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The Evidence of Bone Tools Used at Lobang Batu Puteh, Bukit Sarang, Bintulu, Sarawak in Late Neolithic Culture

by

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Introduction

In 2003, systematical archaeological research was conducted at Lobang Batu Puteh, Bukit Sarang, Ulu Kakus, Bintulu, Sarawak in order to resolve a number of problems and question relating to the chronometric dating, cultural chronology, periodization, the function of site, classification and artifacts technology, subsistence activities and adaptation. This research, which included about two weeks of archaeological survey and excavation, revealed that prehistoric people from 860 BP to 420 BP used Lobang Batu Puteh. The research also indicated that activities such as stone tool, pottery making, faunal tool and also the day-to-day subsistence activities were carried out at Lobang Batu Puteh.

Lobang Batu Puteh is located at Bukit Sarang limestone complex in the upper reaches of Sungai Mayeng Sarang. Bukit Sarang complex is an isolated and small formation, surrounded by extensive swamps. It consists of two main limestone hills: The larger Bukit Sarang (Batu Anyi) and a smaller Bukit Lebik (Map 1). Lobang Batu Puteh has two large mouth and underground stream. There is a considerably large floor area (10 x 8 metres) located at the rock shelf about 30

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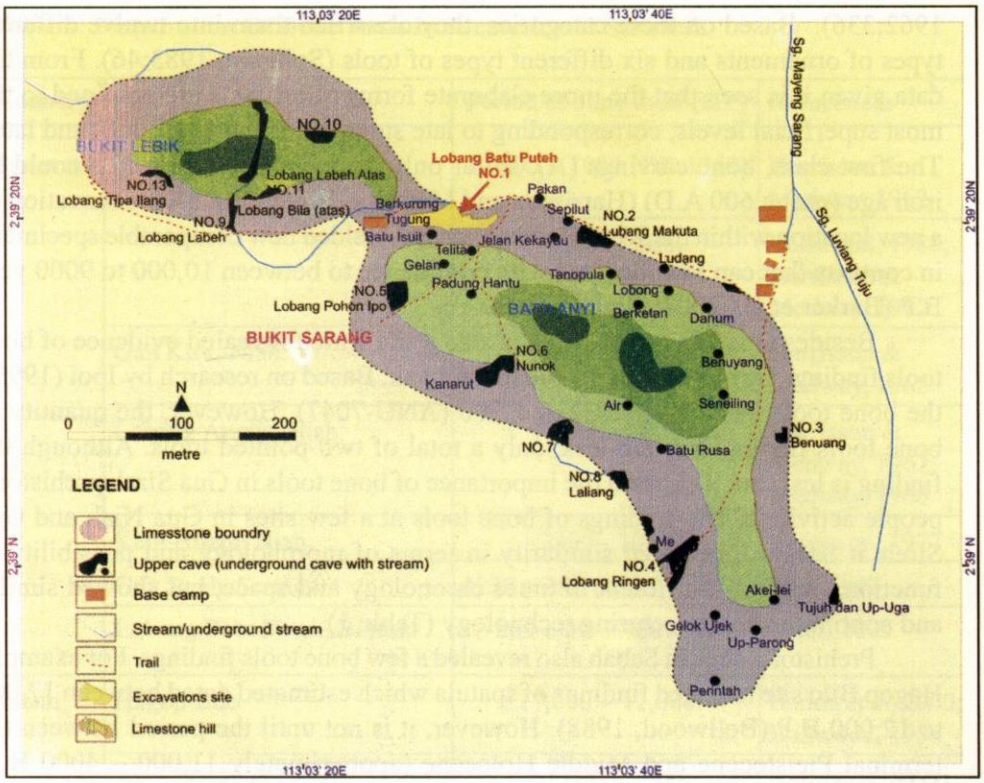

Map 1: Location of site at Bukit Sarang limestone complex, Bintulu, Sarawak.

metres from stream. The earlier trial trench, measuring 1 x 1 metre, excavated by Harrisson and Reavis (1966) is still noticeable on the floor of rock shelf. At the back wall of the rock shelf, charcoal drawings of human figures in the form of stick and geometric styles are stil visible. This article is a focus on the results of faunal tool analysis at the Lobang Batu Puteh site.

Distribution of Bone Tools in Sabah and Sarawak

Evidence for the used of bone technology first rises to prominence in Borneo (Sarawak and Sabah) cave sites and have different time and cultural. In Sarawak, Gua Niah is one of the sites which revealed discovery of the largest quantity of bones tools. Among the sites in Gua Niah which revealed findings of bone tool are West Mouth, Lobang Angus, Lobang Tulang, and Gan Kira. Harrisson and Medway (1962a-b) had classified the bone tools into eighteen categories, based principally on visual analysis of shape. Functional name also accepted for convenience and have been given so far as is possible to various categories, but in many cases the functional of artifact is not clear from its appearance (Harrisson and Medway,

1962:336). Based on these categories, they classified them into twelve different types of ornaments and six different types of tools (Solheim, 1983:46). From the data given it is seen that the more elaborate forms of artifacts are confined to the most superficial levels, corresponding to late stone age (39,600 ± 1000) and later. The first class, bone carvings (A), so far only occur in contexts which could be iron age (past c.600 A.D) (Harrisson and Medway, 1962:357). New excavation of a new location within the West Mouth, Niah has yielded new comparable specimens in contexts that can be bracketed with confidence to between 10,000 to 9000 year B.P (Barker et al., 2002; Cranbrook 2000).

Besides Gua Niah, Gua Sireh is also a site which revealed evidence of bone tools findings by prehistoric people in Sarawak. Based on research by Ipoi (1993), the bone tools dated around 3220 ± 190 (ANU-7047). However, the quantity of bone tools finding was too less, only a total of two pointed tools. Although the finding is less, but it showed the importance of bone tools in Gua Sireh prehistoric people activities. The findings of bone tools at a few sites in Gua Niah and Gua Sireh at Sarawak revealed similarity in terms of morphology and possibility in function. Although different in times chronology and space, but showed similar and continuous manufacturing technology (Table 1).

Prehistoric sites in Sabah also revealed a few bone tools findings. For example, Hagop Bilo site revealed findings of spatula which estimated dated between 17,000 to 12,000 B.P (Bellwood, 1988). However, it is not until the period between the terminal Pleistocene and Middle Holocene (approximately 11,000 – 4000 B.P) that bone-based technologies appeared to become more widespread in the region (Rabett, 2005:154). Research by Bellwood (1988) at Madai, Sabah formation revealed two sites with bone tools findings, the Agop Sarapad (Mad 2) and Madai (Mad 1/28). Based on metric dating, bone tools in Agop Sarapad dated around 11,000 to 7000 and finding in Madai (Mad 1/28) dated 7000 B.P (Bellwood, 1988; Harrisson, 1998). These bone tools has been classified as worked bones (spatula) because signs of secondary working or usage. The other site in Sabah have evidence of bone tools is Agop Atas, part of the Madai complex of 25 caves. Trial trench by Harrisson (1972) showed this site dated between 10,800 B.P from about 60" in a dense deposit believed to continue deeper and was associated with large quantity of worked stone, estuarine and freshwater food shell and animal bones. Agop Atas produced a striking sequence of large fragments from stage's antlers (Cervus Unicolor), rare at Niah, Sarawak.

Research by Jeffrie (2000) at Pulau Balambangan cave showed finding of largest quantity of bone tools in Sabah. The collection of 33 bone tools are mostly from a single hearth feature has been securely dated to between 9960 ± 190 B.P and 8930 ± 150 B.P. Two additional examples of bone implements have come from Hagop Bilo and Madai (Rabett, 2005:155). Majority bones tools in Pulau Balambangan cave site classified to spatula and pointed tools. Neolithic cultural in Sabah also showed the appearance the bone tools technologies. Excavation by

Table 1: Distribution Of Bone Tools In Sarawak and Sarawak

Country	Site	Period of bone tools (B.P)	References
Sarawak	West Mouth, Niah	39,600 ± 1000 (GR-1339)	Harrisson & Medway, 1962
		18,000? - 8000	Bellwood, 1988; Harrisson & Medway, 1962
	Gan Kira, Niah	37,500 ± 2400	Harrisson & Medway, 1962
	Lobang Angus, Niah	11,000 - 7000	Harrisson & Medway, 1962; Medway, 1966
	Kain Hitam, Niah	2300 - 1045	Harrisson, 1977
	Gua Sireh, Serian	3220 ± 190 (ANU – 7047)	Ipoi, 1993
	Lobang Batu Puteh, Bintulu	860 ± 50 - 420 ± 50	Velat, 2005
Sabah	Hagop Bilo	17,000 – 12,000	Barker *et al*, 2000; Bellwood, 1988
	Agop Sarapad (Mad 2), Madai	11,000 - 7000	Bellwood, 1988
	Agop Atas, Madai	10,800?	Harrisson, 1972
	Madai (Mad 1/28)	7000	Bellwood, 1988; Harrison, 1998
	Pulau Balambangan	9960 ± 190, 8930 ± 150	Jeffrie, 2000
	Bukit Tengkorak	1200 - 900 BC	Chia, 1997

Chia (1997) in Bukit Tengkorak, Semporna showed the six pieces of tool and ornaments, two of them are shell spoon and unfinished shell bracelet and four pieces of bone tools. Radiocarbon dating from the shell artifacts layer given dated around 1200 to 900 BC (Chia, 2003:212).

Based on this data, so far the Borneo bone tools technology (Upper Paleaolithic to Late Neolithic) showed no sign of any specific separate "bone tool culture". Although most bone tools is less susceptible to intricate or variable working than stone, even so there is, so far no other quantitative parallel between the two as regards visible changes and developments. The stone cannot be confused seldom even overlapped from different levels. So, based on the different distribution of places and times, probably bone tools technology and the function in life activities

were similar. For examples, both point and spatula present in Pulau Balambangan, Niah and also Lobang Batu Puteh sites are present. The technology is charaterised by point form and it certainly seems plausible that bone was used for different purposes under different behavior circumstances (Rabett, 1999:11). The variety of artifacts of bone indicates a complex and sophisticated lifestyle. For examples, they made new tools including projectile tips, which evidently enhanced their capacity to hunt monkey with increased ease (Cranbrook, 2000:89).

Faunal Tools Analysis

Excavation and lab analyses exposed a total of 29 faunal tools including shell tool (44.8%), bone tool (31.0%), carapace tool (10.4%) and tooth tool (13.8%). The classifications of tools are based on used wear, morphology and comparison through reference sources.

Shell Tool

Identification analysis revealed that 13 (14.88%) shell tools are made of shell from class bivalve (Batissa violacea sp.). The shell of four (0.85%) shell tools still in complete form (Fig.1.a) whereas others (69.2%) has been found in pieces form (Fig. 1b-d). Although in the form of pieces but used wear appeared on the side of the shells still visible.

Shell tool analysis had identified four types of used wear with combination of serrated and notched, serrated, denticulate and miscellaneous. Used wear classification of shell tools is based on edge morphology found on the side of the shells. Observation also showed that the position of edge wear is most suitable to use due to its sharpness and firm holding position. Analysis also showed that there is only three shattered bivalve shell tools that possessed serrated edge wear (Fig. 1c).

Other than that, haematite has been found inside bivalve shell and the present of gloss edge used wear. Bivalve shell tool edge was almost put to maximum usage based on its 6.4cm diameter and 6.4cm used wear measurement (Table 2). This showed that the shell tool edge has been fully utilized for certain work such as scraping, cutting or slicing.

Other than that, the denticulation shape type used wear also had been found on the side of shell tools (Fig. 1d). But only one shell tool, which is shattered, possessed this wear. Used wear analysis showed that the edge had been put to maximum usage based on its 6.4cm diameter and 5.9cm used wear (Table 2). Moreover, the used edge also possessed polished mark and haematite stain on the outer shell. This showed that the shell tool is multi-functional and probably used to crush haematite.

Shell tools used wear also possessed combination of serrated and notched characteristic. However, only two of this used wears type shell tools were found.

Table 2: Distribution and classifications of shell tools from Lobang Batu Puteh

No.	Trench	Spit	Intertwine Measure (cm)		Usewear Type
			Lenght	Usewear Lenght	
1	A1	5	6.3	3.9	Serrated
2	A2	4	4.9	3.0	Serrated
3	B3	3	17.6	9.1	Serrated + Notched
4		3	6.4	5.9	Denticulate
5		4	7.8	7.8	Serrated + Nocthed
6		4	17.4	-	Miscellaneous
7		4	23.5	8.5	Serrated + Misc.
8		8	6.4	6.2	Serrated
9	C2	3	11.7	-	Miscellaneous
10		3	2.9	-	Miscellaneous
11		4	1.8	-	Miscellaneous
12		5	21.0	11.7	Serrated + Misc.
13	E1	6	3.1	-	Miscellaneous

The tool probably had been used for cutting (serrated edge wear) and scraping or whittling (notched edge wear) (Bellwood, 1988: 140). Side usage of the shell produced half-moon breakages used wear. (Fig 1b). The formation of used wears was probably caused by repeated usage on hard materials such as wood, bamboo or rattan.

Other than that, five shell tools have been classified as miscellaneous shell tool. This classification is based on haematite stain and scratch mark or grind mark found inside the shell (Plate 1a-b). The used wear indicated that the tool functioned as platform or bowl to crush and store haematite. Therefore, scratch mark or grind mark were present inside the shell covered with haematite. Besides possessed haematite stain and scratch mark, the side of one of these tools showed notched used wear (Plate 1b), which indicated the shell tools are multi-functional.

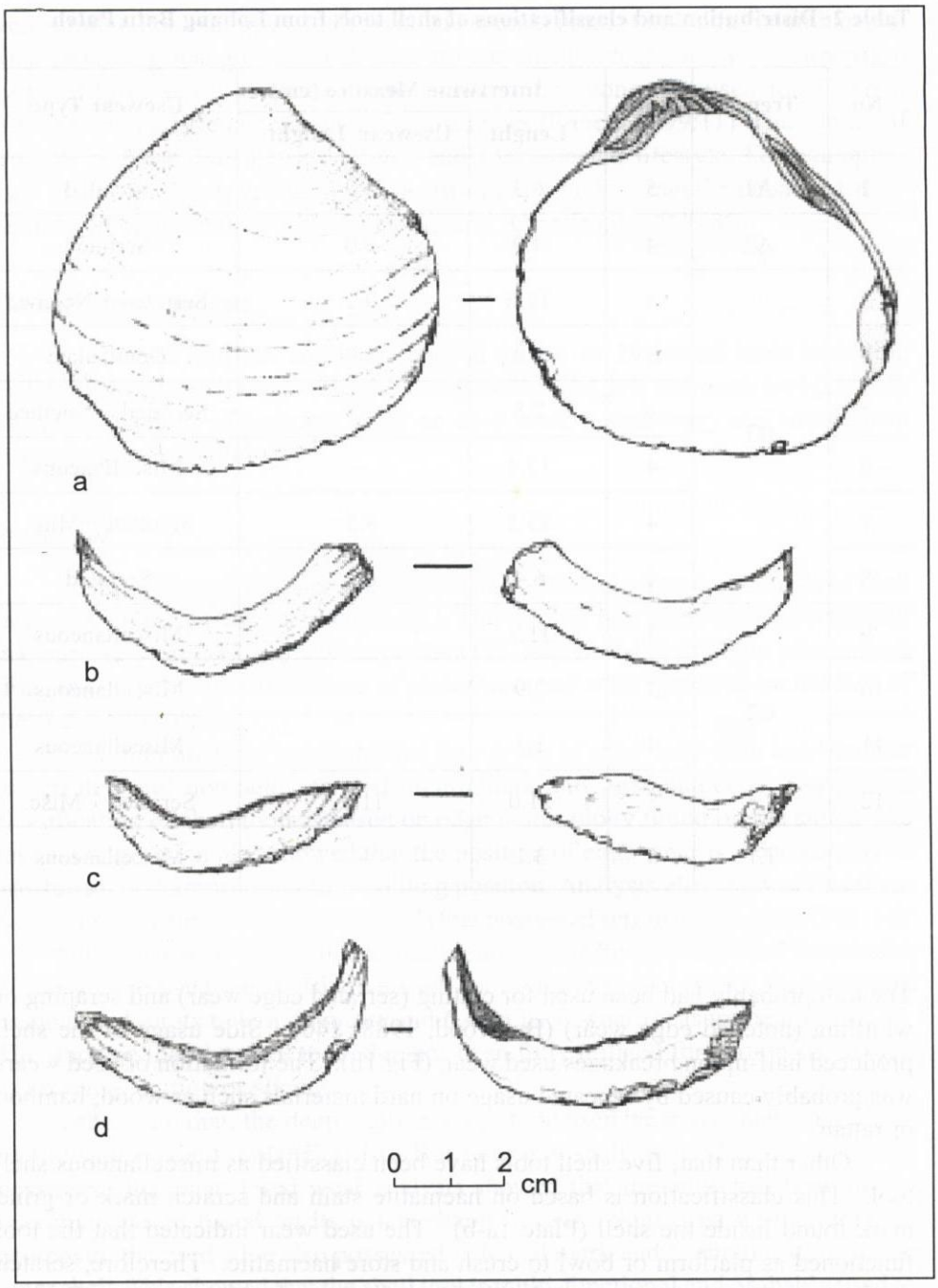

Figure 1a-d: Bivalve Shell tools

Bone Tools

A total of nine bone tools and three carapace tools were found in excavation trench of Lobang Batu Puteh. Three types of bone tools have been categorised through morphology analysis – spatula bone tool, pointed bone tools and carapace tools. Besides that, a total of four primate canine tooth with human manipulation mark have been found and categorized as tooth tool.

Spatula Bone Tools

A total two spatula bone tools were found and one of these tools were made of the rib bone of big size Artiodactyla order mammal and small size bone (Fig. 2a-b). Based on Table 3, the biggest spatula tool is 4.7cm long, 1.88cm wide, 0.78cm thick and weight 5.0gram. Observation suggested that the measurement of this tool was probably longer than present measurement because of the appearance of broken mark at the end of the tool, which is on the opposite side of the spatula edge (Fig. 2b). The suitability of holding position also suggested that the present measurement is not suitable because of its shortness.

Table 3: Distribution and classifications of bone tools, carapace and tooth tools

No.	Trench	Spit	3 Dimensions Measure (cm)			Weight (gm)	Tool Types
			Lenght	Width	Thickness		
1	A3	4	2.29	0.7	0.3	0.6	Pointed
2		0.5	0.22	0.4	Pointed		
3			4.41	0.65	0.32	0.6	Pointed
4	B1	2	3.2	1.1	0.7	2.8	Tooth
5			3.1	1.1	0.7	1.7	
6		4	2.04	0.7	0.21	0.3	Spatula
7	B2	1	3.99	1.15	0.7	2.6	Tooth
8	B3	1	1.5	5.1	0.3	1.4	Carapace
9	C2	4	3.32	1.6	0.7	2.6	Pointed
10	C3	2	3.9	1.2	0.6	2.2	Tooth
11	E1	6	4.79	0.7	0.22	1.1	Pointed
12			3.6	2.5	0.23	1.8	Carapace
13			2.3	1.4	0.2	0.5	Carapace
14		8	5.27	0.99	1.7	0.5	Pointed
15	E2	5	4.7	1.88	0.78	5.0	Spatula
16		6	3.79	0.93	0.65	1.3	Pointed

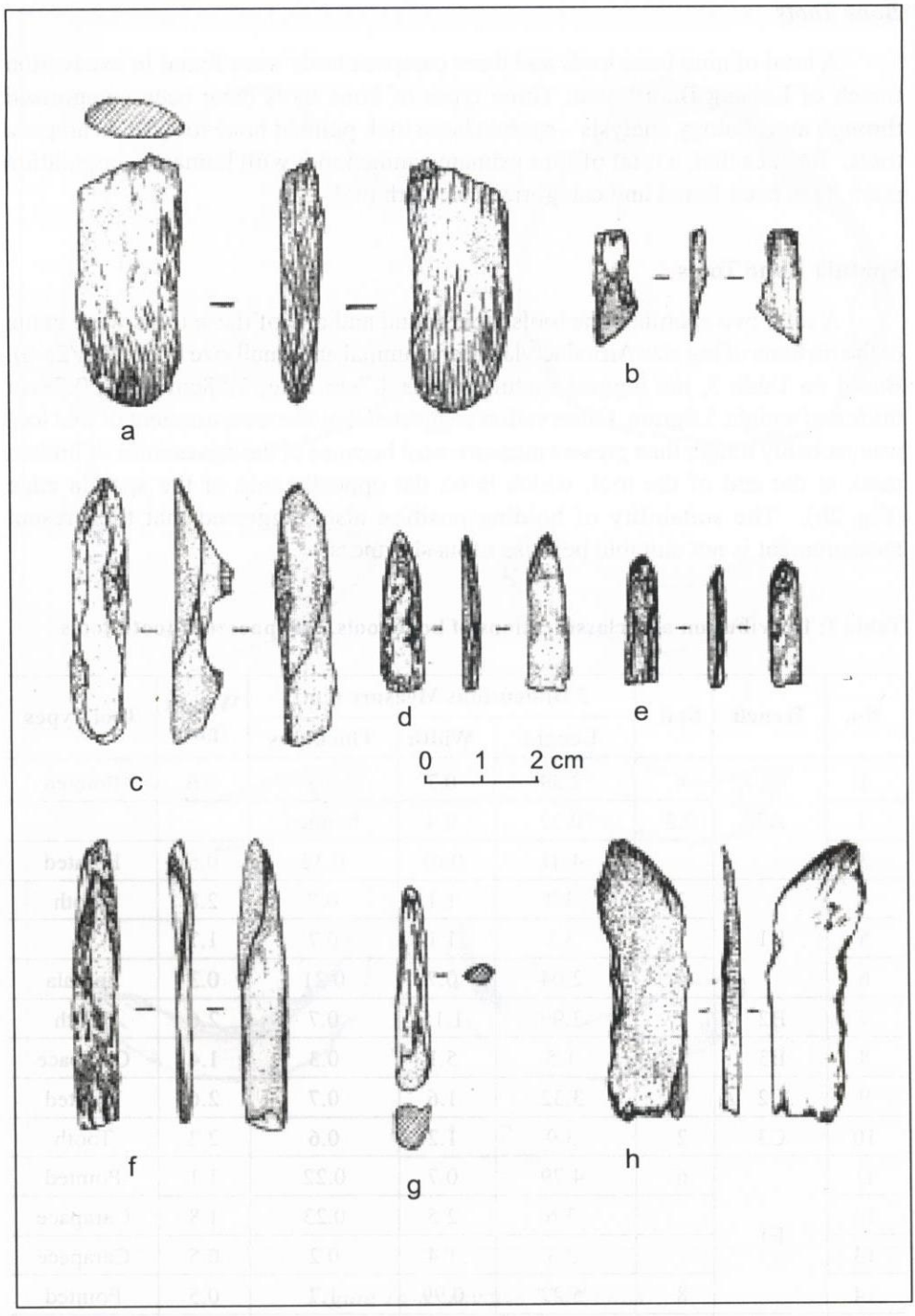

Figure 2: a-b. Spatula, c-g. Pointed and h. Carapace

These two tools have used wear at the edge end. Big size spatula tool possessed scratch marks at edge end (Fig. 2a). Besides that, this tool had charred mark and haematite and even polish mark on its ventral part, which produced smooth and fine surface. Small size spatula tool possessed gloss mark at its edge end (Fig. 2b). Even the ventral part showed charred and polished mark.

Pointed Bone Tool

Pointed bone tools are the dominant (58.3%) finding, from the overall 12 bone tools found. This type of bone tool has "V" or "U" shape sharp edge or tip and flat dorsal part (Fig. 2c-g). One of the tools has sharp edge and round shape (Fig. 2g). Length measurement of pointed tool is between 2.29cm (minimum) and 5.27cm (maximum) and average length 3.83cm (Table 3). The average overall width of pointed bone tool is 0.86cm while minimum width 0.5cm and maximum width 0.99cm. Weight of pointed bone tool is between 0.4 grams (minimum) and 2.6 grams (maximum) and overall average 1.01 gram. Observation showed that pointed bone tool with length measurement less than 3.0cm is probably a broken bone tool caused by usage. This is indicated by snapped mark at end part and length not suitable to hold.

Charred mark and polished mark on majority of the pointed bone tools revealed that the tools went through a burning and polishing process until a smooth surface was produced. Analysis under microscope with low magnification (10x and 20x) revealed that there is gloss mark on the pointed edge of the tool. Gloss mark probably produced by the tool's function to drill or pick.

Carapace Tool

Three carapace tools were discovered in excavation trench and have been classified as tool because of used wear and were made from turtle carapace (order Chelonian). The average dimension measurement is 2.4cm length, 3.0cm width, 0.24 thick and 1.2 grams weight (Table 3). The majority carapace tools discovered possessed grinding mark on both side of the surface. The surface, which has been grinded, appeared smooth, flat and covered by haematite (Plate 2). One of the carapace tools showed sharp edge and serrated edge wear (Fig 2h). Microanalysis revealed gloss mark on the its edge. This tool is also suitable for holding based on its edge position.

Tooth Tool

Prehistoric people of Lobang Batu Puteh exploited primate canine tooth as tools for certain purposes. A total of four primate canine teeth from Macaca sp. species showed manipulation mark by human. Macro and micro analysis revealed

flat grinding mark on the tools enamel or crown canine (Plate 3a-b). Besides that, gloss mark also appeared on the grinded part and possessed striations lines. These striation lines probably have been formed during grinding activity. Comparison analysis with Macaca sp. canine teeth revealed that canine tooth tool characteristic not appear on monkey canine tooth (Plate 3c). The average dimension measurement is 3.45cm length, 1.13cm width, 0.67cm thick and 2.32 grams weight (Table 3).

Vertical Distribution of Faunal Tool

Based on Table 4, bivalve shell tools have been used during the early phase occupation around 860±50 BP and showed continuous usage until late phase occupation (420±50 BP). Usage of shell tools also increased and indicated that the shell tools were first discovered in the fifth cultural layer (80cm-90cm depth) and the finding is continuous to second cultural layer (30cm-40cm depth).

Finding of bone tools showed differences based on tools, example pointed bone tools were made during early phase occupation around 860±50 BP and continue until middle phase occupation (490±50 BP) while carapace tool were made continuously until late phase occupation (420±50 BP). However, carapace tools are not produce during middle phase occupation but spatula tools were produced. Spatula tools found were concentrated between 30cm to 50cm depth but only two spatula tools were found.

Table 4: Vertical analysis of faunal tools from Lobang Batu Puteh

Spit (cm)	Faunal Tools				Total	%
	Shell	Bone	Carapace	Tooth		
1(0 - 10)			1	1	2	6.95
2(10 - 20)				3	3	10.3
3(20 - 30)	4				4	13.8
4(30 - 40)	5	5			10	34.5
5(40 - 50)	2	1			3	10.3
6(50 - 60)	1	2	2		5	17.2
7(60 - 70)					-	-
8(70 - 80)	1	1			2	6.95
9(70 - 90)					-	-
Total	13	9	3	4	29	100
Percent	44.8	31	10.4	13.8	100	

Beside that, faunal tool from primate tooth have been discovered in depth 10cm to 20cm. Based on radiocarbon dating, the cultural layer is dated 420±50 BP which indicated late phase occupation cultural. Overall, prehistoric people of Lobang Batu Puteh produced difference types of faunal tools continuously with times chronology from the early phase occupation (860±50 BP) until late phase occupation (420±50 BP).

Technology and Faunal Tool Function

Prehistoric inhabitants of Lobang Batu Puteh exploited faunal remains to made tools. Among the faunal remains used to make tools are bivalve shell remains, animal bones, soft shell turtle carapace and canine tooth. A total of 13 shell tools discovered are bivalve type shell – sepsis Batissa violacea or local name - lokan. Morphology analysis showed that there is no change to the shell physical aspect. This situation indicated that bivalve shells had been collected and used directly until used wear were present on the edges. The edges of the shells were chosen due to its natural sharpness. Due to this factor, bivalve type shells can be used directly as tool (Harrisson, 1972:398).

Different shapes of used wear on the side of the shells indicated that they were multi function. (Bellwood 1989:151). Based on morphology shape, it is suggested that shell tools probably suitable for scrapping and slicing. Based on the findings at Niah, Sarawak and Jawa, Indonesia, Harrisson (1972:398) suggested that shell tools were suitable to use as scrapping tool. Besides that, shell tools in Lobang Batu Puteh probably have been used for whittling based on the notched used wear. Shell tools found in Gua Keplek, East Jawa also indicated that the tools were used as whittling tools. (Simanjuntak and Asikin, 2004:16). According to Fox (1970:140-146), bivalve shell tools also functioned as tools to collect fruits. Beside that, the tools were used as spoon to prepare food because of their suitable morphology (Tsang, 1992:140).

Bivalve shell tool also probably were used as containers for storing crushed haematite based on haematite stain found inside bivalve shells. Moreover, it is suggested that the tools have been used as container to crush or grind haematite based on the findings of scratch marks or grind mark inside the shells. Observation showed that the morphology of bivalve shells is suitable to use as tray and storage container due to the bowl-like curve shape and the present of lid.

Besides that, the majority of bone tools found were made from big and small size animal bones. A survey conducted at Philippines also indicated that medium size and small size animal bones remains were used dominantly (Bautista, 1991: 52). Among the preferred bone parts are long bones such as humerus, femur and tibia. The findings of bone tools at cave site in Jawa, Indonesia also showed the characteristic usage of the animal bones (Soejono, 1975:143). Besides that, rib

bones also have been used to produce bone tools such as spatula tools at Lobang Batu Puteh site. Spatula bone tools from Lobang Batu Puteh probably have been firstly polished based on the smooth and fine surface. Rabett (2004:132) suggested that polished mark would present due to the tools function or usage.

Pointed bone tools found at Lobang Batu Puteh site were made from medium and small size long animal bones. Research conducted in Philippines showed that medium and small size animal bones remains were used dominantly (Bautista, 1991:52). Long bones were broke using hammerstone on anvil to get long split and small fragment shape. Based on the fragments, long bones probably have been split into two parts (Jeffrie, 2000:257; Medway, 1996:191; Simanjuntak, 1981). This is based on the findings of most of the bones tools were from split bone part. At the same time, prehistoric inhabitants probably collected bone marrow from suitable bone fragments (Harrisson and Medway, 1962:336). Split lengthwise bone fragments revealed that the community possessed advance skill to modified suitable bones probably by controlled hammering. Suitable split bone fragments would be sharpened on both sides of the edge end or tip (Medway, 1966:191; Soejono, 1975:143; Simanjuntak, 1981:2-5). The grinding or sharpening technique would be used to produce pointed and sharp edge end. The tools will be softened through burning or grilling on fire surface to ease the sharpening of the bones. Therefore, most bone tools found possessed charred mark on pointed edge end.

Bone tools making experiment revealed that pointed bone tools edge in research site are easy to make by grinding split bone fragments on the surface of coarse anvil or slab such as sandstone or limestone. The grinding process produced striation lines on the pointed bone tools surface (Plate 4d). Striation lines characteristic was also present at research site (Fig. 2c-f; Plate 4a-c). Therefore, it is suggested that prehistoric people of Lobang Batu Puteh used grinding or sharpening technique to produce pointed bone tools. Besides that, small size sandstone slab were also discovered at the site probably have been used to grinding or sharpen bone tools. Besides being sharpen, the pointed tools also probably have been polished based on the smooth and fine surface (Medway, 1996:191). Microscope (10 x 10 magnifications) analysis revealed clear gloss mark on the tools pointed edge probably caused by repeated function and usage (Rabett, 2004:132).

The morphology of the bone tools discovered at site showed different functions. Spatula tools produced using big size animal bones probably suitable for scraping animal skin fat or tuber (Rabett, 2005:155). Other than that, these tools can remove bark and bucket construction (Ibib: 166). Spatula tools produced probably used to dig tapioca, yam or rooted plants (Pookarjon, 1996:12). The edge end used wear clearly indicated that the tools are suitable for digging rooted plants. Based on experiment conducted by Rabett (2005:162), spatula tools also can be used to wood chisel but will snap when used. However, spatula tools at research site were not used to wood chisel due to the tools bluntness. Despite that, the

spatula tools found were broke probably when used. Small size and possessed sharp edged spatula bone tools probably have been used to slice. Its repeated usage is one of the factors, which caused gloss mark on its edge end. Pointed bone tools produced at site probably were used to piercing or punch hole on animal skin based on the sharp or pointed edge end morphology. Bautista (1991:56) also suggested that pointed bone tools not just used to punch hole on animal skin but also suitable for wood and mat.

Besides that, these tools can also be used to pick shell meat (Adi and Zulkifli, 1990:119). According to Meehan (1982: 109-110), cooked mangrove shell meat whether burnt or boiled were picked using sharp tool. Therefore, it is suggested that one of the pointed bone tools functions is to pick shell meat especially gastropod type shell. Research conducted by Meehan (1982:87) also revealed that bivalve shell meat have to be picked using pick tool. The finding association of shell remains and pointed bone tools further supported the function of the tools.

Pointed bone tools probably have been used as hunting weapon to hunt small size animals by fasten the bone tool to the end of the wood to form spear or arrow (Rabett, 1999:12). Ethnography by Rabett (2005:171), showed that aborigine community in Adaman Island, Australia use pointed bone tools to spear and hooking fishes while this tool were used to kill birds and animals terrestrial at North America. Findings of pointed bone tools at Gua Niah are related to monkey hunting activity based on finding of large amount of monkey bone. Moreover, majority of the pointed bone tools were made from long bones belongs to monkey (Cranbrook, 2002:80-89). Pointed bone tools at research site also associate with food remains, which showed that the tools were used for animal hunting and fish spearing.

It was difficult to determine the exact function of carapace tools based on small quantity of findings. Therefore, morphology and used wear are the important factor to determine the tools function among prehistoric people Lobang Batu Puteh. Carapace tools were made from soft shell turtle carapace (Chelonians). One of the tools showed gloss mark and grinding mark on both sides of its surface. This tool probably had been grinded on a coarse stone surface to produce flat surface. This grinding mark would present if the tool were used as a platform to grind haematite based on haematite stain found on carapace tools, which possessed sharpening mark or grinding mark. Besides that, carapace tools with sharp edge and gloss mark were found. Based on its morphology, these tools are suitable to slice meat and scrapped fat on animal skin. Carapace tools made from sub dermal bone of chelonians, which underlies and is distinct from the carapace were found in a research conducted by Harrisson and Medway (1962:350) at Gua Niah (West Mouth).

Tooth tools found were made from primate (Macaca sp.) canine tooth. The tools morphology didn't show any changes in tooth physical. This indicated that the crown of primate canine tooth had been utilized continuously. Based on the shape of the used wear found on the crown primate canine tooth, it is suggested

that grinding mark (striation lines) probably present due to its function. Comparison through analysis on tusk tool by Rabett (2004:132-133) revealed that the marks were produced due to usage. Therefore, striation lines (grinding marks) on the crown of the tools canine is due to its function. Gloss mark was also found on that part. The present of gloss mark is caused by repeated usage (Rabett, 2004:132). Observation showed that tooth tool had been used repeatedly on hard material. Striation lines mark and gloss mark on the canine crown is caused by strong and repeated pressure. The combination of used wear position and holding position showed that the tools are suitable for scrapping and whittling hard materials such as wood, bamboo and rattan. The sharp tooth tip is suitable to pierce hole. For example, tusk tool were used to scrap, whit and flatten wood surface (Rabett, 2004: 134-135). Other than that, canine tooth tools found at Gua Niah were used to pierce small hole and as ornament tools (necklace) (Harrission and Medway, 1962:334; Medway, 1996:193).

Conclusion

Prehistoric people of Lobang Batu Puteh possessed high thinking skill and logic in their daily life. The variety of artifacts of bones indicates a complex and sophisticated lifestyle. Exploitation of food remains such as shell, bones, tooth and carapace as tools to store haematite and tools to scrap, whit and cut. Big and small size animal long bones have been broke to make spatula tools while pointed bone tools were made from medium and small size animal long bones. Morphology analysis indicated that long bones has been modified by split technique and then being grinded and polished. This activity clearly showed that the community of Lobang Batu Puteh possessed high manufacturing technology skill in pointed and spatula tools. They also can be referred as possessed "mental template" especially in choosing the right materials to make certain tools because only humerus, femur, tibia and rib bone parts have been selected to modify as pointed and spatula tools. Therefore, manufacturing technology faunal tools at Lobang Batu Puteh can be categorized as "Pilih" technique. This technique described the research site prehistoric people behavior from early tools making phase to the usage of the tools made. The faunal tools produced can be function as tools or alternative weapons needed in their daily life besides lithic tools. The alternative tools produced also influenced by fragmentation of faunal remains is consistent, the "raw material" for making faunal tool were readily available. Therefore, this indicated that the findings of faunal tools were able to describe the faunal remains exploitation as tools, which assisted in certain work. The present of various faunal tools indicated the development of alternative tools manufacturing technology.

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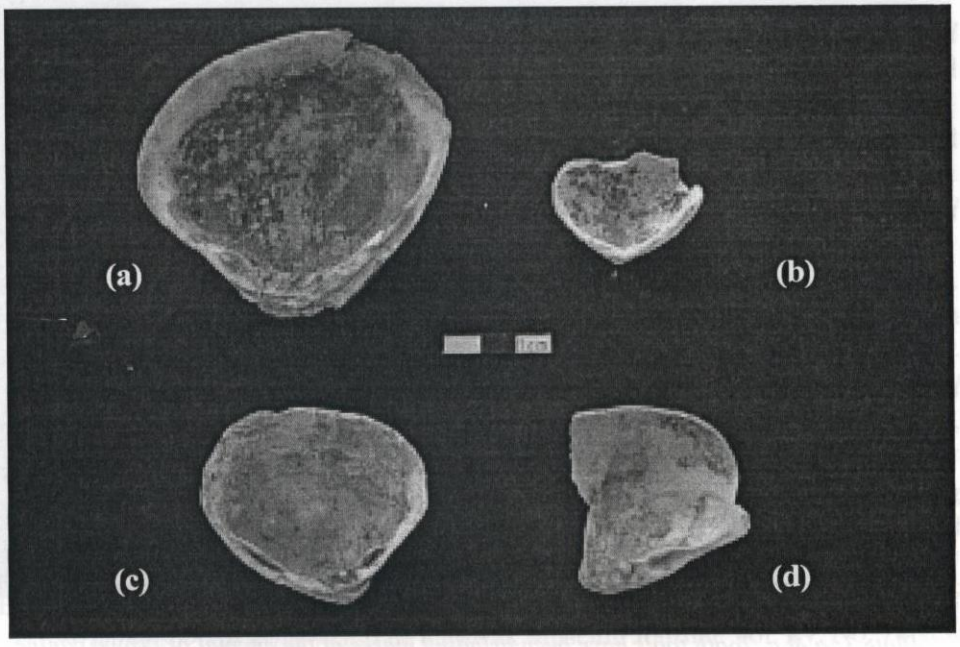

Plate 1: Shell tools with haematite stains.

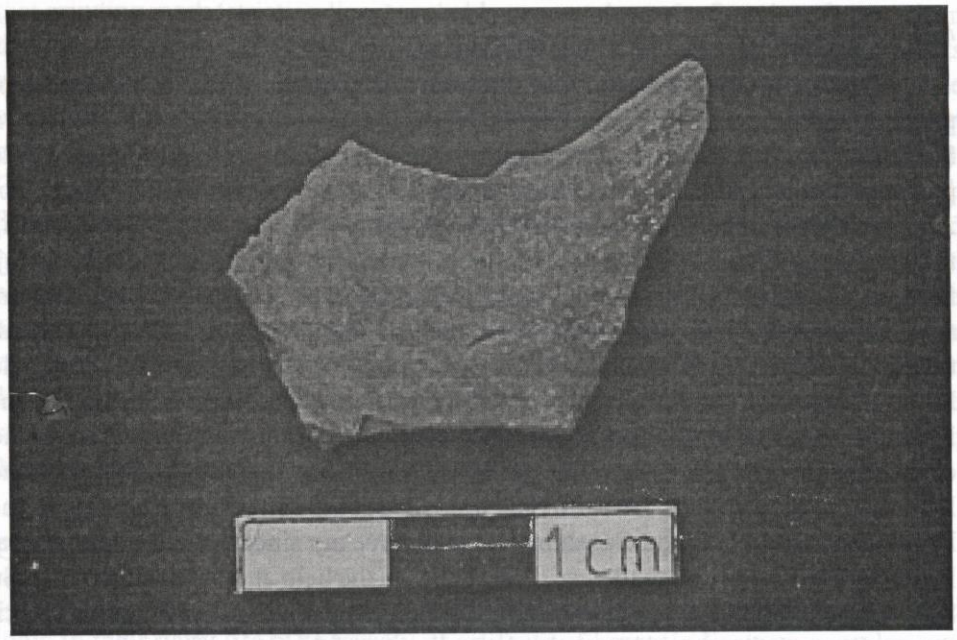

Plate 2: Carapace tools discovered possessed grinding mark on both side of the surface and covered with haemtite stain.

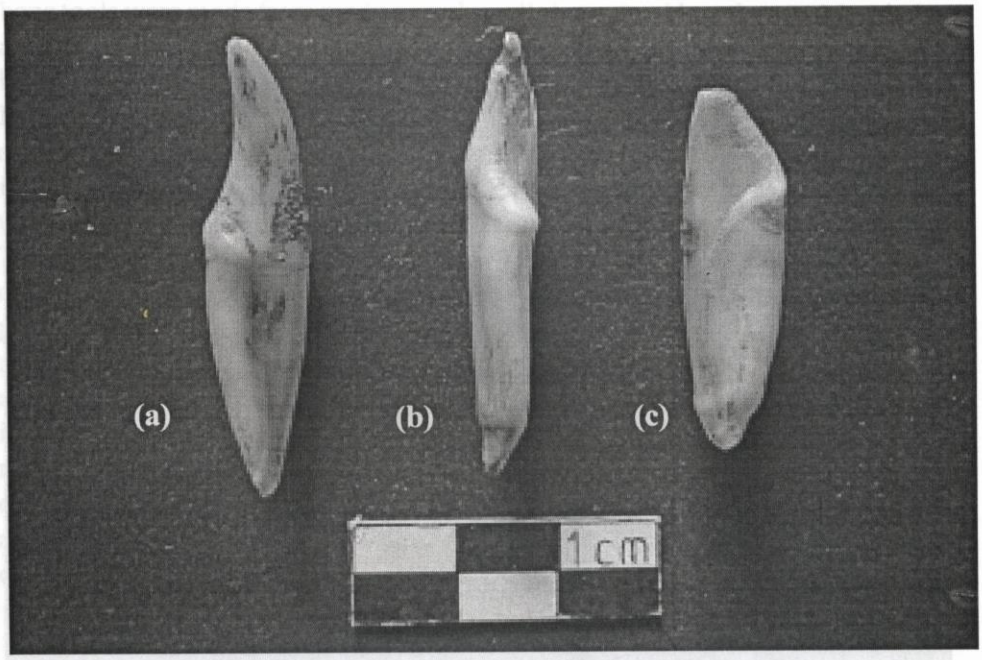

Plate 3: a & c. Tooth tools have been grindind marks at the enemal or crown canine b. Sample of Macaca sp. *canine.*

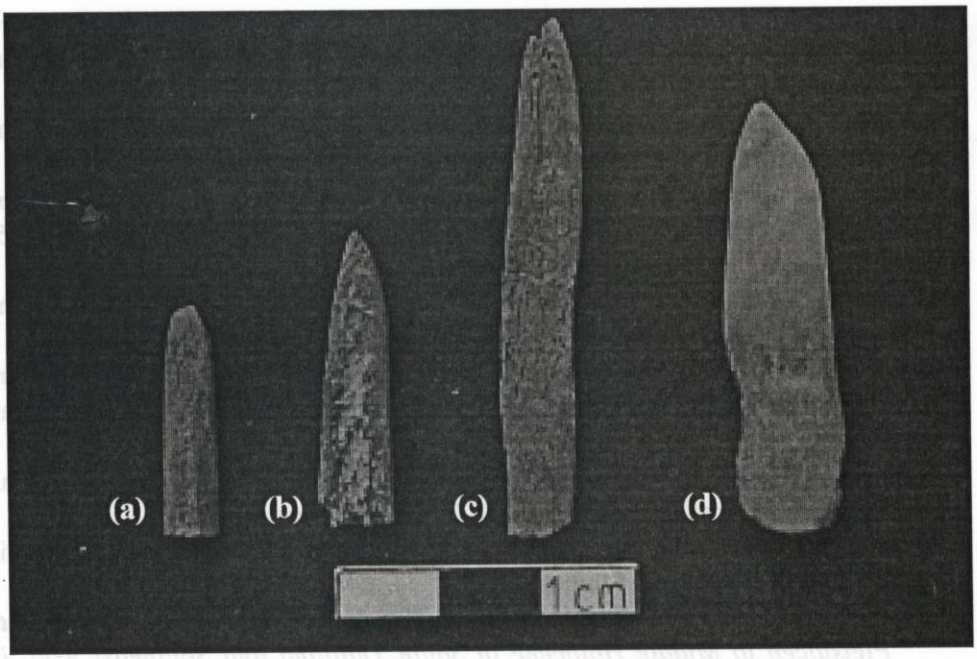

Plate 4: a-c. Pointed bone tools & d. Experiments bone tool for comparison.

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