



A legacy of used stone tools from Palaeolithic to Neolithic at Chuagara in the Suvarnarekha- Burahabanga complex

Arabinda Singha Roy

Researcher

Email: arabindasingharoy@gmail.com

Accepted: 15 June 2022 / Published online: 30 June 2022

<https://doi.org/10.5281/zenodo.7265475>

Abstract

Chuagara or Chau Gora, a site located in a plain land but in the middle of hilly area beside the river Suvarnarekha in Suvarnarekha-Burahabanga complex. The entire drainage system runs over a peneplain surface that was developed due to the lava flow. The complex is known for the occurrences of tools and materials of pre and proto historic culture, that have been collected by scholars in a greater number beside both the rivers. A continuous cultural element of prehistoric culture from palaeolithic to neolithic have been collected. Detail of the tools and their making technologies have been analysed. Though, any postulation would be vague based on the surface collections, but location of the site among the other prehistoric sites and absence of early historic, even late medieval materials somehow let us postulate that collected materials must be placed with the bracket of prehistoric period.

Key Words: Chuagara, Suvarnarekha, Burahabanga, Stone Tools, Palaeolithic, Neolithic



Introduction

The area adjacent to the river Suvarnarekha is quite rich and prosperous. Several archaeological sites have been discovered in the upper reach of the rivers. Their concentrations are mainly around the districts of Ranchi, Khunti, East and West Singhbhum and, in a small number, in Saraikela. Culturally, their lineages have been traced from the prehistoric time period to the early and even the late medieval period (Sen and Ghosh 1960; Sen and Chaturvedi 1957; and Sen 1969). Efforts of researchers prior to our work have brought to light the knowledge of many such places that are associated with the evidence of Palaeolithic tools and based on their properties, they can be designated to the Lower, Middle, and Upper Palaeolithic time periods. Lower Palaeolithic tools have been found from Roro Valley (Sen 1970), Rajdoha, Tilimdah, Ghatsila, Chandil, Sini, Chaibasa, Nimdih, Chakuria, Serenga, Tegra, Musabani, Beniasole, Uldah, Bichhati- Gungri, Kitadi- Dungri, Ful- Dungri, Charakmara, Patbera, Maheshpur, Kalikapur, Kamalpur, Hat Gamaria, Sasaghati, Tatibe, Guntia, Karalajuri, Chakradharpur, Tebo, Hesadih, Lapso- Kyanite, Jojodih, Barudih, Kandra, Purnapani, Bamni, and Dungi (Sinha and Singha Roy 2018, 25) in Singhbhum district; and Tati Silwai, Sabai, Namkum, Chainpur, Banari, Mahabodhi, and Ramgarh in Ranchi district (Sinha and Singha Roy 2018, 27). Tools of the middle Palaeolithic period have been found from Chandil, Sini, Chaibasa, Jamda, Ghatshila, Betwa, and Lotapahada in Singhbhum district (Roy 1985) and Chainpur, Bishunpur, Banari, and Mahabodhi in the Ranchi district (Sinha and Singha Roy 2018, 31-32). Tools belonging to the upper Palaeolithic period have also been found from Sini, Chandil, Ghatshila, and Jamda in the Singhbhum district and Parasdhika, Jilin Buru Pahar, Amjora, Joadih, Hardag, Bajra, Charma, Roshanpur, Kamre, Murgu, Tape, Ghagra, and Pithartoli in the Ranchi district (Chakrabarti 1993). Alongside, a good number of implements belonging to the Mesolithic age have also been noted along the area of the river Suvarnarekha, i.e., Bongara, Barda Bridge (Sen and Chaturvedi 1957), Lotapahada (S.R. Roy 1985) in Singhbhum; Namkum (Ghosh 1970), Potpoto, Jumar, Borea, Patratu, Bharmdih Pahar, Bargain, and Borea in the Ranchi district. By the effort of



Bodding, Anderson, and Walsh in the pre-independence era and Chakrabarti, Narayanan, and Singh in the post- independence period, this upper part of the river valley became famous for the existence of ground and polished stone tools. Such tools have been noted from Chenegutu, Salgi, Burju, Janumpiri, Binda, Chendagutu, Iti, Panguru, Sembua, Torangel, Gora, Pandu, Senegutu, Murud, Indpiri, Buruhatu, Bichna, and Buruhatu in the Khunti district; Omta, Chacho, Nawatoli, Sodag, Arra, Kakra, Soparom, Jurdag, Kakra, Soparom in the Ranchi district; and Chandil, Sini, Chakradharpur, Barda Bridge, Barudih, Haribera, and Dugni in the Singbhum district.

This region along the line of the upper Suvarnarekha valley is also studied by many scholars and their contributions are noteworthy. Among the works, mention may be made of the work of Gopal Chandra Mohapatra (Mohapatra 1962). He studied the entire area of eastern Odisha and discovered many prehistoric sites. Four sites, i.e., Kandalia, Mahulia, Pratappur, Ghantasali, among many other ones in the eastern part of Odisha, especially within the Mayurbhanj district, as discovered by him, are situated within the boundary of the present study area. His study is not limited only to discovering lithic tools. He also gave a vivid description of the context of occurrence and defined their stratigraphical position. Before the work of Mohapatra, several excavations and extensive exploration had been done by N. K. Bose and D. Sen (Bose and Sen, 1948) throughout the eastern part of Odisha which falls within the periphery of the present study area based on the work of E. C. Worman and P. Acharya. A number of sites have come to light with the occurrences of the lithic tools (Ball 1876), through the efforts of P. Acharya, later accompanied by E. C. Worman (Worman 1939).

A few decades later, around 1960s, the area east of the district of Mayurbhanj and morphologically south-eastern extension of the Chotanagpur plateau as well as eastern postponement of the Simlipal Massifi drained by the mighty Suvarnarekha and administratively situated under the boundary of Medinipur district of West Bengal was worked upon for an archaeological expedition (Ghosh 1970: Ghosh and Basu 1969). The State Archaeology Department of West Bengal had undertaken an endeavour to survey this western part of Bengal to understand the nature of the prehistoric settlements. The surveys had revealed more than 2000 lithic tools of Palaeolithic, Mesolithic, and Neolithic periods which are now stored at the State Archaeological Museum in Kolkata. These tools were collected from several places on the western bank of the Suvarnarekha, especially from the villages under the administration of Gopiballavpur and Nayagram C. D. Block. Name of the places are obliterating and illegible due

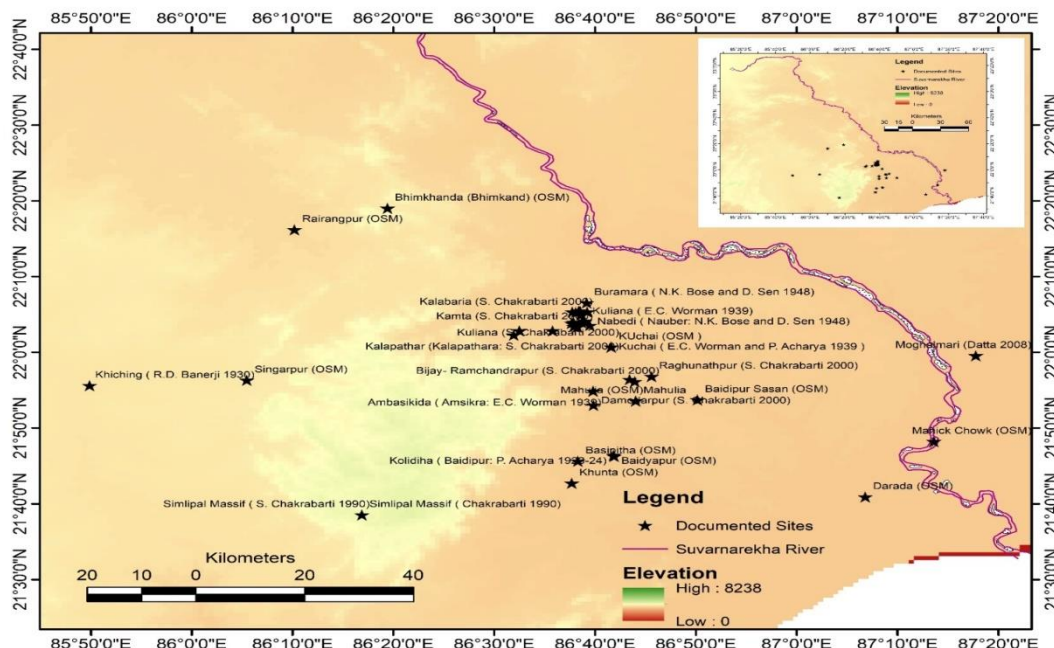


Figure 1: Locations of the sites discovered by N.K. Bose and D.Sen; P. Acharya; Wormen; Chakrabarti; and other places name of which are found in the register of the Odisha State Museum



to lack of care and observation by the museum authorities. Except a few boxes where the names of the places have been found, many of the tools are placed haphazardly and mixed with one another, and therefore, their actual provenances are not clearly understood, except through the records of the expeditor. P. C. Dasgupta, stated his discovery through his two publications. One of these is *Pragaitihasik Bangla* published in 1981, where he cited only the existences of the Palaeolithic to Neolithic implements revealed during 1960s beside the Suvarnarekha (Dasgupta 1981, 54). His other publication, published in 2007, is *Subarnarekhar Prangane Aranyakanya Kangsabati*, and is a branch of the articles collected by his son, Devapriya Dasgupta, where he narrates the assemblages, its nature and places of occurrence. He also classified them according to their properties. Though, not a single article has been written, so far, on a particular site emphasizing rich occurrences.

In the purpose of Ph.D. dissertation present author has surveyed the entire region and collected thousands of tools from different places. Among the place in this article Chuagara or Chau Gora has been taken for occurrences tools from palaeolithic to neolithic period without any break. Though most of the tools were collected from upper surface and without any stratification by the prior researchers (stored in the State Archaeology Museums, Govt. of West Bengal) and present authors.

Geographical and Geological settings:

Geomorphologically, the Suvarnarekha experiences a wide range of variation from the Ranchi plateau to the Balasore coast due to its flow through different geological structures that comprises various compositions of rock and topography. The eastern axis of the Ranchi plateau acts as a watershed between the two river basins, i.e., Suvarnarekha and Damodar, while the Purulia Upland forms a divide between Suvarnarekha and Kasai. Sediments carried by the river have a high amount of heavy metals. Its entire course is divided into three major portions. The



initial course occupies the Ranchi Plateau, and the second phase begins from the Jundru fall (75m) in the Dalma range of northern Jamshedpur. It covers a wide area of erosional surface that is made of granite-gneisses and phyllitequartzose-mica-schist across the Panch Pargana plain and the Dalma range. The lower course, which marks the beginning of Jamshedpur and ends at the Bay of Bengal, consists of a rocky surface of granite, gneiss as well as thick deposits by the river which it carries during its journey through the long upper course. The lower course is further divided into three sub-phases, i.e., (i) Jamshedpur to Ghatsila, (ii) Ghatsila to Jamsola and (iii) Jamsola upto its base level—the coastal bay. The entire area is affected by the Tertiary upliftment and wrapping. The eastern portion of the river is characterized by different types of drainage pattern, river piracy and scarp recession. Along the river, many terraces have formed recently due to the deposition of thick alluvium, which is primarily a result of the recent uplift. It also represents a homoclinal shifting at Jamsola. Four major types of landforms are visible throughout its course by the different actions of the river, i.e., (i) fluvial landform which comprises laterite tableland, river terraces (alluvial uplands) and valley fills which are seen near the Suvarnarekha delta region, (ii) deltaic landforms which comprises extensive alluvial and tidal flats and depressions, meander scrolls and ox-bow lake, abandoned channels and aggraded river segments, levees, back swamps, floodplains and braids, (iii) coastal landforms that include estuaries, spits and bars, tidal and estuarine marshes and swamps, foreshore beach, beach ridges, onshore bars and troughs, backshore mudflats, sand ridges and ancient beach ridges, chenier complex, and (iv) Aeolian landforms which include transverse and obstacle ancient dunes formed through reworking of marine and fluvial sands by wind action (Figure 2).

The geology of the adjacent area of the Suvarnarekha is associated with the geology of the Ranchi and Singhbhum sections of the Chotanagpur plateau. The entire drainage system runs over a peneplain surface that was developed due to the lava flow. In the course of its development, the erosional surface was subjected to upheaval up to 300 m which may have increased the capacity of degradation. New surfaces have developed as a result of the

rejuvenation. In the late Tertiary period, after the formation of Chotanagpur, the prevalent surface further rose up to 300 m that led to a new phase of rejuvenation. Some of the well-known ‘piracy’ along the river are the Jhalida, Baghmundi and Ajodhya gaps.

The Archean rocks are the dominant rock type in this region found in the Suvarnarekha River basin. Dharwar is a metamorphic series that is found in the southern portion of Singbhum, which is the middle portion of the Suvarnarekha basin. Lower beds of Iron ore series rest upon the upturned beds of the Old Metamorphic series in south Singbhum. The Iron series in this region is a highly metamorphosed character. Pronounced volcanic deposit is observed in the northern and middle portion of the valley.

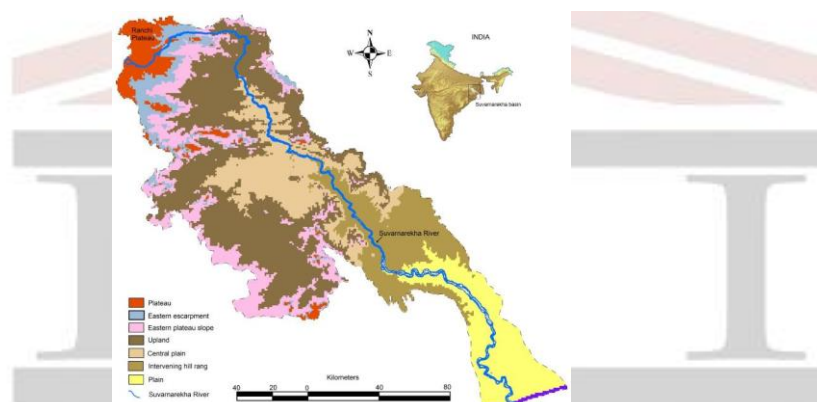


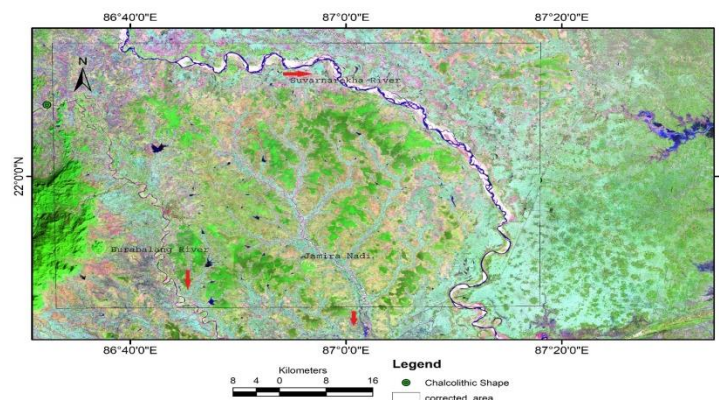
Figure 2: The terrain of the Suvarnarekha Basin has been classified into seven geomorphic divisions.

Concept of Suvarnarekha-Budhabalang Complex:

Suvarnarekha, one of the largest rivers in eastern India, covers a total course of 500 km from its source at Piska near Ranchi to Bay of Bengal in Balasore district in Odisha with a drainage area of 1.93 million hectares. In course of Ph.D dissertation by the present author, Palaeolithic implements have been found from 78 places within the present study area and their concentration is limited within three regions, i.e., (a) on the basin of the Suvarnarekha, (b) along the side of the Burahabanga river, and (c) a few are beside the Jamira river. Microlithic materials

are concentrated only in the basin of Suvarnarekha at 20 find-spots. Only 34 places have been documented, so far, with the polished stone tools and they are concentrated along the river Suvarnarekha, except a few that are located along the river Burahabanga. Palaeolithic people inhabited sites along the river Suvarnarekha and Burahabanga sometime in the Pleistocene period and traces of continuity are marked at many of these sites. The polished stone tool using communities were also acquainted with the technology of making pottery (as found at Kuchai). The beginning of the material cultural milieu of the prehistoric cultural phase in the study area can be tentatively dated to the mid-Pleistocene period. Implements related to the Palaeolithic culture, so far recorded, are substantial in number. It is observed that Palaeolithic, Mesolithic, and Neolithic material are specifically concentrated along the two rivers specified above. In the protohistoric period, within this present study area, people possibly remained scattered and also selected places away from the river, for habitation. Therefore, implements belonging to the protohistoric cultures have been noted in such contexts to the left bank of the river Suvarnarekha where prehistoric material are inconspicuous. Apropos the area of concentration of both pre- and proto-historic cultural materials and their morphological similarities, the entire cultural unit can be named the ‘Suvarnarekha–Burahabanga Cultural Complex’. It could be expected that various studies will be conducted, in future, concerning this geo-cultural unit with the contemporary

cultures on
Jharkhand,
part of
southern and
extension of
Chotanagpur



the highland of
North-Western
Odisha, and
northern
the
plateau.

Figure 3: Suvarnarekha-Budhabalang Complex

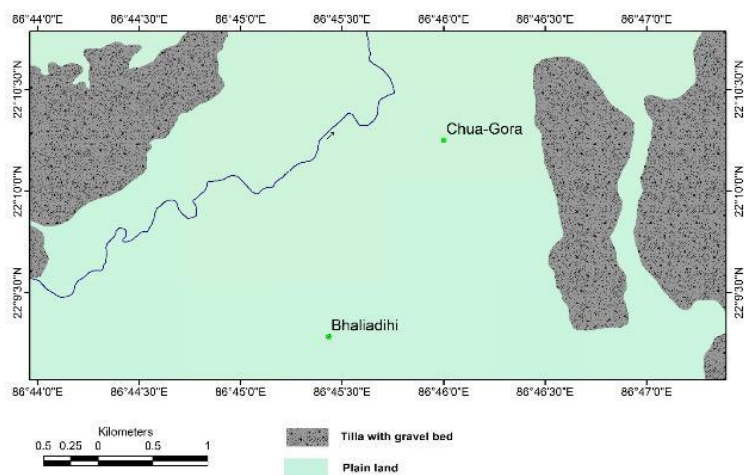


Figure 4.1: Location of the sites Chuagara or Chau Gora.

The Site: Chuagara or Chau Gora (Co-ordinate- 86.76670000000 x 22.17080000000)

A small village with an area of 61.82 hectares situated about 7.63 km south east from Jamsola and 13.63 km south west from Gopiballavpur town on the right bank of the river Suvarnarekha (Figure 4.1). It is situated in the Gopiballavpur C.D. Block under the Jhargram sub-division of Medinipur district in West Bengal. From this site, 46 pieces of lower palaeolithic tools including 6 celts and 2 ringstones, besides numerous microliths have been found. These are:

a. Biface (Figure 4.1 A):

A pebble is trimmed to form a triangular shape. Four large flakes are removed from dorsal face retaining cortex on the lower part. Ventral is shaped by removing five large flakes and retaining a ridge in the middle. Anterior is pointed and thin. Posterior is thick and rounded and cortex is left in the dorsal face.

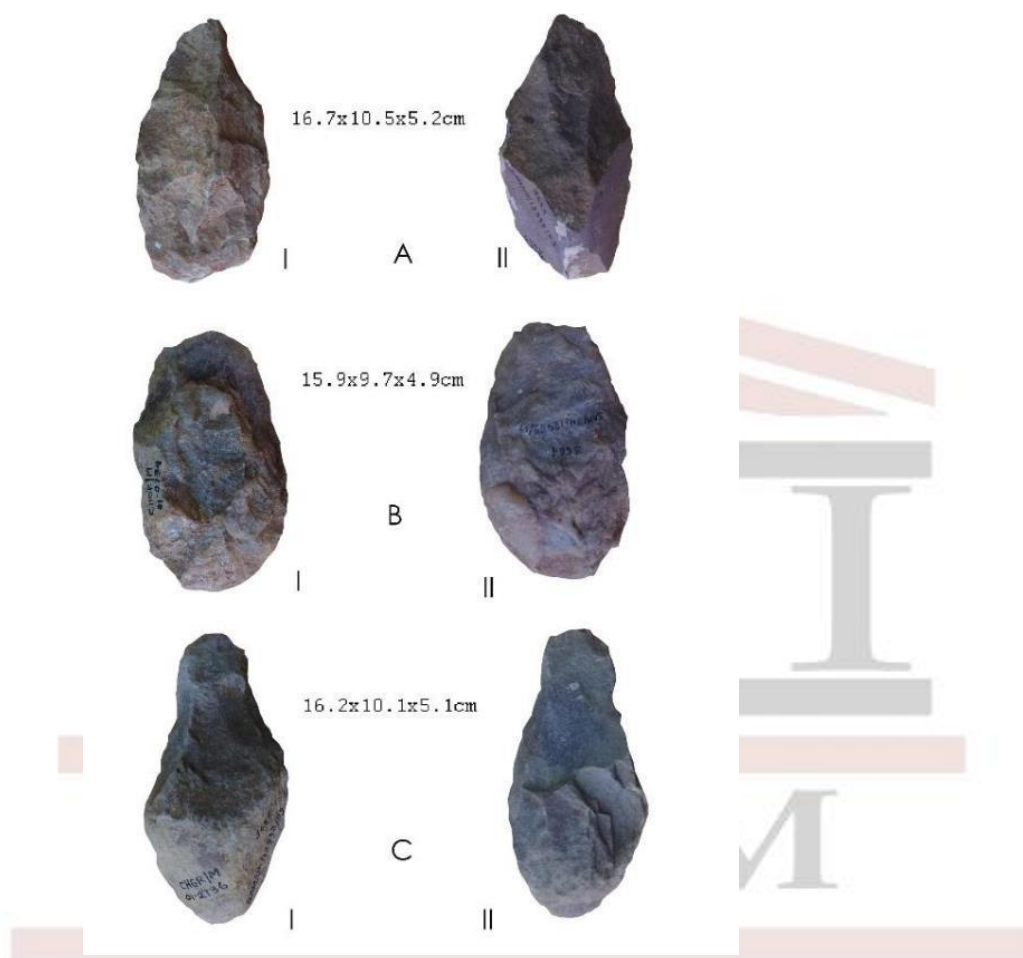


Figure 4.1: Bifaces and Partially bifaces from the village Chuagara or Chau Gora.



b. Biface (Figure 4.1B):

A pebble is trimmed to form a roughly oval shape. Cortex is left on the posterior of the dorsal face. Many small flakes are removed from both the faces. Retouching is done along left and right margins. Anterior is convex and same as the posterior.

c. Biface (Figure 4.1C):

Trimmed the pebble to form Micoquian shape. Seven large flakes are removed from the dorsal face retaining a cortex on the butt. Dorsal is formed due to heavy amount of small flaking from the surface. Both the margins are sharp and formed due to meet flaked surfaces of both the faces. Anterior is thin and pointed. Posterior is concave and cortex is left on the dorsal face.

d. Three broken Bifaces (Accession no. 3666, 3663, 3662):

Three broken pieces of Biface. One of which is made of pebble and other two of the flakes. Small flakes are removed from the dorsal and ventral surface. One of which is pointed anterior, anterior of the other two are broken. Posterior of all of the tools are broken. Retouched seen of both of the margins.

e. Biface (Figure 4.2 A):

Trimmed both the sides to form a roughly triangular shape. Dorsal face is formed due to removed five large flakes retaining cortex along the right margin. Anterior is slightly pointed and thick. Posterior is convex and cortex is left at the end of the dorsal face. Retouches are seen along both the margins.

f. Biface (Figure 4.2 B)

Trimmed both the surface of a pebble to form roughly oval shape. No traces of the cortex can be seen on the surface. Many small flakes are removed from both the surface. Anterior is slightly pointed and posterior is rounded. Secondary flaking can be seen on both the margins.

g. Biface (Figure 4.2 C)

Trimmed both the sides of a pebble to form a cordate shape. It has rolled surface. Posterior is broad and bevelled towards the anterior which is pointed and sharp. Small flakes are removed from both the sides. Both the margins are rolled.

h. Small Ovate (Accession no. 3753):

A well example of ovate. Small tool of flake. Trimmed both of the surface retaining small flake scars. Side lateral margins formed due to removing small secondary flakes. Anterior is pointed and posterior is convex.

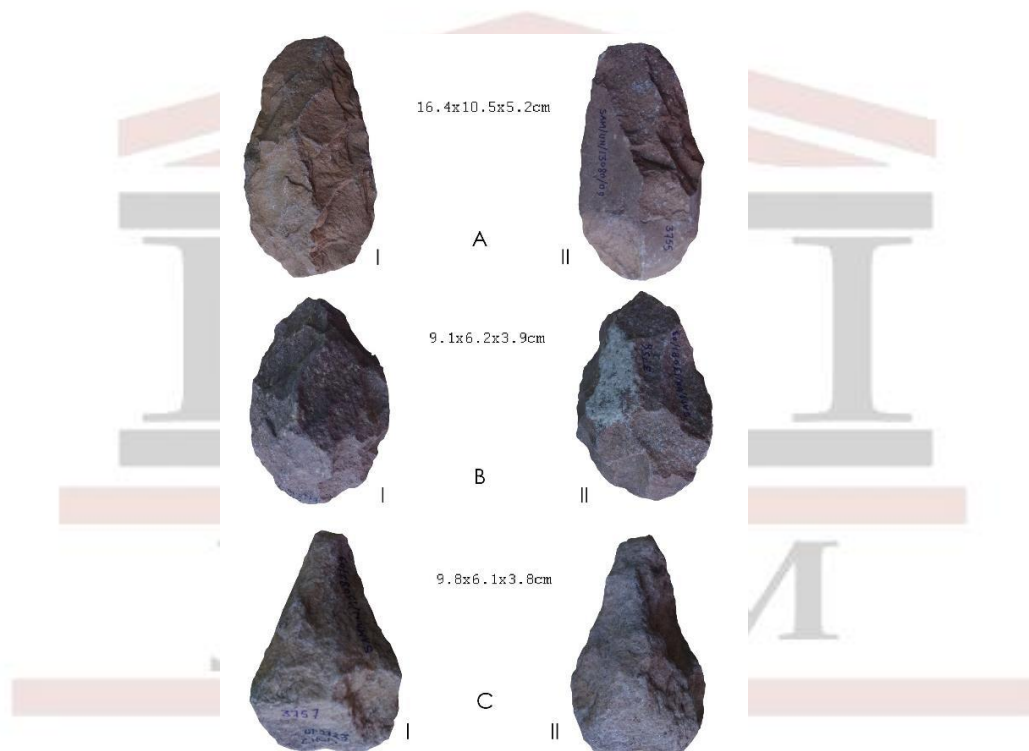


Figure 4.2: Bifaces from the village Chuagara or Chau Gora.



i. Three Flakes tools (Accession no. 3754, 3759, and 3758)

Scraper made of small flakes. Left lateral margins are trimmed to form working end, right margins are left untouched. All the tools have irregular shape. Beside these the present researcher has been collected three tools from this place. All of the three tools are side scraper in nature.

j. Cleaver (Figure 4.3A):

Trimmed entire surface to form a cleaver. Anterior of the tool has a broad and thin working edge which is made by joining two flaked bevelled surfaces. Posterior is dull and rounded. Two large flakes are removed from the right lateral margins of the dorsal faces, other face of the same lateral margin is dressed by trimming secondary flakes. Retouches can be seen along the left lateral margin.

k. Cleaver (Figure 4.3B):

Trimmed the both sides of a pebble to form a rounded butt cleaver. Large flakes are removed from the surfaces. Working end is on the right side of the anterior. It is formed by removing small secondary flakes from the surface after forming a zigzag cutting edge. Posterior is rounded. Both the margins are more or less straight.

l. Two Broken Biface (Figure 4.3C and Accession no 3650):

Broken Biface only the anterior is left, posterior is broken. Small flake scars can be seen all over the surface. Retouches are also seen along both the margins.

m. Two Pointed tools (Accession no. 3695 and 3691):

Two small pointed tools are made by trimming both the surfaces of flakes to form a roughly oval shape. Anterior of these tools are pointed and posteriors are broad. Secondly, flakes and retouches can be seen along the margins. On the ventral surface negative bulb of percussion is also seen.

n. Handaxe on Pebble (Figure 4.4A):

Both the sides of a pebble is trimmed to form a handaxe. Seven large flakes are removed from the dorsal face retaining a cortex along the butt. A very few flakes are also removed from

the ventral face. Anterior is thin with a convex cutting edge. Posterior is rounded and thick, and cortex is left on the dorsal face.

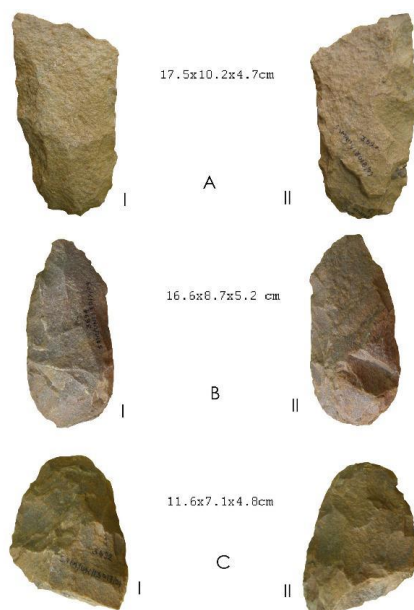


Figure 4.3: Cleaver and bifaces from the village Chuagara or Chau Gora.

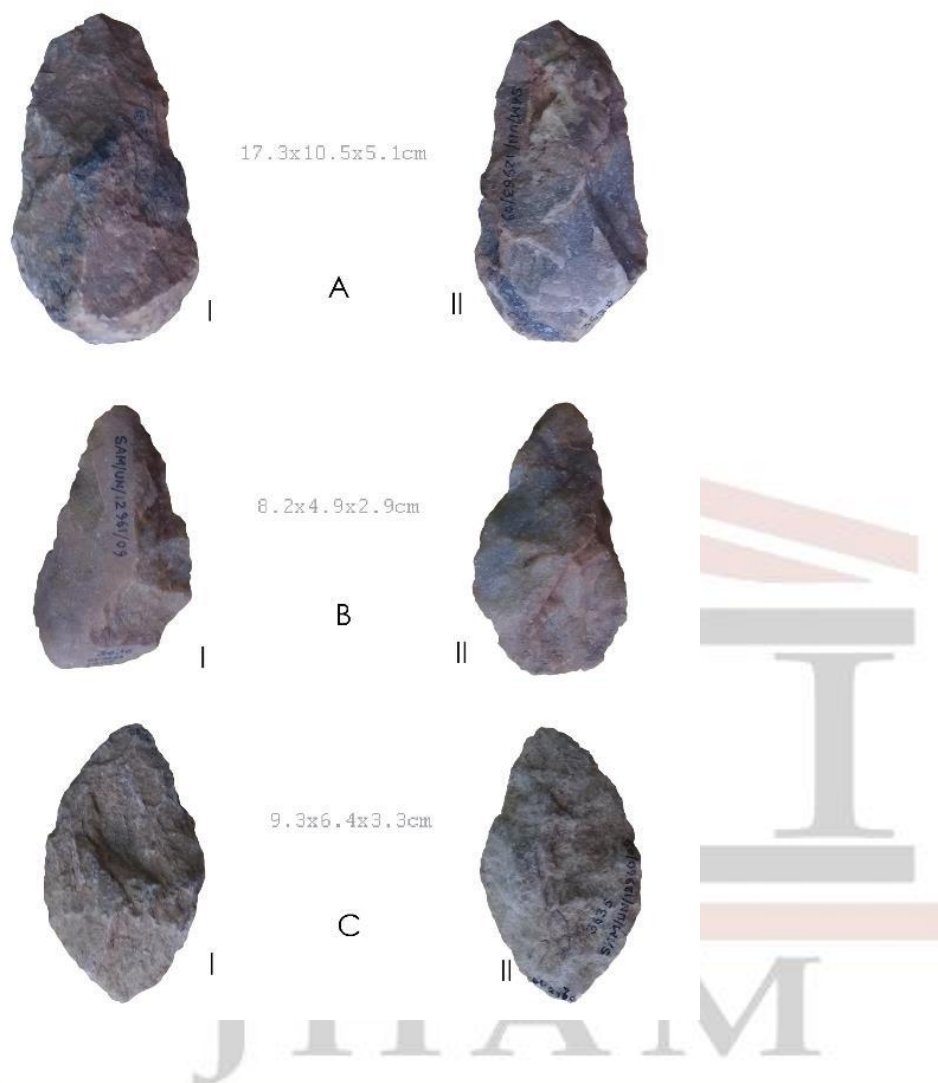


Figure 4.4: Bifaces from the village Chuagara or Chau Gora.

o. Biface (Figure 4.4B):

Both the sides are trimmed well. Three large flakes are removed from the dorsal face retaining a cortex on the right margin. Five flakes are trimmed from the ventral face and left a ridge in the middle of the surface. Retouches can be seen on both the margins. Anterior is pointed and posterior is broad.



p. Biface (Figure 4.4C):

Trimmed both of the sides. Small flakes removed from both of the sides and retaining a steep surface. Anterior is pointed and same as the posterior. Both of the margins are dressed by removing small flakes.

q. Two Pointed tools (Accession no. 3635 and 3639):

Two long points made of flakes. Anterior of these tools are pointed and thin, while the posteriors are thick and convex. Along the right margin, in the case of both the tools, deep and small flakes are removed to form the working end.

r. Biface (Figure 4.5A):

Both the surfaces are trimmed. Posterior is broad and straight and dressed by removing small secondary flakes retaining cortex on the dorsal surface.

s. Biface (Figure 4.5B):

Trimmed both the faces of a pebble to form a triangular shape. Both the lateral margins are trimmed retaining cortex in the middle of the dorsal face. Ventral is dressed by removing several small flakes. Anterior is pointed and thin, while the posterior is thick and straight. Retouches can be seen on the left lateral margin.

t. Flake Tool (Figure 4.5C):

Rounded flake tool. Flakes are removed from both the surface to form a rounded shape. Small flakes are detached from both of the surface. Retouches can be seen along the anterior edge.

u. Biface (Figure 4.6A):

Trimmed both the sides of a pebble. Butt is rounded and cortex is left on both the faces. Anterior is pointed and thick. Four large flakes are removed from the right margin of the dorsal retaining cortex in the middle. Upper part of the ventral face is flaked and cortex remains at the butt.

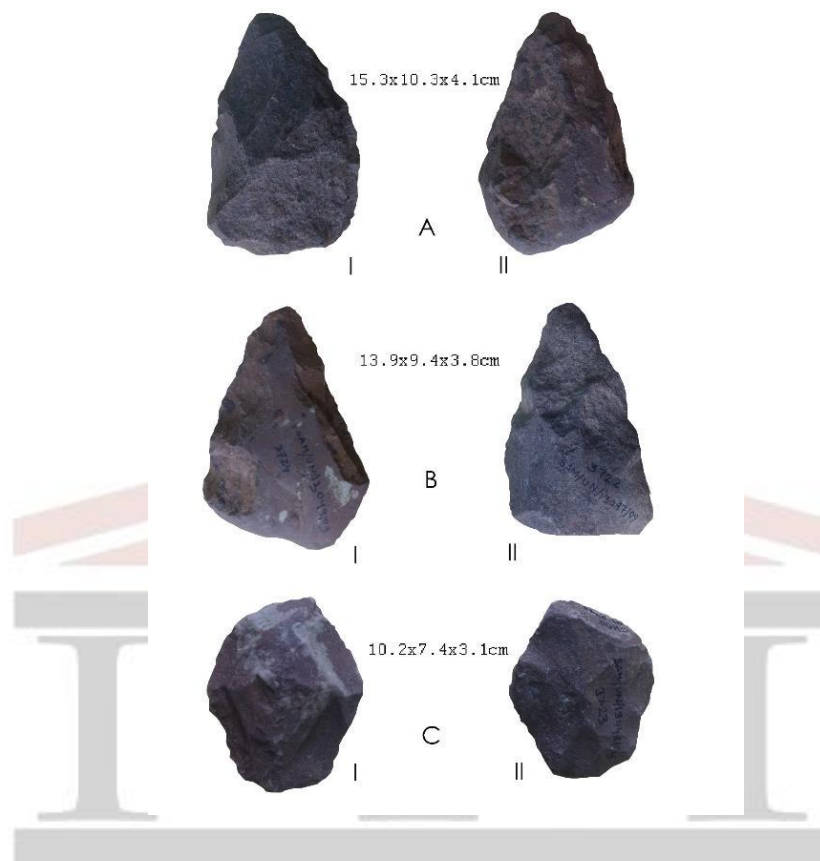


Figure 4.5: Implements from the village Chuagara or Chau Gora.

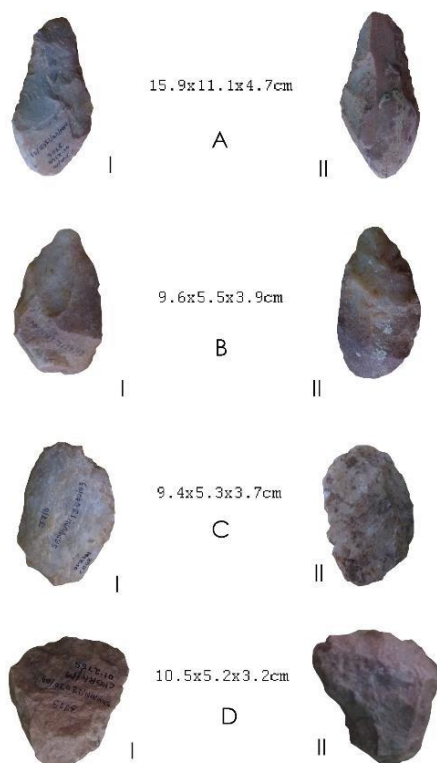


Figure 4.6: Tools from the village Chuagara or Chau Gora.

v. Biface (Figure 4.6 B):

Biface of pebble. Both the surfaces are trimmed. Six large flakes are removed from the dorsal face and retaining cortex on the butt. Five large flakes are also removed from the ventral and cortex is left at the butt. Both the lateral margins on the dorsal faces are shaped by removing small flakes.

w. Flake tool (Figure 4.6 C):

Flake tool with a sharp edge. The left margin and right margin is straight. Small flakes are removed from both the surface. Retouches can be seen along the margins.



x. Cleaver (Figure 4.6 D):

Small cleaver with a zigzag cutting edge along the anterior. The anterior is broad and the cutting edge is formed due to meet both the bevelled surfaces. Posterior is pointed. Large flakes are removed from both of the margins. Retouches can be seen along the margins.

y. Pointed tool (Accession no. 3709):

Pointed tool made of flake. Anterior is pointed and posterior is broad. Small flakes are removed from both the side margins.

z. Scraper (Accession no. 3708 and 3707):

Two flakes, out of which one has a cutting edge on left side, and another one has a cutting edge along the pointed top. Small flakes are removed from all of the sides. Retouches are also seen along the margins.

aa. Celt (Figure 4.8A):

Polished surface. Straight cutting edge is formed by joining both the bevelled surfaces. Both the margins are rounded. Posterior is convex. Scuff marks are seen on one surface.

bb. Celt (Figure 4.8 B):

Small Celt. One side is broken. Working edge is straight. Both the side margins are rounded. The celt is roughly rounded and the cutting edge is formed due to joining both the bevelled surfaces.

cc. Celt (Figure 4.9 A):

Posterior is pointed and both the margins are rectangular. Anterior is broad and has a straight cutting edge which is formed by joining both the bevelled surfaces. A part of the cutting edge is broken.

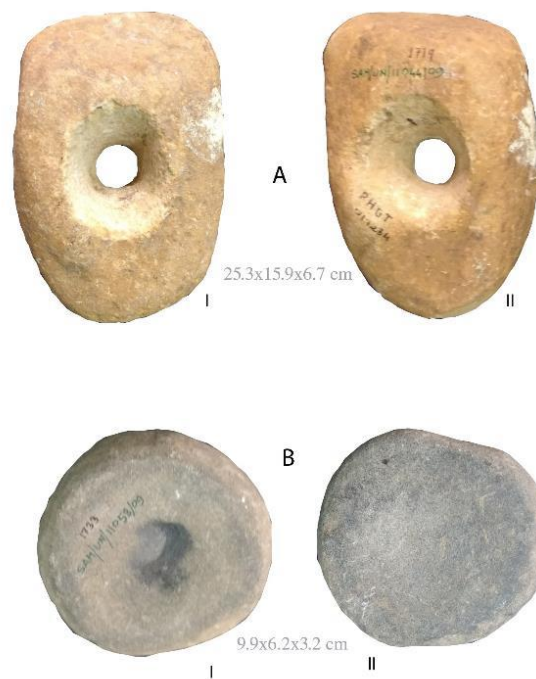


Figure 4.7: Mace Head and Quern from the village Chuagara or Chau Gora.

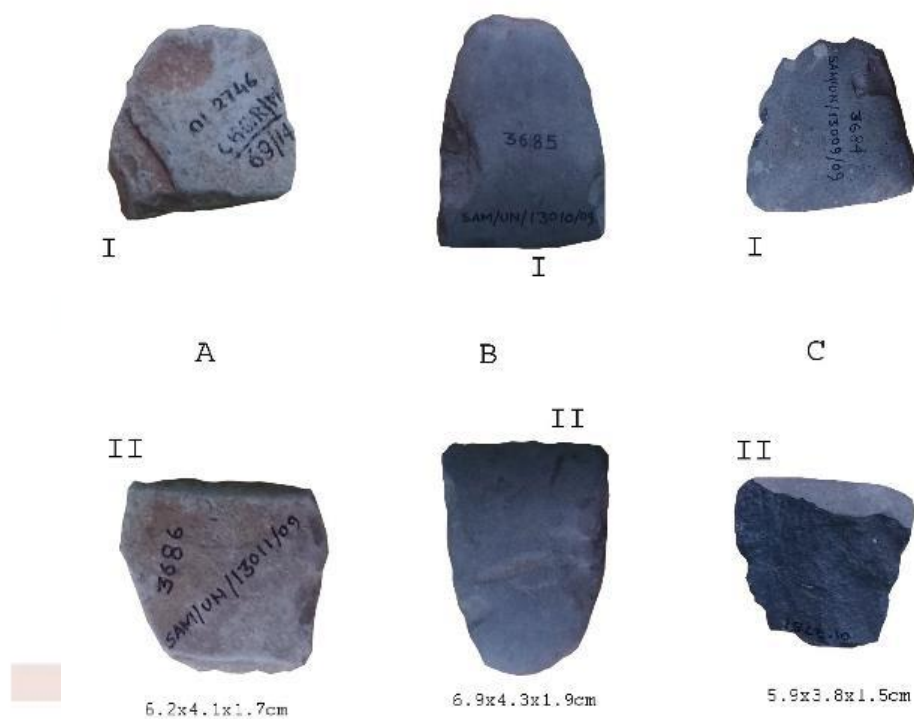


Figure 4.8: Polished Stone Implements from the village Chuagara or Chau Gora.



dd. Celt (Figure 4.9B):

Rectangular shaped, both the margins are rounded. Cutting edge is formed by intersecting both the bevelled surfaces. Towards posterior the surface is comparatively pointed, but it has a straight end at the butt.

ee. Celt (Figure 4.9C):

Large celt. Posterior is pointed and convex. Surface is rough. Cutting edge is straight. Both the margins are rounded.

ff. Broken Celt (Figure 4.8C):

Broken celt, both the surfaces are polished.

gg. Ring Stone or Mace Head (Figure 4.7A):

Big oval shaped stone. A hole is in the middle. Both the margins are linear. Working end is broad and sharp and formed by joining bevelled surfaces of both the sides.

hh. Quern (Figure 4.7B):

Rounded shape. Both the surfaces are plain. Margins are also rounded. A small hole in the middle of one of the surface.

101 pieces of small and tiny tools (**Figure 4.10**) have been found beside these heavy tools. These tools are entirely made of tiny flakes and blades. According to their basic properties they can broadly be classified in the following groups; scrapers (32 pieces), burins (5 pieces), borers (7 pieces), transactions (9 pieces), blades (44 pieces), notches (2 pieces), and segments (2 pieces).

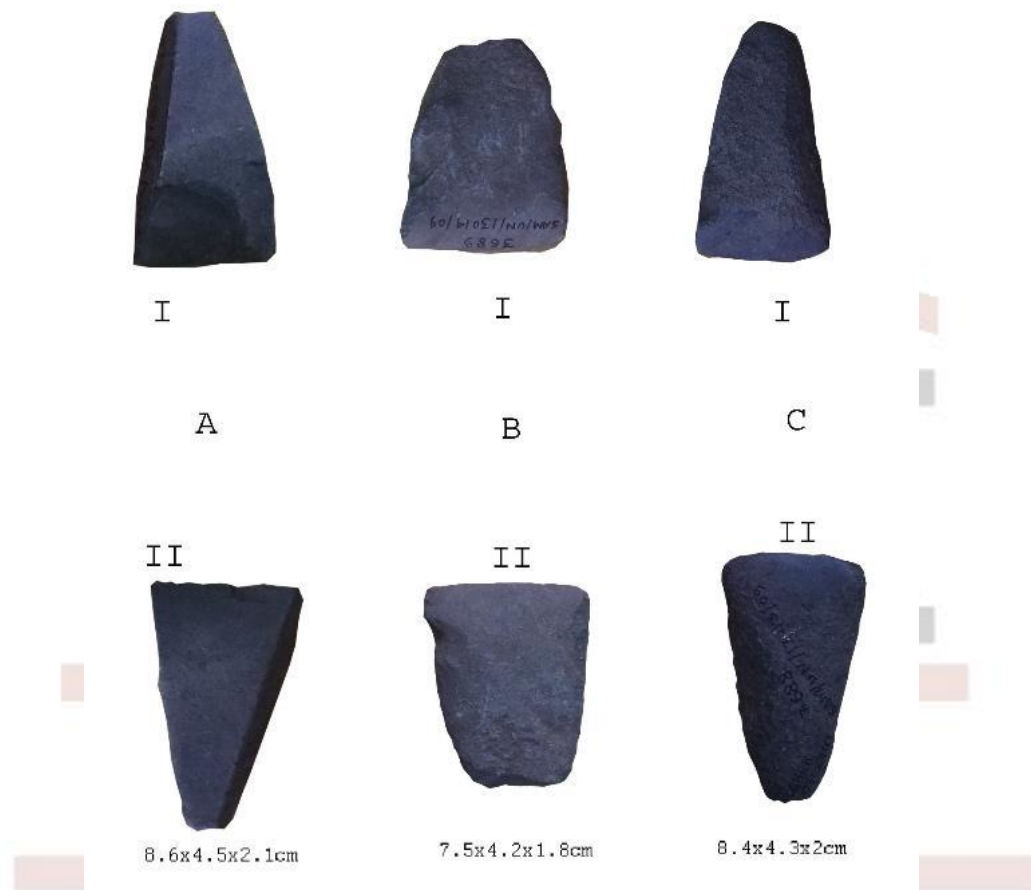


Figure 4.9: Celts from the place Chuagara or Chau Gora.

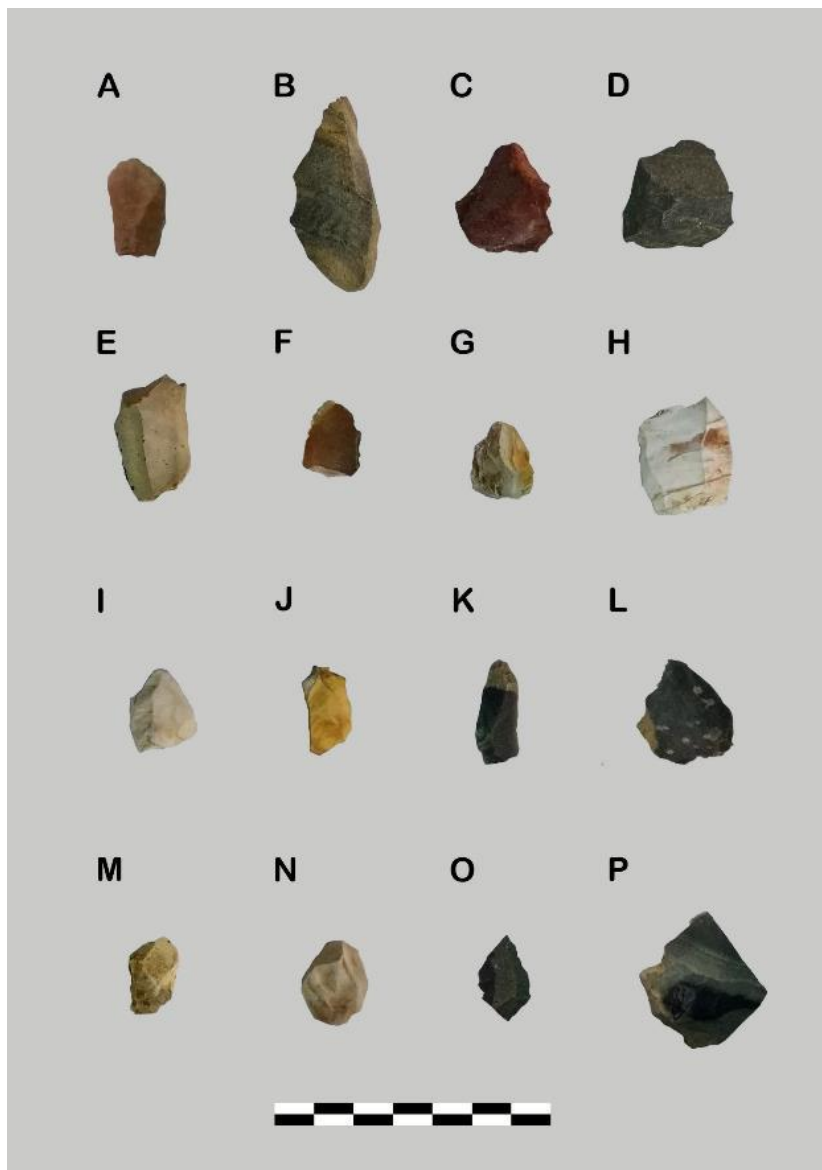


Figure 4.10: Microliths from the site Chuagara.



Discussions

Chuagara is one of the sites in this Suvarnarekha- Burahabanga complex where tools of most of the prehistoric culture have been found. Apart of the collected tools have been collected and stored in the Museum of State Archaeology, West Bengal. The site is located in a plain land surrounded by small hills beside the river Suvarnarekha. After analysis the tools of different periods, the following observations can be made:

1. This site like the most of other sites located beside the Suvarnarekha and the Burahabanga in between the altitude of 1156 and 241 feet are undulating plains covered by thick jungles and drained by major perennial rivers like the Burahabanga and the Suvarnarekha. Raw material are available on the surface and the rivers beds in these areas. But no site has been discovered in the valley north of the study area and between the two major rivers.

2. Most of the tools collected from the upper surface without any stratigraphic context beside a small stream which connected to the river Suvarnarekha, in this regard, it should be mentioned that polished stone tools and microliths can date back to the early, even in some cases the late historical period. But the area from where these tools have been collected is situated along the undulating plains covered with thick jungles — no early or late historical sites have been found in this region. And its stratigraphical position below the polished stone tools are already established by the excavation of Kuchai.

3. All the collected palaeolithic tools are bifaces and made on flakes. The flakes on which the biface is made was produced at first preparing the core carefully by initially roughly trimming the sides and from the upper surfaces. The cortex was removed in such a way that flake scars usually meet in the centre. Then, in the next stage, a flattish place called



“Striking Platform” on the core especially along the margins where two surfaces of the core intersect. Finally, a blow was delivered either directly or by punching on the prepared surface by holding or supporting the core with a suitable medium. The celts and adzes were first shaped by percussion flaking and then the cutting edge of the whole surface was ground down by rubbing on a slab of wetted sandstone, or other hard rock (with sand as an abrasive if the rock itself was not friable). The ring stone of mace head made through pecking or drilling alternately from both sides of the stone until the two conical pits met and formed a perforation. Chisels are made only by precaution flaking. The small and tiny tools are mostly made by pressure flaking technique.

4. However, among a few sites noted in this area Chuagara is noteworthy for revealing stone tools of three different stages of prehistoric culture. Though, any postulation would be vague based on the surface collections, but location of the site among the other prehistoric sites and absence of early historic even late medieval materials somehow let us postulate that collected materials must be placed with the bracket of prehistoric period.

References

- Ball, V. 1876. "On Stone Implements found in the Tributary State of Orissa ." *Proceeding of the Asiatic Society of Bengal*, 122-123.
- Bose, Nirmal Kumar and Dharani Sen. 1948. *Excavations in Mayurbhanj*. Calcutta: University of Calcutta.
- Chakrabarti, D.K. 1993. *Archaeology of Eastern India*. New Delhi: Munshiram Manoharlal Publishers Pvt. Ltd.
- Dasgupta, P.C. 1981. *Pragaitihasik Bengla*. Calcutta.
- Dasgupta, Paresh Chandra. 2007. *Subarnarekhar Prangane Aranyakanya Kangsabati*. Kolkata: Anima Prakashani .



- Ghosh, A.K. 1970. "An Analysis of Mayurbhanj Palaeolithic Industry." *Journal of the Indian Anthropological Society* 5 (1&2): 243-253.
- Ghosh, A.K. 1970. "Palaeolithic culture of Singhbhum." *Transaction of American Physiological Society* LX (1):161-172.
- Ghosh, A.K. and A.N. Basu. 1969. "An Appraisal of the Palaeolithic Industry of Mayurbhanj in the light of Recent Discovery." *Science and Culture* 25 (9): 476-479.
- Mohapatra, G.C. 1962. *The Stone Age Culture of Orissa*. Poona: Deccan College Post Graduate Research and Institute.
- Roy, S.R. 1985. *Stone Age Excavation at Lotapahada (1967)*. Patna: Directorate of Archaeology, Govt. of Bihar .
- Sen, D and A.K. Ghosh. 1960. "On the Occurrences of Palaeolithic in Singhbhum." *Man in India* XL (3): 178-91.
- Sen, D and U. Chaturvedi. 1957. "Microlithic Industry of Singhbhum." *Man in India* XXXVII (4): 104-115.
- Sen, D. 1969. "Profile of a Preliterate Culture in the Sanjay Valley, Singhbhum." *Journal of Indian Anthropological Society* 4: 17-29.
- Sinha, C.P. and Arabinda Singha Roy. 2018. *Prehistory and Protohistory of Jharkhand*. New Delhi: B.R. Publishing Corporation.
- Worman, E.C. 1939. "Letter to the Nirmal K. Bose in Excavation in Mayurbhanj by N.K. Bose and D.Sen." Calcutta . 2.