Prehistoric Explorations in the Central Ken Basin, Panna District, North Central India

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Abstract: *North-Central Indian River systems were the major center of Late Middle Pleistocene and the Upper Pleistocene hominin settlements. The Ken River basin is one of the largest in this region, which yielded Mode 1 dominant Palaeolithic implements and Quaternary mammal fossils in a recent survey. This limelights hominin behavior in this region.*

Keywords: Central Ken Basin, Environment, Mammal Fossils, Microlithic, Panna District, Geomorphology, Son Valley

Introduction

Central India acted as a major corridor for the movement and exchange of technologies and ideas, culture and genes throughout the Pleistocene (Chauhan 2016). River valleys of this region were major centers of hominin settlement during the Late Middle Pleistocene and the Upper Pleistocene (Haslam et al., 2011, Jones & Pal 2009). Considering the above potential, we conducted a systematic survey in the Ken basin (Figure 1), one of the biggest river systems of North-Central India, to understand the geomorphology and features of the hominin occupation in the basin. The Ken originates from the Barner range in the Katni district of Madhya Pradesh and flows approximately 427 km before it joins the Yamuna River at Chilla Ghat. It drains a large part of northern Madhya Pradesh, rich in Quaternary archaeological sites. In spite of the high potential it holds for locating prehistoric sites, very little investigation has been carried out in this river basin.

We conducted surveys in the last field season at three sites – Bariyarpur (BPR), Mohari (MHI) and Garhaghat (GHT) – in the upstream areas of the Ken basin (Figure 1). The Bariyarpur locality among the three recently surveyed sites, was reported earlier by

K.V. Soundararajan (1961) of the Archaeological Survey of India. This paper presents the preliminary study of the archaeology, Pleistocene fauna and sedimentary features reported from the above three sites. Our result shows that Ken valley sites contain a dominant number of Mode 1 (Chopper - Chopping / Pebbles tools) with Mode 2 (Acheulean biface) artefacts. Chronologically Mode 1 and Mode 2 tools tradition are associated with the Early and Middle Pleistocene epoch (Chauhan 2009 and Pappu et al., 2011), however we do not have any scientific dates regarding Ken valley formation to track correct dates of the artefacts.

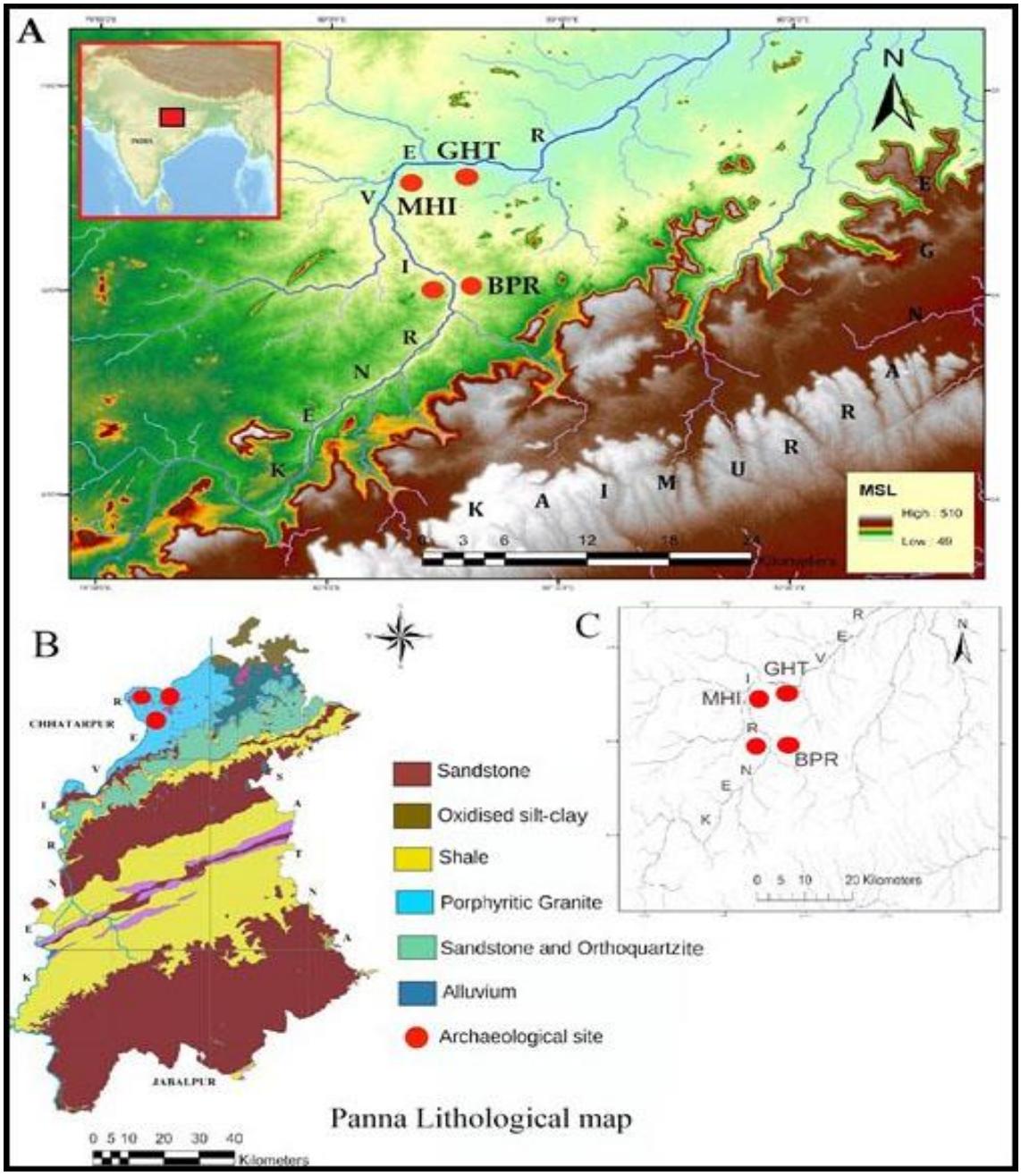

Figure 1: A. Raster topographic map of the Ken basin. B. Lithological map of Panna district (Shape file by Bhukosh, GSI) C. Drainage network, Ken basin

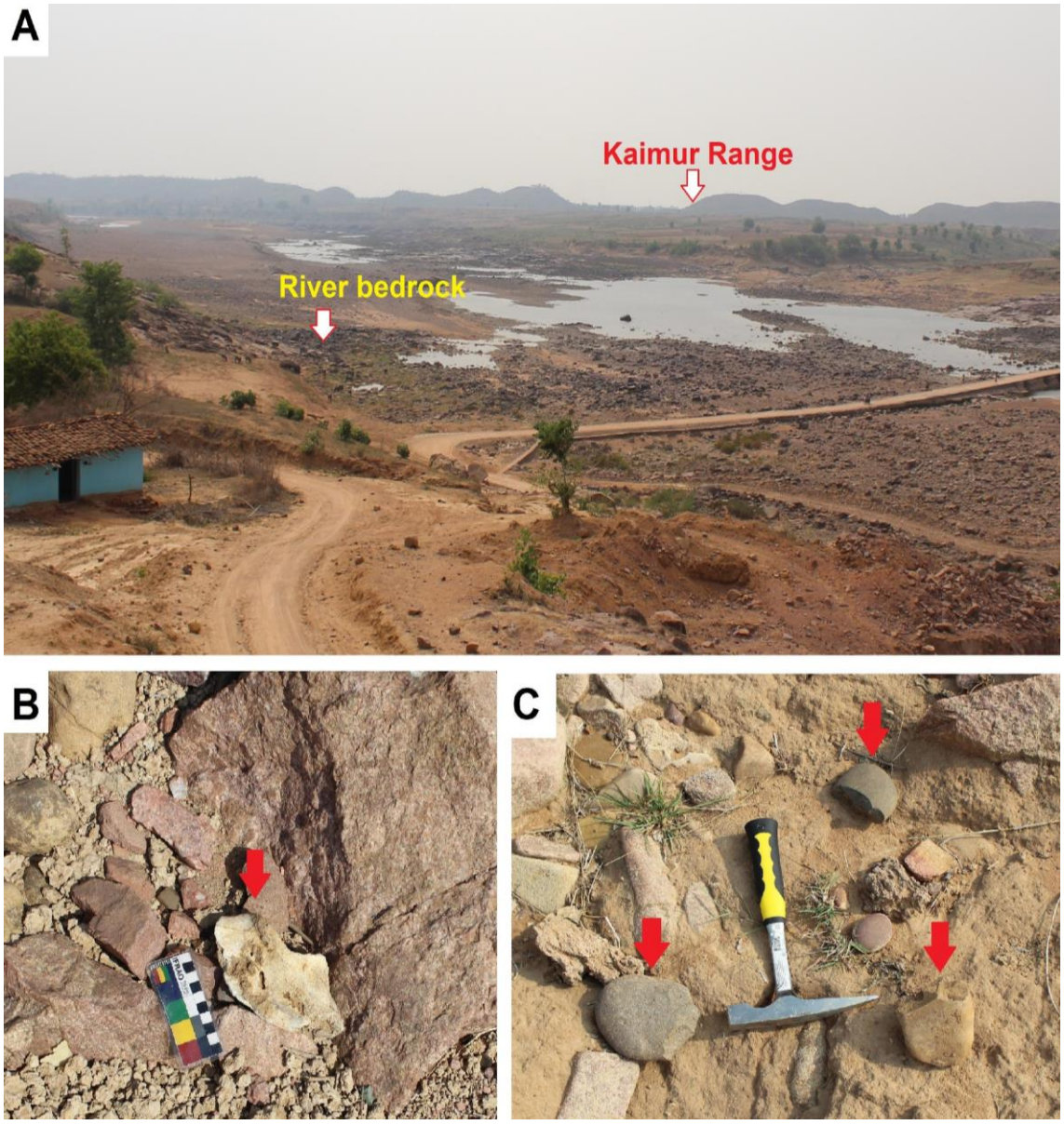

Figure 2: A. General view of Ken river at Mohari. B. Fossil at Bariyarpur. C. Artefacts near the river section at Mohari

Methods

The exploration covered over 1.5 km at Bariyarpur, 2 km at Garhaghat and 2 km at Mohari along the Ken river channel. Lithic samples from these localities are mostly collected from dried up river bed (Figure 2.C) and a few are also found embedded in the sediments exposed in alluvial sections. Important Lithics from the surface are collected through a grid plan of 1 sqm. The collected samples are systematically documented and their typo- technological and morpho-metric features are studied. The raw material exploitation and lithic reduction sequence are investigated in detail. Stratigraphy and features of different sedimentary units, and major rock types associated with each site are recorded. We used ArcGIS software for making

lithological and raster DEM base maps for the study of drainage network, lithology and general topography of research area.

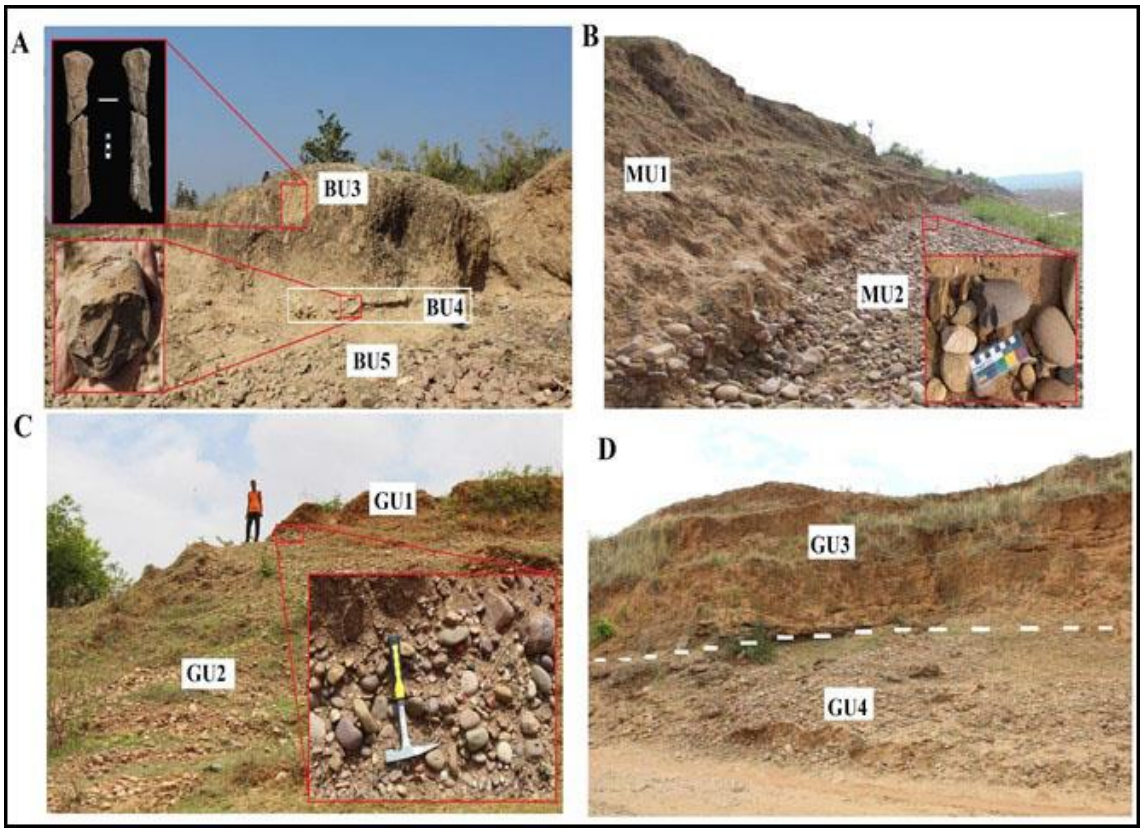

Figure 3: A. Bariyarpur section with artifacts and fossils, B. Mohari section with artifacts, C. and D. Garhaghat section with microlithic tools

Environment and Geomorphology

The average annual rainfall of Panna district is 1182.9 mm and the temperature ranges from 18°C to 35°C. Physiographically Panna district comprises the Bundelkhand upland in the north and the Vindhyan range in the south. The Ken River and its tributaries drain almost the entire Panna district and 40% of the river flows on the Vindhyan sandstone bedrock (Figure 1.B & 2A). Quaternary sediments are exposed on the banks of river Ken in the northern part of the district, bordering Uttar Pradesh.

Bariyarpur

Five strata labeled BU1 to BU5 are noticed at Bariyarpur (24 0 55 '56''N, 80°05'11''E) locality (Figure 4). The lowest stratum, BU5, exposed at this locality is the Porphyritic Granite bedrock. BU4 is a semi consolidated gravel layer which incorporates chopper-chopping artefacts. BU3 comprises yellow sand and soft calcareous nodules. Several fragments of animal fossils are found from this layer (Figure 3.A). BU2 represents unconsolidated pebbles, cobbles and sand along with bifaces and chopper-chopping artefacts. The top most layer is BU1 is a yellow sandy silt which is evident only in a few places along the river.

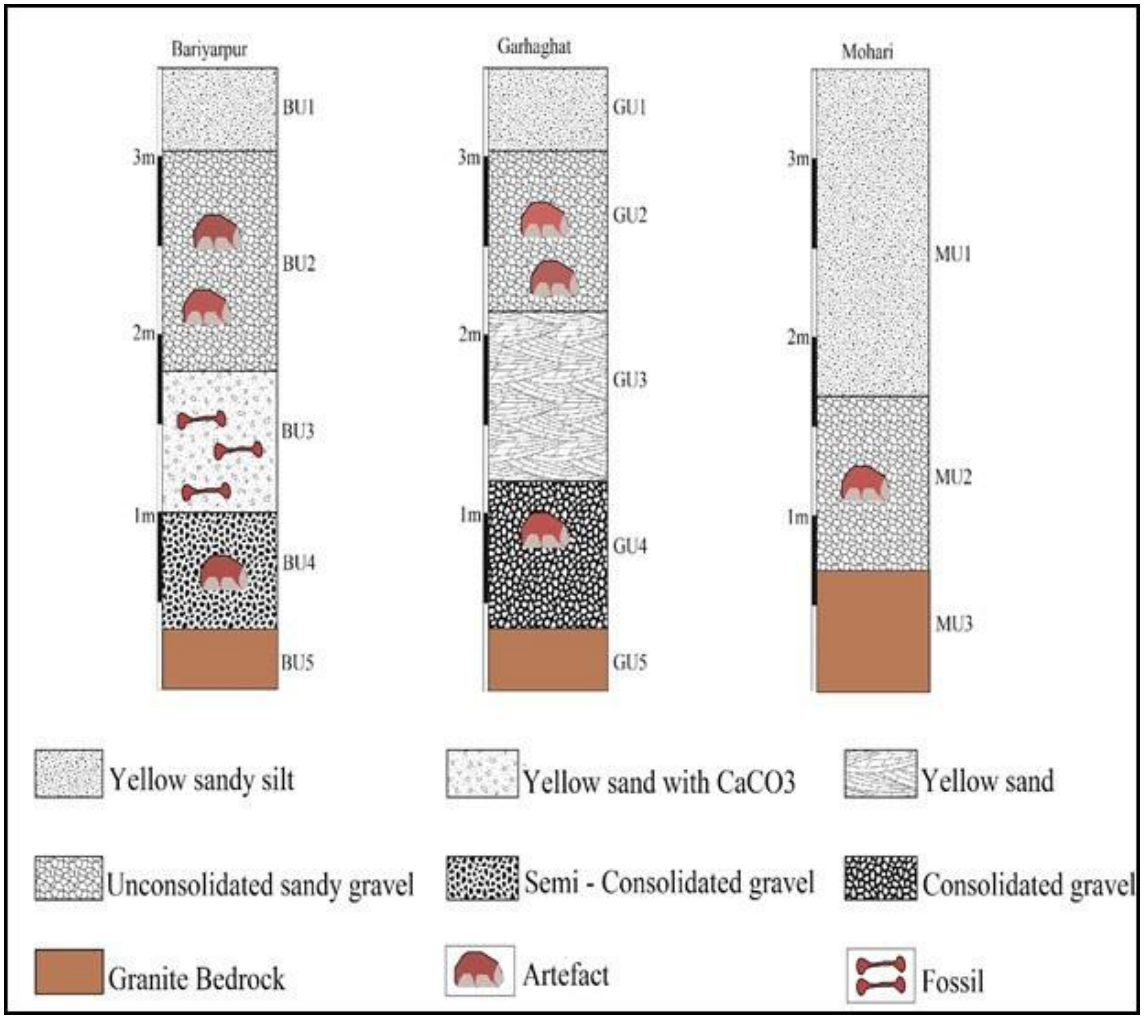

Figure 4: Composite stratigraphy of the Ken valley localities

Mohari

Mohari (24 0 55 '27''N, 80º03'26''E) is 20 km north of Bariyarpur in the downstream of river Ken. Three distinct strata, MU1 – MU3, are identified at Mohari (Figure 4). MU3 is the Porphyritic Granite bedrock which is exposed along the river bank. MU2 is an unconsolidated gravel in a sandy matrix. Chopper-chopping tools and four prepared cores are reported from this stratum. MU 1 is the yellow sandy silt sediment (Figure 3.B).

Garhaghat

Garhaghat (24º56'32''N, 80º04'18''E) is located 16km north of MHI locality. Five distinct sedimentological layers – GU1 to GU5 – are marked here (Figure 4). GU5 is the Porphyritic Granite bedrock at the bottom of the section. GU4 represents the consolidated gravel that incorporates clasts of varied size. GU3 is a yellow sandy sediment overlying the GU4. GU2 is a relatively loose sand and gravel which contains a good number of microlithic artefacts. GU1 at the top of the section represents the yellow sandy silt and the modern alluvial soil (Figure 3.C).

Table 1: Stratigraphic context and distribution of the new and previously reported artefacts from the Ken valley sites

Artefacts			Localities					Total Number	Total %
			Bariyarpur		Mohari	Garhaghat			
			Unit BU 2	Unit BU 4		Unit GU2	Unit GU 4		
Chopper tools			18	2	12	-	-	32	15.09
Chopping tools			10	-	-	-	-	10	4.71
Biface	Hand axe	Previous Report	32	-	-	-	-	32	15.09
	Cleaver	Previous report	9	-	-	-	-	9	4.24
		Newly reported	2	-	-	-	-	2	0.94
Core	Prepared Core	Previous Report	10	-	-	-	-	10	4.71
		Newly Reported	3	-	-	-	2	5	2.35
	Chopper Core		10	3	3	-	1	17	8.01
	Chopping Core		3	4	-	-	2	9	4.24
	Microlithic Core		-	-	-	20	-	20	9.43
	Microlithic blade		-	-	-	64	-	64	30.18
	Ring Stone (surface)		-	-	-	2	-	2	0.94
Total								**212**	**100**

Lithic Assemblage

All together 212 artefacts have been recorded from the three sites (Table 1). The locality at BPR had the maximum tools (106) followed by GHT (91) and MHI (15). Approximately 60% (129) artefacts were made from fine grained sandstone and orthoquartzite pebbles and cobbles and 40% (83) from the fine-grained stones like chert, agate, chalcedony and limestone. All these rocks are part of the geological formations of the valley (Figure 1.B).

Chopper and Chopping Tools

Choppers form 15 % of the lithic collection. Maximum number of choppers are reported from BPR n=20, followed by MHI n=12 (Figure 5.B&F). In contrast, chopping tools are relatively less in the collection from the three sites.

Figure 5. BPR: A. Cleaver, C&D. Chopping Core, F. Chopper tool, H. Prepared Core, MHI: B. Chopper tool, E. Chopping Core, GHT: G. Prepared Core, I. Flake

Biface and Core

Previous researchers have reported several hand axes, n=39, and cleavers, n=9, from BPR (Soundararajan 1961). Barring two cleavers from BPR (Figure 5.A) no other well-defined biface was reported from other sites in the current investigation. Apart from the 2 cleavers, the assemblage included 17 Chopper Cores (13 from BPR, 3 from MHI and 1 from GHT) and 9 Chopping Cores (7 from BPR, 2 from GHT). The collection included 5 Prepared Cores: 2 from the Unit GU4 of GHT (Figure 5.G) and 3 from the Unit BU2 of BPR (Figure 5.H) localities.

Microliths and Ring Stone

A number of microlithic artefacts are found eroding off the Unit GU 2, stratified immediately below the modern soil at the locality GHT. 84 microlithic artefacts (20 cores and 64 microblades) and 200 waste flakes were collected from this sediment (Figure 6.K,F,G&J). Currently these are studied in detail for determining their cultural affiliation. Two broken ring-stones/mace-heads made of sandstone pebbles (Figure

6.H) are also collected from the surface of the site GHT. No other locality in the surveyed region has shown evidence of microlithic association.

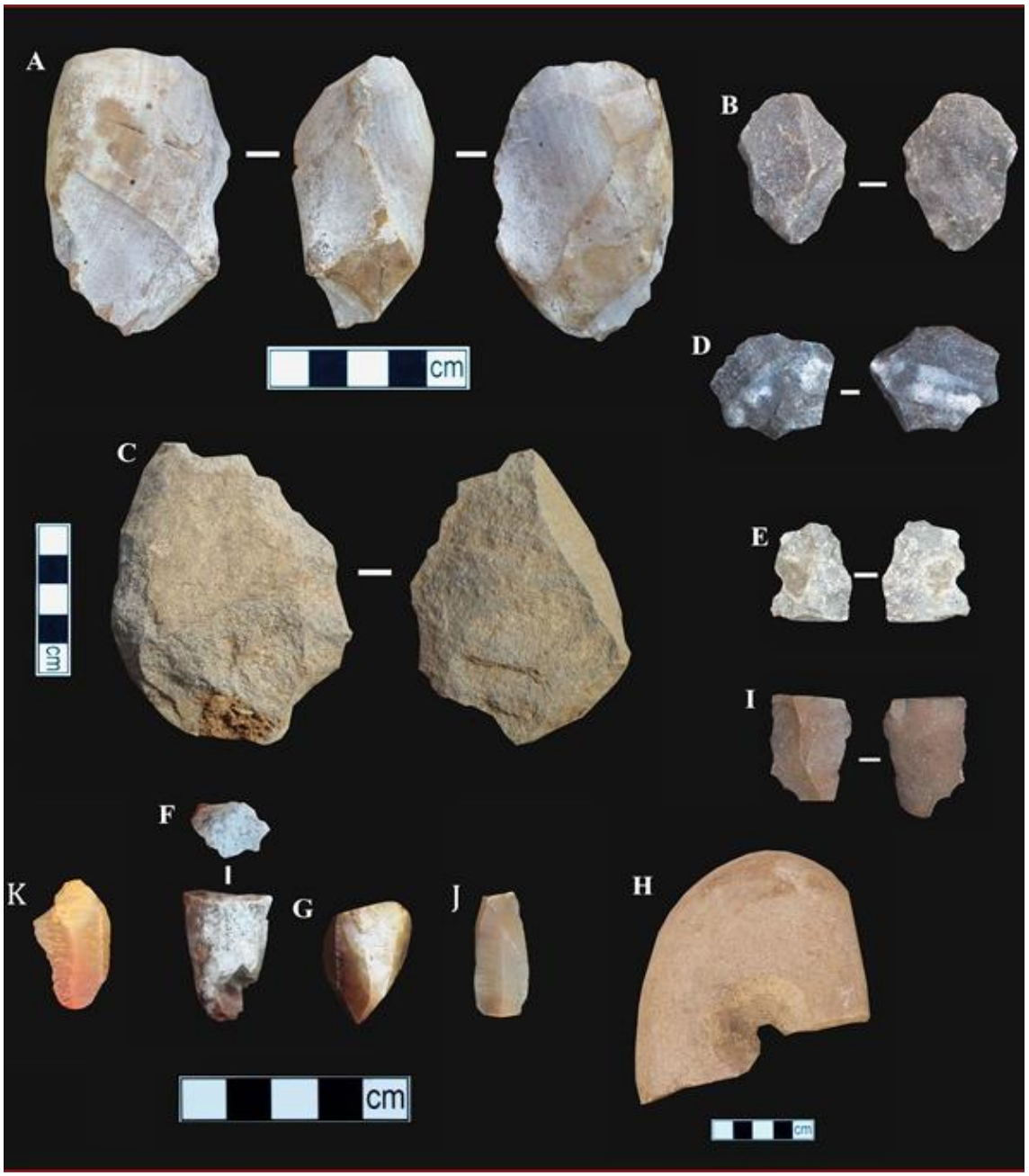

Figure 6: BPR: A. Chopping Core, D, E & I. Flake, B. Prepared Core Flake, MHI: C. Large flake, GHT: H. Ring stone (surface), F & G Microlithic Blade Core, J & K Microlithic blade

Mammal Fossils

Several mammal fossils are reported from the sedimentary layer, unit BU3 of BPR locality (Figure 2.B, 3A&7). A preliminary examination of these fossils suggests that a few of them belong to the bovid family.

Figure 7: Mammal fossils from BPR locality

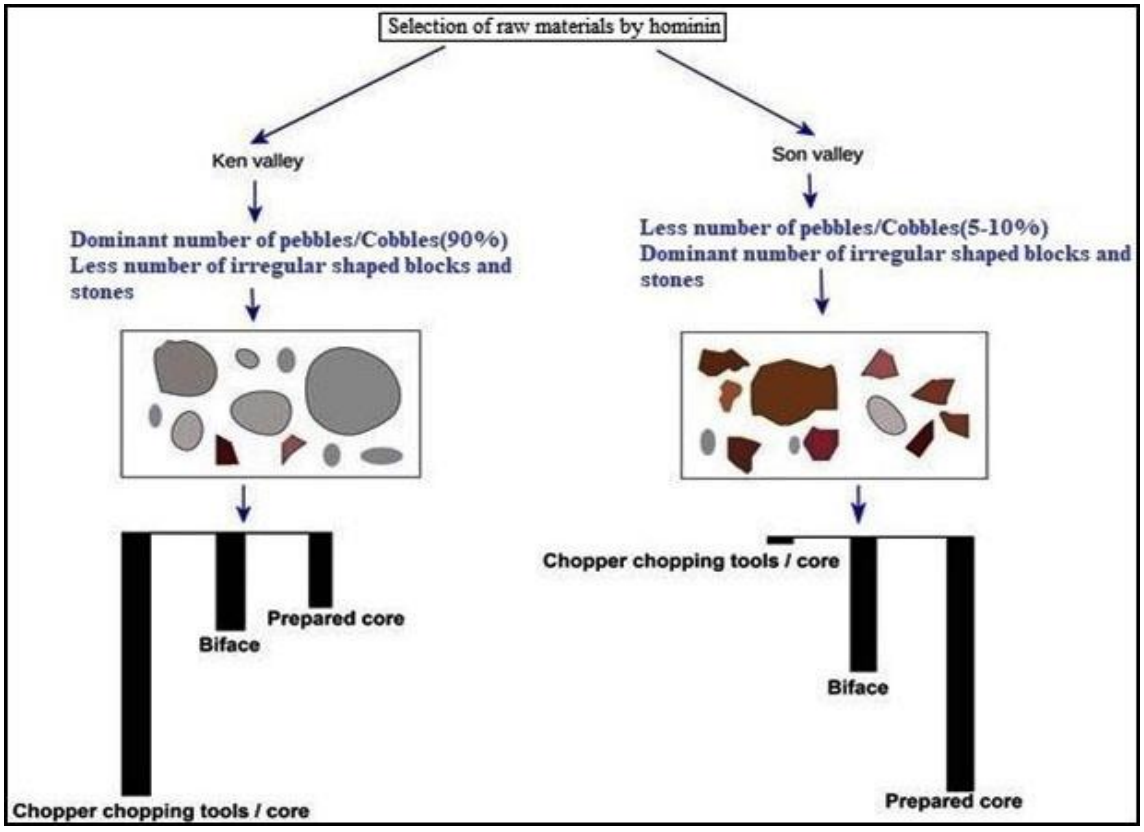

Figure 8: Selection of raw materials and their effects on the typo-technology variation of the Ken and Son valley sites

Conclusions

The gravel Unit 1 of the Ken (BU4 and GU4) represents the oldest hominin occupation of the Ken river basin. Mode 1 tools dominate the assemblages here. The gravel Unit 2 at BPR on the other hand has both Mode 1, and Mode 2 based artefacts. Previous research had associated the gravel Unit 2 as a transitional phase from Acheulean to Middle Palaeolithic (James et al., 2009). However, the current survey did not report any transition phase artefacts such as small bifaces and Levallois cores from this context. It is interesting to observe that numerous Mode 2 affiliated sites of South Asia also contain Mode 1 tools in the same geological stratum. The predominance of Mode 1 based artefacts in the gravel Unit 1 and the Mode 1 and 2 in the gravel unit 2 in the central Ken valley would suggest the possible existence of a Mode 1 tradition prior to the Mode 2 tradition in the valley. Alternatively, the co-occurrence of Mode 1 and Mode 2 may suggest the persistence of Mode 1 reduction procedure during the Acheulean for the removal of simple, expedient flakes especially from pebble cores. This issue can only be resolved by carrying out further research for ascertaining the exclusiveness of Mode 1 in the gravel unit 1 of the Ken valley. While the Ken valley shows a Mode 1 dominant industry, the neighboring Son valley in contrast has rich Late Acheulean and Middle Palaeolithic sites showing a variety of lithic reduction patterns (Shipton et al., 2013). All these indicate huge lithic technological diversity within the same region. What are the major reasons for the dominant number of the

Mode 1 in the Ken valley and they are totally absent in the Son valley? Interesting question, right! There are many possibilities behind this such as raw material factor (Figure 8), most part of the Ken river flows on the Vindhyan bedrock and because of this huge number of pebbles and cobbles are present on the river bed, hence were an easily accessible raw material for the hominin groups. However in the Son valley, because of the huge amount of sedimentation, many places are deficient in pebbles and cobbles. So, the diversity of raw material in both the basins could be a major factor of tool technology variation. Another possibility is that both river valleys were occupied by different hominin or cultural groups in the Pleistocene epoch. In the present scenario, Ken Basin needs further research and future investigation to understand a clear picture of hominin settlement pattern and diversity in North-Central India.

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References

Chauhan, P.R. 2009. The Lower Paleolithic of the Indian Subcontinent. *Evolutionary Anthropology* 18: pp62-78.

Chauhan, P.R. 2016. A Decade of Paleoanthropology in the Indian Subcontinent (2005–2015) *A Companion to South Asia in the Past* pp32-50.

Haslam, M., R.G. Roberts, C. Shipton, J.N. Pal, J. Fenwick, P. Ditchfield, N. Boivin, A. K. Dubey, M.C. Gupta and M. Petraglia. 2011. Late Acheulean hominins at the Marine isotopes age 6/5e transition in north-central India. *Quaternary Research* 75: pp670-682.

James, H. and M. D. Petraglia. 2009. The Lower to Middle Palaeolithic transition in south Asia and its implications for Hominin Cognition and Dispersal *Sourcebook of Palaeolithic transition Springer*: pp255-264.

Jones, S. C. and J. N. Pal. 2009. The Palaeolithic of the Middle Son valley, north-central India: Changes in hominin lithic technology and behaviour during the Upper Pleistocene *Journal of Anthropological Archaeology* 28: pp323–341.

Pappu. S., Y. Gunnell., K. Akhilesh, R. Braucher, M. Taieb, F. Demory, and N. Thouveny. 2011 Early Pleistocene Presence of Acheulian Hominins in South India *Science* 331, 1596.

Shipton, C., C. Clarkson, J. N. Pal, S.C. Jones, R.G. Roberts, C. Harris, M.C. Gupta, P.W. Ditchfield, and M. Petraglia. 2013. Generativity, hierarchical action and recursion in the technology of the Acheulean to Middle Palaeolithic transition: A perspective from Patpara, the Son Valley, India *Journal of Human Evolution* 65: pp93- 108.

Soundararajan, K.V. 1961. Quaternary Pebble, Core and Flake Culture of India- an appraisal of the data. *Ancient India No.* 17: pp68-85.