Results Framework
CETAMURA DEL CHIANTI
by Laura Banducci

A note to reader:

These are the results from statistics tests run on data on ceramics from Cetamura del Chianti, Italy.

The data used can be located at github.com/laurabanducci/foodways_republican_italy and all of the following calculations were completed in SPSS Version 23.

An explanation of the statistical tests and the decisions behind them can be found in the book Foodways in Republican Italy (2020) Appendix I. Interpretation of these results can be found in this publication.

This material is in quite good condition: Only 1 fragment has any incrustation, fragment edges are eroded very little: 1: 67%, 2: 27.5%, 3: 5%

ANALYSIS

1. ceramica da fuoco

CF1 is the worst ceramic fabric I have seen, though it is clearly wheel-made and appears in decent quantity in Roman layers. The theory is that calcite/limestone fell out of the surface of the ceramic either at firing or during use, and there are plenty of examples of large pores with an inclusion still stuck in them, but this still seems strange to me. Despite the blackening on the interior and exterior in parts of the pot (eg. Definite interior sooting on one fragment) it seems like this must be a very porous, not good cooking vessel. However, a quick and dirty water dripping experiment suggested that this fabric is not as porous as it looks. When we dripped water on the interior surface to soak it completely, water sat on the surface without being absorbed. So maybe it would have been a fine cooking ware. Although when these vessels were fired, they seem to have reduced the grey slightly, there's still definite visibility of soot on many of them. A survey of the olla rim fragments with black_ext reveals that 17/31 cf1 fragments had soot, the majority were opacity 2, followed by 4.

B. Olla: Combining cf1 and da fuoco rims: Olla *n=80 (rim EVEs: 3.59+5.93=9.52.....brokenness=7.8)*

a. Morphology

i. general distribution of rim diameter

1: mn=22, md=16; 2: mn=14, md=13.5; 3: mn=14, md=15; 4: mn=15.7, md=16 (in looking the mean and median rim diameters of da fuoco and cf1 separately, they are extremely similar)

1: mn=20.917, md=14.5; 2: mn=14.04, md=13; 3: mn=14, md=15; 4: 15.429, md=15.5

ii. diameter comparison over time > is there a change?

I used a Tukey ANOVA because the samples seemed high enough and the shape of the distribution of diameters in the 4 periods was similar. Yes. Period 1 has a significantly larger diam than Periods 2 and 3, and almost significantly larger than Period 4. When we look at the median, there's no difference. (note: when I compared means and also medians using a Kruskal-Wallis test, there was no significant difference)

iii. wall thickness comparison over time > is there a change?'

In the upper thickness there is a change over time. In Period 1, the walls are on avg significantly thicker than in any other period. Is this related to the higher proportion of da fuoco in this period? It doesn't seem like it. Da fuoco drops off gradually from Period 1-3.

iv. angle of opening comparison over time > is there a change?

Period 4 has a smaller avg angle of opening than Period 2, otherwise no sign. difference

b. Alteration

i. fire damage:

1. proportion interior black, proportion exterior black, proportion which have both

71% (34/48 da fuoco, and 22/32 cf1), 69%, both=52%

2. is there a correlation between interior and exterior black?

Yes. x2=15.584, p=0

3. location of blackening – in a table

type	Location of blackening	Count (interior)	Count (exterior)
1	Around belly of vessel	3	4
2	1 patch on belly	3	2
3	2 patches on belly	-	1
4	Around top of rim	21	19

5	Around top of vessel below rim	6	6
6	Around bottom of vessel and on base	-	-
7	Forming a ring on base	-	-
8	Completely covering base	-	-
9	Entirety of vessel not including lower wall and base	-	-
10	Entirety of vessel	25	27
11	Patch in center of base (inverse of 7)	-	-
22	Everything blackened except a strip just below the rim (inverse of 5)	-	-

4. is there a correlation in different locations of blackening on the interior and exterior?

int and ext 1 (x2=24.95, p=0), ext and int 2 (x2=52.65, p=0), ext 5 and int 5 (x2=6.24, p=0.012), int and ext 10 (x2=14.882, p=0)

5. is there a difference in blackening location in different periods?

Blackening either on int or ext is relative high in all periods between 64 and 92%. Significantly less int blackening in Period 1 compared to Periods 2 and 3 (x2=8.826, p=0.003 and x2=3.459, p=0.063) going from 42% to 88% and 72.4%. Then int blackening drops back down to 57.1% -- which is statistically similar to Period 1 (I also ran logistic regression on the probability of blackening vs. period and there was no correlation)

6. is there any correlation between diameter and the appearance of blackening?

Yes, somewhat. As the Diameter of the rim decreases, the likelihood that it will have black in its interior increases by 8.3% (expb=0.9127, sig=0.032). When I remove all vessels which have soot on their int rim (at 4), this pattern still emerges, but is slightly less significant (expb=0.917, p=0.068). When I remove int 4 and int 5, there is still some trend towards significance with expb=0.919, and p=0.088. My removal of these two locations was an attempt to isolate soot from char, even though 10 is a fairly bad marker of blackening location.

7. is there any correlation between angle and the appearance of blackening?

No.

8. opacity of blackening – in a graph with period and opacity scores *Interior: score 4 most common in every period; Exterior: score 2 and 4 most prominent in all 4 periods*

9. is there any significant difference in the opacity of blackening in different periods?

No. There are far more examples in Periods 2 and 3 than in the other two, so it is not possible to compare these accurately using chisq or logistic reg. I also used ANOVA to compare the mean opacity score in each period and there was no difference.

ii. abrasion:

1. proportion with interior abrasion, proportion with exterior abrasion, proportion with have both

15%, 12.5%, both=3.8% (da fuoco= 10.4, 8.3; cf1=21.9, 18.8)

2. is there a correlation between interior and exterior abrasions?

No. Only 3/80 have both.

3. location of abrasion – in a table

Location of abrasion	Count (interior)	Count (exterior)
Abrasion on base	-	-
Abrasion on wall	-	-
Abrasion on rim	12	10

4. is there a correlation between different locations of abrasion?

No. Although they're all rim abrasion, there are so few which have both int and ext that it is not correlated.

5. direction of abrasion – proportion of different types and correlation with different locations

Yes. All ext and int abrasion is conc. (both x2=80, p=0)

A. optional: proportion of post-depositional masking which may affect the appearance of everything above *None.*

6. is there a correlation between presence of any type of abrasion and diameter?

No.

7. is there a correlation between presence of any type of abrasion and angle of opening?

No.

8. is there a correlation between period and any type of abrasion?

No. Low abrasion in every period.

iii. is there a correlation between presence of abrasion and presence of blackening (at all or in any particular location?)

No.

c. Summary of changes over time of morphology and alteration

Cooking olla are largest in Period 1 (with significantly larger diameter and thicker walls, at least at the rim). They are likely to show some blackening on their rim, in particular around the rim edge, or just below the rim – likely on their interior and exterior. The proportion of blackened rims increases in Period 2 and 3 compared to Period 1 and 4. Smaller vessels have slightly more likelihood of having charring or sooting on their interior. Abrasion is very low (in comparison to other wares

we're seen). This does not seem to be due to recovery bias because CF1 fragments (which are already so rough and porous) have more abrasion (at least visible) than dafuoco fragments do. This may in fact be because cf1 is more friable. Typically for rims, abrasion is concentric.

i. what might these trends suggest about cooking technology or food in reference to this ware and this form?

Incomplete

Cooking bases (as ollae n=63, as jugs=7 >> but this identification was based on my vague appreciation for the thinness of the vessels walls, so I should group these together) n=77 (4o are cf1, 37 are dafuoco)

a. Morphology

i. general distribution of rim diameter

1: mn=12.857, md=11; 2: mn= 8.17, md=8; 3: mn8.1, md=7; 4: mn=9.8, md=9 (separated into da fuoco and cf1, Period 1 vessels are still largest in Period 1, with only a few instances of significance, perhaps due to low sample sizes)

ii. diameter comparison over time > is there a change?

I used a Tukey ANOVA because the samples seemed high enough and the shape of the distribution of diameters in the 4 periods was similar. Yes. Period 1 has a significantly larger diam than Periods 2 and 3, and almost significantly larger than Period 4. When we look at the median, there is also a significant difference. (note: I compared means and also medians using a Kruskal-Wallis test)

iii. wall thickness comparison over time > is there a change?'

In the upper thickness there is a change over time. In Period 1, the walls are on avg significantly thicker than in Periods 3 and 4, though are similar to Period 2 (almost sign. p=0.063). Central thickness also differs with Period 1 being sign. thicker than the other periods. Lower thickness could not be tested because Period 1 only has 1 case (the bases' floors were not well preserved).

iv. angle of opening comparison over time > is there a change?

No difference in angle up measure.

b. Alteration

i. fire damage:

1. proportion interior black, proportion exterior black, proportion which have both

44%, 58.4%, both= 38%

2. is there a correlation between interior and exterior black?

Yes. x2=8.148, p=0

3. location of blackening – in a table

type	Location of blackening	Count (interior)	Count (exterior)
1	Around belly of vessel	-	-
2	1 patch on belly	-	-
3	2 patches on belly	-	-
4	Around top of rim	-	-
5	Around top of vessel below rim	-	-
6	Around bottom of vessel and on base	2	-
7	Forming a ring on base	2	9
8	Completely covering base	6	7
9	Entirety of vessel not including lower wall and base	6	7
10	Entirety of vessel	18	22
11	Patch in center of base (inverse of 7)	-	-
22	Everything blackened except a strip just below the rim (inverse of 5)	-	-

4. is there a correlation in different locations of blackening on the interior and exterior?

ext 8 and int 7 are correlated (x2=4.158, p=0.041), int and ext 9 are correlated (x2=4.627, p=0.031), ext and int 10 (x2=8.382, p=0.04)

5. is there a difference in blackening location in different periods?

No.

6. is there any correlation between diameter and the appearance of blackening?

No.

7. is there any correlation between angle and the appearance of blackening?

No.

8. opacity of blackening – in a graph with period and opacity scores

Int: Score 4 is the most common in every period, whereas the presence of score 5 increases progressively 2 to 4. Exterior: 3 and 4 is equally common in each period.

9. is there any significant difference in the opacity of blackening in different periods?

No. Used ANOVA to compare mean opacity scores. No difference.

ii. abrasion:

1. proportion with interior abrasion, proportion with exterior abrasion, proportion with have both

2.6%, 40.3%, both=0

2. is there a correlation between interior and exterior abrasions?

No.

3. location of abrasion – in a table

Location of abrasion	Count (interior)	Count (exterior)
Abrasion on base	2	31
Abrasion on wall	1	-
Abrasion on rim	-	-

4. is there a correlation between different locations of abrasion?

No.

5. direction of abrasion – proportion of different types and correlation with different locations

Yes. 30/31 of abrasion is concentric (x2=72.9, p=0); the other is surface area of 9cm

A. optional: proportion of post-depositional masking which may affect the appearance of everything above

None.

6. is there a correlation between presence of any type of abrasion and diameter?

No.

7. is there a correlation between presence of any type of abrasion and angle of opening?

No. No differences in angles.

8. is there a correlation between period and any type of abrasion?

No. Low abrasion in every period. Slightly less abrasion in Period 1, in comparison to the other periods, but not stat sign.

iii. is there a correlation between presence of abrasion and presence of blackening (at all or in any particular location?)

No.

c. Summary of changes over time of morphology and alteration

Abrasion is extremely difficult to distinguish on cf1 – often more pores or more of the upper surface of the vessel broken off is the slight indication of this in the base; however, cf1 only accounts for 51.9% of this same. The others are relatively well-intact da fuoco bases. The abrasion levels of these wares is also similarly low (47.%5 for cf1 and 37.8% for da fuoco).

The morphological changes over time match with the rim examples. Vessels seem to have gotten larger and more robust over time. Although less than 50% have blackening, the likelihood that it will be visible on both the interior and the exterior is high. Also, we see that these ollae were mostly elevated over the fire, rather than buried in charcoal (nb. there is no distinction in the data between cf1 bases with location 9 and da fuoco bases with location 9 blackening – both have about half and half in location 9)

i. what might these trends suggest about cooking technology or food in reference to this ware and this form?

Cooking practices with ollae are different here from Musarna and Populonia. Following about the 3rd century BCE, there was in increase in the amount of liquidy food. It seems to have been cooked in the same way over time and there is no discernable distinction between how different sizes of vessels were used.

C. Jug, n=1 >> identified based on the handle attached to the rim, which might be sketchy >> preserved less than 4%

E. Bowl n=8,

a. Morphology diameters between 8 and 28

b. Alteration

blackened 50% on int, 50% on ext; *ext4 and int4 (x2=8, p=0); ext 5 and int10 and ext 10 also exist, but only 1 eg. each; no abrasion*

G. Lids and Rims/Lids *n=28; with their rim preserved more than 3%, n=18*

a. Morphology

i. general distribution of rim diameter

Period 1: mn=13, md=13; 2: 15.667, md=14; mn=16, md=16.25; 4: mn=22, md=22

ii. diameter comparison over time > is there a change?

Yes. Lids from Period 1 are significantly smaller than those from Period 4. Otherwise, they are not at all smaller to a significant degree

iii. wall thickness comparison over time > is there a change?

No.

iv. angle of opening comparison over time > is there a change?

Yes. Period 1 is smaller than 3; Period 4 is smaller than 3

b. Alteration n=28 again

i. fire damage:

1. proportion exterior black, proportion exterior interior, proportion which have both

67.9%; 57.1%; both=50% (of frags I called rim or lid, 64.7% have int and 64.7 ext; of frags i called lids, 72.7% had int and 45.5% have ext)

2. is there a correlation between interior and exterior black?

Yes. x2=6.604 p=0.01

3. location of blackening – in a table

type	Location of blackening	Count (interior)	Count (exterior)

1	Around belly of vessel	-	-
2	1 patch on belly	4	3
3	2 patches on belly	-	1
4	Around top of rim	4	6
5	Around top of vessel below rim	4	2
6	Around bottom of vessel and on base	-	-
7	Forming a ring on base	-	-
8	Completely covering base	-	-
9	Entirety of vessel not including lower wall and base	-	-
10	Entirety of vessel	8	4
11	Patch in center of base (inverse of 7)	-	-
22	Everything blackened except a strip just below the rim (inverse of 5)	-	-

4. is there a correlation in different locations of blackening on the interior and exterior?

Yes. int2 and ext2 (x2=7.529, p=0.006), int2 and ext3 (x2=6.22, p=0.013); int4 and ext4 (x2=7.955, p=0.005)

5. is there a difference in blackening location in different periods?

NO.

6. is there any correlation between diameter and the appearance of blackening?

No.

7. is there any correlation between angle and the appearance of blackening?

No.

8. opacity of blackening – in a graph with period and opacity scores

9. is there any significant difference in the opacity of blackening in different periods? *No*.

ii. abrasion:

1. proportion with interior abrasion, proportion with exterior abrasion, proportion with have both *21%, 25%, both=7%*
2. **is there a correlation between interior and exterior abrasions?** *No.*
3. location of abrasion – in a table

Location of abrasion	Count (interior)	Count (exterior)
Abrasion on base	-	-
Abrasion on wall	-	-
Abrasion on rim	7	5

4. **is there a correlation between different locations of abrasion?** *No.*

c. **direction of abrasion – proportion of different types and correlation with different locations**

all rim int is conc (x2=28, p=0), rim ext all conc (x2=28, p=0)

A. optional: proportion of post-depositional masking which may affect the appearance of everything above *No.*

6. is there a correlation between presence of any type of abrasion and diameter?

Nearly sign with int abrasion, but not quite (0.081)

7. is there a correlation between presence of any type of abrasion and angle of opening?

No.

8. is there a correlation between period and any type of abrasion? *No.*

iii. is there a correlation between presence of abrasion and presence of blackening (at all or in any particular location?) *No.*

c. Summary of changes over time of morphology and alteration

Strange that lids get larger over time while ollae get smaller over time. What does this say about their pairing? Blackening of lids especially on their interiors is quite common – patches of black much more common what other forms. Why would a lid get sooted? When it's put down? It doesn't look like we see multifunctionality, since the fragments which could be both bowl/plates and lids seem to have the same proportion (or less) of blackening as the ones which are certainly lids. There is not very much abrasion visible (perhaps a visibility problem like with the cooking ollae), but where it is it appears on the rims – this is likely a result of use

i. what might these trends suggest about cooking technology or food in reference to this ware and this form?

2. Internal redslip ware

-general discussion of the definition of the ware and the forms in which it appears

A. Tegame n=11 (7 rims and 4 whole, only 1 whole included in the measuring of diam)

a. Morphology

i. general distribution of rim diameter: *none in Period 1; perd 2: mn=24, md=24; 3: mn=22.25, md=25.5; 4: mn=29.5, md=29.5*

ii. diameter comparison over time > is there a change?

No. Very regular across time

iii. wall thickness comparison over time > is there a change?'

No. Very regular across time

iv. angle of opening comparison over time > is there a change?

No. Very regular across time

b. Alteration

i. fire damage:

1. proportion interior black, proportion exterior black, proportion which have both

27.3%, 63.6%, 27.3% In general very low

2. is there a correlation between interior and exterior black?

No.

3. location of blackening – in a table

type	Location of blackening	Count (interior)	Count (exterior)
1	Around belly of vessel	-	-
2	1 patch on belly	1	-
3	2 patches on belly	-	-
4	Around top of rim	-	-
5	Around top of vessel below rim	-	-
6	Around bottom of vessel and on base	-	2
7	Forming a ring on base	-	-
8	Completely covering base	-	1
9	Entirety of vessel not including lower wall and base	-	-
10	Entirety of vessel	2	4
11	Patch in center of base (inverse of 7)	-	-
22	Everything blackened except a strip just below the rim (inverse of 5)	-	-

4. is there a correlation in different locations of blackening on the interior and exterior?

Yes. The one example of ext 6 is correlated with the one examples of int 2 (x2=4.95, p=0.026); 10 int and ext is correlated (x2=4.278, p=0.039)

5. is there a difference in blackening location in different periods?

No.

6. is there any correlation between diameter and the appearance of blackening?

No. consistency of use of different sizes? Or low sample size?

7. is there any correlation between angle and the appearance of blackening? *No.*

8. opacity of blackening – in a graph with period and opacity scores *No. Numbers too low.*

9. is there any significant difference in the opacity of blackening in different periods?

No. Numbers very low.

ii. abrasion:

1. proportion with interior abrasion, proportion with exterior abrasion, proportion with have both

18.2%, 54.5%, both=16.7%

2. is there a correlation between interior and exterior abrasions?

No.

3. location of abrasion – in a table

Location of abrasion	Count (interior)	Count (exterior)
Abrasion on base	-	2
Abrasion on wall	4	1
Abrasion on rim	6	-

4. is there a correlation between different locations of abrasion?

No.

5. direction of abrasion – proportion of different types and correlation with different locations

Rim int correlated with conc (x2=11, p=0.001). Wall int with conc (since all are) (x2=5.238, p=0.022) and one has an additional radial scratch too.

A. optional: proportion of post-depositional masking which may affect the appearance of everything above *None.*

6. is there a correlation between presence of any type of abrasion and diameter?

No.

7. is there a correlation between presence of any type of abrasion and angle of opening?

No.

8. is there a correlation between period and any type of abrasion? *No.*

iii. is there a correlation between presence of abrasion and presence of blackening (at all or in any particular location?) *No.*

c. Summary of changes over time of morphology and alteration

Very low samples in general, but these samples also suggest no change over time in scale or use of these vessels.

i. what might these trends suggest about cooking technology or food in reference to this ware and this form?

Incomplete

***it might be worth combining these tegame with my da fuoco and cf3 egame to see if there's any differences in their traces of wear
** for bases below I need to combine the whole frags with the base frags and perhaps sort out the diam, though i doubt there will be a difference

B. Tegame bases n=4 (plus whole n=4)

a. Morphology

i. general distribution of rim diameter

None in Period 1; 2: one example=22, 3: mn=20.4, md=22; 4: 16, md=16 (there are 2 examples)

ii. diameter comparison over time > is there a change?

No.

iii. wall thickness comparison over time > is there a change?'

No.

iv. angle of opening comparison over time > is there a change?

No.

b. Alteration (included now an additional whole vessel which

i. fire damage:

1. proportion exterior black, proportion exterior interior, proportion which have both

57.1% (4/7), 14.3% (1/7), both=14.3%

2. is there a correlation between interior and exterior black?

No.

3. location of blackening – in a table

type	Location of blackening	Count (interior)	Count (exterior)
1	Around belly of vessel	-	-
2	1 patch on belly	2	-
3	2 patches on belly	-	-
4	Around top of rim	-	-
5	Around top of vessel below rim	-	-
6	Around bottom of vessel and on base	-	1
7	Forming a ring on base	-	-
8	Completely covering base	-	1
9	Entirety of vessel not including lower wall and base	-	-
10	Entirety of vessel	-	1
11	Patch in center of base (inverse of 7)	-	-
22	Everything blackened except a strip just below the rim (inverse of 5)	-	-

4. is there a correlation in different locations of blackening on the interior and exterior?

No. very few examples of blackening (Only one overlap: ext 6 and int 2)

5. is there a difference in blackening location in different periods?

Sample size too small, but no.

6. is there any correlation between diameter and the appearance of blackening?

No.

7. is there any correlation between angle and the appearance of blackening?

No.

8. opacity of blackening – in a graph with period and opacity scores

2 examples of level 4, one of level 5

9. is there any significant difference in the opacity of blackening in different periods?

No.

ii. abrasion:

1. proportion with interior abrasion, proportion with exterior abrasion, proportion with have both

62.5%, 25%, 12.5% (1/8)

2. is there a correlation between interior and exterior abrasions?

No.

3. location of abrasion – in a table

Location of abrasion	Count (interior)	Count (exterior)
Abrasion on base	-	5
Abrasion on wall	1	-
Abrasion on rim	2	1

4. is there a correlation between different locations of abrasion?

No. sample size too small?

5. direction of abrasion – proportion of different types and correlation with different locations

base ext and conc (x2=8, p=0.005); rim int and conc (x2=8, p=0.005)

A. optional: proportion of post-depositional masking which may affect the appearance of everything above: *None.*

6. is there a correlation between presence of any type of abrasion and diameter?

No. sample size too small

7. is there a correlation between presence of any type of abrasion and angle of opening?

No. sample size too small

8. is there a correlation between period and any type of abrasion?

No. sample size too small

iii. is there a correlation between presence of abrasion and presence of blackening (at all or in any particular location?) *No.*

c. Summary of changes over time of morphology and alteration

In the samples examined, there is a great deal of consistency in the sizes of the vessels and a lack of patterns in the alteration, with the exception of fulfilling some expectations we might have for internal red slip tegame (blackening on the ext base), but there is a lower rate of this than at other sites in this study. This may be because these vessels were being used in a different or less consistent way at Cetamura.

i. what might these trends suggest about cooking technology or food in reference to this ware and this form?

Incomplete

C. Semi-diagnostic: b_bases *n=3; all have ext blackening, 1 has int black:* 1 ext 8, 2 ext 10, no correlations; no abrasion

3. Black gloss

A. General discussion of the definition of the ware and the forms in which it appears

-Variability within the assemblage between bowls and plates over time

More bowls in general in every period; Black gloss pretty much absent from Period 4; I should try grouping black gloss and ts, and redgloss together and comparing their morphology over time

There is a difference overall in the mean of these two vessels types. According to a t-test, plates are significantly larger in diameter. t=5224, p=0 (even when I remove Period 1 which has small plates) (bowl mn=14.955, md=15; plate mn=21.94, md=21)

Period 1: bowl mn=11.27, md=10; plate mn=14.33, md=14 >>> different, t=1.943, but with 0.070 sign (due to low sample sizes? there are only 3 plates...)

Period 2: bowl mn=14.04, md=14; plate mn=19.6, md=20 >>> significantly different (t=3.22, p=0.002)

Period 3: bowl mn=16.96, md=16; plates mn=24.38, md=22 >> sig. diff. (t=3.64, p=0.001)

Period 4: bowl eg=18, plate eg=37

B. Bowls n=107 (i've included 1 rim which is vaguely redgloss tegame-like); i'm only going to include vessels with a diameter of 8cm or over, otherwise I will class them as miniatures, n=99

a. Morphology

Period 1: mn=11.27, md=10; Period 2: 14.21, md=14; Period 3: mn=16.96, md=16; Period 4 one eg=18cm

i. general distribution of rim diameter

ii. diameter comparison over time > is there a change?

Period 1 is significantly smaller than the two later periods.

iii. wall thickness comparison over time > is there a change?

no

iv. angle of opening comparison over time > is there a change?

No.

v. change in ratio of height to width? *not studiable*

b. Alteration

i. Discussion about factors affecting abrasion in black gloss:

1. Results of accretion *no accretion*

2. Results of attrition (fracture rounding) 70% are 1 and 30% are 2. There are no 3s.

3. Qualitative assessment of state of post-depositional processes affecting this assemblage > is there a difference between the different SUs or Periods? *No. Similar 70-30% breakdown in each period*

ii. abrasion:

1. proportion with interior abrasion, proportion with exterior abrasion, proportion which have both

54%, 68%, 35%

2. is there a correlation between interior and exterior abrasions?

No.

3. location of abrasion – in a table

Location of abrasion	Count (interior)	Count (exterior)
Abrasion on base	-	2
Abrasion on wall	14	24
Abrasion on rim	49	57

4. is there a correlation between different locations of abrasion?

No.

5. direction of abrasion – proportion of different types and correlation with different locations

wall int chord (x2=25.6, p=0), wall int also has 3 cases of surface patches removed (not enough to be sign.), rim int conc (x2=67.24, p=0) also 5 eg. of surface patches, ext rim conc (x2=65.3, p=0)

6. is there a correlation between presence of any type of abrasion and diameter?

Yes. For every cm probably of interior abrasion increases 10% (expB=1.102, sign =0.051). This seems to be linked to int rim abrasion, rather than wall abrasion, but neither are significant by themselves.

7. is there a correlation between presence of any type of abrasion and angle of opening?

Yes. Wall int abrasion is negatively correlated with angle, expB=0.971, sign=0.031. As the angle decreases, likelihood of abrasion increases by 3%. Int rim abrasion is almost significantly correlated, but not quite. (p=0.076)

8. is there a correlation between period and any type of abrasion?

For int wall abrasion, expB=2.91, sign=0.033 >> what does this mean?

c. Summary of changes over time of morphology and alteration

Bowls dominate the serving assemblage, but get larger in diameter and stay that way (this is even the case if I remove vessels smaller than 10 cm). They are quite abraded, especially on their exteriors, however only their int wear appears with a consistent direction. Chordal scratches on the int wall and concentric int rim scratches are typical, but both are also patchy. Int abrasion is also more likely on larger vessels, which might be expected if we associated larger vessels with food consumption rather than drinking. Similarly, more widely open vessels have less int wall abrasion, which might be counter intuitive. Might this mean that more constrained vessels were stirred more?

i. what might these trends suggest about serving practices, dining, food in reference to this ware and this form?

C. Plates n=17

a. Morphology

i. general distribution of rim diameter

Period 1: mn=14.33, md=14; Period 2: mn=19.6, md=20, Period 3: mn=24.36, md=22; Period 4 1 eg=37

ii. diameter comparison over time > is there a change?

No, not with ANOVA probably due to low sample size. With Kruskal wallis, 1 is significantly smaller than 2 (sig=0.046), but 2 and 3 are similar.

iii. wall thickness comparison over time > is there a change?'

No. They're very similar and the sample size is low.

iv. angle of opening comparison over time > is there a change?

Although the numbers suggest the angles in Period 2 and 3 are a lot lower, there is no significant change.

v. change in ratio of height to width? *How do I even determine this?*

b. Alteration

i. Discussion about factors affecting abrasion in black gloss:

1. Results of accretion. None.

2. Results of attrition (fracture rounding) 12/17 are scored as 1, 4/17 are 2, 1/17 is scored as 3 (this is frag #7076, and I am removing it from the sample below)

3. Qualitative assessment of state of post-depositional processes affecting this assemblage > is there a difference between the different SUs or Periods? *Mostly excellent condition.*

ii. abrasion: *n=16*

1. proportion with interior abrasion, proportion with exterior abrasion, proportion with have both *75%, 25%, 44%*
2. **is there a correlation between interior and exterior abrasions?** *No.*

3. location of abrasion – in a table

Location of abrasion	Count (interior)	Count (exterior)
Abrasion on base	1	0
Abrasion on wall	4	1
Abrasion on rim	10	8

4. is there a correlation between different locations of abrasion?

Base int and wall ext are correlated (but there's only 1 eg.) x2=16, p-=0)

5. direction of abrasion – proportion of different types and correlation with different locations

all rim int is conc (x2=16, p=0), rim ext and conc (x2=16, p=0); wall int has 2 conc, 1 rad, 1 chor << none of these relationships are significant

6. is there a correlation between presence of any type of abrasion and diameter?

No.

7. is there a correlation between presence of any type of abrasion and angle of opening?

No.

8. is there a correlation between period and any type of abrasion?

No.

c. Summary of changes over time of morphology and alteration

Low sample size spread across periods difficult to see any changes over time which may be present, but low sample size also reflects how few plates present in general in the deposits. Plates are wider on average than bowls, and like bowls they get wider after Period 1. They have a lot of abrasion especially on their interior, but this does not seem to be particularly oriented (with the exception of rim orientation which is almost always conc on very vessel type)

i. what might these trends suggest about serving practices, dining, food in reference to this ware and this form?

BG Bases.
Bowls, n=43
a. Morphology

i. general distribution of rim diameter – *Because this is the measurement of feet, there is little variation. Regardless of how wide the rim of the bowl is, base feet tend to have a small range of sizes. Overall the range over all 3 Periods is 4.5-8.5cm*

ii. diameter comparison over time > is there a change?

No, see above.

iii. wall thickness comparison over time > is there a change?'

No. Very small range in wall thicknesses (between 3mm and 10mm)

iv. angle of opening comparison over time > is there a change?

No. Small angle range (between 130˚ (1 eg. at 25˚) and 165˚)

v. change in ratio of height to width? *How do I even determine this?*

b. Alteration

i. Discussion about factors affecting abrasion in black gloss:

1. Results of accretion. None.

2. Results of attrition (fracture rounding) 58% are scored as 1, 37% are 2, 5% is scored as 3 (I am removing them from the sample below)

3. Qualitative assessment of state of post-depositional processes affecting this assemblage > is there a difference between the different SUs or Periods? *Mostly excellent condition.*

ii. abrasion: *n=41*

1. proportion with interior abrasion, proportion with exterior abrasion, proportion with have both *54%, 76%, 39%*
2. **is there a correlation between interior and exterior abrasions?** *No.*

3. location of abrasion – in a table *n=45 because i added in whole vessels*

Location of abrasion	Count (interior)	Count (exterior)
Abrasion on base	27	33
Abrasion on wall	1	2
Abrasion on rim	-	-

4. is there a correlation between different locations of abrasion?

No.

5. direction of abrasion – proportion of different types and correlation with different locations

base int with radial (x2=9.7, p=0.002)(5 of these have an additional chordal scratch) chordal (x2=3.75, p=0.053) (1 of these also has a radial scratch), 3 eg. with surface area patches; base ext is concentric 32/34 times (x2=30.726, p=0)

6. is there a correlation between presence of any type of abrasion and diameter?

No.

7. is there a correlation between presence of any type of abrasion and angle of opening?

No.

8. is there a correlation between Period and any type of abrasion?

No.

BG bases
Plates, n=13

i. general distribution of rim diameter – *Because this is the measurement of feet, there is little variation. Regardless of how wide the rim of the bowl is, base feet tend to have a small range of sizes. Overall the range over all 3 Periods is 4.5-9cm*

ii. diameter comparison over time > is there a change?

No, see above.

iii. wall thickness comparison over time > is there a change?'

No.

iv. angle of opening comparison over time > is there a change?

No. The measurements seem messed up.

b. Alteration

i. Discussion about factors affecting abrasion in black gloss:

1. Results of accretion. None.

2. Results of attrition (fracture rounding) 31% are scored as 1, 54% are 2, 15% is scored as 3 (I am removing them from the sample below)

3. Qualitative assessment of state of post-depositional processes affecting this assemblage > is there a difference between the different SUs or Periods? *Mostly excellent condition.*

ii. abrasion: *n=11*

1. proportion with interior abrasion, proportion with exterior abrasion, proportion with have both *18%, 73%, 18%*
2. **is there a correlation between interior and exterior abrasions?** *No.*

3. location of abrasion – in a table

Location of abrasion	Count (interior)	Count (exterior)
Abrasion on base	3	8
Abrasion on wall	-	1
Abrasion on rim	-	-

4. is there a correlation between different locations of abrasion?

No.

5. direction of abrasion – proportion of different types and correlation with different locations

base int with conc (x2=6.519, p=0.011) and 2 surface patches; base ext all have conc (plus one also has radial) (x2=7.219, p=0.007)

6. is there a correlation between presence of any type of abrasion and diameter?

*No***.**

7. is there a correlation between presence of any type of abrasion and angle of opening?

No.

8. is there a correlation between Period and any type of abrasion?

No.

c. Summary of changes over time of morphology and alteration

Abrasion patterns on interior of plates looks more like expected bowl abrasion pattern.

Red gloss and terra sigillata

Distinguishing the functional difference between a bowl and a flat-bottomed "tegame" dish of the common volterran variety is tricky. With only the bowls selected (n=18), they appear in number in periods 3 and 4 and they have no significant difference in diameter (17cm and 15cm mean – n.b. that in period 3 there are only 2 examples. With only the tegame selected (n=13), they appear in period 1 and 2. There is a significant difference in the diameter of these (t=3.028, p=0.16), but since there are only 2 in period 1, there is little to substantiate this.

BOWLS: i. Discussion about factors affecting abrasion in black gloss:

1. Results of accretion. None.

2. Results of attrition (fracture rounding) 53% are 1, 32% are 2, 16% are 3 (3 vessels, which have now been removed)

3. Qualitative assessment of state of post-depositional processes affecting this assemblage > is there a difference between the different SUs or Periods? *Mostly excellent condition.*

ii. abrasion: *n=17*

3. proportion with interior abrasion, proportion with exterior abrasion, proportion with have both *77%, 47%, both=31%*
4. **is there a correlation between interior and exterior abrasions?** *No.*

3. location of abrasion – in a table

Location of abrasion	Count (interior)	Count (exterior)
Abrasion on base	-	1
Abrasion on wall	2	-
Abrasion on rim	12	7

4. is there a correlation between different locations of abrasion?

No.

5. direction of abrasion – proportion of different types and correlation with different locations

ext rim and conc (x2=17, p=0), int rim and conc (x2=13.388, p=0)

6. is there a correlation between presence of any type of abrasion and diameter?

Somewhat. Int rim abrasion is negatively correlated with diam (expB=.686, sig=0.058).

7. is there a correlation between presence of any type of abrasion and angle of opening?

No.

8. is there a correlation between Period and any type of abrasion?

No.

c. Summary of changes over time of morphology and alteration

Very few available.

TEGAME

1. Results of accretion. None.

2. Results of attrition (fracture rounding) 8% are 1, 15% are 2, 77% are 3 (10/13 vessels!) *It is difficult to tell if these are all rims of the same vessel. They are so worn that their diameters may not be trustworthy, but the little preserved slip looks like different shades of red (some more orange, some more purple). This could be normal variation within the same vessel or evidence of multiple vessels.*

3. Qualitative assessment of state of post-depositional processes affecting this assemblage > is there a difference between the different SUs or Periods? *Mostly in poor condition. Red gloss clearly does not hold up well to water exposure.*

Comparing red gloss/ts to black gloss forms: there are always far more bowls (and tegame) than plates in every Period. Grouping all bowls, plates, and tegame types together, bowls are significantly smaller than plates. But when I just look at RG/TS bowls and plates, there is not a significant difference in their average diameters: NB there are very few RG/TS plates (n=2).

4. Ceramica da mensa, dispensa, per la preparazione

-general description and definition of ware and the forms in which it appears

A. Bowls/Tegame – *these are vessels which are wider than they are deep; they probably all have flat bottoms or ringfeet; their wall angles range from open to vertical to slightly incurved at the top. Some I have classed as "tegame" because are a similar scale and have almond shaped rims like irs tegame, but there's no reasonable way to otherwise distinguish them from bowls. The exterior sooting patterns may prove this inaccurate.*

a. Morphology n=60 (i've taken out 4 miniatures)

i. general distribution of rim diameter:

period1: mn=14, md=12.5, period2: mn=18.45, md=19; period 3: mn=20.5, md=18.5, period 4: mn=22, md=21

ii. diameter comparison over time > is there a change?

Somewhat. ANOVA is appropriate here and only finds a significant increase from period 1 to period 4, otherwise the other periods are similar to each.

iii. wall thickness comparison over time > is there a change?'

No.

iv. angle of opening comparison over time > is there a change?

No.

b. Alteration

i. Discussion about factors affecting abrasion in black gloss:

1. Results of accretion: *one vessel with 30% mineral int*

2. Results of attrition (fracture rounding): *58% are 1, 42% are 2*

3. Qualitative assessment of state of post-depositional processes affecting this assemblage > is there a difference between the different SUs or Periods? *Sherds in good condition*

i. blackening

1. proportion exterior black, proportion exterior interior, proportion which have both

15%, 32%, both= 15%

2. is there a correlation between interior and exterior black?

Yes. x2=22.848, p=0)

3. location of blackening – in a table

type	Location of blackening	Count (interior)	Count (exterior)
1	Around belly of vessel	-	-
2	1 patch on belly	2	3
3	2 patches on belly	-	3
4	Around top of rim	4	6
5	Around top of vessel below rim	-	3
6	Around bottom of vessel and on base	-	1
7	Forming a ring on base	-	-
8	Completely covering base	-	-
9	Entirety of vessel not including lower wall and base	-	-

10	Entirety of vessel	4	5
11	Patch in center of base (inverse of 7)	-	-
22	Everything blackened except a strip just below the rim (inverse of 5)	-	-

4. is there a correlation in different locations of blackening on the interior and exterior?

Int and ext 2 (x2=8.82, p=0.003), int 2 and ext 3 (13.983, p=0), int 4 and ext 3 (28.966, p=0), ext and int 4 (x2=38.571, p=0), int and ext 10 (x2=47.143, p=0)

5. is there a difference in blackening location in different periods?

Very similar proportion of blackening in each period with between 18-37% ext and between 9 and 25% int

6. is there any correlation between diameter and the appearance of blackening?

No.

7. is there any correlation between angle and the appearance of blackening?

Yes. Ext blackening: ExpB=1.036, sig=0.024. This means that the larger the angle is (the more open the rim), the higher the likelihood of exterior blackening by 3.6%. Int blackening: ExpB=1.073, sig=0.005. Thus, the larger the angle is, the higher the likelihood of a blackened interior by 7.3%.

8. opacity of blackening – in a graph with period and opacity scores

Low in every period.

9. is there any significant difference in the opacity of blackening in different periods?

No.

ii. abrasion:

1. proportion with interior abrasion, proportion with exterior abrasion, proportion which have both 25%, 12%, and both=8%

2. is there a correlation between interior and exterior abrasions?

Yes. x2=9.11, p=0.003

3. location of abrasion – in a table

Location of abrasion	Count (interior)	Count (exterior)
Abrasion on base	-	1
Abrasion on wall	1	-
Abrasion on rim	15	6

4. is there a correlation between different locations of abrasion?

Yes. Rim int and ext (x2=6.173, p=0.013)

5. direction of abrasion – proportion of different types and correlation with different locations

All rim int is conc (x2=60, p=0), Rim ext conc (x2=50.476, p=0), base ext with conc (x2=7.7, p=.006)

6. is there a correlation between presence of any type of abrasion and diameter?

No.

7. is there a correlation between presence of any type of abrasion and angle of opening?

NO.

8. is there a correlation between period and any type of abrasion? *No.*

9. Any correlation between presence of blackening and presence of abrasion? *No.*

c. Summary of changes over time of morphology and alteration

Bowls get slightly larger over time, but are otherwise similarly used. Bowls which have a more open rim are very slightly more likely to be used over a fire.