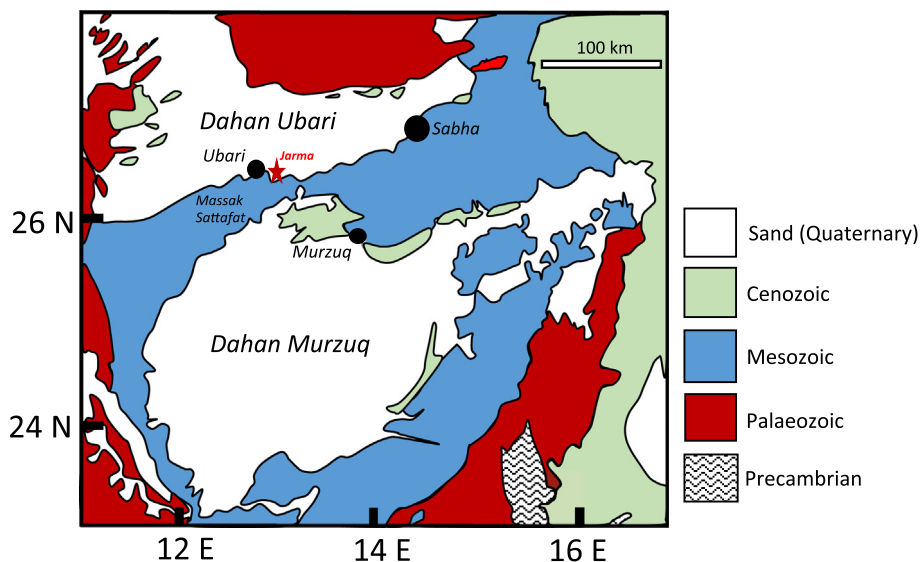


Fig. 2. Sketch map of the geology of part of the Fazzan region (Jarma indicated by the red star). To the south of Jarma the Massak Sattafat escarpment comprises Mesozoic continental deposits of mudstones and sandstones assigned to the Mesák Formation. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.) (Based on Geological map of Libya, Awbári Sheet, NG33-5, 1984, and Mustafa Abdullah, 2010.)

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