

## RESEARCH PAPER

# Explorations of the Rocky Outcrops of Lower Jira Valley of Bargarh Upland, West Odisha, India

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For the last few decades a large number of microlithic sites have been reported in the Jira river valley. All these sites have yielded very rich stone tool antiquities. But these prehistoric lithic assemblages are found in different contexts and geographical locations. A number of open air sites are found in this region which can be categorized into four major types like Foot hill contexts, River Banks, Rocky knobs and Piedmont areas. Prehistoric settlements of all these contexts in this region vary from one to another in use of raw materials and technology. Recent explorations made by author in Jira valley have brought to light some Rocky knob sites in lower part of this valley. In this paper a preliminary study has been made to discuss the cultural antiquity reported from the Rocky Knob sites.

## Introduction

A systematic study of Prehistoric research in Odisha was carried out after independence. Most of the river valleys of Odisha being rich in prehistoric settlements, scholars took keen interest in the study of Prehistory. Occurrence of Late Stone Age assemblages in the Jira river valley was first reported by K. C. Tripathy (1972). Subsequently, S. K. Mishra (1982) discovered a large number of microlith bearing sites in the valley. Besides the above mentioned researchers, exploration have been conducted by P.K. Behera and S. Pradhan with the assistance of numbers of M.A. and M. Phil students, in the Middle Mahanadi and its major and minor tributaries resulting the discovery of hundreds of Mesolithic sites as well as rock art sites in western Odisha. The occurrence of microlithic industry in West Odisha has been reported from the Ong valley by S. Panda, in lower Ong (1996) and Suktel by S. Gadtia (2000). In lower Jira valley by K. Seth (1998), Upper Jira valley by S. Mishra (1998), in the middle Mahanadi valley by A.K. Sethi (1996), lower Bheden valley by J. Naik (2002), Girisul valley by S. Mendaly (2012), Raul valley by B. Patel (2002) and Jira Valley and its tributaries like Ranj and Danta by S. Deep (2016). Besides, the above mentioned sites, occurrence of Microlithic industries was also reported from the Jira valley, a tributary of the river Mahanadi, in the western part of Odisha. Several seasons field investigations carried out in western part of Odisha which have brought to light a number of Palaeolithic and Mesolithic sites. Studies of these sites and their material antiquities provide us very important data about the lithic production technology and use of raw materials of prehistoric people. Recently as many as 44 microlithic bearing sites have been explored by author in the Jira valley of Bargarh upland. The author

has observed certain similarities and variations in cultural remains among the prehistoric settlements of Bargarh upland and such variations can be observed on the basis of contexts of a site and preference of raw material used by prehistoric man of this region. Recent investigations in the Jira valley in the Bargarh upland have yielded as many as 44 microlithic bearing sites. Occurrence of these microliths and other artifacts proved that Jira valley was a conducive area for human settlement in Pleistocene period. The settlements of prehistoric people are not always found in the same geographical setting rather it is varied in nature. Their settlements have been found in four major contexts like in Foot hill contexts, River Banks, Rocky knobs and Piedmont areas. In this paper an effort has been made to discuss five prehistoric settlements of Jira valley which are found along the Rocky outcrops.

## Area and the environment

The Bargarh district lies between 20° 43' to 21° 41' N longitude and 82° 39' to 83° 58' E latitude. The author has selected the Bargarh Uplands for an intensive investigation. Spreading over 2690 km<sup>2</sup> surface area, the Bargarh upland is an erosional surface with the general relief varying between 140 mtrs and 250 mtrs above mean sea level. Four distinct geomorphic units can be seen in the area, viz., (i) denudational hills, hilly terrain with rocky mounds and deep vegetation cover on the north-western and south-eastern parts, (ii) upland plains, and the rugged terrain with rocky knobs on the north-eastern part, (iii) pediplain and the gentle-undulating plains on the north-western and western parts and (iv) the Mahanadi floodplain. The area is drained by the river Jira and its various tributaries (Behera, et. al 2015). It originates from near the border of Bargarh and Chhattisgarh, and after traversing for about 80 km in the district Bargarh in a south-easterly direction it joins the right bank of the Mahanadi at Brahmani-Turum. Except the Jira, which is perennial and all other streams

of this area retain water during the monsoon season. The soil is a mixture of sand and gravel as well as of clay. It is a good rice soil and unlike the more fertile black cotton soil, it grows few seeds and does not harbor dangerous insect pests. The clay soil having high percentage of calcium and rich in organic matter is found in Padampur, Paikmal, Bijepur, Bhatli, Ambabhona, and Gaisilat areas. Besides, the black cotton soil is found in Paikmal area. It contains liberal amount of organic matter. The average annual precipitation in the district is 1527 mm. about 90 percent of the annual rainfall is received in the monsoon season July being the rainiest month in the year. The oldest rock formation of the area is composed of the rocks of Achaean series succeeded by Proterozoic and Cenozoic series. Talchir formation comprising pebbly sand stone, siltstone and needle clay is the only representative of Gondwana rocks occurring in a narrow basin in the southern part of the district. The climate of this area support mostly dry-mixed-Deciduous type of forest, closely resembling that of the semi-arid and sub-tropical zone, with *Sahaj (Terminalia-tormentosa)* and *Bijasal (Pterocarpus marsupium)* being dominant plant species. This dry-mixed formation has, in its turn, to fight a stern battle with Bamboos (*Dendrocalamus strictus*), especially where the underlying rock is granite or a gneiss.

**Sites and Assemblage Compositions**

**Kumrapali (KRP)**

The village Kumrapali is situated on the left bank of river Danta and nearly 9 kilometers from Bheden Township. The exact site is situated about 1 kilometer west of the village Kumrapali near a rocky knob and only 50 m distance from the river bank. It lies between 21° 08 23.6" N longitude and 83° 47 14.7" E latitude. It has an elevation of 131 mtrs above mean sea level. The site has spread over an area of 50 sq.mtrs. The nearby area of the site is destroyed due to cultivation. The artefactual scatters and spread over an area of about 100 mtrs, of which only 15 m × 15 m surface selected for random sampling. A total of 288 artefacts made on chert, quartz, chalcedony raw material were collected from the surface at the site. Almost all the exposed artefacts are in mint fresh condition. The over-

all assemblage composition as indicated in the (Table 1) clearly demonstrate that flakes not only occupy a dominant position in the blank group (46.52%) but the percent of core is very high (28.12%). This suggests that the large majority of the flakes might have been detached during the process of core rejuvenation and preparation methods. Although Bladelets (Plate 5) form only 4.51% in the assemblage, it has minimally been utilized in the production of tools (6.81%). In view of the above the predominance of Flakes elements in the assemblage it remains basically a Bladelet oriented industry.

**Purapali (PRP)**

The site of Purapali is located by the side of the confluence of a streamlet called Kenchwa Nala and the right bank of river Jira. It is 8 kilometers south of Bheden Township and about 5 kilometers west of the microlithic site of Kumrapali. The exact site is situated on the eroded surface of a sheet rock mound near the village which is about 800 mtrs south of the village Purapali (Plate 7). Its longitude is 21° 08 52.1" and latitude is 83° 4 29.2". It has an elevation of 151 mtrs above mean sea level. The eroded surface of this site has exposed a large chunk of area with artefactual scatters spreading over an area of about 30 m × 30 m. Here artefacts were found on the sheet rock as well as below the rocky knob. The lithic scatters, which occurs in the form of small clusters. Random sampling of artefacts was done from a small area measuring 15 m × 15 m which yielded a total of 320 specimens. In respect of general topography, raw material and techno-typology, this industry is closely resembles with Kumrapali. This site is partly preserved. At this site also artefacts (Plate 6) of the microlithic components are made on black and Green chert, Chalcedony and Quartz. Cores comprised 15.31% of the assemblage and flakes 43.12%. Simple Blades constituted 1.87% and Bladelets constituted 9.68%. Within the Flakes, 32 are observed with utilized/edge damage marks. There are very number of tools found in blade but most of the Bladelet (24.48%) are used as tools. Among the fragments distal part has 01 tool. Chunks are only 82 in number which is 25.62% of the grand total. The macro assemblage represented at the site is given in the following table (Table 2).

**Table 1:** Microlithic assemblage of Kumrapali.

Artefacts category	Total Nos.	Percentage	Unretouched Blank Nos.	% of Unretouched blanks	Retouched Blanks	% of Retouched blanks	Percentage Utilized
Core	81	28.12			04	9.09	4.93
Flake	134	46.52	104	81.88	30	68.18	22.38
Blade	11	3.81	05	3.93	06	13.63	54.54
Bladelet	13	4.51	10	7.87	03	6.81	23.07
Fragments							
A-Distal	01	0.34	01	0.78	–		
B-Medial	02	0.69	02	1.57	–		
C-Proximal	06	2.08	05	3.93	01	2.27	
Total	248	86.07					
Chunks	40	13.88					
Grand Total	288	99.95	127	99.96	44	99.98	

**Lohakhandi (LKND)**

The village Lohakhandi is situated at a distance of 6 kilometers south of Purapali. It is nearly 8 kilometers south west of Bheden Township. The exact site located by the side of the confluence of a streamlet called Kenchwa Nala and the right bank of river Jira and about a kilometer west of the village Lohakhandi. It has elevation of 174 mtrs above mean sea level. It lies between 21° 09 13.5" N longitude and 83° 43 59.8" E latitude. The artefactual scatters in the form of small clusters were found exposed on the eroded surface of the rock sheet. The site spread over an area of 50 sq.mtrs. The nearby area of the site is destroyed due to cultivation. A total of 251 artefacts (**Table 3**) were collected randomly from the eroded surface of the River bank measuring 10 m × 10 m. Almost all the artefacts collected are of fine grained. At this site artefacts of microlithic components are made variously on Chert, Chalcedony, Agate and Quartz of fine and milky variety. Cores comprised 23.50% of the assemblage, Flakes 45.41% including 25 broken flakes. Twenty-five Flakes possess utilization or edge damage marks. Blades and Bladelets constitute only 1.59% and 1.19% of the assemblage respectively. Although flakes are dominant in this site, number of tools on flake is very meagre. Chunk comprises only (25.49%). A detailed

typological classification of the finished and semi-finished tools is given below. From the techno typological points of view, the assemblages of Lohakhandi may be compared with that of Purapali. The macro assemblage compositions are indicated in the following tables.

**Pottalgaon (PTLG)**

The village Pottalgaon is located some 5 kilometers north east of Bheden township and The exact site located in the right bank of river Jira and about a 1 kilometers north of the village Pottalgaon. The site is located along the foot hill of Talgaon reserve forest. It lies between 21° 12 20.1" N longitude and 83° 4229.5" E latitude. It has elevation of 164 mtrs above mean sea level. The eroded surface of this site has exposed a large chunk of area with artefactual scatters spreading over an area of about of 200 sqmetre. Here artefacts are found on undulating gravelly surface of rocky outcrop. A very small stream has been originated here and falls into river Jira. The lithic scatters, which occurs in the form of several clusters. A total of 345 artefacts were collected from the exposed surface of the site, measuring 20 m × 15 m. Almost all the artefacts collected are in mint fresh condition. Topographically this site is similar to Kumrapali. The artefacts of this site have been

**Table 2:** Microlithic Assemblages of Purapali.

Artefacts category	Total Nos.	Percentage	Unretouched Blank Nos.	% of Unretouched blanks	Retouched Blanks	% of Retouched blanks	Percentage Utilized
Core	49	15.31					
Flake	138	43.12	105	75.00	33	67.34	23.91
Blade	06	1.87	3	2.14	03	6.12	6.12
Bladelet	31	9.68	19	13.57	12	24.48	63.15
Fragments							
A-Distal	06	1.87	05	3.57	01	2.04	–
B-Medial	03	0.93	03	2.14	–	–	–
C-Proximal	05	1.56	05	3.57	–	–	–
Total	238	74.34					
Chunks	82	25.62					
Grand Total	320	99.96	140	99.99	49	99.98	

**Table 3:** Microlithic assemblage of Lohakhandi.

Artefacts category	Total Nos.	Percentage	Unretouched Blank Nos.	% of Unretouched blanks	Retouched Blanks	% of Retouched blanks	Percentage Utilized
Core	59	23.50			03	15.00	5.08
Flake	114	45.41	102	91.89	12	60.00	10.52
Blade	04	1.59	02	1.80	02	10.00	50.00
Bladelet	03	1.19			03	15.00	100.00
Fragments							
A-Distal	04	1.59	04	3.60	–	–	–
B-Medial	–	–	–	–	–	–	–
C-Proximal	03	1.19	03	2.70	–	–	–
Total	187	74.47					
Chunks	64	25.49					
Grand Total	251	99.96	111	99.99	20	100.00	

fashioned out of locally available nodules and pebbles of crypto-crystalline silica group. The site is rich in material remains. Microlithic components are dominated by chert and quartz. Fine and milky quartz is widely found here. The macro assemblage composition of Pottalgaon (**Plate 4**) shows that only flakes predominate the blank group (51.01%). They are also utilized maximally in the tool production. The Percentage of Blade (4.63%) and Bladelet (2.02%) are very poor. There marked the low representation of Bladelets. The percentage of flake is higher but tools on flake blank are only 52.00%. This suggests that the large majority of the flakes might have been detached during the process of core rejuvenation and preparation methods. However, the core group is dominated by blade-bladelet cores. The proportion of Chunks or Chips is 14.49%. The macro assemblage composition and a list of finished as well as semi-finished tool categories are indicated in the following tables (**Table 4**).

**Baramkela (BRKL)**

The site of Baramkela is situated in the cliff surface of the left bank of the river Jira, and situated nearly seven kilometers south of Pottalgaon. The site was discovered by Seth during 1995–96. But during the field study author revisited this site and collected some artifacts for analysis. It

lies between 21° 14 50.81" N longitude and 83° 41 43.91" E latitude. It has elevation of 158 mtrs above mean sea level. A total number of 548 artifacts were collected. The macro assemblage composition of Baramkela reveals that only flakes occupy a dominant position in the blank group (34.67%). But Percentage of tools in flake blank is very low in this site which is only 17 in number. Bladelets form only 10.04% in the assemblage; it has maximally been utilized in the production of tools (41.30%). The core group is dominated by Blade-bladelet Cores. The chunks or chips comprises of only 13.69% (**Table 5**).

**Tool types from Rocky knob sites**

During the process of analysis of artefacts we have come across a number of tools. All the tools are made on different types of rocks belonging to the Crypto-crystalline Silica. However in Chert category most of the tools have been noticed. Though retouched tools were observed in Blade and Bladelet blanks, yet majority of the tools are found in the flake components. We have not found any retouching on core components. 31 types of tools have been identified in all the sites which have been shown in the table below.

The prehistoric settlements of Jira valley are very rich in geometric as well as non-geometric microliths and

**Table 4:** Microlithic assemblage of Pottalgaon.

Artefacts category	Total Nos.	Percentage	Unretouched Blank Nos.	% of Unretouched blanks	Retouched Blanks	% of Retouched blanks	Percentage Utilized
Core	87	25.21			04	16.00	4.59
Flake	176	51.01	163	87.16	13	52.00	7.38
Blade	16	4.63	13	6.95	03	12.00	18.75
Bladelet	07	2.02	03	1.60	04	16.00	57.14
Fragments							
A-Distal	01	0.28	01	0.53	–		
B-Medial	03	0.86	03	1.60	–		
C-Proximal	05	1.44	04	2.13	01	4.00	
Total	295	85.45					
Chunks	50	14.49					
Grand Total	345	99.94	187	99.97	25	100.00	

**Table 5:** Microlithic assemblage of Baramkela.

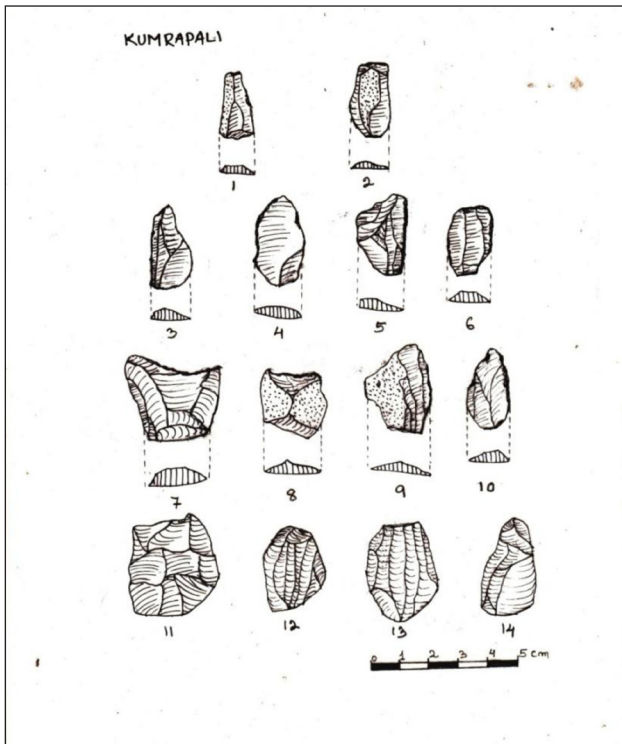
Artefacts category	Total Nos.	Percentage	Unretouched Blank Nos.	% of Unretouched blanks	Retouched Blanks	% of Retouched blanks	Percentage Utilized
Core	168	30.66					
Flake	190	34.67	173	64.07	17	36.96	8.95
Blade	60	10.95	50	18.51	10	21.74	16.67
Bladelet	55	10.04	36	13.33	19	41.30	34.55
Fragments							
A-Distal	03	0.53	03	0.53			
B-Medial	02	0.35	02	0.35			
C-Proximal	06	1.06	06	1.06			
Total	384	86.31					
Chunks	75	13.69					
Grand Total	559	100.00	270	99.98	46	100.00	

the sites adjacent to Rocky outcrop are also not devoid of it. All the explored sites have produced the geometric tool but the percentage of these tools are very low (**Table 6**). In all the Rocky knobs sites basically tool are made on chert of various type and quartz. As many as 186 tools have been noticed in the assemblages of all sites. Among the artifacts Side scrapper, Notch, Denticulate and Partially retouched tool are dominant in all the sites. Notch has been observed in Blade category in Pottalgaon (**Plate 3**). Side scrapers are comprised only 14.51%, whereas the percentage of Notch and Denticulate are 11.29% and 7.52% respectively. The site Kumrapali (**Plate 1**) is Predominated by Side scrapers. Scrapper of different category such as Transverse Scrapper, End scrapper, Round scrapper etc are dominant. Denticulate and Double denticulate tools are also very common in the sites of lower Jira valley. In Purapali

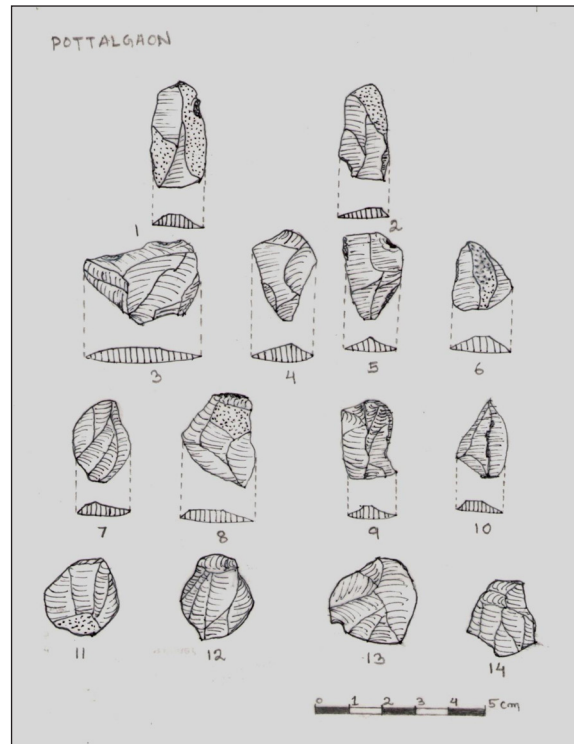
(**Plate 2**) and Lohakahandi Double denticulated tools have been noticed. The tool like Awl is very few in number whose percentage is only 2.15%. During the study Marginally retouched tool and Partially retouched tool have observed in all the sites. Baking is a technique which had been used by the Microlith using communities of this region as it is proved from the availability of Backed tools. Four Backed bladelet and Straight backed tools are found in Baramkela. Besides, Burin forms a major tool component in retouched assemblages. 5 Axial burin, 4 Offset dihedral burin, 5 Transverse burin and only one Axial dihedral burin has been noticed in total assemblages. Use and production of geometric tools are very meagre in these sites. Only 4 Lunates, one from Pottalgaon and 3 from Baramkela have reported. The typical geometric tools like Scalene triangle, Triangle and Isosceles triangle are very few in number.

**Table 6:** Tool types of Jira valley.

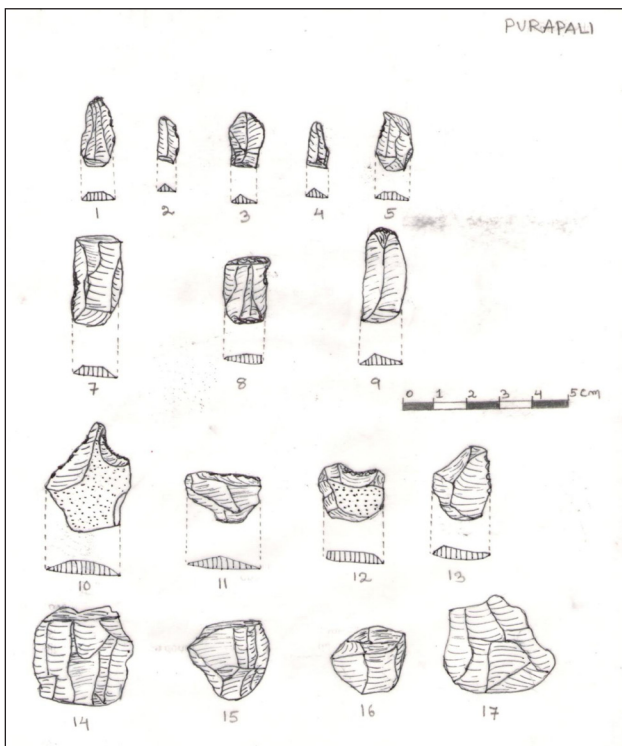
Sl. No	Tool types	Name of the sites					Total	Percentage
		KRP	PRP	LKND	PTLG	BRKL		
1	Side scrapper	10	04	06	05	02	27	14.51
2	Transverse scrapper	02	–	–	–	01	03	1.61
3	End scrapper	01	02	–	02	01	06	3.22
4	Round scrapper	01	–	–	01	–	02	1.07
5	Notch	06	06	03	02	04	21	11.29
6	Denticulate	04	04	01	02	03	14	7.52
7	Double denticulate	–	03	01	–	–	04	2.15
8	Awl	02	01	01	–	–	04	2.15
9	Marginally retouched	01	10	02	04	02	19	10.21
10	Partially retouched	05	10	04	03	03	25	13.44
11	Bilaterally retouched	03	–	–	–	01	04	2.15
12	Partially retouched top	02	–	–	–	–	02	1.07
13	Retouched side	–	01	–	01	–	02	1.07
14	Retouched butt	–	03	01	01	–	05	2.68
15	Retouched top	01	–	01	01	–	03	1.61
16	Unilaterally retouched margin + notch	02	–	–	–	02	04	2.15
17	Backed bladelet	01	01	01	01	–	04	2.15
18	Baked lateral side	–	01	–	–	–	01	0.53
19	Straight baked	–	–	–	–	04	04	2.15
20	Axial burin	01	01	–	01	02	05	2.68
21	Offset dihedral burin	01	–	01	–	02	04	2.15
22	Transverse burin	–	–	–	–	05	05	2.68
23	Axial dihedral burin	–	–	–	–	01	01	0.53
24	Axial burin on butt	–	–	–	–	02	02	1.07
25	Multiple offset burin	–	–	–	–	01	01	0.53
26	Point arched baked	–	–	–	–	07	07	3.76
27	Blunt arched baked	–	–	–	–	01	01	0.53
28	Obliquely truncated	–	–	–	–	01	01	0.53
29	Scalene triangle	–	–	–	–	01	01	0.53
30	Isosceles Triangle	–	01	–	–	–	01	0.53
31	Lunate	–	–	–	01	03	04	2.15
Total		43	48	22	25	48	186	99.99



**Plate 1:** 1, 2-Backed Bladelet, 3-6-Sidescraper, 7, 9-Denticulate, 10-Notch, 11-Core, 12-14-Bladelet Core.



**Plate 3:** 1, 2-Retouched Blade, 3, 5-Notch, 4, 6, 7, 8, 9, 10-Side Scraper, 11-14-Core.



**Plate 2:** 1, 2, 4-Backed Bladelet, 3, 9-End scrapper, 5-Awl, 7, 8, 10, 11-Side Scraper, 12-Notch, 13-Denticulate, 14-15-Bladelet Core, 16-17-Core.



**Plate 4:** Microliths from Pottalgaon.

**Use of Raw Materials in Rocky Knobs sites**

From the below table it is evident that the site Kumrapali has the dominating use of chert as primary material (Table 7). Various type of chert Like Brown chert, Green

chert, Black chert, Grey chert, Banded Reddish chert are chosen as the raw material. Among the chert variety brown and Green chert is fully dominated. Also, of quartz was extensively used at the site is 42 in number, followed

**Table 7:** Raw materials used at Rocky Knob sites.

Raw material type	Name of the Sites					Total in nos.
	KRP	PRP	LKND	PTLG	BMKL	
Brown chert	36	–	06	03	04	49
Green chert	25	03	10	16	07	61
Black chert	22	06	07	12	10	57
Grey chert	03	03	02	12	06	26
Banded Reddish chert	04	–	03	–	–	07
Agate	09	10	02	14	05	40
Chalcedony	07	20	09	05	10	51
Blueish Greyish chert	11	07	–	–	01	19
Reddish off white chert	20	15	06	06	03	50
Cherty Agate	03	10	–	02	04	19
Milky quartz	42	59	66	194	64	425
Crystal quartz	02	19	44	03	21	89
Blackish Grey chert	05	–	–	04	02	11
Yellowish Grey Agate	07	07	07	09	–	30
Coffee coloured chert	–	07	–	–	–	07
Brownish greenish chert	–	07	–	–	02	09
Off White Chert	–	–	09	–	01	10
Total	196	173	171	280	140	960



**Plate 5:** Microliths from Kumrapali.



**Plate 6:** Retouched bladelet from Purapali.

by chalcedony. On the other hand the site Purapali yielded 4 types of raw materials for manufacturing microlithic tools. Cherts of different variety were the dominating raw material. Among the Chert type Reddish chert dominated other variety. Also, the use of quartz was at 45.20%, Out

of which 11.10% is crystal quartz. There is very nominal use of Agate (5.78%) and Chalcedony (11.60%) in the assemblage). In Lohakhandi four types of raw materials were utilized for the production of microlithic tools at this site. Quartz (64.08 %) of Milky and crystal were the major



**Plate 7:** Site View of Purapali.

raw materials found to be widely used. Agate (1.17%) and chalcedonies (34.71%) were also occasionally used for the production of flakes and blade tools. Green chert (5.85%) is predominant in chert category here. Like the previous site different varieties of raw materials were found utilized at the site Pottalgaon. As many as 12 types of raw materials have been classified. Quartz was the dominating raw material in the assemblage at 70.00%, followed by the use of quartz at 24.16%. This site has nominal use of chalcedony at 1.81% and Agate at 5.04% for production of microliths. In chert type Black chert (4.33%), Green chert (4.69%) and Reddish off white chert (2.17%) have not varied in much in percentage of utilization. In Baramkela site there is also domination of chert and quartz. However black chert and green chert forms majority in the chert components. The use of milky quartz is maximum and its percentage is also very high. Agate and chalcedony are minimum used in this site.

### General Discussion on sites

The prehistoric settlements are usually found in two type of context. Such as: open air sites and rock shelter sites. Further sites are also categorized on the basis of topographic and geomorphologic feature of the sites. Geomorphologically the sites of Jira valley are classified into four types. Like the river bank sites, foot hill sites, Rocky knob sites and sites near the piedmont areas. In the Bargarh upland prehistoric settlements are found in all the contexts. However the sites near the Rocky outcrop and piedmont zone are considered to be the open air sites. The entire sites discussed in this paper are located near the rocky knobs. Hence all are the open air sites. These rocky outcrops were also quite useful for prehistoric man for obtaining the raw material for tool production. As the sites are located close to the Rocky outcrop, that

would have provided the resource for producing the various hunting tools. It can be said that some of these site were used as the manufacturing zones. Thick deposit of microliths and manufacturing debris and pattern of raw material use in rocky outcrop sites suggest that prehistoric hunter gatherer used locally available raw material for tool manufacturing (Behera and Panda 1996). Availability of raw materials might have supported the living system of this hunting community. The raw material and techno-typological analysis of the assemblages has provided us clue to understand behavioural pattern of this microlith using community. Impact of raw material abundance at the site is noticed on the Core samples, in which they are rarely found fully exploited and very often they were discarded with slight or without any discernible defects on their blank removal surface. From their exploitation strategy we can evaluate the availability or scarcity of raw material at the site. Further, import of raw material and distance covered for obtaining these can also be ascertained. Many sites of Jira valley located near the rocky outcrops are geometric in nature. These microliths are also found associated with Pebble Cobble tools. The majority of the sites discovered in lower part of Jira valley are primary in nature and still having habitation deposits. In the entire above discussed site as many as 17 types of raw material have been noticed. Chert is the most common raw material exploited by the stone knappers for manufacturing of microlithic artifacts. Prehistoric people preferred this raw materials as this type of rock produced the sharp edge and easily yield desired shape (Pradhan, 2013). The second preferred of raw material was quartz. Both fine and milky variety of quartz have been used for making tools. A large number of scrappers have been noticed which are made on quartz. As all the explored sites are located near the granitic outcrop, quartz becomes



a common raw material. In Pottalgaon and Lohakhandi there is maximum use of quartz. These two sites being predominant in quartz components, these sites have low proportion of shaped artifacts and high percentage of chips and nodules. The concentration of quartz and Chert are common in Jira valley. So these two raw materials have also produced a large number of tools in all the sites. The lithic productions at these sites are mainly focused on bladelets, though flakes predominate the blank group. Tool assemblages of these sites include Backed Bladelet and Blades, Scraper, Side scraper, End scrapers etc. In the site Kumrapali Bladelet cores have been noticed. As many as 3 to 4 Bladelet have been removed from one Core blank. Availability of other tools such as Notch and Denticulate are also very common features of the rocky knob sites of Jira valley. The geometric tools like Lunates, crescent, triangle were made on thin flakes or blades which are made of Chert or fine quartz. Burin also forms another components in tool types which are found in the sites like Kumarapali, Purapali and Pottalgaon.

### Conclusion

The Bargarh upland is quite significant in archaeological point of view. Like other part of our country this region of West Odisha was also an important area for human settlement during the Pleistocene period. The stone tool artifacts and other cultural antiquities explored from the study area shows that this area was inhabited by human being from Paleolithic period to early historic period. However the sites occupied by microlithic using communities are numerous and widespread. The exploration in the lower part of Jira valley reveals that the rocky knob available in the western part of Odisha was also a conducive area for human settlement. These outcrops hold tremendous potential for habitation. All the forgoing discussed sites clearly reveal that microliths are fairly common in highland region of Odisha and seem to represent a distinct cultural phenomenon in this region. Although the discussed assemblages do not contain exactly the same characteristic features, it should be noted that they all share many common characteristic which bind them together and justify treatment as belonging to the culture complex, while the individual features of the different assemblages may treated as intra assemblage and inter assemblage regional variation. Dense concentrations of microlithic bearing sites have been reported from Jira valley but these sites are devoid of any heavy duty tools (Thakur and Behera 2015). The procurement of raw material and lithic reduction strategy of the prehistoric man suggest that large flake blanks were brought to the site form the areas where raw materials was available and produced their tool for various purpose.

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### Competing Interests

The author has no competing interests to declare.

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