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Late Lapita seafaring networks: Giligilina, a new Lapita site on the Papua New Guinea south coast

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ABSTRACT

The discovery of stratified Lapita sites at Caution Bay on the Papua New Guinea (PNG) south coast containing pottery sherds with a limited range of motifs, led to the proposal that the south coast of PNG may have been a late Lapita outpost at the southwestern margins of a broader Oceanic Lapita world. However, confirming such spatial separation has been challenging due to the paucity of known archaeological sites dating to earlier than 2,000 years ago along 500 km of coastline in southern mainland PNG between Caution Bay and the eastern tip of the PNG mainland. Aiming to address this knowledge gap, we turned attention to a former coastal location now positioned 3.2 km inland of the Aroma Coast, 160–180 km southeast of Caution Bay. There, a small Late Lapita pottery sherd assemblage from an ancestral village called Giligilina has now been dated to sometime between 2,660 and 2,420 cal BP. The Giligilina assemblage includes three dentate-stamped sherds and two sherds with distinctive shell-impressed decorations. These decorations are comparable to dentate-stamped and shell-impressed sherds found in stratigraphic association at Late Lapita sites both on the PNG mainland and across island Oceania to the east. Chronostratigraphic associations between dentate-stamped designs and shell-impressions confirm Late Lapita interaction across a broad island Oceanic Lapita world. This was a period marked by the movement of seafarers transporting pottery and/or ceramic-making knowledge westward into the Torres Strait and southward along the Australian coast. Giligilina contributes to a narrative of dynamic and pronounced Late Lapita seafaring suggesting a trajectory of social change that ultimately led to the end of archaeologically recognisable Lapita decorative conventions.

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Coral Sea; Lapita; dentate-stamped; pottery; seafaring; Papua New Guinea

Introduction

The seafaring enterprises of Lapita peoples and their descendants have remained fundamental to archaeological enquiry in Near and Remote Oceania and the southwest Pacific region for 70 years. The presence of Lapita peoples is archaeologically conspicuous in the remains of pots with distinctive dentate-stamped decorations rendered using multi-tined tools. The people who made and decorated the pots were given the name 'Lapita' by archaeologists in the 1960s, after the antiquity of dentate-stamped decoration was confirmed at a site called 'Lapita' in New Caledonia (Gifford and Shutler 1956; for a detailed history of how the term 'Lapita' emerged in archaeological discourse see Spriggs 2025). The earliest evidence of Lapita pottery comes from the Bismarck Archipelago, where dentate-stamped decoration on pottery dates to c.3,300 cal BP (Denham et al. 2012). It took perhaps less than 10 generations for Lapita peoples from the Bismarck Archipelago to spread eastward and establish settlements across Near and Remote Oceania (Spriggs 2022:210). Based on spatial and temporal variations in decorative designs on pottery, Lapita has been divided into Far Western, Western, Eastern and Southern Oceanic provinces (Anson 1986; Kirch 1997:19–21; Kirch and Chiu 2021:269–270). However, the allocation of Lapita decorations to provinces preferencing spatial variation over temporal change has been questioned (e.g. Bedford 2019:225–226; Kirch et al. 1987; Summerhayes 2000b). An alternative interpretation mainly preferencing cultural change through time is now widely accepted, with spatial differences acknowledged as a way of

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understanding changing relations between Lapita communities. Lapita has thus been divided into Early (c.3,300–3,100 BP), Middle (c.3,100–2,900/2,800 BP) and Late (>2,800 BP) phases (see Summerhayes 2000b, 2003:127–138 for initial definitions; Summerhayes 2010:20, Table 3 for an updated chronology). These phases were conceptualised as heuristic devices for characterising changes over time and remain amenable to changing, subject to the determination of refined site chronologies. Transitions between Lapita phases are signalled by changes in means of production and the ways pots were decorated (Summerhayes 2000b). Lapita decoration was most intricate during the Early Lapita phase, when socially and culturally connected Lapita groups began to move across Near Oceania (Kirch 1991:159; Summerhayes 2007:26). The Middle Lapita phase witnessed a decline in the complexity of pottery decoration during a wave of expansions across Remote Oceania, with Lapita peoples reaching islands as far east as Tonga (Poulsen 1987a:22) and later still Samoa (Green 1974a). During the Late Lapita phase, the complexity of pottery decoration diminished further as relations between communities became increasingly regionalised and connections to a shared heritage began to fade.

It has been suggested that changing attitudes to decorating pots during the Late Lapita phase may have been responses to changing subsistence strategies (David et al. 2019:84), changing social relations between groups (Summerhayes 2023:13), or pragmatic responses to challenging environmental conditions (Carson (2018:208–219). Reactions to socio-symbolic, subsistence and/or environmental change may have been implicated in contractions of the spatial extent of seafaring, as apparent in the increasing regionalisation of ceramic conventions towards the end of the Late Lapita phase (Bedford 2024:127, 143; Kirch 1990:123; Summerhayes 2000b:235; Wahome 1997:122). The timing of increasing regionalisation varied from place to place. Against this backdrop, the ways people decorated pots changed in general unison over vast distances, confirming that 'some level of interconnectedness remained' (Bedford 2024:142).

The geographic extent of Oceanic Late Lapita settlement spans c.4,000 km east to west and c.2,000 km north to south (Figure 1). Over several decades, as the inventory of Oceanic Lapita sites and the distribution of the known Lapita world grew, archaeologists became intrigued by an apparent absence of Lapita sites on the Papua New Guinea (PNG) mainland, just 45 km from the closest known island Lapita site (KLK on Tuam Island, Lilley 2002). Nevertheless, researchers were in agreement that PNG mainland pottery dating to after c.2,000 BP had

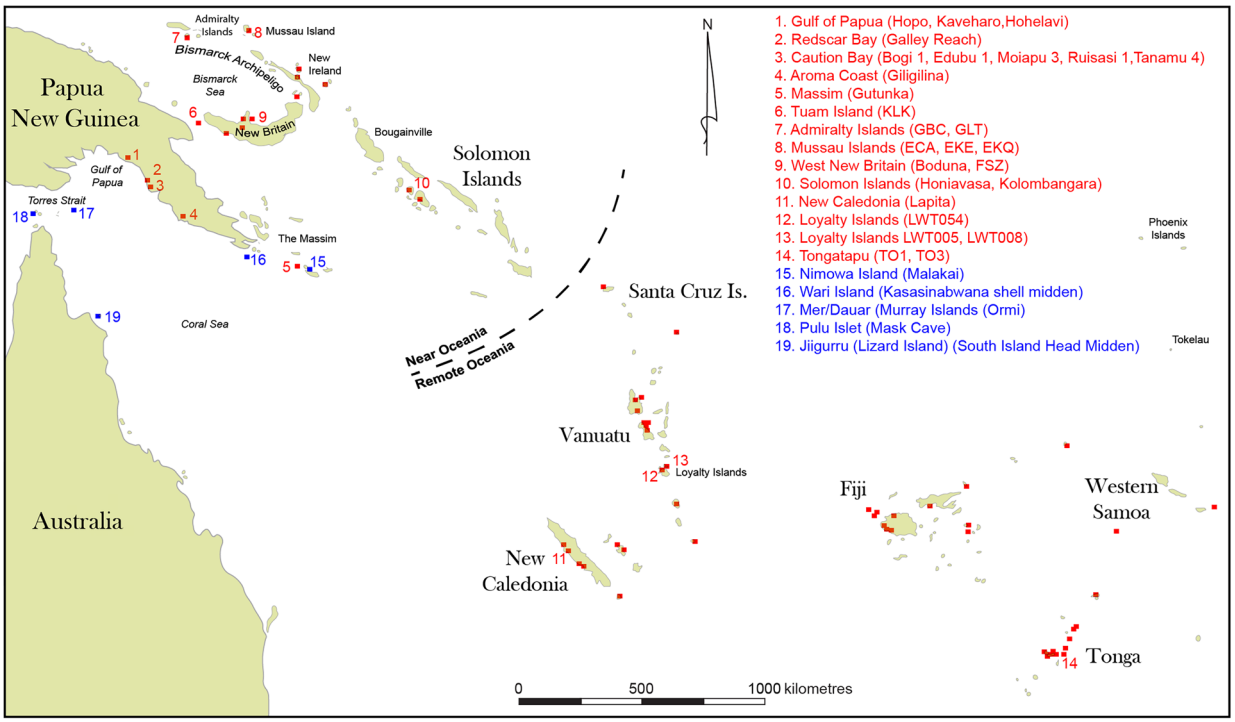


Figure 1. Late Lapita sites and groups of sites referred to in-text, numbered as spot locations in red. The indicative spatial extent of Late Lapita phase settlement is represented by the inclusion of radiocarbon-dated sites (and groups of sites) as unnumbered spot locations in red, following the site inventory compiled by Bedford et al. (2019, Table 1.1) and including the more recently discovered Gutunka site in the Massim (Shaw et al. 2022). Sites mentioned in-text containing pottery sherds contemporaneous or near-contemporaneous with the Late Lapita phase, but without dentate-stamped sherds, are numbered as spot locations in blue.

its origins in Lapita (Allen 1972:121, 1977:391; Bulmer 1971:56, 1999:546; Egloff 1979:113; Irwin 1991:503; Vanderwal 1973:207, 2010:418).

Finding Lapita sites on the PNG mainland is difficult compared to Oceanic Islands, because many mainland coastal landforms have been reshaped by geomorphological processes to a greater extent than islands during the Late Holocene (Spriggs 1984:210–211). On the PNG mainland, beach-fronting locations favoured for Lapita settlement are often found deeply buried beneath alluvial deposits, or buried several kilometres inland from where coastlines have since prograded. It took an expansive program of salvage excavations of 122 archaeological sites at Caution Bay, 20 km northwest of Port Moresby in 2009–2010, for the first stratified mainland Lapita sites to be identified on the south coast of PNG (David et al. 2011, 2019, 2022; McNiven et al. 2011, 2012a, 2012b). Since then, a single dentate-stamped rim sherd has been recovered from the shallow nearshore sea floor at Galley Reach, c.30 km northwest of Caution Bay (Sand et al. 2022), and one Late Lapita site has been described from the Gulf of Papua, c.200 km further again to the northwest (Skelly et al. 2014).

The discovery of stratified Lapita sites on the PNG mainland was not entirely unexpected (Bulmer 1999:573; see also Bedford and Sand 2007:4; Clark and Bedford 2008:70; David et al. 2004; McNiven et al. 2006; Spriggs 1984:213). Nevertheless, the discoveries raised many questions amongst Lapita scholars, including whether a 'South Papuan Lapita Province' should be recognised, as the decoration on the Caution Bay Lapita pottery was of a much narrower range of motifs than on contemporaneous Late Lapita pottery elsewhere although the limited range of motifs could reflect the limited size of the assemblage (see David et al. 2011). Based on the first announcements of Lapita finds at Caution Bay, Geoff Irwin considered the answer to be, 'no, or at least, certainly not yet' (Irwin 2012:11; cf. Burley 2012:14; Specht 2012:23). Since then, further publications and the discovery of additional sites dating to Late Lapita brings us back to this question.

In this paper, we consider whether a spatially defined 'South Papuan Lapita Province' remains heuristically informative and useful. Addressing this question has remained largely informed by the Caution Bay assemblages for the broader region until now, due to the paucity of Lapita sites thus far identified on the PNG mainland compared to island Oceania. A recent inventory lists 275 (94%) Lapita sites on Oceanic Islands and 19 (6%) on the PNG mainland (Bedford et al. 2019). Sixteen of these mainland sites are in Caution Bay (see Bedford et al. 2019; David et al. 2011, 2019, 2022; McNiven et al. 2011, 2012a, 2012b; Richards et al. 2016).

The problem is that along 500 km of coastline, between Caution Bay and the eastern tip of the PNG mainland, the period before c.2,000 years ago has remained archaeologically unknown. To address this knowledge gap, we looked east of Caution Bay to types of locations potentially suited to Lapita settlement. We were drawn to the Aroma Coast 160–180 km southeast of Caution Bay. There we found both Late Lapita dentate-stamped sherds and shell-impressed sherds buried at depth below the oral tradition ancestral village site called Giligilina (Figure 2). It is these findings that we present below.

The Aroma Coast

The Aroma Coast stretches from the village of Paramana eastward for 19 km, passing the villages of Kwapeupa-Kelekapana, Wairavanua and Buru, to Kelerakwa on the west bank of McFarlane Harbour (Figure 3). The Abau District administrative centre of Kupiano is on the east side of the harbour. Today the 1.5–2 km-wide McFarlane Harbour forms the confluence of the Waipara, Imla and Lako rivers, Marshall Lagoon and several minor drainage channels. During the Late Holocene, as the harbour formed, sediments reaching the coast from inland areas via rivers and creeks were deposited to the west, causing the coast to prograde. Strand lines show that Giligilina, which is today 3.2 km inland, used to be nearer the coast (Figure 3). Excavations at Giligilina reached light greenish grey, reddish brown mottled beach sand (see below), suggesting that Giligilina was at one time a beach-fronting location. Pottery sherds indicating the presence of Late Lapita seafarers, here dated to *2,660–2,420 cal BP*, suggest that the coast was prograding at rates of c. 1.4–1.2 m/year (Bayesian-modelled dates are shown in italics, following Hamilton and Krus 2018; Giligilina's calibrated radiocarbon ages are cited at 68.3% probability, see below).

In April 2022, a team from Monash University, the University of Papua New Guinea (UPNG) and the PNG National Museum and Art Gallery (NMAG) visited the Aroma Coast to discuss with communities the possibility of conducting a local archaeological research project. Discussions were led by community leader Ward Councillor Ravu Valikila at the village of Maopa. Introductory meetings included discussions about oral histories, ancestral village sequences and archaeological approaches to informing about the past. Communities were asked to consider whether they were interested in being involved

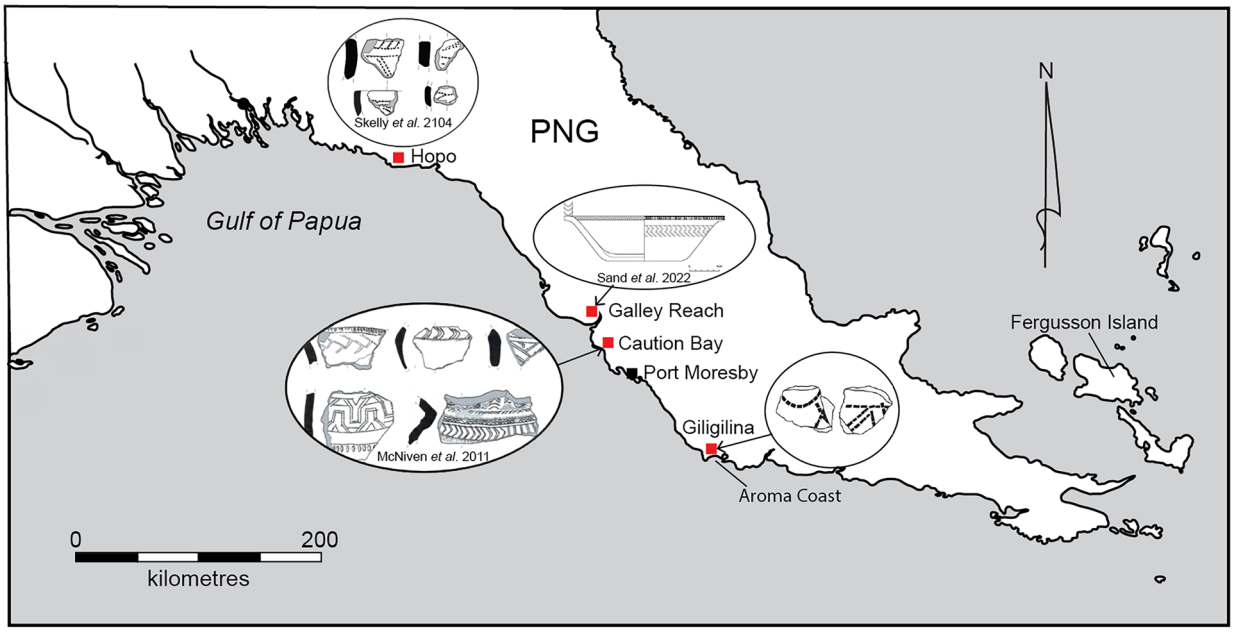


Figure 2. Dentate-stamped Lapita sherds on the PNG mainland south coast.

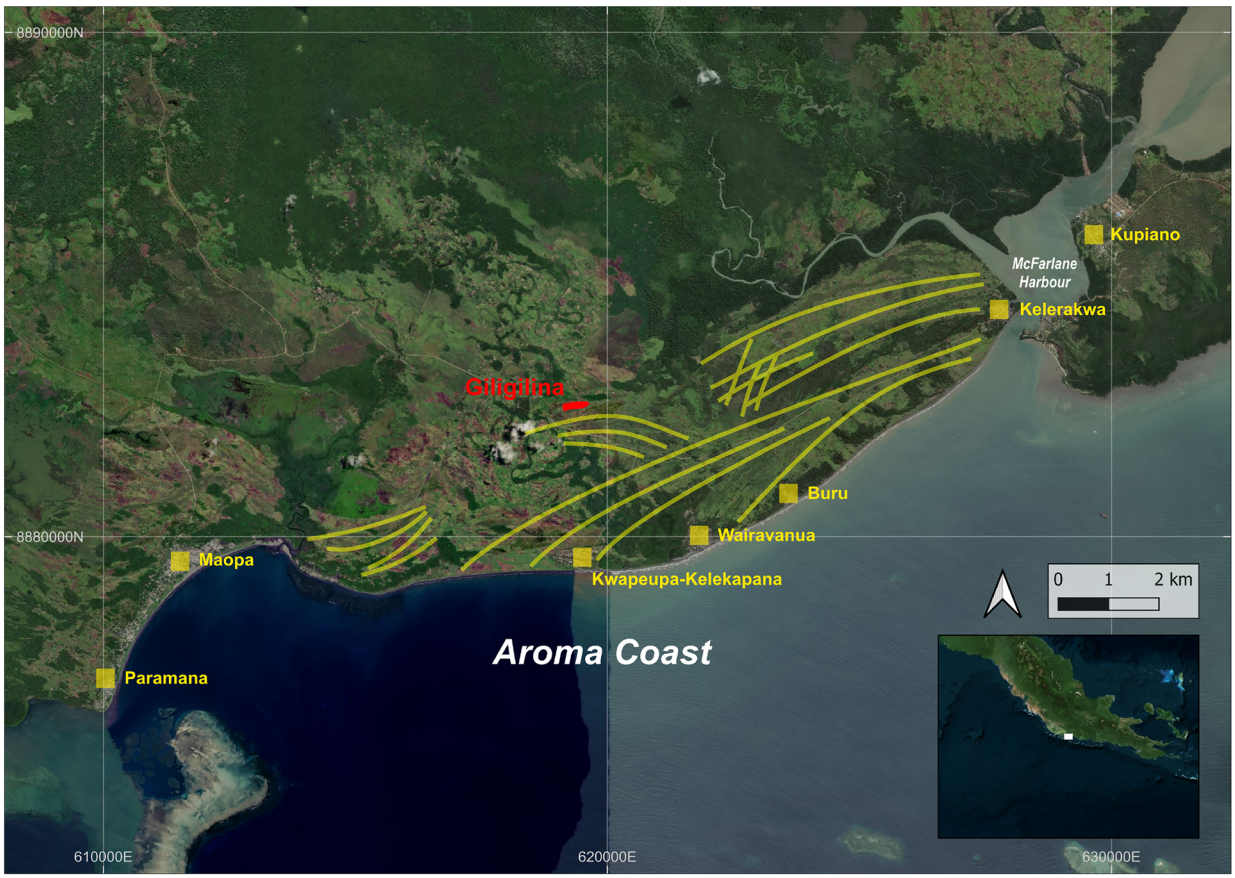


Figure 3. Aroma coast, showing strand lines (former coastlines) in yellow (after Papua New Guinea 1:250,000 geological series 1997: Kalo, Sheet SC 55-11). Map created using Open Source QGIS. http://qgis.osgeo.org (drafted by Georgina Skelly).

in archaeological research, and if so, to consider research questions that interested them. Ravu Valikila and Kylie Sesuki (NMAG Principal Curator) had several follow up conversations about the merits of archaeological research. In late 2022, Ravu informed Kylie that Aroma Coast communities were interested in archaeological information on ancestral village sequencing and settlement chronologies. In February 2023, a team from Monash, UPNG and NMAG returned to the Aroma Coast to commence the project. Following two days spent visiting ancestral village site locations, as led by community members, the team were guided to Giligilina (NMAG site code: ABYP). Ravu Valikila explained that all Aroma

Coast communities traced ancestral histories to Giligilina and that the project should therefore start there.

Giligilina

Today, scatters of shell and pottery sherds are regularly exposed on the ground surface at Giligilina, mostly on old dunes traversing the sandy beach plains (Figure 4(A)). A steep (slope inclination: 30–60°), c.35–50 m-high limestone ridge called Vavine Oualena encloses Giligilina to the north (Figure 4(B)). The Vavine Oualena ridge offers uninterrupted views south to the coast and north across inland plains (Figure 4(C)). The beach plains follow the east–west alignment of the former coastline for 450 m. Giligilina ends to the west, where surface beach sands grade to clay c.200 m from the Upagau River. To the east, Giligilina ends where the Vavine Oualena ridgeline terminates at a limestone column (Figure 4(D)).

Excavations in 2023 and 2024 revealed stratified deposits commencing sometime between *4,050–3,850 cal BP* and a sequence of occupations lasting up to recent centuries. This paper focuses on cultural deposits from six closely spaced 1 × 1 m excavation squares with a shared chronostratigraphic sequence. Together, the six squares contain a small assemblage of sherds with Lapita decoration, here shown to date sometime between *2,660–2,420 cal BP*. Results from other occupation periods at Giligilina, and other excavations on the Aroma Coast, will be published separately.

Excavation

Twelve 1 × 1 m squares were excavated at Giligilina in 2023 and 2024. In this paper, we report results from six squares only (Squares A, C, E, F, K, J). Excavations proceeded in arbitrary excavation units (XUs) following the stratigraphy visible during excavation. The site was excavated by XUs within identified stratigraphic units to investigate the chronostratigraphy and to interrogate the site's taphonomy. Together, 294 XUs of a mean thickness of 3.1 cm were excavated at the six squares. All excavated sediments were sieved through 2.0 mm aperture mesh and all materials from the sieves were retained for laboratory analyses. Five stratigraphic units (SUs) were identified by sediment

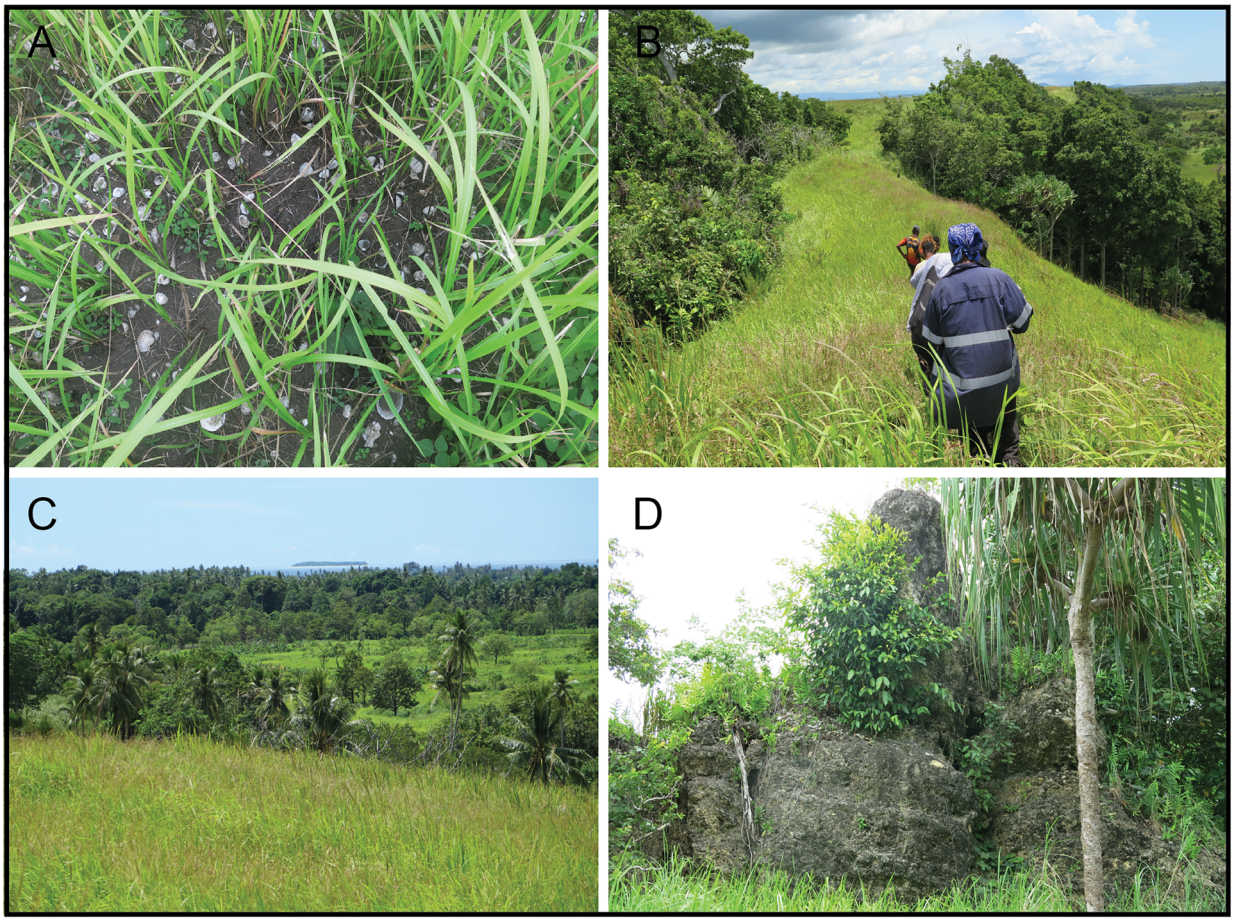


Figure 4. Four views of Giligilina and its surrounds. (A) Cultural materials exposed on the ground surface at Giligilina. (B) Site survey on the Vavine Oualena ridgeline at Giligilina. (C) View from Vavine Oualena south to the coast with the Giligilina beach plains in the immediate foreground. (D) Limestone column marking the eastern extent of Vavine Oualena and Giligilina (photographs by Linda Skelly).

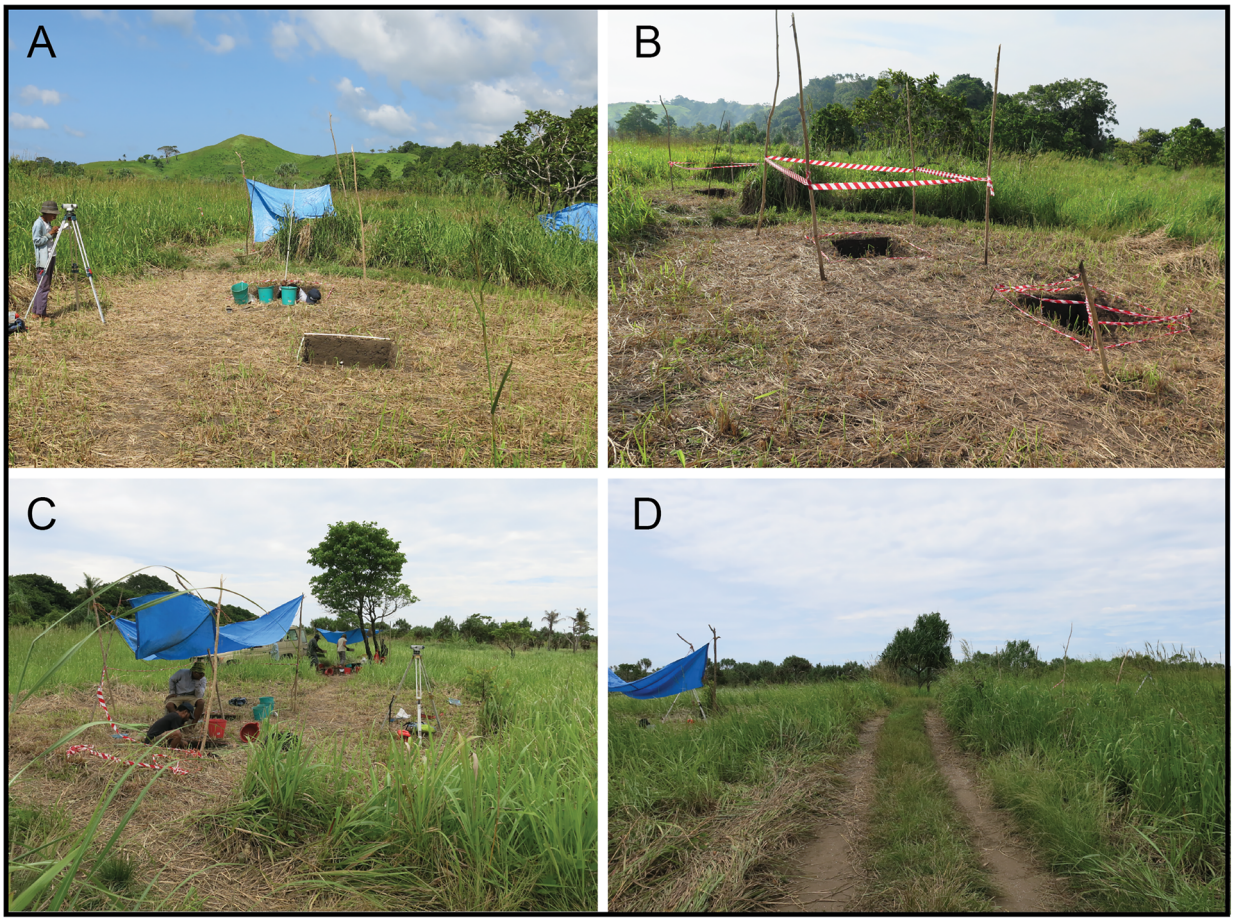


Figure 5. The Giligilina excavations. (A) Excavations in progress, view northwest to Vavine Oualena. (B) Squares D, G and H excavations concluded. (C) Square J excavations in progress, with sieving station in the background. (D) View west along the vehicle track. Square J is to the left of the track, Squares A, C, E, F and K to the right (photographs by Rob Skelly).

colour (dry Munsell), texture, degree of consolidation and compaction (see section below). Excavations began with Square A, 2 m north of a vehicle track. The track had cut a 10–30 cm-deep furrow across Giligilina, in many places exposing stratified deposits containing pottery sherds, shell and stone artefacts. During our 2023 excavations, Square A appeared archaeologically promising and a second, contiguous square (Square C) was excavated west of Square A (the squares were labelled in order of excavation). Squares A and C each contained one sherd with dentate-stamped decoration at depth, but no charcoal or shell that could be dated was stratigraphically associated with the sherds, so the age of the dentate-stamped sherds remained unknown. Returning in 2024, excavations resumed with the aim of finding further evidence of Lapita and materials suitable for radiocarbon dating.

Our 2024 field season began with the excavation of five 1 × 1 m squares (Squares D, G, H, L, M; Square B was excavated in 2023) radiating in all cardinal directions away from contiguous Squares A and C (Figures 5 and 6). In addition, 1 × 1 m excavations were completed on the Vavine Oualena ridgeline and on a strandline 500 m to the south. The dating for Vavine Oualena is yet to be confirmed. All other excavations revealed occupations dating to after *1,420 cal BP*. With no evidence of Lapita pottery in the five excavation squares radiating from Squares A and C, attention turned back to where the dentate-stamped sherds had been found the previous year. Four additional 1 × 1 m squares were excavated close to Squares A and C. Three contiguous Squares (E, F, K) were dug commencing 1.5 m northwest of Square C and Square J south of the vehicle track 6 m from Square A. Careful attention was paid to finding materials suitable for radiocarbon dating; 26 in situ charcoal samples were obtained from Squares E, F, K and J (all in SU3) and plotted in 3D using an automatic level for depth measurements. Eight of these charcoal samples stratigraphically align with the Lapita sherds in Squares A and C. The Lapita sherds in Squares A and C are from close to the base of SU3, where intermixed sediments grade to the underlying SU4 (Figure 7).

Stratigraphy

The six closely spaced excavation squares (A, C, E, F, K, J) share a common stratigraphy that varies only in particular details. Therefore, the stratigraphic

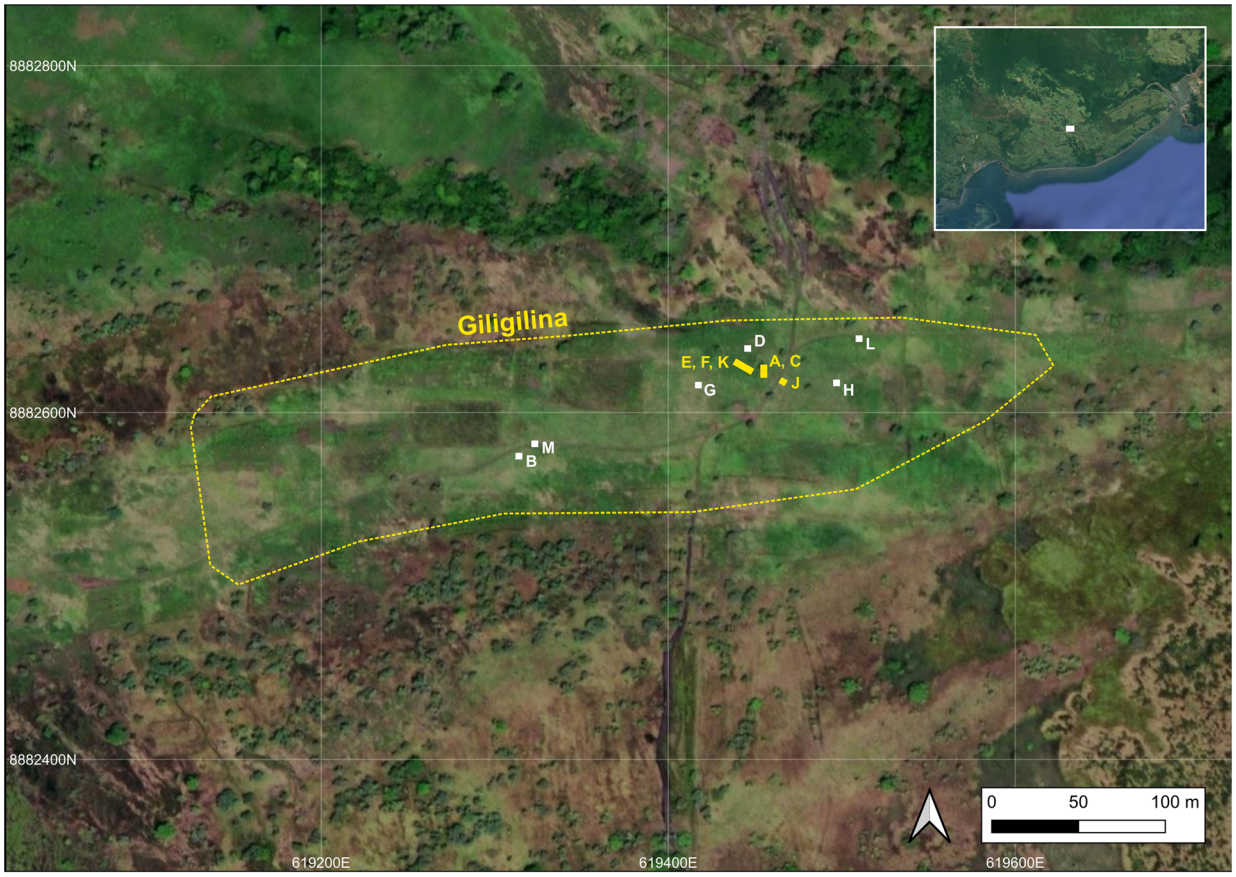


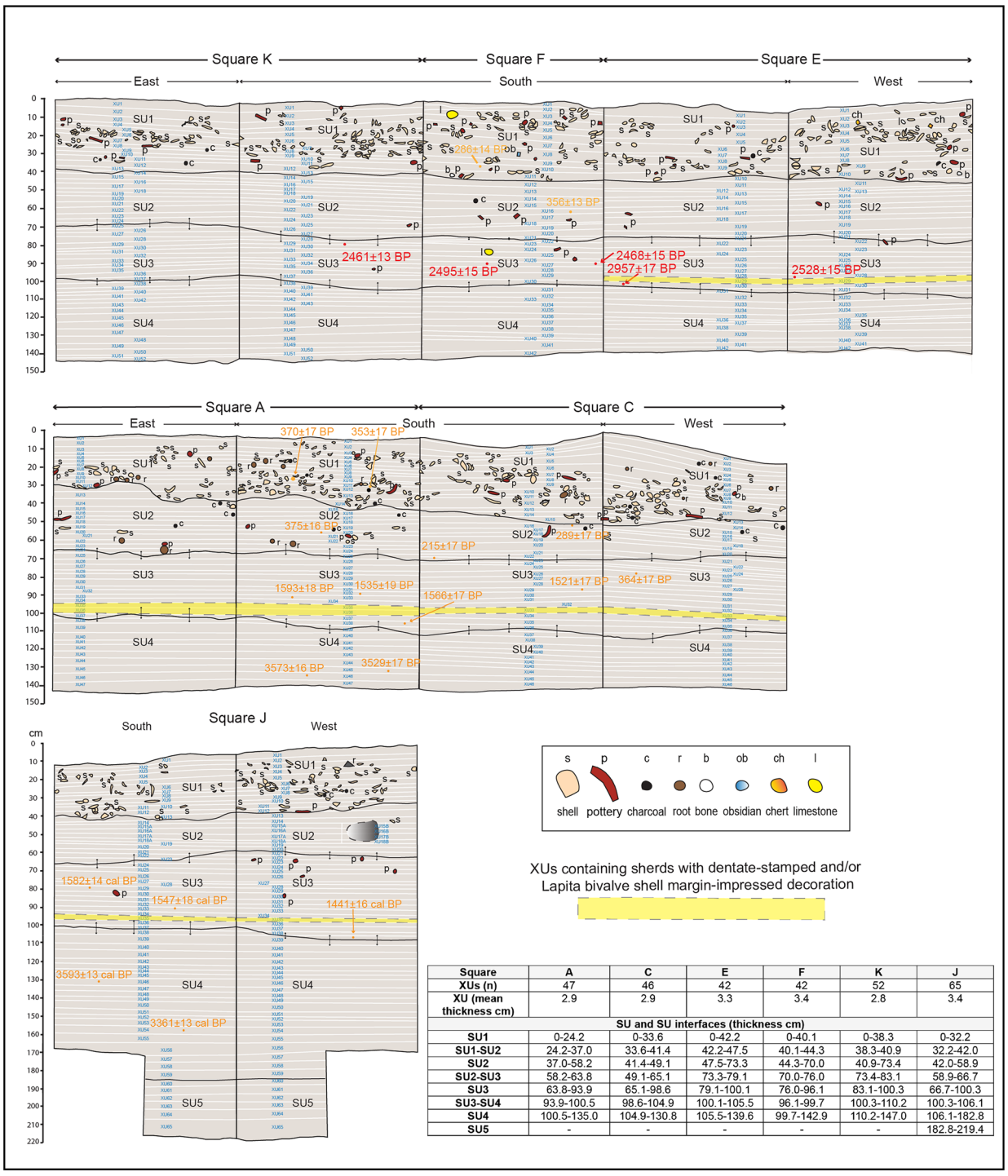
Figure 6. Indicative extent of the archaeological site of Giligilina, in yellow (based on the surface distribution of cultural materials). Excavation Squares A, C, E, F, K, J shown in yellow. Excavation squares not discussed in this paper are shown in white (drafted by Georgina Skelly).

sequences for these squares are described together (Figures 7 and 8). The sequence begins with SU1 at the top, an unconsolidated very fine-grained homogenous humic-stained black sand (5YR 2.5/1) matted with fine rootlets. SU2 below it is a well-consolidated dark reddish-brown fine-grained sand (5YR 3/4). The stratigraphic transition to SU3 is marked by an increase in horizontal tree roots of 2–4 cm diameter. SU3 is a well-consolidated, lightly compacted fine-grained dark yellowish brown sand (10YR 4/6). The SU3–SU4 interface is generally well-defined. SU4 is a compacted medium-grained, dark yellowish brown sand (10YR 4/6). Excavations in Square J continued to greater depth than the other five squares and is the only excavation to have reached SU5. SU5 is a culturally sterile, compacted, light greenish grey, reddish brown mottled medium-grained sand (GLEY1 8/1–2.5 R 5/4) containing small (<3 cm-long) pieces of weathered limestone. In this paper, we consider only the cultural materials from SU3, the layer with the Lapita sherds. No evidence of gardening disturbance or sediment reworking was identified during the excavation of SU3, and animal burrowing disturbance observed only in Square J (SU1–SU2). Nevertheless, the vertical distribution of radiocarbon dates and pottery sherds (described below) suggest that SU3 is in places mixed as palimpsest deposits.

Radiocarbon dates

A total of 24 radiocarbon dates were obtained from the six squares. All dates are tabulated but only those from SU3 relating to Lapita archaeological horizons are discussed in detail (Table 1). The dates are from a flat section of the radiocarbon calibration curve which means that precise dating of the Late Lapita phase at Giligilina remains problematic. The dates fall on the first half of the flat section of the calibration curve. In this paper, we cite the Bayesian-modelled ages at 68.3% probability (the 95.4% probability ages are also shown in Tables 1 and 2). The plant taxa of the charcoal samples were not identified, and the dates include inbuilt ages (for discussion about problems dating Lapita deposits, see Bedford et al. 2023).

To provide a temporal outline for Giligilina, we used Bayesian Sequence Analysis, whereby radiocarbon ages are constrained by prior stratigraphic information (Bronk Ramsey 2009). The dates were grouped into multiple phases within a sequence determined by a stratigraphic order with either



Square	A	C	E	F	K	J
XUs (n)	47	46	42	42	52	65
XU (mean thickness cm)	2.9	2.9	3.3	3.4	2.8	3.4
	SU and SU interfaces (thickness cm)					
SU1	0-24.2	0-33.6	0-42.2	0-40.1	0-38.3	0-32.2
SU1-SU2	24.2-37.0	33.6-41.4	42.2-47.5	40.1-44.3	38.3-40.9	32.2-42.0
SU2	37.0-58.2	41.4-49.1	47.5-73.3	44.3-70.0	40.9-73.4	42.0-58.9
SU2-SU3	58.2-63.8	49.1-65.1	73.3-79.1	70.0-76.0	73.4-83.1	58.9-66.7
SU3	63.8-93.9	65.1-98.6	79.1-100.1	76.0-96.1	83.1-100.3	66.7-100.3
SU3-SU4	93.9-100.5	98.6-104.9	100.1-105.5	96.1-99.7	100.3-110.2	100.3-106.1
SU4	100.5-135.0	104.9-130.8	105.5-139.6	99.7-142.9	110.2-147.0	106.1-182.8
SU5	-	-	-	-	-	182.8-219.4

Figure 7. Giligilina sections from Squares A, C, E, F, K and J, with XUs back-plotted. The radiocarbon ages associated with the Lapita finds are highlighted in red. The pre-ceramic and post-Lapita radiocarbon ages are shown in orange (artwork by Rob Skelly).

contiguous or sequential boundaries, depending on the age difference between superimposed layers. The internal consistency of the calibrated ages was assessed using Outlier Analysis that provides a probabilistic measure of the degree to which samples are outliers in the model and then calculates an offset relative to the stratigraphic unit within which it is found (Bronk Ramsey et al. 2010). Stratigraphic Unit 3 contained a range of ages and has been further divided by the presence of Lapita sherds in some squares (see Figure 7 and Table 1). A General t-type Outlier Model was assigned to all dates with a prior outlier probability of 0.05. The Bayesian age models are presented in Figure 9.

Model A returned three major outliers: WkA-58392 (100%), WkA-56253 (35%) in SU3 and WkA-56829 (99%) in SU2. Minor outliers include WkA-57914 (14%) in SU4 and WkA-57915 (9%) in SU3. These outliers have major impacts on the model, obscuring the boundary ages (see Table S1; A_{model} = 29.3). Removing all five outliers improves the overall agreement of the model (A_{model} = 106) (Figure 9(B),

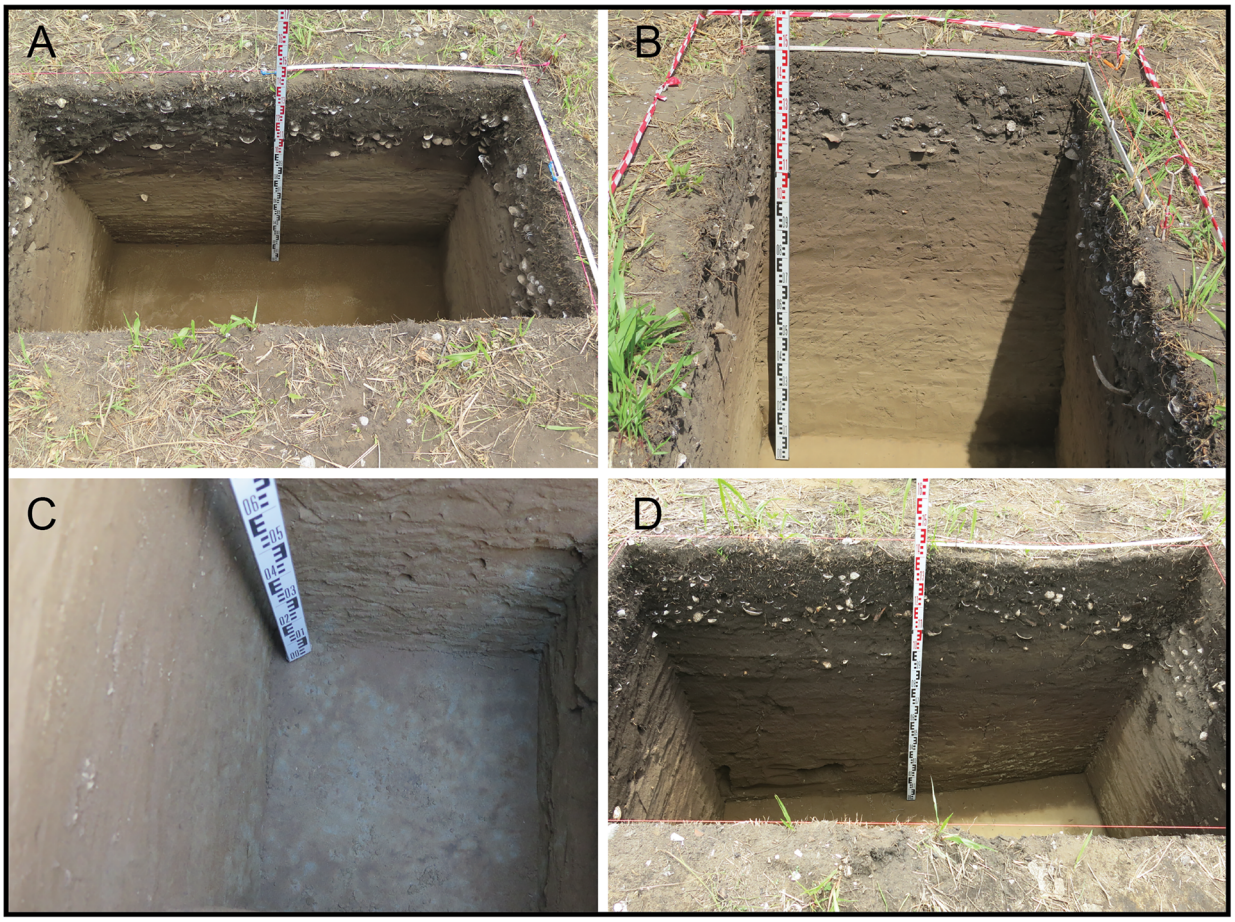


Figure 8. Giligilina completed excavations. (A) Squares E and F, south section. (B) Square K, east section. (C) Square J after XU65, excavation completed. (D) Squares A and C, south section (photographs by Rob Skelly).

Table 1. Radiocarbon determinations for Giligilina (Squares A, C, E, F, K, J).

XU	SU	WkA-laboratory code	14C age BP	Unmodelled calibrated age BP (68.3% probability)	Unmodelled calibrated age BP (95.4% probability)
Square A					
10	1	56825	370 ± 17	480–330	500–320
12	1	56257	353 ± 17	470–320	480–310
20	2	56826	375 ± 16	490–330	500–320
32	3	56255	1,535 ± 19	1,420–1,370	1,520–1,350
33	3	56258	1,593 ± 18	1,520–1410	1,530–1,410
38	3	56253	1,566 ± 17	1,520–1,400	1,520–1,390
45	4	56827	3,529 ± 17	3,850–3,720	3,880–3,720
46	4	57119	3,573 ± 16	3,900–3,840	3,970–3,770
Square C					
16	2	56832	289 ± 17	430–300	430–290
23	2	56829	215 ± 17	300–150	310–20
26	2	56254	364 ± 17	480–330	500–320
29	3	56256	1,521 ± 17	1,410–1,370	1,420–1,350
Square E					
28	3	58181	2,528 ± 16	2,730–2,540	2,730–2,510
30	3	57915	2,957 ± 19	3,170–3,070	3,210–3,000
Square F					
10	2	57916	286 ± 14	430–300	430–290
16	2	57917	356 ± 13	470–330	480–310
27	3	58183	2,468 ± 15	2,700–2,490	2,710–2,430
27	3	58182	2,495 ± 15	2,710–2,500	2,720–2,490
Square K					
29	3	57919	2,461 ± 13	2,700–2,470	2,710–2,420
Square J					
29	3	57912	1,582 ± 14	1,520–1,410	1,520–1,400
33	3	58391	1,547 ± 18	1,510–1,380	1,520–1,360
39	3	58392	1,441 ± 16	1,350–1,300	1,360–1,300
46	4	57913	3,593 ± 13	3,960–3,850	3,970–3,840
54	4	57914	3,361 ± 13	3,630–3,560	3,690–3,510

Notes: All radiocarbon ages are AMS on individual pieces of charcoal collected in situ. Calibrations were undertaken in OxCal v4.4.4 (Bronk Ramsey 2023). Atmospheric data from Reimer et al. (2020). The ages in bold text are associated with Lapita sherds. The agreement index (A) indicates the extent to which the posterior distribution overlaps the prior distribution. This can be tested further by calculating an overall agreement index (Amodel) which is a function of all constraints applied within the model. The agreement index should be questioned if it falls below 60% (Bronk Ramsey 1995).

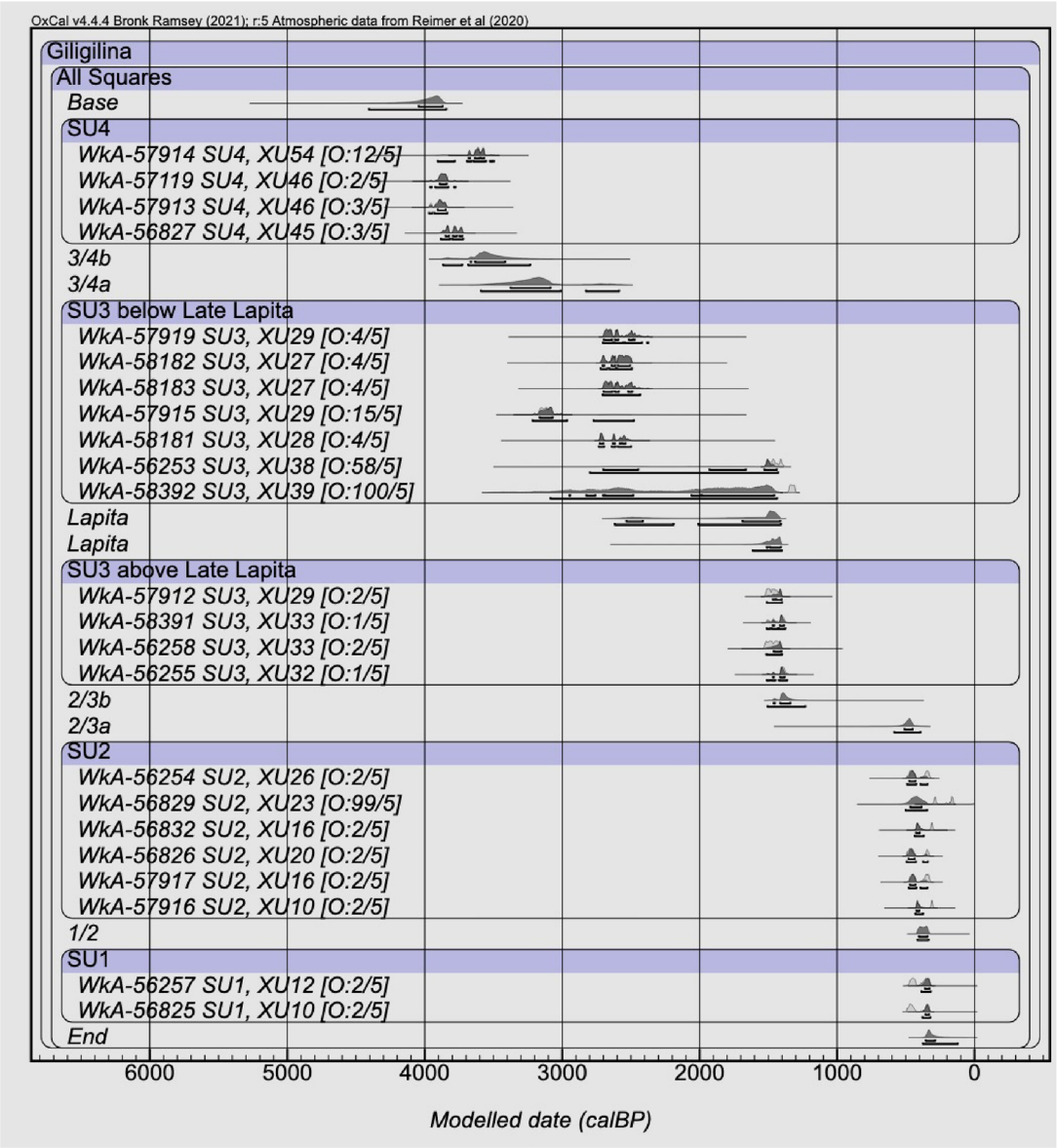


Figure 9. Bayesian age model for radiocarbon ages from Giligilina, grouped by stratigraphic unit. Black distributions represent boundary ages after the Bayesian modelling. The notation [O:2/5] indicates a 2% posterior probability of being an outlier in the model. A: Model including outliers. B: Model rerun excluding all outliers.

Table 2). Overall, model B suggests that deposition of SU4 started after *4,050 cal BP* and ended by *3,670 cal BP*. SU3 (pre-Late Lapita) deposition started after *3,830 cal BP*, with the deposition of Lapita sherds occurring sometime between *2,660* and *2,420 cal BP*. The deposition of SU3 ends by *1,340 cal BP*, and the deposition of SU2 starts after *520 cal BP*, ending by *330 cal BP*. This sequence is punctuated by major periods when no deposition of charcoal is evident at Giligilina.

Pottery

The SU3 sherds (Squares A, C, E, F, K, J) are highly fragmented. They comprise 2,532 sherds >2 mm long, with 81 being ≥3 cm long. The assemblage includes 50 rim sherds of varying sizes and 28 sherds with impressed or incised body decoration. The 50 rim sherds and 24 sherds with body decoration (that are not also rim sherds) comprise the diagnostic assemblage ($n = 74$). The attributes of the diagnostic assemblage were analysed in detail, with the remainder of the SU3 sherd assemblage counted and bulk-weighed by XU.

Dentate-stamped decoration

Three sherds are dentate-stamped. The rectilinear motifs and open designs are typical of Late Lapita. One sherd has curved dentate stamping intersected by a dentate line overlapped by a second dentate line (Figure 10(A)). A second sherd has two parallel lines intersecting a single dentate-stamped line with a further two more widely spaced lines partially overlapping the same dentate line (Figure 10(B)). The dentate stamping on both sherds is imprecise. Similarly imprecise overlapping dentate stamping has been

Table 2. Results of the Bayesian sequence model after removal of outliers.

	Unmodelled calibrated age BP (68.3% probability)		Unmodelled calibrated age BP (95.4% probability)		Modelled calibrated age BP (68.3% probability)		Modelled calibrated age BP (95.4% probability)	
SU1								
Boundary SU1/2					410	330	420	330
WkA-57916 SU2, SqF	430	300	430	290	430	400	430	370
WkA-57917 SU2, SqF	470	330	480	310	480	430	490	340
WkA-56826 SU2, SqA	490	330	500	320	490	440	500	330
WkA-56832 SU2, SqC	430	300	430	290	430	390	440	370
WkA-56254 SU2, SqC	480	330	500	320	480	420	500	330
SU2								
Start SU2					520	450	590	410
End SU3					1,420	1,340	1,420	1,190
WkA-58256 SU3, SqC	1,410	1,370	1,420	1,350	1,410	1,370	1,420	1,350
WkA-56255 SU3, SqA	1,420	1,370	1,520	1,350	1,420	1,380	1,510	1,350
WkA-56258 SU3, SqA	1,520	1,410	1,530	1,410	1,460	1,400	1,520	1,400
WkA-58391 SU3, SqJ	1,510	1,380	1,520	1,360	1,420	1,380	1,510	1,370
WkA-57912 SU3, SqJ	1,520	1,410	1,520	1,400	1,460	1,400	1,510	1,400
SU3 Post-Late Lapita								
XUs containing Lapita sherds					2,660	2,420	2,680	2,230
WkA-58181 SU3, SqE	2,730	2,540	2,730	2,510	2,730	2,540	2,730	2,490
WkA-58183 SU3, SqF	2,700	2,490	2,710	2,430	2,700	2,580	2,710	2,480
WkA-58182 SU3, SqF	2,710	2,500	2,720	2,490	2,710	2,520	2,720	2,490
WkA-57919 SU3, SqK	2,700	2,470	2,710	2,420	2,700	2,590	2,710	2,460
SU3 Pre-Late Lapita								
Start SU3					2,830	2,540	3,030	2,490
End SU4					3,870	3,670	3,880	3,020
WkA-56827 SU4, SqA	3,850	3,720	3,880	3,720	3,880	3,770	3,890	3,720
WkA-57119 SU4, SqA	3,900	3,840	3,970	3,770	3,890	3,840	3,920	3,820
WkA-57913 SU4, SqJ	3,960	3,850	3,970	3,840	3,910	3,840	3,960	3,830
SU4								
Start Giligilina					4,050	3,850	4,650	3,830

Note: The rows highlighted in grey represent boundary ages.

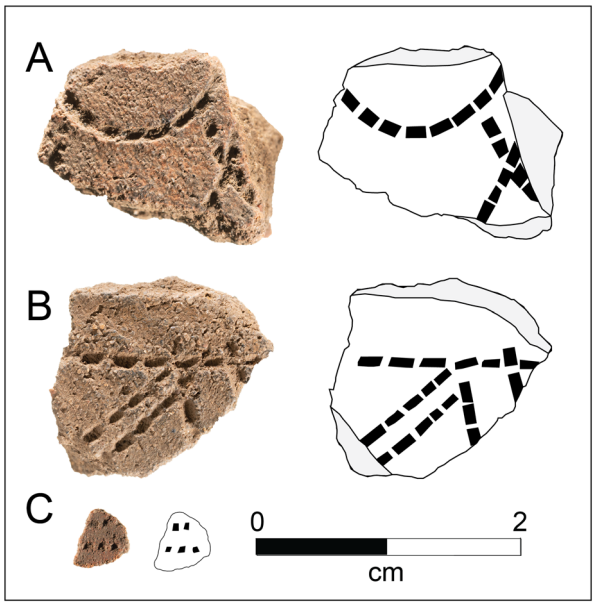


Figure 10. Dentate-stamped decorations from SU3 sherds. (A) Sherd from Square C XU33. (B) Sherd from Square A XU35. (C) Sherd from Square J XU35 (photographs by Steve Morton, drawings by Rob Skelly).

described in Late Lapita assemblages, for example at Caution Bay (e.g. David et al. 2011:582, Figure 2G) and Kolombangara in the western Solomon Islands (Summerhayes and Scales 2005:15, Figure 3). The third dentate-stamped sherd is a tiny, weathered fragment from Square J. Despite the sherd's small size, it is unambiguously dentate-stamped (Figure 10(C)).

Shell-impressed decoration

Shell-impressed decoration makes its appearance in Oceanic Late Lapita assemblages shortly before the end of dentate stamping (Bedford 2024:129–130). Two of Giligilina's SU3 sherds have shell-impressed lines (Figure 11). The decoration is the same as that from Late Lapita contexts also containing dentate-stamped sherds at Moiapu 3 and Edubu 1 in Caution Bay (David et al. 2019:77, Figure 3.12C; McNiven et al. 2012b:142, Figure 7E), site GBC in the Admiralty Islands (Ambrose 1991:108, plate 2; Wahome 1997:119), FSZ in West New Britain (Summerhayes 2000b:146, Figure 9.2), EKQ on Mussau Island (Kirch 2000:127–128) and sites LWT005, LWT008 and LWT054 in the Loyalty Islands (Sand 1998:198, 204, Figure 5H, 215). Late Lapita shell-impressed decoration at Giligilina is consistent with a widespread Late Lapita decorative trend of rendering linear decoration using the margins of bivalve shells. Variations occur where different bivalve taxa were used varying the morphology of the lines.

Variations in the morphology of bivalve margin shell-impressions in Late Lapita assemblages led us to conduct experiments to see if the shell taxa used could be identified. The aim of the experiments was to determine if common shell taxa were used to make shell impressions on pottery across sites and regions and whether such usage matched mollusc

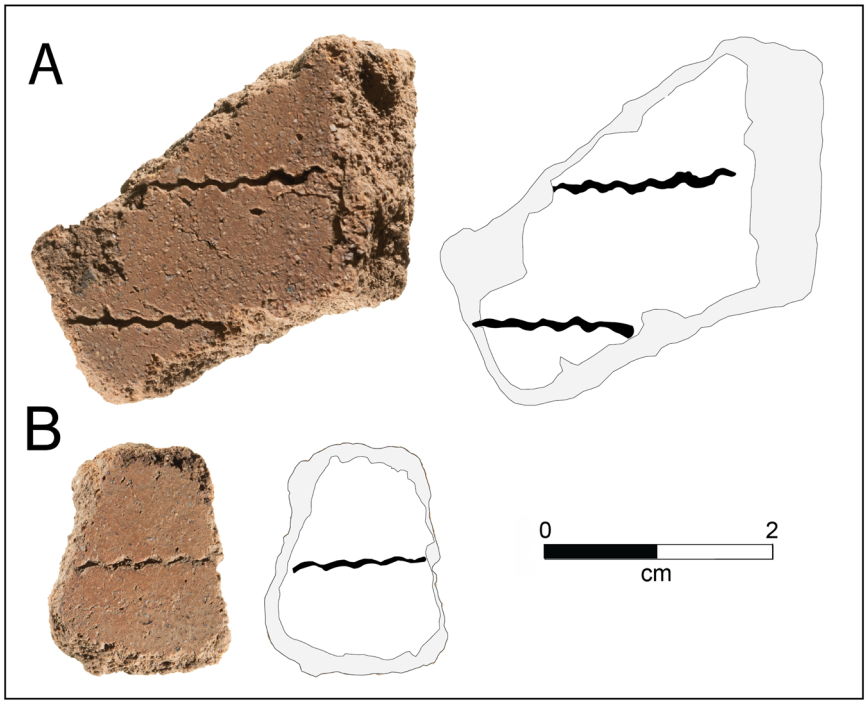


Figure 11. Shell-impressed decoration from SU3. (A) Sherd from Square A XU36. (B) Sherd from Square E XU29 (photographs by Steve Morton, drawings by Rob Skelly).

species distributions. Several taxa commonly found along the south coast of PNG and in local archaeological sites, were pressed into modelling clay and the impressions compared to the Late Lapita decorations (*Anadara antiquata, Decatopecten radula, Gafrarium pectinatum, Lunella cinerea, Mimachlamys sanguinea, Nerita planospira, Mauritia arabica, Monetaria annulus, Tegillarca granosa*). Three matching taxa, i.e. species used as decorative tools, were thus identified. Two taxa, *Tegillarca granosa* and *Gafrarium pectinatum* have margins that make comparable lines with rectilinear undulations (Figure 12(D,F)). *T. granosa* or *G. pectinatum* valves were used to decorate body sherds from the Late Lapita site of Moiapu 3 in Caution Bay (David et al. 2019: 77, Figure 3.12F). Based on mollusc species distributions and shell midden contents, rectilinear lines on pottery at site TO3 in Tonga were probably made using *G. pectinatum* valves (Ahyong et al. 2025; Huard and Burley 2017; Poulsen 1987b:147, Plate 55:3). Again, based on mollusc distributions and midden contents, a *T. granosa* valve was probably used to decorate a rim sherd from Kaveharo in the Gulf of Papua (Figure 12(A)). Kaveharo has not been confirmed as a Lapita site as no dentate-stamped sherds were found there. However, the site is just 200 m northeast of the Late Lapita site of Hopo (see Skelly 2014:238; Skelly and David 2017:280, Figure 130f; Skelly et al. 2014).

The shells used to make more curvilinear wavy lines appear to have been scallop shells (Pectinidae). Two Pectinidae taxa (*Mimachlamys sanguinea*, *Decatopecten radula*) were tested to see how they matched Late Lapita shell decorations at Giligilina. *Mimachlamys sanguinea* impressions provided a good match (Figure 12(E)). The identification to species level is not certain, as morphologically similar Pectinidae shells from other taxa in the family may have been used. Pectinidae shell (likely *M. sanguinea*) margin impressions appear on sherds from Moiapu 3 in Caution Bay (David et al. 2019:77, Figure 2.12C). Pectinidae shells not identified to species level were also used to decorate sherds from Honiavasa in the Solomon Islands (Felgate 2003:228, Figure 49, HV.2.227). Similar decoration is also found at Kaveharo (see above) and Hohelavi, located 60 m northwest of Kaveharo (Figure 12(B,C)). Kaveharo and Hohelavi are in now-inland formerly beach-fronting locations close to Hopo and bivalve margin shell-impressions on sherds at both sites date to sometime between 2350 and 2700 cal BP (Skelly 2014:240, 375). The shell experiments showed that during Late Lapita, the distal margins of *T. granosa* or *G. pectinatum* valves were used to render linear decorations on pottery across some 4,500 km of seascape spanning from the Gulf of Papua east as far as Tonga. We do not know whether the people decorating the pots distinguished between *T. granosa* and *G. pectinatum* shells as decorative tools. However, they did choose to decorate with the rectilinear lines that could be made with the two taxa. Pectinidae valves were used in common ways across at least 1,600 km of seascape, from the Gulf of Papua as far east as the Solomon Islands.

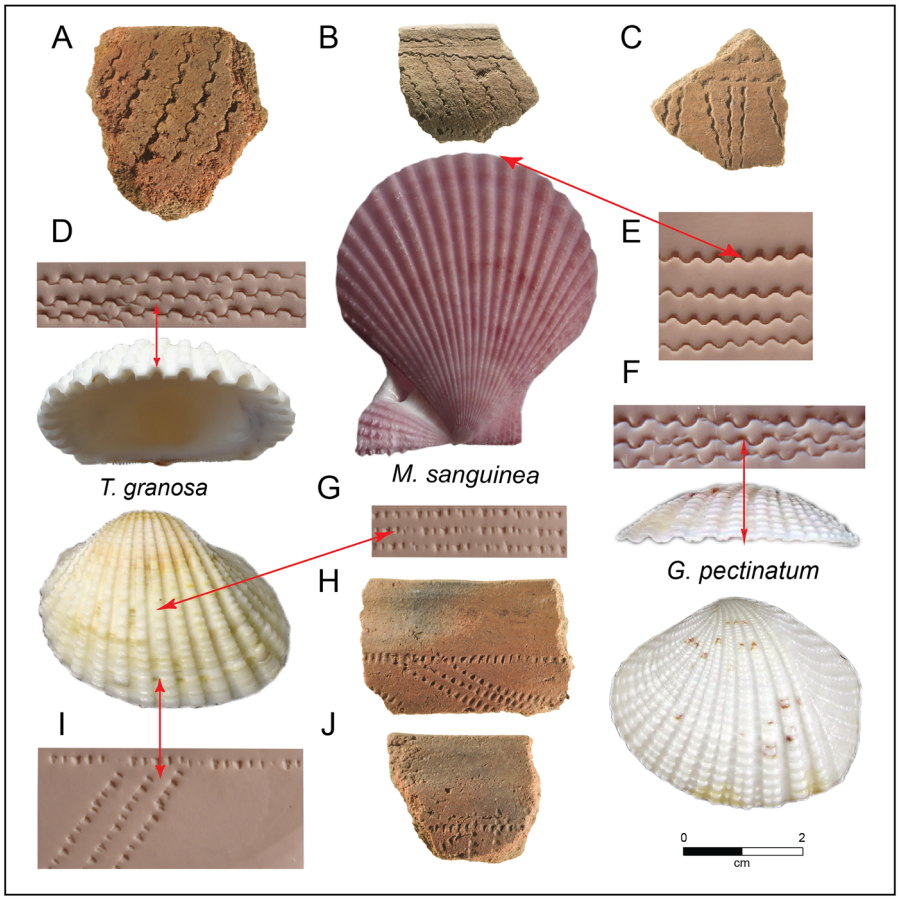


Figure 12. Sherds with bivalve shell margin impressions from the Gulf of Papua. (A and B) Sherds from Kaveharo. (C) Sherd from Hohelavi (Skelly 2014:248, 381). (D) Impressions made by a *T. granosa* valve margin in modelling clay. (E) Impressions made by a *M. sanguinea* valve margin in modelling clay. (F) Impressions made by a *G. pectinatum* valve margin in modelling clay. (G and I) Impressions made by the patterned exterior dorsal surface of a *T. granosa* valve in modelling clay. (H and J) Sherds from Hopo (Skelly 214:456) (pottery sherd photographs by Steve Morton).

Geographically widespread associations between dentate-stamped and, towards the end of Lapita, shell-impressed decorations show that ideas about decorating pottery were exchanged widely including along the south coast of mainland PNG during the Late Lapita phase. Sand (1998:198) described Late Lapita sherds from the Loyalty Islands with 'wavy decoration made from a bivalve shell that forms irregular dentate-stamped impressions'. The Loyalty Island sherds are from stratigraphic levels also containing dentate-stamped sherds. The stratigraphic correlation led Sand (1998:201) to suggest that 'shell-stamped decorations' and dentate stamping were related and used contemporaneously before being replaced by post-Lapita decorative techniques. A clue to the relationship between shell-impressed and dentate-stamped decoration can be drawn from Tonga, where Poulsen (1987a, 1987b) excavated two rims with cross-hatch decoration between the vessel lip and rim base. One rim was decorated using the margin of a bivalve shell (Figure 13(A)). The other is dentate-stamped (Figure 13(B)). Although the making of dentate-stamping combs or comb-like tools was likely not onerous (Siorat 1990:59), the use of bivalve margin shell-impressed decoration may have gained favour as a pragmatic alternative to making or obtaining the materials used to make dentate-stamping tools during the terminal years of Lapita as dentate stamping was waning in fashion. The best indication of the timing for the adoption of bivalve margin shell-impressed decoration comes from Caution Bay (David et al. 2019). At Moiapu 3, dentate-stamped and bivalve margin shell-impressed decoration were used shortly before 2,500 cal BP, within decades of dentate-stamping coming to an end (David et al 2019:79; see also Bedford 2024:129).

Late Lapita shell impression has gained minimal diagnostic attention in the literature. This is probably because shell-impressed decorations also occur on post-Lapita sherds. However, the post-Lapita shell-impressions are different to those found on Late Lapita sherds (see David et al. 2011 for discussion). The post-Lapita 'Shell-edge Impressed Tradition' dating to c.2,150–2,100 cal BP at Bogi 1 and many other sites in Caution Bay involves rows of small triangular indentations made with the patterned exterior dorsal surface of *T. granosa* shells closer to the umbo and not with

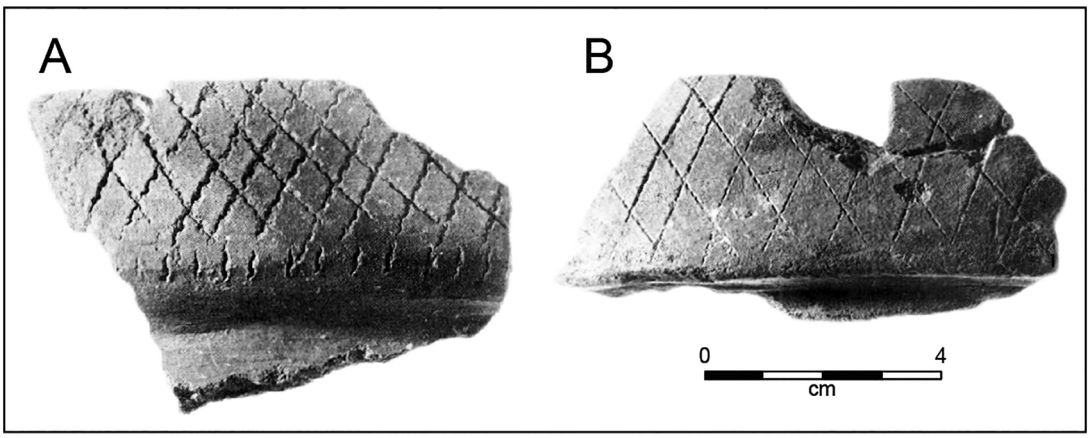


Figure 13. Shell-impressed and dentate-stamped decoration on Tongan Lapita pots. **(**A) Shell-impressed rim sherd from site TO3 Zone II (Poulsen 1987b:147, plate 55:3). (B) Dentate-stamped rim sherd from site TO1 Zone I (Poulsen 1987b:124, plate 47:7).

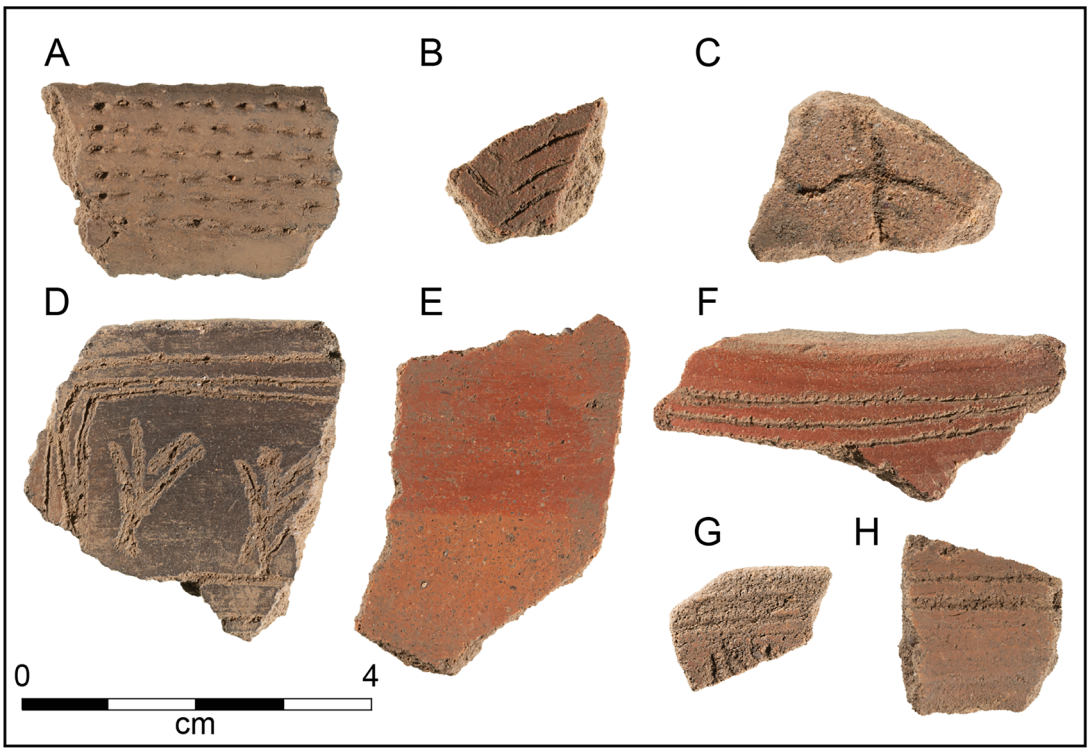


Figure 14. Sherds with incised, punctate, notched and painted decorations from SU3 at Giligilina. (A) Sherd from Square C XU30. (B) Sherd from Square A XU37 (C) Sherd from Square C XU26. (D) Sherd from Square K XU30. (E) Sherd from Square A XU27 (F) Sherd from Square A XU30. (G) Sherd from Square A XU28. (H) Sherd from Square A XU33. (photographs by Steve Morton).

the distal bivalve margin (David et al. 2011:84, see also figures 6 and 8) (Figure 12(G–J)). Much more recent shell-impressed decoration, best known from Motupore Island and other contemporary sites of the south coast of mainland PNG, involves sets of short bivalve margin impressions stacked or juxtaposed on vessel interiors and exteriors, especially on raised relief used to form herringbone and related patterns (Allen 2017:275–280). The use of bivalve margins to render linear designs is only found during Late Lapita, or terminal Lapita, times.

Red-slipped/painted, incised and punctate decoration

Thirty-five of the 74 diagnostic sherds from Giligilina are red-slipped or red-painted. In addition, 22 sherds are incised and one has punctate decorations. One sherd has three curving incisions and two less well-preserved incised lines on its exterior surface (Figure 14(B)). Although the decoration is poorly preserved, it is consistent with Late Lapita incised decoration on Mussau Island (Kirch and Chiu 2021:317, Figure 11.62; Kirch et al. 1991:153, Figure 4g) and Boduna east of the Willaumez Peninsula

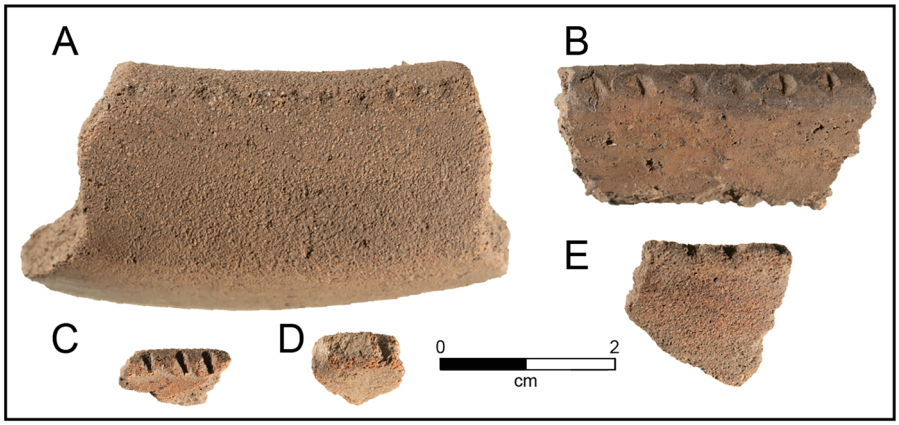


Figure 15. Lip decoration on sherds from SU3, Giligilina. (A) Sherd from Square C XU27. (B) Sherd from Square A XU30. (C) Sherd from Square K XU29. (D) Sherd from Square J XU32. (E) Sherd from Square F XU25 (photographs by Steve Morton).

(Ambrose and Gosden 1991:184, Figure 4). A second sherd from Giligilina (Figure 14(C)) has a curving incision intersecting a second line; it is consistent with Late Lapita incised decoration from site GLT on Mouke Island south of Manus Island (McEldowney and Ballard 1991:98, figure 7GLT/2) and sites FOH and FOJ in West New Brittain (Summerhayes 2000b:74, Figure 5.34, 97, Figure 6.3). In addition, one rim sherd has rows of punctations on the exterior surface below the lip forming parallel lines (Figure 14(A)). The decoration is again comparable with both Late Lapita and post-Lapita decoration found at, for example, site EKE in the Mussau Islands (Kirch and Chiu 2021:313, Figure 11.58). The salient point is that the incised and punctate sherds described above are unlike the later linear-incised decorations also found at Giligilina and described below.

More recent sherds in SU3 at Giligilina are often red-slipped or red-painted, with some also having much later incised decoration. The clearest example is a burnished rim sherd from SU3 (Square A), which has three sub-parallel lines enclosing sets of converging incised lines (Figure 14(D)). A further four SU3 sherds have incised and/or red-slip decoration (Figure 14(E–H)). These sherds come from a much more recent (post-Lapita) decorative tradition dating to within *1,420–1,340 cal BP* at Giligilina. Comparable red-slipped and incised decoration dating to the same general period has been found at (east to west): Nebira 4 (Allen 1972); Oposisi (Vanderwal 1973); Hopo and Opularia (Skelly 2014); Kikiniu (Rhoads 1980). At Giligilina, there is a close stratigraphic association between two pottery horizons within SU3: a lower horizon with Late Lapita sherds, superposed by a horizon of sherds with much later types of decoration. The vertical proximity of the two horizons has minimal stratigraphic separation, as the more recent, post-Lapita sherds occur immediately above the dentate-stamped and shell-impressed Late Lapita sherds. The two superposed deposits are separated by calibrated radiocarbon ages c.1,000 years apart, and in some places, especially in Squares A and C, are mixed as palimpsest deposits.

Lip decoration

Five rim sherds from SU3 have notched lips. One rim with notches inside the lip also has punctate body decoration (Figures 14(A) and 15(B)). Lip notching is common in Lapita assemblages. Examples abound, e.g. at Moiapu 3 in Caution Bay (David et al. 2019:78), EKQ in the Mussau Islands (Kirch 2000:128, Figure 5.5; Kirch et al. 1991:153, Figure 4) and several sites in the Admiralty Islands (Wahome 1997:121). Lip notching is entirely absent in the later, red-slipped incised tradition found in SU3 of Squares A and C at Giligilina. Lip decoration (other than red-slip) is also absent on incised wares from Ruisasi 1 in Caution Bay, dating within 1,630–1,220 cal BP (David et al. 2016:5, 19) and other assemblages of the same period along the PNG south coast (e.g. Rhoads 1980, Figures V12-17; Skelly 2014:312, 328, 341, 442; Vanderwal 1973, Figures V1-7-10). At Caution Bay, such lip notching continues after the end of dentate stamping and shell valve margin impressions between 2,600 and 2,500 cal BP, but ceases sometime before 2,150 cal BP (Bruno David, unpublished data).

Vessel form

Vessel form was determined for five of the 50 rim sherds from SU3 at Giligilina. Four rim sherds are from inverted bowls and one is from an everted pot. The everted pot rim has notched decoration inside the lip (Figure 15(A)). One of the inverted bowl rims has linear incised body decoration which dates to within *1,420–1,340 cal BP* on stylistic grounds (e.g. Skelly and David:70, Figure 41;

Vanderwal 1973:48, Figure 6-7) (Figure 14(A)). The orifice diameters of vessels represented by two undecorated inverted bowl sherds measure 44 and 22 cm, indicating that at least two bowl sizes are represented in the assemblage. Lip profiles are most often rounded (50%) or flat (38%). Flat lip profiles are often found on Oceanic Late Lapita assemblages (e.g. Golson 1971:69) and continue through post-Lapita times in the Massim region (Shaw et al. 2020:1083, Figure 5). Rounded lip profiles predominate in the more recent (after 1500 cal BP), red-slipped incised assemblages of the south coast of PNG (e.g. Oposisi: Vanderwal 1973; Hopo and Opularia: Skelly 2014).

The six squares from Giligilina reported here together contain 1,059 obsidian artefacts, with 925 of these from SU1 (87%) and 131 from SU2 (12%). In contrast, only three tiny pieces of obsidian (mean weight = 0.03 g) are from SU3 (Square A), and none are from SU4. Given that obsidian was reaching Caution Bay after 2900 cal BP, during Lapita times and in association with Lapita pottery (Mialanes et al. 2016) and also afterwards, the three SU3 obsidian flakes from Giligilina (from XUs 26, 30 and 33) are probably of Late Lapita age, although their small sizes and the poor chronostratigraphic differentiation of the Late Lapita horizon from later, overlying deposits also means they could be of post-Lapita age or they could have moved down post-depositionally in the dune sands (analysis of the obsidian assemblage will be the subject of a future publication).

In addition to the obsidian, 1,843 chert artefacts probably made from chert obtained from the Miocene limestone hills north of Giligilina were recovered from the six squares. Of these, 850 (46%) came from SU1, 904 from SU2 (49%) and 84 (<5%) from SU3. Lower down in SU4, dating within *4,050–3,670 cal BP*, five (<1%) flaked pieces of chert and eight volcanic stone fragments were found. The palimpsest nature of the deposits in SU3 does not allow changing discard rates to be determined, but the two largest pieces of volcanic stone from SU4 (weights = 84.9 and 54.4 g) both have pitted use wear on one end, confirming that people frequented the local beach prior to Lapita. These findings are consistent with those of Caution Bay, where Lapita peoples arrived on an occupied coastline (David et al. 2022; McNiven et al. 2011). Filling a spatial 'gap' in Lapita distribution, Giligilina further signals that Lapita peoples did not always intentionally avoid already populated regions but appear instead to have been encouraged by negotiated interactions with existent Indigenous peoples (for discussion see Bedford et al. 2023). Other than charcoal, no cultural materials of organic origin (e.g. shell) were found in SU3 or SU4, and no other objects characteristic of the Lapita cultural complex were found at Giligilina.

Discussion

Archaeologically, dentate stamping on pottery arguably remains the most 'definitive criterion' of a Lapita site (Hunt 1988:49). However, it is not the only material item that makes up the Lapita cultural complex, as long recognised by Lapita specialists (e.g. Green 1974b:254, 1990:33). Three dentate-stamped sherds and two sherds with bivalve margin shell-impressed decoration dating to within *2,680–2,420 cal BP* were found on the Aroma Coast 170 km southeast of Port Moresby. Located on previously coastal beach plains now 3.2 km inland, Giligilina is an example of the challenges involved in finding former coastal sites on the Papuan mainland (see David et al. 2009; Frankel and Vanderwal 1985:114; Skelly et al. 2014; Spriggs 1984:210–211). Giligilina was identified by tracking former beach lines inland, with guidance from Aroma Coast community leaders who have detailed knowledge of ancestral settlement sequences and landscape histories. At Giligilina, the ancestral settlement recalled in oral histories relate to the upper, more recent (post-Lapita) layers, but deeper down are older horizons that archaeologically extend the oral accounts further back to Lapita times.

The social dynamics of Late Lapita presence along the south coast of mainland PNG are currently the subject of debate. Sand et al. (2022:61, 65) suggested that south coast Lapita could reflect 'infrequent circulation', 'more regular exchange', or a period of more widespread, Oceanic Lapita dispersal and settlement. Of these options, and based on the then-available evidence, Sand et al. (2022:65) concluded that there are too few Lapita sites along the south coast to argue for colonisation. Lapita finds at Giligilina take the argument for colonisation further, and alert us to the prospect of more Lapita sites further inland, again deep underground, in past coastal settings.

The Giligilina assemblage adds nuance to understanding relations between mainland communities and their connections with Oceanic Lapita communities further to the east. Associations between dentate-stamped and bivalve margin shell-impressed decoration at Giligilina, Caution Bay and in the Gulf of Papua show that during Late Lapita times, communities remained connected along at least 400 km of coastline. We cannot yet say whether it was the pottery itself, or ideas about decorating pots, that were shared as the clay and temper sources for the

archaeological sherds have not yet been determined. Nevertheless, synchronised changes in Late Lapita pottery decoration show that the coastal communities were not isolated from each other. Mineralogical sourcing studies are needed to test whether Lapita pottery was locally made on the Papuan mainland coast, as was usually the case in island Oceania (Summerhayes 2000b). Regardless of whether coastal communities along the south coast of mainland PNG made pots or were the recipients of pots (e.g. through exchange, or through the maintenance of inter-community relations), ongoing contact between communities adds weight to a networked Lapita colonisation of the mainland coast. It may be that the small size of the Lapita sherd assemblage at Giligilina is evidence of ephemeral settlement during a Late Lapita exploration phase, but this does not sit well with the numerous Lapita settlements (many of which were established with the onset of Lapita) at Caution Bay further to the west. With radiocarbon dates spanning 2,660–2,420 cal BP and located between Lapita settlements to the west at Caution Bay and to the east at Brooker Island, Giligilina is more likely a manifestation of a westward Late Lapita colonisation phase connecting the Massim and PNG south coast.

Looking northeast of the south coast of mainland PNG, Late Lapita decorative conventions at Caution Bay are much akin to (e.g. for the Bismarcks, see Specht 2012:4). Summerhayes (2000b:235) notes that 'homogeneity' in Lapita decoration signals the maintenance of 'cohesive social interaction networks'. Changes in pottery decoration occurred in tandem across c.4,500 km of coastal and open-ocean land-and-seascape, from Hopo in the Gulf of Papua in the west to Tonga in Remote Oceania to the east. The synchronised changes that took place over vast distances during Late Lapita times makes it difficult to interpret relations between individual local practices and sequences as spatially isolated events.

Despite some uncertainties about their precise antiquity, including in some cases possible immediately post-Lapita horizons, it is difficult to exclude the Malakai site on Nimowa Island (Shaw et al. 2020), Kasasinabwana shell midden on Wari Island (Negishi and Ono 2009), Mask Cave in Western Torres Strait (McNiven et al. 2006), Ormi in Eastern Torres Strait (Nutman et al. 2024) and Jiigurru off the Australian mainland coast (Ulm et al. 2024) from the broader pattern of seafaring, expansion, settlement establishment and maritime networking that featured in Late Lapita and immediately post-Lapita times. These five sites are all on islands; they contain pottery sherds dating to, or close to, the Late Lapita phase; and were accessible to Late Lapita seafarers unperturbed by sailing beyond existing social and cultural networks and the known Lapita world. What these five sites show is that seafarers carrying pots and/or knowledge about how to make pots sailed west into Torres Strait and south along the Australian coast at a time when Late Lapita presence was, or had recently been, established along the south coast of PNG.

The 'Coral Sea Cultural Interaction Sphere' emphasising '*interchanges* and two-way movements of objects and ideas' (McNiven 2023:606, italics in original) provides a heuristic framework for interpreting relations between contemporaneous Lapita and 'non-Lapita' peoples. Lapita sites along the south coast of PNG and contemporaneous or near-contemporaneous sites in Torres Strait and off the Australian coast on the terrestrial margins of the Coral Sea, suggest two-way interchanges of knowledge and ideas related to pottery, as evident in the presence of pottery sherds. At Mask Cave and Jiigurru, the pottery is suggested to be locally made (McNiven et al. 2006; Ulm et al. 2024). Pottery likely reached Ormi as items of trade or exchange from the PNG south coast (Nutman et al. 2024). These ancestral connections were a precursor that shaped the social interchanges of later times across the region (see also Barham 2000; McNiven 2022, 2023; Rowland 1987; Rowland and Kerkhove 2022).

The Mid- to Late Lapita phases mark a period of Lapita expansion beyond the southwest edges of the then-Lapita world. The Late Lapita phase saw changes that led to the abandonment of dentate stamping on pottery via a short-lived terminal Lapita transition phase when the margins of single valves of bivalve shells mimicking dentate stamping sometimes replaced (or were added to) the tools used for pottery decoration. Evidence for Late Lapita or immediately post-Lapita expansions progressively south-westward and then to the south of mainland PNG along the eastern coast of north Queensland, is manifest in the presence of pottery as far west as Torres Strait and as far south as Jiigurru. As Bedford (2024:145) argues when referring to the Late Lapita phase, 'the appearance of certain distinctive decorative features across the entire distribution also confirms some wider level of interconnectivity' and the rapid phasing to plainware vessels at the end of Lapita, brings methodological difficulties in arguments made through the comparing of pottery decoration across space.

Connections across vast distances during the Late Lapita phase blur proposed Lapita provincial boundaries. This was a phase of dynamic seafaring suggesting a trajectory of social change had likely begun that ultimately led to the end of archaeologically

recognisable Lapita decorative conventions. Along the south coast of PNG, the so-called 'South Papuan Lapita Province' (David et al. 2011) consists of a depauperate range of the greater corpus of Mid- and Late Lapita decorations found in the contemporary Lapita homeland further to the east and, ultimately, northeast. What is clear from this broader connectivity and the presence of Late Lapita or immediate post-Lapita pottery in Torres Strait and southward to Jiigurru off the Queensland coast, is that towards the end of Lapita long-distance connections were not only maintained, but new expansions continued to be made and perhaps at an accelerating rate. That said spatially and temporally overlapping frameworks such as the 'South Papuan Lapita Province' and the 'Coral Sea Cultural Interaction Sphere' have heuristic value for understanding a period of maritime connections between peoples of PNG, Torres Strait and the far north Australian coast. The difficulty is that spatially shifting seafaring Late Lapita networks such as those along the PNG south coast (which included dentate-stamped pottery) and then to the west into Torres Strait and southwest to Jiigurru of the northern Great Barrier (which have yet to produce archaeological evidence of dentate-stamped pottery) leave social and cultural interactions across space difficult to determine. Any potential demarcation of spatial interactions should remain cognisant of the caveat proposed by Burley (2012:14) that 'premature' attributions of cultural provinces can 'obfuscate' variation and temporal change within that spatially bounded area. For now, Giligilina alerts us to the increasing likelihood that there are more Lapita sites to be found along the palaeo-coastlines of the south coast of mainland PNG and beyond and contributes to Susan Bulmer's (1999:573) suggestion that mainland ceramic traditions in Papua were likely descendent from locally resident Lapita communities.

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