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Human remains from cappa lombo site: Indication of mid-holosen occupation on south sulawesi highland

Fakhri¹, Akin Duli², Muhammad Nur³

¹⁻³ Faculty of Cultural Sciences, Hasanuddin University, Makassar, Indonesia

Corresponding Author: Fakhri

Abstract

This research provides a brief description of the human remains availability as primary data found in previous research. The two problems in this discussion of a research article are How the morphological findings in human skeletal site Cappa Lombo? And What is the treatment of the order found?. The research focused on survey data collection and excavation methods. The description of the skeletal findings in the Bontocani karst area proves a very diverse range of

supporting human activities. During their occupancy, several sites have provided traces of activity spaces related to the daily activities of people who support culture in this area. This cultural activity lasted for thousands of years and continued into the introduction of pottery and the younger times indicate mid-holosen occupation on South Sulawesi highland.

Keywords: Human Remains, Cappa Lombo Site, South Sulawesi Highland

1. Introduction

Sulawesi is the largest island in the *Wallacea* Zone and strongly suspected to have been one of the migration routes for early modern humans (Homo sapiens) through the Sundaland across the deep sea^[1] before finally arriving on the mainland of Northern Australia about 65,000 years ago^[2]. Recent research results indicate that the island of Sulawesi has been inhabited since 44,000 years ago^[3] as well as being the oldest evidence of their presence on the Sulawesi island. Their presence activities continued until 18,000 years ago by introducing the tradition of rock drawings on the cave walls of the Maros-Pangkep Karst Area, South Sulawesi. This evidence results from dating samples of animal drawings and handprints using the Uranium Series method in several caves, which are generally located in the lowlands areas of South Sulawesi^[4]. It is different from the Suku Bajo, which also exists in South Sulawesi, as a sea man or a boat man, the Suku Bajo explored the archipelago for centuries^[5].

Several excavation studies have mentioned the presence of a Late Pleistocene residential culture layer in the same area. Since each country has its own culture and uniqueness, including Indonesia, which has a lot of cultures^[6]. This research, among others, was carried out by Glover (1981) at the Leang Burung 2 Site, with the context of cultural layers 29,000 to 19,000 years ago in context with flaked stone artefacts^[7, 8]. Another study, at the Leang Sakapao 1 site, dated between 30,000 and 20,000 years ago, has a context with a collection of flaked stone artefacts^[9].

Research results from excavations at the Leang Bulu Bettue Site, Maros also showed that the occupancy layers were 30,000 to 19,000 years ago. This research shows the layers of late Pleistocene culture and finds interesting evidence about the symbol of material cultural identity by early modern humans, the inhabitants of *Wallacea*. The evidence includes cuscus bone jewellery, bone beads, stone artefacts with geometric pattern strokes, and the intensive use of mineral painting dyes that show cultural unity with rock images in the region^[10].

The occupation of caves in the lowlands of South Sulawesi continues in the Maros-Pangkep Karst area until it enters the Holocene phase. They even developed stone tool technology which tends to be more complex and more distinctive in the Southeast Asia region. This tool is known as the Toalian/Toalean blade tool technocomplex^[11-14]. Typical types of these tools include a Maros point and a backed artefact consisting of a geometric microlith and a backed blade.

The Holocene cultural layers reported in the Maros-Pangkep Karst area include the Ulu Leang 1 site with dates between 8,000 and 3,500 years ago^[15, 16], Leang Karrassa dated in 2,700 years ago, Leang Burung 1 between 4,000 and 3,500 years ago^[17], and Leang Passaung dated in 6,000 years ago^[18]. Other sites reported outside of this area are Ejayya Rock and Panganreang Tudea, dating back in 4,700 years^[19, 20]. and Leang Panningge dated in 7,000 years ago^[21, 22].

The description of the research results above shows the cultural layers of prehistoric caves in the lowlands of South Sulawesi from the Late Pleistocene to Holocene phases.

The archaeological evidence on this cultural layer shows the interaction patterns of the cave dwellers in the lowlands of Sulawesi with the surrounding environment and their behavior in creating an art symbolizing their identity in the *Wallacea Zone*. During the Holocene settlement phase, they succeeded in developing more complex stone tool technology for hunting equipment. The question then is whether the inhabitants of these caves only exploit the lowlands and ignore the potential of caves and niches in the highlands?

The Bontocani Karst Group is a karst area of the Tonasa limestone formation, located in the Southwestern region of Bone Regency with 129.91 km². Research in this area is nothing new in the world of archaeological research in Sulawesi. The potential of archaeological remains in the Bontocani area was first reported by the Sarasin brothers in 1902 and found Maros sticks, blades and bone tools from their excavation in the Lamoncong area [13].

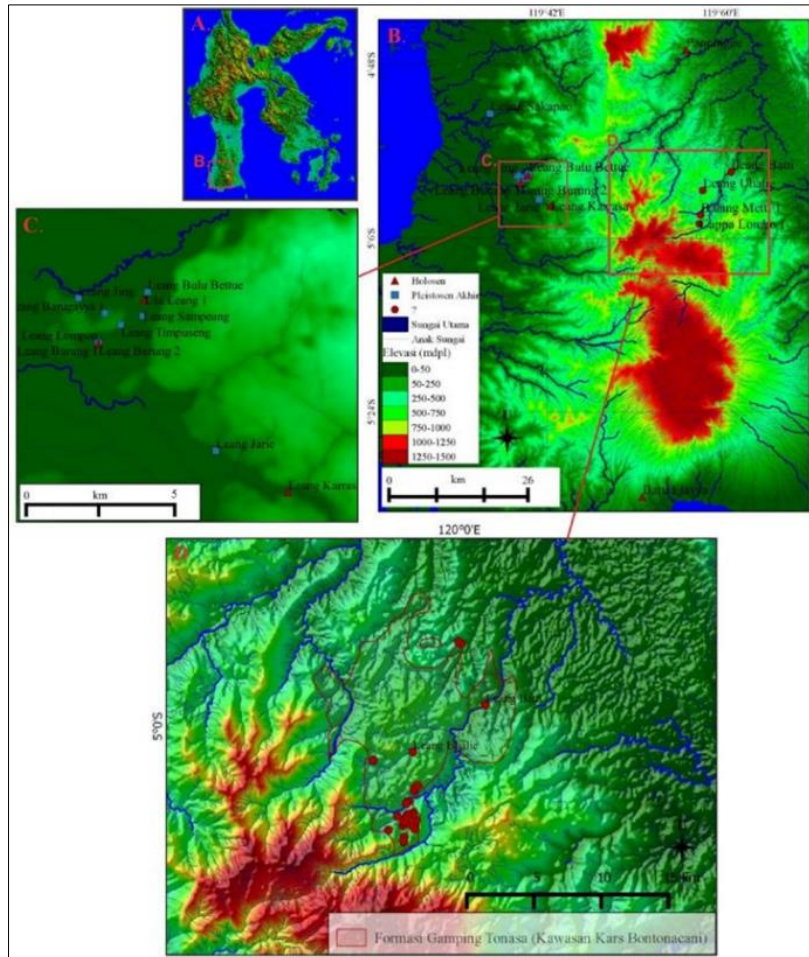


Fig 1: Location map of prehistoric caves in South Sulawesi (Figure 1A). Residential sites from the late Pleistocene (40,000-11,000 years ago) to the Holocene (8,000-3,500 years ago) in lowlands and potential prehistoric caves in the highlands of South Sulawesi (Figure 1B). Prehistoric Cave Occupancy in the Karst Maros Region, lowlands of South Sulawesi (Figure 1C). The potential of prehistoric caves from the results of previous studies in the Bontocani Karst Area (Figure 1D).

In 2009, the Archaeological Center of South Sulawesi conducted exploratory research in this area and found several sites based on information from local residents. Excavations were first carried out at Leang Batti to several stages and found a rich cultural layer with archaeological remains. Archaeological evidence includes flake stone artefacts consisting of total and core stones as flakes, shredded tools in the form of shredders with very rough technology, stone hammers, bone tools, food scraps from animal bone fragments and pottery found in the top layer. Rock drawings in the form of hand drawings and anoa animals were also found on the cave walls [23, 24].

One of the latest interesting data from several excavation findings at sites around this karst area is discovering human remains [25, 26] that are associated with archaeological findings with features of the Holocene technology in one cultural area. Against the background of this research problem,

comprehensive and thorough research was carried out to study the karst cultural area of Bontocani and most of the other highland areas in South Sulawesi. However, to limit the discussion in the cultural context found in this area, this article will describe descriptively the findings of human remains found since 2016 [25].

Referring to the results of the exploration research of Balar Sulsel, it shows that the prehistoric context of the Bontocani karst area found two prehistoric sites containing archaeological remains in the form of human remains, namely the Cappa Lombo 1 site and the Balang Matti site. These two sites are in the same karst area but have different dating data. In terms of quantity and quality, the data variability of the Cappa Lombo 1 Site is different from the Balang Matti Site. The identification carried out shows that the Balang Matti site has younger cultural characteristics compared to the Cappa Lombo 1 site. As for the findings of

human remains at the Balang Matti Site, one human skeleton was found in a state that had been destroyed and only left a very fragmentary *cranial* part. The condition of the human skeletal fragments is largely shapeless, but only fragments of the cranial roof of the skull that remain above the soil of the sediment matrix ^[25, 26]. This condition is then supported by dating results that have been carried out in the laboratory of the University of Waikato in New Zealand and show the various phases of occupancy.

The Bontocani karst area is known to have been inhabited in three phases of the occupancy period, namely: The first phase that is the oldest inhabited period is the early Holocene, with dates ranging from 9,000 to 7,000 years ago. Evidence for this cultural layer has been found at the Leang Batti Site with cultural indications consisting of stone artefacts and animal bones.

The second phase is the middle Holocene, with dates ranging from 7,000 to 3,500 years ago. Evidence for this cultural layer has been found at the Leang Batti and Cappa Lombo 1 Sites. Archaeological evidence found from these two sites is quite different. At the Leang Batti site found a human skeleton labelled BM 1 individuals, pottery, stone artefacts, shells and bones, while at the Cappa Lombo 1 site found consisted of 6 human remains labelled *CL-R11*, *CL-R12*, *CL-R13*, *CL-R14*, *CL-R15* and *CL-R16* contextualized with stone artefacts, animal bones and other. Shells are also found in this layer but in small numbers.

The third phase is the final Holocene, with dates ranging from 3,500 to 1,000 years ago. This cultural layer can be found at the three sites that have been studied by the South Sulawesi Archaeological Center, among others, Leang Batti Site, Balang Matti Site and Cappa Lombo 1 Site. At Leang Batti Site, the final Holocene cultural layer is estimated to be much younger than Cappa Lombo 1 and Balang Matti. Archaeological evidence of the final Holocene layer at the Leang Batti Site is only pottery, while at the Cappa Lombo 1 and Balang Matti Sites, a context with stone artefacts, animal bones, and shells is still found ^[27, 28, 29].

The discovery of the human skeleton in the above description is important data in the prehistoric context in Sulawesi. The presence of this framework becomes the primary data of research that is considered limited in quantity and quality. Its highly fragile and fragmentary condition is prone to damage, both naturally and intentionally. This will of course, implicate the loss of very limited archaeological data. To anticipate this, the description in this article will be the basis for describing the context of one of the prehistoric human remains found in Sulawesi.

This article will provide a brief description of the availability of data related to the human skeleton as primary data found in previous research. The problem in this discussion of a research article, How the morphological findings in human skeletal site Cappa Lombo? What is the treatment of the order found?

2. Research Methods

The research is focused on survey data collection and excavation methods. The survey was conducted to collect

data by tracing the cluster of karst areas around the limestone hills of Bontocani to the southern region. One of the purposes of the survey is to identify and map sites with similar patterns and characters in accordance with the research problems proposed. In addition to surveys, other data collection steps are excavation.

Excavations conducted in this study are included in research excavation or excavation of systematic and in-depth data collection that includes sampling carbon data and other data that can be used to determine the absolute date through radiocarbon dating. Judging from the coverage, this excavation is a selective excavation by selecting a specific place on a site to obtain as much data as possible with the available implementation time.

In this excavation activity, two excavation strategies have performed that aim to look at the period and layers of culture (vertically) and see the context and associations in one or more layers of culture (horizontally). At this stage of research, the making of the box layout is done in two ways, namely: first, using a grid system with an optional box placement system with certain considerations; and second, does not use a lattice system, but the placement of boxes remains optional with certain considerations.

The shape of the mineral box uses a box system with a rectangular base shape. The layout of the box using a grid system (grid System), the implementation of the excavation using the spit technique, which is to dig the soil arbitrarily (arbitrary level) with a depth interval between 10 cm. The thickness of the interval is based on the density of the findings or the type of findings. An important goal of an archaeological excavation is to determine the dating data that will be obtained from carbon samples from each layer of culture. Taking calendar sampling data in this study will still be of special concern as comparative data of previous research results.

Analysis of human remains findings using comparative data in reference books by Tim D. White, Michael T. Black and Pieter A. Folkens entitled *Human Osteology* and the book *The Human Bone Manual* by Tim D. White and Pieter A. Folkens. For initial identification, the findings of the Human Skeleton on the sedimentary soil matrix, we used a reference entitled *Digging up Bones* by D. R. Brothwell and a book entitled *Osteoarchaeology: A Guide to The Macroscopic Study of Human Skeletal Remains* by Efthymia Nikita ^[30, 31, 32, 33]. All of these references serve as comparisons to describe the remaining anatomical sections of human skeletal findings at the Cappa Lombo Site.

3. Results and Discussion

The excavation at the Cappa Lombo site is a follow-up excavation from 2018 by opening 3 excavation boxes, namely TP 1, TP 2 and TP 3. The previous excavation did not follow a north-south direction, but for this year's excavation, the grid of excavation boxes followed a north-south direction with widening the previous digging box. The newly opened excavation boxes are U1T2, U1T1, S1T1 and S1T2. From the latest excavations, some of the latest human remains have been rediscovered.



Fig 2: The excavation at the Cappa Lombo site.

The excavation was carried out to a depth of 90 cm from the SLL, and all excavation boxes were covered with bedrock. The soil visible up to spit 7 consists of two layers. The top layer is layer one (L.1), a very fine sandy texture soil that is very loose in light brown colour (7.5YR 6/3 light brown) still mixed with dry leaves and some dry wood. This layer is 20 to 40 cm thick, but on the northern wall of the U1T1 box infiltrates to a depth of 70 cm from the SLL. Several spots of concentration of dry leaves as thick as 10 to 20 cm are also seen on the north wall of box U1T2 and east of box U1T2.

The second layer (L.2) is the lowest. It shows the texture, and the colour is not different from L.1, but in this layer is no longer visible there are mixed dry leaves. All skeletons found to go in the second layer. A dating sample from L.2 with code SK1 (WK-48654) was bivalve shells from box S1T2 depth 70 to 80 cm. Radiocarbon dating results show a calibration age of 6410-6300 calBP.

Archaeological evidence from the five excavation boxes showed the frequency of findings that looked different up to the end of the spit (table 4). Stone and bone artefacts showed no significantly different weight frequencies between spit in the upper layers (1, 2 and 3) and the lower layers (4, 5, 6 and 7). In contrast to Oker's findings, it tends to decrease from spit 1 to spit 3 and increase from spit 4 to spit 7. The number of pottery fragments is very small but only seen from 1 to spit 3. In box S1T2, 1 pottery fragment was still found in spit 4, it is possible that the findings infiltrated into the lower layer. Shellfish findings can still be found from spit 1 to spit 7, but the number is very small.

Stratigraphic observations, dating data and frequency of findings indicate that there are two cultural layers at the Cappalombo Site. The first layer is the middle Holocene cultural layer with a date between 7000 to 3500 years ago. Archaeological indications that were found were stone artefacts, bones and tails. The second layer is the final Holocene cultural layer with an estimated date of no more than 3500 years ago. The presence of pottery is an indication of a Neolithic layer that is no more than 3500 years old. Stone and bone artefacts are still dense found, but other is significantly less than the first layer.

3.1 Morphological condition of human skeletal findings at the Cappa Lombo Site

3.1.1 Individual Skeleton 1 (RI 1)

RI 1 was one of the first skeletal findings found in the TP1 excavation box in 2017. At the time this skeleton was excavated, it increasingly showed the orientation of the burial and the findings of some parts of other human skeletal elements. The justification for the findings as a human is

supported by the presence of phalangeal bone data scattered around the skeleton and the body structure of the ribs. The orientation of the skeleton is north-south with the superior part to the south and the inferior part to the north. This orientation is seen from the position of the right humerus which is also connected to the radius and ulna located on the right side of the skeleton. Another part that can still be identified from part RI 1 is the metapodial part that is separated and is no longer in the position it should be. The metapodial part and some phalanges were found scattered around the skeleton and in an already very fragile condition.

The number and biometric findings of the recognizable parts of the skeleton are:

- 1 Right Humerus = 9.5 cm.
- 1 Right Radius = 10 cm.
- 1 Right Ulna = 10 cm.
- 6 Fragments of the right rib section
- 4 Fragments of the left rib section
- Basal Phalange = 6 pieces

In this excavation, it was also found that some parts of the cranial fragment were found to be separated from the proper position. The condition of the skeletal findings did not allow the team of analysts to identify further due to the skeletal condition being very fragmentary and almost fused with the soil of the sedimentary matrix.

3.1.2 Individual Skeleton 2 (RI 2)

RI 2 is a finding found in the dig box TP 2 in the previous study, but after updating the name of the box, RI 2 is in the dig box S1T1, with the orientation of the head facing northeast at a position of 30 degrees. Based on observations, the part of RI 2 that can be identified is only the part of the skull with a very fragile condition, while the elements that can be identified are the left cranial, left frontal, left parietal, left temporal, left occipital, left maxilla with premolar 3 and 4 and molar 1. mandible left with lower incisors 1, 2 and 3 and premolar 3 with a very worn condition. Another part that can be identified is that there are piles of fingers in the form of phalanges with an average length of 4 cm, but no other parts of the RI 2 body are found. Other body parts in question are long bones such as the humerus, radius and ulna, femur, tibia, and fibula. Not even the body part could not be found after the dug box was deepened widened by extension to the west.

3.1.3 Individual Skeleton 3 (RI 3)

RI 3 is located and crossed in a folded condition to the southwest of RI 2 with a distance of 10 cm. RI 3 is located on limestone associated with stone artefacts and the orientation of the skull is in the south and the position of the arms and legs are folded. In contrast to RI 2, the findings for RI 3 do not have a complete skull section but only a few parts of the parietal and occipital fractions. Meanwhile, other visible parts of the bone are the left humerus which is above the right ribs, the radius and the ulna, which are at the bottom of the frontal part of the skull. The other long bones are the left and right humerus, left scapula, right eight ribs, radius and ulna, left and right femur, and spinal fragments. In the RI3 skeleton, an adult tibia was also found in the distal part of the skeleton. From the size of the elements that appear, it is likely that RI 3 is a child under the age of five who was buried.

3.1.4 Individual Skeleton 4 (RI 4)

The discovery of RI 4 only found a broken skull and other elements on it. RI 4 was found in the U1T1 box with a depth of 57 cm. The visible parts of the bones apart from the skull fragments with an average size of 10 cm are several long bones such as the right femur which are very worn and there is no femoral head, cervical vertebrae, tibia and fibula which are fused with a length of 6 cm. From the observations made, it was concluded that RI 3 and 4 have similarities, namely that they have not experienced bone fusion in the condyle section which indicates that RI 4 is still very young.

3.1.5 Individual Skeleton 5

The skull of RI 5 is in the U1T1 box with a depth of 70 cm on the north side with the orientation of the frame facing the northeast, which shows that the part of the skull includes the right occipital and right temporal. The maxilla was not found, but the teeth were still intact. There was also a mandible with a length of 6 cm and a canine tooth. Also found mixed phalanges in the teeth, found the left and right humerus with a size of 10 cm, adjacent to the radius and ulna, which indicated that the position of RI 5's hand was folded, then the ilium pelvis was also found. It was found that in the southeast, there is a right femur with a length of 20 cm, while the left femur is under it. The left femur is below it. This femur is adjacent to the tibia and patella and has a size of 14 cm and a complete metatarsal.

3.1.6 Individual Skeleton 6

This bone fragment was found in the form of a skull fragment in the northeast quadrant of the U1T2 box at a depth of 72 cm. In addition, three skull fragments were also found in the corner of the U1T2 box in the southeast quadrant at a depth of 60 cm. It is very difficult to identify the parts of this skeleton, but when viewed from the context, the findings are very large indications that human bone fragments are also part of the occupancy period of the Cappa Lombo site 7000 to 6000 years ago.

4. Conclusion

Overall, the description of the skeletal findings in the Bontocani karst area proves a very diverse range of supporting human activities. During their occupancy, several sites have provided traces of the use of activity spaces related to the daily activities of people who support culture in this area. This cultural activity lasted for thousands of years and continued into the introduction of pottery and the younger times.

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