Ceramics and Social Practices at Ille Cave, Philippines

Volume 2: Appendices

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Appendix A. Ceramic analysis: Comparative Ceramics from Ille Cave

A.1 Comparative ceramics excavated at Ille Cave, 1998-2002 and 2009

This research examines the Ille earthenware ceramics excavated between 2004 and 2008 (Results Chapter 6). This appendix highlights the earthenware ceramics collected from 1998 to 2002, and 2009 to 2010, for comparative purposes. The sherds collected before 2004 were surface finds and from shallow test pits. The introduction of the single context recording system in 2004 enabled confident association of finds with the stratigraphy of the site. After the 2008 excavation at Ille, attention turned to the Dewil Valley and there was considerably less activity at Ille, therefore, less earthenware was excavated. Both earthenware and high-fired ceramics were examined for comparative purposes. With a few exceptions, similar designs, decorative techniques, forms and fabrics were found across all years, which means that the overall earthenware assemblage was consistent when excavated at depth. It was also important to examine the surface sherds at Ille to draw comparison with surface sherds at other sites in the Dewil Valley and El Nido. As the other sites were not excavated, this allows a parity of comparison between surface finds.

Of the sherds that were collected between 1998 and 2002 and accessible for examination, it was not surprising that there were types found in subsequent years. Table A.1 shows the ceramic types established from the 2004-2008 assemblage and the years they were excavated (ceramics were not available from the 2001 excavation). Significant ceramics and those outside of these types are pictured below.

Ceramic type	Year collected				
	1998	1999	2000	2002	2009
Type 1: Red-Slipped Decorated	✓	×	✓	×	✓
Type 2: Red Ware Decorated	✓	×	×	×	×
Type 3: Red Ware Plain	✓	×	×	×	×
Type 4: Grey Cord Marked	✓	✓	×	✓	✓
Type 5: Bound paddle	✓	x	×	×	✓
Subtype 5i: Loose Cord Marked F4	✓	×	×	×	✓
Subtype 5iii: Tight Cord Marked	✓	×	×	✓	×
Type 6: Carved Paddle	✓	x	×	×	×
Subtype 6i: Carved Paddle F4	✓	×	×	×	✓
Subtype 6iii: Carved Paddle (White) F8	✓	×	×	×	×
Type 7: Impressed restricted rim	✓	✓	✓	✓	✓
Type 8: Incised Triangles	✓	✓	✓	✓	✓
Type 9: Shell impressed	×	×	×	×	×
Type 10: Incised, impressed, infilled	×	×	×	×	×
Type 11: Painted	×	×	×	×	×
Potential Type 12: Pedestal bowl	×	×	×	✓	×
Potential Type 13: Large brown rim	×	×	×	×	×
Potential Type 14: Restricted rim	✓	×	×	×	✓
Potential Type 15: Unrestricted rim	✓	×	×	×	×
Potential Type 16: Flat triangular rim	✓	×	×	✓	×
Potential Type 17: Brown fabric	✓	✓	✓	✓	✓
Potential Type 18: Buff fabric	✓	×	×	×	×
Potential Type 19: Rice temper	×	×	×	×	×
Category 20: Body sherds uncategorised	✓	✓	✓	✓	✓

Table A.1 Ceramic types and the years of excavation.

As expected, in other years many variations of fabric were evident. Two samples excavated between 0-20 cm from the surface that were distinctive are shown in fig. A.1. The sherds had white, angular, coarse to very coarse sand size sized inclusions which were common in frequency but poorly sorted. Striations visible on the flat surface of the inclusions with a hand lens (10x) suggests that the inclusions might be shell temper. These inclusions were not clearly distinguishable in the 2004-2008 sample. However, the surface of these sherds were abraded which exposed the inclusions, therefore, shell temper may have been overlooked in macroscopic analysis and, therefore, not selected for thin section.

Fig. A.1 Shell tempered earthenware sherds. Year 1998. Image scale = 0-5 cm (IV-1998-P-39+67; image: Y. Balbaligo)

Of the undecorated sherds, there was a range of restricted and unrestricted rims, both with and without carinations, foot rims, joins and the largest example of a foot rim from a pedestal bowl was recovered between 0-5 cm from the surface in 2002 (fig. A.2). When orientated, the sherd stands up on its own. It is *c.*15 cm in diameter, representing at least 20% of vessel with a wall thickness between 1.5-1.8 cm. It is highly polished, greyish brown fired in an oxidising environment with coarse quartz and rock inclusions; a grey core and margins which indicates not all the organic material has burnt out. It has the same fired colour and alluvial sediment as Fabrics 3, 4, 5 and 6 and, therefore, may be one of these fabrics which link it to other ceramics in the overall assemblage. Despite the size of the sherd, apart from being hand formed, no other primary or secondary forming processes are evident.

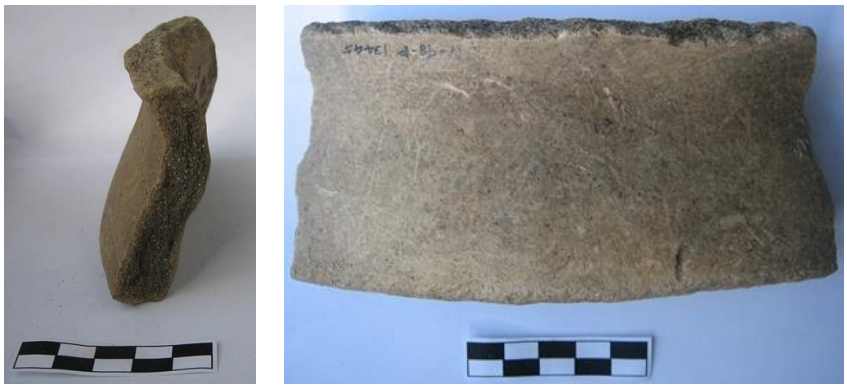


Fig. A.2 Large pedestal bowl. Profile and exterior. Year 2002. Image scale = 0-5 cm (IV-1998-P-13445; image: Y. Balbaligo)

Fig. A.3 Large cylindrical sherd, Type 1. Year 2000. Image scale = 0-5 cm (IV-1998-P-9827; image: Y. Balbaligo)

'Type 5: Bound paddle' and 'Type 6: Carved Paddle' were prevalent with 'Subtype 5i: Loose Cord Marked F4', 'Subtype 5iii: Tight Cord Marked', 'Subtype 6i: Carved Paddle F4' and 'Subtype 6iii: Carved Paddle (White) F8' also found in the upper surfaces. In particular large samples of 'Subtype 6iii: Carved Paddle (White) F8', were found in comparison to the small fragments found between 2004 and 2008. Despite this, the sherds did not have any diagnostic morphological elements. In general, some larger fragments of sherds were found on the surfaces and up to 40 cm from the surfaces because they were relatively undisturbed (until excavations started in 1998), not redeposited or broken up under the weight of soil compaction over the years. Large sherds were also found on the surface of cave sites in the Dewil Valley because they were not disturbed.

The various subtypes of 'Type 1: Red-Slipped Decorated' were present. The fabric and surface finish was homogenous and could visibly be categorised as 'Fabric 1: Grog and chert fabric'. The decorations and decorative techniques such as the c stamps, 'leaf' shapes, and other incised geometric shapes with impressed punctates were seen in the 2004-2008 sample. A large Type 1 sherd excavated in 2000 (fig. A.3) showed the form of a cylinder shaped vessel which may have formed the foot ring of a pedestal bowl.

In 2009, excavated in context 1241, fig. A.4 was the most unusual form of Type 1 that had not been seen in previous years. However, the sherd is badly broken and it is difficult to determine from where on a vessel it may have come from. It has the form of a large rounded carination with crude impressed c stamps and an incised horizontal band. This may be from the carination on the upper or lower part of the vessel or it

might have been the opening of a vessel with a place for a lid or the cover of a vessel. This sherd does not fit the standard morphology for other red-slipped pedestal bowl. If no other similar sherds of this kind are recovered at Ille, the full range of these vessel forms cannot be known.

Fig. A.4 Large unusual form of Type 1. Year 2009. Image scale = cm (IV-1998-P-44467; image: Y. Balbaligo)

Most of the decorations and forms are seen across all years, however, fig. A.5 shows a 'one-off' so far, from 2009. A small restricted vessel with a black lip has shell impressions on the exterior under the rim, diagonal to the rim with continuous and regular 'wavy' patterns in a straight line. This was done by impressing the outer edge of a shell against the wet clay. The sherd has a similar method of impressing a shell edge against leather hard clay as with 'Type 9: Shell impressed'. However, the shell species is different as seen in the impressed pattern, the fabric and forms also differ from Type 9. The two types are not related.

Fig. A.5 Small restricted rim vessel with shell impressions different shell to Type 9: Shell impressed. Year 2009. Image scale = cm (no accession number, not yet accessioned as of 2009; image: Y. Balbaligo)

A.2 Ceramics from the Ille Tower

A site is found at the top of the Ille Tower, Tuktok ng Ille (IV-2007-V) and is accessible by climbing the interior of the karst. Few earthenware and high-fired sherds were found during the ascent and at the top of the tower. It is likely that the ceramics are younger than the artefacts excavated in the cave. Undecorated earthenware body sherds and rims of various fabrics, including red-slipped (or Red Ware) and fired brown sherds were present. The majority of the earthenware sherds bear little resemblance to the earthenware on the surfaces or during excavations. Fig. A.6a shows a body sherd which may be red-slipped with decorated impressions completely different and not seen in the Ille 2004-2008 assemblage. Fig. A.6b shows a brown crenelated restricted rim. This form and rim type is not present in the studied assemblage. Fig. A.6c-d shows a small pedestal foot base which is almost complete measuring 5.5 cm in diameter. However, the form of the foot ring is different in morphology to 'Potential Type 12: Pedestal bowl' due to the shape of the rim lip and the addition of a protruding circular panel on the upper interior of the foot rim. Fig. A.6e-f shows a large brown restricted rim sherd which is similar in fabric, form and size to 'Potential Type 13: Large brown rim'. It is 8 cm in diameter representing 45% of the rim. However, macroscopically it is not possible to say whether it can be grouped into 'Potential Type 13'. No thin sections were taken of the earthenware from the Ille tower. At the top of the tower, blue and white porcelain sherds were found on the surface (Archaeological Studies Program [ASP] 2005-2006: 29; Paz and Ronquillo 2004: 17) but it is not known what period the ceramics are from. The ceramics have not been associated with the archaeology of the Ille platform and cave, and have been given a different site number. The ceramics may represent different activity during the later occupation of the cave to those found in excavation during the earlier use of the cave.

Fig. A.6 Earthenware ceramics from the Ille Tower. Image scale = 0-5 cm (image: Y. Balbaligo)

Fig. A.6a Body sherd, possibly red-slipped with decorated impressions completely different and not seen in the 2004-2008 Ille assemblage.

Fig. A.6b Brown crenelated restricted rim not present in the 2004-2008 Ille assemblage

Figs. A.6c-d Small pedestal foot base different in morphology to Potential Type 12

Figs. A.6e-f Large brown restricted rim sherd similar to Potential Type 13: Large brown rim (year and accession number unknown)

A.3 High-fired sherds at Ille

The high-fired ceramics found at Ille Cave have previously been called “tradeware” (ASP 2005-2006; Paz and Ronquillo 2004). This term has been used somewhat uncritically as a generic term for high-fired kiln-made ceramics that are assured to have been made outside of the Philippine archipelago and traded or exchanged into the area. Although kiln sites have yet to be found in Palawan, it is not impossible for the stoneware to have been manufactured locally. Furthermore, some stoneware may be mistaken for vitrified earthenware. Although there were traded stoneware items found at Ille, which may be traced to certain kilns in China, this group of non-earthenware ceramics will collectively be referred to as high-fired ceramics which encompasses glazed and non-glazed stoneware, celadon and porcelain.

Stoneware was the most frequently occurring of the high-fired ceramic found at Ille (table A.2). Nguyen Long (1992a: 26) says that plain utilitarian stoneware were the most numerous, most dispersed and in constant demand. Vessels are conventionally called “jars” or “storage jars” which defined its usage for storage of ‘trade’ goods to hold food and drink for long voyages (Valdes 1992: 17) but also as containers for non-food commodities such as benzoin, copper rings, mercury and small ceramics (Nguyen Long 1992a: 26). It is possible that the glazed stoneware jars produced in China came to the Philippines from the ninth century AD (Valdes 1992: 17). Valdes (1992: 15) argues that storage jars supplanted or were used alongside locally made earthenware becoming an intrinsic part of local culture. In addition to its utilitarian use for storage of rice, wine or beer for ritual use, they became prestige items and reappropriated for primary or secondary burials, as grave goods, and in modern Philippine society as heirlooms items (Barbosa 1992).

High-fired sherds were found on the surface and in sub-surface fills, and most likely represent Contact Age deposits (*c.*1000 AD). In later years of excavation, they were found in the same contexts as earthenware, but high-fired sherds were not found in all contexts (Balbaligo 2009). A full analysis of the high-fired ceramics at Ille Cave was beyond the scope of this research, but a preliminary examination was essential to

understand their depositional context, to see if they were associated with the earthenware or if the high-fired ceramics were intrusive. This will help to assess in more recent times how the site was used and also the presence of identifiable trade/exchange items may contribute to a better understanding of how the site fitted into the regional distribution systems. Table A.2 shows the number of high-fired sherds found at Ille Cave between 2004 and 2008.

Stoneware	**Celadon**	**Porcelain**	**Total**
420	89	73	582

Table A.2 Total number of high-fired sherds at Ille Cave 2004-2008.

Since 2004, the following have been reported: brown glazed stoneware sherds from large jars determined to be Dusun jars from the tenth century AD, 'brownware' sherds that may come from the twelfth to thirteenth century AD, Jingdezhen ware (*circa* eleventh to twelfth century AD), Fujian ware (*circa* thirteenth to fourteenth century AD); celadon sherds; whiteware; while blue and white porcelain are present but scarce (ASP 2005-2006; Paz and Ronquillo 2004). The stoneware sherds were dense, fine in texture, vitreous and opaque. Where the glaze had abraded, the vessels were orange and brown underneath. Figs. A.7a-b shows an unglazed or badly abraded (exterior and interior) orange restricted rim with combed impressed design above a carination. The majority of the sherds were glazed and colours ranged from brown, green and yellow. The most commonly occurring were the brown and olive-green glaze which appeared speckled. Figs. A.7c-d shows a contrast of a small thin green speckled restricted rim with glaze on the exterior and interior compared to figs. A.7a-b. Brown glazed stoneware jars have been called "Dusun" following Harrisson and Harrisson (1971) who named similar stoneware after a tribe from Sabah who valued them (Valdes 1992: 21).

Fig. A.7 Non-glazed and glazed stoneware sherds from Ille Cave. Image scale = 0-5 cm (image: Y. Balbaligo)

Figs. A.7a-b Unglazed rim profile and exterior of orange restricted rim stoneware sherd with combed impressed design above carination. Year 2006 (IV-1998-P-22405)

Figs. A.7c-d Small thin green speckled restricted rim with glaze on the exterior and interior. Year 2006 (IV-1998-P-20645)

Figs. A.8a-b shows a coil-built vessel and figs. A.8c-d show a slow wheel thrown vessel (KJ Chang pers. comm. 2013) and striations are visible on the interiors of the vessel. Glaze is a vitreous coating which fuses to the vessel when fired at a high temperature in a kiln, usually fired to *c.*1200 °C. However, the glaze was not applied consistently in all cases. Fig. A.8a shows the exterior of an orange large stoneware flat bottomed vessel where the upper portion has a brownish glaze but the lower half and interior are completely unglazed. Similarly, figs. A.8c-d shows a light brownish-orange vessels with a golden brownish-green speckled glaze on the upper portion of the exterior and an unglazed lower portion. The interior shows that the bottom of a vessel base is

glazed but it is sparingly applied and with what looks accidental ‘drip’ marks half way down to the base. It is unknown whether this was intentional and although these vessels show imperfections, the presence at Ille suggests they were considered suitable for trading/exchanging.

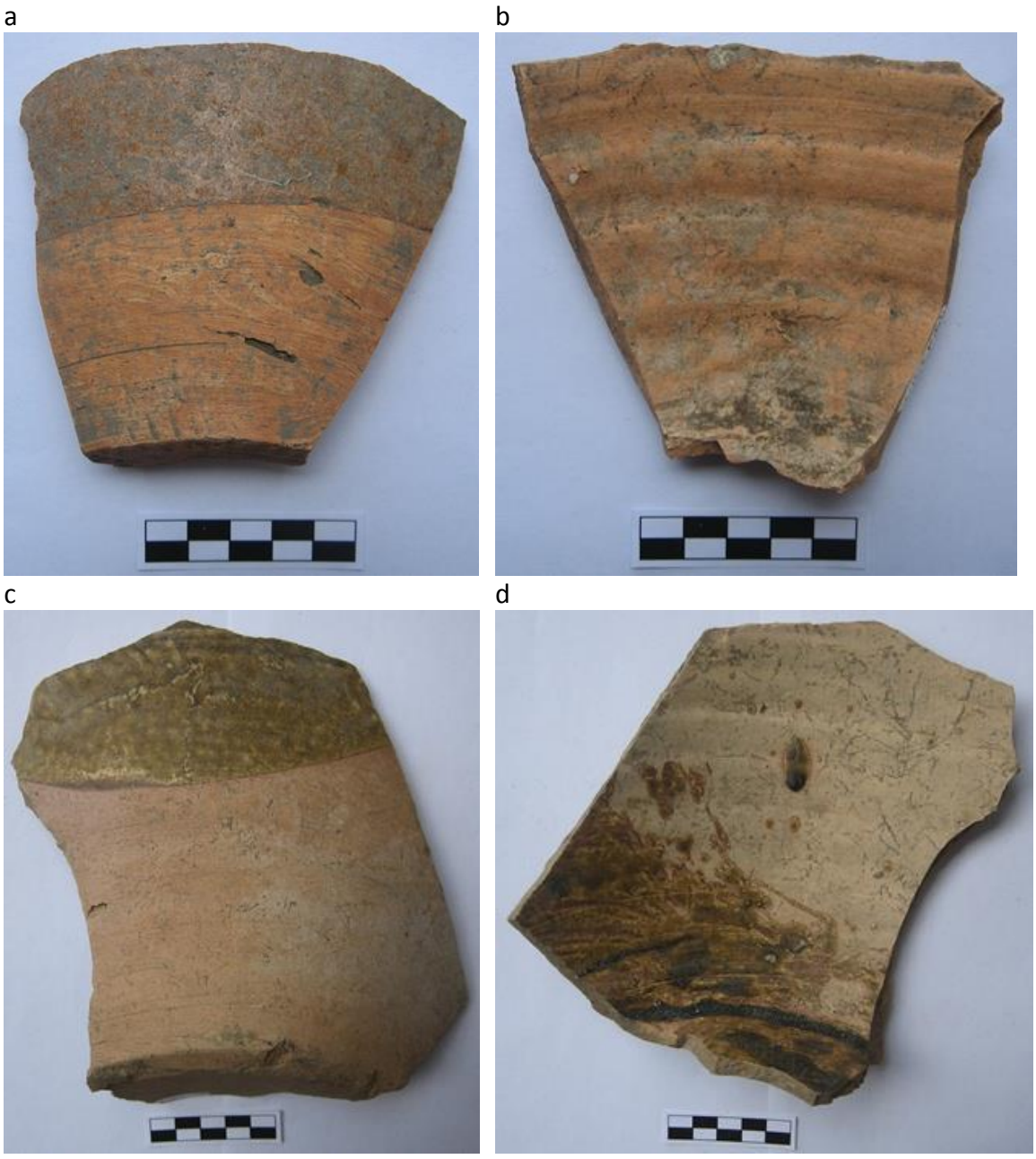


Fig. A.8 Examples of varying glazing on stoneware. Image scale = 0-5 cm (image: Y. Balbaligo)

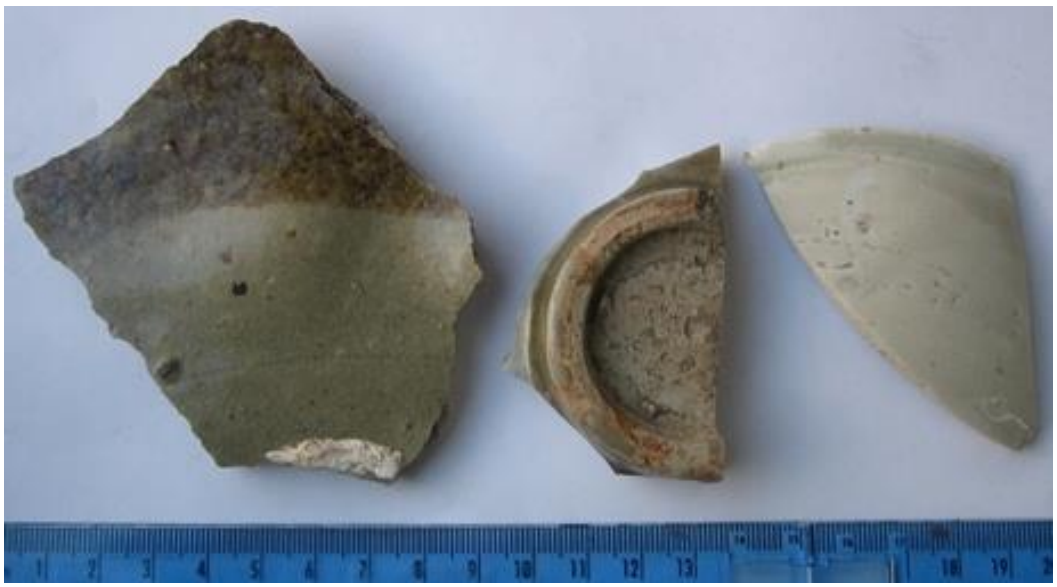
Figs. A.8a-b Exterior and interior of an orange large stoneware flat bottomed vessel, upper portion only is glazed. Year 2005 (IV-1998-P-18451)

Figs. A.8c-d Exterior and interior of light brownish-orange vessels with unevenly distributed golden brownish-green speckled glaze. Year 2006 (IV-1998-P-21629)

Fig. A.9 Stoneware with handles and spout. Image scale = 0-5 cm (image: Y. Balbaligo)
Figs. A.9a-b Two types of handles forms. Year 2005 and 2008 (IV-1998-P-16984, IV-1998-P-40280)
Figs. A.9c-d Unglazed spout. Year 1998 (IV-1998-P-200)

The majority of the ceramics recovered were body sherds, followed by rims and bases. The stoneware had different forms to the earthenware as can be seen by the presence of handles lugs and a spout was recovered. Handles were positioned both vertically and horizontally. Figs. A.9a-b show two types of handles forms. Figs. A.9c-d shows an unglazed spout. This could have been from a ewer, teapot or kendi. However, no earthenware vessels with handles of this size or spouts have been recovered at Ille. It is unlikely that these forms were not imitated in earthenware by local potters.

a



b

Fig. A.10 Celadon and porcelain ceramics. Image scale = 0-5 cm (image: Y. Balbaligo)

Fig. A.10a Left to right: exterior of celadon bowl, celadon bowl exterior rim base, exterior rim of porcelain bowl. Year 2009 (no accession number, not yet accessioned as of 2009).

Fig. A.10b White and blue porcelain plate. Year 2005 (IV-1998-P-17359)

The colour of the celadon ranged from brownish green to light green with iridescence from the glaze containing iron which produced the green and grey colours in reduction firing. Some vessels had swirl patterns and the glazes were speckled and showed crizzling. The majority of the celadon sherds were thin and one light green sherd was possibly a bowl from the thirteenth to fourteenth century AD (*cf.* Southeast Asian Ceramics Society 1979: 136-137). Fig. A.10a shows the exterior of what is probably a plate and the ring base. The porcelain colours ranged from white to light and dark

beige (see fig. A.10a far right and A.10b). One had two tones – half was white and the other half was speckled dark beige. Although blue and white porcelain are rare at Ille, it is not thought to date from the Ming Dynasty (fig. A.10b).

The Calamianes Island and El Nido had been mentioned in Chinese narratives as early as 1209 when visited by Chinese traders for pygmy swiftlets (*colocalia fuciphaga*). It is possible that the celadon and porcelain originated from China. It is likely they may have been "prestige goods" (Barretto-Tesoro 2003a). It is harder to provenance the stoneware as there are few defining diagnostic features to associate them with a time or place. However, to date, no kiln sites have been found in north Palawan, therefore, it is likely the high-fired ceramics are not from this area. It is unlikely that Palawan was a centre of production and, as yet, no Chinese settled sites have been found. More stoneware might then have been found in the upper layers of excavations if there was a local supply. The presence of these high-fired ceramics shows that trade and cultural contact between China and Philippine provinces and islands was extensive. Although we cannot be certain what proportions of the stoneware is local, or even modern, some of the sherds show characteristics of Chinese stoneware and can be classified in relation to typology (Nguyen Long 1992b: 185-199). Although high-fired ceramics falls outside the scope of this research, it is useful to see where they occur on site and the extent of turbation and bioturbation. Where the high-fired ceramic are found within the stratigraphy of the site and its implications are discussed below.

Appendix B. Ceramic analysis: Comparative Ceramics from Dewil Valley and El Nido

B.1 Ceramics from the Dewil Valley and El Nido

This appendix presents the earthenware ceramics from surveys of six sites in the Dewil Valley, two sites in the wider El Nido area and three sites from Islands off the west coast of El Nido (fig. B.1; table B.1). Although other sites in northern Palawan have been surveyed, due to time and access constraints, this research only examines the sites with large enough and significant assemblages (Chapter 3). The majority of the ceramic finds are from surface collections. However, these surface assemblages can be compared directly with the ceramics from the surface of Ille Cave (Appendix A Comparative ceramics from Ille Cave). On initial inspection, these ceramics appeared macroscopically different to the Ille assemblage. This analysis sought to investigate the extent to which the ceramics varied and what could account for this variation. It examines which ceramics were technologically comparable to assess whether any shared technology indicated shared learning traditions with Ille. Comparative analysis with ceramic assemblages at other caves sites may demonstrate further variation and other learning traditions beyond Ille Cave potentially belonging to different communities of practice or groups of people in the Dewil Valley and beyond.

In contrast to the vast amounts of earthenware recovered, there was a limited presence of high-fired ceramics including tradeware found in the rest of the Dewil Valley (Archaeological Studies Program [ASP] 2005-2006: 29). High-fired ceramics are not present at all cave sites and some sites have been subjected to looting. Although a full analysis of the Dewil and El Nido ceramics were not possible due to time constraints, the definition of Ille ceramic types comprising distinct and correlating attributes allowed direct comparison with ceramics from other sites. The comparison

is methodologically sound, however, there are limits to this approach and it must be remembered that this research is the first in modern times to examine ceramics across a wide region from current archaeological work in the Philippines. Overall, the comparative ceramic assemblages are small. The sites have undergone preliminary survey and represent surface collections as few sites have been excavated. The ages or periods of the ceramics and levels of disturbance are currently unknown. Furthermore, the exact functions of the caves and rockshelters and whether they were used as burial or ritual sites is also unknown. Despite this, the Dewil Valley and El Nido ceramics provide essential secure comparative assemblages. The ceramics analysed in this section are based on the sherds available up to 2010.

B.1.1 Makangit Cave, Dewil Valley

Makangit Cave is Ille Cave's closest limestone karst formation which encloses other finds sites. The excavations show the site is disturbed and there are to date no secure contexts (H. Lewis pers. comm. 2012). Overall, there are larger surviving fragments of sherds on the surface due to the density of vegetation around the site and a lack of disturbance. Ceramics were collected in 1998 and 2006. An initial examination of seven restricted rim vessels and a pedestal bowl was undertaken by Reyes (2007). Reyes (2007: 4-5) determined the capacity of the restricted vessels and surmised that the surface decorations were of the Iron Age Kalanay Pottery Complex (Solheim 1964a, 2002) by assigning impressions on the ceramics to one of Solheim's groups of decorations (Solheim 2002: 11). However, these were superficial comparisons of ubiquitous triangular designs to the established Kalanay pottery complex. Some decorations matched Solheim's characteristics and some did not. Regardless of whether the vessels were decorated in the style of, or are in fact Kalanay vessels, the Makangit decorative styles are not found in the Ille assemblage (figs. B.2a-c).

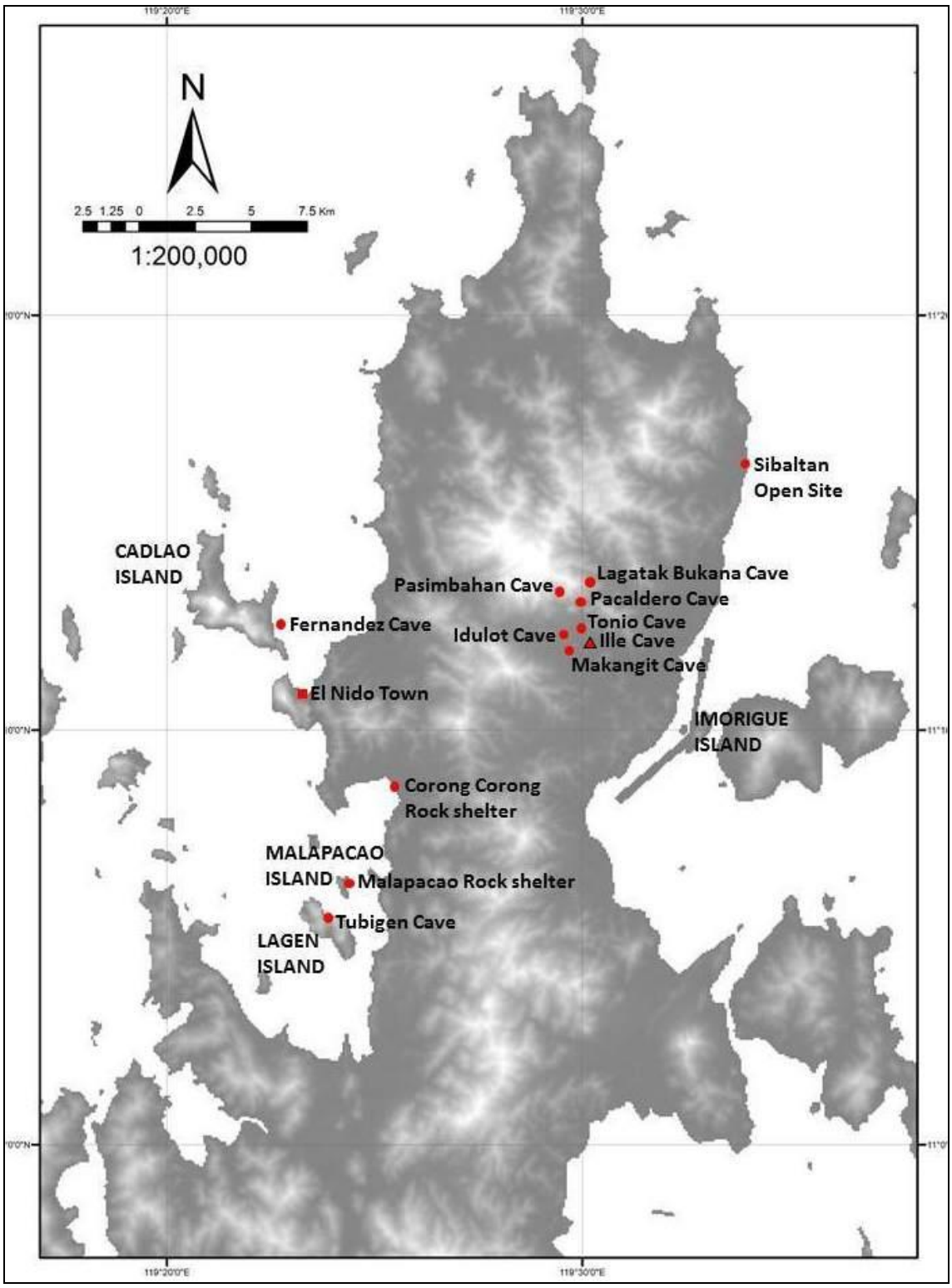


Fig. B.1 Map of northern Palawan showing the location of all the ceramic sites analysed in this appendix (image: Jarvis *et al*. 2008, modified by Y. Balbaligo)

#	Site name	Location	Site number	Potential type site	Sherd quantity
-	Ille Cave	Dewil Valley	IV-1998-P	Inhumation cemetery, cremation burials, and votive offerings	17,693
1	Makangit Cave	Dewil Valley	IV-1998-P IV-2004-U3 IV-2006-L	Votive offerings	67
2	Idulot Cave	Dewil Valley	IV-2007-T	Votive offerings and jar burial	71
3	Tonio Cave	Dewil Valley	IV-1998-J	Votive offerings and jar burial	31
4	Pacaldero Cave	Dewil Valley	IV-1999-G	Votive offerings, secondary burial and jar burial	4
5	Lagatak Bukana Cave	Dewil Valley	IV-2007-X	Votive offerings	18
6	Pasimbahan Cave	Dewil Valley	IV-2007-Q	Secondary burial	19
7	Sibaltan Open Site	El Nido	IV-1998-S	Inhumation cemetery (modern), burials	6
8	Corong Corong Rockshelter	El Nido	IV-2007-P	Votive offerings	23
9	Tubigen Cave	Lagen Island	IV-1998-O	Votive offerings	9
10	Malapacao Rockshelter	Malapacao Island	IV-1965-X2	Votive offerings	18
11	Fernandez Cave	Bukal Island	IV-1965-Y	Votive offerings, jar burial	15

Table B.1 List of caves sites, potential type site and sherd quantities studied in this appendix.

While there were undecorated abraded restricted rims and carinations as seen in the Ille assemblage, there were many highly distinctive pieces in the Makangit assemblage. The pedestal bowls show much variation between themselves and in comparison to the Ille pedestal bowls (fig. B.3). Without thin section analysis it is difficult to determine the fabric composition, provenance and whether they share any mineral or rock components with the Ille assemblage. However, the fired colours are different between themselves and with the Ille assemblage, suggesting different concentrations of iron in the clays and varying firing durations and temperatures. Red Ware is also present, however, they do not appear red-slipped. The sherds appear denser which may also suggest a different clay source to Types 1, 2 and 3. The forms differ in that

they are high footed pedestals with greater wall thicknesses. They are also likely to be larger in their entirety than the Ille pedestal bowls.

The most obvious difference is in the surface treatment. Fig. B.2d shows a large elaborate appliqué handle which is dense and highly polished and not found in the Ille assemblage. The full vessel form is unknown. The surface decorations on the pedestal are different. The decorative techniques differ vastly to the intricate incising at Ille. The vessels show deep regularly occurring stamps in large shapes and sizes not used at Ille (see figs. B.3a-d). These vessels have been compared to Solheim's (2002) description of the Novaliches pottery complex which, in particular to the Makangit assemblage, are defined by their high ring-foot, extremely well-polished surface and in particular their "narrow vertical elements made with an impressing tool having a blunt end" (Solheim 2002: 13). Similar sherds are also found at Tonio Cave discussed below. There are also forms, especially the Novaliches type vessels, which are not present at Ille. These decorative techniques along with the other attributes mentioned above, differs from Ille and these ceramics clearly belong to another learning tradition outside of the traditions found at Ille.

A large number of the extant ceramic fragments are pedestal bowls. It is unknown what other activities took place at this site or if there are any inhumations or other funerary practices. A hypothesis at this stage is that, as the pedestal bowls are offering vessels, therefore, it is possible that this site was used for offerings. At Ille, the pedestal bowls are also offering vessels and were not associated directly with any burials, therefore, the practice of leaving pedestal bowls as an offering is common in this area. Magkangit is not an easily accessible cave and is surrounded by dense undergrowth. It does not have large obvious openings and there are crevices in the limestone karst tower. Therefore, this site may be more suitable for offerings rather than for inhumation or even jar burials.

a b

c d

Fig. B.2 Range ceramics from Makangit Cave, Dewil Valley. Image scale = 0-5 cm (image: Y. Balbaligo)

Figs. B.2a-c Range of decorated rim sherds. Year 2006 (no accession number)

Fig. B.2d Range of decorated rim sherds. Year 2006 (no accession number)

a b

c d

Fig. B.3 Range of foot rims from Makangit Cave, Dewil Valley. Image scale = 0-5 cm (image: Y. Balbaligo)

Figs. B.3a-d Year 2006 (no accession number)

B.1.2 Idulot Cave, Dewil Valley

Idulot Cave is located in the southwestern tower of the Makangit karst complex. The ceramics discussed below were collected in 2007. Overall, the assemblage contains large, thick fragments of varying firing and porosity, undecorated restricted and unrestricted rims both cylindrical and globular in shape, foot rims from pedestal bowls, and body sherds of coarse light and dark brown fabric and Red Ware which may have been slipped as remnants are visible. There are some sherds which have similarities to the Ille assemblage, such as large brown rims similar to 'Potential Type 13: Large brown rim', a large abraded restricted rim with punctate impressions on the large wide flat rim surface has similarities to a sherd in Decorated: No Types (compare figs. B.4c-d with figs. 6.28 and 6.29 from Results Chapter 6) and there are various combed and bound paddle impressions which have similarities but are not identical to the Ille bound paddle impressed sherds. Figs. B.4a-b shows a sherd that has clear similarity to 'Type 7: Impressed restricted rim' with cross hatching on the lip made with a small flat stick. The vessel has dirt and limestone encrustations and, therefore, it is difficult to assess the surface finish. It is a unique find in that it survives as half of a full globular ellipsoid restricted vessel, this full form previously unseen in the assemblage. This sherd is a good example of what a complete Type 7 from Ille might look like.

Figs. B.4e and B.4f show decorations not seen in the Ille assemblage. Fig. B.4e is different to the large coarse sherds in the assemblage. It is a dark brown restricted rim vessel. The decorations have alternating panels of four vertical lines and four incised punctates, over combed wavy lines and further punctates in pairs. Though the exterior is now abraded, it was highly polished. These decorations are not found in the Ille assemblage. The decorations in fig. B.4f are also not found in the Ille assemblage with incised rounded parallel lines and further incised diagonal lines running across them. Though the sherd may be red-slipped, it is highly porous unlike the red-slipped sherds at Ille. The interior is grey showing it was fired in an oxidising environment but was not fired at a sufficient temperature or for long enough for the organic materials to be burnt out. It does not share a resemblance to decorations at Ille.

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Fig. B.4 Range of rim and body sherds from Idulot Cave, Dewil Valley. Image scale = 0-5 cm (image: Y. Balbaligo)

Figs. B.4a-b Sherd similar to Type 7: Impressed restricted rim. Year 2007 (IV-2007-T-15)

Figs. B.4c-d Large abraded restricted rim with punctate impressions on the large wide flat rim. Year 2007 (IV-2007-T-14)

Fig. B.4e Incised and impressed restricted rim. Year 2007 (IV-2007-T-2)

Fig. B.4f Incised body sherd. Year 2007 (IV-2007-T-4)

The site was resurveyed in 2010. Although the 2010 survey falls outside of the scope of this research it can be noted that more ceramics were found along with shell artefacts and human bones with traces of red pigment on their surface (Paz *et al.* 2010). Sherds

were found with intricate full concentric circle stamps, notching and other geometric shapes. The vessels have handle lugs and the full forms are unknown (figs. B.5a-b *cf*. figs. 6.6e and 6.6f handles in Results Chapter 6). To date, full circle stamps impressions have not been found at Ille or in the Dewil Valley. Although similar types to the Ille assemblage were found at Idulot Cave site, the dissimilar vessels represent a different learning tradition from the Ille assemblage as seen in forming and decorations. Thin section work is needed to confirm fabric range. At the time of survey, it was thought that the ceramics were associated with the Metal Period. Along with votive offering vessels, large earthenware pottery sherds with thick walls and wide mouth restricted rims, were found next to human bones in the deep crevices of the cave (Paz *et al.* 2010). Due to the wall thicknesses, vessel form and its proximity to human remains, this cave has the potential to be a jar burial site. However, further investigations are needed.

a   b

Fig. B.5 Sherds from Idulot Cave, Dewil Valley. Image scale = cm (image: courtesy of University of the Philippines-Archaeological Studies Program)

Figs. B.5a-b Sherds with full concentric circle stamps, notching, other geometric shapes and handle lugs. Year 2010 (no accession number)

B.1.3 Tonio Cave, Dewil Valley

Tonio Cave is located on a high limestone cliff towards the northwest of Ille Cave. Earthenware sherds, human bones and shell artefacts were found on the cave floor and within limestone crevices. A representative sample of the ceramics were collected. An initial examination focusing on morphological forms (and not decoration) was undertaken by Reyes (2008). Very few vessel bases were present and no complete vessels were found. Reyes (2008: 4-5) established restricted rim ellipsoid, cylindrical and globular vessels which were deemed to be “cooking pots", restricted rim carinated vessels and unrestricted bowls. These forms are ubiquitous and found in the Ille assemblage. Pedestal bowls similar in form to the Ille pedestal bowls were present but also shallow plates with a foot rims and large tall footed vessels not found at Ille. Reyes (2008: 5) also suggests that large “jars”, with wall thicknesses ranging from 1-1.80 cm, may be burial jars. Sherds similar in form to those in the Ille assemblage include ‘Potential Type 13: Large brown rim’ in form and possibly fabric, which is also found at Idulot.

The fabric is mostly dark brown fired in a reduced atmosphere both coarse, containing quartz and rock fragments, and fine. Light brown oxidised fabrics occur as does potential Red Ware. Thin section analysis is needed to show composition and any geological relationships. Unusually, some sherds have organic material, possible straw, clearly embedded on the surface and also in fracture (figs. B.6a-d). It is difficult to tell whether it occurs within the clay body as temper. It has not charred on the surface, therefore, the vessel was fired at an extremely low temperature (below 360 °C). This fabric with organic material within the sherd and on its surface is also found at Malapacao Rockshelter. At this stage it is unknown whether this was intentional.

a b

c d

Fig. B.6 Undecorated rim sherds with organic material in the paste from Tonio Cave, Dewil Valley. Image scale = 0-5 cm (image: Y. Balbaligo)
Figs. B.6a-b Unrestricted rim. Year 2007 (IV-1998-J398)
Figs. B.6c-d Restricted rim. Year 2007 (IV-1998-J406)

In terms of surface decoration, there are incised and impressed decorations that do not occur in the Ille assemblage but have similarities to decorations at Makangit (fig. B.7a) but also decorations similar to the Kalanay ceramics (Solheim 2002: 40, pl. 40, i, j, l). Fig. B.7b shows a restricted rim with notching on the carination. Notched carinations occur at Ille but usually only the carinated part of the vessel survives, therefore, the vessel form is unknown. Sherds similar to those in the Ille assemblage include 'Type 7: Impressed restricted rim' with diagonal lines on the lip made with a small flat stick and various bound paddle impressions which are similar but not identical. There are more carved paddle impressed sherds in the assemblage similar to 'Subtype: 6i Carved Paddle F4'. This Ille subtype varied as the wooden paddles were non-standardised and the impressions were not a homogenous type. Fig. B.7c shows a globular vessel that has irregular square shapes carved paddle impression covering the whole of the vessel while Fig. B.7d has been sporadically paddled with a lighter pressure and a different decoration with further spacing between the squares has been carved onto the

wooden paddle. Both these types occur in the Ille assemblage in what may be the same dark brown fabric but thin section analysis is needed to make this comparison. If this is the case, is possible that the same group of potters gathered clay in the same area and finished their pottery in the same way or this was a shared tradition across other potting communities who may have been unrelated.

All these variations of incised and impressed and paddle impressed decoration occurred on the same dark brown fabric. However, variation in vessel shaping and active decorative techniques such as incising and impressing vs. paddling show that these are different learning traditions. If they are all from the same clay source, this suggests the same group of people produced different types of pottery with varying forms and decorations with the same clay or different groups of people took clay from the same source and made different types of pottery according to their tradition.

a b

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Fig. B.7 Ceramics from Tonio Cave, Dewil Valley. Image scale = 0-5 cm (image: Y. Balbaligo)

Fig. B.7a Incised and impressed restricted rim. Year 2007 (IV-1998-J398)

Fig. B.7b Restricted rim with notching on the carination. Year 2007 (IV-1998-J3)

Fig. B.7c Body of globular carved paddle impressed vessel. Year 2007 (IV-1998-J93)

Fig. B.7d Restricted rim with light carved paddle impressions. Year 2007 (IV-1998-J2)

Tonio cave, like Ille Cave and Makangit Cave shows a variety in pedestal bowls. There are similarities to Ille pedestal bowls but slight variations in form. Figs. B.8a-b shows an undecorated full 100% circumference of a pedestal foot rim and 11.5 cm in diameter. The foot ring is *c.*2 cm from base to inflection point and is more squat in form than at Ille. A particular pedestal bowl appears at Tonio which is of interest. Fig. B.8c shows a well-polished high ring-foot, possibly Red Ware, with deep long and short triangular impressions and can be compared to the Novaliches pottery complex. However, although a large enough portion of a pedestal bowl of this particular style was not found on the surface of Makangit Cave, a few small sherds with exactly the same long triangular impressions were found at Makangit (fig. B.8d), indicating that this vessel type was in use or deposited at Tonio. It is unusual that although Makangit and Tonio caves are close to Ille, the Novaliches style pedestal bowls are not found at Ille, even on the surface.

Pedestal bowls found at Tonio indicates that like the other caves, it is a votive offering site. There is also the possibility that it might be a jar burial site and excavations are needed to show whether it was also used as a human burial site.

B.1.4 Pacaldero Cave, Dewil Valley

Pacaldero Cave, within Sinalakan Karst, is located north of Ille Cave and was first explored in 1999. The site is hard to reach and does not favour human habitation. The site contained, large mouth rims, foot rims and base portions thought to be burial jars. Earthenware and shells were also found within ledges inside the cave (SEAICE 1999). All human remains were only present in the ledges and did not survive on the floors which were covered with guano.

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Fig. B.8 Pedestal foot rims from Tonio Cave and Makangit Cave, Dewil Valley. Image scale = 0-5 cm (image: Y. Balbaligo)

Figs. B.8a-b Undecorated full pedestal foot ring. Year 2007 (IV-1998-J332)

Fig. B.8c Pedestal foot rim from Tonio Cave. Similarities to the Novaliches pottery complex. Compare to fig. B.8d. Year 2007 (IV-1998-J92)

Fig. B.8d Decorated portion from a pedestal foot rim from Makangit Cave. Has the same design and form as pedestal foot rim from Tonio Cave *cf*. fig. B.8c. Year 2006 (no accession number)

Pacaldero yielded the only earthenware zoomorphic object found in the Dewil Valley so far (Cayron 2004). A 'turtle-like' artefact *c.*14 cm in length and *c.*11 cm in width with the head portion missing was found in one of the ledges inside the cave (figs. B.9a-b). The figurine has an incised curved scroll-design on the 'carapace', it is yellow-brown in colour and coarse with inclusions of quartz sand, rock fragments and iron oxides. It was fired in an oxidising environment and shows a black core. It is likely the vessel was made by hand fashioning. It is hollow and may be a container for liquids, possibly a lamp or oil container (Cayron 2004: 285). Due to its form, the figurine was thought to be a turtle and turtles are a recurring icon in Asian and in other world cosmologies (Cayron 2004: 288). However, this was challenged in 2010 when a 'leg' was recovered

on the ledge where the animal figurine was originally found which fits the underside of the vessel and a 'stopper' where the head should be. It is thought that the figurine might represent a bird rather than a turtle (Paz *et al.* 2010).

Other finds include a sherd *c.*8 cm in thickness with an elliptical bottom and incised design (figs. B.9c-d). This sherd has no parallel in form, however, it has a resemblance to a vessel found in 2010, discussed below. Fig. B.9e is a large rimmed sherd *c.*8 cm in thickness. It cannot be orientated and could be either a foot or mouth rim sherd. It has incised horizontal bands with alternating triangular designs and shows remnants of red paint. Fig. B.9f is *c.*8.5 cm and has incised horizontal bands, circular shapes and geometric shape with red paint which has some similarity to incised painted sherds at Ille (Type 11). The incised lines may have contained white infill. All three sherds are dark brown in colour with inclusions of quartz sand and rock inclusions, likely to be fired in an oxidising environment and highly polished. It is possible they are made of the same fabric.

Pacaldero Cave was briefly revisited in 2004 and 2006 in search of the missing pieces of the animal figurine. However, these surveys did not yield any of the expected pieces. No other zoomorphic or anthropomorphic earthenware was found in the Dewil Valley until Pacaldero was resurveyed in 2010. In addition to the discovery of the 'bird leg', more large sherds, and intricately decorated ceramics including anthropomorphic earthenware was found.

Earthenware sherds representing human faces were found. Fig. B.10a shows almost complete face with an incised eye with eyelashes, appliqué nose with nostrils and a stylised incised mouth. The surface of the face is abraded with red paint streaks on the cheeks. The fabric is brownish-red, with inclusions of iron oxide and rock fragments and possibly quartz sand. It is fired in an oxidising environment with a grey core. A large incised eye with an appliqué eyebrow with the remains of red paint on the surface belonging to a larger vessel of the same fabric was also found. Full vessel forms are unknown.

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Fig. B.9 Range of ceramics from Pacaldero Cave, Dewil Valley. Image scale = 0-5 cm (image: Y. Balbaligo)

Figs. B.9a-b Figurine of turtle with incised designs. Year 1998 (IV-1998-G-1)

Figs. B.9c-d Sherd with elliptical bottom and incised designs. Year 1998 (IV-1998-G-2)

Fig. B.9e Large rimmed sherd with incised horizontal bands with alternating triangular designs with remnants of red paint. Year 1998 (IV-1998-G-3)

Fig. B.9f Sherd with incised horizontal bands, circular shapes and geometric shape with red paint. Year 1998 (IV-1998-G-4)

Many fragments of a large vessel depicting stylized human upper torso were found. At least two ‘nipples’ was present on the underside of the vessel (fig. B.10b). However, the vessel may be difficult to orientate and the ‘nipple’ feature is not the base of the vessel. One of the ‘nipples’ occurs within an elliptical bottom similar to figs. B.9c-d above. The vessel has intricate incised triangular shapes and curvilinear scrolls and remnants of red paint on the body. Large rectangular perforations occur around the rim. The fabric is lighter in colour than the face pottery but has an uneven fired colour across the vessel. It was fired in an oxidising environment. Other ceramics found included carinated vessels with geometric designs painted with red pigment and examples of cord marked paddle impressed sherds, similar but not identical to Ille.

The zoomorphic figurine was recovered in 1999 and zoomorphic and anthropomorphic earthenware was not found again until 2010. Therefore, there is the possibility that further zoomorphic or anthropomorphic earthenware may be found. The Pacaldero earthenware show a clear departure in learning tradition from other ceramics examined so far. The decorations have similarities to ceramics at other sites in terms of horizontal bands, triangular motifs and other geometric shapes. However, it is the zoomorphic and anthropomorphic forms of these ceramics that are the most distinctive and have so far not been found at other sites in the Dewil Valley. The cave openings make it unlikely to be a habitation site, and its suitability as a burial is unknown. Pacaldero is likely to be an offering site with the ceramics representing votive offerings. Cayron (2004: 284) hypothesises that Pacaldero might be a secondary burial site as evidenced by the human bones and earthenware sherds which potentially may be burial jars. Further investigation is needed.

a   b

Fig. B.10 Anthropomorphic sherds from Pacaldero Cave, Dewil Valley. Image scale = cm/no scale (image: courtesy of University of the Philippines-Archaeological Studies Program)

Fig. B.10a Earthenware face with an incised eye with eyelashes, appliqué nose with nostrils and a stylised incised mouth with red paint streaks on the cheeks. Year 2010 (no accession number)

Fig. B.10b 'Nipples' underside of a vessel. Year 2010 (no accession number)

B.1.5 Lagatak Bukana Cave, Dewil Valley

Lagatak Bukana Cave, is a large cave at the north side of Diribungan Karst. The cave was inhabited by a colony of bats and earthenware pottery has been found on small platforms inside the cave. The site contains small, thin walled restricted and unrestricted vessels. So far there are no large pieces. The sherds are poorly abraded and covered with the same depositional substances making it difficult to ascertain fabric. Figs. B.11a-b shows an unrestricted rim carinated (at 126°) shallow bowl with a diameter of 14 cm and representing 68% of the vessel. The decoration is a regular incised spiral concentric squares joined to each other around the vessel with three deep comb incised horizontal bands and impressed comb grooves vertical down the body. This decoration has no other parallel in the Dewil Valley. Due to the abraded surfaces other sherds show faint incised geometric shapes, across the body of a vessel (fig. B.11c), cord bound paddle impressions on the body (fig. B.11d) and (fig. B.11e) in contrast shows very fine incised designs on the upper part of a very sharp carination (100°) then 3 deep horizontal grooves underneath. The lower carination has vertical grooves or is cord marked paddle impressed. Fig. B.11f shows two parts of a broken pedestal foot ring. In comparison to other pedestal foot rims in the Dewil Valley, this example is a very small thin vessel. It is light pale brown, very fine no coarse inclusions unlike the other darker coarse sherds in the Lagatak Bukana assemblage. Overall, the

decorations are very fine, faint over time and can be regarded as delicate. These styles are not seen anywhere else in the Valley. Due to the presence of the pedestal bowl, the cave could be a votive offering site.

B.1.6 Pasimbahan Cave, Dewil Valley

Pasimbahan Cave, is located on the base of the southeast face of the 'Star' (Istar) Karst, Magsanib district of the Dewil Valley southwest from Ille and first excavated in 2007. Charcoal dates provide an early Holocene age range of 8000 to 10,500 BP ([6831-7046 to 10,469-10,584 BC] Ochoa *et al.* 2014). Only few earthenware sherds were found in test trenches. Extant sherds were small, unlike the larger earthenware found at other undisturbed sites in the Dewil Valley. Sherds were made up of mostly thin (*c.*0.5 cm) undecorated body sherds, carinations, small restricted rims and no other morphologically diagnostic features. At least two different fabrics were present; Red Ware and a fired dark brown fabric in an oxidising environment, abraded and coarse with inclusions of quartz sand, rock fragments and iron oxides. The decorative techniques shows faint incised horizontal, diagonal and wavy lines, combed lines, rectangular stamped motifs and incised triangular lines and punctates arranged in a triangle formations (figs. B.12a-d). Apart from the ubiquitous restricted rim form, as yet, the earthenware sherds do not share any clear similarities with ceramics found at other sites. The decorative styles do not have defining features like other sites with ceramics.

A secondary burial comprising a cluster of bones made up of several individuals and covered with traces of hematite were found inside a crevice on a ledge. A small tanged dagger-like metal blade with a broken tip was recovered with the bones (ASP 2007: 14). In addition to a shell midden, other finds included human and animal bones, shells and modified shell, two shell bangles, a copper alloy bangle, glass beads, and a stone adze, hammerstone, flake tools and debitage (Paz *et al.* 2010).

Fig. B.11 Range of sherds from Lagatak Bukana Cave, Dewil Valley. Image scale = 0-5 cm (image: Y. Balbaligo)

Figs. B.11a-b Profile and exterior of unrestricted incised carinated shallow bowl. Year 2007 (IV-2007-X-1-2)

Fig. B.11c Decorated body sherd. Year 2007 (IV-2007-X-14)

Fig. B.11d Restricted rim with cord bound paddle impressed body. Year 2007 (IV-2007-X-13)

Fig. B.11e Incised carination Year 2007 (IV-2007-X-15)

Fig. B.11f Pedestal foot rim Year 2007 (IV-2007-X-7 and X-11)

These ceramics might be part of a wider learning tradition in the Dewil Valley but the ceramics so far identified do not correlate with any of the learning traditions found at other sites. To date, no pedestal bowls sherds were found. Although Pasimbahan is definitely a secondary burial site with the possibility of primary inhumations being found, as yet no earthenware has been found to suggest it is an offering site. However, the shell and copper bangles may suggest votive or ritual activity (Ochoa *et al.* 2014: 28) that does not involve the earthenware ceramics. Pedestal bowls or other similar ritual vessels may be found with further excavation.

B.1.7 Sibaltan Open Site, El Nido

Barangay Sibaltan (administrative division and village) is situated along the eastern coast by Sibaltan Bay approximately 4 km to the northeast of Barangay New Ibajay where Ille Cave is located. An open site in Sibaltan (IV-1998-S) was first surveyed in 1998. Finds from the surface were scant and show indistinct small thin yellowish-brown coarse fabric and possibly Red Ware that are undecorated restricted rims and body sherds, sherds with bound paddle impressions and wavy combed impressions (different in style to the Ille assemblage; figs. B.13a-b). A rim sherd which cannot be orientated, potentially Red Ware fired in an oxidising environment shows cross-hatched incisions across the exterior of the sherd. This decorative style has not yet been seen. The most prominent sherd in this assemblage found in 1998, was reddish-brown in colour, badly abraded and coarse with inclusions of quartz sand and rock fragments. The foot rim is small in comparison to the Ille foot rims, 1.94 cm in height, 0.68 cm thick and 5 cm diameter with a perforated circle in the foot rim. Pedestal bowls with perforations are not seen at Ille and not yet found in the Dewil Valley.

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c d

Fig. B.12 Range of restricted rims with incised, impressed and stamped decorations from Pasimbahan Cave, Dewil Valley. Image scale = 0-5 cm (image: Y. Balbaligo)

Figs. B.12a-d Year 2007 (no accession numbers)

a b

Fig. B.13 Range of sherds from Sibaltan Open Site, El Nido. Image scale = 0-5 cm (image: Y. Balbaligo)

Fig. B.13a Incised rim sherd. Year 1998 (no accession number)

Fig. B.13b Pedestals foot ring with perforated circular whole. Year 1998 (no accession number)

Sibaltan was resurveyed in 2009 and in 2010, test excavations at four sites started. Although these sites and years of excavation fall outside of the scope of this research, Sibaltan is significant and has many potential archaeological connections correlated to the Dewil Valley. Overall, it is thought that Sibaltan is a cemetery and settlement dating to the Metal Age (Paz *et al.* 2010). Only a few earthenware sherds were found in excavation, however, high-fired ceramics were abundant. The stoneware and white and blue porcelain can be dated to between tenth to fourteenth century AD. In terms of burials, some adult and juveniles were directly associated with glass beads, shell beads, carnelian stone beads, and a silver bead, though not directly worn as jewellery but rather sewn on a fabric used to wrap the body before burial.

The beads excavated at Sibaltan were also present in the Dewil Valley. In particular, shell beads hewn from *Tridacna* were similar to the microperforated cut shell beads found at Ille (Basilia 2011). The Sibaltan carnelian stone beads were strung with Chinese glass beads made with a coiling technique. Carnelian beads were also found at Ille and at the Tabon Cave Complex in southern Palawan, first appearing in Palawan Metal Age (from *c.*500 BC) and associated with iron (Fox 1970: 137). Various glass beads of the Indo-Pacific type are also found at Ille and the Tabon Cave Complex where glass beads are a diagnostic trait of the Early Metal Age (Fox 1970: 137). Although, this subject falls outside the scope of this research, the presence of known 'foreign' artefacts such as the high-fired ceramics and stone and glass beads suggests that there was a culture of trade and/or exchange with people from outside of Palawan (Cayron 2012).The earthenware pedestal bowl is a good indication that there was a shared culture of votive offering as part of the funerary practice in Sibaltan and the Dewil Valley. It is clear further investigations are needed at Sibaltan.

B.1.8 Corong Corong Rockshelter, El Nido

Outside of the Dewil Valley near El Nido town proper, Corong Corong Rockshelter is situated in Barangay Corong Corong southwest of Ille Cave. Human remains and earthenware sherds were found. The sherds comprise large carinated sherds and restricted and unrestricted vessels. Some may be red-slipped.

This assemblage is significant as a comparative sample for Ille Cave. Not only are the sherds larger, which might be because there was less disturbance in antiquity and modern times, but the forms and decorative styles are similar to Ille although replicated on larger sized vessels. Sherds similar to Ille 'Type 4: Grey Cord Marked' and 'Type 8: Incised Triangles' were found in Corong Corong. Figs. B.14a-c show sherds from Corong Corong (left) and Ille (right) which both have the characteristics of 'Type 8: Incised Triangles'. Although the petrography is unknown, they have the same form as the Ille restricted rim vessels with the same curved pointed lip and are decorated with incised horizontal bands and diagonal lines forming open triangles shapes with small triangular imprints under the horizontal bands. The only seeming difference is that the Corong Corong sherds are considerably larger than the Ille samples.

Fig. B.15a shows sherds which have almost identical cord marked paddle impressions from a bound paddle, fired in the same reducing environment and seem to be made of a similar fabric with quartz sand inclusions (possibly temper) as Ille 'Type 4: Grey Cord Marked'. They are similarly flat and have same wall thicknesses. The sherds survive in larger fragments due to lack of disturbance. The full form of this vessel is still unknown. However, a restricted rim in the Corong Corong assemblage might potentially be related to the paddle impressed sherds. Figs. B.15b-c shows an abraded and porous rim that does not have any paddle marks to indicate that it was the mouth rim portion of a cord marked bound paddle impressed sherd. Despite this, the rim form and lip, large size and potentially the fabric are similar to rim sherds at Tubigen Cave, Lagen Island, which have the same marked paddle impression under the neck of the rim. These sherds are discussed below.

The discovery of the same ceramic type, at two sites *c.*14 km away from each other is so far unprecedented in northern Palawan. The discovery of a rim that might belong to 'Type 4: Grey Cord Marked' throws light on the morphology of this vessels and the movement of this ceramic in northern Palawan. This is discussed further below.

As yet, no pedestal bowls, clearly indicating an offering site, were found. However, the ceramics found might also be votive offerings suggesting Corong Corong was an

offering site. Some human remains were found but due to disturbance, it is not known if they were secondary burials or associated with ceramics to indicate a jar burial site.

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Fig. B.14 Comparison of sherds from Corong Corong Rockshelter, El Nido (left) with Ille Cave (Right), similar to Type 8: Incised Triangles. Image scale = 0-5 cm (image: Y. Balbaligo)

Compare figs. B.14a-b and figs. B.14e-f left from Corong Corong (2007, unaccessioned) and right from Ille (2008, IV-1998-42100 and IV-1998-P-19034) with similar incised lines and impressed triangular decorations

Figs. B.14c-d Profile with same pointed lip of sherds from Corong Corong (left, unaccessioned) and Ille (right, IV-1998-P-42100)

a

b

c

Fig. B.15 Grey cord marked sherds from Corong Corong Rockshelter, El Nido. Image scale = 0-5 cm (image: Y. Balbaligo)

Fig. B.15a Large grey cord marked paddle impressed sherds from Corong Corong similar or same as Type 4: Grey Cord Marked at Ille. Year 2007 (no accession number)

Figs. B.15b-c Profile and exterior of abraded and porous rim *cf.* figs. B.16c-e from Tubigen Cave, Lagen Island. Year 2007 (no accession number)

B.1.9 Tubigen Cave, Lagen Island

The following two sites are located on Islands off the coast of El Nido and to the southwest of the Dewil Valley. These sites were first surveyed in 1998 and no further work has taken place since then. Tubigen Cave, located on Lagen Island is north of Leta Leta Cave where burials and unparalleled earthenware was found including the anthropomorphic 'yawning jarlet' and cut out pedestal bowls (Fox 1970: 177). The cave opening is difficult to climb to from sea level. Large pottery sherds and human bones were found on the cave floor. No tradeware or high-fired sherds were recovered.

There are at least three different fabrics present at Tubigen. Fig. B.16a shows a Red Ware sherd with rare inclusion of rock fragments and iron oxides. There is incised notching on the carination, regular incised designs on the upper carination and the lower carination is undecorated. A large foot rim of a Red Ware pedestal bowl is also present in the assemblage. Fig. B.16b shows a dark brown sherd, fired in an oxidising environment where the carbon has not burnt out due to insufficient firing and the abraded interior shows frequently occurring inclusions of quartz sand. The sherd is large unrestricted mouth rim sherd with a protruding rim on the exterior of the sherd.

The third fabric present is similar to 'Fabric 10: Coarse quartz temper' from 'Type 4: Grey Cord Marked'. The sherds are fired grey in a reducing environment with angular quartz sand. Body sherds are abraded and porous, thin, flat and cord bound paddle impressed in a similar manner to the Ille assemblage and the Corong Corong assemblage (figs. B.16c-e *cf*. B.15d). It is likely that two large restricted rims (from the same vessels) with the same cord marked paddle impression under the neck of the rim are the mouth rims of this vessel (figs. B.16c-e). The rim is long with a thick pointed rim lip, then thinner for the rim length and then a sharp evertion. The orifice radius is 15 cm representing 30% of the vessel rim. Where the rim is everted on the exterior, there is a clear division from neck to body marked with a crude dull incised line. On the lower body the paddle starts after the neck and is regular with the cords vertical - going downwards. The quality of the paddle impression is not well defined unlike on the body sherds. They look like they may have been padded down when the clay was wet. The twists of the cord are difficult to see but tightness and regularity is the same as the body sherds.

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Fig. B.16 Range of ceramics from Tubigen Cave, Lagen Island. Image scale = 0-5 cm (image: Y. Balbaligo)

Fig. B.16a Carination with notching. Year 1998 (IV-1998-O-9)

Fig. B.16b Abraded interior of restricted rim sherd. Year 1998 (IV-1998-O-13)

Fig. B.16c and B.16e Profile and exterior of large restricted rim with cord bound paddle impressions under the rim. Similar to Type 4. Year 1998 (IV-1998-O-5 and 6)

Fig. B.16d Cord bound paddle impressed body sherd. Year 1998 (IV-1998-O-10)

The ceramics found at Tubigen Cave, especially the pedestal bowl, may have represented votive offerings. The cave may also have been a place for primary inhumations or secondary burials, as evidenced by the human remains on the cave floor disturbed in modern times. It is unknown whether the ceramics were associated with the earthenware to represent a jar burial site. The ceramic types found at this site

point to the movement of people and ceramics for funerary purposes in the northern Palawan area. The presence of a least three fabrics, from different geological locations and which make up vessels with different technology practices shows that learning traditions seen in the Dewil Valley were brought to this hard to access site.

B.1.10 Malapacao Rockshelter, Malapacao Island

Malapacao Rockshelter (IV-1965-X2) is composed of three small sites; I, I-A and II on Malapacao Island in the Bacuit Bay area of El Nido. The same type of earthenware and tradeware/high-fired sherds were found in all three locations. In Malapacao Rockshelter-I-A the earthenware pottery were piled on top of rocks located in the middle of the shelter, likely organised in modern times (Paz 1998). A range of brown fired coarse and fine fabrics and Red Ware were present. Forms include undecorated body sherds, small and large restricted rim vessels both rounded and carinated and pedestal bowls. In particular a pedestal bowl is similar in fabric and form to the Red Ware pedestal foot rims at Ille.

Fig B.17a shows a large dense dark brown coarse undecorated body sherd with organic material on the exterior and interior surfaces of the sherd, similar to sherds from Tonio Cave, the Dewil Valley. However, the organic material does not seem to occur within the body of the sherd and, therefore, might be the root of a plant. Fig. B.17b shows a fragment of a large brown sherd, firing in an oxidising environment but where the carbon has not burnt out. The sherd has deep impressed circular punctates and incised line forming a triangle. Although the final vessel form is unknown, the deep incising decorative technique is seen at Ille. Fig. B.17c shows a small, light brown restricted rim sherd, fired in a complete oxidising environment which is different in fabric, firing and decorative technique to the other sherds in the assemblage. Under the rim, vertical lines and horizontal wavy lines are incised. Three sherds of this type were recovered from at least two different vessels. In contrast, fig. B.17d shows half of a restricted rim with carination with a greyish-brown fabric, fired in a reducing environment. The lower carination has cord bound paddle impressions and the exterior surface is smooth and highly polished. Other paddle impressed sherds with different cord impressions are also present in the assemblage.

a

b

c

d

Fig. B.17 Range of ceramics from Malapacao Rockshelter, Malapacao Island. Image scale = 0-5 cm (image: Y. Balbaligo)

Fig. B.17a Undecorated body sherd with organic material on the exterior and interior surfaces *cf*. Fig. B.6 from Tonio. Year 1998 (IV-1965-XI-18)

Fig. B.17b Large sherd with deep impressed circular punctates and incised line forming a triangle. Year 1998 (IV-1965-X2-12)

Fig. B.17c Small, light brown restricted rim sherd with incised vertical and horizontal wavy lines. Year 1998 (IV-1965-X5-9)

Fig. B.17d Half of a restricted rim with carination with cord bound paddle impressions. Year 1998 (IV-1965-X2-8)

This site shows a range of learning traditions; in its variety of fabrics from different geological locations, and its range of ceramic technologies showing variation in form and decoration, some of which are similar to the assemblage at Ille suggesting relationships between the Dewil Valley and Malapacao Island. The range of ceramics and the inclusion of pedestal bowls suggest that Malapacao is an offering site. It is unknown whether the site was used for primary or secondary burials. The extant

sherds do not have the large characteristics of burial jars, therefore, it is unlikely to be a jar burial site.

B.1.11 Fernandez Cave, Bukal Island

The following site is located on Bukal Island, a small Island next to the larger Cadlao Island, off the east coast of El Nido and to the west of the Dewil Valley. This site was first surveyed in 1998 and no further work has taken place since then. The cave is entrance *c.*20 m from the shore. Human bones and pottery were found scattered across the cave floor (Paz 1998; SEAICE 1999).

The assemblage comprises a few large sherds with thick walls and large restricted rims. Figs. B.18a and B.18b are similar in fabric, size, form and polishing to 'Potential Type 13: Large brown rim'. However, thin section analysis is needed to see if they are the same fabric. It is possible these vessels may represent burial jars but further evidence is needed. Smaller vessels are also evident including thin carinated sherds and restricted rims. It is likely the cave was a votive offering site due to the presence of pedestal bowls. Extant foot rims are large and intact with impressions on the joint portion between the bowl the foot, and on the lower exterior of the foot rim (figs. B.18c and B.18d). The placements of these decorations are not seen on Ille pedestal bowls or on bowls from sites in northern Palawan.

a

b

c

d

Fig. B.18 Range of ceramics from Fernandez Cave, Bukal Island. Image scale = 0-5 cm (image: Y. Balbaligo)

Fig. B.18a Large brown rims similar to Potential Type 13: Large brown rim. Year 1998 (IV-1965-Y-19)

Fig. B.18b Large brown rims similar to Potential Type 13: Large brown rim. Year 1998 (IV-1965-Y-16)

Fig. B.18c Pedestal foot ring with incising under join. Year 1998 (no accession no.)

Fig. B.18d Pedestal foot ring with incising close to rim. Year 1998 (IV-1965-Y-2)

B.1.12 Summary

This research establishes that the ceramics can be compared technologically to indicate that there were some differences as well as shared learning traditions between ceramics from Ille and within El Nido demonstrating relationships in wider the northern Palawan. Ceramic types were established with the Ille earthenware and similarities in types can be compared at other cave sites. Table B.2 shows the Ille ceramic types which were recovered at other sites. Types 4, 7, 8 and 13 (in white) are clear Ille types with correlating attribute and these ceramics found at other caves sites are certain to be the same time. Types 2/3, 5, 6 and 11 (in grey) contain attributes found at Ille but are present in ceramic assemblages across Southeast Asia and, therefore, not necessarily related to the Ille assemblage. Types 12, 14 and 15 (in grey) represent forms that are ubiquitous in Southeast Asia and not necessarily related to the Ille assemblage (table B.3).

Cave sites	Ceramic Types from Ille found at other sites										
	4	7	8	13	2/3	5	6	11	12	14	15
Makangit Cave					✓				✓	✓	
Idulot Cave		✓		✓	✓	✓			✓	✓	
Tonio Cave		✓		✓	✓	✓	✓		✓	✓	✓
Pacaldero Cave								✓	✓	✓	
Lagatak Bukana Cave						✓			✓	✓	✓
Pasimbahan Cave					✓				✓	✓	
Sibaltan Open Site									✓	✓	
Corong Corong Rockshelter	✓		✓		✓	✓				✓	
Tubigen Cave	✓				✓				✓	✓	
Malapacao Rockshelter				✓	✓				✓	✓	
Fernandez Cave				✓	✓				✓	✓	✓

Table B.2 Ille ceramic types recovered at other sites in northern Palawan. Types in white column are clear Ille types. Types in grey column contain attributes found at Ille but are present in ceramic assemblages across Southeast Asia and, therefore, not necessarily related to the Ille assemblage.

Type 4 Grey Cord Marked Type 7 Impressed restricted rim Type 8 Incised Triangles Type 13 Large brown rim (undecorated)	Type 2/3 Red Ware (decorated & undecorated) Type 5 Bound paddle Type 6 Carved Paddle Type 11 Painted Type 12 Pedestal bowl (dec. & undecorated) Type 14 Restricted rim (dec. & undecorated) Type 15 Unrestricted rim (dec. & undecorated)

Table B.3 Ille Ceramic Types for table B.2 above.

Interesting observations about two of the most distinct and defining ceramic types found at Ille Cave; although red-slipped pottery with circular stamped impressions are ubiquitous in Southeast Asia, 'Type 1: Red-slipped Decorated' with its distinctive c stamps have not yet been found in the valley or on the Islands. 'Type 4: Grey Cord Marked' is not found within the Dewil Valley but by the coast near Barangay Corong Corong and on Lagen Island. Furthermore, no other vessels are made of the same fabric as Type 4 (made from Fabric 10). There also seem to be consistent potter 'rules' regarding the decorating of vessels. At Ille, incised and impressed decorations do not occur on Grey Ware vessels; cord bound or carved paddle impressed techniques do not occur on Red Ware vessel; and paddle impressions do not occur with incised and impressed decorations. These configurations are also not found within northern Palawan.

Appendix C. Petrography Report of Earthenware Ceramics from Ille Cave

C.1 Background

Thin section petrographic analysis has been undertaken on 44 earthenware sherds from Ille Cave, Palawan, Philippines (see Appendix C.i). Ille Cave is a relatively small single cave site used for habitation and burial purposes. A considerable range of earthenware pottery types have been recovered.

C.2 Purpose

The objectives of this petrographic study were threefold; firstly, to classify the samples into fabric groups based on characteristics. This contributes towards the classification of sherds into wares, types and subtypes. Secondly, to examine the degree of compositional and technological variation between the samples, and assess whether variation seen at the macroscopic level could also be seen at the microscopic level. Thirdly, to investigate whether provenance could be determined to establish whether raw materials were locally sourced and whether ceramics were manufactured locally. The creation of this dataset has the potential to enable comparison to other ceramic fabrics in the region.

C.3 Methodology

The sampling strategy and a detailed methodology using systematic descriptions of thin section analysis proposed by Whitbread (1995: 365-396) and modified by Quinn (2013) are discussed in the Methodology (Chapter 5). Abundance estimation chart and abbreviations can be found in Appendix C.ii. Sherds were initially examined by macroscopic analysis and classified into ceramic wares and types based on correlating

attributes such as fabric (including temper/inclusions, matrix and fired colour), decorative technique, form and manufacturing technique.

In summary:

- No consistent definition of ‘ware’ has been used in Southeast Asia. Wares have been broadly used as regional descriptions of distinct ceramic groups distributed in Southeast Asia and defined by their exterior visual
- This research defines 'wares' to mean ceramics groups related to wider regional styles that have previously been identified (based on fired colour) and used as a higher level of ordering
- Solheim (2002: 3) has defined ‘types’ as a "group of closely related sherds or vessels which have in common the same paste, temper, general surface colour, finish and decoration"
- Types are hierarchically nested below ‘wares’. This research defines ‘type’ as a local variation of a regional style identified by specific correlating attributes incorporating the forming, decorating, firing and learning techniques. Types may also have correlating fabrics.
- A subtype is a subdivision of a type which has similar decoration but may vary in decorative technique, fabric (i.e. clay and tempering technology) or in form and forming technique.

In the first instance, 21 sherds were available for thin sectioning (Appendix C.iii) and permission granted by the National Museum of the Philippines. The sample of 21 sherds was selected because they represented different wares and types in the Ille assemblage (with some duplication). Each thin section was characterised with descriptions of composition, the determination of their textural characteristics, dominant features and technological processes evident. Characterisation represents the process of combined description and classification. The thin sections were then categorised into fabrics based on similarities of fabric composition and temper technology and to enable assessment of provenance. After the examination of the 21 thin sections, further permission was granted by the National Museum of the Philippines to expand the sample and create more thin sections. The second part of

the petrographic study expanded the sample by focusing on two ware types out of the 21 samples that were most significant. A further 23 thin sections were made of two ware types and analysed; 11 Red Ware and 12 Grey Ware sherds. They were the most commonly occurring wares and two distinct ceramic groups evident in the assemblage. The following report provides characterisation of all sherds thin sectioned and their subsequent groupings by fabric. Discussion and interpretations are presented in the Discussion (Chapter 7).

C.4 Summary of fabrics

All samples were analysed (Appendix C.i) and characterised and divided into 10 fabrics (table C.1). A fabric group has a specific combination of inclusions, clay matrix and voids and differs in a significant way from other samples in the assemblage (Quinn 2013: 77). These differences may be based on raw materials and technological practices. In this case, differences are specifically based on clay matrix and tempering technology.

Fabric	Name	Description	Dominant inclusions/temper	Sample no.
1	Grog and chert fabric	Iron rich clay with coarse sand sized chert, rock inclusions, quartz inclusions, grog temper, red-slip	Coarse sand sized chert (common) and quartz inclusions, grog temper	001, 002, 022, 023, 024, 025, 026, 027, 028, 029, 030, 031, 032
2	Grog, quartz and chert fabric	Iron rich clay with coarse sand sized grog temper, quartz inclusions and chert	Coarse sand sized grog temper, quartz inclusions and chert (few)	003
3	Sandstone and altered igneous fabric	Iron rich clay with coarse sand sized chert, rock inclusions and quartz inclusions	Coarse sand sized chert (common) and quartz inclusions, sandstone, altered igneous rocks	005, 016
4	Grog and quartz fabric	Iron rich clay with coarse sand sized quartz inclusions, rock inclusions and grog temper	Coarse sand sized grog temper, quartz inclusions, chert (few)	006, 009, 011, 017, 018, 019
5	Chert and quartzite fabric	Iron rich clay with coarse sand sized chert, quartz and quartzite inclusions	Coarse sand sized chert (common) and quartz inclusions, quartzite	008
6	Chert and volcanic rock fabric	Iron rich clay with coarse sand sized chert, quartz, volcanic rock fragments and grog temper	Coarse sand sized chert (common), quartz inclusions (common), grog, granite, plagioclase feldspar, serpentinite, volcanic rock fragments	020, 021
7	Mica and quartz fabric	Iron rich clay with medium sand sized mica and quartz	Medium sand sized mica, quartz inclusions, chert and rock inclusions	010, 012
8	Grog temper fabric	Fine clay with grog temper	Grog temper	013, 014
9	Rice temper fabric	Fine clay with rice temper	Rice temper	004, 015
10	Coarse quartz temper fabric	Fine clay with quartz temper	Quartz temper	007, 033, 034, 035, 036, 037, 038, 039, 040, 041, 042, 043, 044

Table C.1 Description of samples with dominant inclusions classified into 10 fabrics

Fabric 1: Grog and chert fabric

(Samples 001, 002, 022, 023, 024, 025, 026, 027, 028, 029, 030, 031, 032)

Inclusions

7-20%. eq. sa-sr. Closed to double spaced. Weakly aligned to margin or randomly orientated. Bimodal, very poorly sorted grain size distribution.

Coarse fraction
0.025-0.1 cm

common-few:	Chert; eq. sa. 0.025-0.05 cm. Varying chert. Some homogenous in composition with distinct fine polycrystalline quartz grains, iron oxides and iron staining. Some brecciated chert. Few circular radiolarian microfossils present but it is not radiolarian chert.
frequent-few:	Grog; eq & el. a-sr. 0.05-0.1 cm. Dark brown in XPL. Non-calcareous, containing fine quartz grains in same proportion as matrix. Grog temper has similar composition and arrangement as the parent fabric, made from same clay material.
few-very few:	Altered basalt (extrusive igneous rock); eq. sr-r. *c.*0.22 cm. Coarse sub-rounded rock (sample 001, fig. 5a-b) Serpentinite; eq. sr-r. *c.*0.10 cm. Highly oxidised showing a fibrous texture with high birefringence (sample 028, fig. 5c-d). Altered igneous rock; eq. sr-r. *c.*0.20 cm. With feldspar laths and chert inclusions (sample 025, fig. 5e-f). The samples also contain frequent occurrences of highly oxidised iron concretions, opaques and heavily altered inclusions that are now unidentifiable
rare-very rare:	Quartz; eq. sa. 0.025 cm. Mainly coarse sand sized monocrystalline and polycrystalline quartz inclusions.

Fine fraction
0.0125-0.025 cm

frequent-common:	Quartz.
very few- rare:	Iron concretions, opaques, amphibole, feldspar, clinopyroxene, biotite, plagioclase.

Matrix

73-77%. Iron-rich, non-calcareous. Deep red-brown to orange in PPL, orange-red brown to dark red-brown in XPL (x40). Homogeneous matrix. Optically active.

Voids

3-7%. Consisting of micro-elongate parallel voids orientated in the same direction as the coarse grains. Grog temper and some rock inclusions are separated from the paste and each other by thin voids around the inclusion.

Comments

This ceramic type had the largest quantity of sherds in the assemblage. There are three ceramic types that come under the higher Red Ware category; 'Type 1: Red-Slipped Decorated', 'Type 2: Red Ware Decorated', and 'Type 3: Red Ware Plain'. Examples of all three ceramic types are thin sectioned in this assemblage. In macroscopic observation, this ceramic type had many correlating attributes. They seemed to be made of the same fabric, shared the same range of incised and impressed decorations and forms and were manufactured in the same way. Furthermore, this ceramic type has a specific history and distribution in Southeast Asia. Initially, 2 sherds of this ceramic type were thin sectioned. A further 11 thin sections were made to see if all the sherds selected had the same fabric and to assess the degree of variation within the fabric (Appendix C.iv). Although there was variation within the thin sections, the additional thin sections of this ceramic type show that all samples categorised as Fabric 1 had several common characteristics and were made from a common raw material source.

This homogenous fabric is characterised by fine iron rich paste and the presence of dominant inclusions of medium and coarse sand sized chert, rock inclusions and quartz inclusions which are interpreted as naturally occurring alluvial sediment in the clay source and not temper. This fabric has an abundance of chert. The rounded nature of the inclusions could suggest that the clay has a fluvial (riverine) origin. There is compositional similarity between the coarse and fine fractions. The paste has been prepared by adding grog temper. All samples showed single to double spacing of inclusions that were weakly to crudely aligned to the margins or randomly orientated. The grain size distribution was bimodal and very poor to poorly sorted.

In macroscopic analysis, the sherds are not porous. In thin section, the voids represent 3-7% of the sample. The voids consisting of mostly micro-elongate parallel voids are orientated in the same direction as the coarse grains and are fabric following, moderately aligned to the margins of the sample. The voids are easier to see in PPL as can be seen in fig. 1b. The grog temper breaks the flow of the voids as the void stops when it meets a grog temper inclusion. The grog temper inclusions are separated from the paste and from each other by thin voids surrounding the inclusion (fig. 7b) where they have shrunk on firing and this distinguishes the grog temper from the rock and chert inclusions. Voids are also visible within the grog temper (fig. 2d).

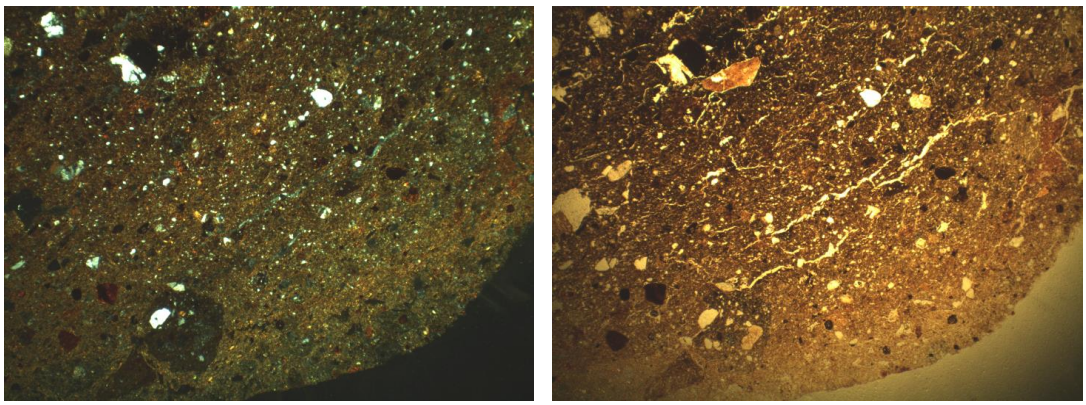
a  b

Fig. 1 Sample 025. Few coarse inclusions (grog temper and rock fragments). Voids clearer in PPL fig. 1b showing micro-elongate parallel voids orientated in the same direction as the coarse grains and are fabric following. XP/PPL. Image width = 5.8 mm

Differences occurred in the frequency, spacing and sorting of the inclusions. There was considerable variation in the abundance of grog temper. Some samples had frequent to commonly occurring grog temper which was single spaced while some were rarely occurring with double spacing. However, all the grog temper was of the same composition with fine sand sized quartz inclusions, iron oxide and other unidentifiable inclusions and was dark brown in XPL. The grog temper ranged from very coarse to coarse sand sized inclusions, were sub-angular and sub-rounded and had both high and low sphericity. The grog temper had the same matrix as the surrounding parent fabric. Thus, the grog temper was made from the same material as the original vessel. Figs. 2a-b and 2c-d show the differences between frequently and rarely occurring grog temper.

There was also variation in the frequency of chert and in the variety of chert based on their microscopic characteristics. Some samples had an abundance of chert while some had very few. The chert were coarse sand sized (0.05-0.1 cm), sub-angular and sub-rounded and had both high and low sphericity. There was a range of features within the chert from those with a clear abundance of quartz inclusions, iron staining, veins of hematite, rectangular shaped iron-rich minerals grown within inclusions in the chert during its diagenetic history (figs. 3a-b and 3c-d) and those which had radiolaria microfossils (fig. 4a-b). However, geological deposits of any rock contain variation in composition, grain size and structure, therefore, the differences between the chert inclusions in this fabric is not of significance.

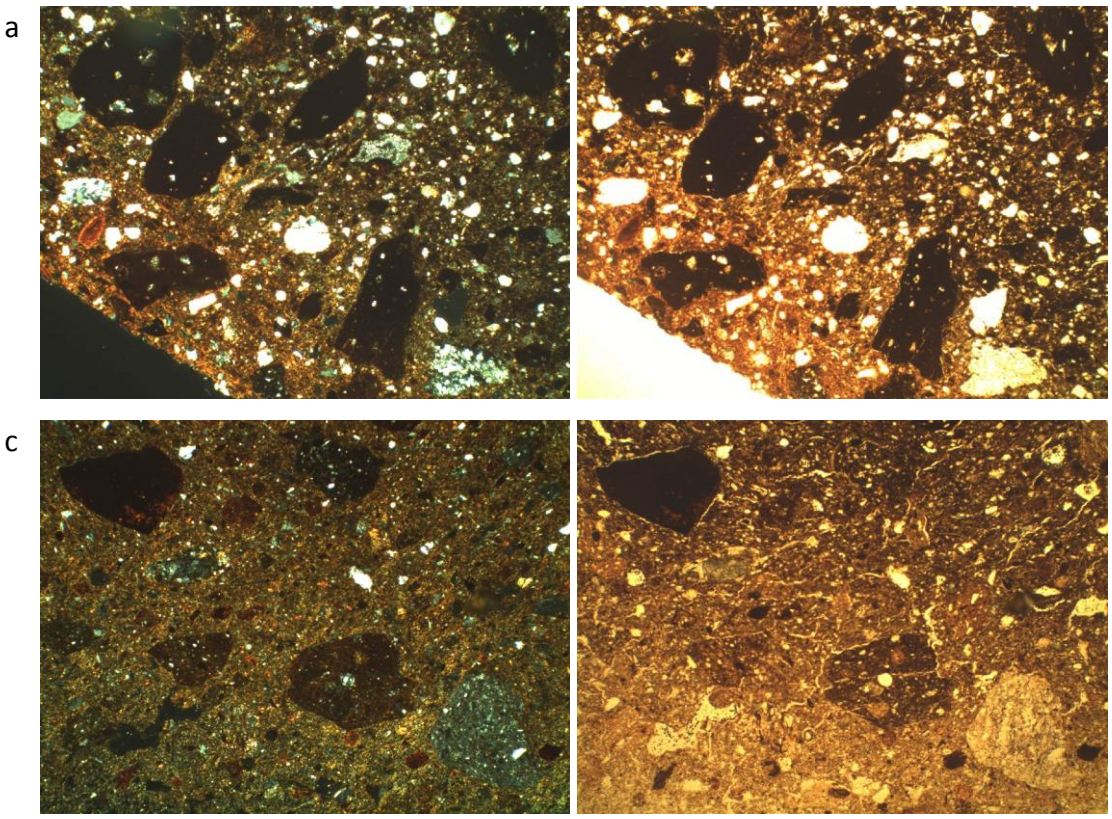


Fig. 2 2a-b sample 032 showing frequently occurring coarse sand sized grog temper with commonly occurring medium and fine sand sized quartz inclusions. Compare with fig. 2c-d sample 025 with few coarse sand sized grog temper inclusions, few medium and fine sand sized quartz inclusions with coarse sand sized chert and altered basalt rock fragment. Fig. 2d shows voids can be seen in and around the grog temper inclusions. Dark part of bottom left corner of fig. 2a is outside of the sherd. XP/PPL. Image width = 2.9 mm

The size and frequency of the quartz inclusions varied. Some samples showed few grains of medium and fine sized quartz while some were more common. Figs. 2a-b and 2c-d also show differences in frequency and spacing of the medium and fine quartz grains in the samples. Some samples showed rare amounts of medium plagioclase feldspar grains with twinning, however, this was not always evident.

Samples contained few rock fragments comprising a range of rocks with metamorphic alterations and altered igneous rocks. Basalt (extrusive igneous rock) (fig. 5a-b) has been identified. Highly oxidised serpentinite showing a fibrous texture with high birefringence was identified (fig. 5c-d). The samples contained common highly oxidised iron concretions and opaques. The samples also contain frequent occurrences of heavily altered inclusions that are now unidentifiable. Fig. 5e-f shows an altered rock with feldspar laths.

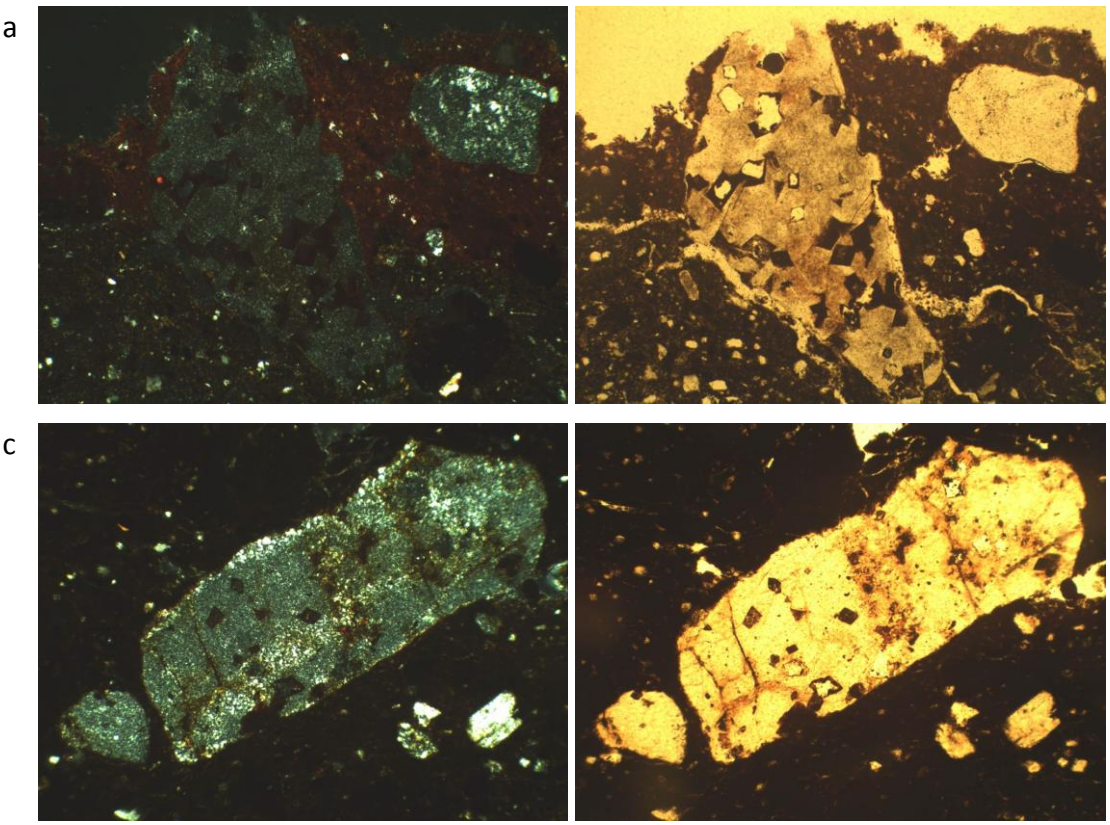


Fig. 3 3a-b sample 026, 3c-d Sample 030. Figs. 3a-d show coarse sand sized chert with iron staining, veins of hematite and rectangular shaped iron-rich mineral inclusions (poor quality thin sections). There are occurrences of chert with different characteristics within the same sample. Compare with samples in fig. 4. XP/PPL. Image width = 1.45 mm

Sample 027 seems to be composed of the same fabric with the same grog temper, chert and quartz grains with similar size, shape, frequency and distribution as the others in the sample and had the same fired colour in XPL. However, differences were evident in the rock inclusions. While other thin section in the fabric had similar fine grained altered igneous rocks, the igneous rocks in sample 027 had larger relics of feldspar which occurred as laths or micro-phenocrysts than in other samples (compare fig. 7a-b with fig. 5e-f). The rock fragments also contained chert inclusions which do not occur in other samples in this fabric (fig. 7c-d). However, this variation is deemed not significant.

Sample 027 showed macroscopic variation in hand specimen where in profile, the sherd had oxidised all the way through, in comparison to other samples in this fabric where in profile, the sherds have cores and margins. This was indicative of firing environment. Therefore, sample 027 was thin sectioned to assess whether its fabric was similar to other sherds in this fabric.

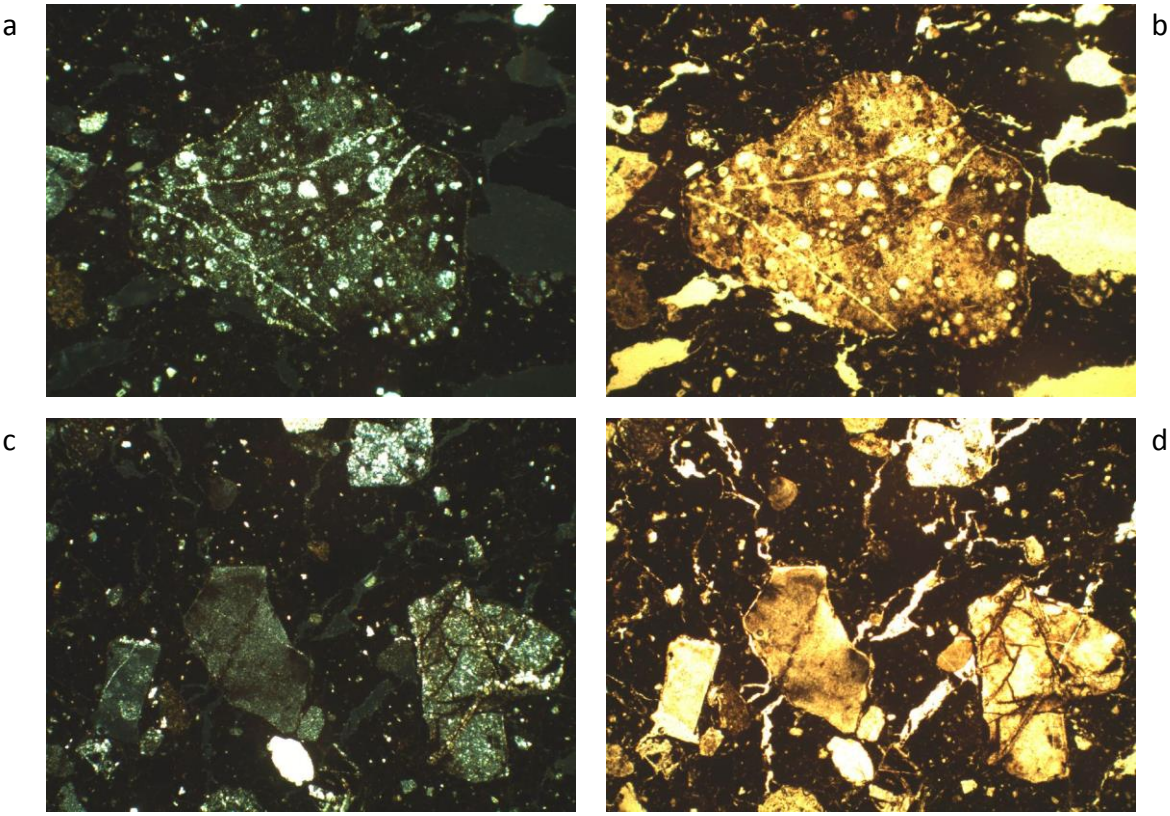


Fig. 4 4a-d sample 026 showing range of chert. Fig. 4a-b shows radiolarian chert and fig. 4c-d shows coarse sand sized chert with iron staining, veins of hematite. Chert in lower right corner is radiolarian chert while other chert in the sample has iron staining and veins of hematite but no other radiolarian fossils (poor quality thin sections). XP/PPL. Image width = 1.45 mm

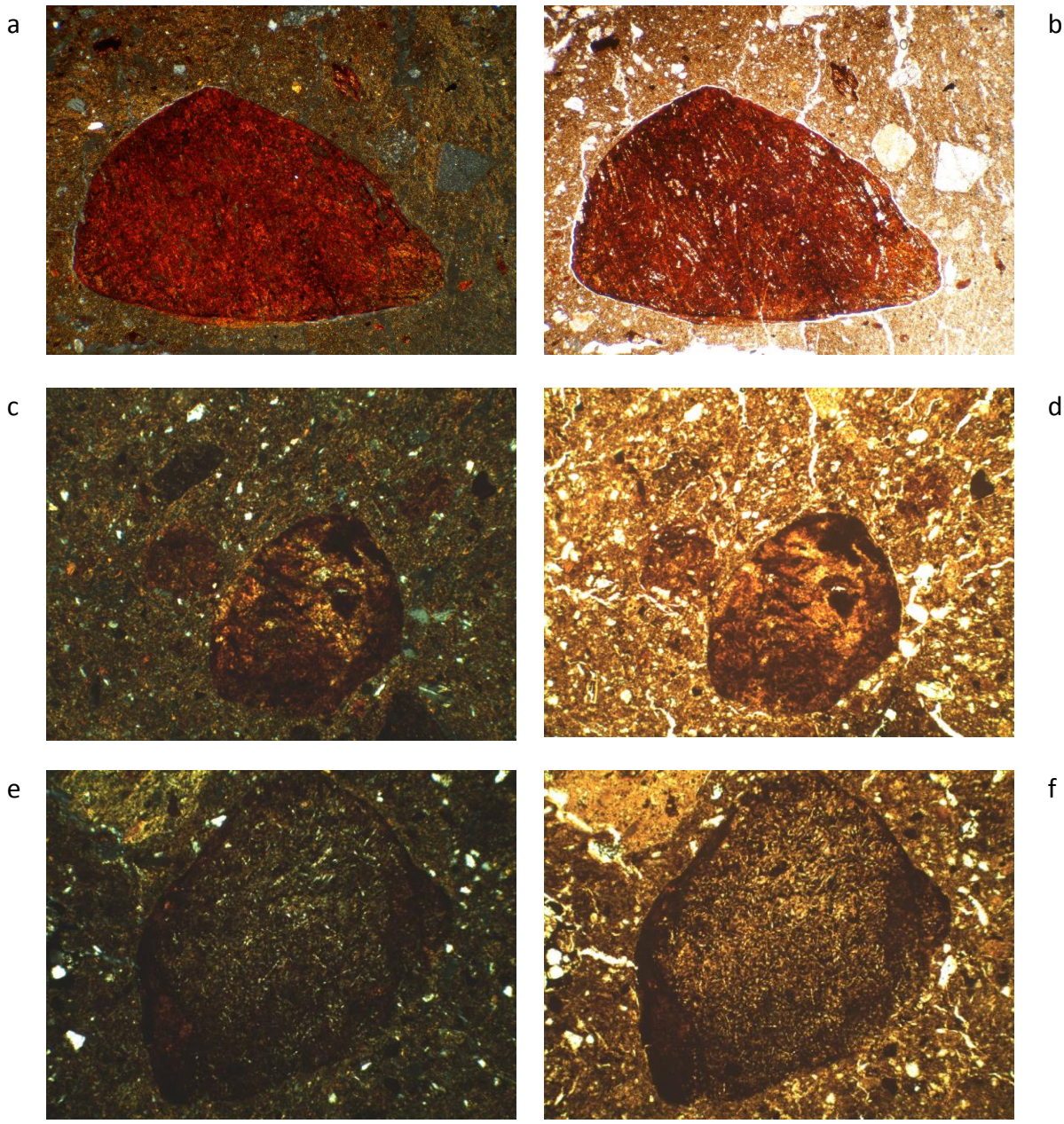


Fig. 5 5a-b, sample 001 shows altered basalt rock fragment (0.22 cm). Fig. 5c-d, sample 028 shows highly oxidised fibrous serpentinite. Fig. 5e-f, sample 025 shows an altered rock with feldspar laths. XP/PPL. Image width 5a-b and 5e-f = 1.45 mm; 5c-d = 2.9 mm

Fig. 6 Images show sherds before thin sectioning. Compare difference in exterior surface, decoration and core profile of carination sample 027, fig. 6a-b 'Type 2: Red Ware Decorated' with carination sample 028, fig. 6c-d 'Type 1: Red-Slipped Decorated'

In terms of technology, there is no evidence of coiling or other methods of primary or secondary forming. Particular to this fabric is the visibility of red-slip to the margins of samples (fig. 8a-b). The red-slip is made up of the same material as the clay body as it contains the same fine quartz grains, iron concretions and opaque grains. There are islands of slip where the slip has eroded and the slip also truncates through coarse inclusions. Red-slip is characteristic of this fabric. Incising is evident in some of the exterior margins which appear as a depression from the objects surface. However, this is more evident in hand specimen. The samples were reasonably low-fired in an oxidising atmosphere, though some were not completely oxidised during firing and may even be partially reduced as seen in the darker core area.

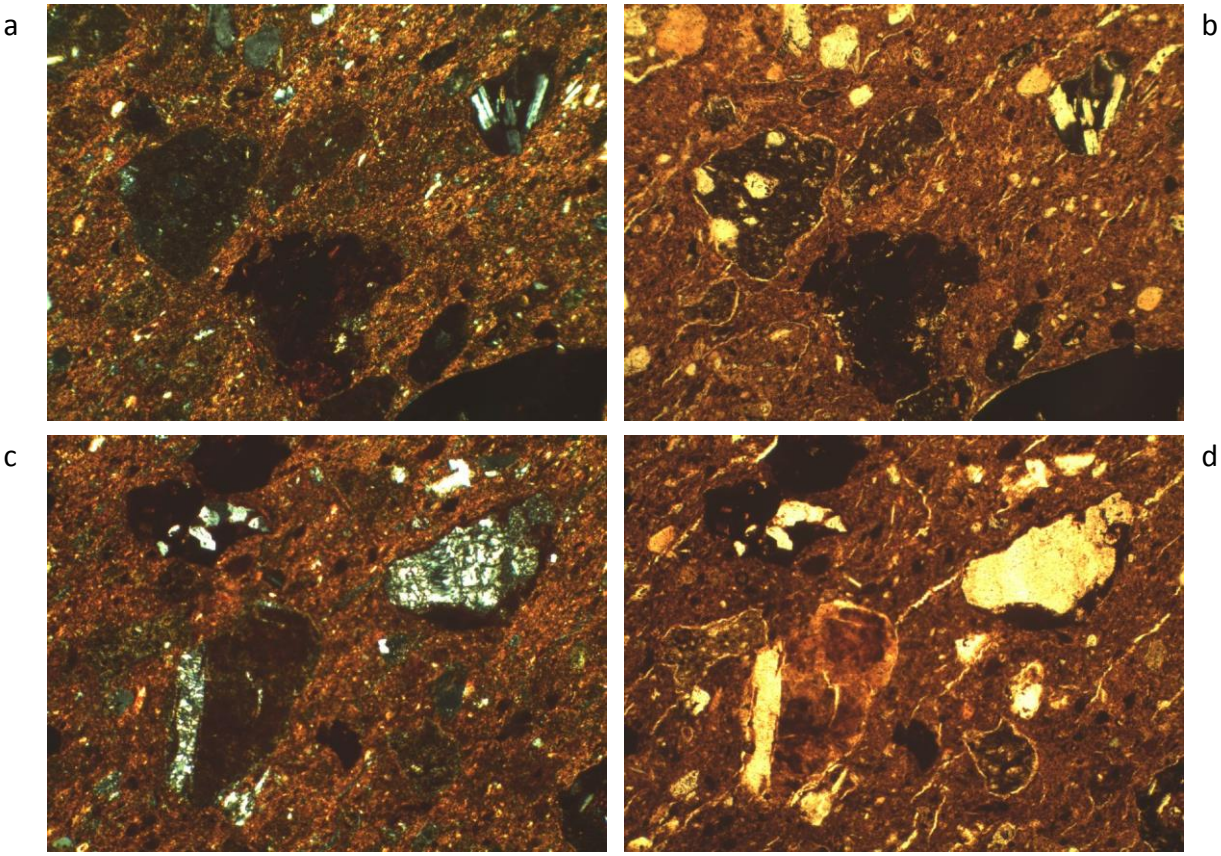


Fig. 7 Compare fabric of figs. 7a-d, sample 027 with other thin sections in Fabric 1. Rock inclusions show fine grained altered igneous rocks with feldspar laths and rock fragments also contained chert inclusions which do not occur in other Fabric 1 samples. XP/PPL. Image width = 1.45 mm

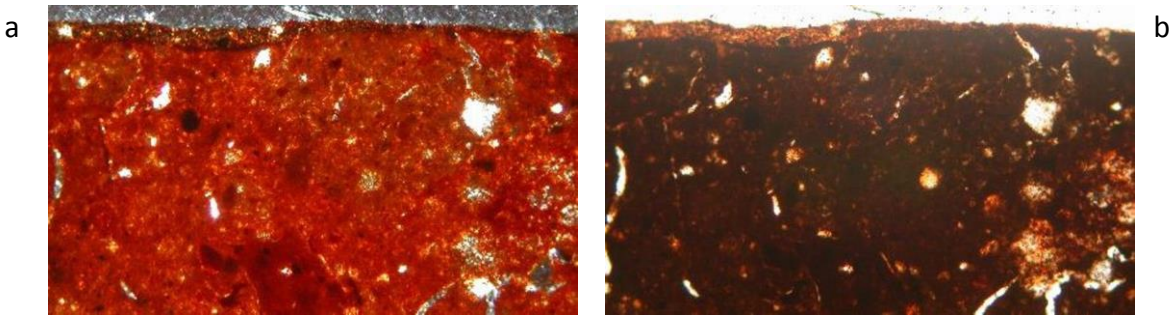


Fig. 8 Red-slip visible in sample 022. XP/PPL. Image width = 1.45 mm

Fabric 2: Grog, quartz and chert fabric

(Sample 003)

Inclusions

20%. eq. sa-sr. Single to double spaced. Weakly aligned to margin or randomly orientated. Bimodal, poorly sorted grain size distribution.

Coarse fraction
0.025-0.1 cm

common: Quartz; eq. sa-a. 0.025-0.05 cm. Mainly coarse sand sized monocrystalline and some polycrystalline quartz inclusions. Straight or undulose extinction.

Grog; eq. sr-r. 0.05-0.1 cm. Dark brown in XPL. Non-calcareous, containing fine quartz grains and chert in same proportion as matrix. Grog temper has similar composition and arrangement as the parent fabric, made from same clay material. Thin void surrounds grog temper. One grog temper shows a relic of a vessel surface.

few: Mudstone; eq. sa-r. 0.025-0.05 cm. Dense fine red angular highly oxidised. The sample also contains frequent occurrences of heavily altered inclusions that are now unidentifiable.

rare: Chert; eq. sa. 0.025-0.05 cm. Homogenous in composition with distinct fine polycrystalline quartz grains, iron oxides and iron staining.

Fine fraction
0.0125-0.025 cm

frequent: Quartz.
very few: Iron concretions, opaques.

Matrix

85%. Iron-rich, non-calcareous. Brown to orange in PPL, orange-red brown to dark red-brown in XPL (x40). Optically active with different domains of colour across the thin section.

Voids

5%. Consisting of micro-elongate parallel voids orientated in the same direction as the coarse grains. Grog temper and rock inclusions separated from the paste and each other by thin voids around the inclusion.

Comments

Although there was only one sample in this fabric, this 'loner' was not the only one in the assemblage but represents a small proportion of the sample. The fabric is characterised by fine iron rich paste and the presence of dominant inclusions of medium and coarse sand size quartz inclusions, rock inclusions and chert and the addition of grog temper. Like Fabric 1, the medium and coarse sand size quartz inclusions and chert inclusions can interpreted as naturally occurring alluvial sediment in the clay source and not temper. There is compositional similarity between the coarse and fine fractions. In terms of technology, the paste has been prepared by adding grog temper. This grog temper is similar to the grog temper in Fabric 1. There is no evidence of coiling or other methods of primary or secondary forming. Although Fabric 2 in macroscopic inspection has a red exterior, in thin section it does not show a red-slip like the samples in Fabric 1. Fabrics 1 and 2 are similar and may be part of a larger fabric group because they both have similar iron-rich paste and dominant coarse fraction such as quartz, chert and grog. However, while the composition is similar the proportions differ as quartz grains are larger, angular and more prominent in Fabric 2 while chert is prominent in Fabric 1. It is possible the clay sources come from similar environments. Like Fabric 1, the sample in Fabric 2 was reasonably low-fired in an oxidising atmosphere without complete oxidised during as the core is a different colour to the margins.

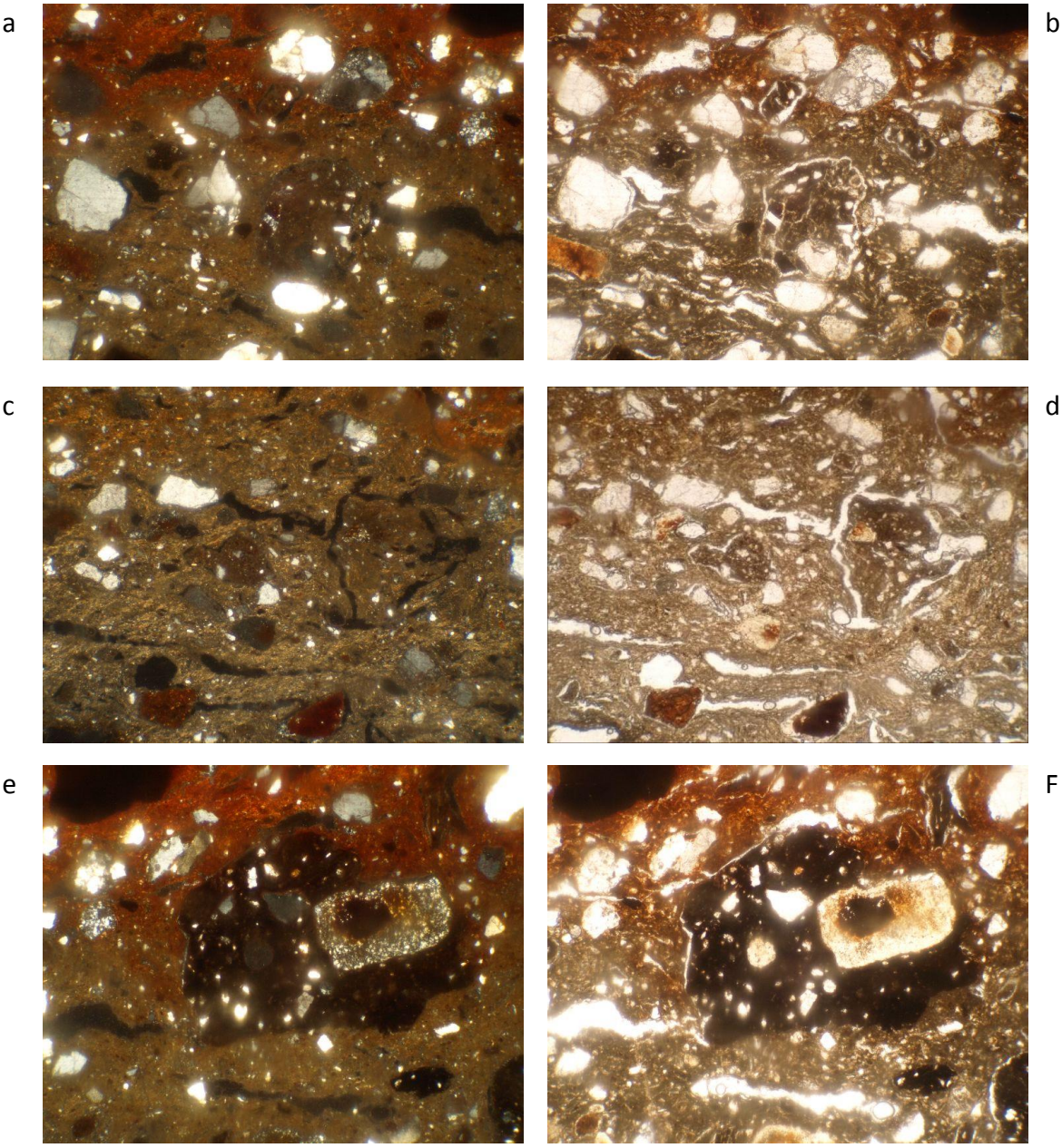


Fig. 9 Sample 003 iron rich clay with dominant quartz, grog temper and rock fragments (grog temper best visible in PPL). Fig. 9c-d shows grog temper that has similar composition and arrangement as the parent fabric, with fine quartz grain inclusions and medium chert within the grog temper with the same proportion as in matrix. Thin void surrounds grog temper. XP/PPL. Image width 9a-b and 9c-d = 2.9 mm; 9e-f = 1.45 mm

Fabric 3: Sandstone and altered igneous fabric

(Samples 005, 016)

Inclusions

20%. eq. sa-sr. Closed spaced to single spaced. Weakly aligned to margin or randomly orientated. Bimodal, poorly sorted grain size distribution.

Coarse fraction
0.025-0.1 cm

common-few: Chert; eq. sa-sr. poorly sorted. 0.05-0.1 cm. Contains fine quartz grains, hematite veins and iron staining. Some radiolaria present.

few-very few: Quartz; eq. sa-a. 0.025-0.05 cm. Mainly coarse sand sized monocrystalline and some polycrystalline quartz inclusions. Monocrystalline quartz possibly derived from quartzite.

Sandstone; eq. sa-a. 0.05-0.1 cm. Arkose showing epidote and interlocking quartz with grey components of weathered feldspar which is diagnostic of arkose where more than 25% of the grains are feldspar. The feldspar grains show some twinning. (Sample 016, fig. 11e-f)

Weathered volcanic rock fragments with remains of feldspar phenocrysts. eq. sr-r. 0.05 cm. (Sample 005, fig. 11a-b, sample 016, fig. 11c-d)

The sample also contains altered igneous rock. Rock fragments including opaques and iron concretions.

rare-very rare: Argillaceous inclusions (clay pellets); eq. sr. 0.025 cm. Red-brown argillaceous bodies rich in clay. Same arrangement as parent fabric, aligned internal microstructure with the same medium sand sized quartz inclusions and fine sand sized iron concretions. Clay pellets are ductile and bend with the clay showing the feature is plastic and not aplastic. The pellets are closed spaced and have contact with the fine paste and the boundaries are diffuse. High to medium optical density.

Fine fraction
0.0125-0.025 cm

frequent-common: Quartz, clinopyroxene, altered feldspar, biotite.
very few- rare: Iron concretions, opaques.

Matrix

72-75%. Iron-rich, non-calcareous. Brown to grey in PPL, brown to orangey-yellow in XPL (x40). Optically active.

Voids

3-5%. Consisting of micro-elongate parallel voids orientated in the same direction as the coarse grains.

Comments

The samples forming this fabric are united by their fine iron rich paste and the presence of dominant inclusions of medium and coarse sand sized chert, sandstone inclusions, volcanic rock fragments (fine grained igneous rock) and quartz inclusions. The rounded clasts in the sandstone have iron staining and look like they eroded from a riverine environment. The epidote within is metamorphic. Like Fabrics 1 and 2, the chert and quartz inclusions can be interpreted as naturally occurring alluvial sediment in the clay source and not temper. There is compositional similarity between the coarse and fine fractions. The samples contain argillaceous inclusions which have the same arrangement as the parent matrix. No grog temper or any other type of temper is present. Fabric 3 is similar to Fabrics 1, 2, 4 and 5 in terms of the iron-rich clay and coarse fraction which all contain similar chert and quartz grains. However, the samples in Fabric 3 contained more chert which were closed spaced. The increased frequency of sandstone and other rock fragments make it a gravelly and sandy fabric compared to the others. Samples 005 and 016 are macroscopically and technologically the same with tight cord marked impressions made from a bound paddle which suggests the vessel was made with a paddle and anvil, though this is not evident in thin section. There is no evidence of coiling or other methods of primary or secondary forming. Like other fabrics, Fabric 3 was reasonably low-fired in an oxidising atmosphere but with potentially less iron content in clay as it does not have the red fired colour of Fabrics 1 and 2.

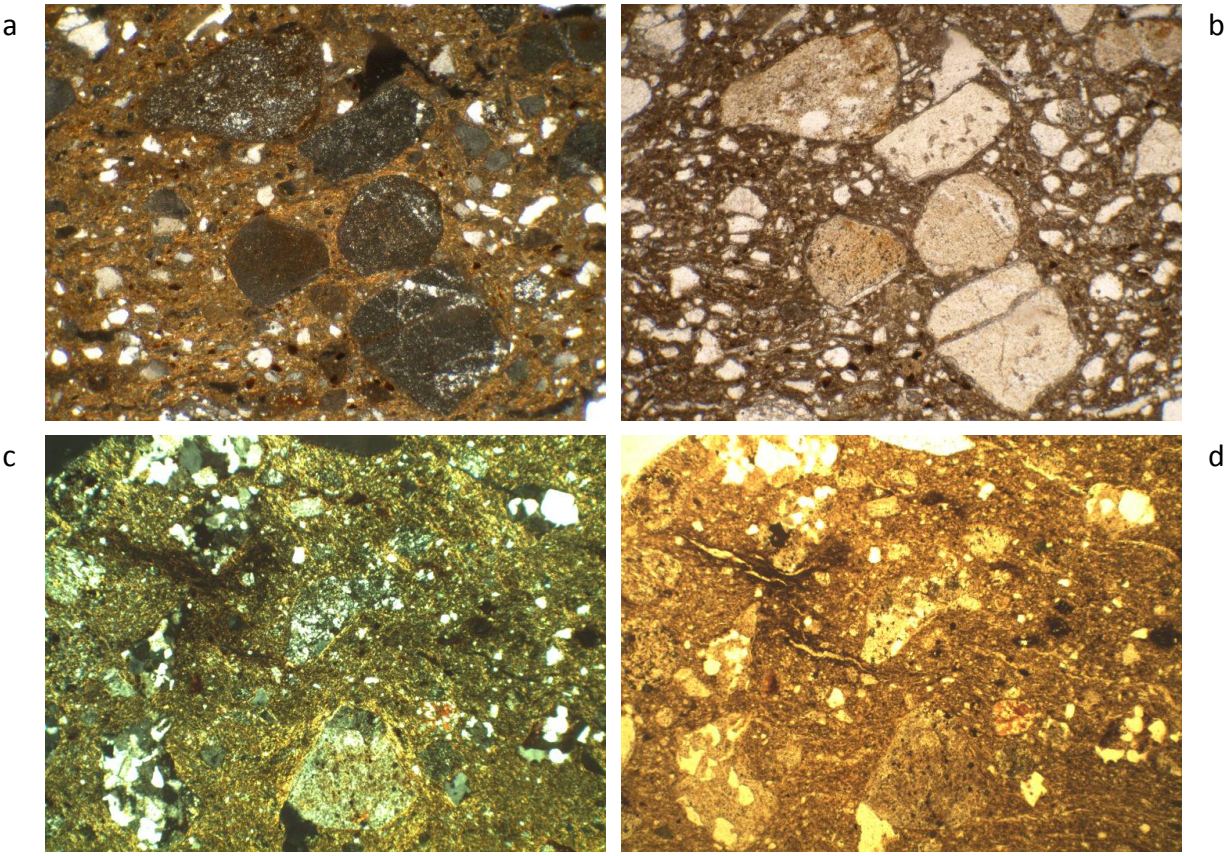


Fig. 10 10a-b sample 005 and 10c-d sample 016 iron rich clay with dominant chert and sandstone. XP/PPL. Image width = 2.9 mm

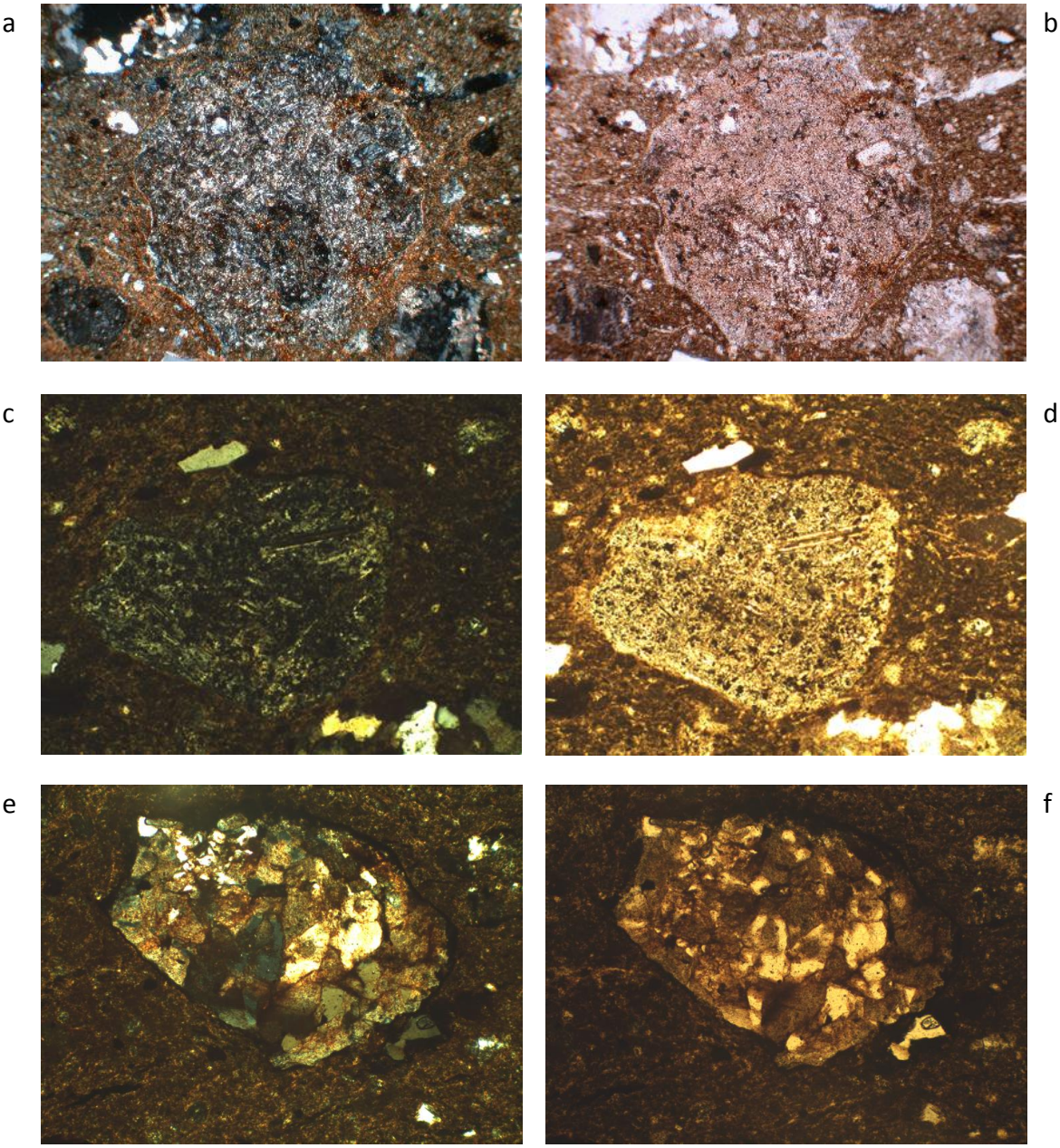


Fig. 11 Fig. 11a-b sample 005 and 11c-d sample 016 shows altered volcanic rock fragments with remains of feldspar phenocrysts. 11e-f sample 016 shows sandstone (arkose) with epidote, and interlocking quartz with weathered feldspar. XP/PPL. Image width 11a-b and 11e-f = 1.45 mm; 11c-d = 2.9 mm

Fabric 4: Grog and quartz Fabric

(Samples 006, 009, 011, 017, 018, 019)

Inclusions

20-25%. Eq . sa-sr. Single spaced. Weakly aligned to margin or randomly orientated. Bimodal, poorly sorted grain size distribution.

Coarse fraction
0.025-0.1 cm

frequent-common: Quartz; eq. sa-a. 0.025-0.05 cm. Mainly coarse sand sized monocrystalline and some polycrystalline quartz inclusions.

few-very few: Grog; eq & el. a-sr. 0.05-0.1 cm. Dark brown in XPL. Non-calcareous, containing fine quartz grains, rock fragments, iron oxides and voids in same proportion as matrix. Grog temper has similar composition and arrangement as the parent fabric, made from similar clay material. Thin void surrounds grog temper. Sample 009 contains the most grog temper. Clay pellets appear similar to grog temper.

very few-rare: Plagioclase feldspar; eq. sa-a. 0.05-0.7 cm. Few plagioclase appear as altered feldspar while some appear with twinning bands. One coarse angular plagioclase in sample 006 measures 0.7 cm and shows clear multiple twinning. There are few altered feldspar with speckles showing clay minerals forming out of the feldspar.

Argillaceous inclusions (clay pellets); eq. sr. 0.025 cm. Clay pellets appear similar to grog temper. Same arrangement as parent fabric, aligned internal microstructure with the same medium sized quartz and fine sand sized iron concretions with no voids around the pellet, has contact with the fine paste and the boundaries are diffuse. The pellet breaks the structure of the matrix and has a different orientation to the matrix. High to medium optical density.

Heavily altered rock fragment, possibly sandstone. Has interlocking quartz grain with clasts showing weathered speckled feldspar. The rounded grains of feldspar touching and no matrix is present (sample 006, fig. 14a-b).

Granite; eq. sa-a. 0.25 cm. Sample 009 (fig. 14e-f) has a rock with interlocked crystals. It is diagnosed as granite because intrusive igneous rocks hold their crystal shape in the way that others do not. The granite fragment also shows decayed speckled feldspar

intermixed with quartz grains which tends to be granite. Feldspar and quartz inter-growths with twinning are visible. It may be perthite which is an inter-growth texture of orthoclase and anorthoclase feldspar which is another granite signature. However, bigger inclusions of granite are needed to confirm this but no other rock inclusions are present in the sample. The sample also includes contains frequent occurrences of heavily altered inclusions that are now unidentifiable.

Chert; eq. sa-sr. poorly sorted. 0.025 cm-0.05 cm. Contains fine quartz grains. No radiolaria present.

Fine fraction
0.0125-0.025 cm

Common-few: Quartz, iron concretions, opaques, amphibole, clinopyroxene, altered feldspar, biotite.

Matrix

70-75%. Iron-rich, non-calcareous. Samples vary from brownish yellow to orange in XPL, brown to orange in PPL (x40). Optically active.

Voids

5%. Consisting of micro to meso-elongate parallel voids orientated in the same direction as the coarse grains. Voids surround the grog temper. The grog temper breaks the flow of the ceramic as voids stops when it meets the grog temper. No voids around clay pellets.

Comments

The samples forming this variable fabric are united by their fine iron rich paste and the presence of dominant coarse sand sized inclusions of grog temper, quartz inclusions and rock inclusions. The quartz inclusions and feldspar are of similar coarse-medium sand size, angularity, sphericity and distribution. There is rare chert. Like Fabrics 1, 2, 3 and 5, these inclusions can interpreted as naturally occurring alluvial sediment in the clay source and not temper. Fabric 1 has similar iron-rich paste and dominant coarse fraction of quartz inclusions and rock inclusions but Fabric 4 has less chert than the others. The paste has been prepared by adding grog temper. The grog temper has the same fabric, inclusions and arrangement as Fabric 1 and 2. Samples 006 and 009 are more similar in composition than sample 011. They both contain rock inclusions that appear to be altered in the alluvial system that has produced the sand in 006 and 009. The rock inclusion is granite and contains quartz grains surrounded by heavily altered feldspar about the same grain size. The sand shows the same grain size distribution, there is similar gradation and the same modal size and all the quartz inclusions are sub-angular to rounded. While the raw materials are the same and the microscopic technology is the same, in that clays were prepared with the same type of grog temper, the macroscopic technology is different and there are two different technological processes in the primary and secondary treatments. The exterior of

sample 006 is different to the other samples in this fabric. The other samples are lighter brown and fired in a more oxidising environment which accounts for the colour of the fired clay. Sample 006 is darker brownish-grey across the exterior which might have happened in a reducing environment or indicative of an environment with an uncontrolled firing atmosphere. Furthermore, in hand specimen it appears polished with faint carved paddle impressions and it is from a thin walled vessel in contrast to the plain or cord bound paddle impressed, thicker, non-polished sherds. However, these colour differences are not evident in thin section and the birefringence is similar across all samples in this group. There is no evidence of coiling or other methods of primary or secondary forming. Although samples 008 and 018 are macroscopically similar in that they have similar wall thickness and no decorations, microscopically they are different and are two distinct fabrics from different clay sources. Sample 008 is chert and quartzite Fabric 5 and sample 018 is grog and quartz Fabric 4.

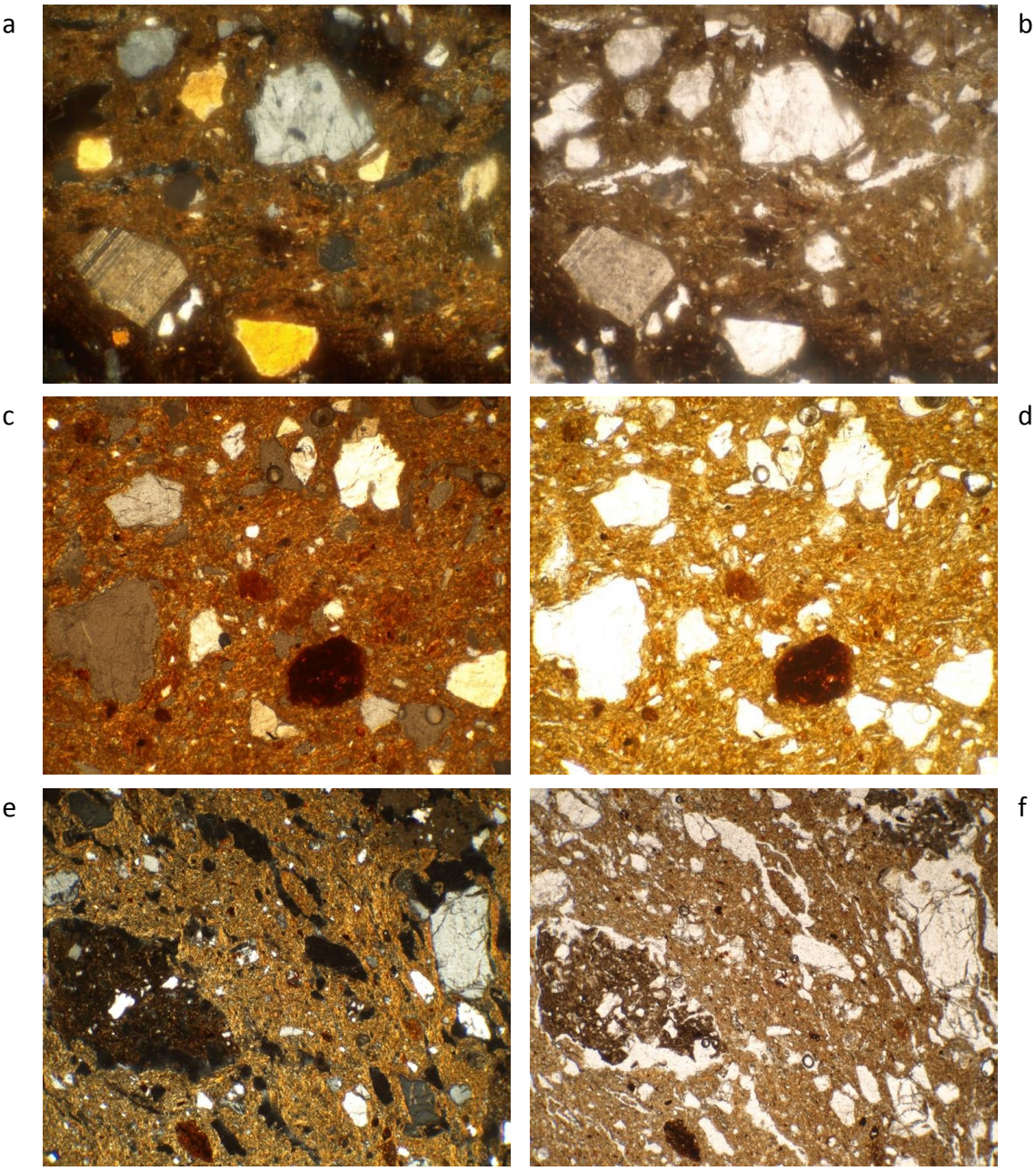


Fig. 12 12a-b sample 006, 12c-d sample 009, 12e-f sample 011. Compare iron rich clay with dominant coarse sand size grog temper, quartz inclusions and rock inclusions. Fig. 12a-b shows dominant coarse quartz inclusions (yellow inclusions are quartz inclusions ground too thick in thin section) and coarse twinned plagioclase feldspar (0.7 cm). Fig. 12c-d shows dominant coarse sand sized quartz inclusions and grog temper. Fig. 12e-f shows coarse sand sized quartz inclusions and grog temper. Compare with similar in fig. 12. XP/PPL. Image width = 2.9 mm

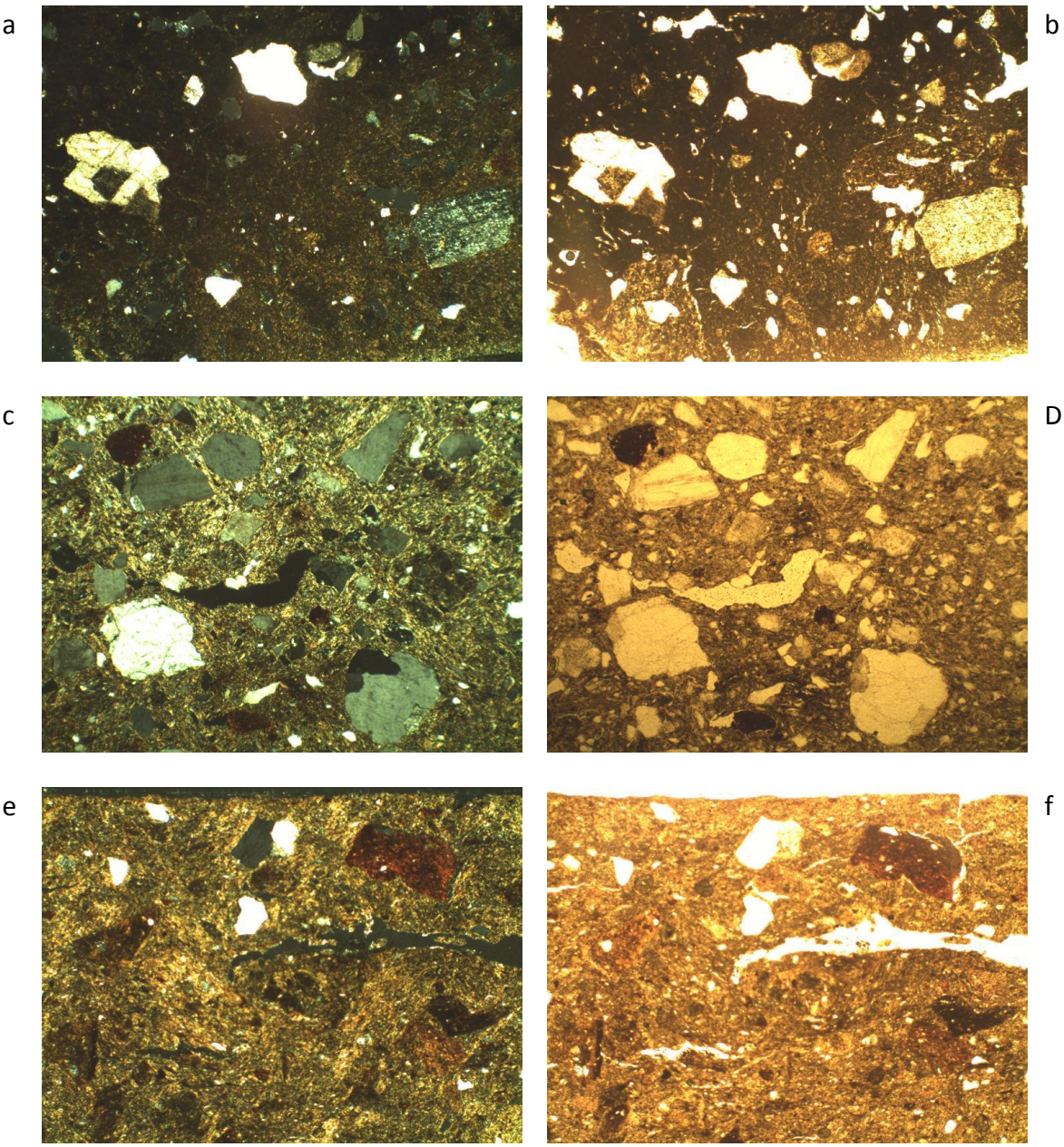


Fig. 13 13a-b sample 017, 13c-d sample 018, 13e-f sample 019. Compare iron rich clay with dominant coarse sand size grog temper, quartz and rock inclusions in each of these three samples with similar samples in fabrics in fig. 12. XP/PPL. Image width = 2.9 mm

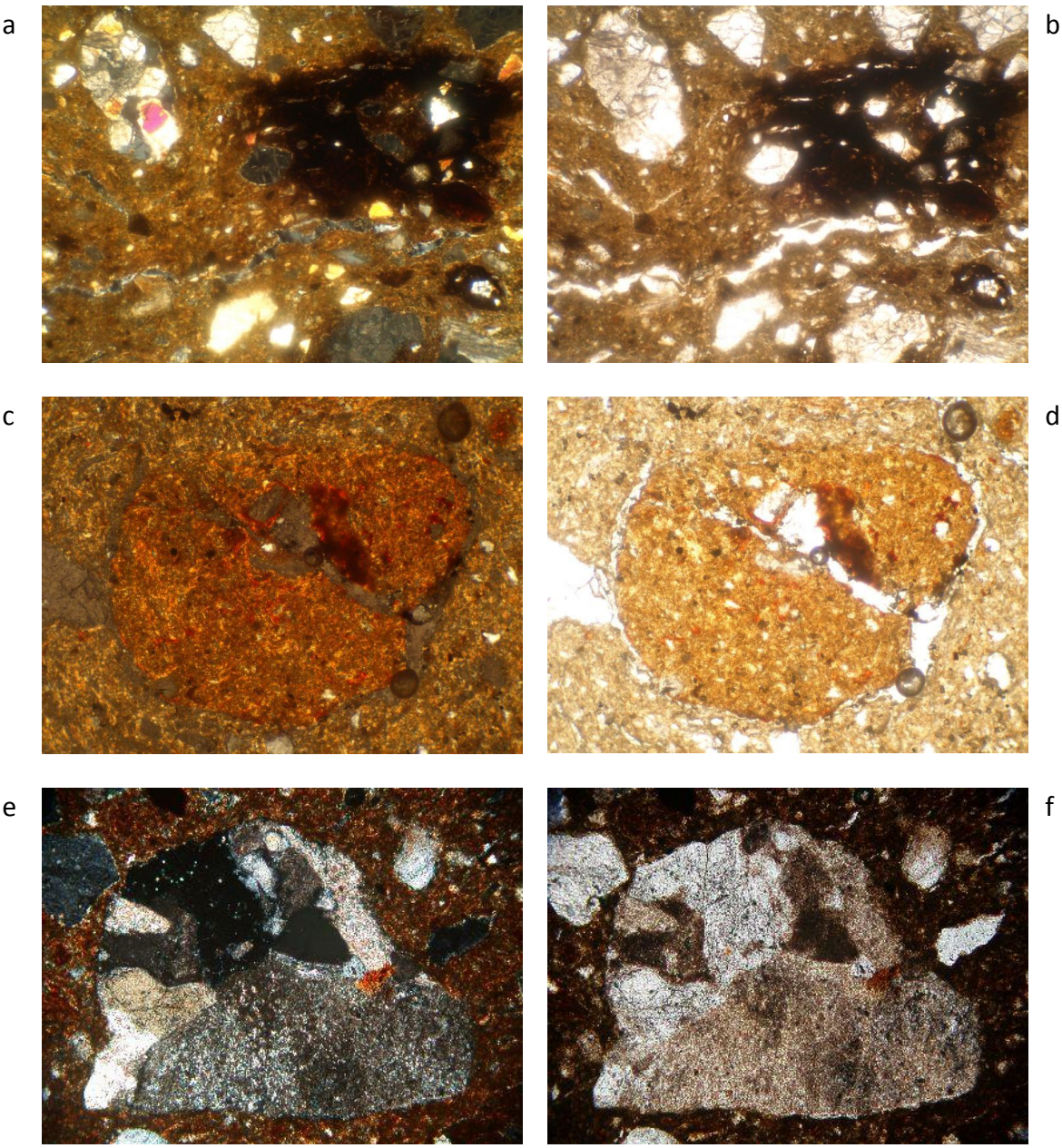


Fig. 14 14a-b sample 006, 14c-d sample 009, 14e-f sample 009. Fig. 14a-b shows possibly sandstone with interlocking quartz grain with weathered speckled feldspar and a clay pellet (no void around the clay pellet). Fig. 14c-d shows grog temper with void within grog temper. Fig. 14e-f shows granite with decayed speckled feldspar intermixed with quartz grains. XP/PPL. Image width 14a-b = 2.9 mm; 14c-d and 14e-f = 1.45 mm

Fabric 5: Chert and quartzite fabric

(Sample 008)

Inclusions

25%. eq. sa-sr. Closed spaced to single spaced. Weakly aligned to margin or randomly orientated. Bimodal, poorly sorted grain size distribution.

Coarse fraction
0.025-0.1 cm

frequent:	Radiolarian chert; eq. sa-sr. poorly sorted. 0.05-0.1 cm. Chert with rounded bioclastic rocks which are the remains of organisms which secrete siliceous hard parts such as some sponges and the microfossils radiolaria and diatoms (MacKenzie and Adams 1994: 140-141). Chert also contains fine quartz grains, hematite veins and iron staining (fig. 15e-f).
common:	Quartzite; eq. sr-r. 0.025-0.05 cm. Iron stained with clear grain boundaries which distinguish it as quartzite. Interlocking individual quartz grains held together by cementing materials. Medium grains in the quartzite are the same size and shape as the medium and fine sand sized monocrystalline quartz in the sample which is where they may have derived (fig. 15c-d).
	Quartz; eq. sa-a. 0.025-0.05 cm. Mainly coarse sand sized monocrystalline and some polycrystalline quartz inclusions. Monocrystalline quartz possibly derived from quartzite.
few:	Plagioclase feldspar; eq. sa-a. 0.025-0.05 cm. Appearing as altered feldspar.
very few:	Grog; eq & el. a-sr. 0.05-0.1 cm. Dark brown in XPL. Non-calcareous, containing fine quartz grains in same proportion as matrix. Grog temper has similar composition and arrangement as the parent fabric, made from same clay material.

Fine fraction
0.0125-0.025 cm

frequent:	Quartz, clinopyroxene, altered feldspar.
very few:	Iron concretions, opaques.

Matrix

70-72%. Iron-rich, non-calcareous. Brown to grey in PPL, brown to orangey-yellow in XPL (x40). Optically active.

Voids

3-5%. Consisting of micro-elongate parallel voids orientated in the same direction as the coarse grains.

Comments

Although there was only one sample in this fabric, this 'loner' was not the only one in the assemblage but represents a small proportion of the sample. The fabric is characterised by its fine iron rich paste and the presence of dominant inclusions of medium and coarse sand sized chert, quartz and quartzite inclusions. It is possible that the large quantity of coarse chert inclusions could have been temper. However, it is more likely that like Fabrics 1 to 3, these inclusions can be interpreted as naturally occurring alluvial sediment in the clay source and the roundness of the inclusions can result from a juvenile sandy alluvial clay source formed by the erosion of chert and quartzose rocks. Furthermore, there is compositional similarity between the coarse and fine fractions. Rare grog inclusions are present. However, due to the rarity of grog in sample, it is possible that the clay was prepared in a pottery making environment where fired ceramic fragments may have entered the paste and not have been intentionally added as temper. Like the other fabrics, there is no evidence of coiling or other methods of primary or secondary forming and Fabric 5 was reasonably low-fired in an oxidising atmosphere but with potentially less iron content in clay as it does not have the red fired colour of Fabrics 1 and 2. Although samples 008 and 018 are macroscopically similar in that they have similar wall thickness and no decorations, microscopically they are different and are two distinct fabrics from different clay sources. Sample 008 is chert and quartzite Fabric 5 and sample 018 is grog and quartz Fabric 4.

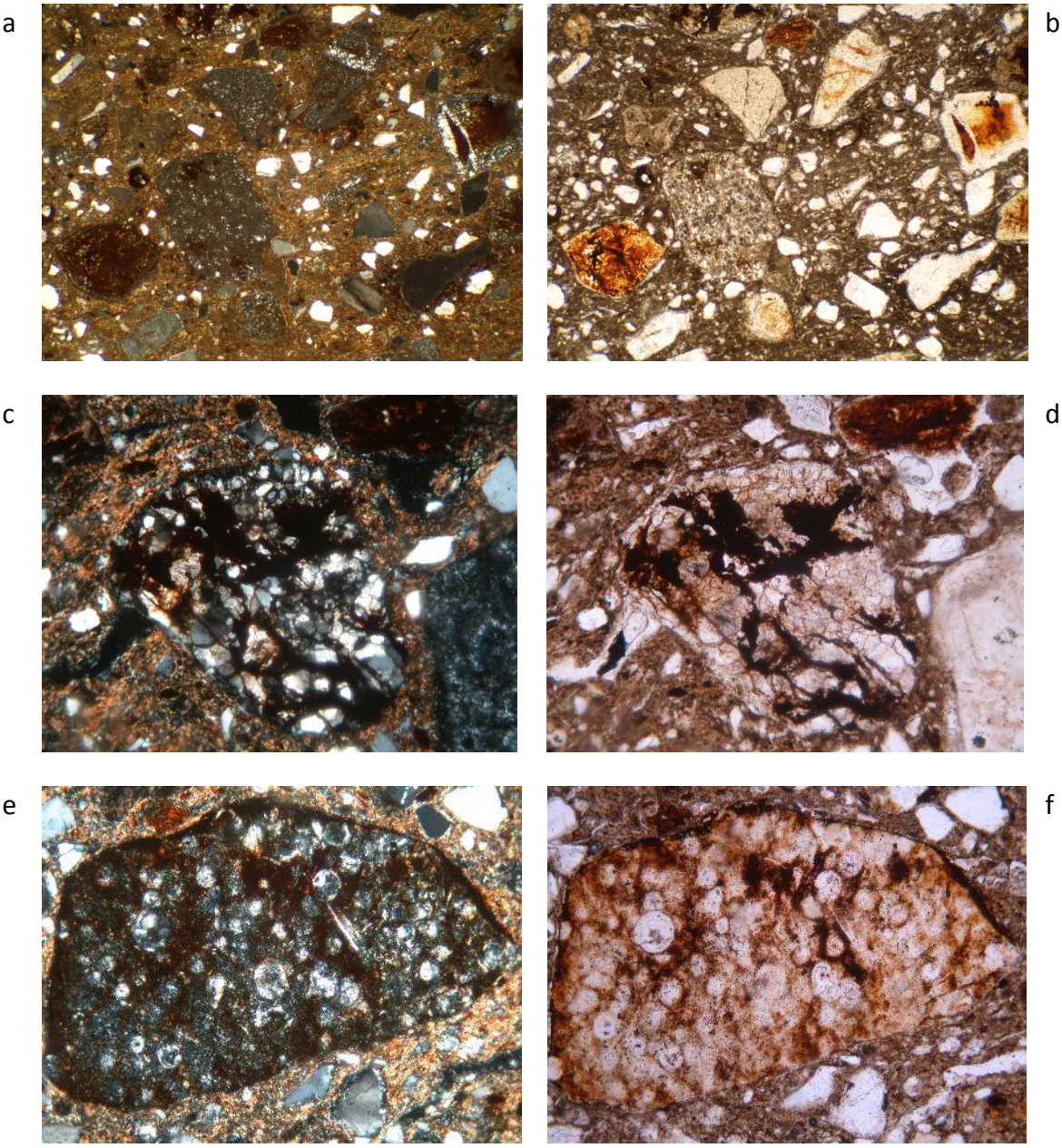


Fig. 15 15a-b sample 008 shows iron rich clay with dominant chert and quartzite. Fig. 15c-d shows iron stained quartzite with interlocking individual quartz grains held together by cementing materials. Fig. 15e-f shows radiolarian chert. XP/PPL. Image width 15a-b = 2.9 mm; 15c-d and 15e-f 1.45 mm

Fabric 6: Chert and volcanic rock fabric

(Samples 020, 021)

Inclusions

25-30%. eq. sa-sr. The sample showed close to single spacing of inclusions that were moderately aligned to the margins. The grain size distribution was bimodal and poorly to moderately sorted.

single to double spaced and moderately to poorly sorted with some impressions occurring together in clusters.

Coarse fraction
0.025-0.1 cm

common-few: Grog; eq & el. a-sr. 0.05-0.1 cm. Dark brown in XPL. Non-calcareous, containing fine quartz grains in same proportion as matrix. Grog temper has similar composition and arrangement as the parent fabric, made from same clay material.

Chert; eq. sa. 0.025-0.05 cm. Homogenous in composition with distinct fine polycrystalline quartz grains. Chert contains some radiolaria.

Volcanic rock fragments; eq. sa-sr. 0.025-0.05 cm. Fine grained igneous rocks with feldspar laths.

Granite; eq. sa-a. 0.025-0.05 cm. Igneous rock with decayed speckled feldspar intermixed with quartz grains. Some show granophyric textures.

Serpentinite; eq. sr-r. *c.*0.10 cm. Choritised serpentinite. Highly oxidised showing a fibrous texture with high birefringence.

Plagioclase feldspar; eq. sa-a. 0.025-0.05 cm. Some plagioclase appear as altered feldspar while some appear with twinning bands.

few-very few: Quartz; eq. sa. 0.025-0.05 cm. Monocrystalline quartz inclusions.

Mica; el. sa-a. 0.025-0.05 cm. Angular, brown and orange in colour with twin bands.

Olivine; eq & el. sa-sr. 0.025-0.05 cm. High birefringence.

Andesite; eq. sr-r. 0.025-0.05 cm. Fine grain igneous rock with fine grain plagioclase and amphibole.

Altered metamorphic material with epidote; eq. sa-sr. *c.*0.025-0.05 cm.

Fine fraction
0.0125-0.025 cm

frequent-common: Quartz, iron concretions, opaques, feldspar, olivine, mica.

Matrix

63-65%. Iron-rich, non-calcareous. Brown to orange in PPL, dark brown to orange in XPL (x50). Homogeneous matrix. Optically active.

Voids

5-7%. Few voids Consisting of micro-elongate parallel voids orientated in the same direction as the quartz inclusions. Grog temper and some rock inclusions are separated from the paste and each other by thin voids around the inclusion.

Comments

The samples forming this variable fabric are united by the same iron-rich dark brown to orange clay paste, similar mineral composition and rock fragments of the same size and frequency, and both have grog temper. However, there are slight differences in composition where sample 020 has more olivine and 021 has more grog temper. Samples 020 and 021 are unlike the other samples thin sectioned so far in terms of mineral and rock composition and frequency. Minerals and rocks appear in an abundance that is not seen in other fabrics which suggest they come from a different clay source. There are some similarities in Fabric 6 with the samples in Fabrics 1 to 5. The samples have a similar iron rich paste. All the samples have similar naturally occurring alluvial sediment (not temper), with fine quartz with the same size and distribution, chert and altered igneous rocks. This links the fabrics together. Technologically, these samples contain grog temper. However, this technique is ubiquitous and does not imply a shared practice. There is no evidence of coiling or other methods of primary or secondary forming. The samples were reasonably low-fired in an oxidising atmosphere.

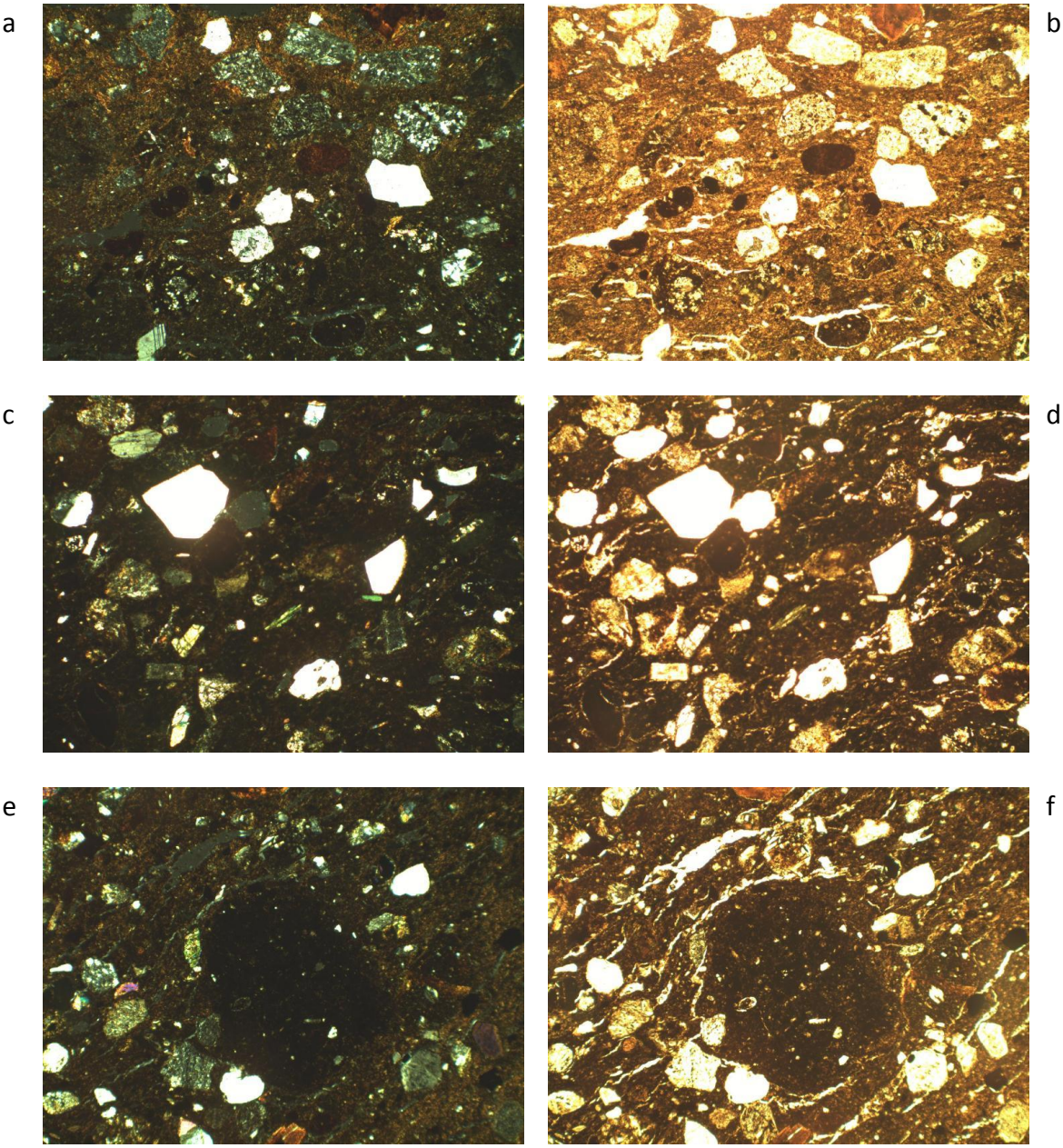


Fig. 16 16a-b samples 020 and fig. 16c-d 021 show similar fabrics with dominant coarse sand sized quartz inclusions, rock fragments and grog. Fig.16 e-f shows grog temper in sample 021 with void separating the inclusion from the paste. XP/PPL. Image width = 2.9 mm

Fabric 7: Mica and quartz fabric

(Samples 010, 012)

Inclusions

15-20%. eq. sa-sr. Single spaced. Crudely aligned to margin of samples. Bimodal, poorly sorted grain size distribution.

Coarse to medium fraction
0.025-0.1 cm

frequent-common: Quartz; eq & el. sa-a. 0.025-0.05 cm. Coarse sand sized monocrystalline and polycrystalline quartz inclusions.

common-very few: Mica; common biotite with some muscovite mica. eq & el. sa-a. 0.025-0.05 cm. The micaeous materials have two appearances. Sample 012 (fig. 17c-d) has angular, short, brown and orange biotite (0.03 cm), while sample 010 (figs. 17a-b and 17e-f) has both biotite and muscovite. The biotite is angular, long (0.05 cm), brown and orange in colour with twin bands. Brown pleochroic micas are considered to be biotite and this is its diagnostic feature. They range in shape but are usually rectangular with perfect basal cleavage and clear lamellar plates. This biotite mica is visible on the surface of the sherds and appears orange and shiny. The muscovite is shorter (0.04 cm) and thicker. The muscovite is colourful and appears pink, yellow and orange with high birefringence in XPL. It is strongly pleochroic in PPL and displays perfect cleavage in one direction. The majority of the micaeous materials are orientated in the direction of the fabric but some are orientated in different directions across the sherd. Appears contiguous to quartz. Possibly part of a mica schist unit.

few-very few: Heavily altered rock fragments eq. sa-r. 0.025-0.05 cm. With polycrystalline quartz inclusions with a fine almost foliated metamorphic texture occur. The sample also contains other occurrences of heavily altered inclusions that are now unidentifiable.

Plagioclase feldspar; eq. sa-a. 0.025-0.05 cm. Some plagioclase appear as altered feldspar while some appear with twinning bands.

very few-rare: Argillaceous inclusions (clay pellets sample 010); eq. sr. 0.025 cm. Sample 010 shows oxidised clay fabric with same arrangement as the parent fabric, aligned internal microstructure with the same fine sand sized iron concretions.

Clearer in PPL without voids around the grain has contact with the paste and the boundaries are diffuse. High to medium optical density.

Fine fraction
0.0125-0.025 cm

frequent-common:	Quartz, mica, feldspar, iron concretions and opaques.
very few-rare:	Shale and phyllite (sample 012).

Matrix

72-75%. Iron-rich, non-calcareous clay. Dark brown to grey in PPL, light brown to yellowish-orange in XPL (x40). Different domains of colour across the thin section. Optically active.

Voids

3-5%. Few voids in each sample but more voids in sample 012 than in sample 010. Consisting of micro-elongate parallel voids orientated in the same direction as the coarse grains.

Comments

The samples forming this variable fabric are united by the presence of dominant medium sand size mica and quartz inclusions. The sample has a mica schist element. The mica is contiguous to coarse grains of metamorphose quartz indicating it might be from a metamorphic schist unit (see fig. 17a-b). This fabric is the only one that contains mica indicating the clay came from an area where schist occurs. This matches the geology of the area (see geological map and Results Chapter 6). The samples in Fabric 7 are not identical to each other. They both contain different types of mica (common biotite and very few muscovite) in terms of size and shape. Furthermore, there are less quartz grains in sample 010 than in sample 012 and the plagioclase is less altered in sample 012. Both samples do not contain grog temper and there are fewer void in this fabric. Although Fabric 7 has similar fine iron-rich matrix and dominant inclusions of quartz inclusions and rock inclusions which have similar range, frequency and size as Fabrics 1 to 5, it is different to the other fabrics because of the mica content and it does not contain the same alluvial sediment with chert component.

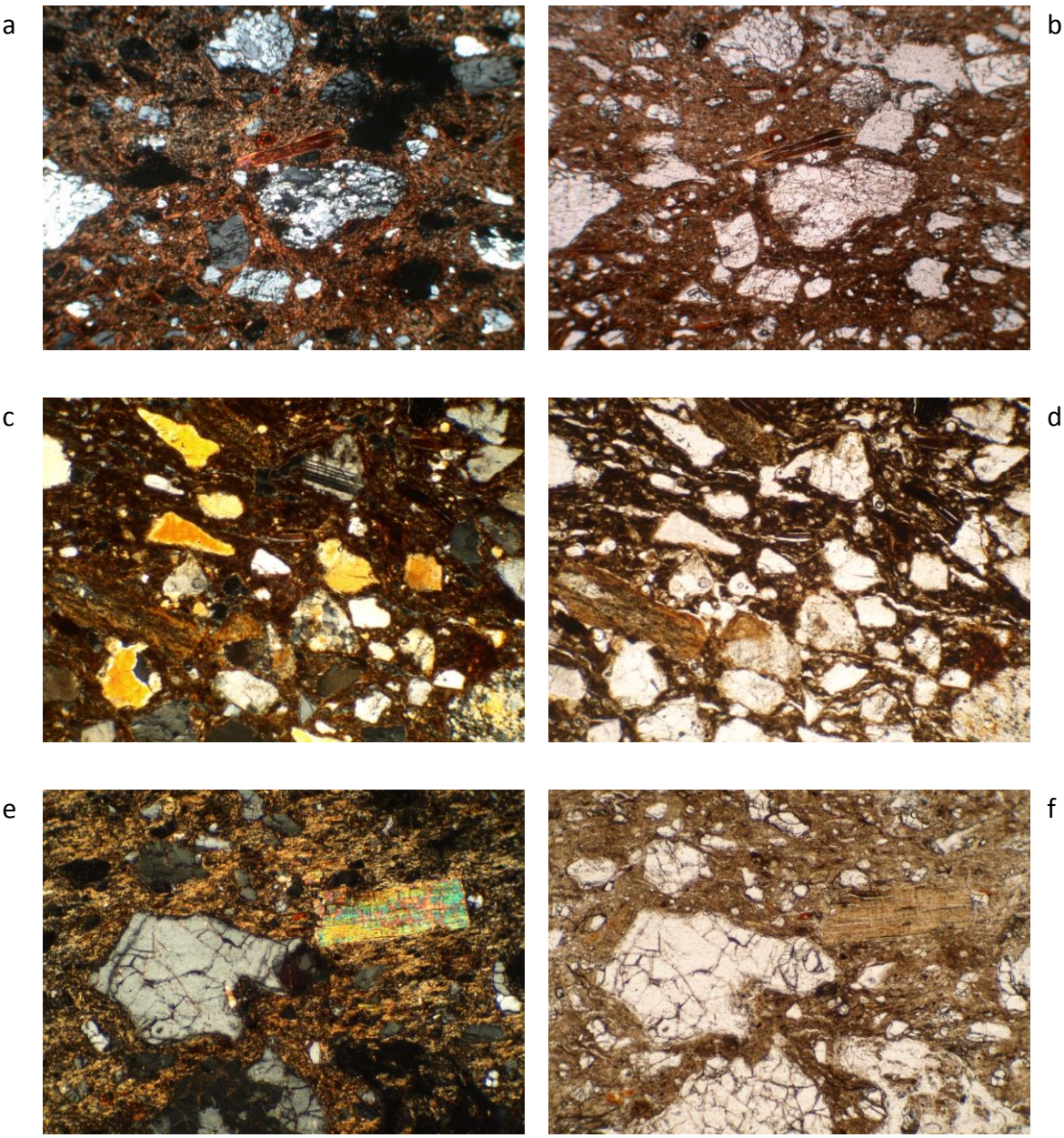


Fig. 17 17a-b sample 010, 17c-d sample 012, 17e-f sample 010. Iron rich clay with dominant medium sand sized mica and quartz inclusions. The micaeous materials have two appearances. Sample 010 (fig. 17a-b) shows biotite – angular, long (0.05 cm), brown and orange in colour, and muscovite – shorter (0.04 cm), thicker and pink, yellow and orange in colour (visible in fig. 17e-f). Sample 012 (fig. 17c-d) has angular, shorter (0.03 cm), brown and orange biotite. Fig. 17c-d also shows twinned plagioclase (yellow inclusions in this sample are quartz inclusions ground too thick in thin section). 17a-b sample 010 shows biotite mica contiguous to coarse grains of metamorphose quartz indicating it may be from a metamorphic schist unit. XP/PPL. Image width 17a-b and 17c-d = 2.9 mm; 17e-f = 1.45 mm

Fabric 8: Grog temper fabric

(Samples 013, 014)

Inclusions

15-20%. eq & el. sa-sr. Single spaced. Poorly aligned to margins or randomly oriented. Unimodal, poorly sorted grain size distribution.

Coarse fraction
0.025-0.1 cm

common-few:	Grog; eq & el. a & sr-r. 0.05-0.1 cm. Shape of grog varies from angular with low sphericity and sub-rounded to rounded with high sphericity. The fired colour of the angular grog temper in XPL is dark brown with a dense matrix and few inclusions of fine quartz inclusions to coarse silt and iron concretions which do not appear in the parent fabric. The fired colour of the rounded grog temper with high sphericity in XPL is light brownish-grey, with few fine iron concretions and quartz grains which does not appear in the parent fabric (sample 014, fig. 19a-e). Sample 013 (fig. 9c-d) shows irregular shaped grog temper.
very few-rare:	Serpentinite; eq. sr-r. *c.*0.10 cm. Highly oxidised showing a fibrous texture with high birefringence.

Fine fraction
0.0125-0.025 cm

few-very few:	Rock fragments, iron concretions, opaques.

Matrix
75%. Non-calcareous. Very fine clay without mineral inclusions. Light brown to grey in PPL, light brown to yellowish in XPL (x40). Different domains of colour across the thin section. Optically active.

Voids
5%. Consisting of micro-elongate parallel voids orientated in the same direction as the grog temper. Voids surround the grog temper and voids are present in the grog temper.

Comments
The samples forming this variable fabric are united by the very fine clay without mineral inclusions and presence of dominant grog temper. Despite the clay being very fine without mineral inclusions there is no evidence of sieving or levigation. Fabric 8 is completely different to Fabrics 1 to 9 in terms of clay and technology. The matrix does not contain the coarse, medium or fine sand sized inclusions, such as quartz inclusions and chert, found in other fabrics. In the thin sections, fine sand quartz grains are only

present in the grog temper and there are no fine sand quartz grains in the parent fabric. This suggests that the grog temper is from a different type of pottery vessel with different clay composition than the final finished vessel. Although Fabrics 1, 2, 4 and 6 contain grog temper, the grog temper in Fabric 8 is different to the grog temper in Fabrics 1, 2, 4 and 6. The composition of the grog temper in Fabrics 1, 2, 4 and 6 is denser and darker brown in XPL and contains chert which is not found in the grog temper of Fabric 8. The difference in paste show that Fabric 8 is from a different environment to Fabrics 1, 2, 4 and 6. Fabric 8 is similar to Fabric 10 in that the clay is very fine clay without mineral inclusions found in other fabrics, but they have different tempering technology. The samples have a dark core from the firing process where it was reduced and cooled in air. The surfaces of sample 013 have a coating or a white 'slip' and this is visible in thin section (with high birefringence) representing a different technological process to sample 014 which is not slipped. In thin section, the clay is homogenous throughout the profile and the change from interior and exterior margins are not visible. While both the sherd and thin section look grey to the naked eye they have high birefringence in thin section. There is no evidence of coiling or other methods of primary or secondary forming.

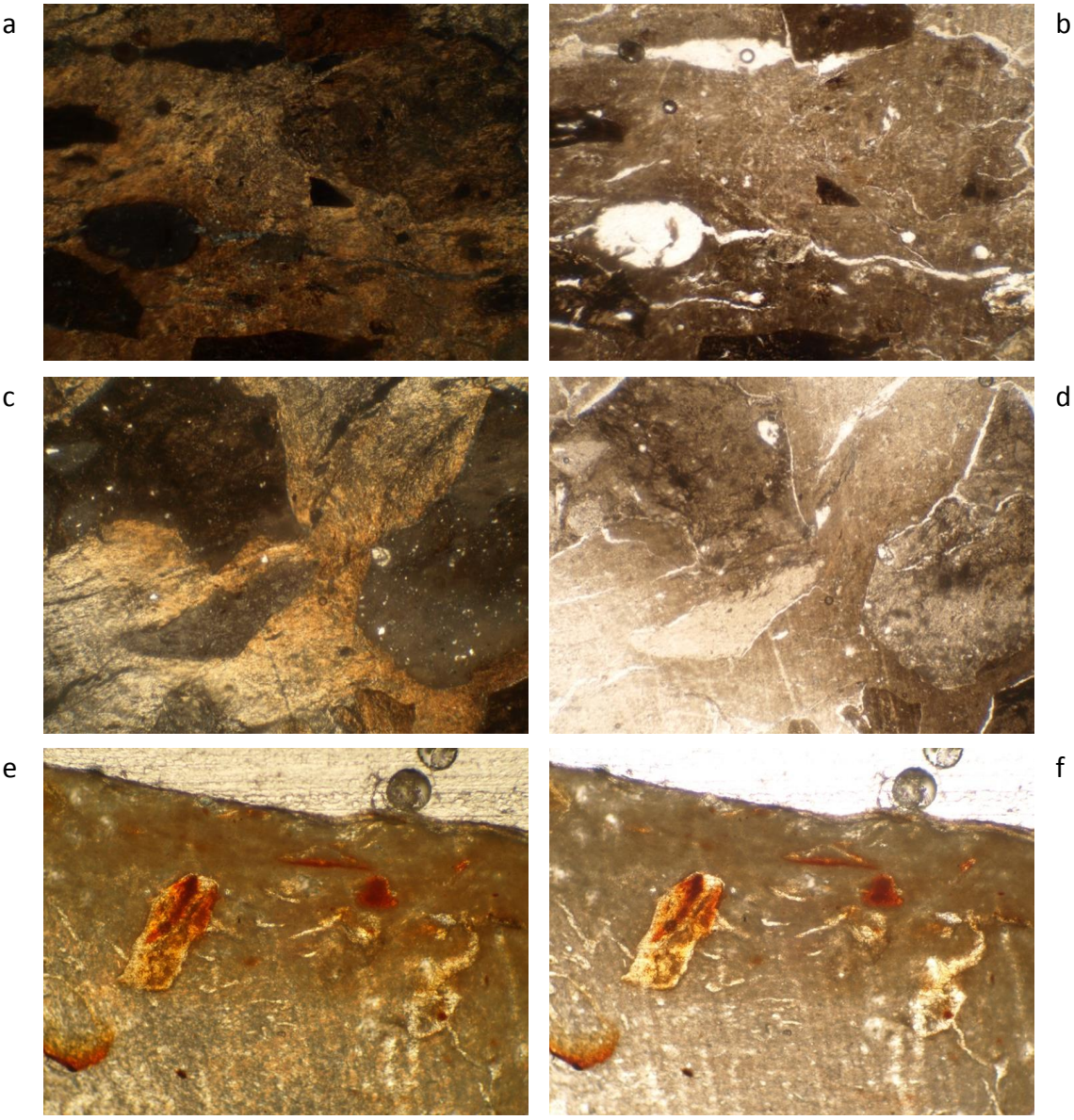


Fig. 18 Sample 013 very fine clay without mineral inclusions and dominant grog temper. Exterior slip 18e-f (with high birefringence). XP/PPL. Image width 18a-b = 2.9 mm; 18c-d and 18e-f = 1.45 mm

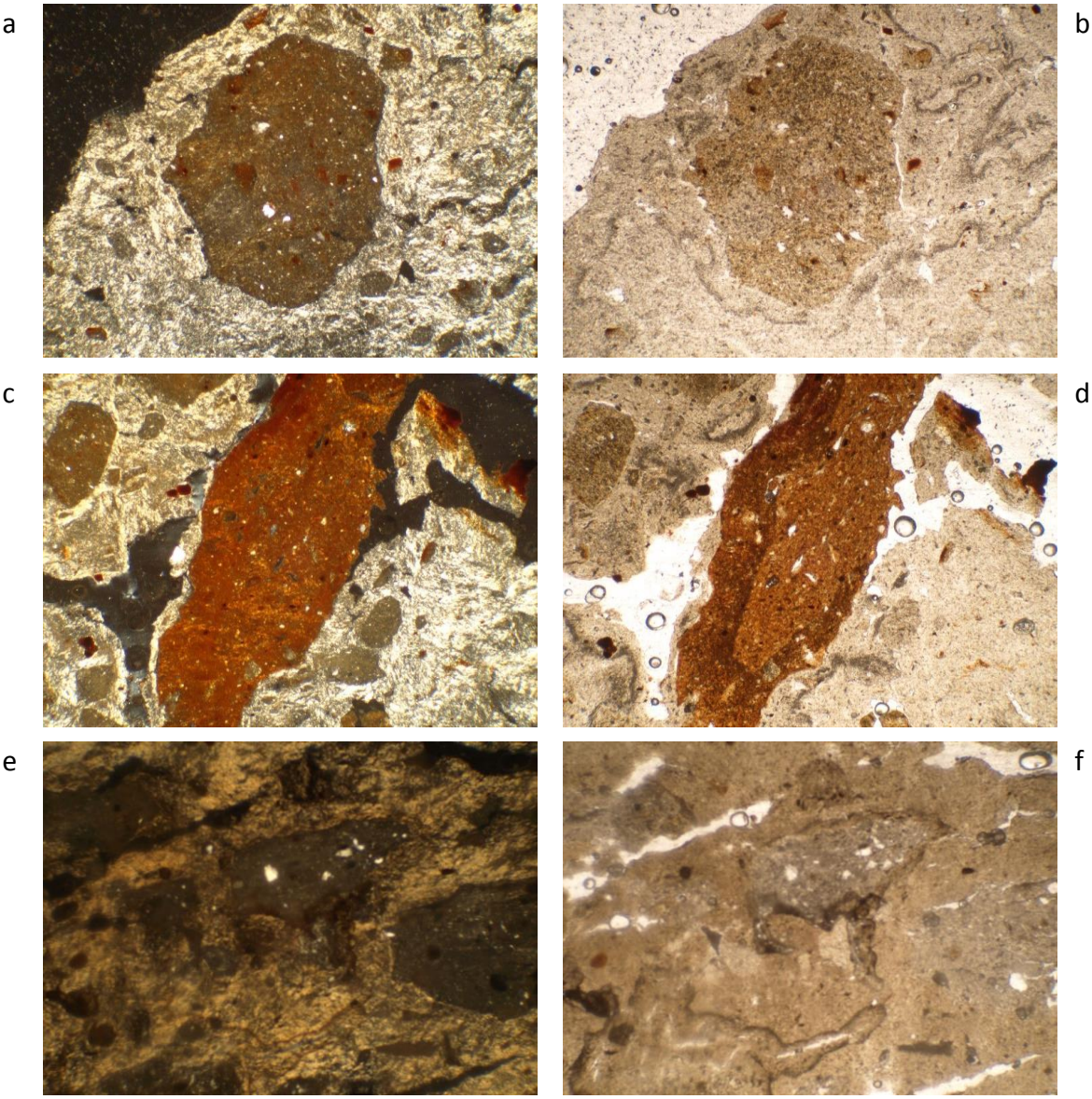


Fig. 19 Sample 014 very fine clay without mineral inclusions and dominant grog temper. Two shapes of grog visible 19a-b shows rounded grog temper with fine sand sized quartz and iron oxides (dark part of top left corner of fig. 19a-b is outside of the sherd) and 19c-f shows angular grog temper with low sphericity. All grog temper inclusions contain fine sand sized quartz that is not present in the parent fabric. XP/PPL. Image width = 2.9 mm

Fabric 9: Rice temper fabric

(Samples 004, 015)

Inclusions

15-20%. eq. sa-sr. Single spaced. Strongly aligned to margins of samples. Unimodal, poorly to moderately sorted grain size distribution.

Coarse fraction
0.025-0.1 cm

frequent-common:	Rice temper; eq & el. sr. 0.05-0.1 cm. Chaff and straw. Chaff appears curved and curled (fig. 20e-f). The straw appears long and relatively flat (figs. 20a-d). All orientated long ways in one direction. The plant matter has been partially destroyed during the firing process leaving carbonised remains and distinctive voids. Poorly sorted.
few-very few:	Quartz; eq. sr. 0.025-0.05 cm. Coarse sand sized monocrystalline and polycrystalline quartz inclusions.
very few-rare:	Weathered feldspar; eq. sa. 0.025-0.05 cm.

Fine fraction
0.0125-0.025 cm

frequent-common:	Quartz, iron oxides and opaques.

Matrix
65-70%. Very fine clay without mineral inclusions apart from frequent fine sand sized quartz. The matrix is dark brown to black in XPL, brown to grey in PPL (x40). Both are optically active.

Voids
10-15%. Few voids from either drying or firing consisting of micro-elongate parallel voids orientated in the same direction as the rice temper. However, some rice temper grains have burnt out leaving voids which are casts of the original. These are organic pseudomorphs. This increases the percentage of voids in the samples. Sample 015 is more porous. There are also voids around the rice temper where it has shrunk during firing.

Comments
This distinctive fabric is unified by its very fine clay without mineral inclusions and dominant rice temper. The paste is dark and fine but has rare medium sand sized quartz and frequent fine sand sized quartz inclusions. Despite the clay being very fine without mineral inclusions apart from quartz grains there is no evidence of sieving or levigation. The paste was prepared by the addition of rice temper which has been

processed by the cutting of the rice temper. While both the samples have rice temper, there are differences between samples 004 and 015. Sample 004 is tempered predominantly with the chaff part of the rice plant while sample 015 has predominantly straw temper with fewer chaff grains. The exterior margin of sample 004 is red. It is not a slip. This shows that the clay may have been iron rich and only the exterior oxidised as it was low-fired in oxidising atmosphere, though not completely oxidised during firing and may even be partially reduced as seen in the darker core area. Fabric 9 is completely different to all other fabrics in terms of clay and technology. It is the only fabric with rice temper. The matrix does not contain the coarse, medium or fine sand sized inclusions, such as chert, rock fragments, iron oxides and grog temper, found in other fabrics. Furthermore, the quartz grains are different to other fabrics in terms of size, shape and frequency. Fabric 9 is petrographically distinct from the other fabrics in terms of its raw materials and paste preparation. Therefore, Fabric 9 might have been from a different geographical location and produced in a different social environment from the others. This does not necessarily mean that the ceramic is 'foreign' to the site, but a non-local provenance is suggested. It is difficult to determine provenance as the dominant inclusions in this fabric are non-diagnostic.

See Chapter 6 and Appendix D for further analysis of the rice tempered sherds.

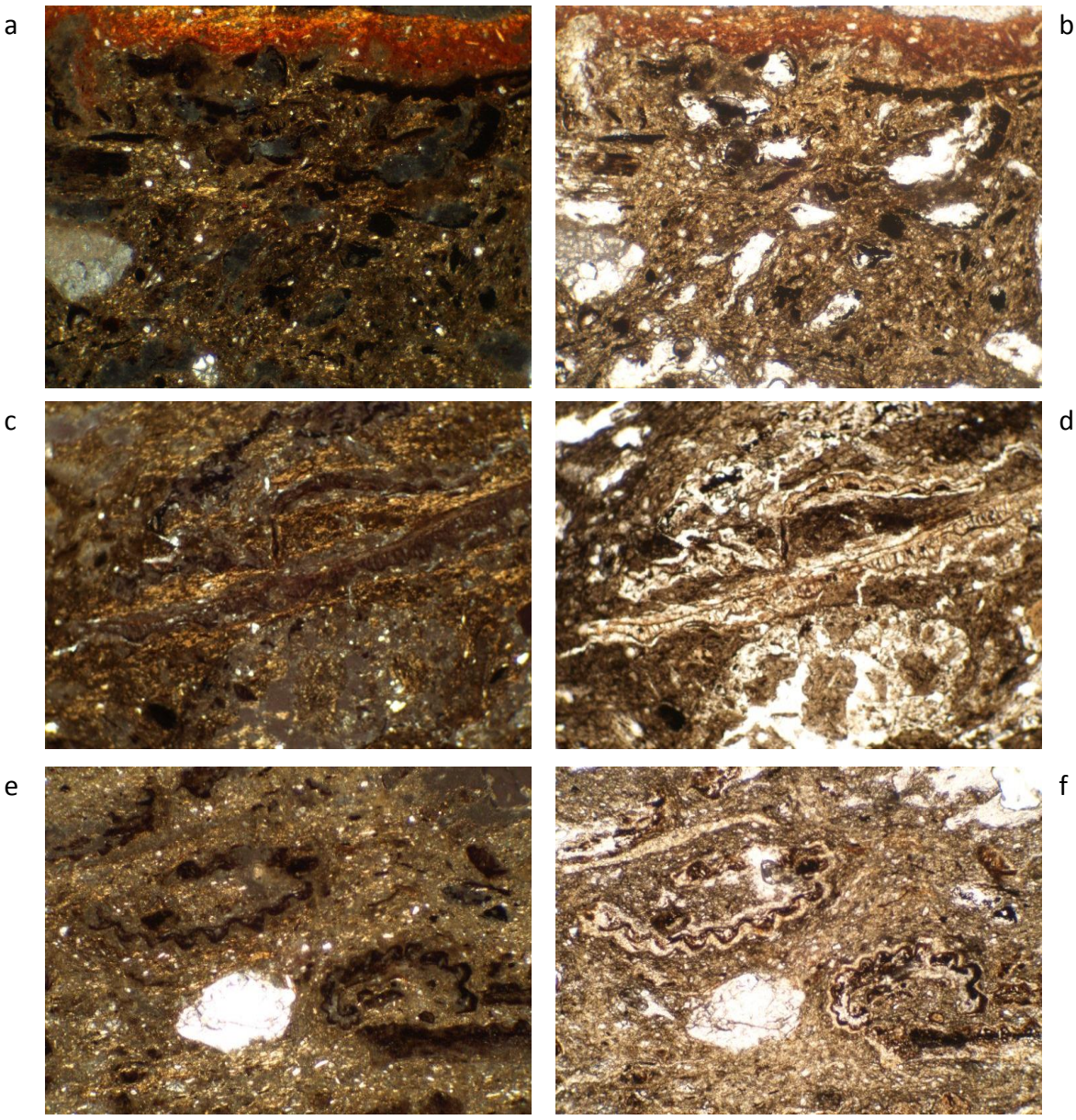


Fig. 20 20a-b sample 004, c-d sample 015, e-f sample 004. Very fine clay without mineral inclusions and dominant rice temper. Chaff and straw parts of rice plant present. Chaff appears curved (fig. 20e-f). The straw appears long and relatively flat (figs. 20a-d). XP/PPL. Image width 20a-b and 20c-d = 2.9 mm; 20e-f = 1.45 mm

Fabric 10: Coarse quartz temper fabric

(Sample 007, 033, 034, 035, 036, 037, 038, 039, 040, 041, 042, 043, 044)

Inclusions

10%. eq. sa-a. Single spaced. Strongly aligned to margins of samples. Unimodal, moderately to well sorted grain size distribution.

Coarse fraction
0.025-0.1 cm

frequent-common:	Quartz; eq & el. sa-a. 0.05-0.1 cm. Metamorphosis quartz appearing as monocrystalline, polycrystalline and brecciated quartz. The quartz that comprises the brecciated quartz is same size as the medium quartz in the matrix. This shows the breakdown of the brecciated quartz. Quartz sand appears degraded in some samples.
few-very few:	Plagioclase feldspar; eq. sa-a. 0.025-0.05 cm. Some plagioclase appear as altered feldspar while some appear with twinning bands. Some samples shows feldspar breaking down into clay minerals.
	Granite; eq. sa-a. 0.025-0.05 cm. Igneous rock inclusion showing interlocked medium and fine quartz and some decayed speckled feldspar intermixed with quartz. Some show granophyric textures indicating it as granite. This particular intergrowth texture occurs in granite. Unidentifiable altered rocks also present.
rare-very rare:	Argillaceous inclusions; eq. sr. 0.025 cm. Clay pellets with the same arrangement as the parent fabric aligned internal microstructure with the same fine sand sized quartz and opaques but is darker and denser. Some pellets have a very thin void around the feature with sharp boundaries and some pellets have contact with the paste and the boundaries are diffuse. High to medium optical density.

Fine fraction
0.0125-0.025 cm

rare-very rare:	Quartz, feldspar and opaques.

Matrix

83-85%. Very fine clay without mineral inclusions. Dark brownish grey in XPL and the brown colour is also pleochroic in PPL (x40). Optically active.

Voids

5-7%. Few voids Consisting of micro-elongate parallel voids orientated in the same direction as the quartz temper.

Comments

This ceramic type had the second largest quantity of sherds in the assemblage, after Fabric 1. The ceramic type is 'Type 4: Grey Cord Marked' and is categorised into the higher order of Grey Ware. In macroscopic observation, this ceramic type had many correlating attributes. They seemed to be made of the same fabric, shared the same range of incised and impressed decorations and forms and were manufactured in the same way. Furthermore, this ceramic type has a specific history and distribution in Southeast Asia. Initially, 1 sherd of this ceramic type was thin sectioned. A further 12 thin sections were made of this ceramic type to see if all the sherds selected had the same fabric and to assess the degree of variation within the fabric (Appendix C.v). Although there was variation within the thin sections, the additional thin sections of this ceramic type show that all samples categorised as Fabric 10 had several common characteristics and were made from common raw material source. Fabric 10 has a more homogeneous petrographic composition than Fabric 1.

This homogenous fabric is characterised by the very fine clay without mineral inclusions, coarse angular quartz temper with low sphericity and the fact it is relatively porous. The paste is dark and fine but some samples have rare fine and silt sand sized quartz inclusions. The quartz temper and voids are visible in the sherd by macroscopic inspection as well as thin section. The quartz sand is strained quartz and polycrystalline quartz. Some are partially foliated and with a brecciated texture, plus coarse quartz and feldspar rock fragments. It is possible that this quartz reflects a metamorphic source, perhaps of gneiss, quartzite and metamorphosed plutonic igneous rocks.

Fabric 10 is completely different to all other Fabrics 1 to 7 and 9 in terms of clay and technology. The matrix does not contain the coarse, medium or fine alluvial sediments, such as chert, rock fragments and iron oxides, found in Fabrics 1 to 7. The paste has been prepared by adding quartz sand. The quartz sand is angular and may have been crushed before being added to the paste or may represent juvenile quartz from a slow moving fluvial system. Thus, the coarse quartz temper differs in size and sphericity from the naturally occurring quartz inclusions in other fabrics. There are some similarities between Fabric 10 and Fabric 8. Both have very fine clay without mineral inclusions, apart from very rare and very fine sand sized quartz. Despite the clay being very fine without mineral inclusions there is no evidence of sieving or levigation.

All samples showed single spacing of inclusions that were strongly aligned to the margins of samples. The grain size distribution was unimodal and moderately to poorly sorted. All samples were coarse and porous and the quartz temper and voids could be seen in macroscopic inspection. There is no evidence of coiling or other methods of primary or secondary forming. The samples were reasonably low-fired in a reducing atmosphere, where it was oxidised at some point but oxidisation has not penetrated as seen in the darker core area. Changes in firing can be seen in the change of colour of

the fabric visible at exterior and interior margins see fig. 25c-f. Minor variations in fabric are discussed below.

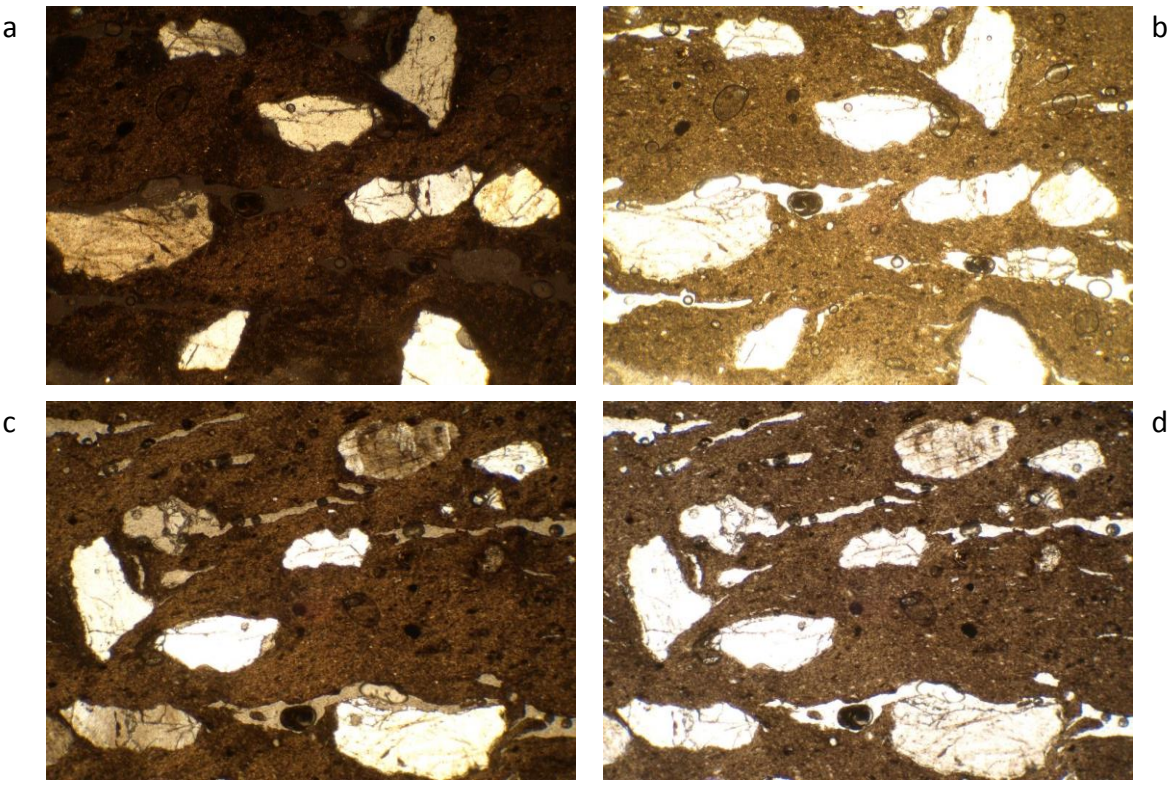


Fig. 21 Sample 007. Very fine clay without mineral inclusions and coarse angular quartz temper. XP/PPL. Image width = 2.9 mm

In thin section, voids occurred at 5-7%. All the samples had the same micro-elongate parallel voids orientated in the same direction as the quartz temper. This ceramic type is paddle impressed and beating with the paddle aligns the clay minerals producing parallel straight sided voids on drying. Figs. 22a-d show typical examples of voids. The sample is porous in hand specimen and in thin section. The voids are the result of the technological process where the cracks may have been formed during drying or firing. Furthermore, drying takes place more rapidly in sherds with coarse paste rather than in fine clay as they contain more pores which aid the movement of water. Clay minerals move closer to one another when water is lost causing the ceramic to shrink. The firing process may also accentuate cracks that developed initially during drying (Quinn 2013: 188).

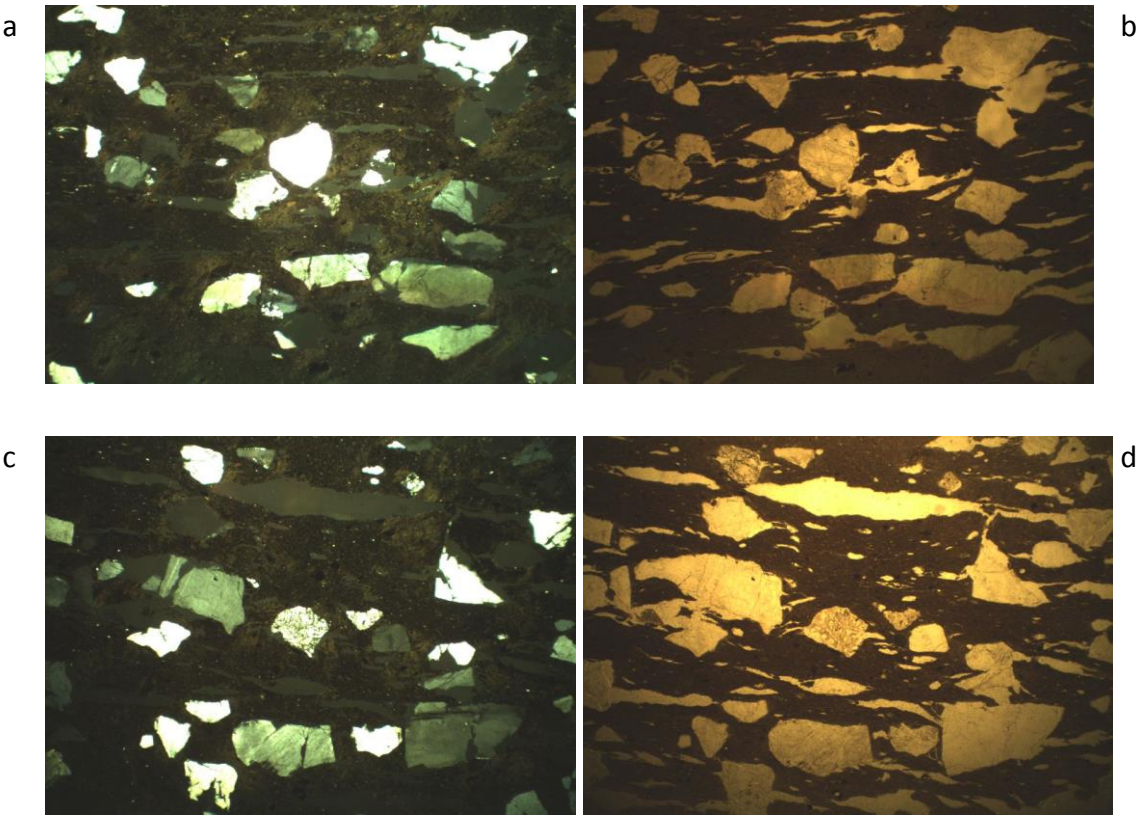


Fig. 22 22a-b sample 034, 22c-d sample 041. Uniform fabric with very fine clay without mineral inclusions, coarse sand sized quartz temper and micro-elongate parallel voids orientated in the same direction as the quartz temper. Fig. 22c-d shows granite with granophyre texture (centre) magnified in fig. 24c-d. XP/PPL. Image width = 5.8 mm

However, while all the thin sections showed attributes which formed the same fabric, there were slight variations in some of the samples. There were differences in the frequency of the medium and fine quartz grains which varied from very few to common. Plagioclase feldspar with twinning was not evident in all samples, however, where they did appear, they appeared in abundance. Fig. 23a-b show clear plagioclase feldspar with twinning when compared to fig. 23c-d showing untwinned feldspar (possibly plagioclase). Fig. 23e-f shows a coarse feldspar grain breaking down into clay minerals.

Occurrences of granophyric textures in the intrusive igneous rocks were visible in some samples (figs. 24a-d at 100x and also 22c-d at 25x). These intergrowth textures indicate it is granite as granophyres “radiate intergrowths of quartz and alkali feldspar and are arranged about euhedral, equant plagioclase crystals” (MacKenzie, Donaldson and Guildford 1982: 48-49). These exotic growth patterns happen in certain areas of igneous rocks.

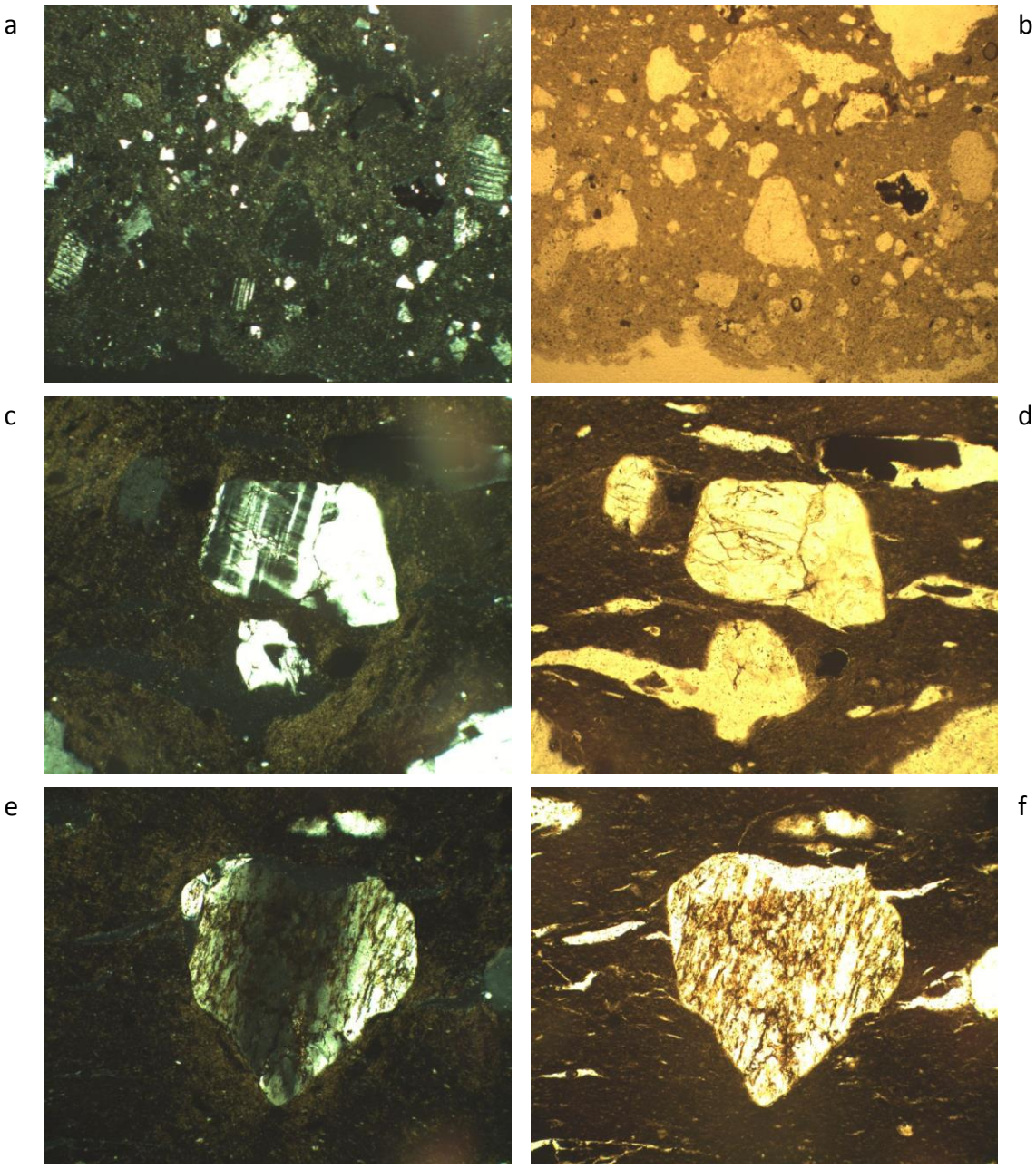


Fig. 23 23a-b Sample 035, 23c-d sample 039, 23e-f sample 040. Fig. 23a-b shows clear plagioclase feldspar with twinning. Fig. 23c-d shows untwinned feldspar. Fig. 23 e-f shows a coarse feldspar grain breaking down into clay minerals. XP/PPL. Image width 23a-b = 5.8 mm; 23c-d and 23e-f = 1.45 mm

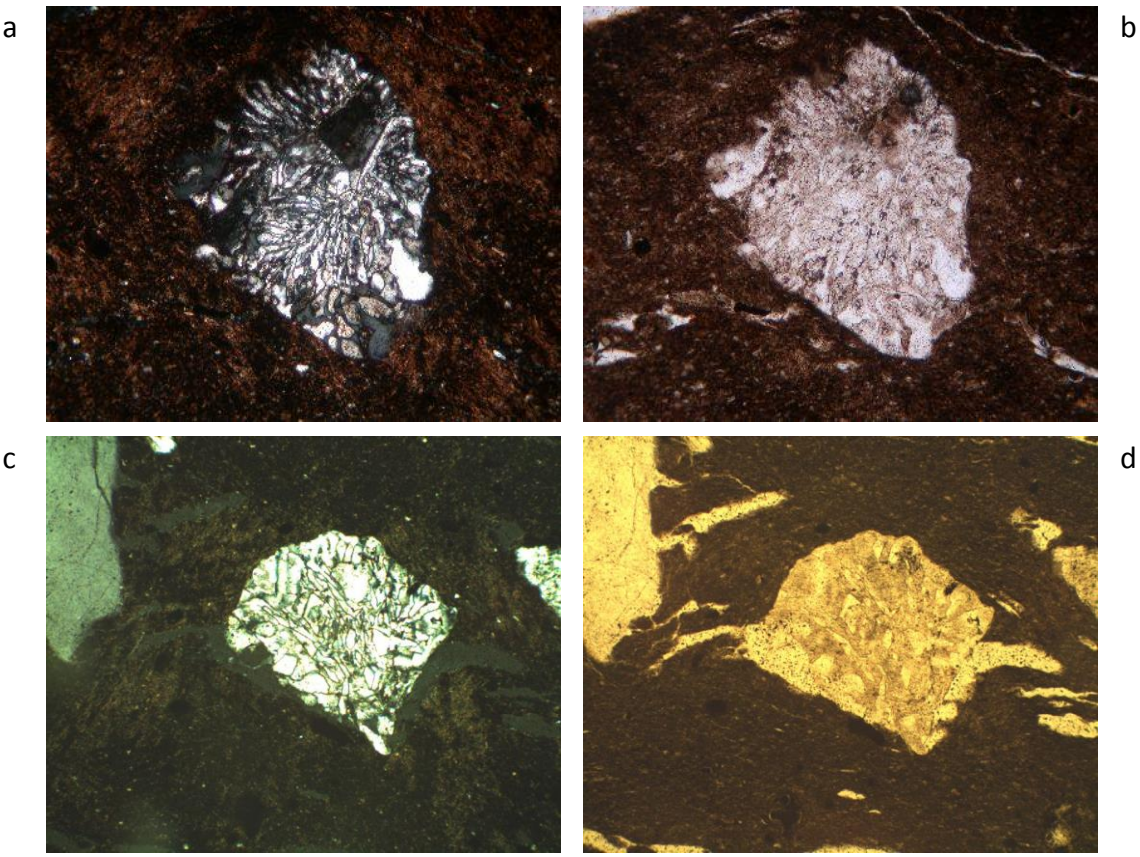


Fig. 24 24a-b Sample 007, 24c-d sample 041. Figures shows granophyric textures in coarse sand sized granite fragment. XP/PPL. Image width 24a-b = 2.9 mm; 24c-d = 1.45 mm

Sample 044 was macroscopically different to other sherds in this ceramic type. Although it had the same form, it did not have the diagnostic paddle impression and it had a different texture to the other sherds in the ceramic type (fig. 25a compared to 25b). Therefore, it was thin sectioned to assess whether its fabric was similar to other sherds in this fabric. Although sample 044 was macroscopically different, it had the same composition as others in the fabric, with the same coarse quartz temper and very fine clay without mineral inclusions (compare similarity of composition of fig. 25c-d with 25e-f). It is likely that this sherd was a part of the vessel that was not paddle impressed.

Fabric 10 is petrographically distinct from the other fabrics in terms of its raw materials and paste preparation. Therefore, Fabric 10 might have been from a different geographical location and produced in a different social environment from the others. This does not necessarily mean that the ceramic is 'foreign' to the site, but a non-local provenance is suggested.

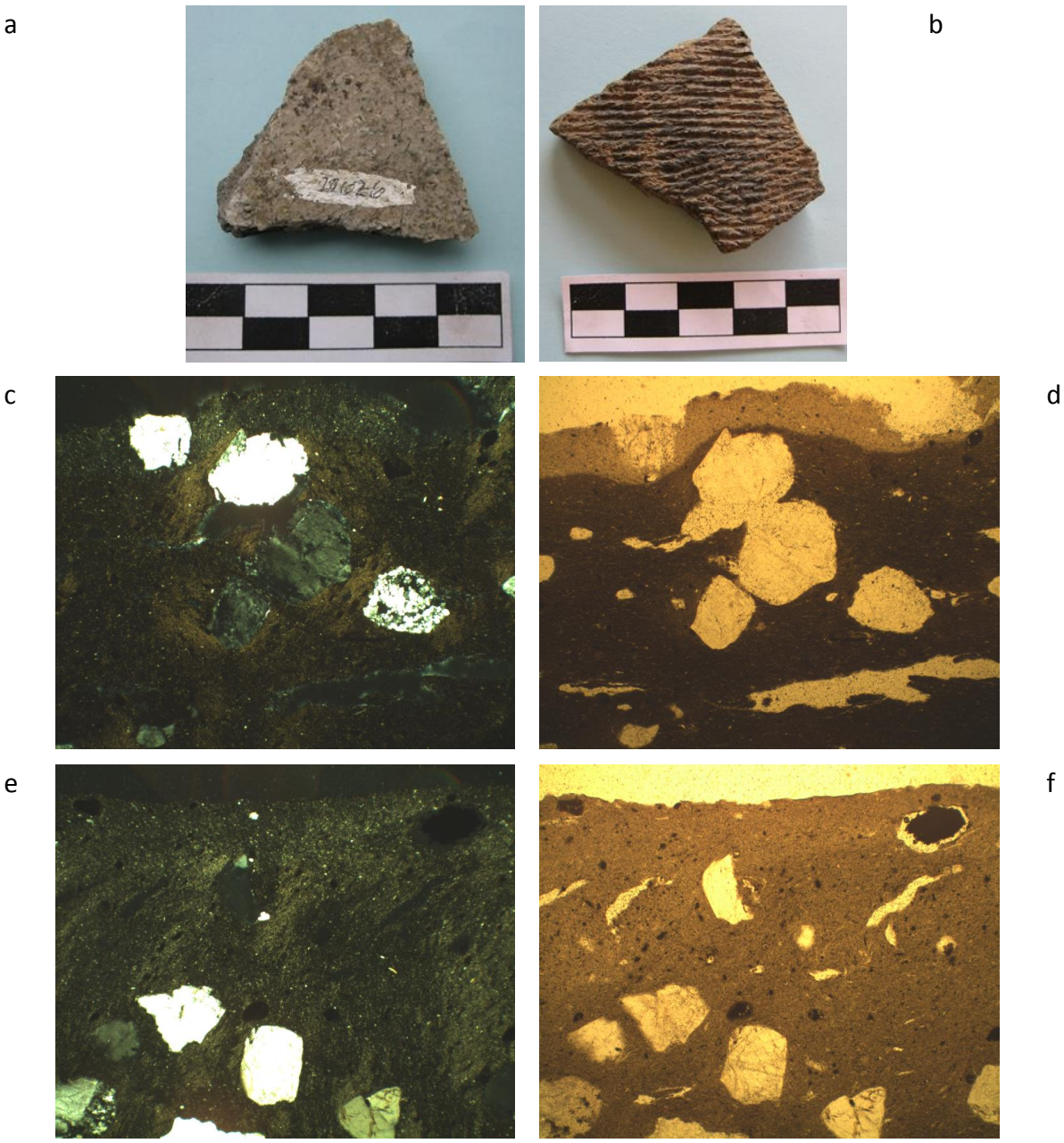


Fig. 25 25a-b samples 043 and 044, image scale = 0-5cm, 25c-d sample 043, 25e-f sample 044. Samples 043 and 044 appear different in macroscopic inspection, but show similarities in thin section. Both have very fine clay without mineral inclusions, dominant coarse sand sized quartz temper and shows colour change in exterior margin reflecting change in oxidisation and reduction environment during the firing process. Dark part of top of micrograph is outside of the sherd. XP/PPL. Image width = 2.9 mm

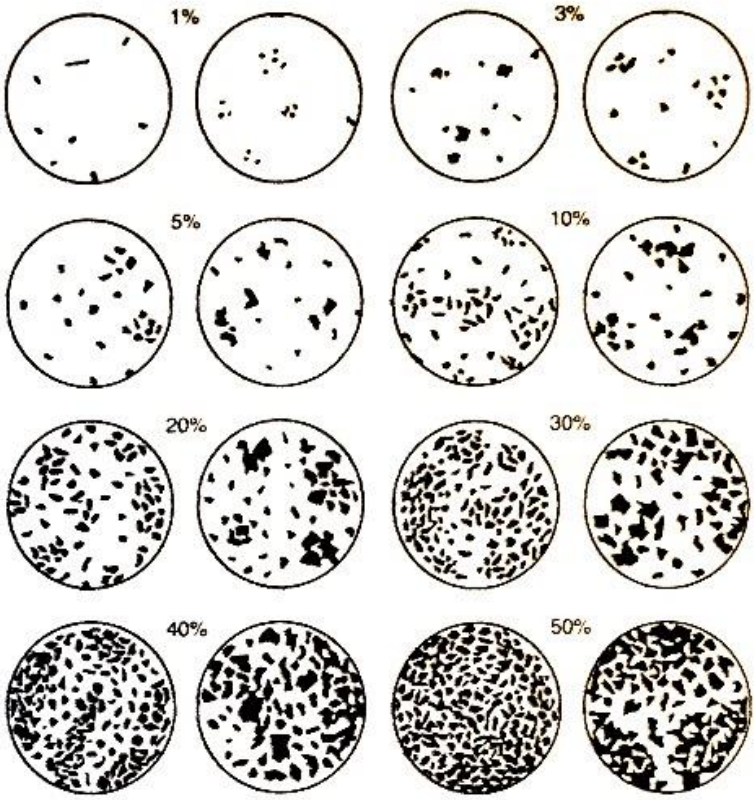
C.4 Closing remarks

The objectives of this petrographic study were to examine the degree of compositional and technological variation between the samples and then classify the samples into fabrics categories. This has contributed towards the classification of sherds into wares, types and subtypes. This analysis has shown that the variation within the samples could be classified into 10 different fabrics based on compositional and technological differences. The samples show that there is a range of related, but not identical, samples. It is likely that a few large groups will be present. Thus, based on the microscopic and macroscopic analysis of the complete Ille assemblage, it is likely that more fabrics can be established through further thin sectioning. The degree to which provenance could be determined is discussed in the results Chapter 6.

Appendix C.i Earthenware sherds from Ille Cave thin sectioned for petrographic analysis

Sample no.	Accession number IV-1998-P-	Context no.	Type no.	Sub-type no.	Ceramic Type	Ware	Fabric
001	36952	897	1	ii	Red-Slipped Decorated	Red	1
002	38063	897	1	vii	Red-Slipped Decorated	Red	1
003	19777b	798	3	ix	Red Ware Plain	Red	2
004	20636	None	6	ii	Carved Paddle (Rice) F9	-	9
005	20050	703	5	iii	Tight Cord Marked F3	-	3
006	42504	1844	6	i	Carved Paddle F4	-	4
007	14398	65	2	-	Grey Cord Marked	Grey	10
008	13899	57	17	i	Brown fabric	-	5
009	14400	65	13	-	Large brown rim	-	4
010	43370	1517	12	i	Pedestal bowl F7	-	7
011	16286	227	7	-	Impressed restricted rim	-	4
012	22062	None	8	i	Incised Triangles F7	-	7
013	21607	None	6	iii	Carved Paddle (White) F8	-	8
014	15753	None	18	-	Buff fabric	-	8
015	16438	80	19	-	Rice temper	-	9
016	20871	None	5	iii	Tight Cord Marked F3	-	3
017	35995	883	7	-	Impressed restricted rim	-	4
018	20627	None	17	ii	Brown fabric	-	4
019	20872	None	5	i	Loose Cord Marked F4	-	4
020	888001	Surface	14	-	Plain restricted rim	-	6
021	888002	Surface	14	-	Plain restricted rim	-	6
022	888003	None	1	vii	Red-Slipped Decorated	Red	1
023	35997	883	1	i	Red-Slipped Decorated	Red	1
024	21692	753	1	i	Red-Slipped Decorated	Red	1
025	27945	897	1	i	Red-Slipped Decorated	Red	1
026	27946	897	1	vii	Red-Slipped Decorated	Red	1
027	43052	1838	2	-	Red Ware Decorated	Red	1
028	43053	1838	1	viii	Red-Slipped Decorated	Red	1
029	16485	301	1	vii	Red-Slipped Decorated	Red	1
030	35900	883	1	i	Red-Slipped Decorated	Red	1
031	18173	None	1	i	Red-Slipped Decorated	Red	1
032	27359	1802	1	i	Red-Slipped Decorated	Red	1
033	888004	None	4	-	Grey Cord Marked	Grey	10
034	14938	None	4	-	Grey Cord Marked	Grey	10
035	18612	None	4	-	Grey Cord Marked	Grey	10
036	20723	None	4	-	Grey Cord Marked	Grey	10
037	20804	189	4	-	Grey Cord Marked	Grey	10
038	41591	1844	4	-	Grey Cord Marked	Grey	10
039	23289	1224	4	-	Grey Cord Marked	Grey	10
040	15995	485	4	-	Grey Cord Marked	Grey	10
041	21730	None	4	-	Grey Cord Marked	Grey	10
042	13983	33	4	-	Grey Cord Marked	Grey	10
043	14650	None	4	-	Grey Cord Marked	Grey	10
044	20626	None	4	-	Grey Cord Marked	Grey	10

Appendix C.ii. Abundance estimation chart used for petrographic analysis and abbreviations



Abundance Estimation Chart (Terry and Chilingar, 1955)

Abbreviations for shape	**Abbreviations for roundness**
eq : equant el : elongate	a : angular sa : sub-angular sr : sub-rounded r : rounded wr : well-rounded
Description of spacing	**Semi-quantitative frequency labels**
Close-spaced : inclusions in contact Single-spaced : spacing = mean diameter Double-spaced : spacing 2 x diameter Open-spaced : spacing > 2 x diameter	Predominant : > 70 % Dominant : 50–70 % Frequent : 30–50 % Common :15 30 % Few : 5 15 % Very few : 2 5 % Rare : 0.5–2 % Very rare : < 0.5 %

Appendix C.iii Images of sherds for thin section – samples 001 to 021

Sample 001, IV-1998-P-36952

Sample 002, IV-1998-P-38063

Sample 003, IV-1998-P-19777b

Sample 004, IV-1998-P-20636

Sample 005, IV-1998-P-20050

Sample 006, IV-1998-P-42504

Sample 007, IV-1998-P-14398

Sample 008, IV-1998-P-13899

Sample 009, IV-1998-P-14400

Sample 010, IV-1998-P-43370

Sample 011, IV-1998-P-16286

Sample 012, IV-1998-P-22062

Image scale = 0-5 cm

Sample 013, IV-1998-P-21607

Sample 014, IV-1998-P-15753

Sample 015, IV-1998-P-16438

Sample 016, IV-1998-P-20871

Sample 017, IV-1998-P-35995

Sample 018, IV-1998-P-20627

Sample 019, IV-1998-P-20872

Sample 020, IV-1998-P-888001

Sample 021, IV-1998-P-888002

Image scale = 0-5 cm

Appendix C.iv Images of Red Ware sherds for thin section – samples 023 to 032

Sample 022, IV-1998-P-888003

Sample 023, IV-1998-P-35997

Sample 024, IV-1998-P-21692

Sample 025, IV-1998-P-27945

Sample 026, IV-1998-P-27946

Sample 027, IV-1998-P-43052

Sample 028, IV-1998-P-43053

Sample 029, IV-1998-P-16485

Sample 030, IV-1998-P-35900

Sample 031, IV-1998-P-18173

Sample 032, IV-1998-P-27359

Image scale = 0-5 cm

Appendix C.v Images of Grey Ware sherds for thin section – samples 033 to 044

Sample 033, IV-1998-P-888004

Sample 034, IV-1998-P-14938

Sample 035, IV-1998-P-18612

Sample 036, IV-1998-P-20723

Sample 037, IV-1998-P-20804

Sample 038, IV-1998-P-41591

Sample 039, IV-1998-P-23289

Sample 040, IV-1998-P-15995

Sample 041, IV-1998-P-21730

Sample 042, IV-1998-P-13983

Sample 043, IV-1998-P-14650

Sample 044, IV-1998-P-20626

Image scale = 0-5 cm

(All images and photomicrographs: Y. Balbaligo)

Appendix D. Report on the Rice Tempered Ceramic from Ille Cave

D.1 Background

Earthenware ceramics with plant impressions on exterior and interior surfaces have been excavated at Ille Cave in the Dewil Valley, Palawan. These have been identified as rice hulls from the characteristic microtubule impressions made by rice husks (Carlos 2006). These samples were not found in a secure context. Samples were selected and examined by macroscopic analysis and stereomicroscope, and two samples 004 and 015, were analysed further by Scanning Electron Microscopy (SEM), thin section petrography and dating by Accelerator Mass Spectrometry (AMS) and Optically Stimulated Luminescence (OSL) at the Oxford Radiocarbon Accelerator Unit (ORAU), University of Oxford. This resulted in the total destruction of the two samples.

D.2 Purpose

The objectives of the rice temper study were threefold; firstly, to determine what kind of plant materials were present in the earthenware sherds and to identify their components. Secondly, to assess the process of temper preparation as part of the ceramic *chaîne opératoire*. This contributes to the understanding of technological variation, ceramic learning traditions and the communities of practice at Ille Cave. Thirdly, to examine whether rice agriculture was present in the Dewil Valley and in what period.

D.3 Methodology

At least 22 earthenware sherds were identified as having plant impressions, of which 10 were available for macroscopic analysis and 2 sherds were available for thin sectioning, spectroscopy and dating (table D.1). Plant components from the impressions were identified and compared to reference materials in the Archaeobotanical Laboratory, Institute of Archaeology, UCL. Fig. 1 shows a schematic diagram with components of rice plant *Oryza sativa*. Comparisons to this diagram provide an understanding of what parts of the plant were used and how they might have been processed. The sampling strategy and a detailed methodology for the macroscopic analysis, microscopy (stereomicroscope and SEM), thin section petrography, AMS and OSL are discussed in the methodology Chapter 5.

The prevalence and study of rice temper in Southeast Asia is discussed in the Chapter 2. Ten petrographic fabrics have been established in the Ille assemblage from a sample of 44 thin sections (see Appendix C Petrography Report). The rice tempered sherds are characterised as 'Fabric 9: Rice temper fabric' and are typologised in two categories; 'Subtype 6ii: Carved Paddle (Rice) F9' and 'Potential type 19: Undecorated rice temper fabric'. The results of the macroscopic analysis and ceramic typology are presented in the Results Chapter 6 and discussion and interpretations are presented for Discussion in Chapter 7. The following report provides the results of the rice temper in thin section, microscopy and dating.

#	Accession number IV-P-1998	ORAU sample number	Trench	Context	Ceramic type	Analysis				
						Macro-scopic	Thin section	Stereo-microscope	SEM	Dating
1	14025	-	East	Wall scrapping	19 Undecorated	✓	-	✓	-	-
2	15988	-	East	Unknown	6ii Carved Paddle	-	-	-	-	-
3	17796	-	East	Unknown	19 Undecorated	-	-	-	-	-
4	17797	-	West	Unknown	19 Undecorated	-	-	-	-	-
5	16437	-	West	80	19 Undecorated	-	-	-	-	-
6	16438	P31,038	East	80	19 Undecorated	✓	✓	✓	✓	✓
7	18327	-	East	Unknown	19 Undecorated	-	-	-	-	-
8	14733	-	East	Burial 17	19 Undecorated	-	-	-	-	-
9	14114	-	East	Disturbed layer	6ii Carved Paddle	✓	-	✓	-	-
10	14118	-	East	Disturbed layer	19 Undecorated	-	-	-	-	-
11	18461	-	East	Unknown	19 Undecorated	-	-	-	-	-
12	17129	-	West	Unknown	19 Undecorated	-	-	-	-	-
13	16488	-	East	Burial 79	19 Undecorated	-	-	-	-	-
14	14111	-	East	Treasure hunter's pit	19 Undecorated	-	-	-	-	-
15	20383	-	West	Surface	19 Undecorated	-	-	-	-	-
16	24508	-	East	1214	19 Undecorated	✓	-	-	-	-
17	14651	-	East	Unknown	6ii Carved Paddle	✓	-	-	-	-
18	20635	-	East	Unknown	6ii Carved Paddle	✓	-	-	-	-
19	20636	P31,037	East	Unknown	6ii Carved Paddle	✓	✓	✓	✓	✓
20	20637	-	East	Unknown	6ii Carved Paddle	✓	-	-	-	-
21	21720	-	East	Unknown	6ii Carved Paddle	✓	-	-	-	-
22	21728	-	East	Unknown	6ii Carved Paddle	✓	-	-	-	-

Table D.1 Earthenware sherds with plant impressions from Ille Cave and method of analysis

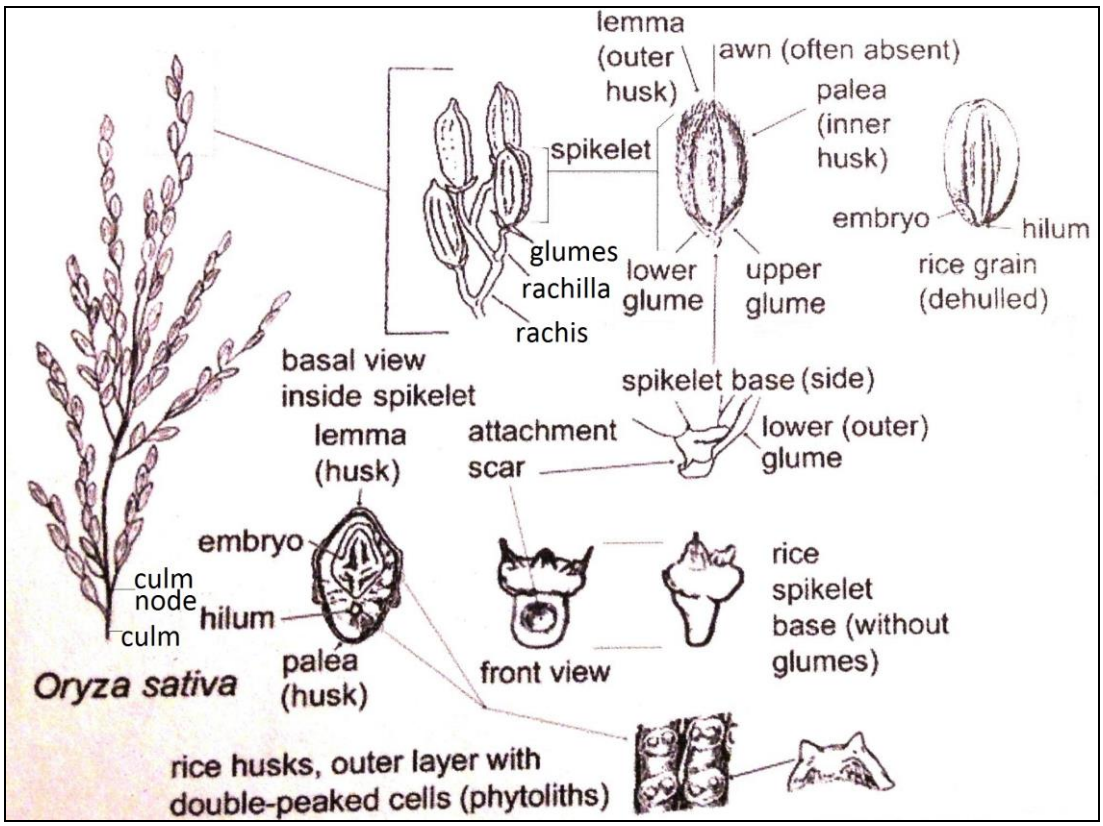


Fig. 1 Schematic diagram showing morphological components of rice plant *Oryza sativa* (image: courtesy of D. Fuller)

D.4 Microscopy analysis

In macroscopic analysis, plant impressions have been found on undecorated and carved paddled impressed ceramics. In microscopic analysis, figs. 2, 3 and 4 show the surface of three sherds magnified by stereomicroscope. The surfaces of samples 004 (IV-1998-P-20636, fig. 2) and 015 (IV-1998-P-16438, fig. 3) show an abundance of plant impressions with a frequency of 25-30%. The plant impressions were closed to single spaced and moderately to poorly sorted with some impressions occurring together in clusters. Examination by stereomicroscope showed that two elements from the impressions could be identified. Figs. 2c, 3c and 4c show clear microtubercle impressions of husk which has a distinctive and diagnostic checkerboard pattern. Other impressions show linear venations which may be from straw. Fig. 3d shows a close up of venations from a plant imprint. Sherd IV-1998-P-14025 (fig. 4) shows the only example of a rounded outline of an intact spikelet base with an impression of the lower glume and microtubercle (fig. 4c). Other husk impressions in the assemblage

show broken husks and microtubercles. Spikelet bases, glumes and apexes are not evident.

The components of the rice plant identified using SEM are the husk, culm (with culm nodes), awn, rachis and leaf/blade (lamina). These terms refer to the morphological parts of the plant (*cf*. diagram in fig. 1). No caryopses (grain) were evident in the sherds. The majority of the plant components present in the sherd are the husk and the culm. In agricultural terms, the husk is the chaff which refers to the shell of the separated rice spikelet and the culm refers to the straw (stem), therefore, the ceramics are chaff and straw tempered. Sample 004 (carved paddle) has more chaff impressions, while sample 015 (undecorated) has more straw impressions.

SEM results show husk impressions (fig. 5) with the diagnostic outer layer of phytoliths, the double-peaked cells of *Oryza*, which are only found in the rice genus and thus identifying it as rice (Harvey and Fuller 2005; Terrell *et al.* 2001). Specifically, the impressions are the *Oryza cf. sativa* variety which is a domesticated rice crop (D. Fuller pers. comm. 2010). The rice chaff shows the epidermis with evident silicified tubercles but the spikelet base, glumes and apex are not present. It is unknown whether they were broken off during preparation or are still present in the sherd but not taken by the cast (*cf*. fig. 4 sherd IV-1998-P-14025 with glumes present). Figs. 5a and 5c show the husks have been cut or broken and appear in different sizes, in poorly mixed clusters but oriented in the same direction. Figs. 5b and 5d show a sample of *Oryza sativa* L., modern reference material of unhulled whole spikelet of an intact rice grain (USDAARS P1584566 from Bhutan, local variety name Phudugey) for comparison with figs. 5a and 5b at common scale. This unequivocally determines the inclusions as rice husks.

Fig. 2 Sample 004, IV-1998-P-20636, 'Type 6, subtype 6ii: Carved Paddle (Rice) F9'.
Figs. 2a-b Exterior and interior surfaces of intact earthenware sherd in hand specimen before analysis. Image scale = 0-5 cm
Fig. 2c Impressions of husk and culm from interior surface. Top centre (arrow) highlights clear large husk impression of microtubercle surrounded by husk and straw impressions

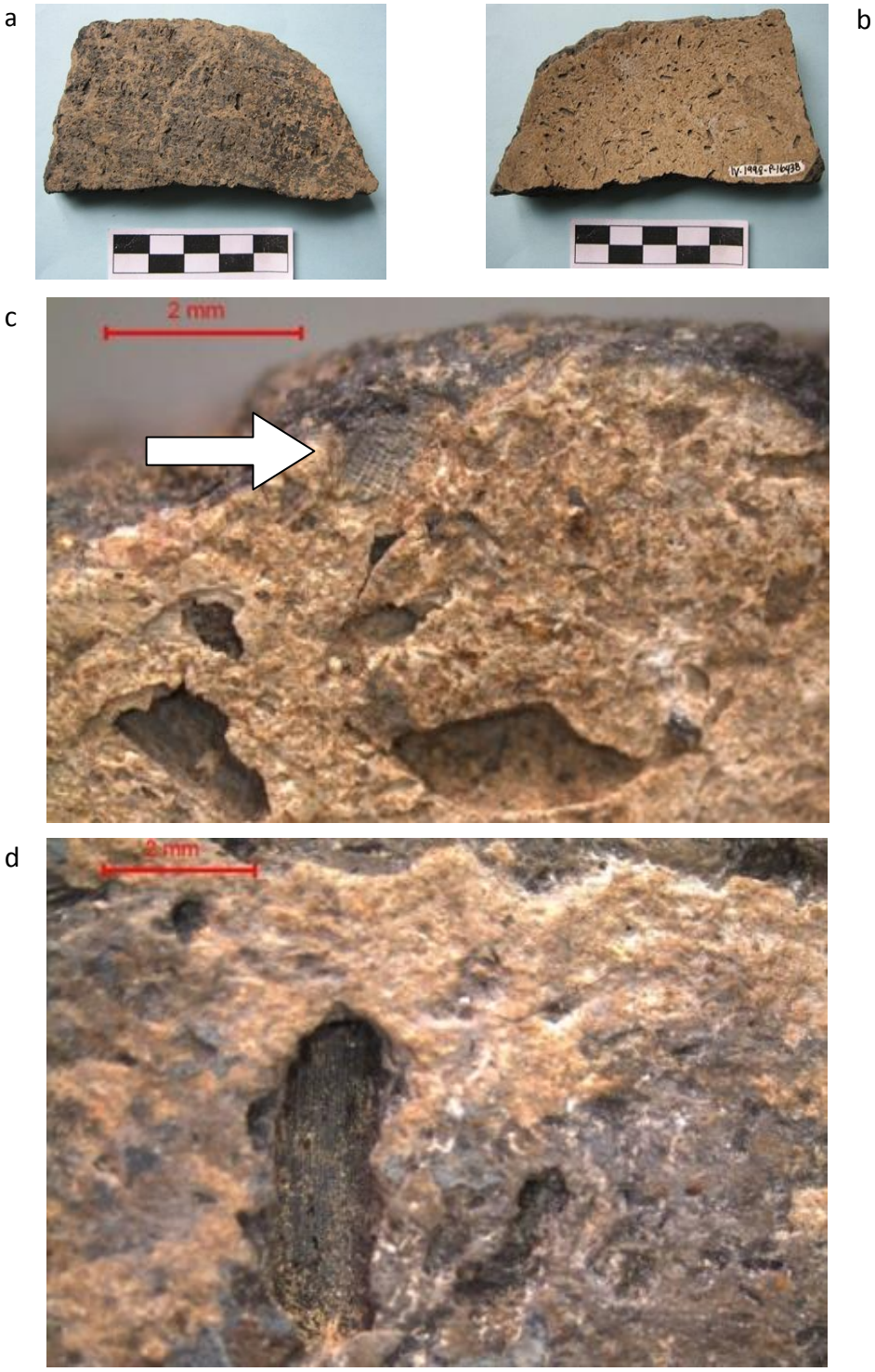


Fig. 3 Sample 015, IV-1998-P-16438, 'Potential ceramic type 19: Rice temper undecorated'.

Figs. 3a-b Exterior and interior surfaces of intact earthenware sherd in hand specimen before analysis. Image scale = 0-5 cm

Fig. 3c Plant impressions from interior surface. Top centre (arrow) shows husk impression surrounded by culm or leaves.

Fig. 3d Venations of culm or leaf

Fig. 4 IV-1998-P-14025, 'Potential ceramic type 19: Rice temper undecorated'.

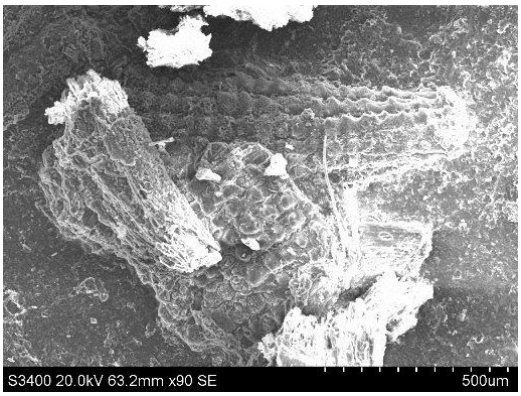
Figs. 4a-b Exterior and interior surfaces of intact earthenware sherd in hand specimen (no further analysis undertaken). Image scale = 0-5 cm

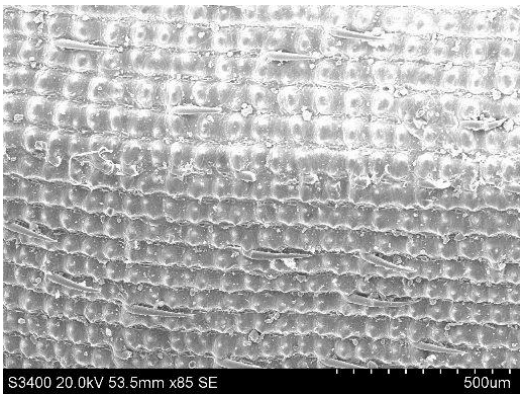
Fig. 4b Interior surface with post depositional cluster of what might be salt.

Fig. 4c Chaff showing microtubercle impression from interior surface. This sherd shows the only example of a rounded outline of an intact spikelet base with an impression of the lower glume and microtubercle

The culm or straw impressions are hollow and curved (figs. 6a and 6b), possibly from drying. Fig. 6a shows a culm node, the point at which two successive internodes meet. The culm is different lengths depending on where it was cut or broken during the preparation process. Different sizes depend on which part of the plant it was taken from. The examples of culm occur with other plant components such as the rachis and awn which are structurally the same as culm but from different parts of the plant (see figs. 6b, 6e and 6f and compare with fig. 1). The rachis (main axis or stem) which holds the spikelets is thinner and smaller than the culm. Fig. 7a shows the venations of rachis that have been cut and is flattened and ribbed while fig. 7b shows modern reference material of a leaf rachis from *O. Sativa* subspecies *indica* (collected in Orissa, India) at a common scale. Figs. 7c and 7e show a straight awn, a fibrous outgrowth of the flower. Unlike the culm or rachis, the awn has hairs, as found in domesticated rice. However, all the observed elements in SEM lacked hairs. This may be due to preservation as the hairs are single cells and are not robust. Hairs are visible in the modern reference samples (figs. 7d and 7f, awn origin unknown). Figs 6c and 6d show the leaves/blades (lamina) of the plant. Venations are clear and are tightly packed together. The leaf is flat and has a bigger surface area than the culm, rachis and awn.

a





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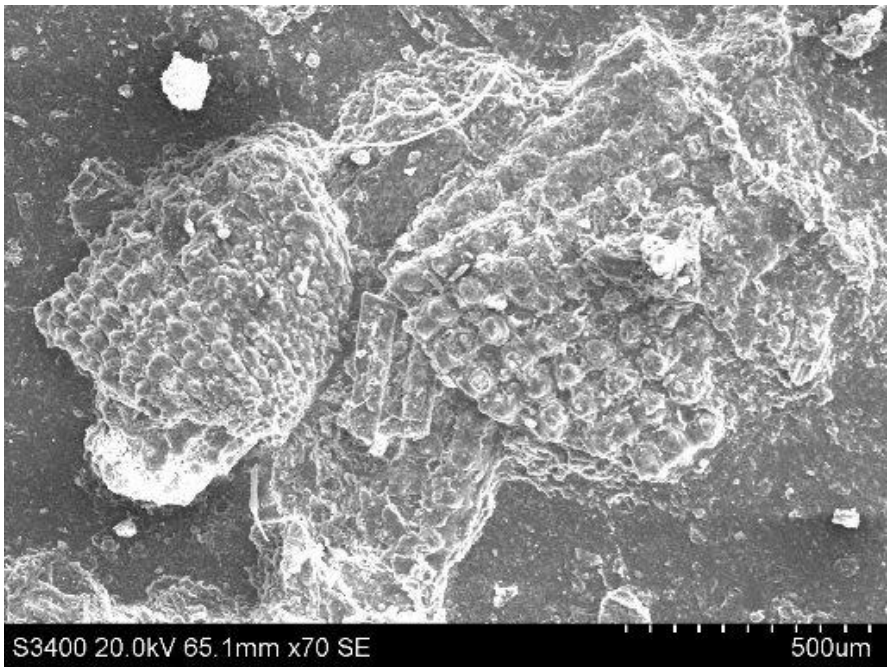

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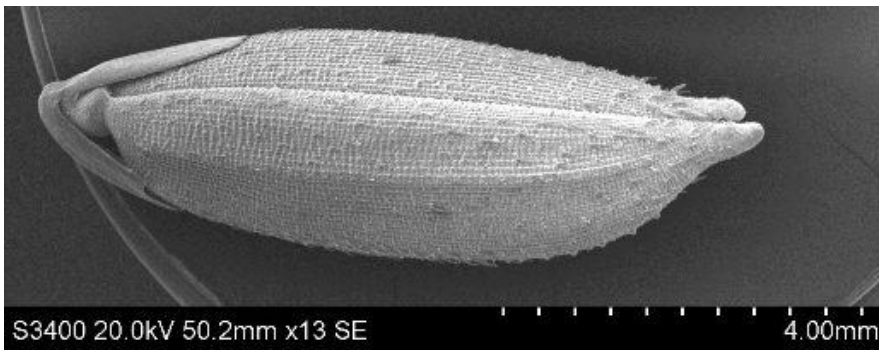


Fig. 5 Sample 004, IV-1998-P-20636 and modern reference material.

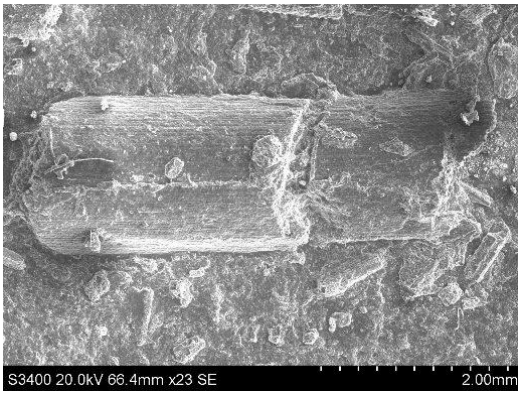
Fig. 5a Cluster of chaff impressions from sample 004.

Fig 5b. Modern reference material of *Oryza sativa* L. Figs. 5a-b At common scale for comparison.

Fig 5c. Cluster of chaff impressions from sample 004.

Fig. 5d Modern reference material of *Oryza sativa* L. Unhulled whole spikelet of an intact rice grain (USDAARS P1584566 from Bhutan, local variety name Phudugey)

a



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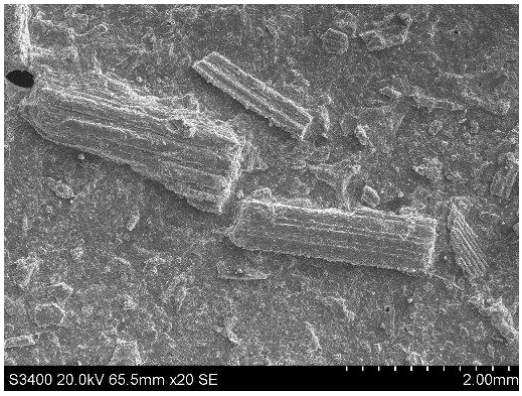

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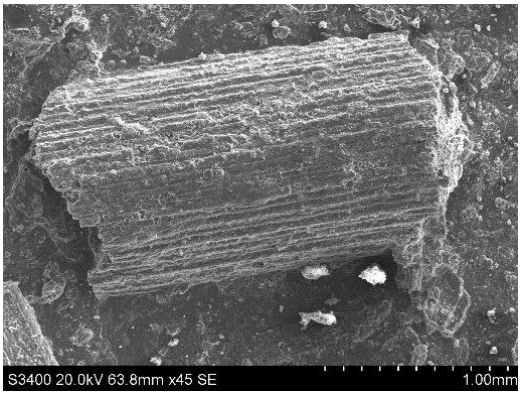

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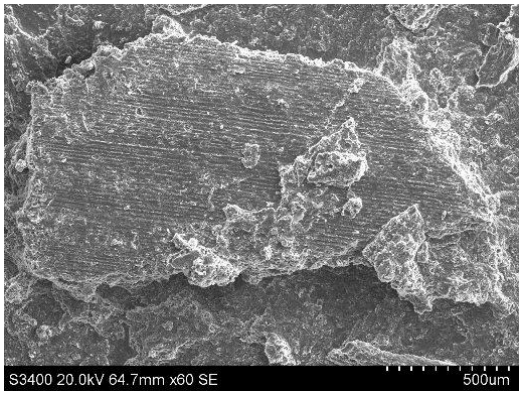

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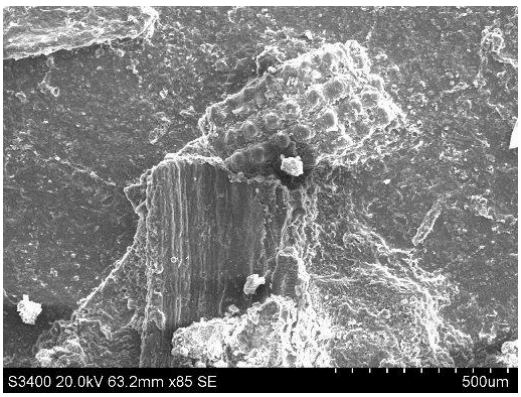

f

Fig. 6 Sample 004, IV-1998-P-20636 and 015, IV-1998-P-16438.

Fig. 6a Impression of culm with culm node sample 015.

Fig. 6b Impression of culm, rachis and leaves sample 015. Clean breakages across the short axis of the plant indicating they may have been intentionally cut with an implement.

Figs. 6c-d Impression of leaf/blade sample 015.

Figs. 6e-f Impression of cluster of husk, culm and leaf sample 004

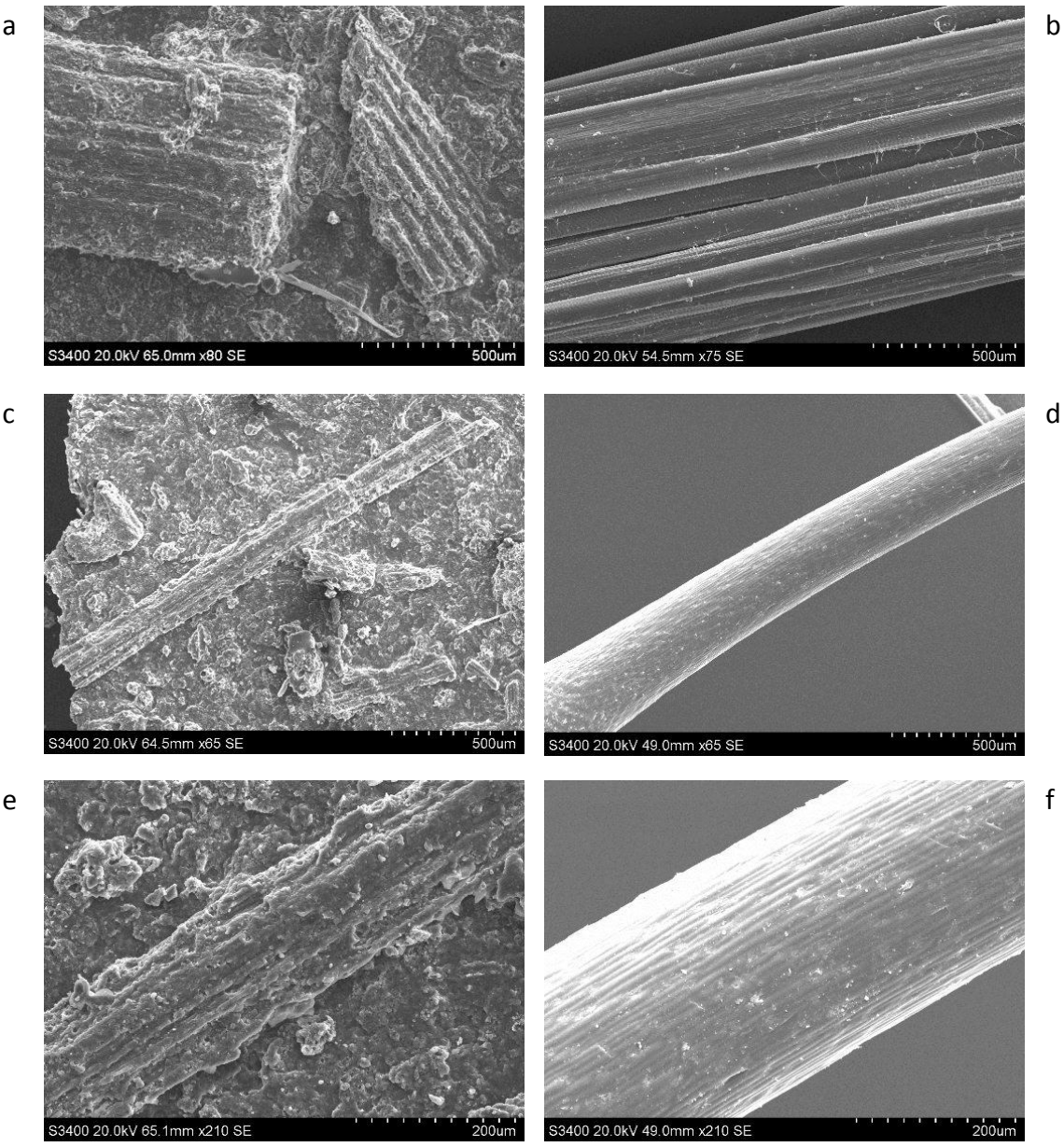

Fig. 7 Sample 004, IV-1998-P-20636, sample 015, IV-1998-P-16438 and modern reference materials.

Fig. 7a Impression of rachis sample 015. Clean breakages across the short axis of the plant indicating they may have been intentionally cut with an implement.

Fig. 7b Modern reference material of Leaf rachis from *O. Sativa* subspecies *indica* (collected in Orissa, India). Figs. 7a-b At common scale for comparison.

Fig. 7c Impression of an awn sample 015.

Fig. 7d Modern reference material of an awn, origin unknown. Figs. 7c-d At common scale for comparison.

Fig. 7e Impression of an awn sample 015.

Fig. 7f Modern reference material of an awn (from the UCL Archaeobotany reference collection, geographic origin unknown). Modern sample shows hair bases.

Figs. 7e-f At common scale for comparison

D.5 Thin section analysis

Although plant impressions were evident on the exterior and interior surfaces of the earthenware ceramics, thin section petrography was used to test whether the plant remains were consistent throughout the sherd to ascertain whether it was temper and not just material deposited on the surfaces. Ten petrographic fabrics have been established in the Ille assemblage from a sample of 44 thin sections (see Appendix C Petrography Report). The thin section analysis of two samples 004 and 015, showed that the fabric was distinctive and compositionally and technologically different from the nine other fabrics in the assemblage. This fabric was classified as 'Fabric 9: Rice temper fabric'. The paste was made of very fine clay without diagnostic mineral and rock inclusions apart from very few coarse sand sized monocrystalline and polycrystalline quartz inclusions and weathered feldspar which were sub-angular and sub-rounded, rare medium sand sized quartz and frequent fine sand sized quartz inclusions, iron oxides and opaques which were naturally occurring inclusions in the clay and not added temper (see Abundance Estimation Chart in Appendix C Petrography Report). The matrix is dark brown to black in cross polarised light (XPL), brown to grey in plain polarised light (PPL at x40). Samples were optically active. Despite the clay being very fine without mineral inclusions apart from coarse quartz and feldspar grains, there is no evidence of sieving or levigation.

The thin sections show that the paste was prepared by the addition of rice temper which measured between 0.05-0.1 cm occurring in abundance throughout the sherds. The temper is fabric following (i.e. strongly aligned to margins of samples), the distribution was unimodal and poorly to moderately sorted. Straw components are visible length ways (figs. 8c-d, 9a-b and 9c-d). Assuming the chaff is unmodified, some parts of the chaff are flat and some parts are very steeply angled and show two small ridges which are double peaked cells, most visible in the curled husk (fig. 8e-f shown by arrows). The curls in the chaff may be due to the fact that once it dried it becomes fragmentary causing the chaff to curl.

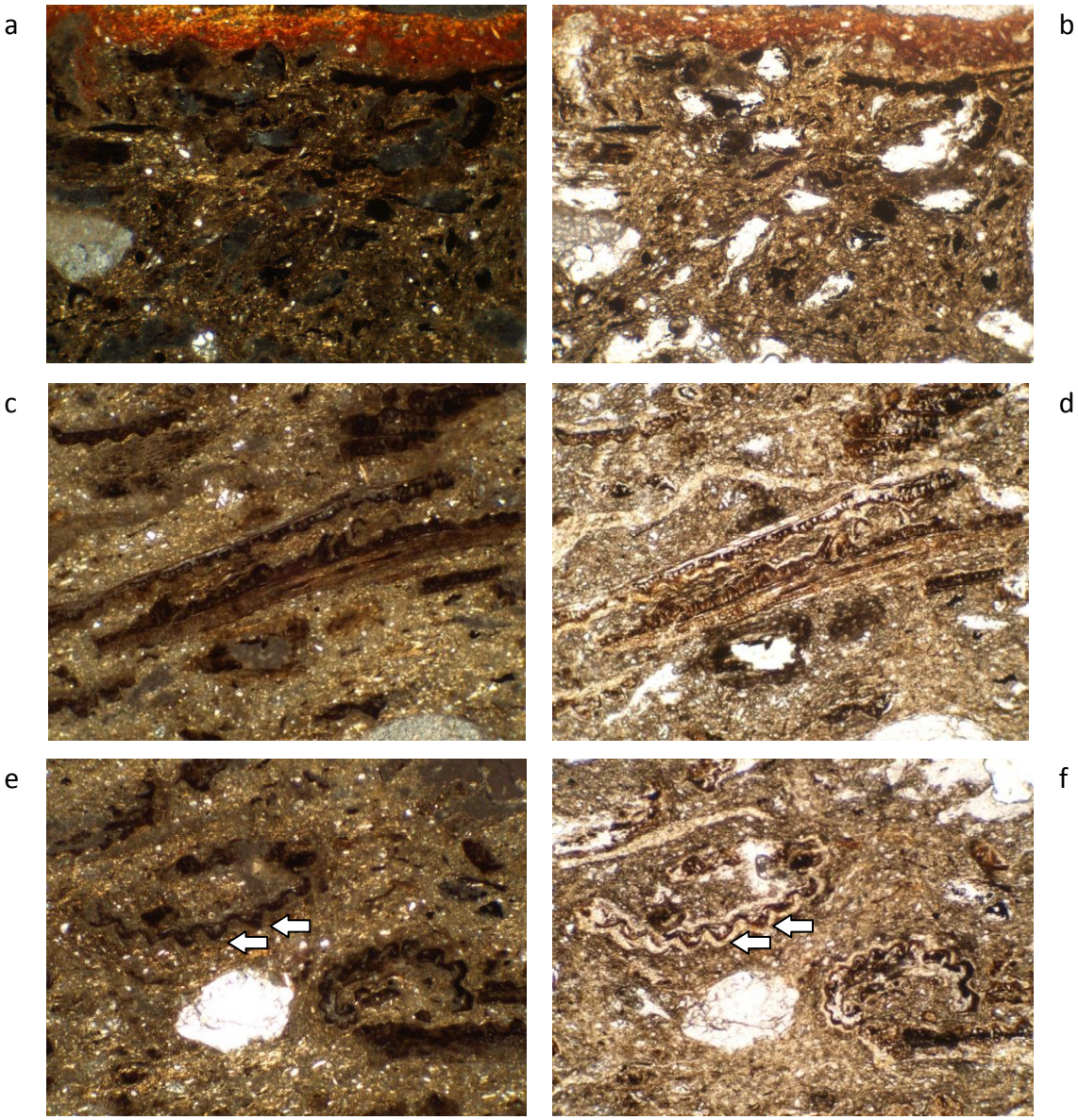

Fig. 8 Sample 004, IV-1998-P-20636 in thin section (XP/PPL).

Figs. 8a-b Outer exterior of sherd which has oxidised to a red colour (not slipped). Very fine clay without coarse mineral inclusions except quartz and dominant rice temper.

Figs. 8c-d Straw component appears long and relatively flat.

Figs. 8e-f Chaff appears curved. Arrows highlights small ridges which are double peaked cells of *Oryza* which are only found in the rice genus. Image width = 1.45 mm

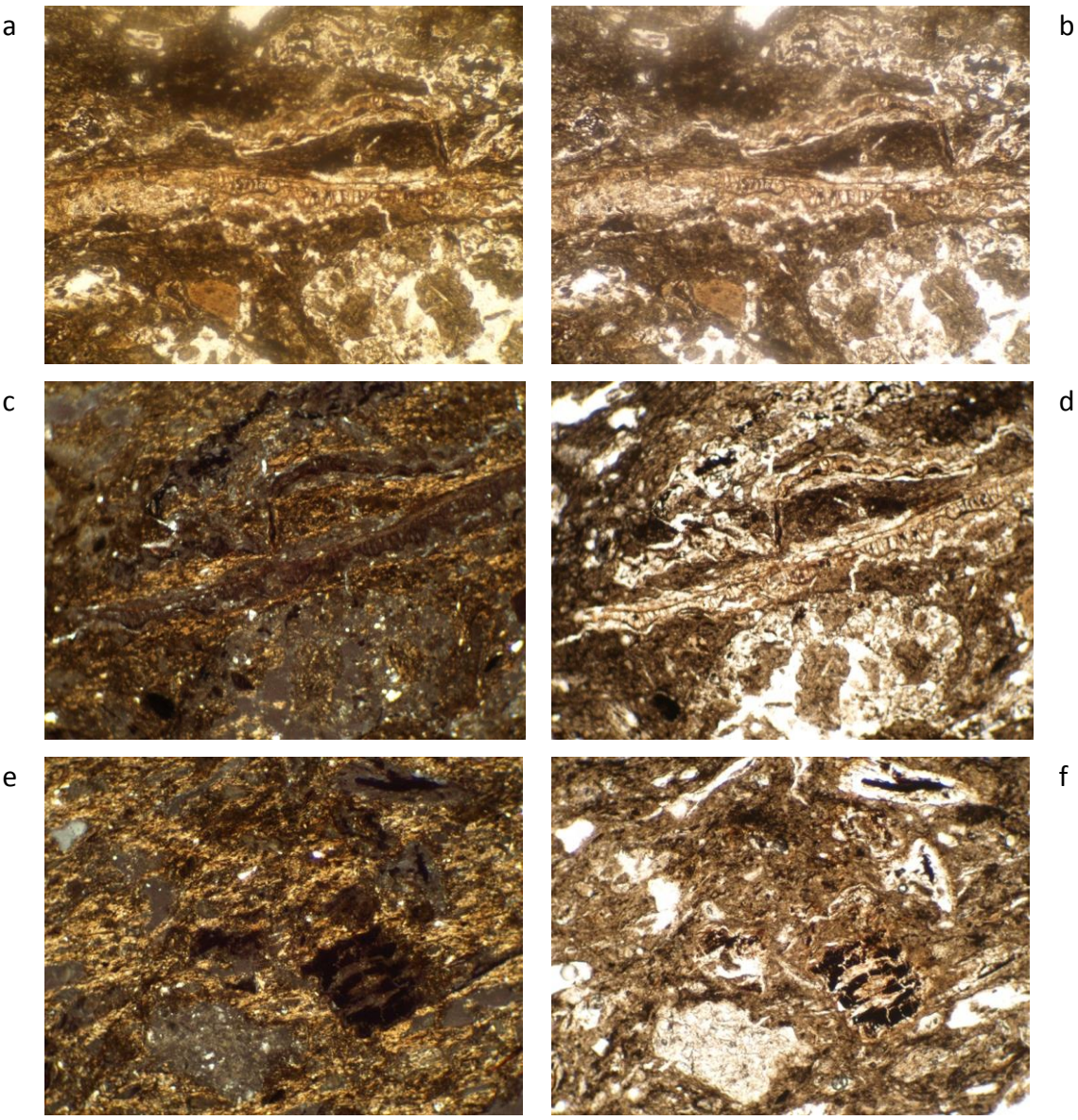

Fig. 9 Sample 015, IV-1998-P-16438 in thin section (XP/PPL).

Figs. 9a-b and 9c-d Very fine clay without coarse mineral inclusions and dominant rice temper. Straw component appears long and relatively flat.

Figs. 9e-f Coarse plant material. Possibly leaf. Image width = 1.45 mm

While both the samples have rice temper, there are differences between samples 004 and 015. Sample 004 is tempered predominantly with the chaff component of the rice plant while sample 015 has predominantly straw temper with fewer chaff grains. The plant matter has been partially destroyed during the firing process leaving carbonised remains and distinctive pseudomorphs which are casts of the original rice temper at 10-15% in the thin section. This increases the percentage of voids in the samples. There are also voids around the rice temper where it has shrunk during drying or firing. The voids are fabric following, like the rice temper, meaning it is orientated in the same direction as the rice temper. Sample 015 is more porous than sample 004.

D.6 Dating

Although much of the rice husk temper rice would have been destroyed during the firing process, it is assumed that some of the organic component remained in the clay. The organic component of ceramics tempered with crop-derived material has been used for dating in the past, and have provided a basis for a chronology of early pearl millet cultivation in western Africa (Manning *et al.* 2011), and for the presence of rice in parts of South and Southeast Asia (Bellwood *et al.* 1992). Although it is clear that such dates incorporate old carbon from the clay as well as that from the tempering plant material they still provide dates within a few centuries of the actual age (Higham *et al.* 2009; Manning *et al*. 2011).

The two samples 004 and 015 were submitted for AMS and OSL to the Oxford Radiocarbon Accelerator Unit, University of Oxford. However, these attempts at dating the rice-tempered sherds were unsuccessful. The samples produced no yield of carbon that could be AMS radiocarbon dated. No signal could be detected for OSL dating.

Appendix E. Harris matrix analysis

E.1 Introduction

This appendix presents the Harris matrices of the East and West mouth trenches. The matrices were constructed to assess the degree to which stratigraphy could be used to develop a chronology of the ceramics at the site, to establish if the ceramics were associated with other material culture and understand how ceramics were associated with burials. The phasing is based on the stratigraphy but not cultural meaning or association. It was clear during the excavations that the site was disturbed. This was especially evident in the upper phases of the site which comprised the cemetery. Therefore, it was unlikely that a clear pottery sequence linked to site chronology could be established. However, this proposition needed to be tested and the extent the site was disturbed needed to be examined. It was essential to understand the contexts and relationships even if the site was disturbed. As stated in the methodology, at the start of this PhD research, the matrices were not available and only became available from Palawan Island Prehistory Research Project (PIPRP) in the later stages of research. To date, the Harris matrices created by the project are not complete and await further work. The Harris matrices in this section were created by the author based on the Project's Harris matrix and are correct and fit for purpose. Any errata are the responsibility of the author and will be corrected by the Project Team.

Overall, the Harris matrices cannot be used on their own to determine a ceramic chronology due to the turbation and disturbed nature of the site which prevents a clear pottery sequence from being established. Furthermore, the ceramics do not show clear associations with other material culture or the burials (see Appendix F Context Register).

However, the Harris matrix could be divided into phases to enable analysis of the ceramic assemblage within that phase. Contexts with burials containing a skeleton (S),

cut (C) and fill (F) are shown in a cartouche. However, some burials were not given fill or cut numbers and a context number was only given to the skeleton which then included artefacts found in the cut or fill. Almost all of the skeletons were fully articulated but may have had additional unrelated bones as part of the context. While most of the skeletons were relatively complete, their graves did cut through lower graves, and were cut into by higher graves (H. Lewis pers. comm. 2012). This affects the movement of finds. Contexts are grouped together into proposed levels and given 'YB level' numbers (after the author) to separate the contexts and to distinguish original levels established by the Palawan Island Palaeohistoric Research Project (PIPRP). This differentiates levels between these matrices and the overall project matrices. Contexts containing ceramics are shown in red for visual distinction.

E.2 The East Mouth stratigraphy

Analysis of the East mouth was broken down into the following sections:

i. Topsoil and early excavations (Fig. E.2)
ii. Cemetery Phase A (Fig. E.2)
iii. Cemetery Phase B (Fig. E.2)
iv. Cemetery Phase C (Fig. E.3)
v. Cemetery Phase D (Fig. E.3)
vi. Shell middens and hearth layers (Fig. E.4)
vii. Clay and Gravel (Fig. E.4)

Figs. E.2 and E.3 show the topsoil and cemetery phases and fig. E.4 and E.5 shows the shell midden, hearths and clays and gravel phases dating from *c.*5000-14,000 cal BP ([3713-3797 to 14,868-15,215 BC] fig. E.1). Ceramics are found in these phases but are likely to be intrusive.

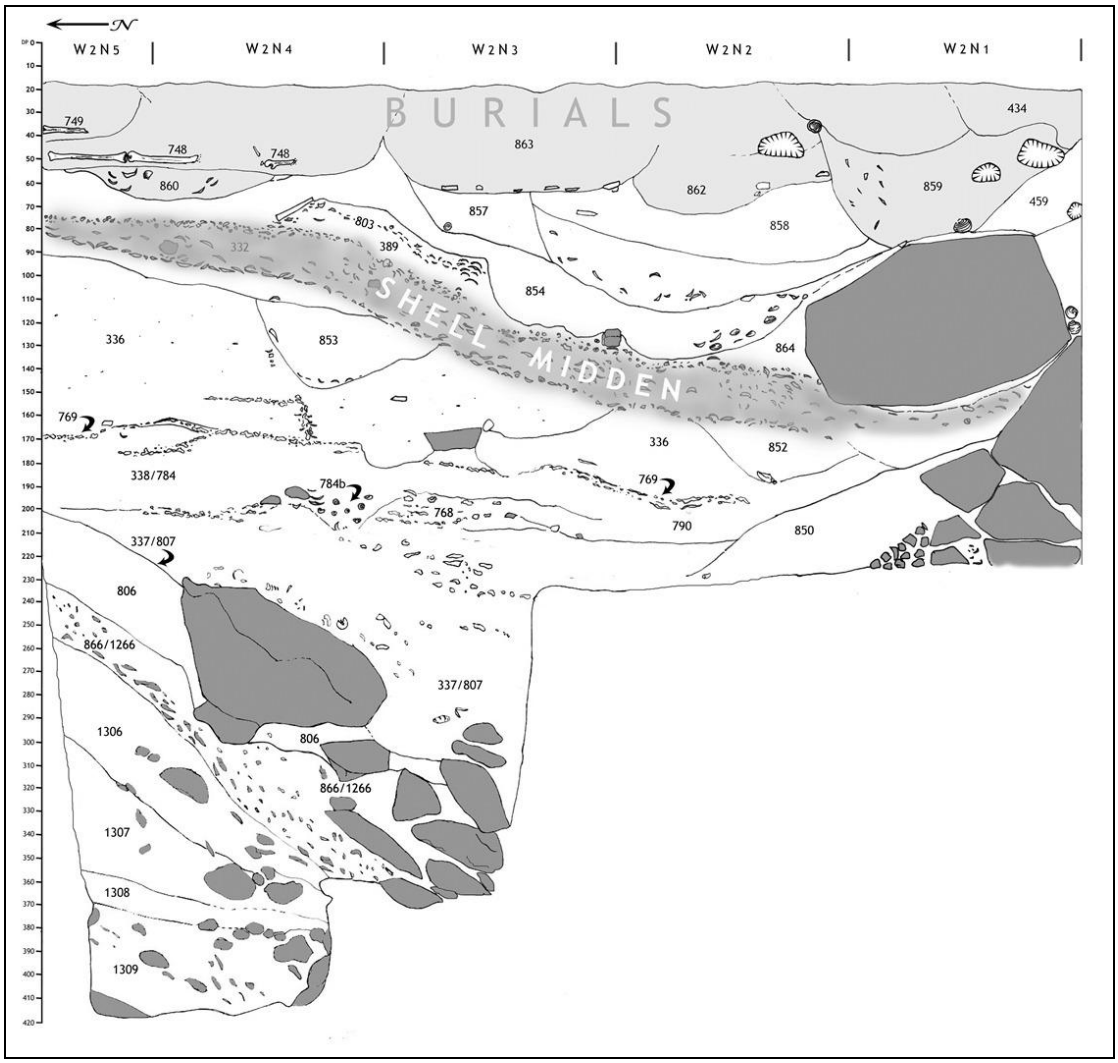

Fig. E.1 West-facing section through the East mouth main trench with burial cemetery in the top layers (image: courtesy of T. Vitales, after V. Paz, H. Lewis and J. Carlos; Lewis *et al.* 2008)

i. Topsoil

In the first four years of excavation from 1998 to 2002, and before the construction of a Harris matrix and the use of single context recording, survey and surface collections took place and the site was excavated to a depth of less than *c.*30 cm in the East mouth. Earthenware pottery types and high-fired ceramics were noted but not recorded as part of the original sample. The ceramic types found in the silty topsoil and in the surface excavations were the same ceramic types found in the lower depths and across the disturbed cemetery. At least 1248 earthenware sherds were found in this phase (see Appendix F Context Register for ceramic quantities per context). These included undecorated Red Ware (Type 3) and red-slipped decorated with c stamps and

white infill (Type 1), grey cord marked (Type 4), various carved paddle impressed sherds (Type 6) including white slipped (Subtype 6iii) and rice tempered (Subtype 6ii), incised triangles (Type 8), pedestal bowls (Type 12), undecorated rice temper sherds (Potential Type 19), restricted (Type 14) and unrestricted rims (Type 15), carinations and a variety of decorated body sherds (Decorated: No Type) and undecorated body sherds (Category 20), especially brown fabric (Type 17). High-fired sherds including stoneware, celadon and porcelain were also found in the topsoil phase. Other finds in this phase included human and animal bone fragments and teeth, shell fragments, a chert flake, metal including copper alloy, iron and other unidentified metal fragments. A range of personal adornments including a metal ring, a green nephrite lingling-o, shell bangle fragment including a *Tridacna* shell bangle fragment, shell beads and Indo-Pacific beads were found. However, the ceramics cannot be associated with finds from this phase.

ii. Cemetery Phase A

Excavations using single context recording commenced from 2004. The upper and chronologically youngest layers in both the East and West mouths comprise a series of late prehistoric and protohistoric burials which form the cemetery, and pits, truncating other late sedimentary layers (Piper *et al*. 2011: 144; H. Lewis pers. comm. 2012). At least 1673 earthenware sherds were recorded by 2008 but this number is a minimum as ceramics from some contexts were not recorded (see Appendix F Context Register). The majority were undecorated body sherds (Category 20) and restricted and unrestricted rim sherds (Types 14 and 15). However, not all these sherds were marked with a context but were excavated from this phase. Ceramic types that occur in this phase include 1, 2, 3, 4, 5, 7, 8, 9, 19 (see table E.1, cemetery Phase A). No pattern of deposition is discernible in the distribution of these types.

The pottery types found in the surface layers are consistent with all pottery types found across the cemetery and in the lower phases and, therefore, show how disturbed the site is. In the silt layers beneath the surface layer and above the cemetery, there were large amounts of earthenware and high-fired pottery including tradeware and, therefore, not clearly connected with burials. Hundreds of

undecorated sherds were found in contexts 903=1224 (context 903 is equal to context 1224; 1701 earthenware sherds; YB level 2) and 904=1226 (549 earthenware sherds; YB level 2) and may have formed whole vessels but full reconstructions were not carried out due to time constraints. These layers included stoneware, celadon, porcelain which is to be expected. The earliest stoneware has been tentatively dated to tenth century AD trade with China (Paz and Ronquillo 2004). However, all high-fired ceramics require further investigation. Other finds include a one peso coin dated to 1994 AD (context 1224; YB level 2) and various iron fragments. Large amounts of shell, glass and carnelian beads were present in the fill but it is difficult to know whether they were part of the burials unless directly associated with the skeleton.

Phase A contains the most burials in the East mouth cemetery and there are at least 21 distinct burials (Paz and Ronquillo 2004; ASP 2005-2006; ASP 2007; Paz *et al*. 2008; Paz *et al*. 2009; Paz *et al*. 2010). In many instances, where ceramics were found in a burial and given the same context number as the skeleton, it is likely that the ceramic was part of the fill and not directly associated with the skeleton as a grave good. Furthermore, some cut numbers have pottery which is an error of recording. All the pottery found in the burial contexts occurs in the fill and not with the skeleton, therefore, they were not part of the sealed burial. The same ceramic types occur in both the burial fills and in the non-burial contexts in Phase A. Furthermore, there is no discernible distinction between the pottery types between the burials. Pottery occurs in the burial contexts through disturbance and redepositing and not documented to be through actual placement.

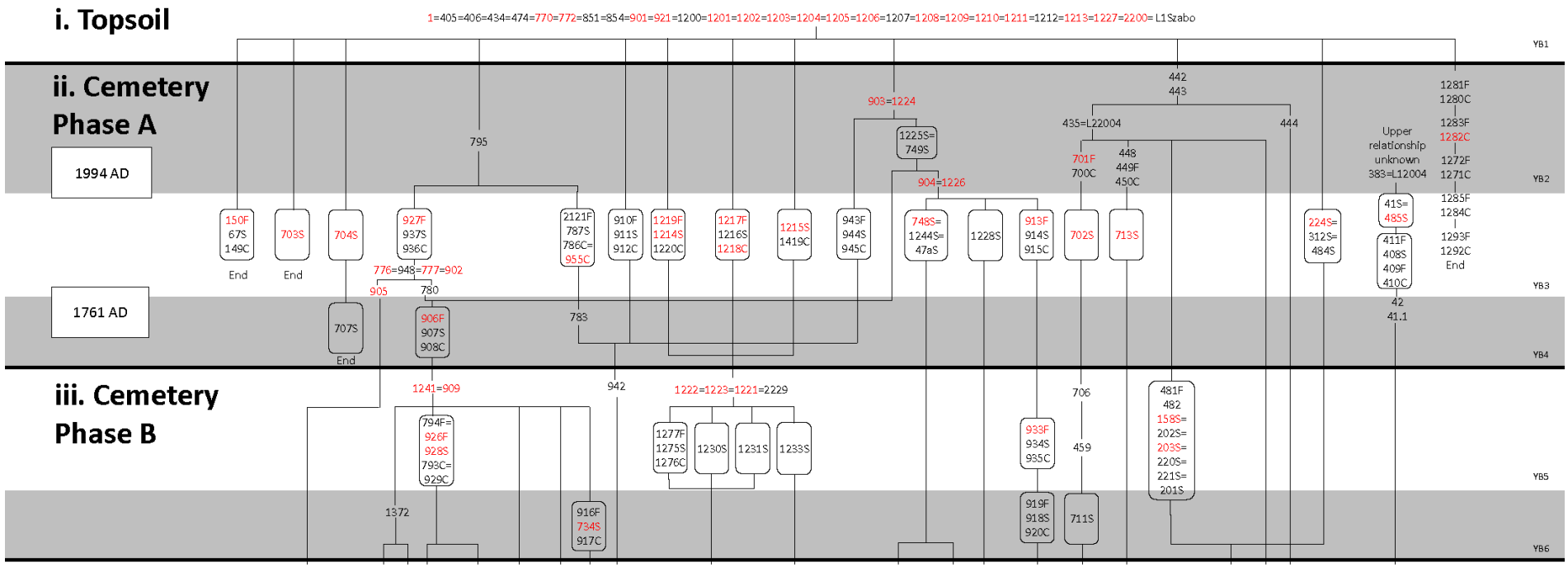

Fig. E.2 East mouth, Topsoil, Cemetery Phase A and Cemetery Phase B

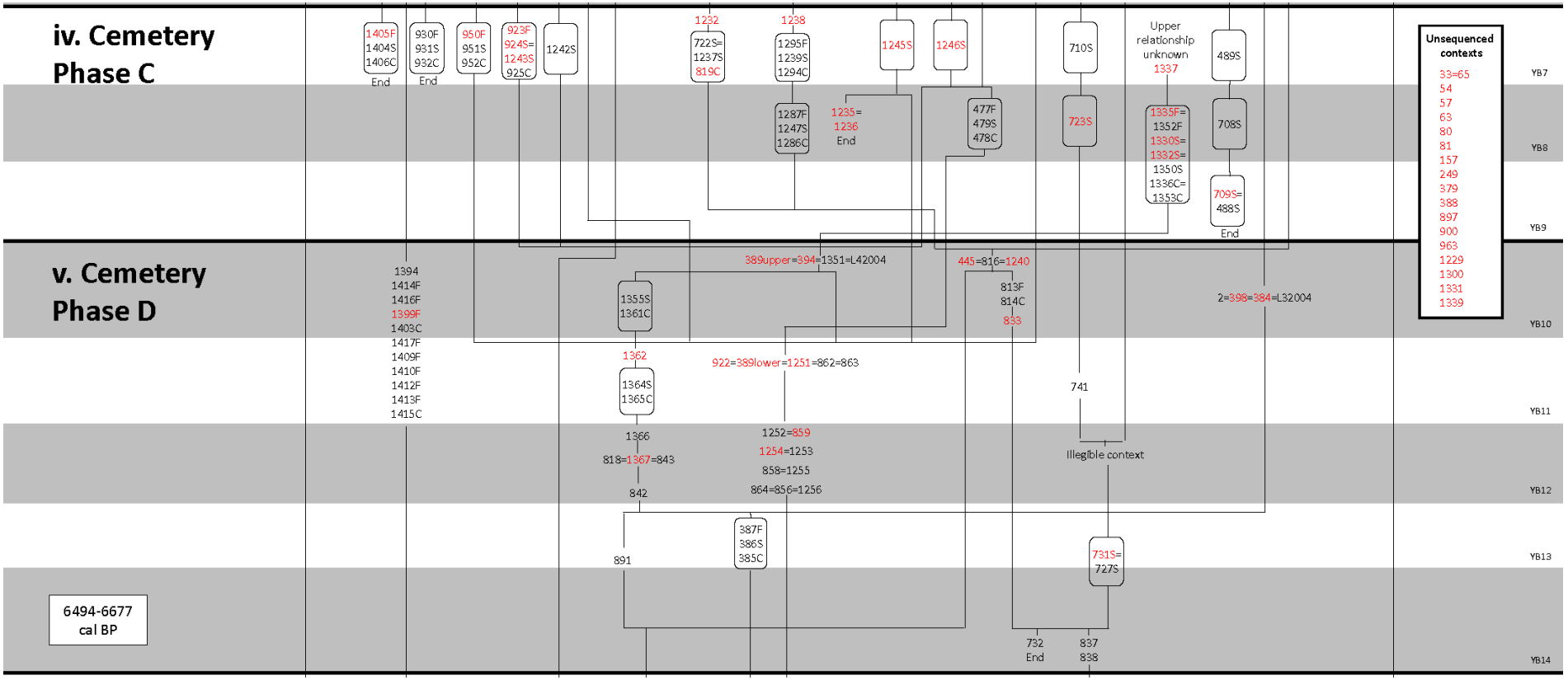

Fig. E.3 East mouth, Cemetery Phase C and Cemetery Phase D

Only one context in Phase A had a definite grave good which could be associated with the burial. Burial 713S (YB level 3) had a copper alloy ring on one of the left proximal phalanx bone. This burial contained one undecorated sherd. Other contexts had items which could constitute personal adornment. However, they cannot be associated with certainty. For example, burials 748S and 914S (YB levels 25 and 3 respectively) had 2 blue beads and shell beads in the fill, but unless they were directly associated with the skeleton (which some were), caution must be exercised. Burial 748S (YB level 3) included a Spanish coin dating to the year 1761 AD. Again, it is unknown whether this coin is directly associated with the skeleton and the context is, therefore, datable. Undecorated sherds were also found in this context.

Other contexts had artefacts which could be construed as grave goods but again cannot be associated with certainty. For example, 1216S (YB level 3) had a piece of knapped green chert under the left femur, a fractured pebble by left arm, and a large *Melo* shell fragment near right upper thigh/pelvis. The pottery in the fill is undecorated with one rice tempered sherd (Potential Type 19). Context 1214S (YB level 3) had an iron fragment, pig incisor, one fragment of burnt animal bone, shells, lithics and the pottery in the fill was a rice tempered body sherd. Context 907S (YB level 4) had frequent broken shells, occasional angular limestone, charcoal fragments, and a flat rectangular iron artefact, with undecorated and stoneware sherds. Although these artefacts were placed directly in association with the skeleton, it is difficult to assess whether they were burial goods and for what purpose.

There were unsequenced contexts in the upper layers from cleaning of walls or poorly recorded contexts. The pottery found included a number of grey cord marked (Type 4) and brown cord marked sherds (Type 5), carved paddle (Type 6), Red Ware including foot rims and c stamped (Types 1, 2 and 3), incised triangle (Type 8), and undecorated (Category 20) and decorated rims with decorated lips (Type 7) and rice temper (Potential Type 19). The ceramic types in these unsequenced contexts were the same types as those found in the surface layers, and are all consistent with pottery types found across the cemetery and in the lower phases.

All the pottery in Phase A and the unsequenced contexts are all consistent with pottery found across the cemetery and in lower layers showing how disturbed the site is. Grey Ware, Red Ware and decorated sherds and undecorated sherds were the most commonly occurring. These types are found in the non-burial layers as well as in the fill of burials, but are not associated with the burials. The vessels were not clearly interred as grave goods, they are not burial jars nor are they likely to be ritually broken as this practice is not found in the area (*cf*. the Niah Caves, Cole 2012). The frequency and quantities of the ceramics suggest that it is most likely that the earthenware pottery and high-fired ceramics, possibly tradeware, were used in this phase of the cemetery.

iii. Cemetery Phase B

A silt layer, interpreted as a period non-burial activity, separated the burials in Phase A from Phase B. The silt layers show that there was a clear passage of time between burials. However, it is unknown how long this passage of time was. This phase contained fewer earthenware sherds (at least 901 were studied here). The earthenware is mostly undecorated (Category 20) with grey cord marked (Type 4) and decorated body sherds (see table E.2, ceramic Phase B). The silt layers contain only few fragments of stoneware, celadon and porcelain. Silt layer 1241=909 (YB level 5) between burials contained 466 earthenware sherds as well as lithic flakes and core, metal fragments, animal bones and shell beads.

There were 10 burials excavated in Phase B (by 2010), fewer than in Phase A. Unlike Phases A and C, very few burials in Phase B have pottery inclusions. Only four burials have earthenware. Contexts from 481F (YB level 5) contains a large amount of undecorated sherds (Category 20) and few grey cord marked (Type 4) and brown cord marked sherds (Type 5). The pottery types are the same as in the phases above and below. As mentioned above, types such as grey cord marked (Type 4) were found in the silt layers of Phase B and in the burial fill of 158S (Phase B; YB level 5) as well as burial fills and other non-burial layers across the cemetery. Although the grey cord marked sherds are found in burial 702S (YB level 3) in Phase A and 158S (YB level 5) in Phase B it also occurs in the silt layers, therefore, it is unlikely that this type is related to any burials. Although 158S and 203S (YB level 5) have a large amount of

undecorated sherds (245 sherds) it is possible that there are whole vessels in this context but full reconstructions were not carried out due to time. Types that were identified were consistent within the entire assemblage and also found in the lower layers. No high-fired sherds stoneware or tradeware were found in the burials but only in the silt deposits. However, more high-fired sherds occur in Phases C and D below Phase B showing how disturbed the site is.

As with Phase A, grave goods are scant. Where shell beads occur in burial fills such as 794F and 916F (YB levels 5 and 6), it is hard to associate them directly with any burial. The majority of the burials are North-South orientated, however, Phase B has one of two East-West orientated burials 918S (YB level 6); however, there is no pottery in the burial fill and although it has few shells, no burial goods were recorded. It is likely that the ceramics occur mainly in Phase A and possibly in Phase B, however, there is less pottery in this phase. No pattern of deposition is discernible through the distribution of these types.

iv. Cemetery Phase C

A thin silt layer separates Phase B from C. This phase contains more burials (17) and ceramics are found in 8 of the burials in this phase. The number of earthenware sherds decreases from the upper phases (at least 630 earthenware sherds were studied) with fewer large clusters of sherds (context 1232 [YB level 7] contains 286 sherds). Grey cord marked (Type 4) is not found in this phase but occurs below in Phase D showing disturbance at the site or might be an error of recording. Again, it is unlikely to be directly associated with the burials. The pottery found in silt layers are the same as pottery found within burials of the upper and lower phases. In this phase, only 6 stoneware sherds are found and no celadon or porcelain, although celadon is found in Phase D. The small quantities of stoneware/tradeware make it unlikely that present or used in this phase and likely to be intrusive. Although stoneware and celadon (but not porcelain) occur in lower levels they too are likely to be intrusive as the site is disturbed.

The majority of the burials do not have clear grave goods and very few burial goods are recorded although there were many finds in grave fills. A context of particular note include burial 722S (YB level 7) which has an iron implement under the arm bone of a juvenile skeleton. This is a clear example of direct association, which is lacking with the ceramics as no ceramics occur on the skeletons. Furthermore, iron fragments, a chert flake and 3 undecorated sherds were found in the burial context but it is unknown whether they were associated with the burial. In burial 1246S (YB level 7), a skeleton lying on its back with arms folded up and hands on chest with its left leg turned over on top of the right, beads and a shell pendant were found in the fill sieving and burial 1237S (YB level 7) had iron implements associated with arm bones and one chert lithic, however, it is unknown whether the lithic was directly associated or intrusive. Although earthenware occurred in these burials with these finds, it is unlikely that they are associated. Some burials had extra comingled human bones (1245S) and crania (489S; both YB level 7) and no grave goods, however, it is unknown whether they were inhumed with the extra bones or whether this happened post-depositionally.

The second East-West orientated burial 931S (no ceramics) like 918S in Phase B does not have any pottery; however, unlike 918S it does have clear burial goods in the form of personal adornment on the body. The skeleton is associated with dozens of tiny Indo-Pacific glass beads (red, yellow, green, blue), gold, shell beads, and six carnelian beads, along with an iron blade; most beads appeared to form a single necklace around neck; shell beads were also found in pairs at regular intervals across and under the torso. This shows that beads were part of burial goods and shell and glass beads together on one burial, along with an iron blade, linking this to the Metal Age. It is likely that the ceramics occur mainly in Phase A and possibly in Phases B and C, despite there being fewer ceramics in Phase B. However, occurrences in lower phases may be due to the nature of disturbance at the site or errors of recording. Finds in the silt layer included shells, pigs tusks, a granitic hammerstone in 1238 and shells, animal and human bones, three *Melo* shell fragments and shell beads in 1232 (both YB level 7).

v. Cemetery Phase D

Phase D is an extremely disturbed layer and some ceramics in these contexts have been labelled incorrectly. As with the other phases, a silt layer separates the burials in Phase C and Phase D. There are at least 407 earthenware sherds studied in this phase. A large cluster of earthenware sherds (242) occurred in silt later 1240 (YB level 10). The pottery in the silt layer is mostly undecorated (Type 20) with Red Ware (Types 1, 2 and 3), grey cord marked (Type 4), brown cord marked (Type 5) and decorated sherds (Decorated: No Type). The types that were identified were consistent with the entire studied assemblage and are the same types as the pottery found within burials of the upper phases. The non-burial layers have very few stoneware and celadon with no porcelain. Finds in the silt layer include frequent shells, animal bones, worked fish vertebra, stray human bones and teeth, shell beads and iron fragments.

Burials at this level do not have pottery or burial goods apart from context 731S=727S (YB levels 13-14) which is the deepest inhumation and the only burial which has a number of burial goods associated directly with the skeleton. These include a large partial *Turbo marmoratus* conch shell placed above the pelvis, a pair of large shell discs in proximity to each of the left and right forearms and a pair of hammerstones to the right, a further single shell disc bead was found near the waist, a group of smaller shell beads and pig tusks. The burial has one standard restricted rim, 3 stoneware and 1 celadon sherd, which are all intrusive. This burial is radiocarbon dated by charcoal to 6494-6677 cal BP ([5469-5485 to 5563-5631 BC] Lewis *et al.* 2008), the terminal Palaeolithic. Fox (1970) finds that shell tools and ornaments in burials were an early phase of the Neolithic in Palawan. However, if this grave is considered Neolithic, it is difficult to demonstrate based on the grave goods, as burials do not always include items representative of a period. This would also mean that there is no demonstrably Neolithic earthenware pottery at the site. Although cord bound paddle impressed pottery is considered Neolithic (Bellwood 1984-85, 2004), this technique is also prevalent throughout the Metal Age (*cf*. the Niah Caves, Cole 2012: 231).

It is extremely unlikely that pottery comes from this layer. The disturbance suggests that this pottery does not occur this early. Below the cemetery, the shell midden and

hearth phases are well dated and demonstrate evidence of habitation and a cremation cemetery. It is unknown whether there was a direct continuation in culture between the cemetery phase and the habitation phase in the mid-Holocene from *c.*5000-7000 cal BP (3713-3797 to 5845-5973 BC). Although pottery occurs in the lower layers these are all disturbed and intrusive in deep pits or rockfall deposits.

Phase	Context	High-fired	T1-3	T4	T5	T6	T7	T8	T9	PT 13	PT 14	PT 15	PT 16	PT 19
i. Topsoil	901	✓												
	1201	✓												
	1202	✓												
	1204	✓												
	1205	✓												
	1208	✓												
	1209	✓		✓										
	1210	✓												
	1211	✓												
	1213	✓												
	None	✓	✓	✓		✓		✓			✓	✓		✓
ii. Cem. Phase A	903	✓		✓										✓
	1224	✓		✓										✓
	904	✓												
	1226	✓												
	150	✓												
	67		✓				✓							
	703		✓		✓			✓						
	704	✓			✓									
	1215	✓												
	913	✓												
	702			✓			✓							
	905	✓	✓											
	485	✓		✓										
	902	✓							✓					
	906	✓												
iii. Cem. Phase B	1241	✓												
	1222	✓												
	1221	✓												
	909			✓										
	158			✓	✓									
iv. Cem. Phase C	924	✓												
	1243	✓												
	1232								✓					
	1235	✓												
	1245							✓						
	1246	✓							✓					
	1337	✓							✓					
v. Cem. Phase D	398		✓								✓			
	384	✓												
	833	✓												
	1251	✓		✓										
	1240	✓						✓						
	731	✓									✓			
	859		✓											

Table E.1 List of contexts in the East mouth from Topsoil and cemetery Phases A-D with ceramics broken down by Type and Potential Type

vi. Shell midden and vii Hearth phases

122 earthenware sherds were found in the shell midden and 129 earthenware sherds, along with small amounts of stoneware and celadon in the hearth phase. Significantly more pottery was found in contexts 337 and 748a (YB level 25) than in other contexts in the lower shell and hearth layers. The pottery types found are red-slipped decorated (Type 1), other decorated sherds with the majority being undecorated body sherds (see tables E.2 and E.3). Metal has also been found has been found in context 333 (YB level 21). However, this layer has a radiocarbon date from charcoal which ranges from 9480-9696 cal BP (8747-8810 to 9182-9240 BC). Other contexts that contain ceramics such as 336=947, 784, 807 (YB levels 23, 26, 27 respectively) have radiocarbon dates. This is the early Holocene *c.*9000-11,000 cal BP (8233-8269 to 10,781-10,986 BC) in Southeast Asia and, therefore, the pottery and metal cannot come from this context. These ceramics are clearly intrusive which shows evidence of disturbance.

Layers below the cemetery have radiocarbon dates which anchor the stratigraphy to a numerical chronology. The shell midden dates to the mid-Holocene *c.*5000-7000 cal BP (3713-3797 to 5845-5973 BC) while the hearth layers date to the early Holocene *c.*9000-11,000 cal BP (8233-8269 to 10,781-10,986 BC). There are no pre-Neolithic pottery sites in the Philippines and the evidence from Ille Cave suggest that no pre-Neolithic earthenware will be found at Ille.

Hearth and activity contexts comprise a sloping 60 to 100 cm thick unit of burnt deposits in clayey silt along with flaked lithics, faunal remains and an early cremation cemetery dated to *c.*9000-9500 cal BP (8233-8269 to 8754-8829 BC) was excavated in the hearth phase and no ceramics were found in these contexts. No earthenware or high-fired ceramics were found in the clay and gravel phases dated to the terminal Pleistocene *c.*11,500-14,000 cal BP (11,334-11,450 to 14,868-15,215 BC). These deposits contained a few stone artefacts, fragments of charred nut and worked chert recovered in association with a substantial anthropic-derived assemblage of burnt and unburnt animal bones (Lewis *et al*. 2008).

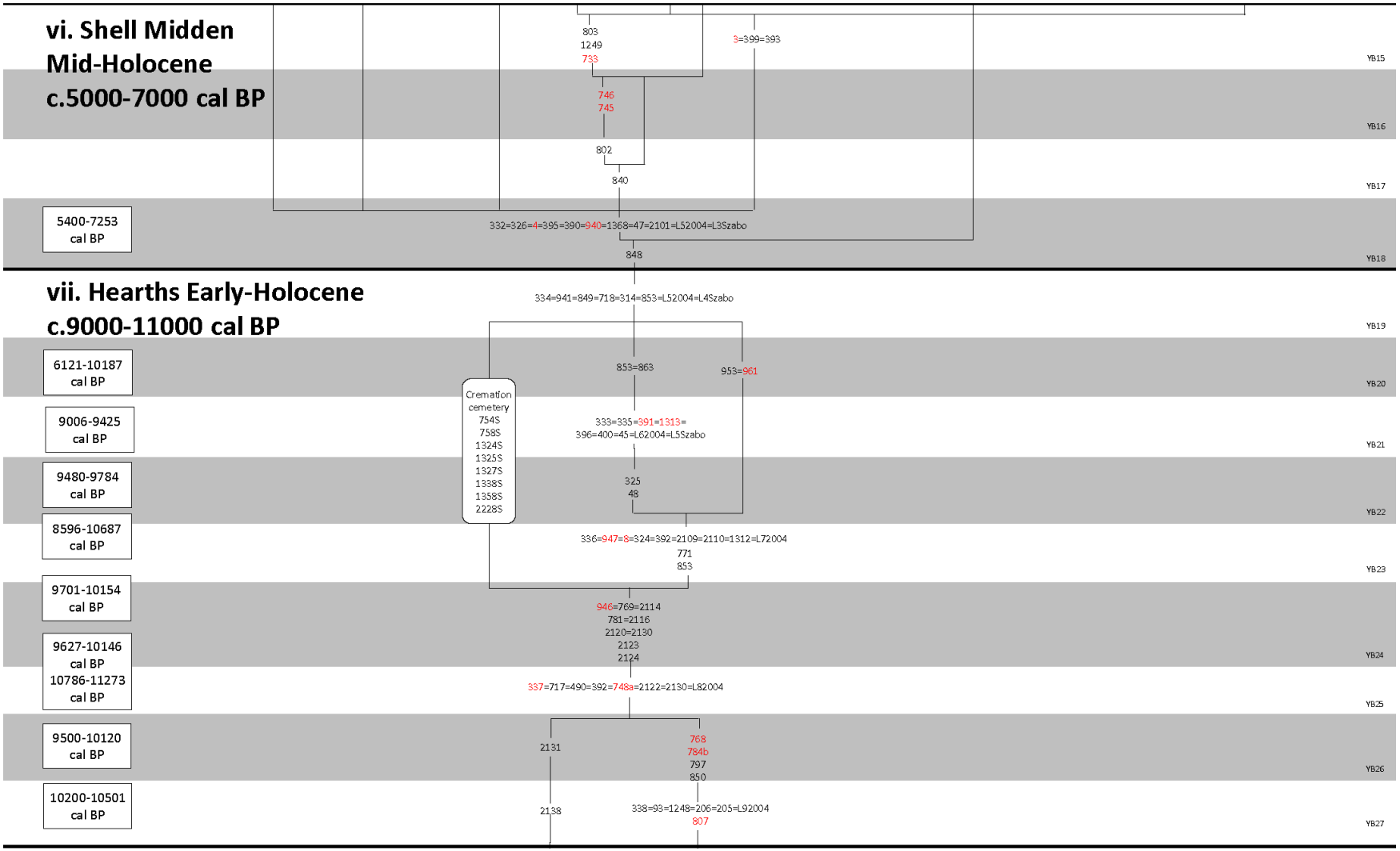

Fig. E.4 East mouth, Shell middens and Hearth layers

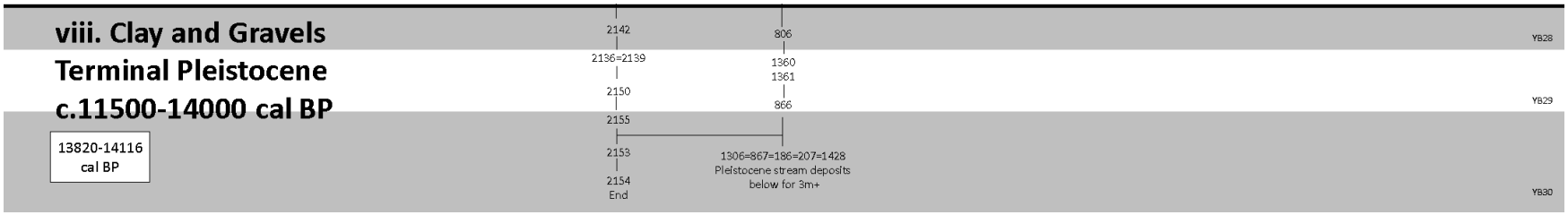

Fig. E.5 East mouth, Clay and Gravels layer

Phase	Context	High-fired	T1-3	T4	T5	T6	T7	T8	T9	PT 13	PT 14	PT 15	PT 16	PT 19
vi. Shell Midden	733	✓												
	745	✓												
	746	✓												
vii. Hearths	394				✓	✓					✓			
	946	✓												
	337		✓		✓									
	768	✓												
Unsequenced contexts	33=65	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	
	54		✓											
	57	✓												
	63						✓							
	80	✓	✓		✓		✓				✓			✓
	81	✓	✓		✓	✓								
	157	✓		✓										
	249		✓								✓			
	379			✓										
	897	✓												
	900	✓												
	1331				✓									

Table E.2 List of contexts in the East mouth from the shell middle, hearths and unsequenced contexts with ceramics broken down by Type and Potential Type

Type 1 Red-Slipped Decorated	Potential Type 13 Large brown rim
Type 2 Red Ware Decorated	Potential Type 14 Restricted rim
Type 3 Red Ware Plain	Potential Type 15 Unrestricted rim
Type 4 Grey Cord Marked	Potential Type 16 Flat triangular rim
Type 5 Bound paddle	Potential Type 19 Rice temper
Type 6 Carved Paddle	
Type 7 Impressed restricted rim	
Type 8 Incised Triangles	
Type 9 Shell impressed	

Table E.3 Ille Ceramic Types for table E.2 above

E.3 The West mouth stratigraphy

The West mouth matrix is divided in to:

i. Topsoil and early excavations (Fig. E.6)

ii. Cemetery Phase (Fig. E.6)

iii. Shell middens Phase (Fig. E.7 and E.8)

iv. Mid-Holocene to Early Pleistocene Phase (Fig. E.9)

The stratigraphy of the West mouth is problematic and needs further work by the Project Team while the trench sequence awaits comprehensive dating. The West mouth trench is significantly different to the East mouth. There are fewer burials, this area of the site slopes, there is considerable rockfall and it contains more deep pits, both natural and through ancient excavation which make it harder to establish any kind of sequence. Because the West mouth is considerably more disturbed, it does not have well-stratified archaeological sequences which have been dated like in the East mouth. This makes it harder to separate the trench into clear and contained phases for analysis. Furthermore, there are errors of recording that contribute to the difficulties in working with the West mouth. There are, however, corresponding layers between the East and West mouths matched by sediment and archaeology. Like the East mouth, it is the lower layers which are better stratified and the upper cemetery is disturbed.

i. Topsoil

The silty topsoil surface layers start from context 1 in the East mouth and correspond to context 18 in the West mouth (H. Lewis pers. comm. 2012). Contexts with pottery are 18=99=705=214=1833 (YB level 1). Types in these contexts include 1, 2, 3, 5, 6, 7, 8, 10, 14 and 15 (see table E.4). Context 705 (YB level 1) contains 483 sherds of which 422 were undecorated comprising body and rim sherds. In the surface layer, stoneware and celadon are only found in context 705. The pottery types found in the surface layers are consistent with all pottery types found in the East and West mouth cemetery and in the lower phases of the West mouth showing how disturbed the site is. In addition to the ceramics, other finds in the surface layers included both univalve and bivalve shells, mammal and reptile animal bones, fish mandible, human bones and teeth, limestone rock debris, animal burrows, mica bead/pendant (705), mica and shell beads and a chert flake. Metal pieces, including iron fragments, are found in the upper layers in contexts 18 and 705. Although few Red Ware sherds occur in the upper layers of the East mouth, more Red Ware is found in the upper layers of the West mouth and throughout all levels of this trench.

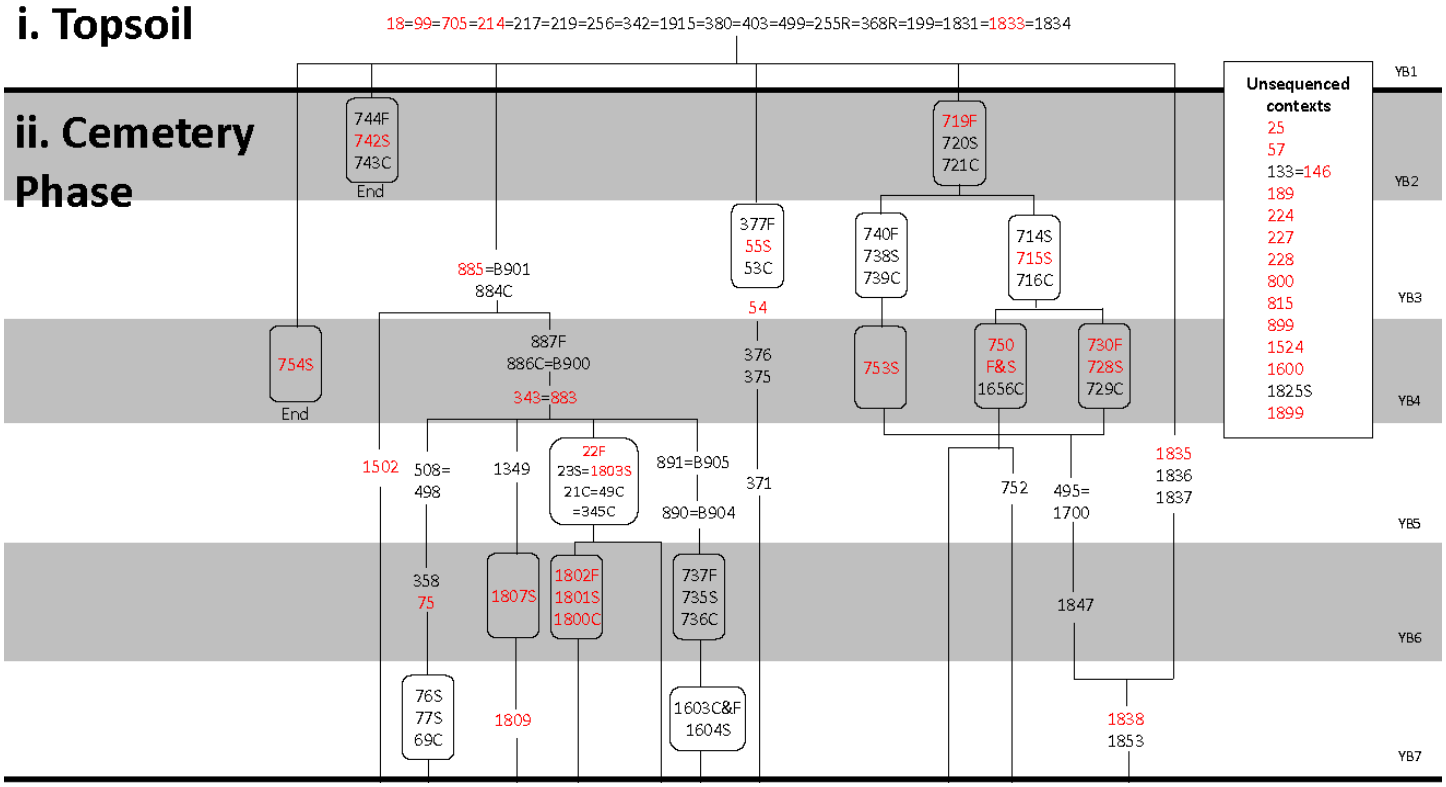

Fig. E.6 West mouth, Topsoil and early excavations and Cemetery Phase

ii. The Cemetery Phase

The West mouth cemetery contained 1526 earthenware sherds and there were fewer burials in the West mouth when compared to the East mouth. While burials in the East mouth cemetery could be divided into four phases, the 16 burials in the West mouth could not be divided into phases. Burials 742S and 719S (YB level 2) were found 6 to 8 cm from the surface. Burial 742S contains 127 earthenware sherds of which the majority undecorated as well as stoneware and porcelain. The types are the same as those seen in the East mouth and throughout the West mouth such as red-slipped incised and impressed with c stamps decorations and white infill (Type 1), cord bound paddled impressed (Type 5), and decorated rims and carinations (Decorated: No Types/Category 20). Earthenware sherds were also found in the fill of burial 720S (YB level 2), however, no quantities or descriptions were recorded. The skeleton in this burial had a copper alloy ring on one of the right proximal phalanx bone which is the only definite grave good which could be associated with a burial. Glass beads pale yellow in colour were also found in the burial context. These finds are similar to those found with burial 713S (YB level 3) in the East mouth which had a copper alloy ring on one of the left proximal phalanx bone and glass and shell beads in the fill. This burial contained one undecorated sherd compared to the large quantity found in West mouth burial 720S. Although 713S and 720S have similar burial assemblage with copper alloy rings directly associated with the skeleton and glass beads in the fill, it is not possible that the burials are related culturally or in time because of the Indo-Pacific glass beads.

Underneath the surface burials, burial 55S (YB level 3) had undecorated sherds but no other information was recorded. 714S and 715S (YB level 3) contain a disarticulated burial with 3 skulls in 715S. 715S contained 48 earthenware sherds of which the majority were undecorated. The types were the same as those seen in the East mouth and throughout the West mouth such as red-slipped incised and impressed with c stamps decorations and white infill (Type 1) as well as one celadon sherd. This layer also contained a pit of loose greyish brown silt with small amounts of undecorated sherds, human bones and shells (context 885; YB level 3).

Another burial of note is 77S=76S (YB level 7) which is a juvenile skeleton oriented East-West. It is the only East-West orientated burial found in the West mouth so far and one of three East-West burials at the site to date, with the other two being adult burials 918S and 931S in the East mouth. None of the East-West burials contain any ceramics, however, while 918S (no ceramics) did not have any clear burial goods, like 931S (no ceramics), 77S=76S (YB level 20) contained an Indo-Pacific bead bracelet, clearly a trade item.

The rest of the burials with pottery in the fill are the same types found across the whole site and the undecorated sherds always outnumber the decorated sherds (see table E.4). Most noticeably there was a large concentration of red-slipped incised and impressed sherds with c stamps decorations and white infill (Type 1) with different part of the vessel present other than the mouth and foot rims that were more common in the East mouth. These red-slipped sherds occurred in the fill of burials but also occurred in non-burials layers and deep pits. Therefore, it is unlikely that the red-slipped vessels were directly associated with the burials. Grey cord marked sherds (Type 4) occurred in small quantities throughout the West mouth and not in burial contexts unlike in the East mouth, however, this may be a results of recording rather than any pattern. There were considerably fewer stoneware, celadon and porcelain sherds in the west mouth. As discussed, the same pottery types occur both within burial contexts and in the non-burial layers. There are also a series of deep pits or sink holes in the West mouth which contain large amounts of pottery of the same type as that found across the site.

Context 343=883 (YB level 4) is a possible pit occurring around 37 cm where 343 is composed of a light reddish brown loose silt layer which has 30 earthenware sherds and 883 is a layer of light greyish brown sandy silt with 425 earthenware sherds. In both contexts, the majority of the sherds were undecorated. 883 contained grey cord marked sherds (Type 4), large quantities of red-slipped sherds (Type 1) from different vessels which can be determined by the variation in decoration and form of the foot rims. Shell beads and a metal point were found in 883 and a socketed axe possibly a copper alloy and an iron fragment were found in 343.

Context 1835 (YB level 5) is a pit with 255 earthenware sherds, 4 celadon and 2 porcelain sherds. While the majority was undecorated, types include 1, 4, 5, 6, 7, 10, 12, 14 and 15. Metal, possibly slag, was also found in this context. Context 1838 (YB level 7) is under context 1835 and maybe part of the pit. It contains 321 earthenware sherds, 3 stoneware and 1 porcelain sherds. Again the majority was undecorated along with type 1 and other decorated sherds. Iron fragments were also found in this context. Context 75 (YB level 6) is also possibly a pit with 197 earthenware comprising undecorated sherds, Red Ware (Types 1, 2 and 3) and other decorated sherds and 9 stoneware sherds.

It is evident that the ceramics come from this cemetery layer, as it does in the East mouth, and not the earlier shell midden phase dating from 5300 cal BP (4050-4229 BC) which is the mid-Holocene in this region. However, although there are sherds in the shell midden phase, this is due to site disturbance and the deep pits that are located around the West mouth.

iii. The Shell Midden Phase

The 332 (YB level 18) shell midden in the East mouth is interpreted to correspond to the B912 (no ceramics) shell midden in the West mouth (Piper *et al.* 2011: 144). While context 332 has been dated to *c.*5000-7000 cal BP (3713-3797 to 5845-5973 BC), dating of this phase of the West mouth trench has not occurred yet. The upper part of this phase contains a shell midden which is most likely connected to the shell midden in the East mouth. Pits or sink holes are also prevalent in this layer. In shell layer context 897=B911 (YB level 9), there are 120 earthenware sherds of which the majority is undecorated and 1 stoneware sherd. Contexts with few stoneware sherds but a large numbers of undecorated sherds may also contain ceramics from features stratigraphically above it including 344=1921 (55 sherds; YB level 9), 1616 (82 sherds; YB level 10), 1848 (57 sherds; YB level 9) and 1500 (145 sherds; YB level 11). These ceramics may have been redistributed from features stratigraphically above it.

A context of note is layer 798 (YB level 8). In this context 45 earthenware sherds were found, mostly undecorated sherds; however, it contains the only example of an earthenware square lid recorded on site to 2010. Furthermore, no square mouthed vessels have been found on site (see 6.10). These ceramics were associated with human and animal bones, shell and stone fragments. Context 1541 (YB level 25) contained 98 earthenware, with the majority being undecorated sherds with some Type 1 and the only completely intact vessel, a small restricted rim jar (see 6.11.3; Eusebio 2006). There is also a possible hearth in context 1806H (YB level 8). This grey compact layer with charcoal and burnt stones contains two undecorated sherds which may be intrusive to the hearth.

A further context of note is 782S=796=1572 (YB level 9), which contained cranial fragments, a few teeth, and two pig tusks, possibly as grave goods (782S) and a dog burial (796). No ceramics were found associated with it or intrusive in the burials but in the same layers an orange stoneware sherd was found which is likely intrusive.

Pits occur through this layer and a cluster occur in contexts 1509, 1512, 1517, 1609 (YB level 12), 1843 and 1844 (YB level 13) and are shown in proximity on the matrix. Contexts 1517 and 1844 have large numbers of earthenware sherds 315 and 306 respectively. As with other contexts in this mouth, these pits contain large numbers of undecorated sherds and red-slipped with c stamps (Type 1), grey cord mark (Type 4) and various decorated sherds.

The position of the two burials 1931S (YB level 20) and 874S (YB level 24) in the matrix is uncertain. However, they do not contain ceramics and will be left in the matrix until it can be revised by the project team. Burial 874S is of note because it contains a similar assemblage as burial 727S (YB level 14) in East Mouth with large rocks arranged in such a way as to cover the whole body. Shell artefacts, a rounded stone and macaque incisors retrieved from the head and neck areas were found associated with this burial. Similar to the 727S East mouth burial, no ceramics were present. Burial 874S shows how disturbed the West mouth is, as this burial is straigraphicallly between two earlier dates from the mid-Holocene (H. Lewis pers. comm. 2012). The

contexts surrounding the burial have undecorated sherds, red-slipped with c stamps, other Decorated: No Type and one stoneware sherd.

iv. Mid-Holocene to Early Pleistocene Phase

Beneath the shell midden lies a sequence of silty clay deposits contexts 334, 336 and 769 (YB levels 19, 23 and 24 respectively) in the East mouth matching context 1626 (YB level 26) in the West mouth. This phase in the East mouth dates to between 9400-11,000 cal BP (8632-8726 to 10,781-10,986 BC) which is the mid-Holocene to Early Pleistocene Phase in the region. The oldest deposit 1306 (YB level 30) containing stone tools and animal bones in the East mouth appears to correspond to context 1832 (YB level 27) in the West mouth which is one of the deepest deposits (Piper *et al.* 2011: 145). However, this context at this level contains 81 sherds of undecorated sherds and red-slipped sherds with c stamps (Type 1), grey cord marked (Type 4) and other Decorated: No Type sherds and stoneware. Context 1545 (YB level 27), a layer with loose light greyish brown sediment, contained 57 earthenware sherds; the majority undecorated with red-slipped c stamped sherds (Type 1) and other Decorated: No Type sherds and 2 stoneware sherds. The context also contained shells, bones, *Melo* shell fragments, a green bead, and the only example of a T-shaped cross section *Tridacna* bracelet (Paz and Vitales 2008). These lower contexts also contained a hammerstone, shells, charcoal, animal bone, fragments of limestone and chert. The cultural material are obviously intrusive because of the date of the contexts and as a parallel, cultural items such as these are not found in the lower layers of the East mouth.

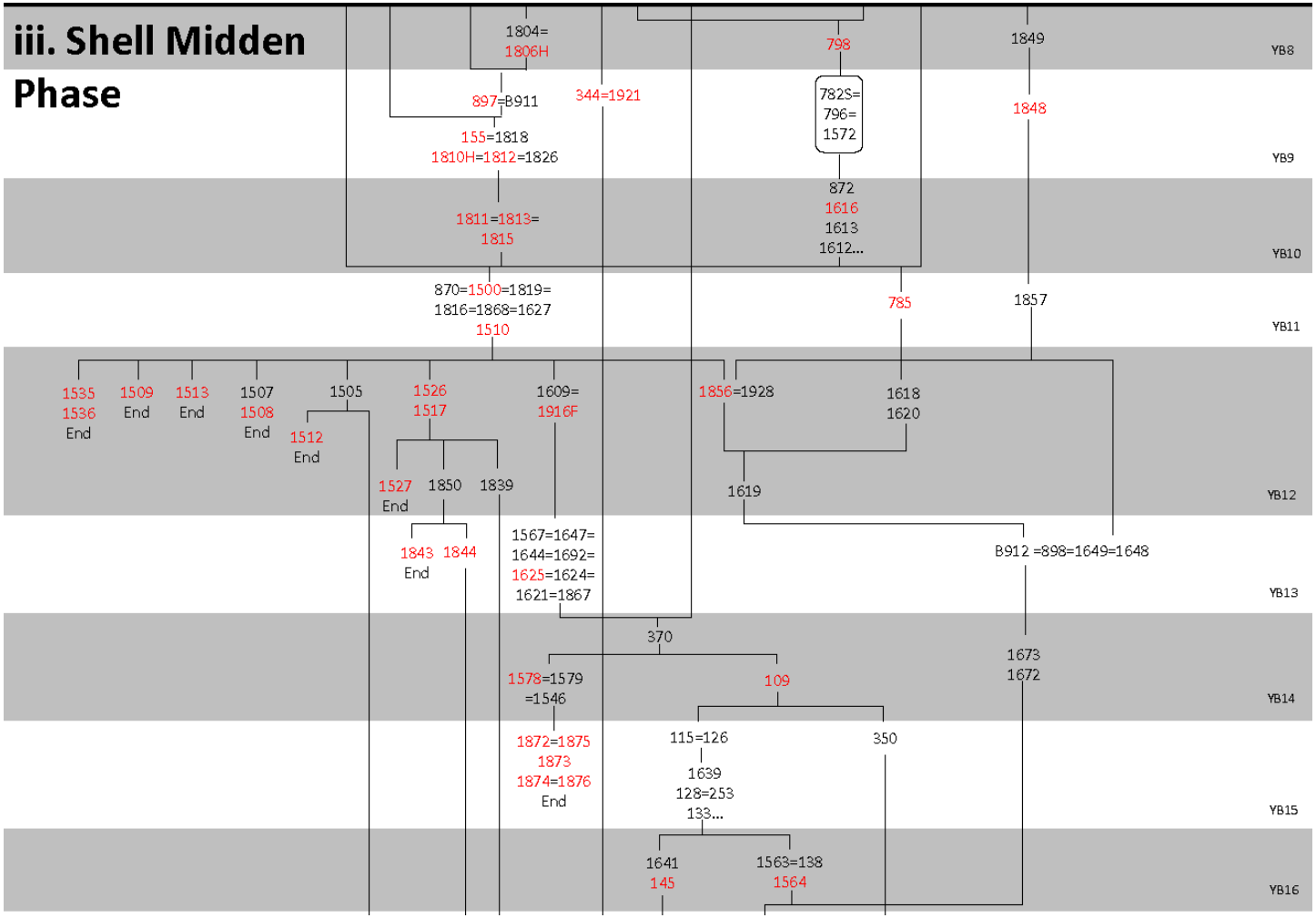

Fig. E.7 West mouth, Shell middens Phase upper

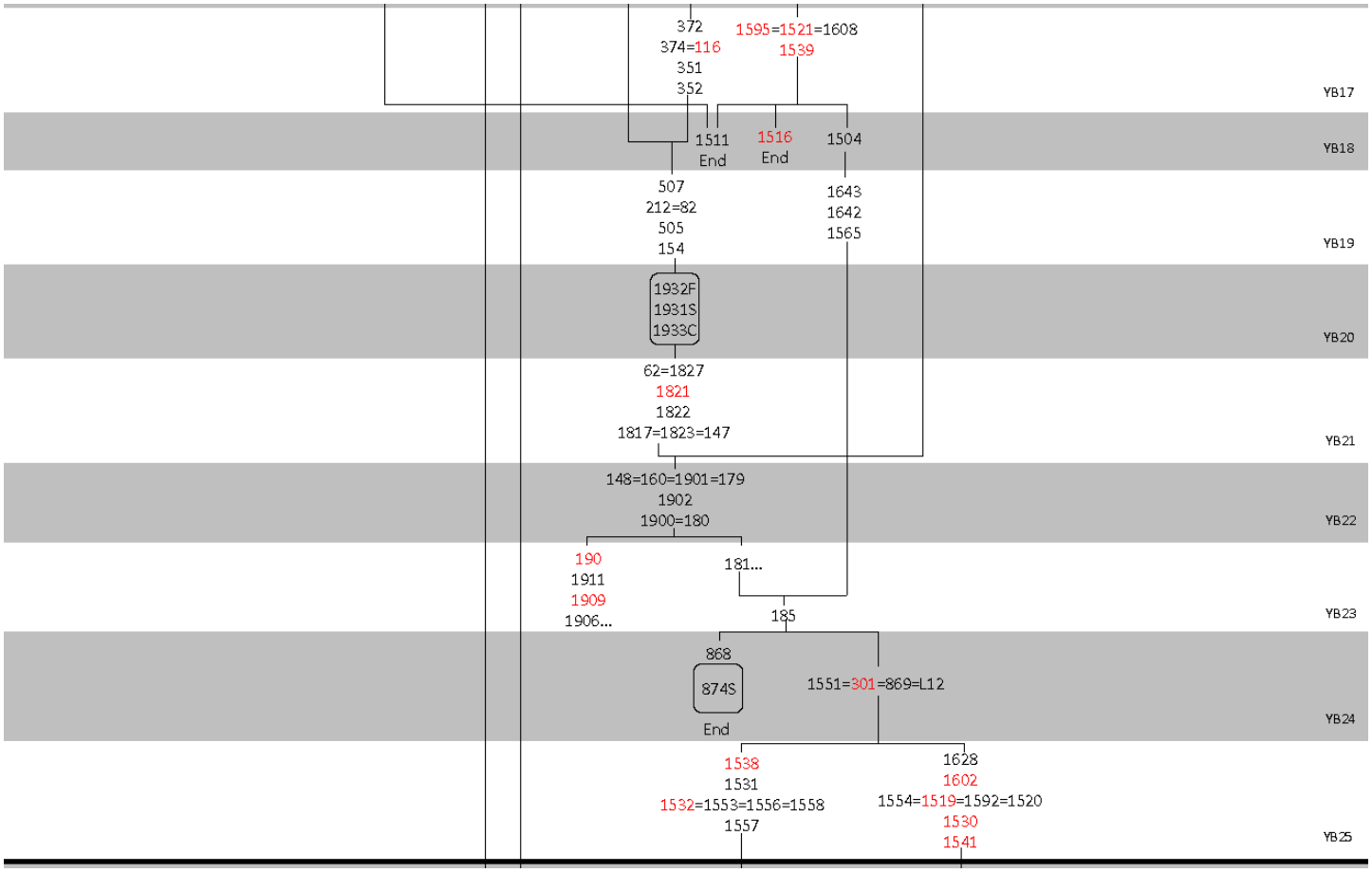

Fig. E.8 West mouth, Shell middens Phase lower

The West mouth has considerably more pottery in contexts and without context numbers than the East mouth. The West mouth also has more Red Ware and pedestal bowls than the East mouth. The same types of pottery occur in the fill and burial in both the West and East mouths. As with the East mouth, the West mouth has few grave goods associated with the burials and no pottery was associated with the burials. Metal was found in the upper layers of both mouths. The West mouth shows that although some of the ceramics occur in the burial fills, they are not directly associated with the burials. The ceramics occur in layers outside of the burials and in this mouth the majority occur in pits. The pits contribute to the disturbed nature of the site making it difficult to phase the West mouth and see if there are any ceramic sequences. Like the East mouth, no ceramics sequences are evident.

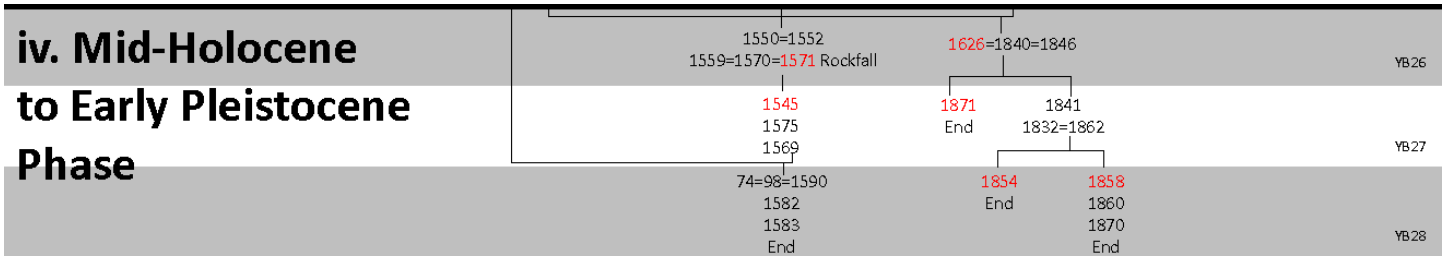

Fig. E.9 West mouth, Mid-Holocene to Early Pleistocene Phase

Phase	Context	High-fired	T1-3	T4	T5	T6	T7	T8	T9	T 10	T 11	PT 12	PT 13	PT 14	PT 15	PT 16
i. Topsoil	99		✓													
	705		✓		✓	✓	✓	✓		✓				✓	✓	
	None		✓		✓	✓	✓			✓				✓	✓	
ii. Cemetery Phase	742	✓	✓		✓		✓		✓	✓	✓					
	719		✓		✓		✓	✓						✓		
	754	✓	✓		✓		✓		✓					✓		
	883		✓	✓		✓	✓	✓		✓			✓	✓	✓	
	753	✓														
	75	✓			✓		✓				✓			✓	✓	
	22	✓												✓		
	715	✓	✓											✓		
	753		✓													
	750	✓											✓	✓	✓	
	728	✓														
	343	✓												✓		
	1807	✓														
	1801	✓														
	55	✓														
	730		✓		✓			✓								
	1835	✓	✓	✓	✓	✓	✓			✓		✓		✓	✓	
	1800						✓									
	1838	✓										✓		✓	✓	
iii. Shell Midden	798						✓							✓	✓	
	897		✓		✓	✓				✓		✓		✓	✓	
	344		✓													
	1848													✓		
	1500	✓	✓													
	1508				✓											
	1512	✓						✓								
	1517	✓				✓	✓	✓				✓		✓	✓	✓
	1527													✓		
	1526	✓														
	1521	✓													✓	
	1539	✓														
	1811									✓						
	1616	✓				✓								✓	✓	✓
	785		✓													
	1843													✓	✓	
	1844	✓		✓	✓	✓	✓					✓		✓	✓	
	1578						✓									
	1538	✓														
	145		✓											✓		
	116					✓										
	301		✓													
	1532				✓	✓										
	1530						✓							✓		
	1541													✓		
iv. Mid-Holocene	1571	✓														
	1545	✓					✓						✓			
Unsequenced	25		✓													
	57		✓													
	189			✓		✓								✓		
	224			✓												
	227		✓			✓	✓							✓		
	228		✓													
	800													✓		
	815						✓								✓	
	899		✓													
	1899				✓											

Table E.4 List of contexts in the West mouth ceramics broken down by Type and Potential Type

E.4 Summary

This analysis sought to assess the degree to which the stratigraphy could be used to develop a chronology of the ceramics at the site and to map the ceramics to the Harris matrix to see if a ceramic sequence could be recovered. The disturbed nature of the site and recording errors show that there does not seem to be a clear ceramic sequenced linked to chronology. Problems with post excavation recording errors have hindered analysis. Not all pottery can be associated to the matrices because not all of the pottery were given context numbers. During excavation, each context was given a number, and during the accessioning of artefacts, each object should have been given a unique identifying accession number and the context number written on the accessioning card when it was bagged. However, a majority of the earthenware sherds do not have context number or ceramics may have been separated from their context number, therefore, making it difficult to associate to a context. This is an omission that took place in post excavation. Therefore, not all ceramic types may be represented on the matrices. In future work, if context numbers can be reattributed to ceramics, the author is confident that the occurrences of pottery types when mapped to the matrix contexts will not contradict the evidence presented. Any pottery presented in different contexts will not change the interpretation of the pottery. There are enough substantial examples of types throughout.

Despite these shortcomings, this analysis has clearly established that the ceramics were not directly associated with the burials as grave goods. The largest clusters of ceramics occur in the silt layers and not in the burials. However, the ceramics may still be part of the burial practice as votive offerings as can be seen with the pedestal bowl but it is unlikely that the ceramics were burial jars. This is discussed in Chapter 7. Furthermore, although the ceramics may have been contemporaneous with other material culture, the ceramics were not clearly associated with other material culture. As the ceramics could not be treated according to its stratigraphic sequence, it has been necessary to consider the assemblage as a whole. A shortcoming of the site is that the ceramic assemblage cannot fully contribute to the creation of a chronological ceramic sequence in the region.

Appendix F. Context Register

This Context Register contains a brief description of features, material culture (including earthenware and high-fired ceramics) and other significant information within a context to be compared against the Ille Harris matrices (Appendix E Harris matrix analysis). Where possible, depths and dates are given from published papers and reports (BC/AD dates from the original BP date are found throughout the thesis). Related contexts are grouped together for example, by burial, cut and fill, where F is the fill, S is the Skeleton and C is the cut, or where context have equalling numbers. The contexts are ordered by YB level (after the author) to separate the contexts and to distinguish original levels established by the Palawan Island Palaeohistoric Research Project (PIPRP). This differentiates levels and is for ease of reading when compared against the Harris matrices. Contexts containing earthenware and high-fired ceramics are shown in red for visual distinction. Analysis of the contexts was based on information recovered in the contexts and synthesized here. The material culture listed in this Context Register are taken from the Palawan Island Palaeohistoric Research Project's database and Paz and Ronquillo 2004; Archaeological Studies Program 2005-2006; Lewis *et al.* 2006; Lewis *et al*. 2008; Paz *et al*. 2009; Paz *et al*. 2010; Paz *et al*. 2011.

EAST MOUTH

i. TOPSOIL

Context nos.	1=405=406=434=474=770=772=851=854=901=921=1200=1201=1202=1203=1204=1205= 1206=1207=1208=1209=1210=1211=1212=1213=1227=2200=L1Szabo
Feature	Surface. Range of topsoils across surface of cave from fine silt and white speckles to light greyish brown loose silt with gravel.
Ceramics	1 earthenware (23) 770 earthenware (13) 772 earthenware (17) 901 earthenware (185), stoneware (4), celadon (1) 921 earthenware (37) 1201 earthenware (52), stoneware (2) 1202 earthenware (5), stoneware (2) 1203 earthenware (54)

	1204 earthenware (8), stoneware (1) 1205 stoneware (1) 1206 earthenware (10) 1208 earthenware (105) stoneware (1), celadon (1), porcelain (1) 1209 earthenware (138), stoneware (7) and porcelain (1) 1210 earthenware (138) 1211 earthenware (52), stoneware (2) and celadon (2) 1213 earthenware (346), stoneware (17), celadon (5) and porcelain (4) 1227 earthenware (25) 2200 earthenware (40), stoneware (2), celadon (1), porcelain (1)
Other finds	From 1 metal ring, from 1213 green nephrite ling-ling-o, from 1208 shell bangle fragment, human bone, from 1227 bone fragment from 1201 copper alloy fragment, from 772 animal bone fragments and shell inclusions, from 1202 2 iron fragments, from 1203 quite a few fragments of metal, from 1209 animal bones and bead, from 1227 bone fragment, from 406 chert flake, from 1208 1 *Tridacna* shell bangle fragment, from 2200 (4) shell beads (901, 1203, 1208, 1209, 1210), (3) Indo-Pacific beads, human bones and teeth, animal bones.
Depth	Surface extending from 0 cm to 30 cm in some parts of the cave.
YB level	YB1

ii. CEMETERY PHASE A

Context nos.	903=1224
Feature	Dark brown silty guano layer, blocky and very compact.
Ceramics	903 earthenware - range of rim, body and base sherds (477), stoneware (7), celadon (4) and porcelain (10) 1224 earthenware (241) stoneware (95), and celadon (1).
Other finds	Frequent broken shells, fragmented human and animal bones, 2 porcupine mandibles, frequent shell beads (903, 1224) and carnelian beads, lithics, iron fragments (903), 1994 Philippines 1 peso coin (1224).
Depth	>20 cm, 10-15 cm (1224), 0-5 cm (903)
YB level	YB2

Context nos.	904=1226
Feature	Layer in between burials.
Ceramics	904 earthenware - range of rim, carinated and body sherds (305), stoneware (4), celadon (6) and porcelain (1) 1226 earthenware (244), stoneware (1) and celadon (1)
Other finds	Animal bones, shell beads (904, 1226), gold bead (1226).
Depth	5-10 cm (904), 20-30 cm (1226)
YB level	YB2

Context nos.	701F, 700C
Feature	Fill and cut of layer/pit.
Ceramics	Earthenware (1).
Other finds	-
Depth	-
YB level	YB2

Context nos.	1283F, 1282C
Feature	Fill and cut of layer.
Ceramics	Earthenware (1).
Other finds	-
Depth	-
YB level	YB2

Context nos.	150F, 67S, 149C
Feature	Burial. Female adult, head disturbed by root, missing left leg and lower right leg. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Stoneware (2). No earthenware.
Other finds	No burial goods recorded.
Depth	38 cm
YB level	YB3

Context nos.	703S
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth. Burials 703 and 704 intercut, but different episodes of inhumation.
Ceramics	Earthenware - body sherds (27), celadon (4).
Other finds	No burial goods recorded.
Depth	30 cm
YB level	YB3

Context nos.	704S
Feature	Burial. Juvenile under 15 years of age. 3rd molar missing. Supine, extended, oriented north-south with head towards the cave mouth. Burials 703 and 704 intercut, but different episodes of inhumation.
Ceramics	Earthenware (13) and stoneware (4).
Other finds	No burial goods recorded.
Depth	23 cm
YB level	YB3

Context nos.	905
Feature	Layer. Friable dark greyish brown silty clay with limestone gravel.
Ceramics	Earthenware (59), stoneware (2).
Other finds	Lithic (core).
Depth	45-50 cm
YB level	YB3

Context nos.	776=948=777=902
Feature	Layer of fine laminated light grey silt (guano).
Ceramics	776 earthenware (11) 777 earthenware (7) 902 earthenware (131), porcelain (1).
Other finds	Animal bone, shell inclusions, occasional angular limestone fragments, iron fragments (902).
Depth	30-45 cm
YB level	YB3

Context nos.	927F, 936S, 937C
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth. Dark greyish brown silt with angular limestones.
Ceramics	Earthenware (12).
Other finds	Animal bones. No burial goods recorded.
Depth	-
YB level	YB3

Context nos.	2121F, 787S, 786C=955C
Feature	Burial. Juvenile with ochre on bones near foot. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware (3)
Other finds	No burial goods recorded.

Depth	-
YB level	YB3

Context nos.	910F, 911S, 912C
Feature	Burial. Adult male, arms bent, hands on pelvis. Supine, extended, oriented north-south with head towards the cave mouth. Dark brown silty clay of varying compaction, guano-rich.
Ceramics	No ceramics.
Other finds	Frequent animal bones, stingray vertebra found in heavy fraction, obsidian, inclusions of burnt limestone and ashy grey lumps.
Depth	70 cm
YB level	YB3

Context nos.	1219F, 1214S, 1220C
Feature	Burial. Articulated legs. Supine, extended, oriented north-south with head towards the cave mouth. Stray human remains in fill.
Ceramics	1214 earthenware (24) 1219 earthenware and stoneware – no amounts or descriptions recorded/incomplete recording
Other finds	Pig incisor, one fragment of burnt animal bone, shells, lithics, iron fragment (1214). In all cases uncertain if part of grave or intrusive.
Depth	45 cm
YB level	YB3

Context nos.	1217F, 1216S, 1218C
Feature	Burial. Juvenile (4-5yrs old) burial. Teeth well preserved, bones poorly preserved. Supine, extended, oriented north-south with head towards the cave mouth. Fill of juvenile burial includes red ochre by left foot.
Ceramics	1217 earthenware (16) 1218 earthenware (1)
Other finds	Piece of knapped green chert under left femur, a fractured pebble by left arm, and a large *Melo* shell fragment near right upper thigh/pelvis.
Depth	45 cm
YB level	YB3

Context nos.	1215S, 1419C
Feature	Burial. Cranium with termite colony. Supine, extended, skeleton oriented southeast-northwest, with head at southeast.
Ceramics	Earthenware (7) and celadon (1).
Other finds	Bone, shell. No burial goods recorded.
Depth	45 cm
YB level	YB3

Context nos.	748S=1244S=47a
Feature	Burial. Juvenile. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	Shell layer (47), grave fill includes Spanish coin dating to 1761 (748) CAR III D G HISP ET IND P (obverse), VTRA QUE VNUM M 1761 M (reverse), 2 blue beads, animal bones.
Depth	Burial 26 cm, fill 35-60 cm.
YB level	YB3

Context nos.	913F, 914S, 915C
Feature	Burial. Juvenile, cranial bones poorly preserved damaged by termites, arms bent, both

	hands on pelvis, possibly originally holding something. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware - range of rim, carinated and body sherds (23) and stoneware (1).
Other finds	Shell inclusions, shell beads (913).
Depth	-
YB level	YB3

Context nos.	702S
Feature	Burial. Juvenile. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware (8).
Other finds	No burial goods recorded.
Depth	15 cm
YB level	YB3

Context nos.	713S
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware (1).
Other finds	Copper alloy ring on one of the left proximal phalanx bone.
Depth	55 cm
YB level	YB3

Context nos.	224S=312S=484S
Feature	Burial. A number of skulls associated, pelvis and long bones (commingled human, no burial in proximity had a missing body part. Isolated bones from disturbance). Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware (11).
Other finds	No burial goods recorded.
Depth	40 cm
YB level	YB3

Context nos.	41S=485S
Feature	Burial. Exposed human tarsal bones. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware (2), celadon (1).
Other finds	Metal fragments in 485.
Depth	50 cm
YB level	YB3

Context nos.	906F, 907S, 908C
Feature	Burial, adult, supine, extended, arms bent, hands of pelvis, with head to south.
Ceramics	Earthenware (48), stoneware (2).
Other finds	Frequent broken shells, occasional angular limestone and charcoal fragments, flat, rectangular iron artefact (906).
Depth	-
YB level	YB4

iii. CEMETERY PHASE B

Context nos.	1241=909
Feature	Layer between burials.
Ceramics	1241 earthenware including red-slipped (227), stoneware (3), celadon (3), porcelain (4) 909 earthenware (239), stoneware (1), celadon (2)
Other finds	Lithic flake and core, iron fragment, animal bones, shell beads (909, 1241), metal

	fragment with mat impression (1241).
Depth	40-50 cm
YB level	YB5

Context nos.	794F, 926S=928S, 793C=929C
Feature	Burial. Supine, extended, feet to north, head, right arm and right ribs missing. Skeleton, particularly legs-feet, close together and may have been tightly wrapped (e.g. in shroud), left arm fully bent. Found in a very large grave cut (225 cm long, 70 cm wide, 45 cm deep).
Ceramics	926 earthenware (49) 928 earthenware (12).
Other finds	Frequent shells, small limestone fragments, shell beads (926).
Depth	30 cm (793)
YB level	YB5

Context nos.	1221=1222=1223=2229
Feature	Layer of silt between burials.
Ceramics	1221 earthenware (25), celadon (2) and porcelain (1) 1222 earthenware (30) and stoneware (1) 1223 earthenware (27)
Other finds	Juvenile foot bones in 1222 appear to be part of context 1237.
Depth	30-35 cm (2229)
YB level	YB5

Context nos.	933F, 934S, 935C
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware (47).
Other finds	No burial goods recorded.
Depth	-
YB level	YB5

Context nos.	481F=482=158S=201S=202S=203S=220S=221S
Feature	Burial. Adult skeleton with termite colony in skull. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	158 earthenware (59) 203 earthenware - range of rim and body sherds (186)
Other finds	Human remains not associated with the burial, animal bones, beads, lithics, shells, coin (unknown).
Depth	40 cm
YB level	YB5

Context nos.	916F, 734S, 917C
Feature	Burial. Supine, extended, north orientation, feet point outwards away from central axis.
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	Frequent shell inclusions, shell beads (916).
Depth	42-58 cm
YB level	YB6

Context nos.	919F, 918S, 920C
Feature	Burial. Adult. Supine, extended, oriented east-west.
Ceramics	No ceramics.
Other finds	Occasional shells. No burial goods recorded.
Depth	42-58 cm
YB level	YB6

iv. CEMETERY PHASE C

Context nos.	1405F, 1404S, 1406C
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware - range of sherds (6)
Other finds	No burial goods recorded.
Depth	-
YB level	YB7

Context nos.	930F, 931S, 932C
Feature	Burial. Adult. Supine, extended, oriented east-west. Skeleton associated with dozens of tiny glass beads (red, yellow, green, blue), shell beads, and six carnelian beads, along with an iron blade; most beads appeared to form a single necklace around neck; shell beads were also found in pairs at regular intervals across and under the torso.
Ceramics	No ceramics.
Other finds	-
Depth	-
YB level	YB7

Context nos.	950F, 951S, 952C
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware (4).
Other finds	No burial goods recorded.
Depth	-
YB level	YB7

Context nos.	923F, 924S=1243S, 925C
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth. Only left lower leg exposed, skull, very fragmented, disturbed by termites and rooting, no facial bones found although one loose tooth recovered.
Ceramics	923 earthenware (2) 924 stoneware (2 - no earthenware), 1243 earthenware (1) and stoneware (1).
Other finds	Mollusc shell (gastropod), shell inclusions.
Depth	45-50 cm
YB level	YB7

Context nos.	1232
Feature	Layer. Reddish brown silt.
Ceramics	Earthenware (286).
Other finds	Shells, animal and human bones, three *Melo* shell fragments, shell beads (1232).
Depth	62 cm, 50-60 cm (1232)
YB level	YB7

Context nos.	1238
Feature	Disturbed layer of very loose sediment.
Ceramics	Earthenware (3).
Other finds	Shells, pigs tusks, lithic (hammerstone, pitted, granitic).
Depth	60-70 cm
YB level	YB7

Context nos.	1245S
Feature	Burial. Adult. Supine, extended, oriented north-south with head towards the cave mouth. Hands on pelvis, with extra comingled human bones including a skull and

	mandible plus some extra arm bones.
Ceramics	Earthenware (86)
Other finds	-
Depth	-
YB level	YB7

Context nos.	1246S
Feature	Burial. Adult, lying on back with arms folded up and hands on chest, left leg turned over on top of the right. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware - range of rim, carinated and body sherds (10), stoneware (1).
Other finds	Beads found in fill sieving, shell pendant.
Depth	50-60 cm
YB level	YB7

Context nos.	722S=1237S, 819C
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware (3).
Other finds	Iron implement associated with arm bones, iron fragments (probable blade), 1 chert lithic.
Depth	31 cm
YB level	YB7

Context nos.	1337
Feature	Possible feature/pit, grey loose sediments.
Ceramics	Earthenware (52), stoneware (1).
Other finds	-
Depth	49-63 cm
YB level	YB7

Context nos.	489S
Feature	Burial. 'Queen of Palawan'. Supine, extended, oriented north-south with head towards the cave mouth. Three extra crania included in its grave.
Ceramics	No ceramics.
Other finds	-
Depth	50 cm
YB level	YB7

Context nos.	1235=1236
Feature	Spit.
Ceramics	1235 earthenware (88), stoneware (1) 1236 earthenware (34).
Other finds	Shell, animal bones.
Depth	30-40 cm
YB level	YB8

Context nos.	723S
Feature	Burial. Sub-adult skeleton. Supine, extended, oriented north-south with head towards the cave mouth. Burial 723 intercut with burial 710 (not represented on matrix). Intervening matrix but different episodes of inhumation.
Ceramics	Earthenware (14).
Other finds	-
Depth	60 cm
YB level	YB8

Context nos.	1335F=1352F, 1350S=1332S=1330S, 1353=1336.
Feature	Burial. Adult. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	1330 earthenware - no amounts or descriptions recorded/incomplete recording 1332 earthenware (12) 1335 earthenware (28)
Other finds	Frequent shells.
Depth	46 cm
YB level	YB8

Context nos.	709S=488S
Feature	Burial. Supine, extended, oriented head to south, feet to north. Crania missing. Under 'Queen of Palawan' (489).
Ceramics	Earthenware (1).
Other finds	-
Depth	40-60 cm
YB level	YB9

v. CEMETERY PHASE D

Context nos.	1399
Feature	Layer. Fill of 1403. Surrounding contexts in area (1414F to 1415C) fills and cuts of layers.
Ceramics	Earthenware - range of rim, base and body sherds (18)
Other finds	Bead.
Depth	-
YB level	YB10

Context nos.	389upper=394=1351=L42004
Feature	Layer (394 red silt layer)
Ceramics	Earthenware (20)
Other finds	-
Depth	-
YB level	YB10

Context nos.	445=816=1240
Feature	Layer loose greyish brown silt.
Ceramics	445 earthenware (1) 1240 earthenware (242), stoneware (1) and celadon (1).
Other finds	Shell beads (1240)
Depth	60-70 cm (1240)
YB level	YB10

Context nos.	2=398=384=L32004
Feature	Layer.
Ceramics	384 earthenware (9), stoneware (3), celadon (1) and porcelain (1). 398 earthenware - no amounts or descriptions recorded/incomplete recording
Other finds	Shells and pebbles. Metal fragments (384)
Depth	-
YB level	YB10

Context nos.	833
Feature	Cut and fill.
Ceramics	Stoneware (1). No earthenware.
Other finds	-

Depth	-
YB level	YB10

Context nos.	922=389lower=1251=862=863
Feature	Layer (389lower red silt layer).
Ceramics	1251 earthenware (34), celadon (1) 922 earthenware (55)
Other finds	Frequent shells, some animal bones, human bones and teeth, iron fragment, shell beads (862, 922), worked fish vertebra.
Depth	40-50 cm (922), 50-60 cm (862)
YB level	YB11

Context nos.	1362
Feature	Layer.
Ceramics	Earthenware (2).
Other finds	-
Depth	-
YB level	YB11

Context nos.	1252=859
Feature	Possible pit or depression, filled with clean reddish brown silt loam.
Ceramics	Earthenware (1).
Other finds	Shells.
Depth	-
YB level	YB12

Context nos.	818=1367=843
Feature	Layer
Ceramics	Earthenware (22).
Other finds	Shells.
Depth	-
YB level	YB12

Context nos.	1254=1253
Feature	Layer. Reddish brown silty clay.
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	Shells, stones and animal bones.
Depth	70-80 cm
YB level	YB12

Context nos.	387F, 386S, 385C
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	No ceramics.
Other finds	-
Depth	20-40 cm
YB level	YB13 (Uncertain of this position on Harris matrix)

Context nos.	731S=727S
Feature	Burial within shell midden layer. 727 is the deepest inhumation. Skeleton is adult male, supine, extended, oriented north-south with head towards the cave mouth (facing west). The context includes brown silt (no clear cut/fill) overlying the shell midden but might have cut the shell midden on its foot area. Large rocks above burial arranged as burial markers, variable in shape ranging in size from *c.*16-48 cm in length arranged in an elongated form covering the remains from the head to above the knee.

	731 is the area of fragmented skulls of context 727, in a brown loamy matrix. Charcoal for dating (731). 6494-6677 cal BP. Mid-Holocene *c.*5000-7000 cal BP.
Ceramics	731 earthenware (3), stoneware (1) and celadon (1)
Other finds	Large partial turbo marmoratus conch shell placed above pelvis, pair of large shell discs, a pair of hammerstones, shell disc bead, group of smaller shell beads and pig tusks. Burial was intermixed with shells, operculum, animal remains and some human remains that are not part of this skeleton.
Depth	Skeleton at *c.*75 cm, iron fragment from 80-90 cm, charcoal taken at 100-120 cm,
YB level	YB14

vi. SHELL MIDDEN MID-HOLOCENE *c.*5000-7000 CAL BP

Context nos.	803
Feature	Disturbed layer. Part of shell midden.
Ceramics	No ceramics.
Other finds	Frequent large shells, 2 pig tusks, 3 rounded stones, 1 grinding stone, 1 hammerstone/mortar and a hammerstone, charcoal, burnt soil, charred shells and animal bones.
Depth	-
YB level	YB15

Context nos.	733
Feature	Layer. Part of shell midden.
Ceramics	Stoneware (1). No earthenware.
Other finds	-
Depth	-
YB level	YB15

Context nos.	3=399=393
Feature	Layer (silt).
Ceramics	3 earthenware - no amounts or descriptions recorded/incomplete recording
Other finds	-
Depth	-
YB level	YB15

Context nos.	746
Feature	Layer (reddish). Part of shell midden
Ceramics	Earthenware (4), stoneware (1).
Other finds	Bivalve shells, hammerstone, a possible bone tool and shell beads.
Depth	120 cm
YB level	YB16

Context nos.	745
Feature	Layer. Part of shell midden. Black layer with frequent charcoal.
Ceramics	Earthenware (2), stoneware (1) and celadon (1).
Other finds	-
Depth	140-160 cm
YB level	YB16

Context nos.	332=326=4=395=390=940=1368=47=2101=L52004=L3Szabo
Feature	Shell midden. Mid-Holocene *c.*5000-7000 cal BP.
Ceramics	Earthenware - range of rim and body sherds (113).
Other finds	Shells, lithic, starch analysis, bone. Animal bones (332 - deer, pig, turtle, monitor lizard, macaque, small carnivores). Charcoal for dating and charred fragment of *C. hirsutum* nut for dating (332). 5400-

	7200 cal BP. Mid-Holocene *c.*5000-7000 cal BP
Depth	75-83 cm (326), 150-160 cm (1368).
YB level	YB18

vii. HEARTHS EARLY HOLOCENE *c.*9000-11,000 CAL BP

Context nos.	334=941=849=718=314=853=L52004=L4Szabo
Feature	Layer. Silty clay. Part of hearth feature. Under shell midden. Hearth (718) Early-Holocene *c.*9000-11,000 cal BP.
Ceramics	No ceramics.
Other finds	Animal bones (334 - pig, turtle, monitor lizard, macaque, small carnivores), charcoal for dating (334) 6121-10,187 cal BP Early-Holocene *c.*9000-11,000 cal BP
Depth	-
YB level	YB19

Context nos.	754S, 758S, 1324S, 1325S, 1327S, 1338S, 1358S, 2228S
Feature	Cremation burials within hearths phase. Concentration of burnt, fragmented human bones. Cut marks found on cremation 758 indicative of disarticulation, defleshing and skinning. Stones, pieces of burnt shells, two chert fragments and charcoal found with 1325. 758 Sent for dating 9006-9425 cal BP. Early-Holocene *c.*9000-9500 cal BP.
Ceramics	No ceramics.
Other finds	-
Depth	100-120 cm (758 charcoal non-cremation), 130-148 cm (758 cremation), 195 cm (1324), 180 cm (1325), 206 cm (1327)
YB level	From YB20

Context nos.	953=961
Feature	Layer.
Ceramics	Earthenware (1)
Other finds	-
Depth	-
YB level	YB20

Context nos.	333=335=391=1313=396=400=45=L62004=L5Szabo
Feature	Part of hearth feature. Early-Holocene *c.*9000-11,000 cal BP
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	Metal fragment (1313) Charcoal for dating (335) 9480-9784 cal BP Early-Holocene *c.*9000-11,000 cal BP.
Depth	153 cm and 155 cm (335)
YB level	YB21

Context nos.	336=947=8=324=392=2109=2110=1312=L72004
Feature	Layer. Reddish-brown silty clay, limestone/speleothems, hearths and burning deposits. Early-Holocene *c.*9000-11,000 cal BP
Ceramics	Earthenware - range of rim, carinated and body sherds and red-slipped (34) and celadon (1).
Other finds	Speleothem patch, shell and animal bone inclusions, possible worked lithics, decayed limestone/ash deposit, charcoal for dating and charred fragment of *C. hirsutum* nut for dating (336) 8596-10,687 cal BP Early-Holocene *c.*9000-11,000 cal BP. Gastropods, univalve and bivalve shells (336). Animal bones (336 - deer, pig, turtle, monitor lizard, macaque, small carnivores). Concentration of shells of similar molluscan composition to shell midden 332 (1312). Soil micromorphology sample, chert flakes, modified tooth, Indo-Pacific and glass beads, shell beads (336), animal bones, human remains (947).
Depth	155-160 cm, 170 cm, 180-205 cm (336)

YB level	YB23

Context nos.	946=769=2114
Feature	Speleothem deposit layer with both hard and soft white to greyish-white deposits, incorporating bones, charcoal and soil fragments and wood ash.
Ceramics	Stoneware (1). No earthenware.
Other finds	Chert flake, charcoal, charred *Canarium* sp. fragment in 769. Animal bones (769 - pig, turtle, monitor lizard, macaque, small carnivores). Charcoal for dating (769). 9701-10,154 cal BP Early-Holocene *c.*9000-11,000 cal BP.
Depth	160-180 cm, 180-195 cm (769)
YB level	YB24

Context nos.	337=717=490=392=748a=2122=2130=2122=L82004
Feature	Layer. Silty clay layer with frequent shell fragments. Part of hearth feature. 10,786-11,273 cal BP Early-Holocene *c.*9000-11,000 cal BP.
Ceramics	337 earthenware (37) 748a earthenware (43).
Other finds	Shell. Charcoal for dating (337 and 717).
Depth	180 cm (717), 200 cm (337)
YB level	YB25

Context nos.	768
Feature	Hearth/activity area. Early-Holocene *c.*9000-11,000 cal BP
Ceramics	Earthenware (1), stoneware (2).
Other finds	Stones, bone, some burnt, chert flakes.
Depth	160-180 cm
YB level	YB26

Context nos.	784
Feature	Layer. Brown silty clay. Part of hearth feature. Early-Holocene *c.*9000-11,000 cal BP
Ceramics	Earthenware (2).
Other finds	Although like 336 no shells present but contained chert flakes and animal bones, charcoal for dating and charred fragment of *C. hirsutum* nut for dating 9549-10,100 cal BP Early-Holocene *c.*9000-11,000 cal BP, animal bones (deer, pig, turtle, monitor lizard, macaque, small carnivores).
Depth	160-181 cm, samples taken at 180-200 cm and 200-220 cm
YB level	YB26

Context nos.	338=93=1248=206=205=L92004
Feature	Hearth layer
Ceramics	No ceramics.
Other finds	-
Depth	198-203 cm
YB level	YB39

Context nos.	807
Feature	Layer. Silty clay. Hearth layer. Interface with clay and gravel layer.
Ceramics	Earthenware (11).
Other finds	Shell fragments, animal bones (deer, pig, turtle, monitor lizard, macaque, small carnivores), charcoal for dating, dated charred fragment of *C. hirsutum* nut 10,252-10,501 cal BP Early-Holocene *c.*9000-11,000 cal BP.
Depth	*c.*200-470 cm, sample taken from 240-255 cm
YB level	YB27

viii. CLAY AND GRAVELS TERMINAL PLEISTOCENE *c.*11,500-14,000 CAL BP

Context nos.	866
Feature	Clay and gravel deposit. Compact yellowish-orange clay.
Ceramics	No ceramics.
Other finds	Few animal bones, antler, chert, charcoal for dating 13,820-14,116 cal BP, Terminal Pleistocene *c.*11,500-14,000 cal BP.
Depth	*c.*200-470 cm, sample taken from 240-255 cm
YB level	YB30

Context nos.	1306=867=186=207=1428
Feature	Clay and gravel stream deposits. Terminal Pleistocene *c.*11,500-14,000 cal BP.
Ceramics	No ceramics.
Other finds	Angular stones. Animal bones (deer, pig, turtle, monitor lizard, macaque, small carnivores).
Depth	*c.*200-470 cm
YB level	YB30

UNSEQUENCED CONTEXTS

Context nos.	33=65
Feature	Disturbed layer.
Ceramics	33 earthenware (16) 65 earthenware (62) and stoneware (3).
Other finds	One red bead.
Depth	-
YB level	-

Context nos.	54
Feature	Layer. Brown loose layer.
Ceramics	Earthenware (5)
Other finds	-
Depth	-
YB level	-

Context nos.	57
Feature	Cut
Ceramics	Earthenware (9), stoneware (15) and porcelain (1).
Other finds	One Indo-Pacific bead, 8 glass and paste beads, 33 glass beads, 1 seed.
Depth	-
YB level	-

Context nos.	63
Feature	Brown layer.
Ceramics	Earthenware (3).
Other finds	20 cm
Depth	-
YB level	-

Context nos.	80, 81
Feature	Layer (sectioned area).
Ceramics	80 earthenware (34), stoneware (1) 81 earthenware (60), stoneware (1).
Other finds	Shell beads (80)
Depth	-
YB level	-

Context nos.	157
Feature	Layer (sectioned area).
Ceramics	Earthenware (14), stoneware (2).
Other finds	Shell beads
Depth	Start depth 22 cm
YB level	-

Context nos.	249
Feature	Possible hearth feature
Ceramics	Earthenware (3).
Other finds	-
Depth	170-200 cm
YB level	-

Context nos.	379
Feature	Layer.
Ceramics	Earthenware (3)
Other finds	-
Depth	170 cm
YB level	-

Context nos.	388
Feature	Interface. Fill and cut.
Ceramics	Earthenware (10).
Other finds	-
Depth	-
YB level	-

Context nos.	897
Feature	Fill. Light orange-brown sandy silt.
Ceramics	Earthenware and stoneware. No amounts or descriptions recorded/incomplete recording.
Other finds	-
Depth	-
YB level	-

Context nos.	900
Feature	Surface cleaning.
Ceramics	Earthenware (22), stoneware (1).
Other finds	-
Depth	-
YB level	-

Context nos.	963
Feature	Number used but no information in database (used in error).
Ceramics	Earthenware (3).
Other finds	-
Depth	-
YB level	-

Context nos.	1229
Feature	Burial. Juvenile. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware (52).

Other finds	-
Depth	40-50 cm
YB level	-

Context nos.	1300
Feature	Fill.
Ceramics	Earthenware (1).
Other finds	-
Depth	-
YB level	-

Context nos.	1331
Feature	Termite mounds.
Ceramics	Earthenware (14).
Other finds	-
Depth	26-37 cm
YB level	-

Context nos.	1339
Feature	Pit with shells and animal bones.
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	-
Depth	-
YB level	-

WEST MOUTH

i. TOPSOIL

Context nos.	18=99=705=214=217=219=256=342=1915=380=403=499=255R=368R=199=1831=1833=1834
Feature	Surface. Light greyish brown sandy silt to dark brown sandy silt. 255R and 368R are large rocks.
Ceramics	18 earthenware (19) 99 earthenware (27) 214 earthenware (49) 705 earthenware (483) of which 422 were undecorated, stoneware (9) and celadon (8) 1833 earthenware (1)
Other finds	Shells (univalve and bivalve), animal bones (mammals and reptiles), human bones and teeth, limestone rock debris, animal burrow, iron fragments (705), sediment sample for OSL and mica bead/pendant (705), shell beads (705), metal (18), 1 chert flake, fish mandible.
Depth	-
YB level	YB1

Context nos.	754S
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware - range of rim, carinated and body sherds (107), stoneware (1) and porcelain (1).
Other finds	Shell fragment, possibly *Tridacna*.
Depth	20 cm
YB level	YB1

ii. CEMETERY PHASE

Context nos.	744F, 742S, 743C
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth (disturbed).
Ceramics	Earthenware (127), stoneware (2) and porcelain (1).
Other finds	-
Depth	6 cm
YB level	YB1

Context nos.	885=B901, 884C
Feature	Pit (concave with sharp break of slope, steep sides). Loose greyish brown silt.
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	Human remains (vertebrae, phalanges, other bones and teeth), shells, shell beads (885).
Depth	30-56 cm
YB level	YB1

Context nos.	719F, 720S, 721C
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	Copper alloy ring on one of the right proximal phalanx bone
Depth	8 cm
YB level	YB1

Context nos.	1835
Feature	Pit.
Ceramics	Earthenware (255), celadon (4) and porcelain (2).
Other finds	Metal slag
Depth	Metal slag from 49 cm
YB level	YB1

Context nos.	1502
Feature	Rocks.
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	-
Depth	-
YB level	YB2

Context nos.	377F, 55S, 53C, 54
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	-
Depth	-
YB level	YB2

Context nos.	714S, 715S, 716C
Feature	Disarticulated burial. 3 skulls in 715.
Ceramics	Earthenware (48), celadon (1).
Other finds	-
Depth	18 cm
YB level	YB2

Context nos.	343=883
Feature	Layer. Light reddish brown loose silt layer (343), layer of light greyish brown sandy silt (883).
Ceramics	343 earthenware (30) 883 earthenware (425).
Other finds	Shell beads and metal point (883), socketed axe – copper alloy, iron fragment (343)
Depth	0-37 cm
YB level	YB3

Context nos.	753S
Feature	Burial. Juvenile. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware (2) and stoneware (1).
Other finds	-
Depth	-
YB level	YB3

Context nos.	750F and S, 1656C
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware (37).
Other finds	-
Depth	5 cm
YB level	YB3

Context nos.	730F, 728S, 729C
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware and stoneware. No amounts or descriptions recorded/incomplete recording.
Other finds	-
Depth	0-25 cm
YB level	YB3

Context nos.	22F, 23S=1803S, 21C=49C=345C
Feature	Burial (contexts unclear).
Ceramics	22 earthenware (17) 1803 earthenware (8).
Other finds	-
Depth	-
YB level	YB4

Context nos.	1807S
Feature	Burial. Juvenile, age based on teeth estimated 3-5years, facing east, body oriented N-S.
Ceramics	Earthenware (27) and celadon (1).
Other finds	Piece of chert found between the legs, worked *Melo* fragment in the skull.
Depth	67-77 cm
YB level	YB5

Context nos.	75
Feature	Midden
Ceramics	Earthenware - range of rim and body sherds (197) and stoneware (9).
Other finds	-
Depth	125 cm
YB level	YB6

Context nos.	1809
Feature	Layer. Grey sediment with chracoal.
Ceramics	Earthenware (2).
Other finds	-
Depth	-
YB level	YB6

Context nos.	1802F, 1801S, 1800C
Feature	Burial. Adult, lower legs only. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	1800 earthenware (6), 1801 earthenware (15), stoneware (4) 1802 earthenware (9)
Other finds	-
Depth	-
YB level	YB6

Context nos.	1838
Feature	Spit.
Ceramics	Earthenware (321), stoneware (3) and porcelain (1).
Other finds	Iron fragment, lingling-o
Depth	Iron fragment taken from 64-74 cm
YB level	YB6

Context nos.	76S, 77S, 69C
Feature	Burial. Juvenile. Skeleton in 69, oriented East-West, ribs, long bones and other fragments recovered. Skeleton in 77 contained long bones and oriented head to south, feet to north.
Ceramics	No ceramics.
Other finds	69=77 infant burial with an Indo-Pacific bead bracelet (Paz 2005).
Depth	58 cm
YB level	YB7

iii. SHELL MIDDEN PHASE

Context nos.	1804=1806H
Feature	Grey compact layer with charcoal and burnt stones, silty with coarse pebbles (1804). Possible hearth (1806).
Ceramics	Earthenware (2).
Other finds	-
Depth	-
YB level	YB7

Context nos.	897=B911
Feature	Cut and fill.
Ceramics	Earthenware (120) and stoneware (1).
Other finds	-
Depth	-
YB level	YB8

Context nos.	798
Feature	Layer.
Ceramics	Earthenware 45 including square earthenware lid.
Other finds	-
Depth	7-26 cm

YB level	YB8

Context nos.	155=1818
Feature	Layer. Limestone layer (155), light greyish brown layer (1818)
Ceramics	Earthenware. No amounts or descriptions given/amounts unknown (155).
Other finds	Animal bones.
Depth	74 cm.
YB level	YB9

Context nos.	1810H=1812=1826
Feature	Layer. Ashy brown limestone layer possible hearth under infant burial.
Ceramics	1810 earthenware (2) 1812 earthenware (7).
Other finds	Charred shells and burnt limestone.
Depth	10 cm under 1807 (1807 67-77 cm)
YB level	YB9

Context nos.	344=1921
Feature	Layer. Silty sand layer (344), mid-dark yellowish brown silty clay, very loose (1921).
Ceramics	344 earthenware (55) 1921 earthenware (23).
Other finds	Fragments of human bones, animal bones, shell, angular limestone fragments.
Depth	-
YB level	YB9

Context nos.	782S=796=1572
Feature	Dog burial (796). Sample taken to Oxford for AMS dating. Sample failed. Fragile cranial fragments (782)
Ceramics	No ceramics.
Other finds	Fragments of human bones (1572) mixed in with the dog burial (796), animal bones, shell, angular limestone fragments. 782 fragile cranial fragments, a few teeth, and two pig tusks, possibly as grave goods (burial cut into by dog burial 796).
Depth	-
YB level	YB9

Context nos.	1848
Feature	Layer.
Ceramics	Earthenware (57).
Other finds	Animal bones
Depth	84 cm
YB level	YB9

Context nos.	1811=1813=1815
Feature	Layer. Dark orange sediment, possibly altered by hearth nearby.
Ceramics	1811 earthenware (11) 1815 earthenware (2).
Other finds	Possible bone pendant, lithics (1811), mandible (1815), shell beads (1813).
Depth	-
YB level	YB10

Context nos.	872, 1616, 1613, 1612…
Feature	872 cluster of shells below dog burial 796 1616, 1613, 1612 are fills of pits. Ellipsis […] indicates there are more contexts in this layer but do not have pottery and are therefore omitted

Ceramics	Earthenware (82) and stoneware (2).
Other finds	-
Depth	-
YB level	YB13

Context nos.	785
Feature	Combustion area.
Ceramics	Earthenware (12).
Other finds	-
Depth	67 cm
YB level	YB

Context nos.	870=1500=1571=1819=1816=1868=1627
Feature	Layer. Mixed deposit of red silt and calcareous white silt, possibly some guano.
Ceramics	Earthenware (145) and stoneware (2).
Other finds	Shells, animal bones, charcoal
Depth	-
YB level	YB16

Context nos.	1510
Feature	Rocks.
Ceramics	Earthenware (13).
Other finds	-
Depth	110-125 cm
YB level	YB16

Context nos.	1535
Feature	Layer. Loose mid-reddish brown sediment.
Ceramics	Earthenware (6).
Other finds	Shells
Depth	165 cm
YB level	YB17

Context nos.	1536
Feature	Concentration of cobbles in loose grey sediment.
Ceramics	Earthenware (1).
Other finds	-
Depth	165-185 cm
YB level	YB17

Context nos.	1509
Feature	Pit with very compact dark brown silt fill.
Ceramics	Earthenware (2).
Other finds	Charcoal, bones and shells.
Depth	-
YB level	YB17

Context nos.	1513
Feature	Layer. Dark ashy sediment.
Ceramics	Earthenware (1).
Other finds	-
Depth	-
YB level	YB17

Context nos.	1507, 1508
Feature	Layer. Dark ashy sediment.
Ceramics	Earthenware (34).
Other finds	Shells and bones.
Depth	-
YB level	YB17

Context nos.	1512
Feature	Pit or ditch-like depression (fill & cut), upper part is dark greyish brown.
Ceramics	Earthenware (93), stoneware (1) and porcelain (1).
Other finds	Bones, shells. A lump of hardened grey ash with plant remains was found as an inclusion.
Depth	110 cm
YB level	YB17

Context nos.	1526
Feature	Fill of feature, dark grey sediment with small greenish patches.
Ceramics	Earthenware (96) and stoneware (1).
Other finds	Shells
Depth	127 cm
YB level	YB17

Context nos.	1517
Feature	Layer. Reddish brown silt.
Ceramics	Earthenware - range of rim and body sherds (315), stoneware (1) and porcelain (2).
Other finds	Shells, including *Polymesoda* sp. (3), bone, hammerstone (2), *Melo* shell artefact.
Depth	135-145 cm
YB level	YB17

Context nos.	1609=1916F
Feature	Pit fill. Decaying limestone, grey brown silty clay, loose and friable
Ceramics	Earthenware (1).
Other finds	Shell, bone, angular limestone.
Depth	-
YB level	YB17

Context nos.	1856=1928
Feature	Layer. Very loose fine medium greyish brown silty clay
Ceramics	Earthenware (15)
Other finds	Large angular limestone fragments, batissa shells.
Depth	-
YB level	YB17

Context nos.	1639, 128=253, 133…
Feature	1639 sediment layers 128=253 layer of shell and stones 133 fill with stones and shells Ellipsis […] indicates there are more contexts in this layer but do not have pottery and are therefore omitted
Ceramics	-
Other finds	-
Depth	-
YB level	YB17

Context nos.	1527
Feature	Shell midden. Broken shells mixed with silt.
Ceramics	Earthenware (46).
Other finds	-
Depth	125 cm
YB level	YB18

Context nos.	1567=1647=1644=1692=1625=1624=1621=1867 Shell midden
Feature	Shell midden. Broken shells mixed with silt.
Ceramics	Earthenware (4).
Other finds	
Depth	
YB level	YB

Context nos.	1843
Feature	Layer. Grey ashy patch
Ceramics	Earthenware (53).
Other finds	-
Depth	216 cm
YB level	YB19

Context nos.	1844
Feature	Layer.
Ceramics	Earthenware (306), stoneware (1) and celadon (1).
Other finds	*Melo* shell artefact.
Depth	-
YB level	YB19

Context nos.	B912=898=1867 1649=1648
Feature	Shell midden.
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	-
Depth	-
YB level	YB19

Context nos.	109
Feature	Layer.
Ceramics	Earthenware (1).
Other finds	Bones, rubber.
Depth	-
YB level	YB20

Context nos.	1578=1579=1546
Feature	Rocks
Ceramics	Earthenware (14)
Other finds	-
Depth	195-220 cm
YB level	YB20

Context nos.	1872=1875, 1873, 1874=1876
Feature	Layer. Mid-reddish brown silty clay with small fragments of oxidised limestone and other angular limestone fragments.
Ceramics	1872 earthenware (12) 1873 earthenware (1)

	1874 earthenware (3) 1875 earthenware (84) 1876 earthenware (5).
Other finds	Shells.
Depth	-
YB level	YB21

Context nos.	145
Feature	Layer.
Ceramics	Earthenware (1).
Other finds	-
Depth	-
YB level	YB25

Context nos.	1564
Feature	Shell midden
Ceramics	Earthenware (1).
Other finds	-
Depth	-
YB level	YB25

Context nos.	374=116
Feature	Layer.
Ceramics	Earthenware - range of rim, carinated and body sherds (31)
Other finds	Shells and stones.
Depth	-
YB level	YB26

Context nos.	1595=1521=1608
Feature	Shell midden, broken shells mixed with silt (1521), calcium carbonate/gypsum crystal inclusions, loose brown silty sediment (1595).
Ceramics	1521 earthenware (24) and stoneware (1) 1595 earthenware (13).
Other finds	Metal fragment (1595)
Depth	139-179 cm
YB level	YB26

Context nos.	1539
Feature	Layer. Light greyish brown sediment
Ceramics	Earthenware (4) and stoneware (1).
Other finds	Shells, animal bones.
Depth	165-196 cm
YB level	YB26

Context nos.	1516
Feature	Layer. Brown silt.
Ceramics	Earthenware (2).
Other finds	Few shells, frequent lumps of limestone, several patches of charcoal and few animal bones.
Depth	-
YB level	YB27

Context nos.	1932F, 1931S, 1933C

Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	No ceramics.
Other finds	Shells, hammerstone.
Depth	-
YB level	YB28

Context nos.	1821
Feature	Layer. Loose light reddish brown.
Ceramics	Earthenware (2).
Other finds	-
Depth	110 cm
YB level	YB32

Context nos.	1817=1823=147
Feature	Layer. Mid orange brown sediment with stones.
Ceramics	No ceramics.
Other finds	Charcoal sample taken and sent to Oxford, granitic hammerstone (1823).
Depth	130 cm
YB level	YB32

Context nos.	190
Feature	Fill/layer. Part of shell midden.
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	Shells, bones, rocks, shell beads.
Depth	125 cm depth
YB level	YB34

Context nos.	1909
Feature	Possible feature.
Ceramics	Earthenware (17).
Other finds	-
Depth	-
YB level	YB34

Context nos.	868, 874S
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth (874). Possibly earliest burial. Large rocks arranged as burial markers (formed an elongated shape, tapering at the ends, described as 'boat-like'). Cluster of seven irregularly shaped stones, all limestone but one andesite (868). Similar to burial 727 in East Mouth.
Ceramics	No ceramics.
Other finds	Individual grave accompaniment composed of necklace made of conus shell and macaque tooth, a modified cobble and a cluster of mangrove clams, *Melo* shell (*Polymesoda erosa*) with traces of red pigments, and 2 worked *Melo* sp. Hammerstone found in chest area as grave good.
Depth	-
YB level	YB35

Context nos.	1551=301=869=L12
Feature	Layer. Loose reddish brown sediment with frequent stone.
Ceramics	Earthenware (2).
Other finds	Charcoal for dating (301)
Depth	126-145 cm, samples taken at 160 cm (301)
YB level	YB36

Context nos.	1538
Feature	Sediment under large rock.
Ceramics	Earthenware (33) and stoneware (4).
Other finds	-
Depth	195 cm
YB level	YB37

Context nos.	1532=1553=1556=1558
Feature	Orange to dark greyish brown sediments with rocks
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	Broken shells, *Melo* shell and bones
Depth	185-205 cm
YB level	YB37

Context nos.	1602
Feature	Round feature (cut and fill).
Ceramics	Earthenware (1).
Other finds	Shells and stone.
Depth	120 cm
YB level	YB37

Context nos.	1554=1519=1592=1520
Feature	Layer. Dark grey-brown silt.
Ceramics	Earthenware (1).
Other finds	1592=1554 contains inclusion of frequent charcoal in light orange brown sediment with fragments of calcium carbonate, interpreted as a combustion area but treated as an inclusion in 1519. Shells, granitic hammerstone (1519), charcoal taken to Oxford for dating (1520).
Depth	105-115 cm
YB level	YB38

Context nos.	1530
Feature	Layer. Orange-brown compact sediment.
Ceramics	Earthenware (4).
Other finds	Shells, cobbles, iron oxidation mottles/nodules as inclusions, charcoal taken to Oxford for dating.
Depth	-
YB level	YB38

Context nos.	1541
Feature	Layer. Loose mid-greyish brown sediment.
Ceramics	Earthenware (98). Intact jarlet.
Other finds	-
Depth	183 cm
YB level	YB38

iv. MID-HOLOCENE TO EARLY PLEISTOCENE PHASE

Context nos.	1550=1552, 1559=1570=1571 Rockfall
Feature	Rockfall. Large limestone rocks.
Ceramics	1 stoneware in 1571 (no earthenware).
Other finds	-
Depth	220 cm
YB level	YB39

Context nos.	1545
Feature	Layer. Loose light greyish brown sediment.
Ceramics	Earthenware (57) and stoneware (2).
Other finds	Shells, bones, one human longbone, *Melo* shell fragments, green bead, 1 T-shaped cross section *Tridacna* bracelet (T. Gigas).
Depth	260-280 cm
YB level	YB40

Context nos.	1626=1840=1846
Feature	Layer. Dark greyish brown silty clay.
Ceramics	Earthenware. No amounts or descriptions recorded/incomplete recording.
Other finds	Shells, large angular rocks (limestone cobbles and pebbles), animal bones (1 large mammal humerus, 1 large mammal metapodial), molluscs. Tiger bones in 1840.
Depth	140-170 cm (1626), 215-232 cm (1846)
YB level	YB40

Context nos.	1871
Feature	Layer.
Ceramics	Earthenware (2).
Other finds	-
Depth	-
YB level	YB41

Context nos.	1854
Feature	Layer. Dark reddish brown layer
Ceramics	Earthenware (20).
Other finds	Bones, shells, snails.
Depth	-
YB level	YB42

Context nos.	1858
Feature	Layer. Brown clayey silt.
Ceramics	Earthenware (2).
Other finds	Chert, animal bones.
Depth	-
YB level	YB42

Unsequenced context

Context nos.	25
Feature	Unknown
Ceramics	Earthenware and stoneware. No amounts or descriptions recorded/incomplete recording.
Other finds	-
Depth	-
YB level	-

Context nos.	133=146
Feature	Fill with stones and shells
Ceramics	133 earthenware - no amounts or descriptions recorded/incomplete recording 146 earthenware (6).
Other finds	Sediment sample.
Depth	-
YB level	-

Context nos.	227
Feature	Unknown
Ceramics	Earthenware (67).
Other finds	-
Depth	160-170 cm
YB level	-

Context nos.	228 (relationships unknown)
Feature	Heart
Ceramics	Earthenware (1)
Other finds	-
Depth	-
YB level	-

Context nos.	800
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	Earthenware (60). Burial associated with a large earthenware jar sherd.
Other finds	Charcoal next to skull.
Depth	33-44 cm
YB level	-

Context nos.	815
Feature	Pit.
Ceramics	Earthenware (12).
Other finds	Jade adze, shell scoop portion, large rectangular shell fragment.
Depth	100 cm
YB level	-

Anomalies / errors

Context nos.	80
Feature	Database lists this as Makangit Cave 2004 not Ille Cave.
Ceramics	Earthenware (30).
Other finds	-
Depth	-
YB level	-

Context nos.	189
Feature	Large rock.
Ceramics	Earthenware (3). Pottery, comingled with rock.
Other finds	-
Depth	-
YB level	-

Context nos.	899
Feature	Number used but no information in database (used in error).
Ceramics	Earthenware (29).
Other finds	-
Depth	-
YB level	-

Context nos.	1524 (relationships unknown)
Feature	Rocks.
Ceramics	Earthenware (2).

Other finds	-
Depth	80 cm
YB level	-

Context nos.	1600 (relationships unknown)
Feature	Layer. Loose, white-brown silt.
Ceramics	Earthenware (5)
Other finds	Shells
Depth	130-150 cm
YB level	-

Context nos.	1825S (relationships unknown)
Feature	Burial. Adult, skull, both humeri and femora, left ulna only. These were not found in correct anatomical position.
Ceramics	No ceramics.
Other finds	Artefacts found in close proximity were three pig tusks and two possible hammerstones, but remains were disturbed such that the association of these is not certain.
Depth	82 cm
YB level	-

Context nos.	1899
Feature	Number used but no information in database (used in error).
Ceramics	Earthenware (1)
Other finds	-
Depth	-
YB level	-

Context nos.	1924 (relationships unknown)
Feature	Burial. Supine, extended, oriented north-south with head towards the cave mouth.
Ceramics	No ceramics.
Other finds	Burial with four shell disc beads and a pig tusk.
Depth	-
YB level	-