A Survey on Prehistoric Cultural Remains in Tang River Valley in Bolangir, Odisha, India

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Abstract: The present paper is a preliminary report based on surface exploration carried out in the Tang River Stream, which is a tributary of the River Undar in Bolangir District of Odisha. This exploration has brought to light as many as 5 Prehistoric settlements in semi-Primary context. The cultural remains of this region exhibits several characteristic features which are usually noticed in other river valleys of Odisha. Ample availability of raw materials adjacent to the river bank has attracted the prehistoric microlith using community to settle in this region. The area also appears to hold tremendous potential for understanding human adaptation from the Pleistocene epoch to Holocene epoch. The valley was fortunate in having such a wonderful landscape of hills rock shelters and chain of hillocks which is quite befitting to nourish a rich culture in this region. Thus, this valley has been the cradle of human activities as testified by the discovery of numerous and diverse implement types of lithic cultures.

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Keywords: Microliths, Paleolithic, Mesolithic, Core, Flake, Blade, Tang Stream

Introduction

The transition from the Middle Paleolithic to the Upper Paleolithic is considered to be one of the major revolutions in the prehistory of humankind. The various causes for the Upper Paleolithic revolution are enumerated, from the biological through the techno-cultural aspect that relies on the analogy with the Neolithic revolution. The Techno-cultural aspect of this phase is characterized by use of Microliths by prehistoric man. Microlithic industries are defined by systematic microblade or backed artefact production associated with modern humans, found in different parts of the world at different timescales. Microlithic technology varies worldwide and is often defined regionally. Microlith is used to describe small stone blades and bladelets retouched to create highly standardized shapes (backed blades or segments), or assemblages with high frequencies of small tools (Kuhn and Elston 2002). For a long time finds of microlithic tools were simply ascribed to Mesolithic period. In 1874, M. Torell began to understand this period as a transitional period between the Paleolithic and Neolithic period with microlithic geometrical tools as a prominent feature (Mellar, P. 2005, 2). Mesolithic societies relied on highly specialized economy based on hunting, fishing
and gathering (Galiński 2002, 13). It is marked by the predominance of Mesolithic artifacts comprising both small geometric and non-geometric tools. In India the term “Mesolithic” came into being with the British School of Archaeology. It was as early as 1867-68 when it was used by A. C. L. Carlyle, one of the pioneers of prehistoric research on the subcontinent, in reference to discoveries of microlithic tools. Despite the fact that in Europe Mesolithic has been of equal importance to other phases of Stone Age for a long time now, in Indian archaeology it still happens to be perceived as a transitional period (Chakrabarti 2002, 332).

The best known microliths belong to Mesolithic period. Typical microlithic artefacts are usually very abundant in Mesolithic assemblages. Possible usage of the microliths during the Mesolithic period is exemplified by several extraordinary finds of composite tools made of bone, antler or wood with lithic inserts. Thus the Mesolithic culture is the most prolific and widely distributed prehistoric cultural period in Indian sub-continent. It has been found in a wide variety of geographical situations and ecological habitats. However use of microlith was not peculiar only to Mesolithic period rather it had been used by prehistoric men from upper Paleolithic period to Neolithic period. In India, Microlithic settlements have been found in different geographical setting which covered from sand dunes of Rajasthan (Singh et al. 1974, 493-494, 497) to plain of Middle Ganga valley (Pant & Jayaswal 1991). Throughout the country such settlements are either found as open air sites or located around river valleys or rock-shelter/cave sites. The findings of microlith across the world gave a diverse timescale with diverse features. Although geometric microliths found from Howieson’s Poort in Southern Africa are dated into the Middle Stone Age, around 90000 BP, the date of microliths in India so far is only 48000BP. The antiquity of microlithic cultures in the Indian subcontinent has been pushed back to 48000 BP in Mehtakheri in Madhya Pradesh (Mishra, et al. 2013: 1-14) and 35000 BP in Jwalapuram in Andhra Pradesh (Clarkson, et al. 2009: 326-348). These sites provide a new light on technological diversity, ecological situations and human behavior in the Late Pleistocene period. Besides, the discovery of microlithic industries in Kana dated back to 46000BP and Mahadebbera dated back from 37000-28000BP is especially significant. Both these sites are located in Purulia district in West Bengal.

Various researchers worked in Stone Age culture in different parts of Orissa from time to time since 1876. Although, the systematic Paleolithic research in Orissa started only after 1939 A.D. From the first half of 20th century, an extensive and intensive prehistoric research has been carried out in the different part of Orissa. Acharya (1923-24) and Banerji (1930: 38-39) were amateur workers and their investigations were a major factor behind their realization of the wealth of the Stone Age record of the North-eastern Orissa. After Independence, G.C. Mohapatra started his research in the regions of Mayurbhanj, Denkanal, Sambalpur and Sundargarh and brought to light eight microlithic sites. Afterwards Tripathy (1972), Nanda (1984, 1985) Mohanty (1989) made valuable contributions towards this direction. The significance of Mohapatra’s work was that, it for the first time brought to light a succession of Stone Age cultures in
Orissa and demonstrated that the Paleolithic industry extended beyond the frontiers of Mayurbhanj district and flourished over a much larger area. During late 50’s and early 60’s quite a few isolated discoveries of stone age sites have reported microliths from Kaniha in Talcher sub-division by Ghosh (1958 29: 36), Baramandar, Bonaikala, Danguapasi in Keonjhar district by Mitra (1961-62: 32-37), from Tel and its tributaries and from the districts of Balangir, Ganjam, Kalahandi by Raghunath (1963-64: 27). The work of Tripathy during the early 70’s in South-western Orissa has made known several Stone Age sites from the Tel river basin. He discovered three sites of pebble tool industry, sixteen sites giving flake tool industry of Middle Paleolithic cultures and twenty seven sites of flake-blade industry (Mesolithic culture) covering the districts of Phulbani, Balangir, Kalahandi and Sambalpur. The intensive exploration carried out by P.K. Behera (1983-1984: 64-67, 1984-85: 60-61) has brought to light several Lower, Middle, Upper Paleolithic as well as Mesolithic and Neolithic sites in upper Brahmani valley and its tributaries in the Sundergarh district of Odisha. Occurrence of Late Stone Age assemblages in the Tel river valley was also reported by S.B. Ota (1982-83, 1986). The occurrence of microlithic industry in West Odisha has also been reported from the Ong valley by S. Panda (1998), in lower Ong and Suktel by S. Gadodia (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 by S. Deep (2016). Besides the above mentioned area, occurrence of Microlithic industries was also reported from the Tang stream, a tributary of the river Undar, in Bolangir district of Orissa (ref.?). In this paper an attempt has been made to discuss 5 Microlithic sites and the cultural assemblages of Tang Stream.

**Physiographical Features of the Study Area**

Bolangir district is a district situated in the western part of Odisha. It lies between 20° 11’ 40" – 21° 05’ 08" North longitude and 82° 41’ 15" – 83° 40’ 22" East latitude. The geographical area of the district is 6575 km². The town of Bolangir was founded by Balaram Deo, the 12th Raja of Patna Princely state and constructed it as the capital city of his own kingdom during the middle of 16th century. The Chauhan rule ended with the merger of the state of Patna and Sonepur with Orissa on the 1st January 1948. Sonepur was carved out as a separate district during 1993 A.D. Patna and Sonepur constituted the integrated whole of the Bolangir district. The District was formed on 1st Nov, 1949. The District has a unique geographical and environmental setting. It is bounded by Sonepur and Boudh in the east, Nuapara in the west, Kalahandi in the south and Bargarh in the north. The Bolangir district is flanked in North-west by the Gandhamardhan Hills and in the North-east by the rock infested Mahanadi river. It is traversed by many hill streams and is interspersed with the evergreen woodlands, which are the shelter of Bison, Sambar and other wild animals. The main forest area stretches along the western boundary bordering the Nuapada, Kalahandi district and then turns to the east running parallel to the Gandhamardhan range. The major hills of this district are Gandhamardhan (3,296 ft), Butel (2,670 ft), Chandli (2,630 ft), Thuta
(2,056 ft), Patpani, Bender (1,920 ft), Chhatardandi and Matkhai (2,591) etc. The Tel, Suktel, Rahul, Lanth, Udei and Ong are the principal rivers flowing in the district. The Tel River is a perennial river along the eastern boundary of the district and confluences with the Mahanadi at Sonepur. The Suktel, which emanates from the hill ranges of the western part of the district trickles through Patnagarh, Balangir and Loisingha blocks and finally joins the Tel in Subaranpur district. An interesting feature of the river system of the district is that except for the Tel which flows along the Eastern boundary of the district, the course of all other rivers is towards the northern or north-eastern part of the district.

Figure 1: Map of Microlithic Settlements of Tang Stream (Courtesy: Google Earth)

The river Tang which is a minor tributary of river Undar has its origin from a plain open scrub near the village Sindhpali in western part of the district. To its lower course it is joined by many small seasonal rivulets like Debang Nala, and Gadia Jhor on the right banks. After flowing for about more than 40 km in southern direction it joins at the left bank of the river Undar near the village Diaton. The topography of the district is from flat to undulating, having hill ranges at North-west boundary and small hillocks at some places. The drainage pattern of the district is sub-dentritic to dentritic mainly controlled by river Undar, Suktel, Lanth, Ong, Tel and other small rivulets. The area forms a part of Eastern Ghats Super group of rocks comprising of khondalite granite, calc granulite, anorthside, quartz vein and pegmatite. The climatic condition of this district is quite extreme. The summer season is too hot and the rainy season is
characterized by fairly good rainfall and a high degree of humidity. Rains in the district are caused by the south-west monsoon, which breaks out in the month of June, reaches its peak in August and then retreats in the middle of October. The average rainfall annually comes to 1443 mm. The climate of this area support mostly dry-mixed-deciduous type of forest, closely resembling that of the semi-arid and sub-tropical zone. This forest track is broken by occasional clearings and small settlements, but it mostly consists of thick vegetation in which bamboo of excellent quality grows and Sal, Sahaj (Terminalia tormentosa), Piasal, Dhaura (Anogeissus latifolia), and Ebony form the principal timber. Other important species are Bijasal (Pterocarpus marsupium), Arjun (Terminalia arjuna), and Teak. Among the minor forest products of this region are Kendu (Diospyros melanoxylon) leaf, Bamboo, Broom-grass, Mohua (Bassia latifolia) flower and seed, Antia bark and Sabai-grass (Eulaliopsis). Timber, Bamboo and Kendu leaf are the main exports from this region to other states.

![Figure 2: Overall Composition of Lithic Assemblages in Tang Stream](image)

**Figure 2: Overall Composition of Lithic Assemblages in Tang Stream**

**Lithic Assemblages in the Tang Stream**
The microlithic culture in Orissa has been reported from surface in a varied geomorphological settings viz. hill slope, foothill, river bank, within river section, caves and pedimented land surface, and waste land. However, all the explored microlithic sites of Tang Stream are found either in foothill region or on the river bank (Figure 1). The sites like Bhoipada, Jhinkidunguri, Siletpada-1 and Siletpada-2 are riverbank sites whereas the site Mahagaon is a foothill site. A total of 854 lithic components have been reported from all sites. During the analysis, a good number of finished tools have been observed from these sites. The overall lithic assemblages with various blank forms have been shown in Figure 2. It shows the overall microlithic components of Tang Stream. Cores comprise 19%. Flakes consist of 387 artefacts with 45% of total assemblages. Blades constitute 6% of the total assemblages and the percentage of
bladelets is only 7% which comprises 61 artefacts. Fragments of different distal, medial and proximal parts of both blades and bladelets form only 4% of the total artefacts collected from all the 5 sites. Chunks constitute the third largest category in artefacts with 19% which is 163 in number in the overall microlithic assemblages.

**Bhoipada (BHP)**

The village Bhoipada is located some 12 kilometers East of Bongomunda Township and the exact site is located in the left bank of river Tang at a distance 50 m from the river bank and about 1 km West of the village Bhoipada. It lies on the eroded surface of a cultivated field between 20° 20' 11.14" N longitudes and 82° 58' 09. 73" E latitude. It has an elevation of 742ft above mean sea level. This is a very rich microlithic site. The artefactual scatter spreads over an area of about 50 m² on the surface of a sandy clayey deposit. In respect of general topography and raw material, it closely resembles the site of Siletpada (see below). Artefacts were collected from the exposed surface of a small portion of the site measuring 10m x 10m which yielded 106 artefacts. The collection of microlithic components include red chert, black chert, grey chert, chalcedony and quartz of oxidized variety. The material composition consists of cores (29.75%), flakes (30.18%), blades (0.94%) and bladelets (1.88%) (Figure 3). Chunks and chips consist of 44.33% of the total assemblage. Out of 106 artefacts only 16 specimens are retouched tools. Among them, 10 are made on flakes (75%), 1 on blade and 2 on bladelets. In this site retouching has been noticed in quartz flakes. The percentage of retouched tools on blade and bladelet is very low: most of the tools are made on flakes. Fragments are also quite negligible except single piece in distal category.

![Figure 3: Backed Bladelets from Bhoipada](image)

**Jhinkidunguri (JKD)**

This site Jhinkidunguri is located on the right bank of the river Tang and some 13 kilometers South-east of Bongomunda Township. The exact site is situated near a small rocky knob and about 40 m from the river bank. It has an elevation of 715ft above mean sea level. It lies between 20° 18' 50.73" N longitudes and 82° 57’ 15. 68” E latitude. The artefacts in this site scatter in the form of small clusters which were found exposed on the eroded surface on rocky knob. The site spreads over an area of 30 m². Sampling of artifacts was done from a small area measuring 10 m x 10 m which yielded a total of 98
specimens. This site has greater concentration of milky quartz. Besides, the collection of microlithic component includes chert, and quartz of fine variety. The assemblage composition of microlithic components consist of cores (20.40%), flakes (47.95%), blades (8.17%) and bladelets (5.10%) (Figures 4 and 5). Chunks or debris are only 18.38% of the total assemblage. Bladelet cores have been noticed in this site from which more than 6 bladelets have been removed from one core. Out of the total assemblage 20 artifacts are retouched tools, with 60.33% made on flakes, 25.66% on blades and only 5% on bladelets. In this site also flakes have been maximally used for tool production. The percentage of retouched tools on bladelet blanks is very low but in blade category it is quite high: 62.50% of blades are retouched. As far as the fragments are concerned all category show equal percentage i.e. 3.03%.

Figure 4: Cores from Jhinkiduguri

Figure 5: Notched Tools from Jhinkidungri
Siletpada - 1 (SLP-1)
The microlithic industry of Siletpada-1 is found at the left bank of river Tang near a rock sheet close to the river (Figure 6). The exact site is located 2 km west of the village Siletpada. It has an elevation of 696ft above mean sea level. It lies between 20° 16' 56.40” N longitudes and 82° 58' 53.18” E latitude. The site spreads over an area of 75 m². Thick deposit of microliths has been noticed near a crop field but due to heavy cultivation close to the site, this site is partially destroyed. The artefacts scatter throughout the cultivated field. Some small clusters were found exposed on the surface of the rock sheet. A total number of 285 specimens were collected from a small area measuring 20 m x 20 m which are made on chert of different colour, quartz, chalcedony etc. The assemblage composition of microlithic component consist of cores, 21.40%, flakes, 51.57%, blades and bladelets, 8.07% and 7.01% respectively (Figures 7 and 8). Chunks or debris are only 11.95 % of the total assemblage. Out of 285 artefacts, 40 are retouched tools. Their blanks are mostly flakes (56.56%), then blades (6.78%) and bladelets (6.33%). In this site also flakes (Fig.7) have been maximally (34.78%) used for tool production followed by bladelets which are only 30% of the blanks. Retouching has also been observed in all the fragmented components. 10 fragmented specimens have been noticed, of which 5 distal, 3 medial and 2 proximal parts.

Figure 6: General View of Site Siletpada - 1
Siletpada - 2 (SLP-2)
The site is located just about 400 meters south of previous site, on the right bank of the river Tang, 1.5 kilometer west of the village Siletpada. It lies between 20° 16’ 48.06” N longitude and 82° 59’ 15.96” E latitude, at an elevation of 706ft above mean sea level.
The artefacts occur in the form of small clusters exposed on the eroded surface, over an area of 25 m². Sampling of artefacts was done from a small area measuring 15 m x 15 m which yielded a total of 263 specimens. At this site also artefacts are made on grey chert, chalcedony and quartz. The assemblage composition of microlithic components consist of core (13.31%), flake (42.20%), blade (6.46%) and bladelet (10.26%) in total (Figures 9 and 10). Chunks and debris account for only 23.19% of the total assemblage (61 items). Out of 263 artifacts, 38 are retouched tools, among which flakes represent 50%, blades 21.05% and bladelets 18.42%. In this site bladelets made of fine quartz have been used for tool production. However tools are dominated by the flake components. No retouching has been noticed in core components. As many as 6 distal fragments, 3 medial and 3 proximal were found in fragments category.
Mahagaon (MHG)
The microlithic site of Mahagaon is located approximately 300 m away from right bank of river Tang, about 1 km south-west of the village Mahagaon. The site is found on the eroded surface of the hill slope. Its longitude is 20° 14’ 12.50” N and latitude is 83° 01’ 06.77” E. It has an elevation of 657 ft above mean sea level. The microlithic artefacts are scattered in the form of small clusters on the surface of foothill over an area of about 40 m². Weathering of quartz is also seen in many places around the hill. This site is partially destroyed due to a neighbouring quarry. Sampling of microliths was done from a small area measuring 15 m x 15 m which yielded a total of 102 specimens. At this site, also the microlithic artefacts are made on black chert, grey chert, red chert, chalcedony and quartz of fine and milky variety. However, black chert is dominating here. The macrolithic composition consists of cores (21.56%), flakes (49.10%) (Figure 11), blades (0.98%) and bladelets (6.86%). Chunks and Chips consist of only 18.62% of the total assemblage. Out of 102 artefacts, only 23 are retouched tools, of which 73.2 % are made on flakes, 4.3 % on blades and 17.4 % on bladelets. The percentage of retouched tool on blades is very low in comparison to bladelets but anyway, in this site most of the tools are made on flakes. Fragments are also quite negligible except a single piece in distal category.

![Flakes from Mahagaon](image)

Figure 11: Flakes from Mahagaon

Lithic Analysis and Tool Types
The analysis of lithic artefacts reported from Tang streams reveals a number of retouched tools (Table 1). These microlithic assemblages show similarity of flakes, from which mostly the bigger ones had been chosen for retouch. To obtain desirable and final tools various forms of secondary retouch techniques had been used, with high domination of edge retouch. As Deetz (1967:51) suggests, the main aim of typology is to enable comparisons to be made between the material from one site and that from others. Interpreting and explaining numerical variance in artefact assemblages has not played an important role in lithic analysis, rather this
measurement has much to offer in understanding prehistoric behaviour. Variance in microlithic assemblages is examined to understand the changing behaviour of men in hunting strategies from the Early-to-Later Mesolithic transition. Prehistoric men used various types of microlithic tools since the Upper Paleolithic to Neolithic period. Hence, it is a particular cultural phase which continues for a long period of time. In this cultural phase there is also a sequential variation in use of raw materials as well as technology for its production. It is argued that Early Mesolithic microliths were produced in large numbers ahead of time within a reliable weapons system focused on intercept hunting. While Later Mesolithic microliths were produced in smaller batches as needed, within a maintainable System optimized for encounter based hunting (Myers 1987).

The study examines metrical Variability within and between collections. It has great relevance to cultural evolution and other theories of culture change. Variance or within type Variability has received little direct attention in the archaeological literature. The categories of microlithic Points, Burins, and Backed blades, all of which correspond to specific techniques of manufacture, appear to be discrete functional units, whereas the formal categories of knives, side-scrapers, end-scrapers, borers, and axes, all of which are less discrete technologically but defined more by shape and location of retouch, show varying degrees of functional heterogeneity (Odell, 1981). As far as manufacturing techniques of microliths of the Tang Stream are concerned a careful examination of cultural assemblages show that they were produced by various techniques like pressure flaking, direct or indirect percussion and retouching techniques. Usually the tools were prepared on small flakes and blades. Further, the finished artefacts like scrapper, point, borer, burin, notch and lunate were often produced from cores, flakes and blades. For the production of these tools microlith using community used to apply minute and careful intentional retouching.

A total of 137 tools have been noticed in all the sites of Tang Stream. The Table 1 shows various tools which are made on flakes, blades, bladelets and blade-bladelet segments, among which a large majority appears on flake and bladelet blanks. Among the various finished tool types, a good number of tools belong to backed category and typical microlithic forms like scalene triangle, isosceles triangle and lunate. This is considered to be one of the important typological features of these industries. There are 14 burins of various types in this group. Significantly the group is also represented by a few finely made micro burins and their products. Notches (15.33%) and marginally retouched tools (8.02%) are dominant in all the sites. Scrappers of different varieties are also found in good number (16.79%) and are dominating the tool types, especially in the sites of Siletpada and Jhinkidungri. They include side scrapers, transverse scrapers, end scrapper, and concave scrapper. Although the percentage of borers and burins is very low still it bears its own unique characteristics. The number of finished tools is higher in both the Siletpada sites. Only a few tools are found in Bhoipada site. Notch occupies the first position among the tool types followed by denticulate (12.40%).
Table 1: Tool Typology of Tang Stream

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Tool types</th>
<th>Name of the sites</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SLP-1</td>
<td>SLP-2</td>
<td>JKD</td>
</tr>
<tr>
<td>1</td>
<td>Side scrapper</td>
<td>6</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Concave Scraper</td>
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<td>1</td>
<td>1</td>
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<tr>
<td>3</td>
<td>End Scraper</td>
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<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Transverse scrapper</td>
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<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Transverse scrapper + Notch</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Notch</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Denticulate</td>
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<td>4</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Double denticulate</td>
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<td></td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Denticulated top</td>
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<td></td>
</tr>
<tr>
<td>10</td>
<td>Awl</td>
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<td>4</td>
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</tr>
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<td>11</td>
<td>Borer</td>
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<tr>
<td>12</td>
<td>Awl + Marginally retouched</td>
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<td>Partially Retouched</td>
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<td>15</td>
<td>Axial Dihedral Burin</td>
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</tr>
<tr>
<td>16</td>
<td>Offset Burin at butt</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Offset Dihedral Burin</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>18</td>
<td>Transverse burin</td>
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<tr>
<td>19</td>
<td>Scalene Triangle</td>
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<td>20</td>
<td>Backed Bladelet</td>
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<td>21</td>
<td>Isosceles Triangle</td>
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<tr>
<td>22</td>
<td>Lunate</td>
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<td></td>
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<tr>
<td>23</td>
<td>Retouched top</td>
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<td>2</td>
</tr>
<tr>
<td>24</td>
<td>Retouched on butt</td>
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</tr>
<tr>
<td>25</td>
<td>Retouched on lateral side</td>
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</tr>
<tr>
<td>26</td>
<td>Convex baked Point</td>
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<tr>
<td>27</td>
<td>Baked Lateral side</td>
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</tr>
<tr>
<td>28</td>
<td>Truncated Blade</td>
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<tr>
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<td></td>
<td><strong>40</strong></td>
<td><strong>38</strong></td>
<td><strong>20</strong></td>
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</table>

Various types of denticulates have also been noticed such as simple denticulate, double denticulate and denticulated top. Notches are even observed in bladelet components. Another important tool type, the awl (7.29%), is seen in all sites though its percentage is low in comparison to scrappers and notches. Third position is occupied by marginally retouched (8.02%) and partially retouched (5.83%) tools. Baked points have
been observed in bladelet category only in Jhinkidunguri and Bhoipada (Figure 12). The number of borers (1.46%) is also very low and they are found only in Siletpada. The site Mahagaon has also yielded similar types of tools as it is seen in Bhoipada and Siletpada. The following table shows the tool types collected from Tang River Valley.

![Figure 12: Retouched Quartz Flakes from Bhoipada](image)

**Raw Materials Used in Tang Stream**

The geological formation in the study area includes the Achaean and Cudappah formations. The crystalline rocks like khondalites, granite gneisses, charnockites, quartzites and anorthosites, which are devoid of primary porosity, occupy about 95% of the area of the district. These are the most predominant rock types occurring in the undulating plains and topographic lows. The area is very rich in Quartzite river pebbles, cobbles and boulders. Basically, five types of raw material have been observed in the explored area, such as Chert, Quartz, Chalcedony, Agate and Quartzite (Figure 13). Therefore, microlithic sites located close to the river were dominated by chert as the main raw material. Chert, Chalcedony, Agate were the most preferred raw materials in this regions. Quartz is also the dominant material and exceptionally also quartzite were used. Use of quartz as a raw material dominates at the sites located away from the river and near to the granitic rocks, bedrock or hills. It is observed that quartz is used most abundantly in the developed microlithic phase. In the case of chalcedony, it was the major raw material found in the Tang valley but its use is minimal. In no site we can find the use of jasper, opaline silica, and limestone as raw material. Quartz has very large crystals which produce sharp edges after breaking. So it is the most dominating material and is found all across the river valley. There are three types of quartz common in this area such as crystal quartz, oxidized quartz and milky quartz. The major raw material sources of this phase were river pebbles and hill slope nodules.

![Figure 12: Retouched Quartz Flakes from Bhoipada](image)
Concluding Remarks
The main purpose of this article was to outline the cultural situation of Microlithic phase in Odisha. The above discussed cultural assemblages from the Tang River are considered as belonging to the Microlithic cultural phase. The presence of typical microlithic forms like cores of various types, blades, bladelets and geometric tools are testimony of this cultural phase. The sites occupied by the microlith-using communities are numerous and widespread in this region. The majority of the prehistoric sites in the study area were found on the river bank and along the foothills. Older surfaces, pediments are exposed on the river bank sections of Tang River due to heavy erosion. These exposed sections are quite helpful in identifying the microlithic artefacts. The river Undar and its small tributaries like Tang stream are covered with small hillocks and forest tracts. Such a favourable environment might have attracted the prehistoric man to this locality for seasonal hunting or gathering. Prehistoric people
of this region had a mobile lifestyle moving across the landscape in search of various resources starting from raw material procurement to hunting-gathering and collecting of food items. Gradually they might have changed their mobility. In due course of the time the hunter-gatherers must have come down from the rock shelters to the rocky plains, and foothills for their survival. As this area is rich in diverse kinds of flora and fauna, the microlith-using community might have exploited these resources by using some new techniques, and skills. They might have collected forest product or made them eatable. It is observed that wherever the ancient surface is exposed most of the sites are found from those areas which have undergone erosional activities or partly been destroyed by the modern construction or habitation (Padhan T. 2014).

The available granitic outcrops and rocky knobs on the bank area of Tang provide a suitable natural floor for settlements. The tools, which are found in the Tang Valley provide a suitable natural floor for settlements. The change in tool technology, their sizes, shapes and forms suggest the ways of exploitation of certain types of food items or even possibility of change in subsistence pattern with a developed stone tool technology and wider choice of exploitation of larger variety of flora and fauna and other eatables. The occurrence of these tools suggests that the encampments were temporarily settled during the Microlithic phase, most probably for hunting purposes. The presence of cores, debitage flakes and waste pieces indicate that the tools were manufactured locally. At present the mobility patterns of the last hunter-gatherers can be established only on the basis of the circulation of the raw materials employed for the manufacture of the tools. Perhaps there was an increase in population among the microlith-using communities and they would have been able to use sophisticated method in hunting as well as gathering. They would have dispersed themselves to different places of this valley. Dispersed tribal communities are still there in present India, pursuing traditional economies, based on fishery, hunting and gathering, for this reason it can be assumed that natural resources available in this region enabled hunter-gatherers to enjoy sufficient independence for hunting. So availability of raw materials and use of advance technology in this region forced the prehistoric hunter and gatherer to settle in this valley. The copiousness, quality and form of raw materials available play a very significant role in the lithic technology.

Andrefsky (1994: 21-34) argued that the availability of lithic raw materials might be the most important factor in the organization of technology that influenced the settlement configurations. Thus the procurement of raw material and lithic reduction strategy of the prehistoric man in this area suggest that large flake blanks were brought to the sites from the areas where raw materials was available and were reduced to produce their tools for various purposes. However, the exact chronology of the Microlithic culture in Orissa has not yet been established. Although a large numbers of sites have been discovered in different parts, most sites are basically reported from a secondary context. Large scale excavation has not been conducted so far to fix the date of microliths in this region. Further, it is also not possible to identify chronology of microliths on the basis of typological features of the lithic industries. Formulating
typology of Microlithic assemblages has not been successful as yet, despite few attempts (Ray 1975; Misra 2009). In addition, the inadequacy of comparing artefacts from two different not related regions and basing chronologies on those results has to be stressed. Although the discussed assemblages do not contain exactly the same characteristic features, it should be noted that they all share many common characteristics. Further research in the region will be aimed at the discovery of stratified sites, the definition of their absolute chronology, and the study of the subsistence economy and mobility patterns of the populations that inhabited the area around the beginning of Holocene.

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