Microlithic Assemblages of Tapaban Pahar: An Emerging Mesolithic Site of District Bankura, West Bengal

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ABSTRACT: The Mesolithic of the Indian subcontinent is still an argument and of debatable by several authors. On the Indian background the term "Mesolithic" came to life with the British School of Archaeology. It was as early as 1867-68 when the term used by A. C. L. Carleyle, one of the pioneers of prehistoric research on the subcontinent, in reference to discoveries of microlithic tools. In 1939, N. G. Majumdar first recorded the Microlithic assemblages of West Bengal from Durgapur which lies to the North of Bankura district. The present article is an endeavour to understand the typological and technological characterization of Mesolithic assemblages collected from the 'Tapaban Pahar' site (near the famous palaeolithic site of Siulibona) of district Bankura, West Bengal. The study tried to explore and analyse the assemblages revealed from the site 'Tapaban Pahar' which seems to be an inclusion of Mesolithic sites in eastern India and particularly at Bankura district of West Bengal. Four consecutive years of field study equipped with surface collection and very short digging greatly resulted in a varied collection of artifacts and tools but the site mentioned above provided only an assemblage of only microliths.

INTRODUCTION

The term, 'Mesolithic' has made its first appearance in 1872, when it was used by H. M. Westropp to describe the hunting stage in his evolutionist view of human society development (Rowley-Conwy 1996). In 1874 due to M. Torell it began to be understood as a transitional period between the Paleolithic and Neolithic with microlithic tools as a prominent feature (Milner and Woodman, 2005). But it was not until the 1930's when it was popularised by the works of J. G. D. Clark ('32, '36) and since then the term has started to be commonly used. As time passes the meaning underwent two major changes. Initially it was determined by its typological-technological aspect; afterwards economical-environmental approach was also considered. The former assumed the presence of microliths as a determinant of Mesolithic culture, while the latter highlighted the economical adaptations to the changed environment. In this regard few notable points were raised by some scholars who made the distinction between "mesolithic" and "microlithic" (Sali, '90; Mohanty, 2000; Sinha, 2009). It was well put by V. Jayaswal who stated that "microlithic technology may be identified as the diagnostic character of Mesolithic, but it is not synonymous to Mesolithic" (Jayaswal, 2009).

On the Indian background the term "Mesolithic" came to life with the British School of Archaeology.

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It was as early as 1867-68 when it was used by A. C. L. Carleyle, one of the pioneers of prehistoric research on the subcontinent, in reference to discoveries of microlithic tools. He understood it as a period of "alleged hiatus" between Paleolithic and Neolithic (Binford, '68; Misra, 2002).

Climatic changes on the turn of the Pleistocene and the Holocene played a fundamental role in the formation process of Mesolithic in Eurasia. Relying on data acquired from palinological research from Rajasthan and Ganga Valley and cores from Arabian Sea, it is possible to identify several climatic phases during the late Pleistocene and the Holocene. Shortly before the beginning of the latter (equivalent to Dryas III in Europe) the climate was much drier than at present, which manifested by dune formation in north-west India among the others. It is worth noting that while in eastern part of India (Ganga Valley) increase in rainfall was related to the summer monsoon, in the dry western region it was the winter time, which experienced more intensified rainfall (Prasad and Enzel 2006; Sharma *et al*., 2004). After the phase of amelioration, climate became drier, similar to present.

The Mesolithic of the Indian subcontinent is still an argument of debate by several authors. G. L. Possehl (2003) believes that "confusion over the definition of Mesolithic settlement and subsistence versus typology has mudded much writing on Indian sites with microlithic technology". In contrast, Misra (2002) suggests that "the Mesolithic or Middle Stone Age represents a transition, lasting only a few thousand years, between the Palaeolithic or Old Stone Age, spanning half-a-million years, and the Neolithic period", while Allchin *et al.* (1978) considered that "the Mesolithic is a more comprehensive cultural term, as it designates their position in the industries of hunting groups, or communities partly dependent upon hunting, in many cases overlapping in time with settled agricultural and urban communities".

Even though there is little doubt that the stratigraphic sequence of the first post Pleistocene communities of the Indian subcontinent can be traced within the deposits of a restricted number of sites which are distributed in various geomorphologic and climatic environments (Misra, '73, '85; Sharma *et al*., '80; Sali, '89), their absolute chronology is stll poorly known. The results obtained so far cover a period of a few millennia (Misra, 2001). This might be also due to the small number of radiocarbon dates, the high standard of deviation among the results, and the different materials and laboratories in which the samples have been processed (Agrawal, '85; Chakrabarti, '99). Nevertheless, the new assays from the site of Inamgoan near Pune would suggest that "the beginning of the microlithic industries can therefore be assigned to c. 10,000 BC", that is, to the Early Holocene (Misra, 2002).

In 1939, N. G. Majumdar first recorded the Microlithic assemblages of West Bengal from Durgapur which lies to the north of Bankura district. Later, H. C. Chakladar discovered several microlithic clusters while exploring some parts of the districts of Midnapur, Bankura and Burdwan. B. B. Lal excavated the site of Birbhanpur and explored many potential microlith bearing areas viz. Dejuri, Malandighi and Gopalpur. From 1960-61 onwards, the districts of Bankura, Burdwn, Birbhum, Midnapur and Purulia were surveyed for several seasons by the Directorate of Archaeology and Museums, Government of West Bengal. During their survey the DAM traced several microlith yielding sites such as Paharghata, Jaljali, Bharatpur, Babladanga, Dhankura, Ramnathpur, Biribari, Bankajor, Kushbona, Siulibona, Metela, Simulberia and Hapania. Besides these, Mitra ('57-'58) and Ghosh and Basu ('69) and Ghosh and Chakrabarty('68) also reported some microlithic sites like Chiada (on the bank of the Kumari) and Jhilimili in Ranibandh P.S.

For the present study a systemic survey was undertaken in the Tapaban Pahar (hill) region of Gangajalghati, Bankura near the famous hill Susunia and the famous site Siulibona (Tarafdar *et al*,. 2012-2013). The area is a newly identified Mesolithic site and is situated in the left bank of river 'Sali' which is an important tributary of river Damodar and flows in the northern part of district Bankura. The field study was carried out throughout four successive years from 2009 to 2012 during the months of January to February. The tools were mainly found and collected from the surface areas so it was convenient to conduct field work specifically in winter for more availability of tools and raw material due to dry weather and perfect soil condition. For the present study 164 well finished microliths are considered among more than

450 of such tools collected from that particular site during the field work of four consecutive years.

GEOMORPHOLOGY

Geomorphologically the upland Bengal belongs to a compact geophysical unit lying between Chotonagpur Plateau and Lower Ganga Basin (86°-87° 30′ EL; 24°-22° 30′NL) which is basically a plateau pane plane region. The tract is bounded by the Purulia-Dhalbhum upland on the west and Rupnarayan plain on the east. The district Bankura is divided in to three geomorphic categories- (i) the hilly zone of west, (ii) the undulating red soil area of the centre and (iii) the alluvial flat plain in the east (Neogi, 2011). The studied area, i.e., Tapaban Pahar (hill) is situated in the north-western part of the district. A major part of the north-western zone, being an extension of the Chotanagpur plateau is of Lower Gondwana formation. A number of doleritic dykes of the Mesozoic age are found cutting across the Gondwana rocks and the Archaean formations in the north-western parts of the district.

Chronologically, the geological history of the region may be arranged as follows:

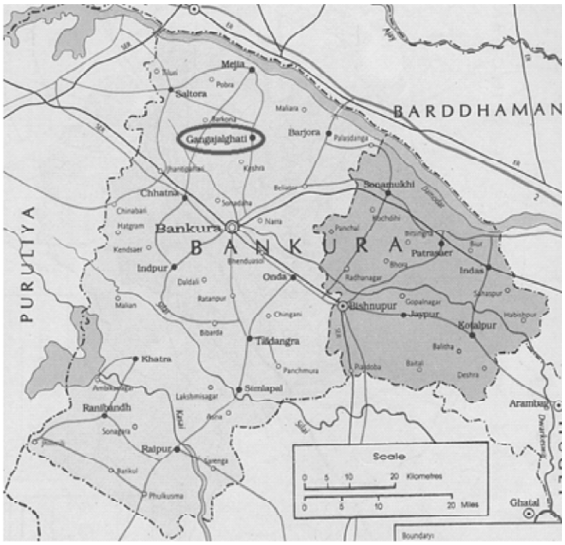
Recent	–	Alluvium
Pleistocene	–	Laterite
Oligocene-Miocene	–	Sandstone, gravel and conglomerate
Permian (Lower Gondwana)	–	Sandstone and Shale
Archaean	–	Dolorite, etc.

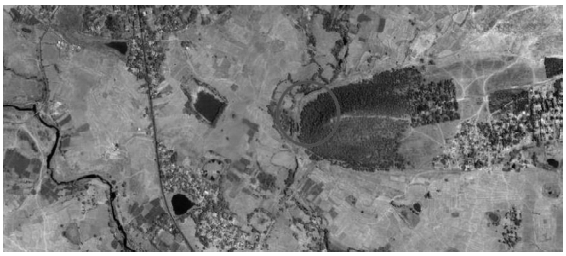
(*Source*: Chattopadhyay, R. K. 2010)

SITE AND STRATIGRAPHY

Tapaban Pahar (Lat: 23°38´88´´ Long: 87°11´61´´) is a hilly terrain lies on the left bank of river Sali. Administratively the area situated in the Gobindodham Gram Panchayat under Gangajalghati block of district

Bankura, West Bengal. The above site is formed as a result of volcanic eruption and having the evidences of Mesolithic industry nearly one square kilometer area. The entire area is on hill slopes which are not substantially spread but very roughly steep in its contour. Hill slopes are filled with the tropical





Satellite picture of the studied site (red circle) showing river *Sali* in the left
(*Source*: google satellite map)

deciduous trees with gravelly and sandy undulated surface. The collection of microliths was made from that surface.

The assemblages of the site distributed in scattered way surrounding the hill slopes, gullies and palaeo-channels. In general, they were collected within one meter thick or so, alluvial-colluvial debris of fragmented quartz, interspersed with silt and clay sedimentation embodies the lithic industry. The top horizon shows one meter thickness of calcareous clay-sand deposition (Chattopadhyay, R.K. 2010).

TYPOLOGICAL AND TECHNOLOGICAL STUDY ON COLLECTED MICROLITHS

The microlithic assemblages of Tapaban Pahar are well versed with various raw material and typo-technological features. Chert is the most common raw

Figure 1 & 2: Tapaban Pahar, the emerging mesolithic site of West Bengal

material exploited for manufacturing microlithic artifacts and for producing desired tools. The other materials, in descending numerical order, are jasper, quartz, rock crystal, chalcedony, basalt, white dolomite and dacite (Fig. 3). The collected tools made on quartz are of two types, one is white in colour and another is green. Fig. 4 shows the two division of the quartz on the basis of its colour. The white part indicates the tools made on white quartz where as the green part signifies the tools made on green quartz.

Microliths considered for the present study are conspicuously dominated by blade (20.12%), point (18.29%), scraper (17.68%) and burin (13.41%) along with Backed Blade (06.71%), Lunate (07.93%) and Triangle (03.05%) (see Table 1). Both geometric and non-geomatric microliths revealed from the present site although the percentage of the former is considerable less than the later. Among the total 164 identified tools only few are geometric in shape. Point should be noted that geometric shape of microliths is obviously advance than the non-geomatric one. More existence of non-geomatric form of microliths exemplifies once again the fundamental feature of most of the mesolitic sites of India (Sosnowska, 2011).

Blade: The assemblages of well developed blade tools (also known as micro-blade or blade lets on microliths) are one of the most remarkable features of the site. The blades of different shapes and sizes had been struck off from variety of cores. A few cores, especially the fluted one, indicate that the blades were removed in one of several ways: in one direction, in two directions either from one end and side or from both ends, in three directions or sometimes in multiple directions. The blades and flakes have been removed by a soft hammer of bone or wood, by the punch, or by pressure technique. All the blades having the common feature of two parallel sides along with blunted one side in some of the tools presumably unfold the application of blunting technique. Most of the collected blades are made on chert, jasper, quartz

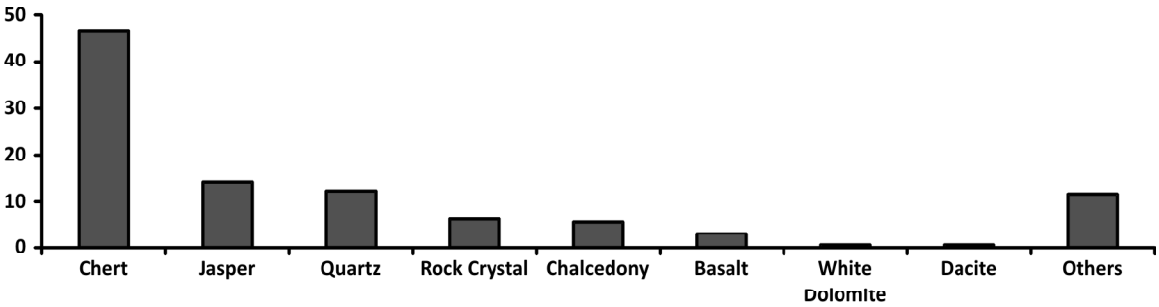


Figure 3: Distribution of the collected tools on the basis of raw materials

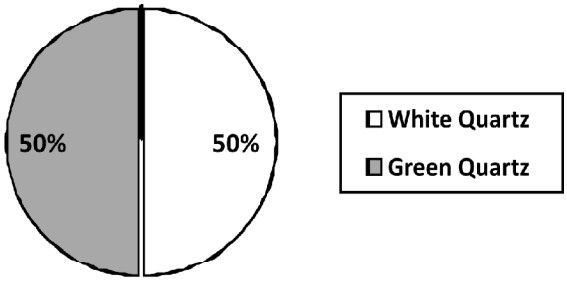


Figure 4: Division of quartz made tools on the basis of colour

and chalcedony (Table 2). Including backed blade a total of 44 (26.83%) finished blades were identified from the total collected assemblages of Tapaban Pahar region which appear to be the highest number of same category of microliths depicted from the site (Table 1). Out of the 44 microblades 33 are blades and 11 are backed blades. 42.42 per cent of total collected blades and 45.45 per cent of the total collected backed blades are made on chert. Apart from chert the other identified raw materials used for making blades are jasper, chalcedony, quartz, rock crystal and basalt. The lowest range of length, breadth, thickness and weight of the collected blades are 1.1 cm, 0.7 cm, 0.1 cm and 0.26 gm respectively. Whereas, the highest range of the same are 4.2 cm, 1.9 cm, 0.9 cm and 6.79 gm (Table 3). The blades are mostly with sharp edging in one or both of the parallel sides. Concave blade, blade with the scraping end and predominance of the unifacial blade are the important features of the assemblage.

Burin: Fine finished burin is another important aspect of the industry. The burin (also known as micro-burin on microliths) can be easily identified by its chisel like shape. 13.41 per cent of the total collected tools are identified in this category (Table 1); these are the fourth largest assemblage of microliths under the study where burin notch is distinctively present in each of the selected tool. According to their length, breadth, thickness and weight the collected burins are ranging from 1.1 cm to 4.2 cm, 0.8 cm to 2.5 cm, 0.2 cm to 0.7 cm and 0.28 gm to 4.66 gm respectively (Table 3). Most of the bruins were made on chert (50.00%) but jasper, quartz, rock crystal and dacite were also used for manufacturing such tools (Table 2). Like the blades most of the burins are also typologically unifacial having single notch on one side of the working edge. Although rare but occurrence of bifacial burin is also identified. Generally the burin features very prominent and perfect contour but some of them have less perfection might be due to workers less accuracy during the entire manufacturing procedures while making such advance shaped microliths.

Point: Generally point is manufactured on small or large flake after necessary trimming on its working end and a convenient hafting presumably make it ready for exercising hunting and fishing. There are five different categories of points collected from the site area. Among the 30 total identified points 30.00 percent is micro point, 16.67 percent is backed point, 43.33 per cent is arrow point, 06.67 per cent is shoulder point and 03.33 per cent is leaf point (Table 1a). Micro points are mainly made on chert (66.67%) but there are also existence of chalcedony and quartz made micro points (Table 2). The lateral margins of micro points are converging towards the pointed working end. The length, breadth, thickness and weight of the collected micro points ranges from 1.3 cm to 2.9 cm, 0.7 cm to 1.1 cm, 0.1 to 0.4 cm and 0.29 gm to 1.40 gm respectively (Table 3). The backed points are mainly made on brick red jasper but the same made on chert, chalcedony and quartz are also in the collection (Table 2). Some of the backed points are curved in nature and projected on the hafting end. Primarily unifacial variety is identified having retouching at the effective end of the longitudinal edge, although rare but the existence of bifacial backed points is also noticeable. The length, breadth, thickness and weight of collected backed points vary from 1.2 cm to 2.7 cm, 0.6 cm to 1.1 cm, 0.2 to 0.5 cm and 0.33 gm to 1.41 gm respectively (Table 3). The arrow points collected from Tapaban Pahar site are mainly made on quartz (38.46%) and rock crystal (23.08%). Chert (15.38%), jasper (07.69%) and basalt (07.69%) were occasionally used to make the above varieties of microliths (Table 2). Arrow point usually fixed at the tip of an arrow and used for hunting and fishing. Impression of few retouching is present at the both side of the edge but the tang portion of the collected arrow points is not well developed. The length, breadth, thickness and weight of the collected arrow points range from 1.6 cm to 2.9 cm, 0.8 cm to 2.1 cm, 0.3 to 0.9 cm and 0.52 gm to 5.85 gm

respectively (Table 3). Two well finished single shoulder points are also found from the site under study. These shoulder points are made on chalcedony and hafting portion of these points is well developed. The length, breadth, thickness and weight of the comparatively larger single shoulder point are 1.7 cm, 0.7 cm 0.4 cm and 0.46 gm respectively. While, the length, breadth, thickness and weight of the comparatively smaller single shoulder point are 1.4 cm, 0.5 cm, 0.3 cm, 0.27 gm respectively (Table 3). One well finished leaf point was also collected from the site. Morphologically the point has some resemblance with small leaf as the name implies. The length, breadth, thickness and weight of the collected leaf point is 2.2 cm, 0.8 cm, 0.2 cm and 0.44 gm respectively.

Scrapers: 17.68 per cent of the total collected microliths (Table: 1) are identified as scrapers those were manufactured for scraping bark of trees, dressing of the wooden or bamboo shafts and skin of hunted animals. The total selected scrapers are typologically categories in to four (4) sub-divisions viz. (a) side scraper, (b) nose scraper, (c) thumbnail scraper and (d) keeled scraper on the basis of shape, nature and position of the cutting edge for diversified usages. Percentage of the side scraper (41.38%) is highest among the above stated typological sub-divisions.

Most of the side scrapers are made on chert (41.67%) but basalt, jasper, quartz and rock crystal were also used to produce side scrapers (Table 2). Sharp retouching are found in both of the surfaces intrinsically towards the effective end . On the basis of their length, breadth, thickness and weight the collected side scrapers vary from 1.5 cm to 2.7 cm, 1.0 cm to 1.8 cm, 0.2 cm to 0.7 cm and 0.78 gm to 2.17 gm respectively (Table 3). Nose scraper consists 31.03 percent of the total collected scrapers. These are more elongated in shape where scraping end is in the upper direction and semi circular. Most of the collected nose scrapers are made on chert (77.78%) and a few are made on rock crystal (Table: 2). According to their length, breadth, thickness and weight the collected nose scrapers range from 1.6 cm to 3.3 cm, 1.5 cm to 2.2 cm, 0.2 cm to 0.6 cm and 0.74 gm to 3.50 gm respectively (Table 3). Thumbnail scrapers are very small in shape and have resemblance with the thumb of the human finger. 20.69 per cent of the total collected scrapers are identified as thumbnail scraper (Table 1b). These are mainly made with chert and jasper but quartz was also used to produce it (Table: 2). The cutting edge is semicircular fashion. The length, breadth, thickness and weight of collected thumbnail scrapers vary from 1.1 cm to 2.0 cm, 1.6 cm to 2.1 cm, 0.3 cm to 0.7 cm and 0.74 gm to 3.50 gm respectively (Table 3). Keeled scraper is another important Mesolithic tool found from the site under the study. Only two keeled scrapers were collected which seems to be made up with jasper; one of them is significantly well-finished thus produced a good workmanship (Table 2). The unearthed keeled scrapers are bifacial in nature and show some fluted scars towards the working edge in both of the surfaces. The length, breadth, thickness and weight of the comparative larger keeled scraper are 2 cm, 1.6 cm, 0.6 cm and 1.41 gm respectively. The length, breadth, thickness and weight of the comparatively smaller keeled scraper are 1.3 cm, 1.1 cm, 0.5 cm and 0.71 cm respectively (Table 3).

Lunates collected from the site are mainly of crescent shape which is more advance type of Microliths. These are slightly curved and pointed towards effective end and mainly made with chert and jasper. Among the total thirteen collected lunates, seven are made with chert and two are made with jasper, whereas the others are made with chalcedony, rock crystal and basalt. The length, breadth, thickness and weight of the collected lunates varies from 1.5 cm to 4.0 cm, 0.5 cm to 1.5 cm, 0.2 cm to 0.6 cm and 0.30 gm to 2.60 gm respectively (Table 3). Mainly the identified lunates are bipolar in feature. Technologically, the pieces were manufactured on bladelets. Functionally the tools were utilized as either in arrowhead, or as a transverse arrowhead coated with poison for hunting or those also used for making composite microliths also known as microliths-per-excellence.

Triangle: Triangles are another advance type of microlith collected from the site. Like the crescent shaped lunates, the triangles are also considered as the geometric shape of microlith. Triangles might be used as scraping purpose or as a part of arrow point. 03.05 per cent (Table 1) of the total collected microliths identified as triangles which are mainly made on chert (40%), jasper (20%), quartz (20%) and

rock crystal (20%). According to their length, breadth, width and weight the triangles have ranges from 2.7 cm to 3.1 cm, 1.9 cm to 2.4 cm, 0.2 cm to 0.8 cm and 1.52 gm to 3.86 gm respectively (Table 3).

Others: In each year of field work a substantive quantity of tools collected from the site but it was rather a tough job to categories them in any of the existing tool families. Composite character with presumably multipurpose working features make harder for any sort of exact categorization. Most of them were manufactured on chert (57.14%). Among the total 21 of such kind of tools two have resemblance with trapeze but due to less perfection of conventional shape it would be justified to state them trapeze like tools. Another tool identified with composite morphological character of blade and burin with sharp working edge like scraper in one side and another blunted edge having resemblance with knife, it also has a notch like portion with sharp trimming in the scrapping edge. Two of the tools have more or less similar with end scarper but one of them has less perfection in its working edge presumably for erosion, another more accurate in its shape and effective edge but it might also be experienced by weathering and patination. Three of the identified artifacts have similar structure with wide flat and sharp working edges having diversified lateral sides but they do not show any similarities with any of the conventional microlithic tool typology. Another three artifacts have similar notch like burin but the overall contour does not looks like the same. According to the length, breadth, thickness and weight the collected tools of this category range from 1.0 cm to 4.3 cm, 0.8 cm to 2.2 cm, 0.4 cm to 1.1 cm and 0.53 gm to 5.55 gm respectively (Table 3).

Apart from the above discussed microliths there are lots of unfinished artifacts collected from the Tapaban Pahar site. These unfinished implements

TABLE 1

Different types of microlith collected from Tapaban Pahar, Bankura

Sl No.	Types of microlith	Years of fieldwork				
		2009	2010	2011	2012	Total
1.	Blade	09†	09	09	06	33
		25.00‡	17.31	36.00	11.76	20.12
2.	Backed Blade	02	04	02	03	11
		05.55	07.69	08.00	05.88	06.71
3.	Burin	05	09	04	04	22
		13.89	17.31	16.00	07.84	13.41
4.	Lunate	03	02	–	08	13
		08.33	03.85		15.69	07.93
5.	Point	02	10	04	14	30
		05.55	19.23	16.00	27.45	18.29
6.	Scraper	07	10	02	10	29
		19.44	19.23	08.00	19.61	17.68
7.	Triangle	–	01	02	02	05
			01.92	08.00	03.92	03.05
8.	Others	08	07	02	04	21
		22.22	13.46	08.00	07.84	12.80
Total		36	52	25	51	16
		100.00	100.00	100.00	100.00	4100.00

Note: †Absolute frequency; ‡Percentage frequency

TABLE 1A

Different Types of Point collected from Tapaban Pahar, Bankura

Sl No.	Types of point	Years of Fieldwork				
		2009	2010	2011	2012	Total
1.	Micro point	–	05	01	03	09
			50.00	25.00	21.43	30.00
2.	Backed point	01	–	01	03	05
		50.00		25.00	21.43	16.67
3.	Arrow point	01	03	02	07	13
		50.00	30.00	50.00	50.00	43.33
4.	Shoulder point	–	01	–	01	02
			10.00		07.14	06.67
5.	Leaf point	–	01	–	–	01
			10.00			03.33
Total		02	10	04	14	30
		100.00	100.00	100.00	100.00	100.00

TABLE 1B

Different types of scraper collected from Tapaban Pahar, Bankura

Sl No.	Types of scraper	Years of fieldwork				
		2009	2010	2011	2012	Total
1.	Side scraper	02	06	–	04	12
		28.57	60.00		40.00	41.38
2.	Nose scraper	03	02	01	03	09
		42.86	20.00	50.00	30.00	31.03
3.	Thumbnail scraper	02	01	–	03	06
		28.57	10.00		30.00	20.69
4.	Keeled scraper	–	01	01	–	02
			10.00	50.00		06.90
	Total	07	10	02	10	29
		100.00	100.00	100.00	100.00	100.00

TABLE 2

Raw materials of the microliths (Tapaban Pahar, Bankura)

Sl. No	Microliths		Raw Materials										
			Chert	Jasper	Chalcedony	White Quartz	Green Quartz	Rock Crystal	Basalt	White Dolomite	Dacite	Others	Total
1.	Blade		14	07	03	01	03	02	01	-	-	02	33
			42.42	21.21	09.09	03.03	09.09	06.06	03.03			06.06	100.00
2.	Backed Blade		05	-	01	-	02	-	-	-	-	03	11
			45.45		09.09		18.18					27.27	100.00
3.	Burin		11	03	-	01	02	01	-	-	01	03	22
			50.00	13.64		04.54	09.09	04.54			04.54	13.64	100.00
4.	Lunate		07	02	01	-	-	01	01	-	-	01	13
			53.85	15.38	07.69			07.69	07.69			07.69	100.00
5.	Point	Micro Point	06	-	01	-	01	-	-	-	-	01	09
			66.67		11.11		11.11					11.11	100.00
		Backed Point	01	02	01	01	-	-	-	-	-	-	05
			20.00	40.00	20.00	20.00							100.00
		Arrow Point	02	01	-	05	-	03	01	-	-	01	13
			15.38	07.69		38.46		23.08	07.69			07.69	100.00
		Shoulder Point	-	-	02	-	-	-	-	-	-	-	02
					100.00								100.00
		Leaf Point	01	-	-	-	-	-	-	-	-	-	01
			100.00										100.00
6.	Scraper	Side Scraper	05	01	-	01	-	-	02	01	-	02	12
			41.67	08.33		08.33			16.67	08.33		16.67	100.00
		Nose Scraper	07	-	-	-	-	02	-	-	-	-	09
			77.78					22.22					100.00
		Thumbnail Scraper	03	02	-	-	01	-	-	-	-	-	06
			50.00	33.33			16.67						100.00
		Keeled Scraper	-	02	-	-	-	-	-	-	-	-	02
				100.00									100.00
7.	Triangle		02	01	-	01	-	01	-	-	-	-	05
			40.00	20.00		20.00		20.00					100.00
8.	Others		12	02	-	-	01	-	-	-	-	06	21
			57.14	09.52			04.76					28.57	100.00
Total			76	23	09	10	10	10	05	01	01	19	164
			46.34	14.02	05.49	06.10	06.10	06.10	03.05	00.61	00.61	11.58	100.00

TABLE 3

Measurements(cm) of identified microliths (Tapaban Pahar, Bankura)

Measurement		Microliths														
Type	Scale	Blade	Backed Blade	Burin	Lunate	Micro Point	Backed Point	Arrow Point	Shoulder Point	Leaf Point	Side Scraper	Nose Scraper	Thumbnail Scraper	Keeled Scraper	Triangle	Others
Length	Highest	4.2	3.9	4.2	4.0	2.9	2.7	2.9	1.8	2.2	2.7	3.3	2.0	2.0	3.1	4.3
(in cm)	Lowest	1.1	1.5	1.1	1.5	1.3	1.2	1.6	1.4	2.2	1.5	1.6	1.1	1.3	2.7	1.0
Breadth	Highest	1.9	1.7	2.5	1.5	1.1	1.1	2.1	0.7	0.8	1.8	2.2	2.1	1.6	2.4	2.2
(in cm)	Lowest	0.7	0.6	0.8	0.5	0.7	0.6	0.8	0.5	0.8	1.0	1.5	1.6	1.1	1.9	0.8
Thickness	Highest	0.9	0.8	0.7	0.6	0.4	0.5	0.9	0.4	0.2	0.7	0.6	0.7	0.6	0.8	1.1
(in cm)	Lowest	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.5	0.2	0.4
Weight	Highest	6.79	3.78	4.66	2.60	1.40	1.41	5.85	0.46	0.44	2.83	2.17	3.50	1.41	3.86	5.55
(in gm)	Lowest	0.26	0.28	0.28	0.30	0.29	0.33	0.52	0.27	0.44	0.44	0.78	0.74	0.71	1.52	0.53

Figure 5. Microliths (1-7 Blades; 8-12 Backed Blades; 13-18 Burins; 19-25 Lunates; 26-31 Micro Points; 32-34 backed Points; 35 Leaf Point; 36 Shoulder Point; 37-41 Arrow Points; 42-46 Side Scraper; 47-48 Nose Scraper; 49 Keeled Scraper; 50-51 Thumbnail Scraper; 52-54 Triangle; 55-65 Others.

seem to be providing evidences for existed mesolithic industry in and surrounding the site under the study.

CONCLUSION

The present article is an endeavour to understand the typological and technological characterization of Mesolithic assemblages collected from the 'Tapaban Pahar' site (near the famous palaeolithic site of Siulibona) of district Bankura, West Bengal. Earlier scholaristic works in the field of prehistoric archaeology already unfolded numerous sites in the district of Bankura and adjoining areas; the present work seems to be continuation of such effort. Along with a number of Paleolithic sites the district Bankura is also significant for considerable existence of Mesolithic sites.

Four consecutive years of field study equipped with surface collection and very short digging vehemently resultant for well-versed collection of artifacts and tools but the site mentionable assembled with only microliths. There was not any heavy-duty tool unearthed during the entire exploration. The numerical predominance of chert as a raw material signifies once again the availability and proficiency of the material specifically for microliths in Indian sub-continent because of its accurate conchoidal fracture the entire manufacturing procedure eventually became more convenient. A variety of chart which is red in colour known as Jasper also identified as conspicuous raw material used for the collected microliths. Apart from other identified raw material basalt signifies the existence of volcanic substance on that area.

Availability of microblades or bladelets (including backed blade) were significantly high in comparison to other collected tools. Consistence availability of such tools provides conspicuous dominancy of the same in the site under the study. Points also had prominent presence during the entire four years of field work. To continue with more accurate hunting and fishing activities in the nearby forest and palaeo-channel presumably indulged the denizens for numerous productions of micro-points. Both micro-burin and scraper subsequently available in all the phases of field works resultant their continuous existence in the entire site. As a prominent mark of Mesolithic culture burin also had remarkable existence throughout the four phases of field work; so both blade and burin in a combination might be responsible for delineating with specific typological tag for the site as blade-burin Mesolithic culture.

Collection and identification of triangle, trapeze and cresant shaped lunate confirm the presence of geometric microliths in the site 'Tapaban Phar'; generally in case of Indian Mesolithic sites there were less existence of geometric macroliths and that site also confirms such trends of having numerically less availability of aforesaid advanced form of microliths.

Inspite of its limitation the present study tried to explore and analyse the assemblages revealed from the site 'Tapaban Pahar' which seems to be an inclusion of Mesolithic sites in eastern India and particularly at Bankura district. Relative dating of startigraphic method vehemently proved the approximate age of the artifacts and labeled them as the assemblages of Mesolithic period. Even after intensive field work of four consecutive years the absence of any heavy duty stone implements presumably confirm the prominent feature of exclusive microlithic industry. The existences of nearby palaeo-channel suppose to be notified once again the proposition of Mesolithic environment. So in nutshell all the collected and identified assemblages of the site 'Tapaban Pahar' intrinsically unfold the typological and technological specification of the tools manufactured and used during the period of Mesolithic culture.

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REFERENCES CITED

Agrawal, D. P. 1985. *The Archaeology of India*. Scandinavian Institute of Asian Studies, Monograph Series 46. Curzon Press: London.

Allchin, B., A. Goudie and K. Hedge 1978. *The Prehistory and Archaeology of the Great Indian Desert*. Academic Press: London.

Binford, Lewis, R. 1968. Post-Pleistocene adaptations. In: S. R. Binford and L. R. Binford, (eds.), *New Perspectives in Archaeology*, pp. 313-341. Aldine Publishing: Chicago.

Chakladar, H. C. 1951. The prehistoric culture of Bengal. *Man in India*, 31: 129-164.

Chakrabarti, D. P. 1999. *India: An Archaeological History*. Oxford University Press: New Delhi.

Chattopadhyay, R. K. 2010. *Bankura: A Study of Its Archaeological Sources*. Platinum Publishers: Kolkata.

Childe, V. G. 1936. *Man Makes Himself*. New American Library: New York.

Clark, J. G. D. 1932. *The Mesolithic Age in Britain*. Cambridge University Press: Cambridge.

Mitra, Debala 1957-58. Cited by Ghosh, A. In: A. Ghosh (ed.), *Indian Archaeology – A Review*. (1957-58), pp. 69. Archaeological Survey of India, Government of India: New Delhi.

Ghose, A. K. and D. K. Chakrabarty 1968. Prehistoric Metal Stage in West Bengal. *Bulletin of Cultural Research Institute*, 7(1-2): 112-123.

Jayaswal, Vidula 2009. Status of Archaeology of the Middle Ganga Valley: Stone and Early Iron Age Cultures. *Presidential Address, 36 Congress Indian Society for Prehistoric and Quaternary Studies (November 14, 2009). University of Allahabad: Allahabad*.

Lal, B. B. 1958. Birbhanpur, a micrilithic site in the Damodar valley, West Bengal. *Ancient India*, 14: 4-48.

Majumdar, N. G. 1939. Prehistoric and Protohistoric Civilization. In: J. Cumming (ed.), *Revealing India's Past*, pp. 116-117. The India Society: London.

Misra, V. N. 1973. Bagor: a Late Mesolithic Settlement in Northwest India. *World Archaeology*, 5 (1): 92-110.

— 1985. Microlithic Industries in India. In: V. N Misra and P. Bellwood (eds.), *Recent Advances in Indo-Pacific Prehistory*, pp. 111–122. Oxford and IBH: New Delhi-Bombay-Calcutta.

— 2001. Prehistoric human colonization of India. *Journal of Bioscience*, 26(4): 491-531.

— 2002. The Mesolithic Age in India. In: S. Settar, and R. Korisettar (eds.), *Indian Archaeology in Retrospect, volume 1. Prehistory. Archaeology of South Asia*, pp. 111–126. Manohar Publications: New Delhi.

Mitra, Panchanan 1979. *Prehistoric India: Its Place in the World's Cultures*. Bharatiya Publishing House: Delhi.

Mohanty, P. 2000. Mesolithic culture and ethnography of Keonjhar district, Orissa. In: K. K. Basa and P. Mohanty (eds.), *Archaeology of Orissa*, vol. 1, pp. 114-152. Pratibha Prakashan: Delhi.

Neogi, Sayantani 2011. Scope of Geoarchaeology in depicting the Early Hominin Environments in the Gandheswari River Basin of Bankura district, West Bengal. *The Indian Journal of Spatial Science (e Traverse)*, 2(6): 1-4.

Possehl, G. L. 2003. *The Indus Civilization. A Contemporary Perspective*. Vistaar Publications: New Delhi.

Prasad, S. and Y. Enzel 2006. Holocene paleoclimates of India. *Quaternary Research*, 20: 1-12.

Rowley-Conwey, P. 1996. Why didn't Westropp's 'Mesolithic' catch on in 1872? *Antiquity*, 70 (270): 940-944.

Sali, S. A. 1989. *The Upper Palaeolithic and Mesolithic Cultures of Maharastra*. Deccan College Post Graduate and Research Institute: Pune.

Sali, S. A. 1990. *Stone Age in India*. Shankar Publishers: Aurangabad.

Sharma, G. R. 1980. *History to Prehistory: Archaeology of the Ganga Valley and the Vindhyas*. Department of AHC and Archaeoloogy: University of Allahabad.

Sharma, S., M. Joachimski, M. Sharma, H.J. Tobschall, I.B. Singh, C. Sharma, M.S. Chauhan and G. Morgenroth 2004. Lateglacial and Holocene environmental changes in Ganga plain, Northern India. *Quaternary Science Review*, 23: 145-159.

Tarafdar, P., S. Roy and D. Pandey 2012 & 2013. Palaeolothic Tools of Siulibona, District-Bankura, West Bengal: A Typological and Morphometric Study. *Journal of the Anthropological Survey of India*, 61(2) & 62(1): 651-665.