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Tracing the Palaeolithic Footprints in Western Orissa: Insights and Discoveries

[*1]Neena Thakur

[*1]Assistant Professor, Department of History, Sambalpur University, Odisha, India.

Abstract

As far as the Prehistoric discoveries in the country are concerned, Orissa is an upcoming promising region. Numerous scholars have played a vital role in bringing out prehistoric cultures in different areas of the state. Their relentless endeavours have helped to attract many new scholars from all over the country. The sites and artefacts are reported by scholars yet there is a dearth of detailed and systematic metrical data. Nevertheless an attempt has been made by the researcher to understand the basic fabric of Orissan Prehistory. This paper presents a synthesis of our published research papers and thesis concerning the earliest human culture i.e.; the Acheulian Facies of Lower Palaeolithic age in the state. The works of all regions of Orissa has been revisited for the present study.

Keywords: Acheulian, Kombewa, Levallois, Mousterian.

Introduction

This paper deals with the prehistoric sites discovered across the state Odisha (formerly Orissa), a land of rich cultural heritage and natural beauty, also holds a significant place in prehistoric archaeology. Beneath its lush landscapes and rugged terrains lies a fascinating chronicle of human evolution, dating back to the Pleistocene era. This article explores the archaeological sites, tools, and evidence that trace the footprints of early human inhabitants in Odisha, shedding light on their survival, adaptation, cognitive ability and incipient group activities.

By examining these antiquities, we uncover insights into the life of early humans their use of stone tools, interaction with the environment, and gradual progression towards a more structured society. Odisha's diverse geographical features, ranging from the Eastern Ghats to river valleys like the Mahanadi, provided a fertile ground for prehistoric settlements. This study not only contributes to the broader narrative of human evolution in India but also emphasizes the region's critical role in shaping the subcontinent's pre historic era. The researcher delves into the intriguing world of Odisha's Palaeolithic past, piecing together the evidence left behind by our distant ancestors. The paper attempts to bring together all earlier works done by various scholars

The Geology and Environmental Settings

Extending over an area of nearly 1, 55, 842 Sq.km, the state of Odisha lies along the east coast of India within latitudes 17°48' to 22°34' North and longitude 81°24' to 87° 29' East with a sprawling 480 km coastline against the Bay of Bengal to the east. It is bounded by the states of Jharkhand, Andhra Pradesh, Chhattisgarh and West Bengal to the north, south, west, and northeast, respectively. The state comprises dominantly Precambrian rocks (73%) ranging in age from Mesoarchean to Neoproterozoic. Phanerozoic rocks, represented by the Gondwana Supergroup (Late Palaeozoic-Middle/Late Mesozoic) and minor Tertiary patches, constitute about 8% of the state. The remaining 19% of the state is covered by Quaternary formations (Senapati and Mahanti 1971) [48]. The state is drained by major river systems, viz. the Mahanadi, the Brahmani, the Baitarani, the Burhabalang, etc. Geographically, it comprises three natural divisions, viz., Highlands, Coastal plains and Dandakaranya (Singh 2004).

Environmental factors have often been given due consideration since the early stage of our archaeological studies. Mention may be made of the pioneering works of F.J. Richards (1933: 235-243), Aurel Stein (c.f. Deva 1982: 387-393) and B. Subbarao (1958) in the Indian subcontinent. It is a well-known fact that cultural systems are adaptive systems, hence to understand their operation and the processes of their modifications, one must be in a position to define their adaptive milieu (Binford 1972: 148). Thus, in this section, a brief sketch of the present environment, Geology and Minerals have been discussed.The state is bounteously blessed with large reserves of bauxite, china clay, chromite, coal, dolomite, fire clay, graphite, gemstones, iron ore, limestone, manganese ore, mineral sand, nickel ore, pyrophyllite and quartz. Dharambandha area of Nuapada district has diamond mine. The Archaean rocks in northern Odisha include the Supracrustal belts of metasedimentary

*Corresponding Author: Neena Thakur

rocks including Iron Ore super Group having deposits of iron, manganese, gold and base metals. Red soil has highest coverage of all soil groups of the state. Presence of excess amounts of oxides of iron imparts red colours to the soil. The soils are strongly to moderately acidic with low to medium organic matter status and poor water retentive capacity. These soils are deficient in nitrogen and phosphorus. Mixed red and Yellow Soil occupy most of the district followed by red soil. The soils are moderately shallow in depth and coarse-textured. The upland soils are moderately acidic whereas, low land soils are slightly acidic. There is no regular occurrence of black soils in the state. These soils occur sporadically found in a few districts. The colour of the soil is black due to presence of titaniferous, magnetite, bitumens etc. Lateritic soil is characterized by compact vesicular structure. It is rich in oxides of iron and aluminium with small amounts of manganese, titanium and quartz. These soils are loamy sand to sandy loam in the surface having hard clay pan in the subsoil. These soils are poorly fertile with low organic matter. Deltaic alluvial soil covers the deltaic regions of the rivers such as Mahanadi, Brahamani, Baitarani, Subarnarekha and Rushikullya. Texture of the soil varies from coarse sand to clay and is mostly dependent on geomorphology of the flood plain and the type of alluvial material carried by river water. Brown Forest soils are being associated with forest areas. These soils are brown to gray brown in colour, light texture and acidic in reaction. Organic matter and nitrogen content of the soils are medium to high.

Prehistoric Researchers in Orissa

The Odisha have been identified as the potential habitat of prehistoric communities since the nineteenth century, not many concerted efforts leading to intensive prehistoric investigations have been carried out in the state. Compared to the Protohistoric and Early Historic periods, very little attention has been paid towards studies on the prehistoric cultures in the state. A thorough study of previous Prehistoric research in the state revealed that it has a great potential of yielding prehistoric culture. The last century witnessed many foreign and Indian Scholars contributing to this field.

For the first time, V. Ball in 1876 discovered a few Paleolithic in Dhenkanal, Kaliakata in Angul District, Harichandanpur, Talcher and Bursapali in Sambalpur District of Orissa. After a half-century, Acharya in 1923-24 reported a few neoliths from Baidipur in Mayurbhanj and later Banerjee in 1930 visited the site of Baidipur (Lat.20°46'22" Long. 86°41'22"), Khiching (Lat. 21°55'N, Long. 85°50' E.) and a locality on the Manda-Jashipur road and published his report with details of the implements in History of Orissa (Sahu *et al* 2017).

In late thirties of the last century, a good number of Acheulian sites were reported from different areas of Odisha. The sites bearing lithic artefacts belonging to Acheulian culture were found in various contexts. (Bose and Sen 1948, Bose *et al* 1956:49-55, Mohapatra 1962 [35], 1979:183-186, Tripathy 1973: 47-59 and 1980, Singh 1985 [57], 1988: 87-99, Ratha and Bhattacharya 1988: 23-28, Chakrabarti 1990: 13-21, Acharya and Basu 1993: 10-19, Sharma 1994 [51]: 285-90, Behera *et al* 1996 [4]: 15-26, Ray *et al* 1997 [46]: 33-34 and many others. Refer the Table given in the end).

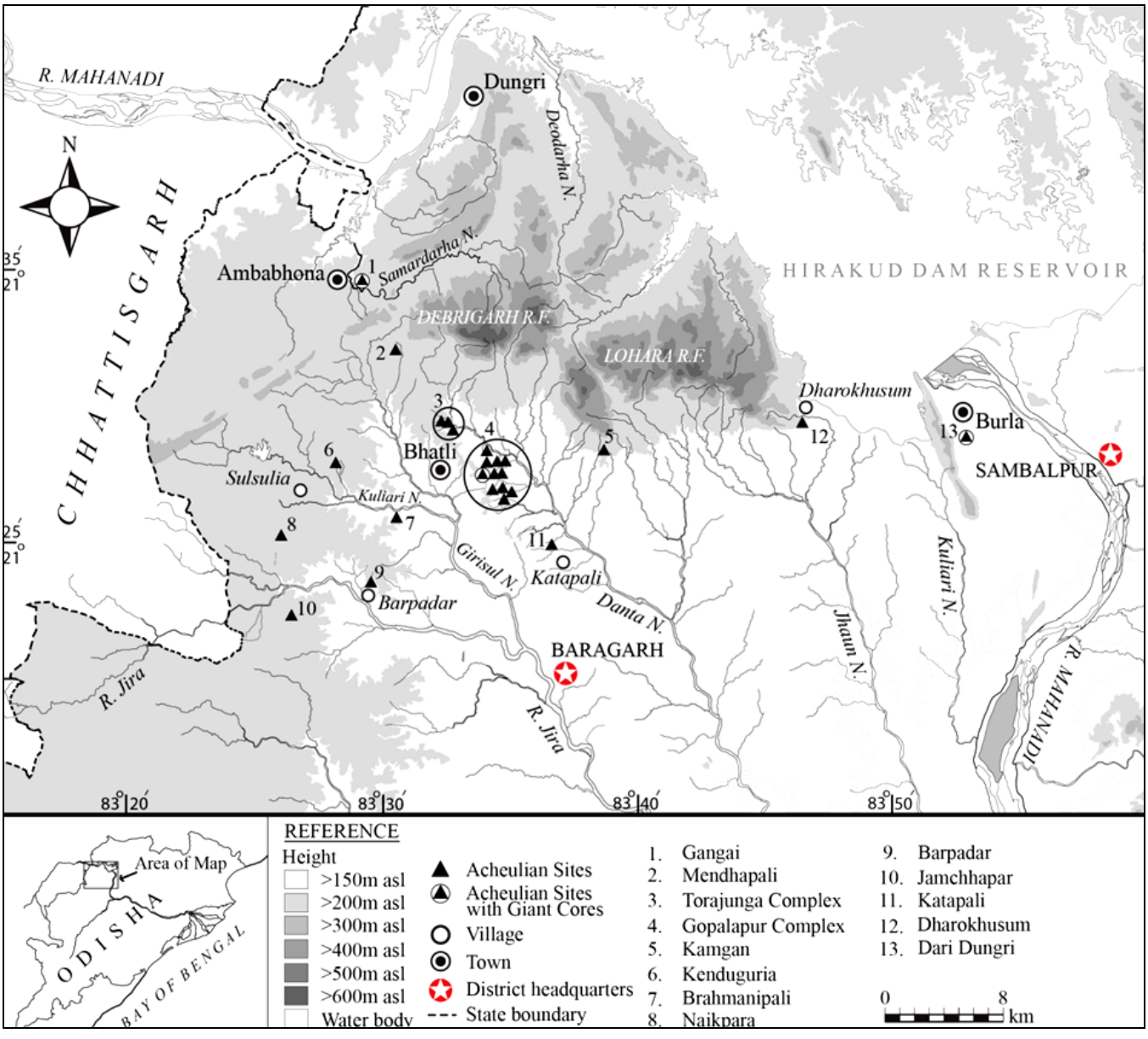
Most of the Orissan sites are open-air sites in semi-primary contexts and found in alluvial, colluvial and sometimes alluvial-colluvial contexts. Besides, the hilly areas i.e.; the piedmont area, hilltops and hill slopes, ephemeral streams, perennial rivers with their tributaries and sub tributaries are considered significant to understand the site distribution, landscape behaviour of the hominin, land-human relationship, the environment at the time of deposition as well as the post-depositional processes (Binford 1982: 5-31, Schiffer 1983: 675-706, Schiffer 1987, Nash & Petraglia 1987, Goldenberg *et al* 1993, Paddayya & Petraglia 1995: 333-351, Jhaldiyal 1998) [7, 55, 37, 28].

Table 1: Researchers and their findings

Researcher	Year	Area Surveyed	Findings	River/Hill Range
V. Ball*	1876	Dhenkanal, Angul & Sambalpur	A few Paleolithic	
Acharya*	1923-24	Baripada in Mayurbhanj	Neolithic	Budhabalanga
Banerjee*	1930	Baidipur, Khiching, Manda Jashipur	Paleolithic implements	Do
Acharya & Worman*	1939	Kuliana & others, Baripada in Mayurbhanj	Paleolithic implements	Do
Bose & Sen*	1948	Kuliana & others	Paleolithic implements	Do
Bose *et al**	1956	Kuliana & other sites	do	Do
Mohapatra*	1957	Cultures from M Pleistocene onwards	L Palaeo, M. Palaeo, Microliths	Brahamani, Baitarani, Budhabalanga, Kherki
Ray *et al**	1995	Jamara in Dhenkanal	Acheulian & M Palaeolithic	
Mohanta *et al**	1997-99	Manda in Mayurbhaj	Lower Palaeolithic artefacts	
Sharma*	1994	Burla & Hirakud	Lower Palaeolithic artefacts	Mahanadi
Bhattacharya*	1999	Balasore-Bangriposi	Lower Palaeolithic artefacts	Re-explored V.Ball sites
Khiler*	1992	Parjung in Dhenkanal	Lower Palaeolithic artefacts	Brahmani R. V.
Tripathi*	1972, 1973, 1980		L. Palaeo, M Palaeo & Mesolithic	Tel, Jira, Ong R.Valleys
Singh	1982, 1985, 1988. 2000	Dhenkanal	L Palaeo, Mesolithic & Neolithic	
Mohanty *et al**	1997	Jashipur in Baripada	L Palaeolithic	A small stream near Khairi Project
Rath & Bhattacharya*	1988	Kuchinda in Sambalpur	L Palaeolithic	Mahanadi

Prushty*	1992, 1996	Dharmagarh in Kalahandi	Lower Palaeolithic & Mesolithic	Moter & Bahera R. Basin
Dehuri*	2013	N.C.Odisha at Barika guda	Paleolithic implements	
Kar*	2008	Simulipather R F. & Kanha R F-Bursadanger	Paleolithic implements	Singida R V
Ambuj*	2016	Re-explored Mayurbhanj Dist. Burhabalang R V	Paleolithic implements	Buirhabalang R V
Chakraborti*	1990, 1993	Simlipal Massif & Khiching Iin Mayurbhanj	L.Palaeo, MPalaeo & Mesolithic	Khairi bandhan R, V,
Dasgupta*	2014	Re-surveyed Mayurbhanj	L Paleolithic sites	
Raffia*	N, A.	Gunupur	L.Palaeo & M Palaeolithic	Vanshdhara in Koraput
Behera*	1988	Bonaigarh in Sundergarh District	L Palaeo. Meso & Neolithic	Brahmani RV
Biswal *	N.A	Kamakhyanagar in Dhenkanal	L Palaeo. Meso & Neolithic	
Padhan*	2013		L Palaeo. Meso & Neolithic	Jonk R. Valley
Behera & Thakur *	1993 onwards continues	Bargarh, Sambalpur, Sonpur, Sundergarh & Others	L Palaeo, M.Palaeo, Mesoli & Neolithic	Mahanadi & Tributaries

In the 80s and 90s, a systematic survey was carried out by Behera which brought to light many sites of Lower Palaeolithic, Middle Palaeolithic, Mesolithic and Neolithic in the Brahmani and Mahanadi valleys. To ascertain the stratigraphical context of Stone Age culture, he undertook trial Trenches at a few sites in the Jira R Valley. Between 2010-2020, Behera brought to light numerous sites belonging to Lower and Middle Palaeolithic sites and



Map 1: Sites in Jira valley

Microlithic sites in semi-primary contexts. Even before this, in 1996, a paper on Acheulian assemblage at Dari-Dungri was published (Behera *et al* 1996) [4]. Map.3 Showing the Palaeolithic Sites. (After Behera.) The last three decades of relentless research by him revealed the potential of the Lohara reserve forest, Debrigarh hill and Barapahar hill ranges along the Middle Mahanadi and its tributaries. A general survey was carried out in the Western Orissa and extensive work was carried out in Sambalpur (SBP) and Bargarh (BRG) districts. As a result, 25 sites (Gopalpur Complex1-11), Torajonga Complex (1-3), Ainlapali, Kenduguria, Brahmanipali, Mendhapali, Jamchhapar, Badpadar, Katapali, Samardhara, Kamgan, Dharokhusum (BRG) (Thakur 2015, 2016) [61] and Dari-dungri (SBP) (Behera *et al* 1997), Samardhara(SRD) (Thakur 2024) [63] belonging to the Lower Palaeolithic period found in varied landscapes. The antiquity of the hominin in the Bargarh Upland is now well established by our findings in the region.

Stratigraphic Context

To understand the sedimentary context of the surface assemblage, trial pits were takenat three sites Dari Dungri, Barpadar and Torajonga. The stratigraphy of these sites show the similarity in context of L Palaeolithic and Microlithic. Locality-A and B. of Barpadar has revealed eight litho units (Fig. of which the Litho Unit-5 was found to be the context of the Acheulian artefacts. In both localities, artefacts have been found embedded in a compact lateritic deposit associated with angular to sub-angular cobbles, pebbles and gravels of mostly quartz raw material of local origin, besides a few abraded sub-angular cobbles (total five in number) of medium grained quartzite. The angularity of the coarser clasts, except the five quartzite cobbles, suggests short distance transportation through low energy episodic fluvial processes. Two flakes and a small handaxe of quartzite were found from the excavated floor in Trench-I. The floor in Trench-Il yielded only three-flakes of quartzite and quartz. The artefacts are in fresh condition and show little or no impact of post-depositional processes. Interestingly, the upper level of the Litho Unit-3in Locality-A yielded seven microlithic flakes of Chert.

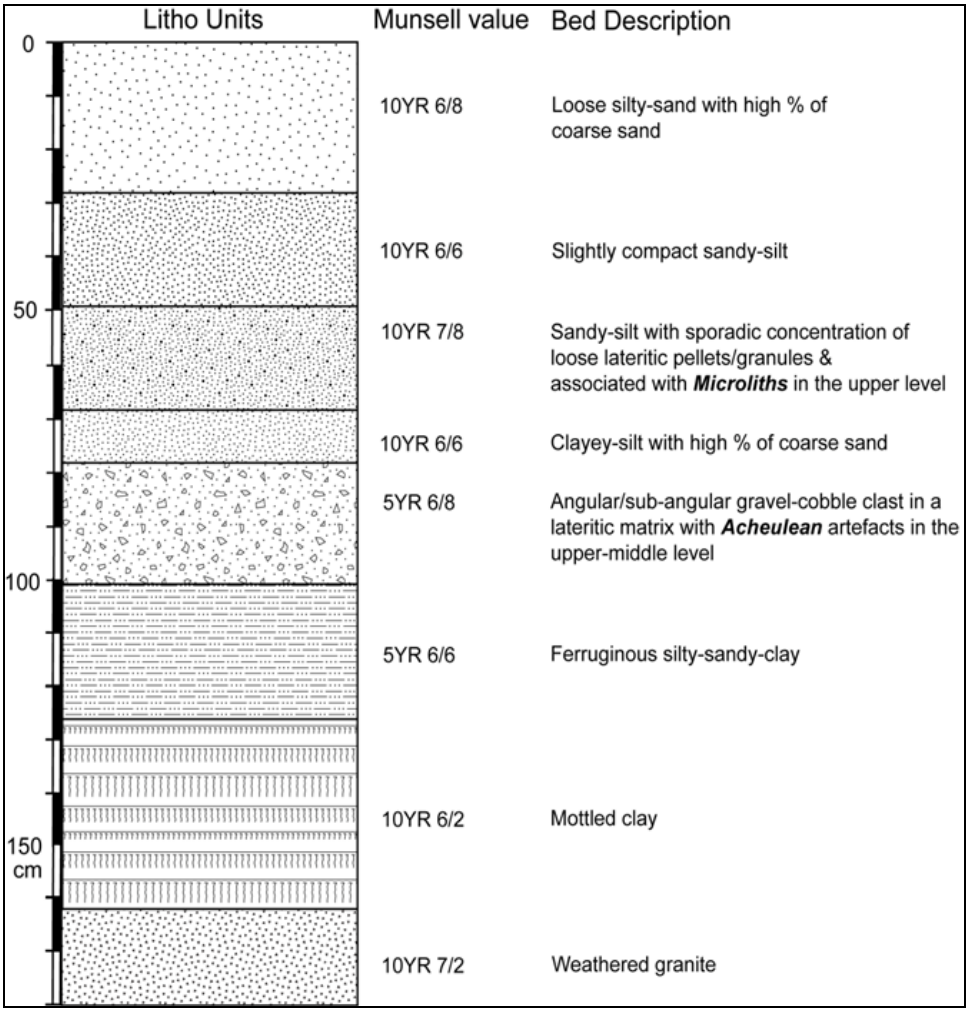


Fig 1: Stratigraphy at Badpadar

Acheulian Industries have been identified in all parts of the world however India is being held as one of the core regions for yielding evidences of Prehistoric cultures (Petraglia 2009) [42]. Acheulian industries in Orissa show gradual development in the technical stages in the same tool kit. All 25 sites in Bargarh Upland and Sambalpur have yielded 4226 artefacts. Even though the artefacts were found on the erosional surface in mixed conditions yet they appear to be in different contexts based on their two distinct states of preservations and techno-typology on one hand, there are large cutting tools (Inizan) and flake tools mostly made of quartzite casually retouched in the Clactonian way with complementing giant cores in the vicinity, on the other hand, sites yield chert components dominated by small flakes meticulously retouched and small-sized prepared cores (1936 artefacts) with deep yellow thick patination. They bear marked difference in state of

preservation as well as technology from the Acheulian component. The district is divided into two halves by the Jira River, which flows from east to west. Although microlithic industries in the district are dispersed all over, Acheulian sites in the majority are concentrated towards the north of the Jira River. There is also a predominance of complete specimens (87.88%) over broken ones (4.33%), in which distal breakage is the most frequent. In case of handaxes distal tips are broken, either perpendicular (23.27%) or at an oblique angle (27.12%) to the tool axis. Such a type of breakage normally occurs when lithic artefacts are stepped upon (Owen 1982: 77-87).

Table 2: Artefacts in Bargarh (BRG), Daridungri (DRDRG) & Dharokhusum (DKM)

Artefact	BRG	DRDGR	DKM	Total	%
Handaxe	294	94	4	392	9.28
Uniface	10	3	2	15	0.35
Cleaver	136	21	2	159	3.76
Core	517	84	30	631	14.93
Ret. Flake	638	238	9	885	20.94
Flake blank	1317	198	23	1538	36.39
Point	8	0	0	8	0.19
Pick	15	5	0	20	0.47
Polyhedron	22	0	0	22	0.52
Spheroid	5	1	0	6	0.14
Chopper/Chopping	7	2	5	14	0.33
R.Blade	17	11	0	28	0.66
Bladelet	30	8	3	41	0.97
Hammer	12	0	0	12	0.28
Worked cobble/Pebble	0	0	5	5	0.12
Misc/Indeterminate	196	254	0	450	10.65
	3224	919	83	4226	100.00

The main tool types of this industry are handaxes, cleavers, unifaces, picks/trihedral, spheroids, polyhedrons, hammers, discoids, cores, flake and blade blanks and tools consisting mainly of scrapers, notches, denticulates, Levallois points, blade points and awl etc. with a little frequency of large blades. Generally Odishan Acheulian seems to have handaxes in majority as compared to cleaver. However, in the eastern and central part of Odisha, there are several sites reported with a substantial number of chopper-choppings along with handaxes and cleavers (Bose and Sen 1948; Mohapatra 1962, Sharma 1994 etc.) [35, 51].

Our study shows that in the Western Odishan Acheulian, the handaxes predominate the cleavers while choppers on sandstone and quartzite nodules/Cobbles are doubtful due to their small quantity (14/4226) as they may be in the process of preparing core. The medium grain quartzite was the preferred stone.

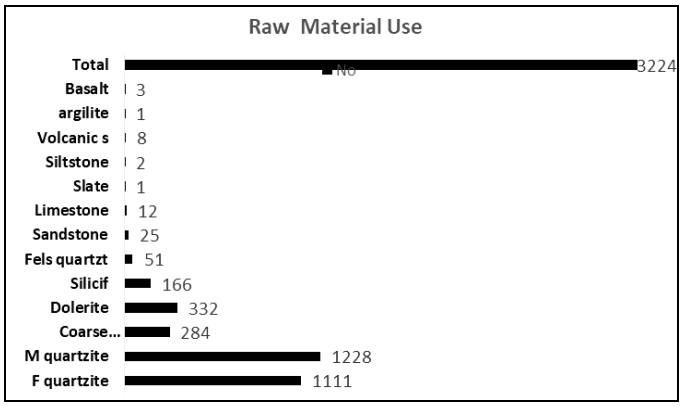


Fig 2: Raw material Ratio

This Table doesn't include Dari Dungri and Dharokhusum

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Fig 3: Cleavers from Badpadar

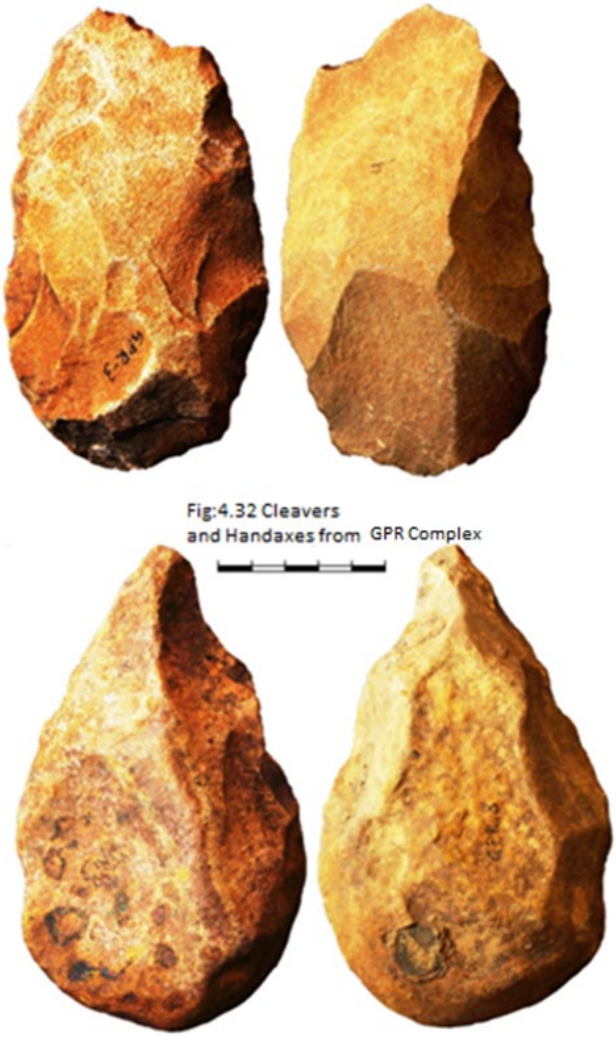

Fig 4: Cleaver and Handaxes from GPR

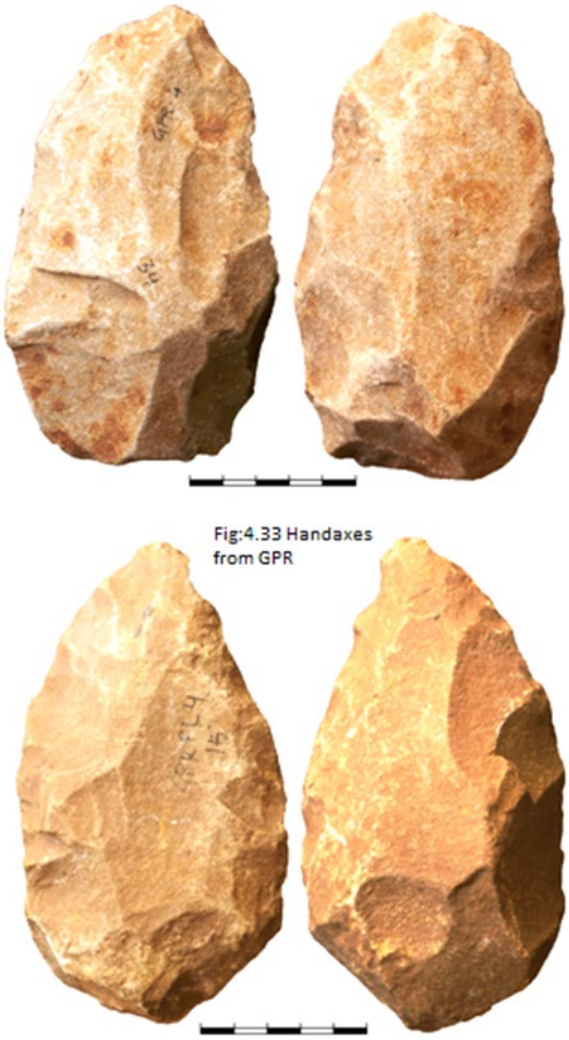

Fig 5: Handaxes

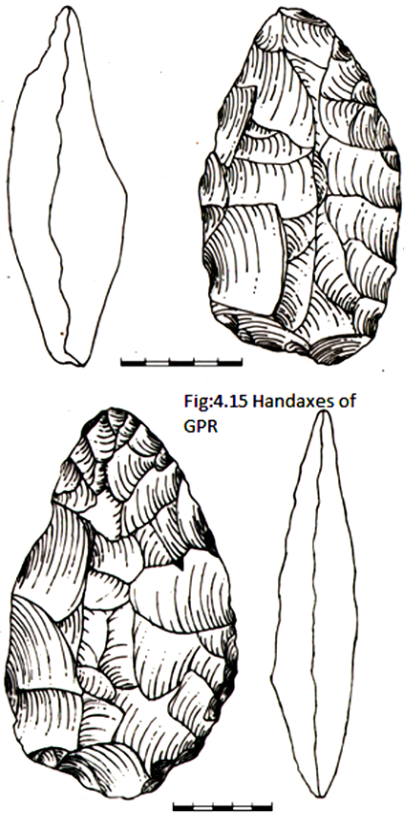

Fig 6: Handaxes

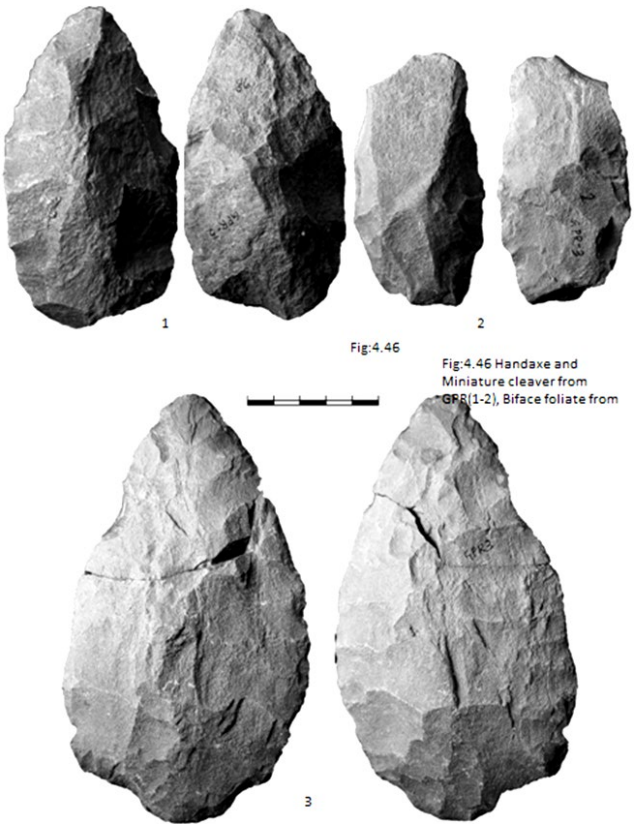

Fig 7: Handaxes

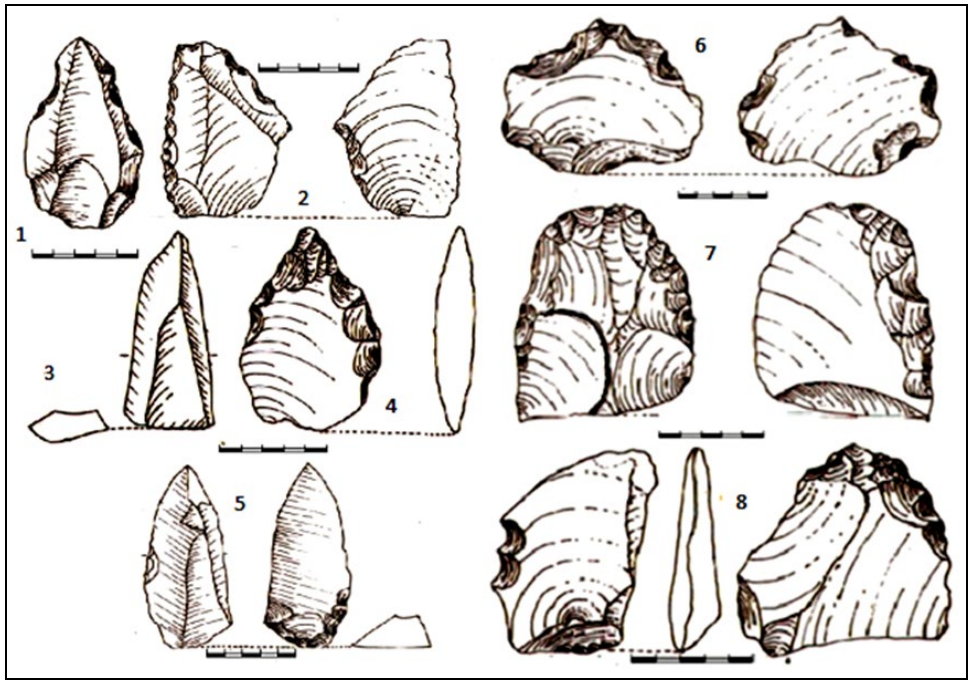

Fig 8: 1, 2, 3, 5 Levallois points 4. Leaf point 6, 7, 8 Scrapers

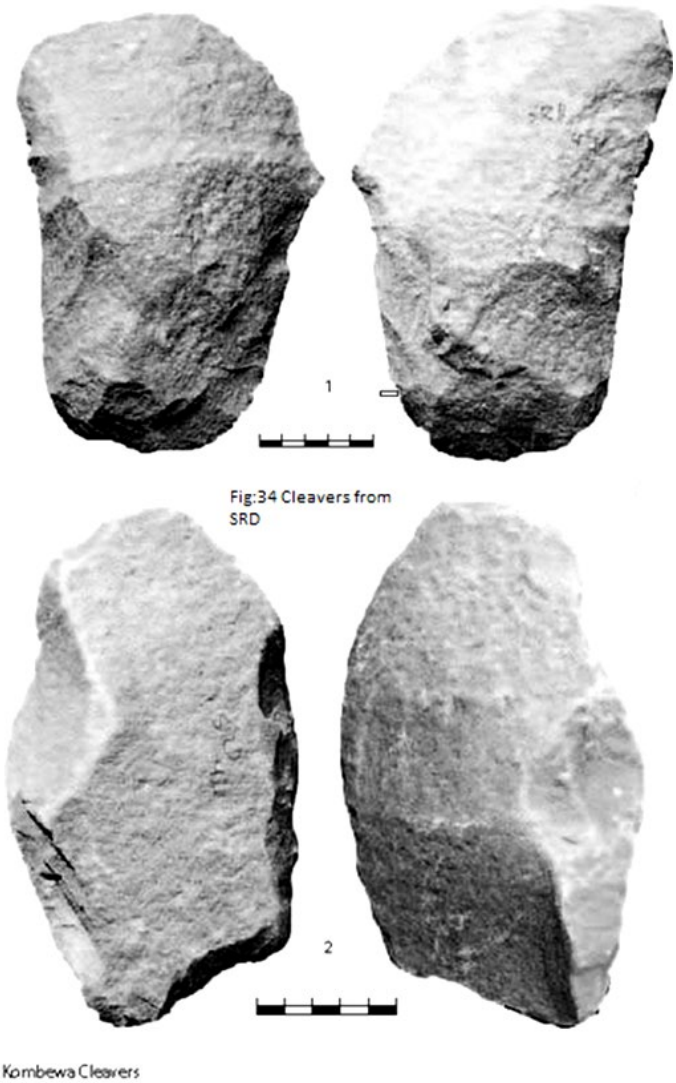

Fig 9: Cleavers on kombewa flake from SRD

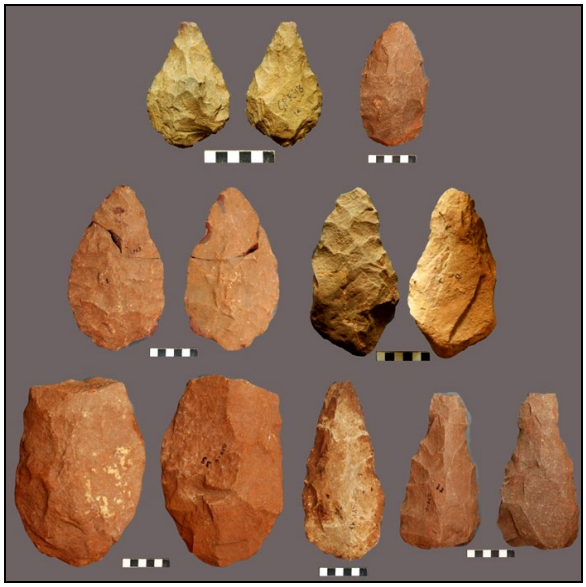

Fig 10: Handaxes

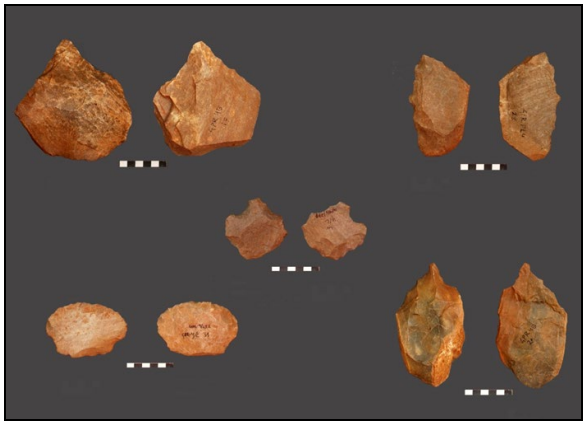

Fig 11: Scrapers and Awls

Fig 12: Amorphous and levallois cores

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In the Bargarh Acheulian site, Quartzite is the predominant material used for making tools. This durable, fine-grained stone is well-suited for the production of bifacial handaxes, cleavers, and other Acheulian implements. In addition to quartzite, other stones such as dolerite and silicified rocks are also utilized, though to a lesser extent. These materials were carefully selected by the hominin for their toughness and suitability for shaping sharp-edged tools, essential for hunting, butchering, and other survival tasks during the Palaeolithic era.

Interpretation derived from the Acheulian Sites of Western Odisha

After a close study of the raw material source, the spatial distribution of the sites, the distance between them and the location of the sites on the pedeplains and foothills has helped us to understand that these sites form a network on the undulating landscape of the valley, possibly they had rudimentary coordination. It could even be assumed that the Debrigarh hills near the Samardhara stream, located on the boundary of the Gangai village, might have worked as the main source of quartzite. The surface strewn with huge dykes and reefs might have helped the hominin in many ways. The height of the dyke must have enabled them to take a panoramic view to keep themselves safe from wild animals as well as it might have helped in watching the position and movement of the game animals in the valley.

Some of the semi-primary sites, mostly occur in clusters exposed very recently due to climatic conditions and anthropogenic activities. Their locations away from modern habitation have helped them in retaining their good state of preservation. They have not suffered much from post-depositional disturbances. Apart from semi-abrasion and a little rolling, majority of the assemblages are fresh. The artefacts are complete except for about 4-8% broken due to using the sites as roads and agricultural activities. The sites are located in an area of approximately 30x30 square km and the distance between them varies from 4-7 km with two main quarries at SRD for quartzite and GPR-3 for dolerite and coarse quartzite. The dolerite has been showing numerous large flakes but due to their abraded condition it was too difficult to recognize their actual form i.e.; retouching pattern, cortex, platform etc. Literally it was impossible to include them in the study. The prominence of quartzite rock could be seen in all sites. In this situation, it can be inferred that SRD (Samardhara) might have served as a supplier of quartzite to other sites located in the lower plains and stream/river banks in the vicinity as it is a quarry site with a good proportion of medium grain quartzite boulders with big negative flake scars. After a close study of the raw material source, the spatial distribution of the sites, the distance between them and the location of the sites on the pedeplains and foothills has helped us to understand that these sites form a network on the undulating landscape of the valley, possibly they had rudimentary coordination. It could even be assumed that the Debrigarh hills near the Samardhara stream, located on the boundary of the Gangai village, might have worked as the main source of quartzite. The surface strewn with huge dykes and reefs might have helped the hominin in many ways. The height of the dyke must have helped them to take a panoramic view to keep themselves safe from wild animals as well as it might have helped in watching the position and movement of the game animals in the valley

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The bifaces became diminutive over the time and slowly disappeared and flake and blade increased with a shift in typo-technology as well as change in raw material.

So far as the chronology is concerned, the excavators (Bose and Sen) could not assign the Kuliana industry to any chronological slot on the basis of the typology of the tools as none of the single types or even subtypes had a restricted zonal distribution and a consequent high index value. Only a general resemblance with Lower Palaeolithic was suggested. Sankalia (1974) has raised certain important questions regarding the evolution of the Early Stone Age industry of Mayurbhanj. He agreed with Ghosh (1970) in suggesting a Middle Pleistocene date. The artefacts found at these sites are

divided into two forms-Core type and Flake type. Core types include hand axes, cleavers and chopper-chopping tools. The flake type includes scraper, notches and backed knives. Certain features such as lack of Levallois core, tortoise core and proper side scrapers on one hand and the other, deep hammer scars, mostly butt showing cortex in handaxes and cleavers indicate the archaic form of the Lower palaeolithic in Mayurbhanj. The surface collection has indicated the lower Palaeolithic mixed up with Late Acheulian artefacts, many of these sites show Late Acheulian features mixed with massive artefacts such as bifaces and others. (Dasgupta. 2014).

However, Broadly the Bargarh Acheulian can be compared to many Late Acheulian sites such as Bhimbetka in Madhya Pradesh, Paisra in Bihar and Singhbhum in Jharkhand (Ghosh 1970:3-68, 1979:186-187) which can be mentioned for their similarity with Bargarh Industry. At Bargarh in the absence of proper stratigraphy, scientific chronology and the nature of the industries as semi-primary it is difficult to suggest a date.

The fossil tool types of Acheulian culture (handaxe and cleaver) have been reported in sporadic research articles yet not many have bothered to give qualitative and quantitative typo-technological studies. In this situation, the available data though insufficient, have been utilized to assess the morpho-technological homogeneity within Orissa.

With a substantial quantity of handaxes (276 complete-18 broken handaxes excluded) and cleavers (128 complete-8 broken cleavers excluded) in Bargarh district, the researcher has presented comparative metrical data of the intact handaxes (241) and cleavers (68) from other sites of Orissa reported so far. It shows that the length of handaxes varies but symmetricity in elongation and refinement can be on the same pattern. In general terms, the handaxes of Mayurbhanj and Dhenkanal appear to be bigger. Here it must be read with caution as we do not have the metrics from these sites. The mean length of handaxes in all sites varies between 117-139cm however it is significant that Bargarh upland has the credit of having 48 handaxes below 90 mm and the largest one at least 228 cm (tip broken thus reconstructed-available portion 225cm). The mean elongation, mean refinement and mean flatness ratio of the handaxes are similar while size may vary. It presents a homogenous morpho-technology in the entire state.

The graphic presentation shows that Bargarh has mostly medium-sized handaxes whereas the frequency of handaxes in the districts of Mayurbhanj, Sundergarh, Dhenkanal, Nuapara and Keonjhar is low. The metric details are elaborately given in the book of the present author (Thakur 2016) [61]. On the same pattern, 128 cleavers from the Bargarh district were studied together with 65 cleavers from other districts. Around 3 cleavers are the diminutive type with lengths ranging between 6.5mm-9.2mm. The mean length of the cleavers varies between 108.2-141.8mm. The maximum mean is from Mayurbhanj which is doubtful due to the availability of partial metrical data. The flatness ratio of Bargarh is 0.58 which indicates the high value in tool refinement Technique.

It is noteworthy that usually cleavers from Bargarh are made on flake therefore these are more thin than those of other sites of Odisha. The reason for this difference can be explained by understanding the topography of the sites. In Mayurbhanj, the tools are largely made of cobble/pebble due to their abundance in the neighbourhood. Quartzite is (up to 80-90%) used in all sites. Silicified rock, sandstone and dolerite are used in some of the sites of Bargarh district and Nuapara district. Mayurbhanj and other sites have equally shown a predominance of quartzite though quartz and other cryptocrystalline silica were also used in a limited quantity. Bargarh has revealed a few new tool types such as polyhedrons, bola stones, leaf points (biface foliates), Sangoan pick (Bordes 1962) [11] along Levallois points,

Mousterian points, Faust Keilblatter and Keilmesser (Bordes 1962) [11] which were hitherto and Pebble-cobble based, the industry of Bargarh and Nuapara show a predominance of flakes. (Flake bifaces and flake cores) except a few cobbles, block, boulder and giant static cores with evidence of flaking scars at Samardhara (SRD).

Our knowledge of the antiquity and duration of Lower Palaeolithic culture is far from satisfactory. It is likely that with the refinement of dating techniques and their application to more sites, the lower Palaeolithic may go back to the Early Pleistocene. The upper limit of the Acheulian culture is equally uncertain. However earliest scientific date of Acheulean assemblage at the site of Attirampakkam in Tamil Nadu have pushed back the antiquity to 1.51 my respectively.

A Critical Assessment of Odishan Acheulian

A large number of Acheulian sites have been discovered but a few of them are excavated at a small scale. Most of the early Excavation Reports hardly give systematic metrical data. (Chauhan 2010) [18] No Acheulian site in Odisha has revealed the chip and debris (barring a meager quantity of chunk) thus eluding the original place of tool production and actual lithic reduction process (Chain Operation). It is noteworthy that the principal sites of Mayurbhanj were excavated but other are merely explored. In such a situation one has to wait until more sites are excavated. Nevertheless, minor differences in tool typology and overall Shape and size in Palaeolithic artefacts of the state indicate the homogeneity with a few exception. It was a vast landscape and the hominin was able to move in the stretch of the undulating landscape and made some sort of communication/transaction among themselves. The site location patterns and knapping of blanks from large and giant cores are a few points to indicate community behavior at the earliest level.

A few handaxes bear two levels of patinations on two phases of flaking. At least 13 handaxes in the assemblage seem to belong to the earlier phase due to hard hammer knapping showing deep and big scars whereas others are finely and symmetrically produced. In contrast to handaxes, there is only one cleaver found to be recycled. A few handaxes are close to *biface massiforme* or *Abbevillian type biface* of Bordes (1962: pl. 88, 89) [11]. Besides, 34 cores are found to be re-flaked for further use as other tools such as awl or scraper. The broken handaxes particularly those which have oblique/perpendicular breakage, are converted into cores.

However, a large part of the bifaces is fresh and beautifully made up. These have shallow scars indicating the soft hammering technique. Among light-duty tools i.e; awl, denticulate and notch etc. are comparable to any contemporary sites. It is noteworthy that the focus seems to be shifting towards scrapers and denticulates. It seems convincing due to 13 denticulated cleavers, 7 laterally denticulated handaxes and 34 core tools mostly turned into scrapers, awl and denticulates, sometimes a combination of both could be observed one Artfact. About 13 cleavers are found to be edge damaged due to vigorous use. Though in low proportion, a few artefacts i.e.; Levallois Mousterian points, picks, blade scraper, polyhedron, bola stone, hammers and other tools (Thakur 2016) [61] along with miniature thin Levallois-type cores indicate the transition of Late Acheulian into Early Middle Palaeolithic. Besides there are (9) handaxes

and (3) cleavers are of diminutive size (5.5 cm-9.6 cm) echoing the entrance into next era of Middle Palaeolithic.

Kuliana as we know, is the earliest Palaeolithic excavated site not only in Orissa but also in India. The study of artefacts of Kuliana revealed rudimentary technical skills and crude variety indicate their primitive technological skill. Large handaxes, unfaceted platforms of the flakes and amorphous cores and non-Levallois artefacts are some features of this stage. According to Mohapatra the Levallois technique was not known to the hominin of this region but this has been refuted by our research in Bargarh Upland, not only the Levallois technique (L. core, L. flake and L. point) is well discernible but also Levallois-Mousterian points have been discovered. Significantly one cannot ignore the fact that Kombewa technique was known to them as some cleavers and handaxes (4%) are made on symmetrical flakes with both side bulbs. These have Straight profile and shallow scars all over.

Bargarh has yielded both varieties of artefacts: Crude and fine. Still fine, symmetrical artefacts are more than cruder variety. Most of the artefacts though patinated, are in a fresh condition indicating their recent exposure due to natural climatic conditions. On the basis of overall assessment, the assemblages could be called Late Acheulian. One extremely rolled and abraided biggest yet broken handaxe (appr.23cm, after reconstruction it may reach to 26cm) from Gopalpur-9 shows deep scars indicating the hard hammering. Its major part is having cortex. Its huge size could not be held in hand thus it was left unflaked.

The Occurrence of Acheulian artefacts in lateritic gravel deposits near the river valleys or found in the cliff or erosional surface. The sites of western Orissa belong to the same geological formation and show the same stratigraphy as that of in other regions of Odisha. However, the present study may help to develop a general idea about the Odishan Lower Palaeolithic. Some handaxes and cleavers from Kuliana of Mayurbhanj, Samardhara and Gopalpur of Bargarh qualify for the term *Large Cutting Tool* (Inizan 1999) defined by Inizan. Their technology is crude thus showing irregularity in the form with zigzag profile.

As a raw material, quartzite predominates in all LP assemblages of Odisha due to the geological formation of the region, Most of the sites have recorded the largest number of artefacts made of quartzite. Other stones used in this land are silicified (Dari Dungri), dolerite, quartz and chert. Some other stones in meager proportion seem to be brought from nearby regions and/or might be Manu ports.

At the beginning of the twentieth century, the total attention was upon the collection of Handaxes and Cleaver type big artefacts but somehow other associated artefacts were ignored assuming useless. Till the concept of Chain Operation developed, we already lost plenty of evidence. However, these days the understanding regarding debitage and debris has increased.

However, our research in Bargarh upland has revealed a constant development of cognitive ability, raw material procurement strategy and technological growth regarding production of artefacts and probably some rudimentary group activities such as helping in tool production and sharing raw material among themselves. Living in a group however smallest it might be, still essential to survive from dangers lurking from all sides.

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