

Characterisation Studies of selected medieval pottery from Winchester

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Six samples of medieval pottery from an excavation in Winchester were submitted to the author for characterisation and comparison with other sampled pottery from the area. The samples form five groups which were assigned MoLAS and Winchester Museum codes as shown in Table 1.

Group 1 and 2: Handmade, gravel-tempered wares.

Group 3: Handmade, sand-tempered glazed ware.

Group 4: Handmade, sand-tempered glazed ware with a light-coloured body. Probably of South-East Wiltshire origin.

Group 5. Wheelthrown glazed whiteware. Probably Winchester ware (Biddle and Barclay 1974)

Table 1

Sample	MoLAS Code	Winchester Code	Fabric Group
V4615	WINC	MWW	4
V4616	WTPTCH	MAD	3
V4617	VWEMFLCH	MBE	1
V4618	WTPTCH	MAD	2
V4619	WEMFL	MAB	1
V4620	WEMCHI	MGX	2

The samples were examined in thin section. These were prepared by Steve Caldwell, University of Manchester, and stained using Dickson's method (Dickson 1965).

Their chemical composition was determined using Inductively Coupled Plasma Spectroscopy (ICP-AES). This was carried out at Royal Holloway College, London, under the supervision of Dr J N Walsh. A range of major elements was measured and expressed as percent oxides (App 1). A range of minor and trace elements was measured and expressed as parts per million (App 2). Silica content was estimated by subtraction of the total measured oxides from 100% and the data were normalised to aluminium before comparison using factor analysis.

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Local Handmade wares

Thin-Section Analysis

Fabric 1

The following inclusion types were noted in thin section.

- Quartz. Moderate well-rounded grains, up to 0.5mm across. Some are coated with dark brown material and some have brown-stained veins.
- Calcite. Sparse rounded fragments of sparry non-ferroan calcite up to 0.5mm across.
- Chalk. Sparse rounded fragments of non-ferroan micrite up to 1.0mm across with moderate microfossils.
- Clay/iron. Moderate subangular dark brown to opaque grains up to 0.3mm across.
- Calcareous algae. Rounded fragments up to 1.0mm across.

The groundmass consists of light brown, optically anisotropic, highly birefringent baked clay with sparse angular quartz and muscovite laths up to 0.1mm long.

Fabric 2

The following inclusion types were noted in thin section.

- Quartz. Moderate well-rounded grains, up to 0.5mm across. Some are coated with dark brown material and some have brown-stained veins.
- Calcite. Sparse rounded fragments of sparry non-ferroan calcite up to 0.5mm across.
- Chalk. Sparse rounded fragments of non-ferroan micrite up to 1.0mm across with moderate microfossils.
- Clay/iron. Moderate subangular dark brown to opaque grains up to 0.3mm across.
- Bivalve shell. Rare angular fragments of non-ferroan calcite up to 1.0mm long.
- Flint. Sparse angular unstained fragments up to 1.0mm across.
- Microfossils. Sparse non-ferroan calcite microfossils up to 0.5mm across. The tests are filled with ferroan calcite. One of these might be *nummulites* and another is multi-chambered, possibly *globigerina*.
- Selenite. Rare acicular crystals up to 1.0mm long and 0.2mm wide.
- Siltstone. Rare rounded fragments up to 0.5mm across.

The groundmass consists of light brown, optically anisotropic, highly birefringent baked clay with sparse angular quartz and muscovite laths up to 0.1mm long.

Chemical Analysis

The ICPS data for the three handmade, gravel-tempered samples were compared with that for a series of similar wares from Staple Gardens. The latter samples were of three groups: i) vessels of bag-shaped profile and everted rims with thickened necks. These, typologically, are of late Saxon date; ii) vessels with squat, globular profiles and sagging bases. These, typologically, are of Saxo-Norman date; iii) vessels which typologically are paralleled with those produced in the Vale of Pewsey and Kennett valley (Newbury Group B) in the later 12th to 14th centuries although analysis of the Staples Garden samples suggested that all three groups were produced in the Winchester area. A sample of fired clay of Iron Age date from Winchester and samples of flint-tempered saucepan pots were also included.

Factor analysis of this dataset revealed four factors and a plot of the F1 against F2 scores (Fig 1) indicates that the Iron Age vessels are separated by their F2 scores but that the remaining samples form a single cluster. The Fabric 1 samples match the late Saxon gravel-tempered samples best whilst the Fabric 2 sample is not particularly close to any of the comparanda, although definitely within the same cluster.

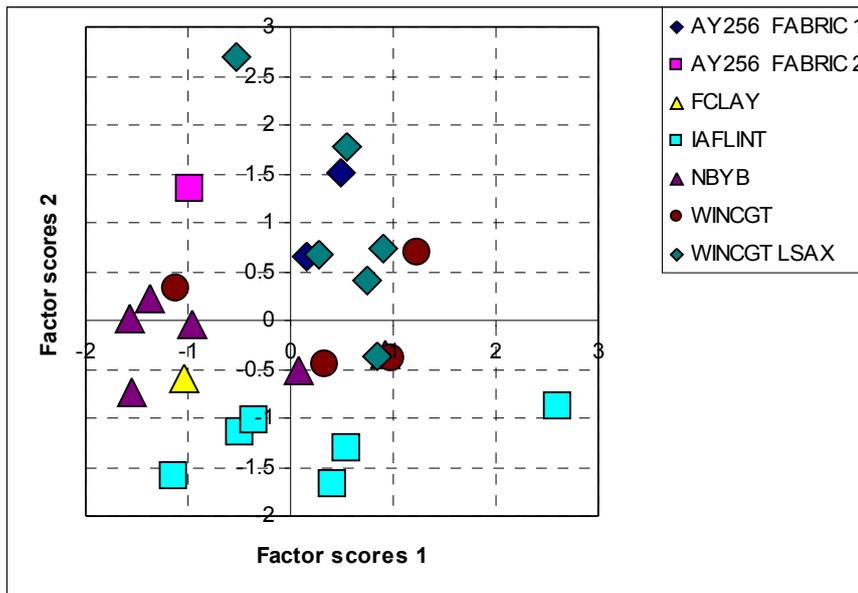


Figure 1

The F3 and F4 scores separate the Fabric 2 sample from the remainder and fail to distinguish clearly between the Iron Age and Late Saxon and medieval samples (Fig 2).

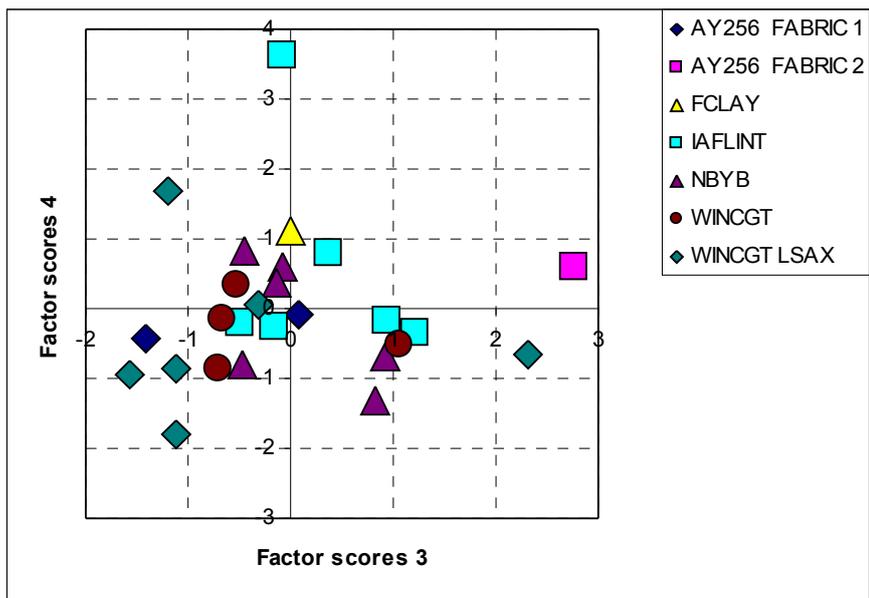


Figure 2

Discussion

The Fabric 1 samples are identical in the range and character of their inclusions to samples of gravel-tempered wares from Staple Gardens. Their chemical composition also matches these wares and distinguishes them from the Iron Age flint-tempered ware and, less clearly, from the Newbury Group B vessels and the fired clay.

The Fabric 2 sample is slightly different petrologically from the Staple Gardens samples. It contains inclusions which suggest a Tertiary component in the sand (e.g. the large microfossils and the siltstone). However, the chemical analysis shows that the composition is similar to that of the comparanda, although the F3 score distinguishes it.

Sand-tempered light-bodied wares

Thin-Section Analysis

Fabric 3

The following inclusion types were present in V4618:

- Quartz. Abundant, angular (overgrown?) to rounded grains c.0.2mm to 0.3mm across.
- Clay/Iron/Opaques. Moderate dark brown to opaque grains, some euhedral in outline, up to 0.2mm across or occasionally as aggregates of grains of this size, forming pellets up to 0.5mm across.
- Chert. Sparse rounded grains c.0.2mm to 0.3mm across.
- Flint? Rare angular fragments c.0.3mm to 0.4mm long.

The groundmass consists of light brown optically anisotropic baked clay and lenses of lighter and darker colour are visible. Few inclusions are visible in the groundmass.

Fabric 4

The following inclusion types were noted in thin section:

- Quartz. Abundant rounded grains up to 0.5mm across.
- Chert. Sparse rounded grains up to 0.5mm across.
- Flint. Rare subangular grains up to 0.5mm across.
- Calcareous inclusions. Rare heat-altered grains up to 0.5mm across.
- Organics. Sparse burnt-out organic material up to 0.5mm across surrounded by a darkened halo.
- Clay/iron/opagues. Sparse subangular grains c.0.2mm to 0.4mm across.

The groundmass consists of light brown optically anisotropic baked clay with few inclusions.

Fabric 5

The following inclusion types were noted in thin section:

- Quartz. Abundant subangular and rounded grains up to 0.2mm across. The subangular grains include probable overgrown grains.
- Chert. Sparse rounded grains up to 0.3mm across.
- Flint. Rare angular grains up to 0.3mm across.

The groundmass consists of optically anisotropic baked clay minerals, abundant angular quartz grains up to 0.1mm across.

Chemical Analysis

The ICPS data for the three sand-tempered glazed wares was compared with a series of comparanda: Winchester ware; South East Wiltshire ware; Surrey/Hampshire Border ware, Coarse Border Ware and Tudor Green ware; and a series of samples of sand-tempered whitewares from the Lower Seine valley.

Factor analysis of this dataset found four main factors and a plot of F1 against F2 scores (Fig 3) found that the comparative South-East Wiltshire sample, from a consumer site in Dursley, Gloucestershire, did not match well with any of the remainder. Otherwise, the various comparative groups are only poorly separated.

By contrast, the F3 and F4 scores (Fig 4) clearly distinguish Surrey/Hampshire border wares from the remainder (with the exception of one of the Winchester Staple Gardens

samples which falls into this group, and might be a mis-identified Surrey whiteware). The Fabric 3 sample plots with the Staple Gardens South Hampshire Redware samples whilst the Fabric 4 sample plots with the South Hampshire Redware and South Hampshire Whiteware samples. The Fabric 5 sample plots in a part of the diagram where several groups (Lower Seine valley and South Hampshire red and white wares) overlap.

Omitting the Surrey/Hampshire border samples are re-running the factor analysis produces three factors. A plot of F1 against F2 clearly places the Fabric 3 to 5 samples with the South Hampshire wares and not with the Staple Gardens Winchester ware samples or the Lower Seine valley wares. This suggests that both the handmade tripod pitchers (Fabrics 3 and 4) and the freestanding tubular spot with a plain lead glaze (Fabric 5) are South Hampshire products.

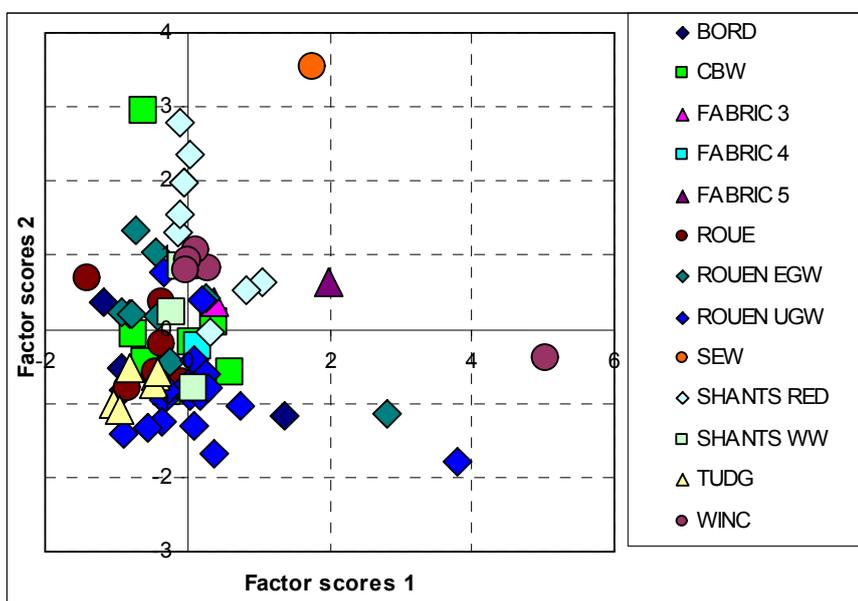


Figure 3

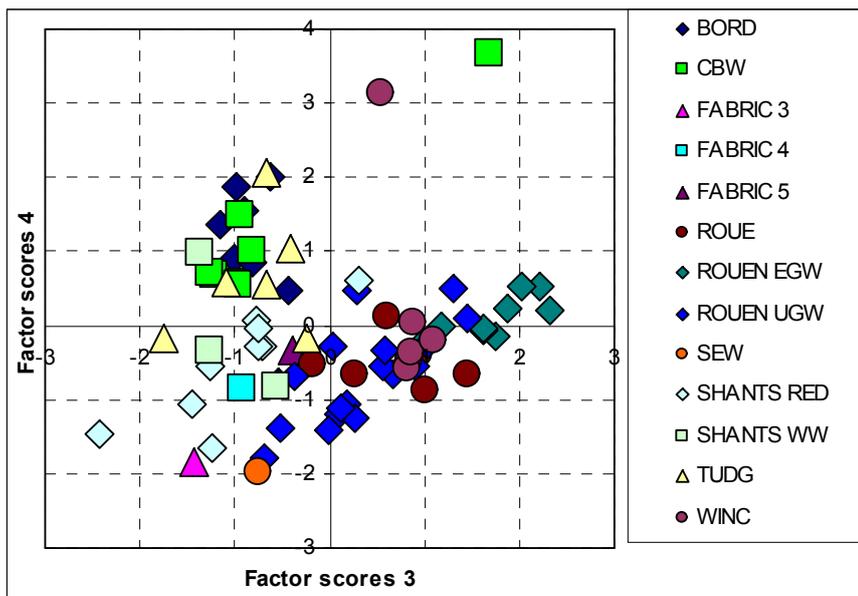


Figure 4

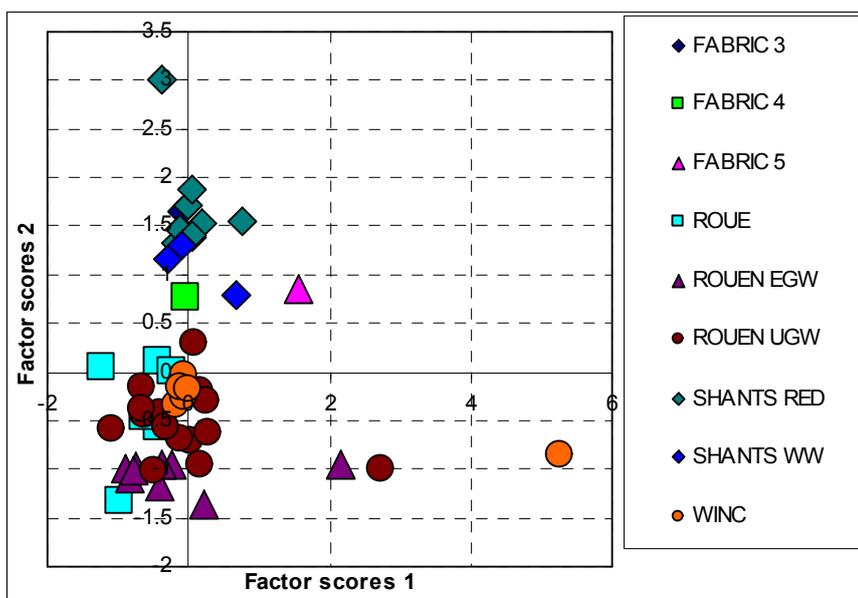


Figure 5

Discussion

None of the three sand-tempered glazed ware samples has a distinctive appearance in thin section and two, Fabrics 3 and 4, contain quartz inclusions in a fine-textured groundmass which contains clay/iron inclusions which are characteristic of the south Hampshire area. This clay is probably derived from the Reading Beds, which outcrop to the south of Winchester, and ICPS analysis of samples of unglazed Late Saxon wheelthrown ware and samples from the Michelmersh production site indicate that the iron-rich inclusions are found in the late Saxon ware but not in the Michelmersh wasters.

Clearly, further comparative material is needed to enable a south-east Wilshire source to be discounted, whilst similar white-firing clays were used at Southampton (e.g. wasters from Holy Trinity church).

The results from the analysis of the tubular-spouted vessel are less easy to interpret. The petrological evidence suggests that the clay is quite different in texture from that used for other South Hampshire ware and is more similar to wares from the Lower Seine valley and to some of the Surrey/Hampshire border whitewares. However, the chemical analysis clearly distinguishes the sample from the Lower Seine and Surrey/Hampshire whitewares and suggests strongly that this is a South Hampshire whiteware.

Bibliography

- Biddle, M. and Barclay, K. (1974) "Winchester Ware." in V. I. Evison, H. Hodges, and J. G. Hurst, eds., *Medieval Pottery from Excavations: Studies presented to Gerald Clough Dunning, with a bibliography of his works*, John Baker, London, 137-66
- Dickson, J. A. D. (1965) "A modified staining technique for carbonates in thin section." *Nature*, 205, 587

Appendix 1

TSNO	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO
V4615	12.77	2.34	0.63	0.29	0.19	1.97	0.81	0.16	0.013
V4616	18.76	3.43	0.59	0.96	0.18	1.82	0.6	0.32	0.015
V4617	17.74	5.84	1.26	8.6	0.17	3.15	0.65	0.25	0.02
V4618	12.6	4.06	0.64	1.33	0.12	1.86	0.49	1.24	0.009
V4619	14.49	4.75	0.98	5.93	0.38	2.6	0.69	0.51	0.021
V4620	11.12	5.14	1.02	13.22	0.24	1.8	0.52	0.76	0.054

Appendix 2

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
V4615	351	80	26	47	22	14	78	94	30	81	41	74	43	9	2	5	2	168	41	9
V4616	316	115	29	57	31	18	125	115	17	107	41	75	41	6	1	3	2	67	49	11
V4617	418	119	48	25	23	18	265	114	21	98	48	89	49	7	1	4	2	33	76	9
V4618	380	96	41	17	26	12	141	79	20	76	24	40	25	2	1	3	2	252	66	7
V4619	367	110	31	23	31	14	162	102	38	104	40	68	41	6	1	4	3	23	95	16
V4620	307	79	21	40	44	10	276	78	15	58	28	57	29	4	1	3	1	17	78	10