

LONG-CONTINUOUS OR SHORT-OCCASIONAL OCCUPATION? THE HUMAN USE OF LEANG SARRU ROCKSHELTER IN THE TALAUD ISLANDS, NORTHEASTERN INDONESIA

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ABSTRACT

Leang Sarru is a small rockshelter on the coast of Salebabu Island (Talaud group, northeastern Indonesia). Excavation has revealed a circa 100 cm thick cultural deposit, consisting of at least four observable stratigraphic layers and containing pottery (within the uppermost layers), lithic materials, food shells, and occasional pieces of ochre. C14 dates suggest c. 30,000 years of human occupation here. Although it is possible to establish a general cultural sequence for this site (three cultural phases are proposed), difficulties arise when one attempts to reconstruct more detailed habitation processes, especially in the second phase (21,000-10,000 BP). In this time span, it is unclear whether the cultural deposit is the result of relatively continuous habitation over a long period of time, or whether it resulted from a single but very intensive period of use of the site as a lithic workshop. After considering the available data on lithic technology, ecofactual evidence, and the provenances of the absolute dates, it is possible to suggest a general history of human use of the cave from c. 30,000 years ago up to the ethnographic present.

Leang Sarru is a small rockshelter on the coast of Salebabu Island of the Talaud group in northeastern Indonesia (Fig. 1). It is situated in an uplifted coral limestone block about 400 m inland from the beach and about 15 m above the sea level in the middle of a clove plantation. It faces northeast and has a sheltered area of about 5 m by 3 m, with a curving ceiling about 2.5 m high at the dripline. The floor is dry and flat in the sheltered area, but slopes down slightly from the dripline outwards. Fragments of reddish chert were scattered quite abundantly in and around the rockshelter when it was discovered. In 1995, a grid of 1X1 m squares was laid out in the sheltered area and two adjacent squares, denoted B2 and C2, were excavated by 10 cm spits down to 90 and 80 cm respectively below the surface. Seven C14 dates were derived from the site ranging from circa 30,000 to 9,000 years ago (Table 1).

CULTURAL PHASES AND DATING

At least four stratigraphic layers could be recognized during excavation in Leang Sarru (Fig. 2). However, it turned out to be difficult to follow the layers when digging, since the boundaries between them were sometimes gradual. The uppermost layer is a topsoil about 10-25 cm thick. It is brownish grey in colour and fairly compact. Underneath the topsoil lies the second layer, a dark brown fairly compact deposit. It has an uneven thickness of about 20-45 cm. The third layer consists of a loose pale brown sandy deposit. This layer is about 5-20 cm thick and becomes thinner towards the front of the rockshelter. The basal layer comprises a hard calcareous deposit with relatively small quantities of archaeological materials.

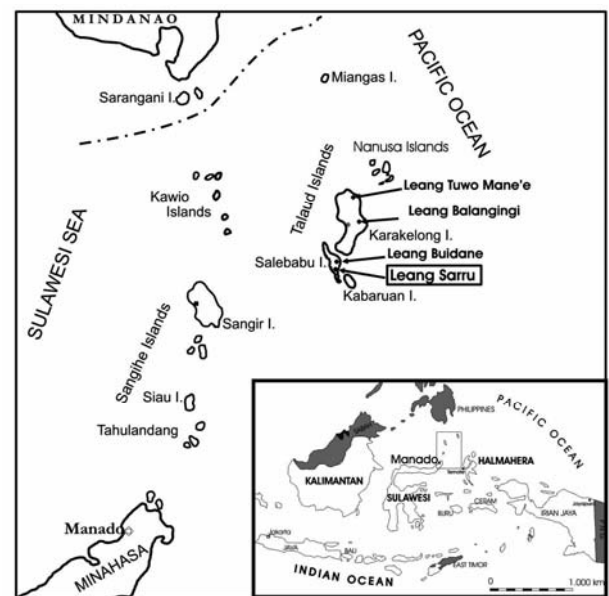


Figure 1. The location of Leang Sarru, on the eastern coast of Salebabu Island.

Those four stratigraphic layers correspond fairly closely to the distribution of archaeological materials (Table 1) and can be grouped into three cultural phases.

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Table 1. Distribution of cultural materials in Leang Sarru, Square B2 (top) and Square C2 (bottom)

B2														
Spit	Potsherds		Blade-like flakes		Stone waste		Utilised Flakes		Cores		Shells		Other finds	C14 dates
	No.	Gr.	No.	Gr.	No.	Gr.	No.	Gr.	No.	Gr.	No.	Gr.		
1	69	180			33	125					51	139		
2	84	395			106	495	3	15			125	327		
3	4	30	10	12	839	3480	10	50	2	65	97	421	stone anvil, charcoal	10372 - 10139*
4			5	20	848	3735	24	135	8	215	117	447	ochre	17346 - 17099*
5			15	25	600	2640	10	75	4	125	378	1080	ochre	30740 ± 720
6			5	15	101	1010	3	60			692	1769	hammerstone	30850 ± 340
7					52	540	2	45			200	680	stone anvil	
8 [^]					6	45					51	301		29590 ± 630
9 [^]					5	85					77	193		

C2														
Spit	Potsherds		Blade-like flakes		Stone waste		Utilised Flakes		Cores		Shells		Other finds	C14 dates
	No.	Gr.	No.	Gr.	No.	Gr.	No.	Gr.	No.	Gr.	No.	Gr.		
1	149	1560			9	60					81	575		
2	291	3005	2	6	37	200					262	2210		
3			3	5	560	2285					266	745	charcoal, ochre	
4			10	25	625	4145	9	50			132	625	ochre, hammerstone	
5			20	50	802	4385	14	135	3	90	465	1865	hammerstone	21763 - 21275*
6			6	10	138	1020			3	100	633	1640		
7					93	1210					343	1285		
8 [^]					35	355			2	75	165	900		29760 ± 650

* C14 dates calibrated one sigma range using Calib 3.0, the rest are uncalibrated [^] only half square excavated

Table 2. C14 dates for middle phase layers from Leang Sarru.

Square	Depth*	Lab. No.	Sample	Lab. Dates BP	Calibrated dates**
B2	20-30	ANU-10203	<i>Turbo</i>	9750 ± 90	10372 - 10139 BP
B2	30-40	ANU-10810	<i>Turbo</i>	14820 ± 80	17346 - 17099 BP
B2	40-50	ANU-10499	<i>Turbo</i>	30740 ± 720	
C2	40-50	ANU-10960	<i>Turbo</i>	18880 ± 140	21763 – 21275 BP
B2	50-60	ANU-10961	<i>Turbo</i>	30850 ± 340	

Notes : * depth below surface in cm ** CALIB 3.0 at one sigma

The uppermost contained potsherds, ochre, lithic debitage, charcoal and marine shells. There are no C14 dates for this phase, but some of the decorated potsherds, for instance the scroll-incised sherds in Figure 3, are

almost identical to those of the Metal Age (first millennium AD) pottery excavated by Bellwood (1976) in 1974 from the Leang Buidane burial cave situated about 12 km northeast of Leang Sarru. The few flake tools

which occur in this phase were probably disturbed upwards from below.

Underneath the Metal Age deposit lie the second and third stratigraphic layers, belonging to a middle cultural phase and containing dense lithic debitage down to about 60 cm below the surface. Five C14 dates have been obtained from within these two middle phase layers (Table 2).

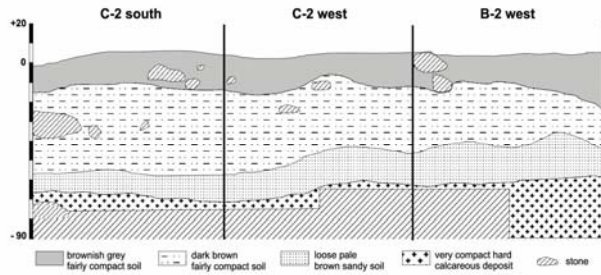


Figure 2. Sections of squares B2 and C2, Leang Sarru.

These dates could imply that the two layers were deposited overall between about 30,000 and 10,000 BP. ANU 10960 from square C2 appears to be out of order compared to the B2 series, and it is not uncommon for C14 samples to be displaced up or down from their original positions (Straus 1990; see also Spriggs 1989, 1999 for Indo-Pacific cases). However, this disjunction is probably misleading as depths below surface need not be exactly comparable between both squares. Figure 4 shows the Leang Sarru dates plotted on to a graph of stone debitage distribution. From this, it is clear that most debitage occurs between 21,000 BP (ANU-10960) and 10,000 BP (ANU-10203), from the last glacial maximum to the end of the Pleistocene.

The basal layer contains relatively small quantities of archaeological materials. When the excavation terminated, about 30-40 cm of this hard calcareous deposit had been revealed, but at the lowest level archaeological materials became very scarce. Two C14 dates on *Turbo* marine shell samples were derived from within the hard calcareous deposit, 29,590±630 BP (ANU-10498) from B2 at 60-70 cm, and 29,760±650 BP (ANU-10204) from C2 at 70-80 cm. These dates, and the similar dates from the middle layer (ANU-10499 and ANU-10961), indicate that Leang Sarru was initially in use at least 30,000 years ago.

THE HUMAN USE OF THE ROCKSHELTER

It is quite obvious from the above description that Leang Sarru rockshelter was used at least in three phases. The earliest phase dates to c. 30,000 years ago. Shortly after that, it is very likely that a long hiatus occurred, though it was hardly seen in the site stratigraphy. This was followed by more intensive occupation between 21,000 and 10,000 years ago. Then, after a long hiatus of about 9000 years, the rockshelter was finally reused in the Early Metal phase, around the first millennium AD.

During the earliest phase, the site was apparently used on a short-term basis, as shown by the small quantities of archaeological materials recovered from layer 4. It is less obvious, however, if the site was used at this time as a lithic workshop. The debitage found within this layer is relatively small in quantity and shows no different technology to that from the middle layer. Perhaps it was trampled down into this basal layer. But this does not rule out the possibility that stone tools were manufactured in the site 30,000 years ago, at least occasionally. One cannot be sure about this until further research is carried out.

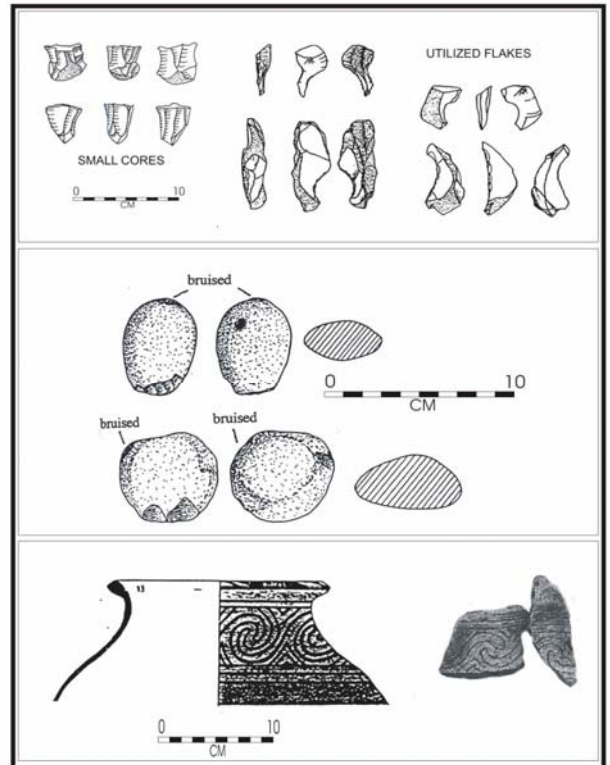


Figure 3. Archaeological materials excavated from Leang Sarru. Top: cores and utilised flakes. Middle: hammerstones. Lower: scroll-incised sherd (right) compared with a similar reconstructed vessel from Leang Buidane (left).

In the following phase, between 21,000 to 10,000 years ago, more intensive activities seem to have been carried out in the site. This phase coincides with the end of the Last Glacial Maximum, when the island of Salebabu was joined to Karakelong and Kabaruan islands to form a larger island, together with the following phase of post-glacial climatic amelioration.

The density of stone materials suggests that stone tool manufacture was conducted in Leang Sarru in this middle phase. Based mainly on analysis of the lithic materials, consisting of debitage, cores, flakes and hammerstones (see Tanudirjo 2001 for details), there is a possibility that bifaces might have been produced. Usually, bifacial tool manufacture produces a greater quantity of debitage than less formal tool manufacture, and shows a quite

distinctive size distribution (Andrefsky 1998; Patterson 1990). Most of the decortification flakes from Leang Sarru cover the same size ranges as those from the Tingkayu biface workshop site in Sabah (Bellwood 1988). If Leang Sarru was a bifacial tool workshop, then it is questionable whether the dense cultural deposit was the result of relatively continuous habitation over a long period of time, or the result of an episode of very intensive use of the site as a lithic workshop.

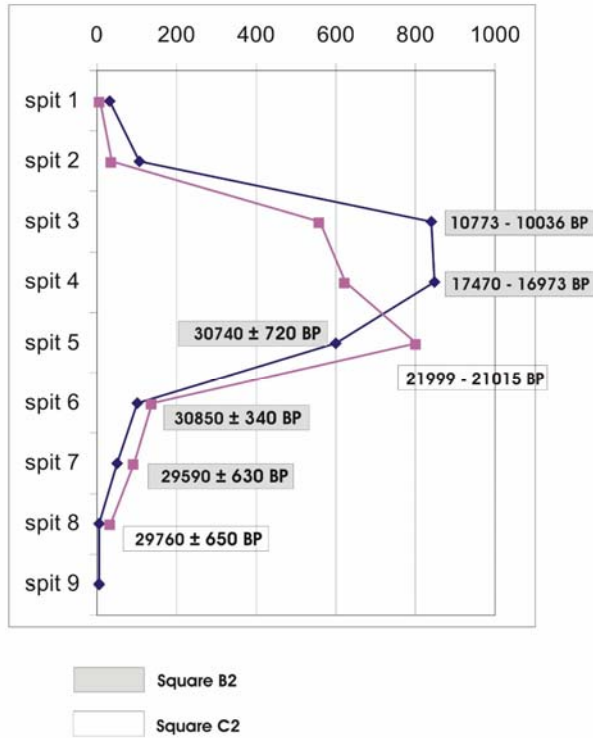


Figure 4. Radiocarbon dates from Leang Sarru, plotted on a graph of the distribution of stone debitage (weight in grammes per spit).

Some effort has been applied to find a solution to this problem. Refitting has been tried with all the debitage excavated from Squares B2 and C2, which cover about 15% of the potential area of the site, but with only very limited success. This suggests that the debitage was not a result of one episode of intensive stone tool manufacture from a limited number of cores.

Another effort to solve the problem would be to identify possible 'living floors' or 'activity areas' (Straus 1990), but none could be identified during the excavation. This suggests that the cultural materials were deposited gradually, over quite a long time.

The analysis of the food shells from Leang Sarru throws light on this problem. Figure 5 shows the distribution of shells in B2 and C2 by number and weight per spit, and also the mean weight of the shells in each spit. It is quite clear that most shells occurred between 30 and 70 cm below the surface, with a peak at about 60 cm in both squares. However, during this period of greatest

shell deposition the mean weights of the shells were low, indicating heavy exploitation, such that average size decreased. A similar trend has been suggested for Matenkupkum cave in New Ireland (Gosden and Robertson 1991), where a decrease over time in the numbers of large shells was suggested to reflect more intensive collection.

For Leang Sarru, the shell distribution seems to be consistent with the distribution of the stone debitage, which demonstrated the most intensive use of the site as a lithic workshop during the same period of time. In addition, the C14 dates obtained from within the second and third stratigraphic layers seem to be in good order, and imply that the deposits were built slowly and gradually over a long period of time. Hence, the human occupation during the middle phase, between 21,000 to 10,000 years ago, was relatively long and continuous.

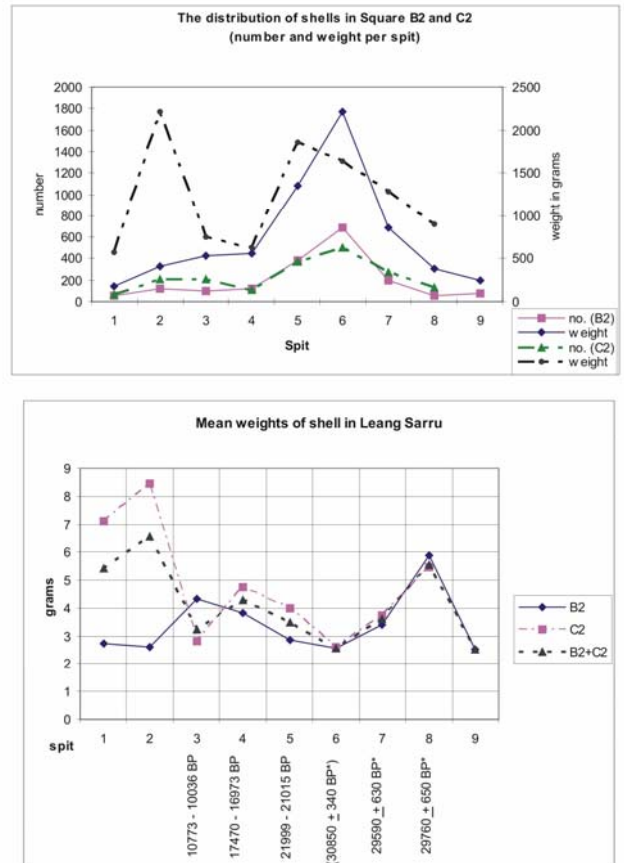


Figure 5. Distributions of shells by weight and number per spit (upper), and by average weight per spit (lower), for Leang Sarru.

Apparently Leang Sarru was abandoned about 10,000 years ago and not reused until the Metal Age, between 2000 and 1000 years ago. The reason for this is not clear, but during the Metal Age the rockshelter was mainly used for ceremonies probably connected with burial. The few relatively large sherds found could have been from pottery vessels smashed intentionally before deposition,

as seems to have happened in other Talaud burial sites such as Leang Buidane and Leang Balangingi (Bellwood 1980). Although no human bones were recovered, the pottery box-like sherds discovered in the upper layer suggest that Leang Sarru might have been used as a jar burial site.

Until several years ago, Leang Sarru and Leang Managapi, another rockshelter close by, were still being used for ceremonies by members of a religious sect called Kepercayaan Musi (Musi belief, Musi being the main town on Salebabu Island), a blend of local animist belief and Christianity. Even now, these rockshelters are considered as sacred places by the local population.

From the foregoing, it is obvious that Leang Sarru has been used by humans since at least 30,000 years ago. However, the way humans used the cave changed through time. Initially, it was used for short-term habitation. After an apparent hiatus in use across the last glacial maximum, when shorelines would have been furthest from the site, it was used more intensively as a lithic workshop site between 21,000 and 10,000 years ago. After a long abandonment following the rise of sea level in the terminal Pleistocene, the cave was reused occasionally as a ceremonial site from about 2000 years ago. Until recently, the local community considered the cave as a sacred site, where they conducted their traditional rituals.

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