[Supplementary material]

Patterned and plain baked clay from pre-pottery contexts in Southeast Sulawesi, Indonesia

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Computer code

The Gua Talimbue radiocarbon ages were calibrated using the R pkg Bchron (IntCal13 curve, Reimer *et al.* 2013):

```
# read in data
t_ages <- readxl::read_excel("../data/Talimbue_radiocarbon_ages.xlsx")

# clean columns
suppressPackageStartupMessages(library(tidyverse))
t_ages_clean <-
t_ages %>%
  mutate(Depth = if_else(str_detect(Depth, "cm"),
               parse_number(Depth) / 100,
               parse_number(Depth))) %>%
  mutate(`Date (BP)` = str_remove_all(`Date (BP)`, ",")) %>%
  separate(`Date (BP)`, into = c("age", "error")) %>%
```

```
    mutate_at(vars(age, error), as.numeric)
```
along with the calibration code:
```
# calibrate ages and plot
library(Bchron)


t_ages_clean_calibrated <-
BchronCalibrate(t_ages_clean$age,
            t_ages_clean$error,
            calCurves = rep('intcal13',
                    length(t_ages_clean$age)),
            positions = t_ages_clean$Depth)
```
A non-parametric chronology model to age/depth data was then fitted according to the Compound Poisson-Gamma model defined by Haslett & Parnell (2008)
```
t_out  = Bchronology(t_ages_clean$age,
            t_ages_clean$error,
            calCurves = rep('intcal13',
                    length(t_ages_clean$age)),
            positions = t_ages_clean$Depth,
            )
```
to produce the plot in Figure 3 showing the interpolated ages:
```
# plot with age-position
plot(t_out,
    main="Talimbue Square B",
    xlab='Age (cal years BP)',
    ylab='Depth (m)',
    las=1,
    dateHeight = 0.2,
    legLoc = "topright",
    xlim = c(0, 20000))
```

The chronology model computed above predicts ages for any depth in the site, by assigning ages to the spits.
```
# predict ages for a given depth
predictAges = predict(t_out,
```

```
            newPositions = seq(0,

                        max(t_ages_clean$Depth),

                        by=0.001))


predictAges_means <- colMeans(predictAges)


predictAges_means_df <-
predictAges_means %>%
  as_data_frame() %>%
  mutate(depth = as.numeric(str_remove(names(predictAges_means), "Pos"))) %>%
  rename(age = value)
```

Table S1. Weights of artefact and ecofact classes recorded for the Gua Talimbue excavated spits.

Table S2 is an Excel spreadsheet with the baked clay weights assigned to analytical units of approximately 50mm depth, as presented in Figure 2 of the main text. **Table S3** (below) summarises the information from **Tables S1–2 and Figures 4– 5** of the main text in the context of the site's calibrated AMS dates.

Tables S4 is an Excel spreadsheet with detailed data on the Talimbue baked-clay patterns by spit, separated into linear, curvilinear and irregular motifs. **Tables S5–6** detail a possible assignment of the Gua Talimbue patterned baked-clay fragments into 46 sets.

Table S7 is an Excel spreadsheet with the weights of artefact and ecofact classes recorded for Gua Sambagowala, and **Table S8** (below) focuses on the baked clay along with contextual information relevant for its interpretation.

Table S3. Baked clay weights (grams) from Gua Talimbue spits, Squares B and E.

Depth below surface (m)	Square B spit(s)	Square E spit(s)	Square B calibrated dates cal BP	Plain baked clay	Patterned baked clay	Total baked clay	Cultural materials in squares B and E
0.03	1	–		–	–	–	Sparse contents
0.07	2	1		7	0.5	7.5	Ceramic shell midden (B/E)
0.12	3	2	315–486	55	–	55	As above
0.17	4	3		29	11.5	40	Shell midden, pottery still in E
0.23	5	4		92.5	252	344.5	As above
0.29	6	5–6		105	127.5	232.5	As above
0.35	7	7		85	86	171	Preceramic shell midden (B/E)
0.42	8–9	8	3563–3691	138.5	107	245.5	As above
0.48	10	9	3999–4238	169.5	165.5	335	As above
0.525	11	10		19	21	40	As above
0.56	12	11		81	21.5	102.5	As above
0.615	13	12		52	33	85	As above
0.66	14			–	32	32	As above
0.725	15	13	3983–4215	7	24	31	As above

0.77	16	14		22.5	15	37.5	As above
0.81	17	15	4152–4405	51	28	79	As above
0.85		16		22.5	17.5	40	As above
0.90	18	17		93.5	54	147.5	As above
0.95	19	18		401	51	452	As above
1.00	20	19	4248–4436	6.5	84	90.5	As above
1.05	21	20	4089–4285	28.5	63.5	92	As above
1.10		21		68.5	96	164.5	As above
1.16	22	22		16	14	30	As above
1.20	23	23		31	–	31	As above
1.25	24	24		–	–	–	As above
1.31	25	25	6446–6639	37	–	37	As above
1.35	26	26		29	25	54	As above
1.40	27			42.5	13	55.5	As above
1.46	28	27		14	–	14	As above
1.50	29	28		–	–	–	As above
1.55		29	6733–6892	21.5	10.5	32	As above
1.59–1.7	30–32	30–32		–	–	–	As above
1.75	33	33		15	1	16	As above
1.80	34	34		8	–	8	As above
1.84	35	35	6933–7159	8	–	8	As above

1.90	36	36–37		5	–	5	As above
1.95–2.63	37–51	38–52	7323–7485	–	–	–	As above
2.69	52	53	8650–8991	–	1	1	Mainly lithics and bone
2.74	53	54	9028–9260	–	17	17	As above
2.79	54	55		–	–	–	As above
2.84	55	56–57	9474–9546	58.5	45.5	104	As above
2.89	56	58		157.5	3	160.5	As above
2.94	57	59		33	–	33	As above
2.98	58–59	60		72.5	48	120.5	As above
3.01	60	61		19.5	2	21.5	As above
3.07	61	62		29	110	139	As above
3.10	62	63		–	4.5	4.5	As above
3.165	63	64		4	9.5	13.5	As above
3.195	64	65		–	57	57	As above
3.24	65	66	9559–9887	30.5	–	30.5	Imbricated shell
3.29–3.33	66–67	67–68		–	–	–	Mainly lithics
3.37	68	69		10	–	10	As above
3.44–3.93	69–79	70–80	Pleistocene	–	–	–	Sparse contents
3.98–4.23	80–83	81–86		1	–	1	As above
Total				**2177**	**1651**	**3828**	**Variable**

Table S5. Assignment of the Gua Talimbue decorated baked clay fragments to 46 sets (Late Holocene sets)

Set	Pattern	Surface	Number of fragments	Spits	Approximate stratigraphic age (cal BP)
#1	Regularly/irregularly parallel striations	Unevenly smoothed	3	E1, E3	500
#2	Irregularly parallel corrugations	Knobbly	1	E3	500
#3	Parallel striations with irregular obliquely crossing striations	Concave	1	E4	500–2000
#4	Wavy striations	Concave	2	B5	2000
#5	Obliquely oriented sets of parallel striations	Concave	3	B5–7	2000–3000
#6	Regularly parallel striations	Flat to concave	12	B5–7, E6–8	2000–3500
#7	Irregularly parallel striations	Concave to unevenly smoothed	17	B5–7, E8	2000–3500
#8	Regularly/irregularly parallel corrugations	Flat to concave	26	B5–8, E5–7	2000–3500

#9	Faint perpendicular cross-hatched lines	Undulating	1	B6	2500
#10	Deep incisions	Unevenly smoothed	2	B6	2500
#11	Regularly/irregularly parallel corrugations	Knobbly	6	B7–10	3000–4000
#12	Widely spaced parallel striations	Undulating	3	B10, E9–10	4000
#13	Closely spaced parallel striations	Undulating	11	B9–10, E11	4000–4500
#14	Wavy corrugations	Concave to unevenly smoothed	5	B11, E8–9	4000–4500
#15	Ridges, regularly/irregularly parallel corrugations	Undulating to concave	10	B9–11, E9–11	4000–4500
#16	Irregularly parallel striations	Undulating to concave	11	B9–11, E9	4000–4500
#17	Wavy striations	Undulating	5	B9–11, E11–13	4000–4500

#18	White-infilled parallel striations	Unevenly smoothed	4	B10–15	4100–4500
#19	Irregularly parallel striations	Undulating to concave	10	B10–15	4100–4500
#20	Cross-hatched striations	Unevenly smoothed	2	B13	4100–4500
#21	Deep incisions	Knobbly to undulating	4	B14–15, E14	4100–4500
#22	Ridges, regularly/irregularly parallel corrugations	Knobbly to undulating	7	B14, E14–17	4100–4500
#23	Wavy striations	Concave to unevenly smoothed	6	B17, E18–20	4100–4500
#24	Regularly/irregularly parallel striations	Flat to concave	20	B16–21, E16–21	4100–4500
#25	Regularly/irregularly parallel corrugations	Knobbly to undulating	10	B17–21, E16–21	4100–4500

				B18–	
	Parallel/sub-parallel striations in two			22,	
#26	oblique sets	Flat	6	E19–21	4100–4500
#27	Semi-circular incisions	Flat	1	E21	4100–4500
#28	Deep incisions	Concave	3	B22, E21	4100–4500

Table S6. Assignment of the Gua Talimbue decorated baked clay fragments to 46 sets (Early to Mid Holocene sets)

Set	Pattern	Surface	Number of fragments	Spits	Approximate stratigraphic age (cal BP)
#29	Irregularly parallel corrugations	Concave	1	B26	6500
#30	Field of dots of variable depth and distinctiveness	Convex	2	B26, E26	6500
#31	Cross-hatched striations	Convex	1	E26	6500
#32	Regularly/irregularly parallel striations	Undulating to concave	6	B26–27, E29	6500–7000
#33	Irregularly parallel striations with cross-striations	Undulating	2	B27, E29	6500–7000
#34	Regularly/irregularly parallel striations	Undulating to concave	2	E33	6500–7000
#35	Irregularly parallel corrugations	Convex	1	E33	6500–7000
#36	Field of dots with distinct outlines	Flat	1	B41	7000–7500
#37	Irregularly parallel gashes	Convex	1	E53	8800
#38	Deep incisions	Concave	2	E54	9000
#39	Quadrangular impression perpendicular to a gash	Knobbly	2	E54	9000

				B58–64,	
#40	Semi-circles of variable depth and distinctiveness	Flat to concave	7	E54–57	9000–9900
#41	Irregularly parallel corrugations	Undulating to convex	8	B61–64, E56–62	9500–9900
#42	Irregularly parallel striations	Undulating to convex	4	E57–58	9500–9900
#43	Dashes arranged in series perpendicular to dashes	Undulating to convex	7	B58–61	9500–9900
#44	Dashes arranged in parallel	Undulating	2	B61, E62	9500–9900
#45	Lunates arranged in parallel rounded zigzags	Flat to convex	5	B63–64, E57–63	9500–9900
#46	Perpendicularly arrayed lunates	Undulating	1	E63	9500–9900

Table S8. Baked clay weights and contextual information from Gua Sambagowala, Pit A

Spit/s	Calibrated dates cal bp[a]	Baked clay weight (gm)	Fireplace evidence	Charcoal[b]	Freshwater shell density (gm/kg sediment)	Comments
1		–		X, N	5.8	Pottery sherds
2		–		–	19.2	Pottery sherds
3		–		–	38.2	Pre-ceramic

Spit/s	Calibrated dates cal bp[a]	Baked clay weight (gm)	Fireplace evidence	Charcoal[b]	Freshwater shell density (gm/kg sediment)	Comments
4	3453–3586[c]	–	Burnt ironstone lump	X, N	39.1	
5		–		X, N	50.9	
6		–	Burnt rock	X, N	40.5	
7		12		X, N	55.1	
8		85	Fire-cracked rock	X, N	64.1	
9		18	Fire-cracked rock	X, N	73.2	
10	4248–4438[d]	–		X, N	69.0	
11		3		X, N	68.9	Parallel striations on clay fragment
12		–		X, N	74.2	
13		1		X, N	41.6	
14–16		–		X, N	27.2–36.5	
17		139		X, N	38.0	
18		9	Adhesive clay	X, N	36.0	

Spit/s	Calibrated dates cal bp[a]	Baked clay weight (gm)	Fireplace evidence	Charcoal[b]	Freshwater shell density (gm/kg sediment)	Comments
19		–	Clay bulge in spit base	X, N	38.7	
20	4235–4418[e]	–		X, N	44.9	
21		–		X, N	56.7	
22–24		–		X	47.9–63.1	
25	5333–5589[f]	–	White ash/ burnt stone	X	56.8	
26		–	Burnt stone	X	61.6	
27		–		X	70.1	
28		11		X	64.6	
29		–	White ash/ burnt stone	X	59.0	
30		1	White ash	X	37.7	Parallel striations on clay fragment
31	4983–5290[g]	–	Burnt stone	X	37.4	
32		–	Burnt stone	–	29.5	
33		3		X	30.9	

Spit/s	Calibrated dates cal bp[a]	Baked clay weight (gm)	Fireplace evidence	Charcoal[b]	Freshwater shell density (gm/kg sediment)	Comments
34–36		–		X	28.7–33.0	
37	5597–5715[h]	–		X	24.5	
38	5475–5595[i]	12		X	27.2	

(a) AMS dates on unidentified charcoal, calibrated using Oxcal 4.2 (Bronk Ramsey 2013)

(b) X: wood charcoal present (1–19g); N: charred nut remains also present (2–7g)

(c) 3297±29 BP (D-AMS 001988)

(d) 3925±29 BP (D-AMS 001989)

(e) 3883±29 BP (D-AMS 001990)

(f) 4766±31 BP (D-AMS 001991)

(g) 4482±28 BP (D-AMS 001992)

(h) 4923±30 BP (D-AMS 001993)
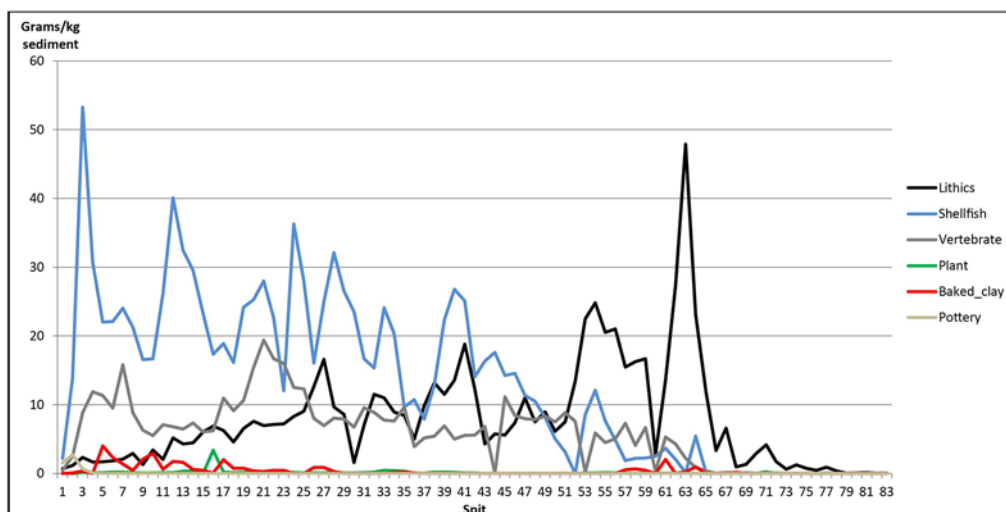
(i) 4802±26 BP (D-AMS 001994)

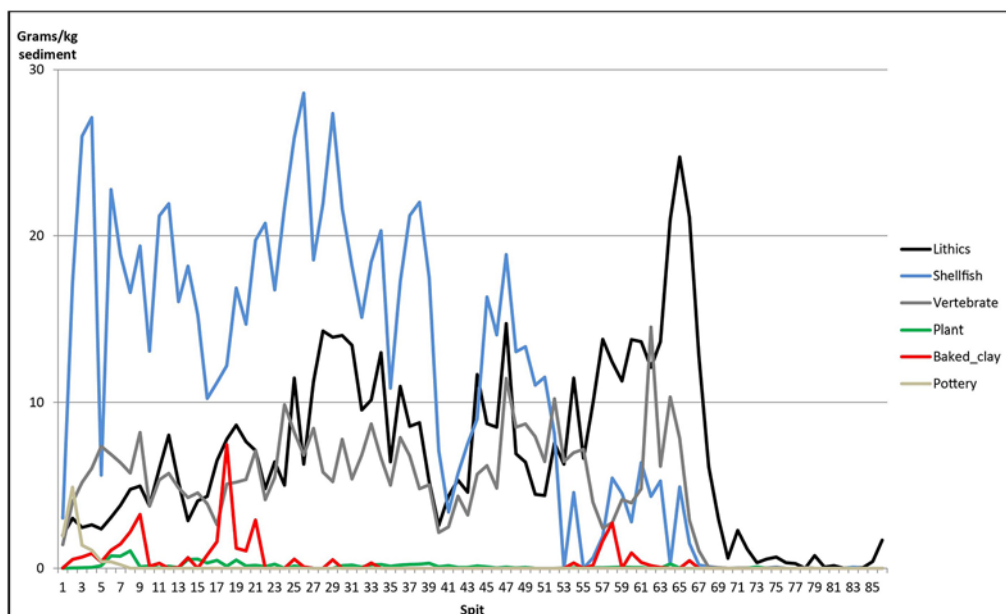*Figure S1. Densities of artefact and ecofact classes at Gua Talimbue square B.*

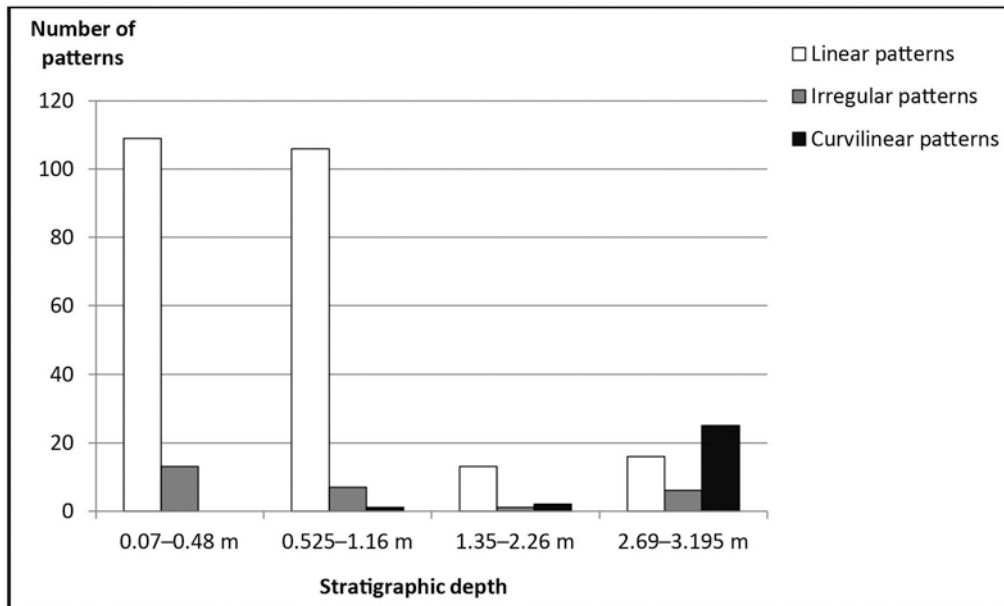*Figure S2. Densities of artefact and ecofact classes at Gua Talimbue square E.*

16

Figure S3. Numbers of linear, irregular and curvilinear patterns by stratigraphic depth. Source: Table 2.

References

HASLETT, J. & A. PARNELL. 2008. A single monotone process with application to radiocarbon-dated depth chronologies. *Journal of the Royal Statistical Society Applied Statistics Series C* 57: 399–418. https://doi.org/10.1111/j.1467-9876.2008.00623.x

REIMER, P.J. *et al*. 2013. IntCal13 and Marine13 radiocarbon age calibration curves 0–50 000 years cal BP. *Radiocarbon* 55:1869–87. https://doi.org/10.2458/azu_js_rc.55.16947