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EXCAVATION REPORT FOR LEANG RAKKOE: A NEW TOALEAN SITE WITH ENGRAVED ART IN THE BOMBORO VALLEY, MAROS REGENCY, SOUTH SULAWESI

Laporan Ekskavasi Terhadap Situs Rakkoe: Situs Toala yang Baru dengan Seni Pahat di Lembah Bomboro, Kabupaten Maros, Sulawesi Selatan

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Abstrak

Kumpulan pra-Neolitik di Sulawesi Selatan didominasi oleh endapan dari periode Toala, namun demikian sifat dan luas teknokultur Toala masih mengandung teka-teki. Hingga saat ini, kronologi dari teknologi Toala masih belum jelas dan belum ada karya seni yang bisa dikaitkan dengan periode ini, meskipun terdapat seni gua dengan gambar cadas di wilayah Karst Kabupaten Maros dan Pangkep. Ekskavasi dilakukan di ceruk Leang Rakkoe, di Lembah Bomboro Maros, dengan tujuan untuk membantu mengklarifikasi masalah ini. Sementara itu, endapan tersebut terbukti tidak stabil dan tidak bisa dilakukan penanggalan, penggalian ini memberikan wawasan baru tentang teknik pembuatan artefak batu Toala pada situs dengan contoh-contoh seni pahat yang sebelumnya tidak didokumentasikan.

***Kata Kunci*:** *Arkeologi Toala, teknologi litik; seni pahat; lancipan Maros; ekskavasi di ceruk.*

Abstract

South Sulawesi's pre-Neolithic assemblages are dominated by Toalean-period cultural deposits, however the nature and extent of the Toalean technoculture continues to be enigmatic. To date, the chronology of Toalean technology remains unclear, and no art has yet been attributed to this period despite the rich cave art of the karst region of the Maros and Pangkep regencies. An excavation was conducted at Leang Rakkoe rockshelter, in the Bomboro Valley of Maros, in the hope that it could help clarify these issues. While the deposits proved unstable and could not be directly dated, the excavation did provide new insights into Toalean stone artefact manufacture techniques at a site containing previously-undocumented examples of engraved art.

Keywords: Toalean archaeology; lithic technology; parietal engravings; Maros point; rockshelter excavation.

INTRODUCTION

The archaeological record of South Sulawesi (the southwest Sulawesi peninsular) is dominated by mid-Holocene assemblages displaying a unique technocomplex known as the 'Toalean'. While a growing number of Pleistocene sites have been discovered (Brumm et al., 2018, 2017; Bulbeck et al., 2005; Glover, 1981; van den Bergh et al., 2016), the vast majority of pre-Neolithic sites in this region date to between approximately 8-2 thousand years ago (kya) (Bulbeck et al., 2000, p. 71). Sites dating to the intervening period of ca. 12-8 kya have not yet been identified in South Sulawesi, but may have been destroyed through climate-induced erosion or historic soil mining (Glover, 1979). Mid-Holocene Toalean sites, which only occur south of Lake Tempe (Bulbeck et al., 2000, pp. 93–95), are easily recognisable for the presence of refined bone points, backed microliths, large amounts of shell (especially the freshwater gastropod *Tylomelania perfecta*[1]), small denticulate stone 'Maros points' (Bellwood, 2007, pp. 193–196; Mulvaney & Soejono, 1970, p. 171), and an absence of ground stone technologies. Later 'Neolithic' assemblages, in contrast, lack bone points and Maros points and instead contain ceramics and small flaked and ground-edge axes. Despite being one of the most heavily investigated periods of Indonesian prehistory, almost every Toalean site so far excavated has been found to be badly disturbed, meaning that basic questions surrounding the origin, development, and ultimate disappearance of the Toalean technoculture remain unresolved. While several authors have attempted to produce a chronology for Toalean technologies, suggesting phases of development that place the appearance of microliths well- before the advent of Maros points (Bulbeck et al., 2000, p. 87; Soejono, 1969; van Heekeren, 1957, pp. 92–93), recent finds have disrupted these models by showing that Maros points date back to the start of the known Toalean period (Suryatman et al., 2019).

Questions also stand around whether or not art was produced during the Toalean period. The Maros-Pangkep (Pangkajene dan Kepulauan) region north east of the capital city of Makassar, South Sulawesi, is rich in rock art of international importance, yet no Toalean art has yet been identified. The region is dominated by steep limestone karst cliffs, and rock art including hand stencils, animal motifs, and geometric black *kangkang*-style ffigures and symbols can be found on the walls of the majority of these caves. Recently the decay rate of dissolved isotopes within the speleothems that have formed over parts of the rock art has been used to obtain Uranium-series dates for a selection of these images (Aubert et al., 2014). Ochre hand stencils, animal motifs, and a composite figurative image that possibly depicts a hunting scene, were dated using this technique to at least 39.9-43.9 kya (Aubert et al., 2014, 2019), while black charcoal drawings appear to belong to the period of Austronesian expansion into the area a few thousand years ago (O'Connor, 2007; Simanjuntak, 2008). However, to date no rock art has been dated to the intervening Toalean period.

Leang Rakkoe is a shallow rockshelter with potential for shedding new light on the Toalean chronology and art. The site appeared to be undisturbed and contained previously-undescribed rock engravings, with unusually good organic preservation conditions in this tropical environment. Unlike most archaeological sites in South Sulawesi, Leang Rakkoe did not initially appear to have any calcareous breccia deposits adhering to the rock wall above the modern ground level, deposits which are often taken as an indication that the site has suffered deflation or erosion in

[1] previously *Brotia perfecta*

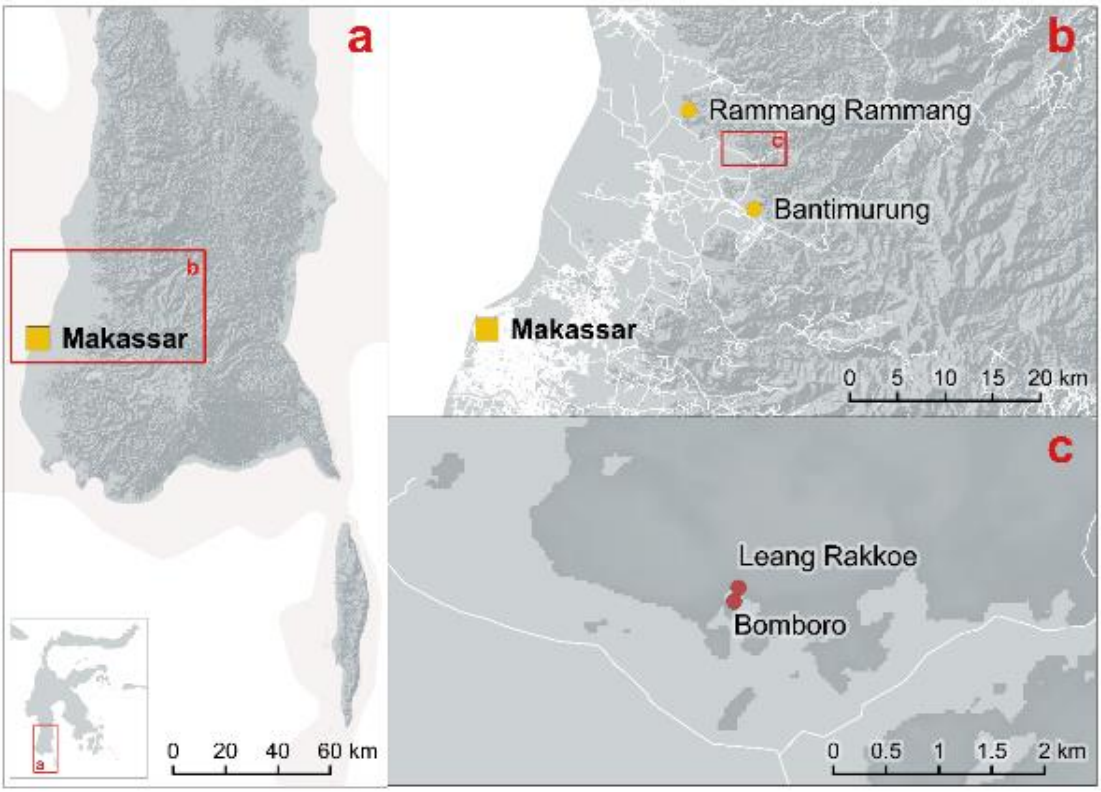

Figure 1. Location of Leang Rakkoe and Situs Bomboro within the Bomboro valley of the Maros regency of South Sulawesi, showing elevated areas in darker grey and roads as white lines. **Coordinates for the Leang Rakkoe excavation:** S 04° 57.580', E 119° 40.166. Approx. 85m above sea level (**Source**: Created by Kim Newman, 2020).

the past (Brumm et al., 2018; Glover, 1979); however, this observation later proved to be inaccurate when small pockets of breccia were discovered adhering within cracks in the cliff face above the present surface. Surface finds indicated that the deposits included typical Toalean technology, and engraved grooves were observed in the limestone overhang above the deposits which are apparently unique in this region.

Site Description

1. Location and Current Use

Leang Rakkoe ('dry cave' in the local Bugis language) is a rockshelter located in the densely vegetated Bomboro valley approximately 2.5 km north of the Leang-Leang Prehistoric Park (*Taman Prasejarah Leang-Leang*), in the Maros-Pangkep tower karst region of South Sulawesi (Figure 1). Today a narrow walking path leads into the valley, through the rockshelter, and along the edge of the base of the cliff. A small creek flows through the floor of the valley during rains, and near to the mouth of the valley modern usage includes small hand-worked limestone mines, wood plantations, residential housing, and a small cemetery. Local residents report that historically the area was used as a refuge or hideout during the Darul Islam rebellion (1949-1965). In prehistoric times the valley was a source of raw material for stone tool manufacture, and the Rakkoe rockshelter is located 140 metres from the chert quarry at Situs Bomboro (Perston et al., in press). Leang Rakkoe was identified as an archaeological site by AB in 2017 and sits just within the boundary of the Bantimurung Bulusaraung National Park.

2. Site Description

Leang Rakkoe is a shallow rockshelter at the base of a tall, near-vertical limestone cliff, created by a gradual outward protrusion of the cliff face. The shelter floor includes abundant stone artefacts and mollusc shells scattered throughout the dry, ashy soil. A series of thin straight lines are engraved in the limestone cliff face above. While the valley cliffs hold many rockshelters, a (non-extensive) survey encountered no other prehistoric occupation sites.

The dripline at Leang Rakkoe occurs at 5.7 m from the base of the cliff, which looms tens of metres above. The narrow valley offers further protection from rain and wind, and direct sunlight is absent until mid-afternoon, an important consideration in the hot climate. The rockshelter is a short but steep climb up from the small, seasonal creek. Further downstream, south of the site, a small amount of clear water permanently flows out of a natural spring. Leang Rakkoe is located beyond the northern extent of the chert quarry of Bomboro (Perston et al., in press). The rockshelter is unusual, as most cave archaeological sites in the area are reasonably deep limestone caves close to the water table, carved out by erosion and containing abundant speleothems. Painted art can often be found on the walls and/or ceiling of these caves. In contrast, the Leang Rakkoe shelter is very shallow and has no visible paintings, although it does contain hitherto unreported linear engravings that may constitute a form of rock art. The cliff face is also marked by a horizontal, natural crack at 1.56 m above the ground surface, and small lumps of breccia concretions occur as lumps adhering to the rock at this height and at the present ground level. These breccia deposits are common in the limestone cave sites of southern South Sulawesi and are often softly consolidated sediments held together by calcareous precipitations from the surrounding limestone, and may contain cultural materials (e.g. Glover, 1979). The horizontal entrance to a partially collapsed sinkhole was noted approximately 5 metres to the north of the excavation, leading to a large void that extends along the cliff towards the excavated area.

3. Purpose of Excavation

The presence of abundant surface finds and dense archaeological deposits exposed at the dripline suggested that the site would yield a rich Toalean sequence, and the test excavation aimed to recover these assemblages in stratigraphic context. In addition, it was hoped that excavation would shed light on the unusual linear markings on the cliff face, as some small section of these engraved surfaces had spalled and were likely buried in the deposits below. For this reason, the test pit was located directly below the area of spalled rock engravings in an attempt to recover them in datable contexts.

METHOD

In July 2018 a one metre square test pit was excavated within the dripline of the Leang Rakkoe rockshelter, close to the cliff face, and near the highest point of a gentle rise. A large boulder at the dripline helps contain most of the sediments within this location. The ground surface drops to the north and south of the raised area, further defining the boundaries of the site.

The excavation was conducted in 10 cm spits, as no stratigraphy was visible, using trowels and brushes. All sediment was dry sieved through 3 mm and a 1 mm sieves on site, and the sieved sediments were used as backfill. Finds noted *in situ* during excavation were piece-plotted using a Trimble total station before being individually bagged and numbered.

Owing to time constraints a full analysis of the finds has not yet been conducted, although counts and weights have been recorded. Particularly remarkable finds including backed microliths and

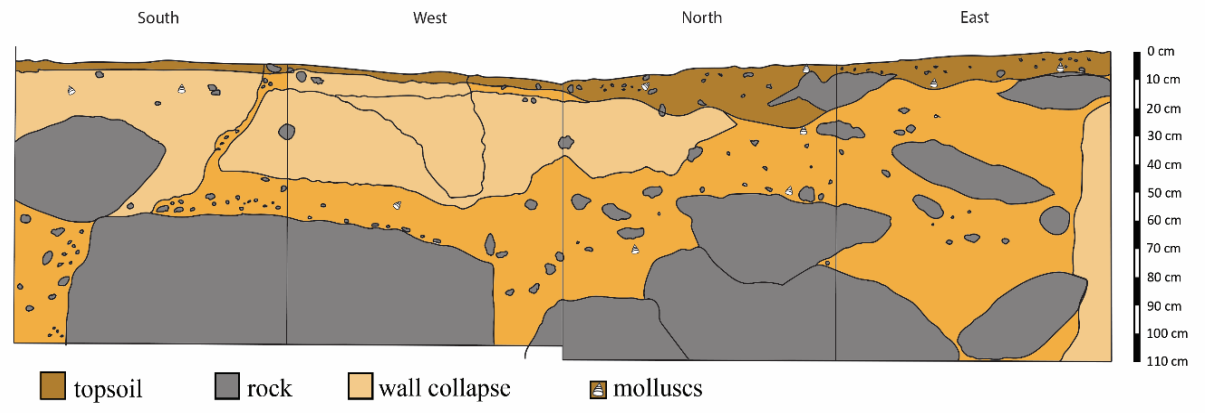

Figure 2. Stratigraphic section diagram of Leang Rakkoe excavation.
(**Source**: Drawn by Khairil Akram and digitized by Yinika L. Perston, 2020)

retouched points were analysed in some detail by YLP, as described below.

RESULT AND DISCUSSION

1. Results

The excavation trench was orientated NE-SW. Excavation stopped at 110 cm due to increasingly dense and large stone inclusions and safety considerations raised by baulk collapses (Figure 2). The soil was very loosely compacted at the surface, and, unusually, compaction further decreased with depth. At Spit 10 fist-sized voids began to appear among the increasingly frequent limestone rocks and small boulders. The deposits became so soft that team members constructed a make-shift wooden plank platform within the trench to prevent sinking up to our ankles in the deposits. The surrounding ground surface was also covered by planks, but this failed to prevent frequent baulk collapses. Owing to the remote location of the rockshelter, apparent lack of stratigraphic integrity, and safety considerations, it was decided not to construct vertical shoring, and excavation was discontinued. At the end of the excavation, a 1.5 m long probe was easily pushed into the floor of the test pit, indicating that these soft deposits continued to an unidentified depth. Small magnetic iron particles occurred through deposit, and the soil itself was so dry and ashy that it was nearly hydrophobic.

Cultural material was found throughout the deposit (Appendix 1, Figure 3) but no stratigraphic layers or changes were observed. The missing pieces of exfoliated engraved lines from the cliff wall were not encountered in the excavated deposits. Charcoal samples were collected for dating but as the site was clearly badly disturbed these were not submitted for dating.

a. Faunal Remains

The site contained abundant faunal remains. Most pieces were from small bodied land-mammals, and none appeared to be human. Of the mollusc shells recovered from the deposits the majority were *T. perfecta*, with a small number of large, unidentified bivalves. A crab claw was recovered from Spit 9. A bone concentration was encountered on top of a flat boulder in Spit 8, including several articulated long bones from a small, unidentified mammal. A full formal analysis has not yet been conducted of the faunal assemblage.

b. Stone Artefacts

Some 8,400 stone artefacts were recovered from Leang Rakkoe, composed mostly of high-quality chert (Appendix 1). The assemblage was composed

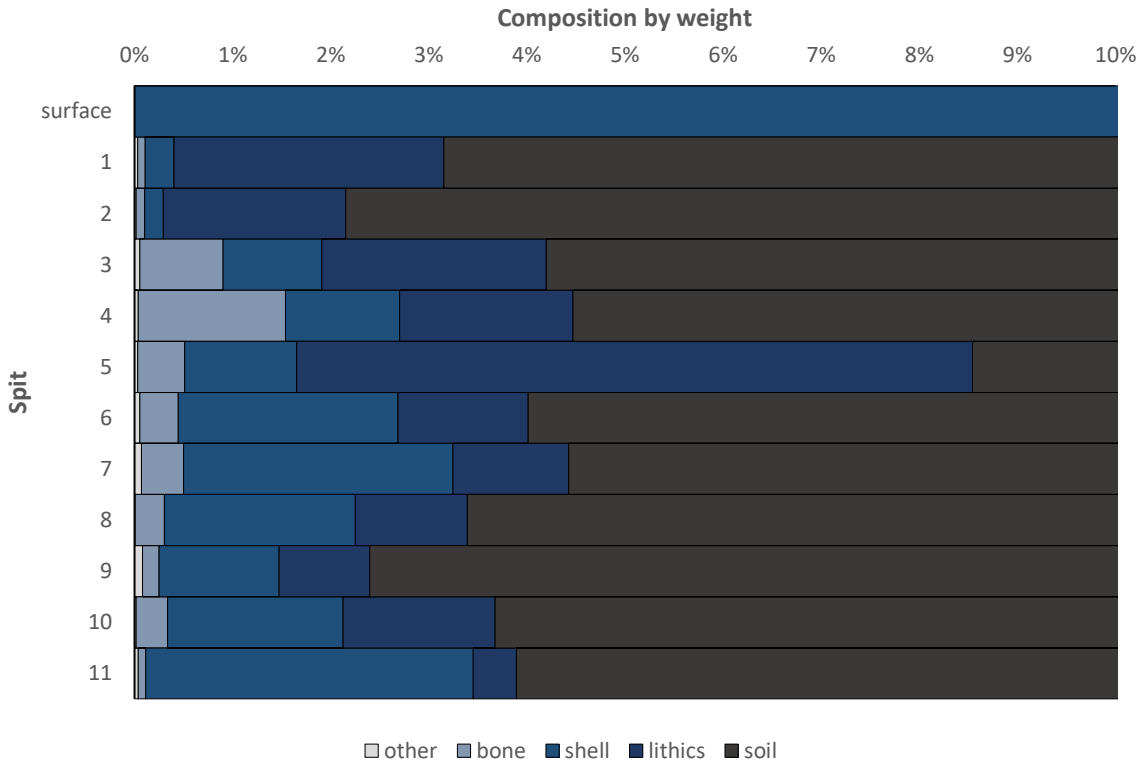

Figure 3. Artefact finds by weight, as a percentage of total mass recovered from each spit. Majority of mass is made up of soil (90+ %) and is not shown. Stone artefacts make up the majority of the finds, followed by unmodified shells and bone.

predominately of hard-hammer percussion chert flakes, with a small number of chert cores and modified flaked stone pieces, including seven Maros or Maros-like points (Mulvaney & Soejono, 1970, p. 171). At least one chert core was made from a water-rolled cobble, rather than the bedrock chert nodules found at the nearby Bomboro prehistoric quarry (Perston et al., in press). A small ceramic fragment was recovered from Spit 1. Thsere was no clear change in the stone technology through the deposit, however, analysis is ongoing. Retouched pieces are described in the following section.

c. Special Finds

Painted Bivalve

In Spit 1 a large fragment of a bivalve shell decorated with angular, red ochre lines was recovered. Analysis with a low powered digital microscope (Dino-Lite Edge 3.0 AM73915 Series) shows that the lines appear to have been applied before the shell broke.

Retouched Points

Seven retouched stone points were recovered. Most of these points exhibit some degree of tooth-like serrations around the margin, including across the base in some instances (Figure 4A), though none are deeply serrated as in the 'classic' Maros point (e.g. Chapman, 1986; Glover, 1977, p. 56; Mulvaney & Soejono, 1970, p. 171; Suryatman et al., 2019). All points have some degree of basal indentation. The hollow bases suggest that they can be classified as Maros points, broadly defined, although several vary somewhat from the classic points described elsewhere (e.g. Chapman, 1986; Glover, 1977, p. 56). Furthermore, one point which lacks serrations was made on a bipolar flake, the first recorded instance of this combination of

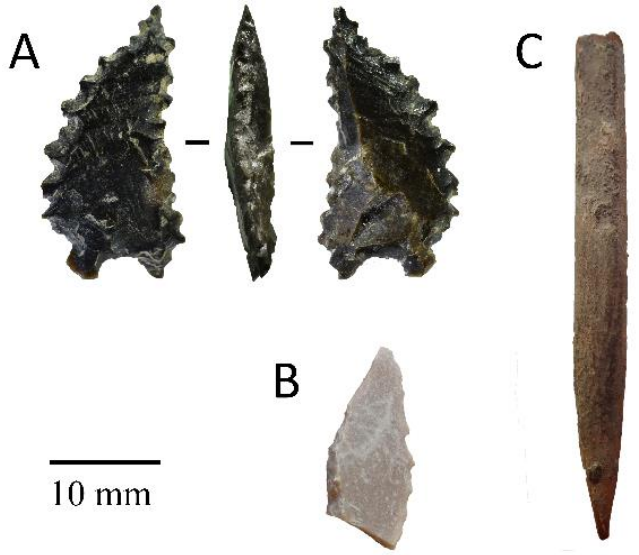

Figure 4. Artefacts recovered from the Leang Rakkoe excavations: (**A**) 'Maros point' from Spit 1 (**B**) Backed microlith (**C**) Bone point from Spit 4 (**Source**: Photo by Yinika L. Perston, 2018)

the Maros point and bipolar core reduction technologies. A further three flakes and miscellaneous pieces display varying degrees of edge serrations but lack a pointed morphology.

Backed Microliths

Three backed microliths were recovered, all of which are double backed (Figure 4B). Two of these are broken, and probably broke during production.

Bone Points

Four bone points were identified during excavation or sieving (Figure 4C), three of which were from Spit 4, but in is anticipated that more will be discovered if the faunal remains are sorted. Toalean bone points are small and are either bipoints or modified unipoints (after Langley, 2018) and their function is currently unknown.

Groove Marks in Rock Face

The engraved lines on the cliff face above the excavation consist of at least 109 short, straight lines extending for approximately three metres. These marks occur from 2.82 to 3.32 m above the modern ground surface. The grooves are approximately 5 mm in depth and width, with a roughly V-shaped cross section, although weathering has impacted their morphology (Figure 5).

Breccia deposits

Three small patches of calcified deposits were found concreted to the cliff face. These occur at the current ground level and at 1.9 m above ground level. These brecciated deposits are rich in *T. perfecta* shells and include a few fragments of what appeared to be stone flakes. These are likely the remains of archaeological deposits that were cemented together by calcite precipitating from the limestone cliff when the floor level was higher (Glover, 1979).

2. Discussion

The soft deposits at Leang Rakkoe rockshelter are unstable and disturbed, possibly as a result of the subsidence of an subterranean void (Figure 6). Excavation proved to be difficult as not only was baulk collapse a regular occurrence, but the base of

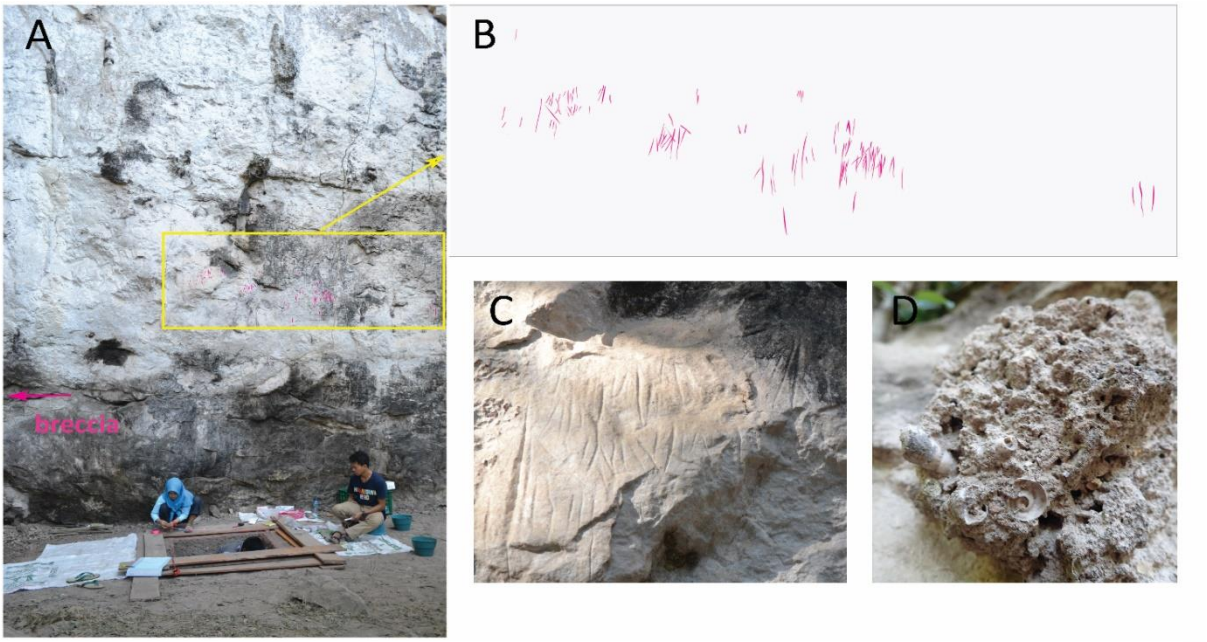

Figure 5. Leang Rakkoe rockshelter showing engraved lines on the limestone surface (**A, B, C**). (**D**) Shell-rich breccia deposit adhering to Leang Rakkoe rockface (**Source**: Photo and tracing by Yinika L. Perston, 2018).

the excavation began to subside dramatically. The site of Leang Rakkoe is located on the high point of the cliff base, but the occurrence of archaeological breccia or 'cemented deposits' (Glover, 1979) on the cliff wall suggest that the surface was even higher at one point and has since eroded, subsided or become deflated. Site disturbance is common for the Maros-Pangkep region, with the majority of Toalean sites showing mild to intense deflation or mixing. Glover suggested such situations may be attributed to sink action in this low-lying and monsoonal environment. This hypothesis was largely based on work at the nearby site of Ulu Leang 1, where a date from charcoal from breccia deposits adhering to the cave wall of 4050 +/- 90 B.P. closely approximated that of the floor sediments which otherwise seemed to have good stratigraphic integrity. In Glover's scenario, water erosion below the ground surface leads to undercutting and gentle subsidence, and the remaining breccia adhering to the cave wall mark an earlier floor surface (Glover, 1979). However, recent deep trench excavations at the nearby Late Pleistocene site of Leang Burung 2 revealed no evidence for this phenomenon. Nonetheless, sink action may yet be a factor at Leang Rakkoe, as the observed partially-collapsed void space at the cliff base may once have been larger and extended below the excavation zone. The collapse of this space could plausibly have caused the sediments to partially subside, leaving loose, uncompacted sediments while traces of brecciated deposits remained adhering to the cliff face above. Alternatively, wind may have caused aeolian deflation, although this seems unlikely and would not explain how the site lost the compaction we would expect of a living floor.

The majority of the assemblage recovered from the Leang Rakkoe excavation can be classified as belonging to the Toalean technocomplex, mixed with some later deposits. The presence of bone points, backed microliths, and Maros points place the occupation phase to the Toalean period, around 8-2 kya (Bulbeck et al., 2000, p. 71), although without a reliable

Figure 6. A large subterranean void that may extend below the Leang Rakkoe excavation. (**Source**: Photo by Yinika L. Perston, 2018)

chronology (as noted by Suryatman et al., 2019), we cannot be more precise.

The engraved grooves on the shelter walls also appear to be unique and may represent a new form of Toalean art in the region, though this requires further study. While the limestone karsts of the Maros-Pangkep archaeological region is rich in painted and drawn rock art, no engraved art has yet been reported. Long, linear grooves have been observed at several sites in the Maros region, including Leang Kado 1 (S 05°02.410', E 119°41.489'), Leang Kado 4 (S 05°02.551', E 119°41.268'), and two instances at Leang Bulu Karampung (pers. obs., YLP; Brumm et al., n.d., in press). However these markings are all located on smooth, shiny, horizontal limestone surfaces, and appear fairly randomly orientated. These latter cases strongly resemble the grooves of the Lower Pecos Canyonlands, Texas, the function of which appears to be largely symbolic with a shiny surface formed by repeated contact with bare hands (Connolly, 2012; Gershtein et al., 2017). In contrast to these cases, however, the Leang Rakkoe engravings occur on a vertical cliff face and are quite regular, short, and lack a shiny crust. Similar to the Lower Pecos Canyonlands example, the grooves at all four Sulawesi sites have an approximate V-shape profile, and controlled experimental studies on limestone surfaces suggest this is indicative of formation from deliberate use of a chert flake similar, rather than use-wear from grinding stone axes or bone points and tools (Connolly, 2012; Loeb, 1926). Connolly's experiments also demonstrate that chert edges are quickly dulled in engraving grooves into a limestone surface (Connolly, 2012), thus requiring multiple tools to manufacture, and she concludes that these marks were almost certainly ritual or artistic rather than functional. It may therefore be the case that the Leang Rakkoe vertical grooves are also symbolic rather than functional.

In the case of the Leang Rakkoe grooves, the lines are etched into a surface high above the current ground level, but only 0.90-1.42 m above the upper breccia deposits that are adhering to the cliff face. If

this breccia line marks a prior floor level, as discussed above, the lines would have been at a more accessible height before the deflation event. As the breccia contains shells typical of Toalean sites, this may suggest that the engravings were created during the Toalean period, though this is only speculative until an association between the two features is confirmed. Until then it remains possible that the ages may differ substantially, as in the neighbouring site of Leang Jarie where the dozens of hand stencils were originally assumed to be contemporaneous with the mid-Holocene deposits in the cave until two of the stencils were dated to the Late Pleistocene (Aubert et al., 2014).

CONCLUSION

Despite being heavily disturbed, Leang Rakkoe provides useful insights into the Toalean period. Both quarry stone and river cobbles were utilised as raw materials at this site, and bipolar technology – generally more common in the Late Pleistocene of South Sulawesi (pers. obs, YLP; Brumm et al., 2017; Glover, 1979) – was incorporated into the Maros point reduction strategy in at least one instance. Leang Rakkoe may provide the first instances of Toalean cave art and portable art, though this requires further research to provide absolute dating. Furthermore, the excavation contributes new observations to the old problem of site disturbance that has long hindered our understanding of the Toalean period.

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The Leang Rakkoe archaeological site was identified as such by AB. The site excavation was led by YLP and Iwan Sumantri, assisted by Asri, Aisyah Arung, Jey Faud Latanro, Fardi Ali Gurit, Sofyan 'Ian' Setia Budi, Khairil 'Heri' Akram, Hekta Plantikano, BPCB staff, and local residents. Finds were curated by Hasliana and Hikma and are stored at the Balar Sulsel storehouse. Artefact analysis was conducted by YLP. Thanks to Mark W. Moore, Michelle Langley, and Basran for feedback on this report, to Kimberlee ‘Kim’ Newman for the map, and to Putu Bagus Mahardika for assistance with Indonesian translations.

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Appendix 1. Table of Leang Rakkoe excavation finds

Spit	Depth (cm)	Excavated soil weight (kg)	Bone > 1 mm		Shell		Animal teeth	Charcoal piece	Lithics > 3 mm		Lithics 3-1 mm		Ochre (g)
			#	g	#	g			#	g	#	g	
Surface	0	0	0	0	3	31	0	0	25	231	0	0	0
1	0-10	45.15	759	36	147	136	9	0	234	1270	282	15	6
2	10-20	131.70	378	114	415	258	22	5	1363	2496	250	9	3
3	20-30	90.81	3459	803	1164	952	30	3	1042	2163	283	9	24
4	30-40	100.80	2842	1584	3559	1227	29	1	825	1860	897	8	11
5	40-50	77.66	2212	407	1482	970	24	2	957	5848	102	5	4
6	50-60	99.69	2348	410	2868	2323	21	2	708	1372	295	9	35
7	60-70	59.70	976	270	2367	1714.39	35	2	109	725	404	13	9
8	70-80	41.28	208	129	1542	832	1	1	182	482	174	6	>1
9	80-90	38.37	449	66	881	482	10	0	97	362	0	0	22
10	90-100	24.09	77	80	731	448	4	0	42	387	16	1	0
11	100-110	25.87	569	20	791	899	4	0	44	119	77	>1	6
Total		**735.20**	**14277**	**3919**	**15950**	**10271**	**189**	**89 g**	**5628**	**17315**	**2780**	**75**	**122**