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Prehistoric Explorations in the Mayar River, District Singrauli, North Central India

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Abstract: *South Asia has produced rich evidence of Middle Palaeolithic sites belonging to the Middle and Late Pleistocene. A large number of Middle Palaeolithic sites have been reported in various river valleys of India. The Central Indian river systems contain a significant number of Middle Palaeolithic sites. The Middle Son valley is one of the major river valleys in this region that has yielded the evidence of dated Late Acheulian to Middle Palaeolithic artefacts. Dated artefact horizons from the Middle Son valley are chronologically significant in South Asian Palaeolithic. The current research sought to investigate the Mayar river valley, which is geographically situated close to the Middle Son valley. The explorations at the Mayar river valley have yielded rich evidence of Middle Palaeolithic artefacts including Levallois and Discoidal cores from stratified contexts. The Middle Palaeolithic artefacts in the Mayar river valleys open up a new opportunity to understand the nature of Palaeolithic occupation in the adjoining area of the Middle Son valley.*

Keywords: Late Pleistocene, Levallois core, Middle Pleistocene, Middle Palaeolithic, Mayar River, North central India, Middle Son valley.

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Introduction

South Asia has yielded rich evidence of Middle Palaeolithic sites which are reported from various parts of India. Earlier, sites have been reported from the Luni valley (Misra, 1961), around Didwana (Misra and Rajaguru 1986), Budha Pushkar (Allchin *et al.*, 1978), Katoati in Western Rajasthan (Blinkhorn *et*

al., 2013), the Belan (Sharma 1980; Jayaswal 1989) and the Middle Son valleys (Ahmed 1966; Sharma and Clark 1983; Jones and Pal, 2009), the Narmada valley (Mishra, 2016) and other areas in Central India, Chota Nagpur plateau, the Deccan plateau and the Eastern Ghats (Ghosh, 1970; Sankalia, 1956; Murty, 1966; Misra, 1989; Kumar *et al.*, 2018). The Indian Middle Palaeolithic is characterized by the use of cryptocrystalline material and findings of Discoidal and Levallois cores, a variety of flake tools such as scrapers, points, and sometimes biface artefacts (Sankalia, 1964; Pal, 2002; Kumar *et al.*, 2018; Misra 2001). In the current scenario, the origin of Indian Middle Palaeolithic elements is still a debated issue. It is associated with Anatomically Modern Human (AMH) dispersal in the South Asian context (Petraglia *et al.*, 2007; Blinkhorn *et al.*, 2013; Clarkson *et al.*, 2012), and also known to have the earliest dated context at Attirampakkam in South India and the date is even before AMH arrival (Kumar *et al.*, 2018). In this scenario, the Middle and Late Pleistocene Middle Palaeolithic sites of the Indian peninsular region are very significant to understand the nature and origin of Middle Palaeolithic culture.

Unlike the other parts, Central India is known for its rich Palaeolithic evidence. This region was a significant corridor for the movement and exchange of technologies, ideas and culture, behaviour, and genes throughout the Pleistocene (Chauhan, 2016). This can be evident from the numerous Palaeolithic sites found in this region. During the Late Middle Pleistocene and Late Pleistocene, river valleys of this region were a major center of hominin settlements as well-known from the Narmada and the Middle Son valleys (Patnaik *et al.*, 2009; Jones and Pal, 2009; Mishra, 2016). The Middle Son valley is one of the major and important quaternary river basins in the north-central Vindhyan region containing rich dated quaternary sediments, Late Acheulian and Middle Palaeolithic evidence (Jones and Pal, 2009;

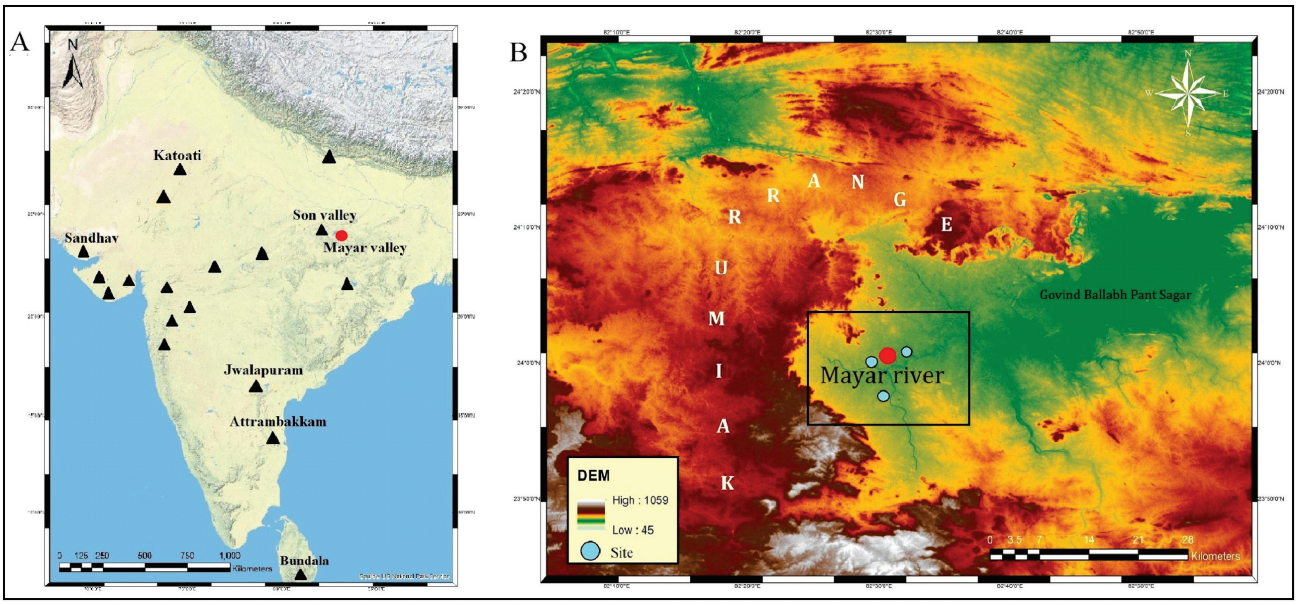

Figure 1: (A) Distribution of major South Asian dated Middle Palaeolithic sites showing the location of Mayar river (B) Raster DEM map of the Mayar river region; sampled lithic localities are shown in blue dots

Haslam *et al.*, 2011; Shipton *et al.*, 2013; Clarkson *et al.*, 2020). The Mayar river (23°59'23" N 82°31'28" E) is a tributary of the Rihand river and flows close to the Middle Son valley. Geographically the river originates from Kaimur range located in the Singrauli district in the northeastern part of Madhya Pradesh (Figure 1). During the early 1950s, initial prehistoric investigations were undertaken in this region, and various Lower Palaeolithic and Middle Palaeolithic sites were reported from the

Singrauli basin (Krishnaswami and Soundarajan, 1951). The Palaeolithic archaeology of this region is very significant to understand the cultural development of Middle Palaeolithic technology and hominin colonisations. However, very few investigations have been undertaken in this region. Close to the Mayar river system, authors conducted systematic explorations to understand the basic geomorphology of the river and Palaeolithic settlement patterns. Middle Palaeolithic artefacts were found in the river bed and river section. Most of the artefacts are in fresh condition and show minimal signs of abrasion. The preliminary investigations show that the Mayar Middle Palaeolithic artefacts are dominated by Levallois and Discoidal core reduction techniques.

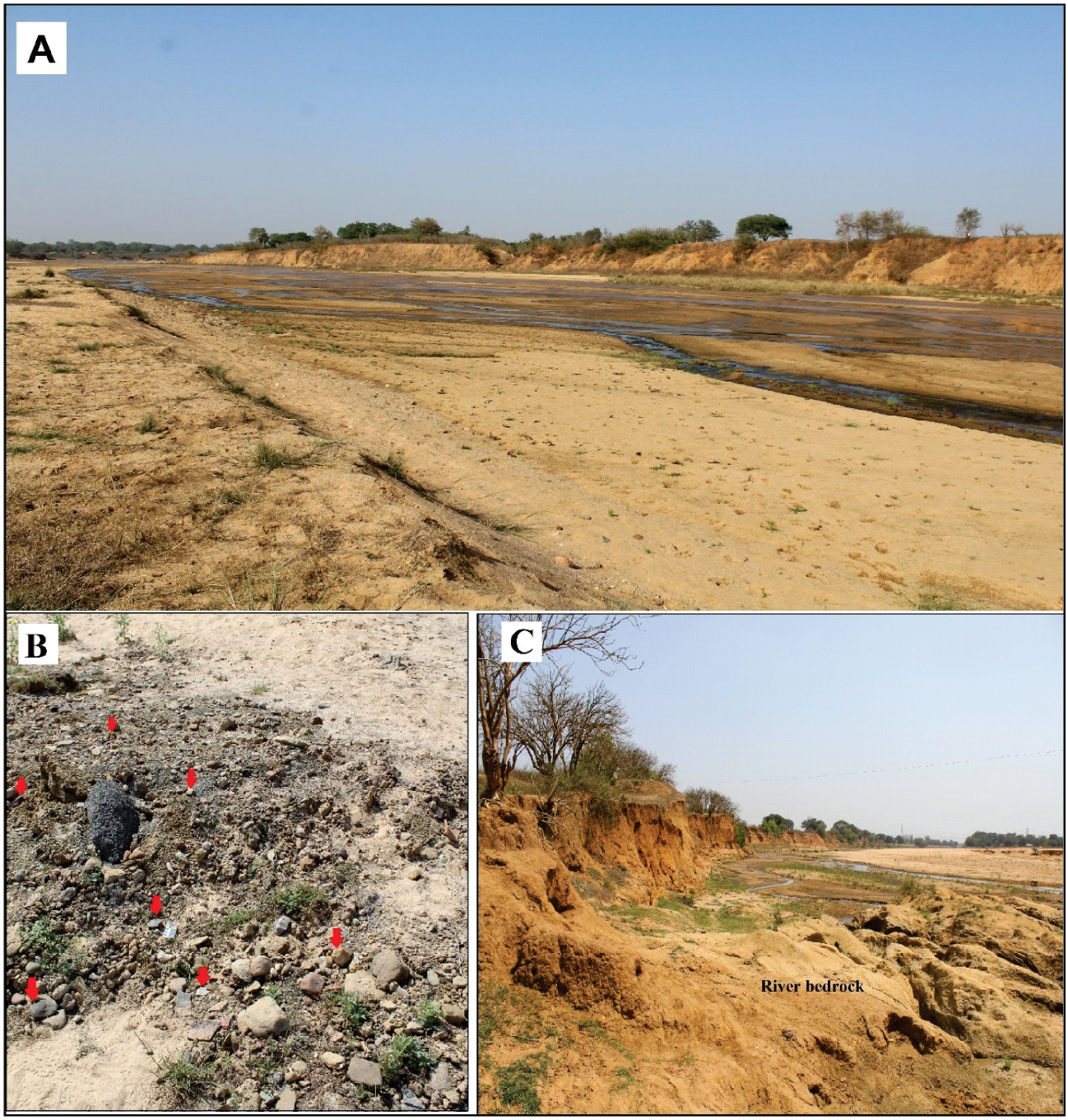

Figure 2: A) general view of the Mayar river B) exposed lithics scatters on the river bed (artefacts shown by red arrows) C) river with exposed bedrock

Methodology

The explorations were conducted in an area of about 9 Sq.km on the left bank of the Mayar river in 2018. During the survey important geomorphological features of the river valley i.e. river section, sediment type, colour, gravel size, and types of gravels were recorded.

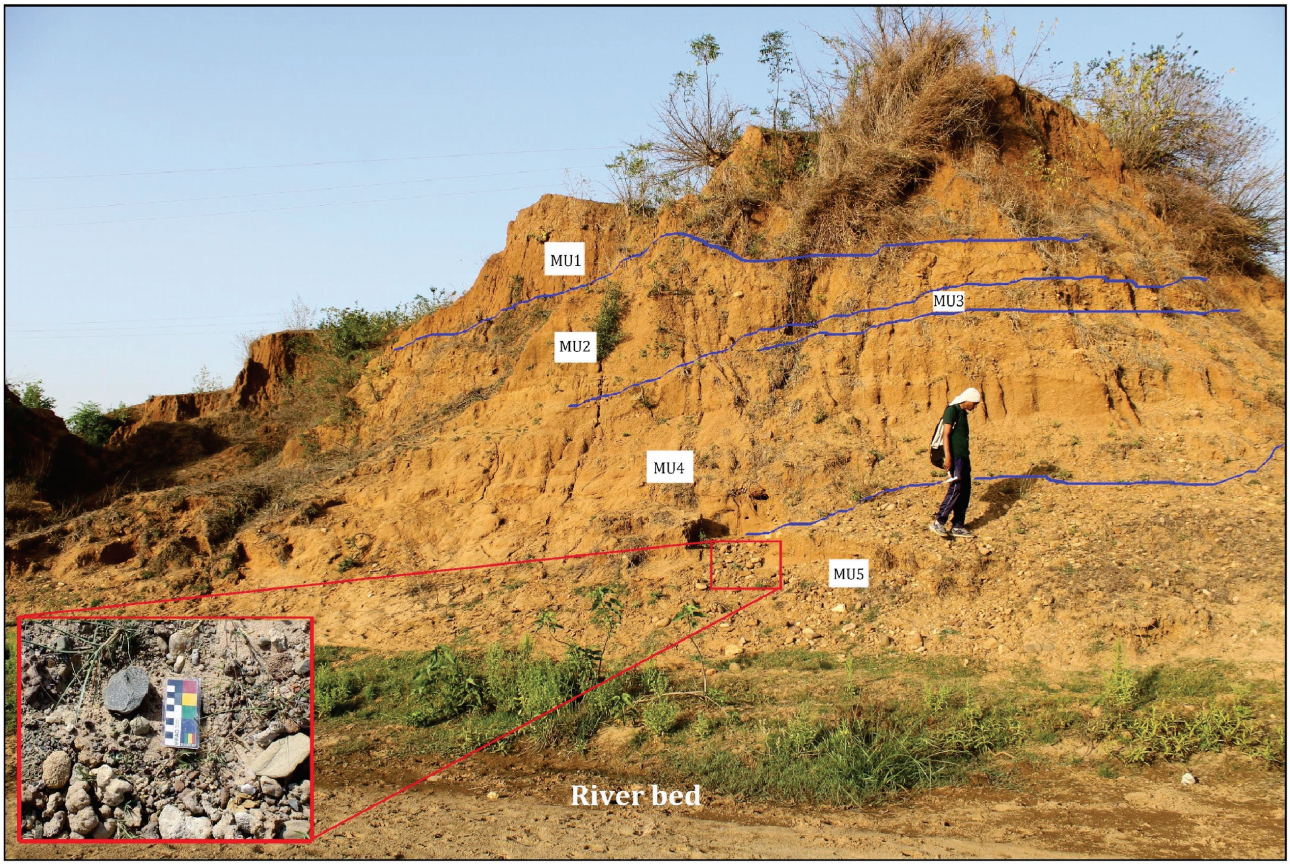

Figure 3: Mayar river section (artefact on the left side of photo)

Sediment samples and a few artefacts were collected from the section for basic analysis. Artefacts were also collected from the surface context for further study. Lithics scatters have been subjected to collection from three important localities following a 1 sqm. grid system (Figure 1, B). These localities are 3 km far from each other. Artefacts were collected randomly and typo-technological studies were done in the lab. The typo-technology and basic classification of the lithics followed the scheme proposed by Van Peer (1993) and Andrefsky (2005).

Environment and Geomorphology

The study area is a hilly terrain within the Kaimur hilly ranges. The Singrauli district wherein the sites are located is divided into three physiographic divisions: (i) the Kaimur hill ranges (ii) the Central part hilly ranges and (iii) the Southern hilly ranges.

In the district, three main rivers flow along with their several tributaries. The major rivers are the Son, the Gopad and the Rihand. The daily mean maximum temperature of Singrauli district is 42.0°C and the mean minimum temperature is recorded at 25.0°C. The normal rainfall of the district is 1132.7mm. The relatively high rainfall associated with the southwestern monsoon and other factors make the region an ideal habitat for numerous fauna and flora.

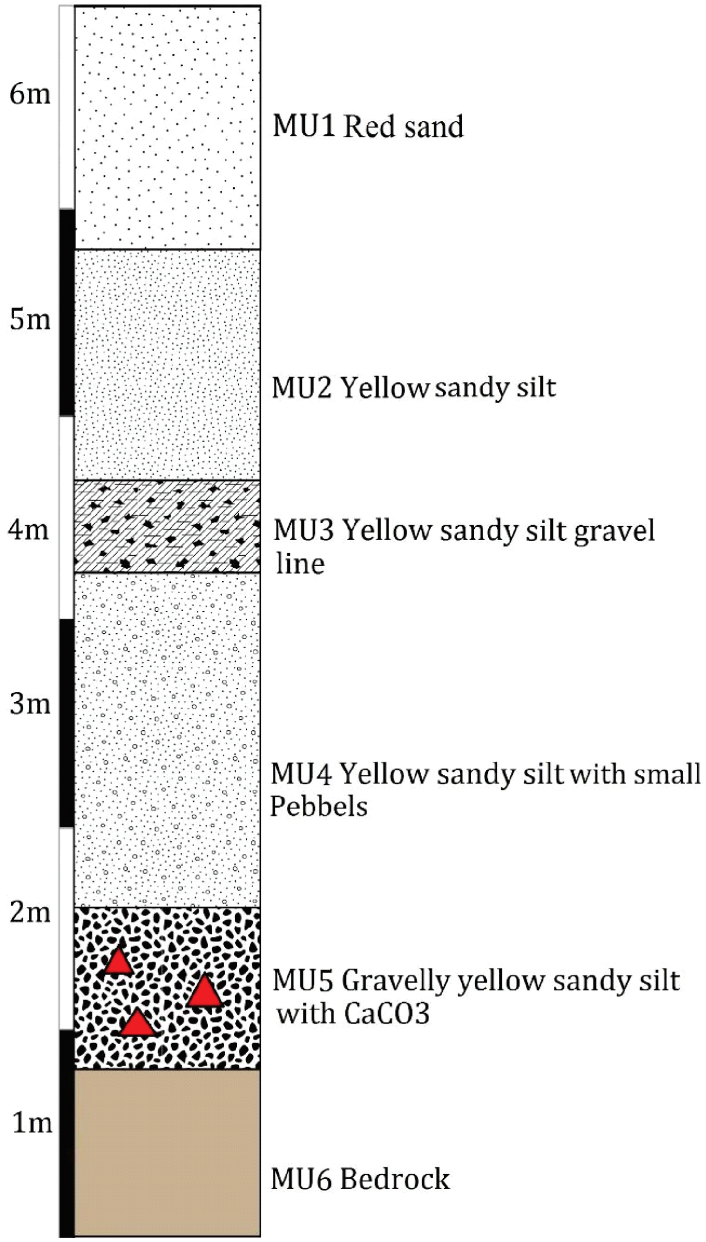

Figure 4: Composite stratigraphy of the Mayar river (artefacts shown by Red triangle)

The Kaimur range stretches from NE and SW direction and covers most of the district. The central part of the district forms a series of hill ranges. In the southern part, elevation of hills ranges from 365 to 488 AMSL. The general slope of the area is towards the northeast (Ministry of Water Resources 2013). The entire district's river system is part of the Ganges drainage system. The pattern of drainage is dendrite in nature and in the hilly terrain it follows a radial pattern. The stratigraphy of the Mayar river is labelled as unit MU 1 to MU 6 (Figure 3 & 4). The lower most Unit MU 6 is the greyish sandstone bedrock (Figure 2 C) which is followed by MU 5 – a gravelly yellow sandy silt and $CaCO_3$ formation – which yielded fresh Middle Palaeolithic tools. MU4 is composed of yellow sandy silt with small pebble nodules overlying the MU5. MU3 unit is represented by yellow-colored sandy silt and gravel observed at a few places. Unit MU2 is composed of only yellow sandy silty sediments and the surface layer, MU1 is the red-colored sandy soil.

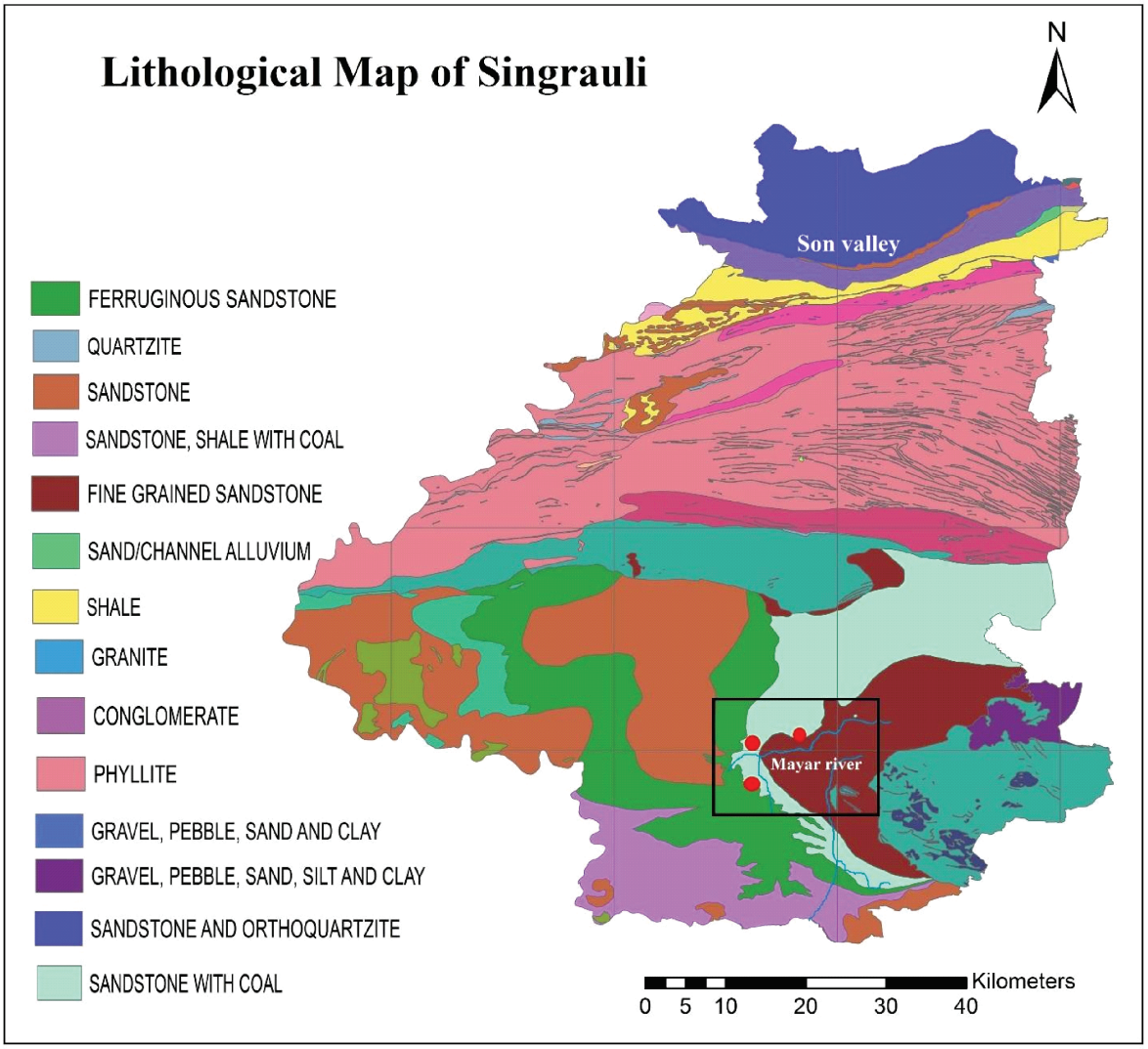

Figure 5: Lithological Map of Singrauli district, the study area is highlighted by the black square, and sites are shown in red dot (Map shape file source form Bhukosh GSI)

Table 1: Geological history and Lithology of Singrauli region (Ministry of Water Resources Central Ground Water Board North Central Region Bhopal, 2013)

Period	*Series/ stage*	*Lithology*	
Recent Pleistocene	Alluvium	Alluvium and soil cap comprising clay, sand, gravel, etc. (Major soil - Red soil, Alluvial & Lateritic soil)	
Cretaceous to Eocene	Deccan traps	Basaltic Lavas flows	
Permian to up Carboniferous	Gondwanas	Upper Gondwanas formation, Raging formation, Talchir formation	Sandstone, Shale, Evel, Conglomerate and Glauconite
Cambrian	Vindhyans	Kaimur series Semri series	Porcellinite Sandstone Orthoquartzite and Conglomerate
Pre Cambrian	Archeans	Phyllite, Quartzite, Granite, schist, gneisses metabasic sedimentary and intrusives	

In the river gravel, various types of fine-grained sandstone, quartz, and quartzite nodules have been observed and their size measures between 3 cm to 13 cm. The artefacts have been made out of catechu quartzite, whitish quartzite, greyish quartzite, fine grained sandstone and bluish quartzite (Figure 6 & 9 E). The majority of artefacts are made on grayish quartzite and fine-grained sandstone. Most of the above raw materials are found in the river gravel. Geologically fine-grained sandstone and quartzite are related to the Gondwanas and the Vindhyan series formation, which belong to the Permian and Cambrian periods (Figure 5) (Table 1).

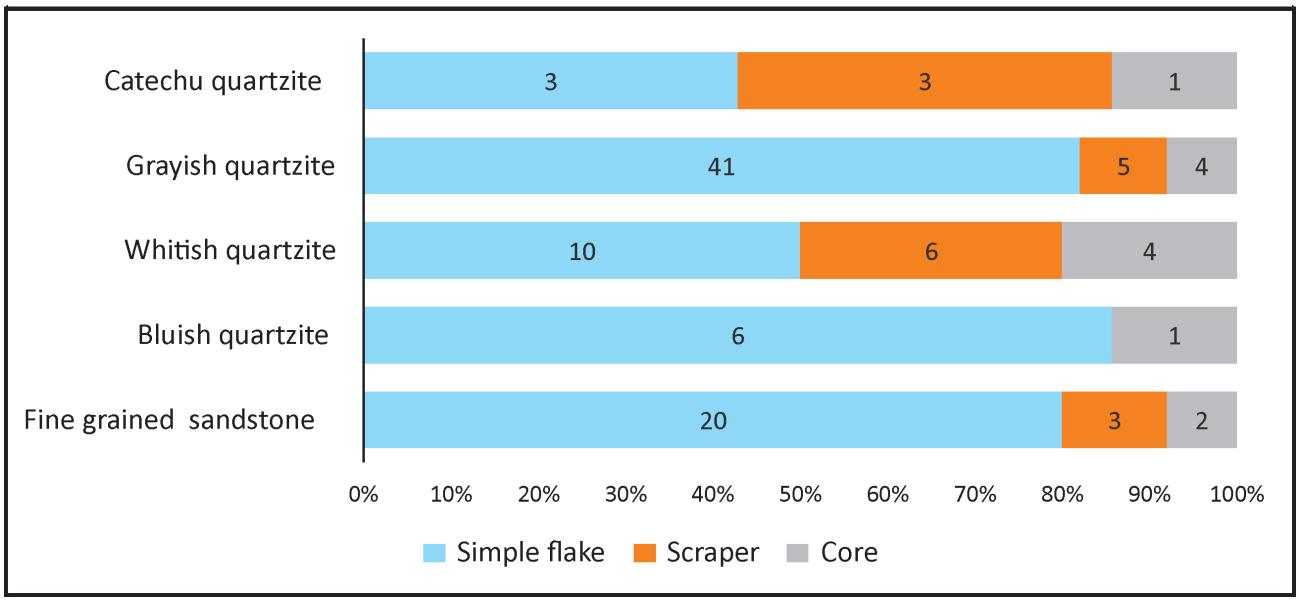

Figure 6: Percentage utilization of raw material

Lithic Assemblage

Various types of stone tools have been collected from the Mayar river section and its channel (Figure 7A & 8). Most of the artefacts are found within the yellow sandy silt gravel horizon (MU5) of the river. This indicates that, after the formation of gravel nodules, hominins started settling on the top of the gravel formation and manufactured artefacts at the site. The lithic typologies can be associated with prepared core Middle Palaeolithic technology. Most of the artefacts are found in fresh conditions. 109 artefacts have been collected from the riverbed and river section which include 12 prepared cores and 17 scrapers. None the less, no evidence of bifaces is found from any of the three localities (Figure 9).

Core/Scraper

At all the three localities, 2 Preferential Levallois cores (Figure 10 A & B, Figure 12 a & c), 3 Levallois recurrent cores (Figure 7 C, 10 C, 11 D & 12 b), 1 multidirectional core (Figure 11 A), 2 Discoidal (Figure 10, D), 2 multiplatform cores (Figure 11, C) and 2 unidirectional cores have been recorded. The length of the cores measured between 23 cm to 4 cm and the flake scars measured between 10 cm to 0.4 cm. The evidence of platform preparations is observed on the Levallois cores. Plain and cortical platforms have been observed on the Multidirectional cores and plain and dihedral platforms are observed on the Discoidal cores. 17 various types of scrapers (Figure 9, B) including 3 side scrapers (Figure 12 i & e), 6 double side scrapers, 4 end scrapers (Figure 11 F & 12 f) and 4 transverse scrapers have been documented. Overall, their length measures between 5 cm to 3 cm and intensive retouching

appear on the distal end as well as on the left, and right side of the flakes suggesting a strong scraping edge.

Flake

Total numbers of 80 flakes (Figure 10 E, 11 B & E) were collected from the three localities. The length of most of these flakes (70) measures between 7 cm to 1 cm. However, a few big (8 cm to 13 cm) flake blanks are also found (Figure 10 E) which are very big in the size, compared to the nodules found in the gravel and they are also very fresh which indicate that most probably these blanks were brought by hominins from elsewhere at the site. Most of the flakes have plain and cortical platforms and a few flakes have facetted platforms (Figure 12 d) which was most probably part of the Levallois reduction method and the cortical platform was part of the early stage of core reduction at the site. The plain and cortical platform angle of flakes measures between 40° to 110° and the facetted platform angle measures between 80° to 100°. The number of simple flakes is high as compared to the core and flakes tools which indicate that most probably, they represent high reduction intensity of the cores at the site.

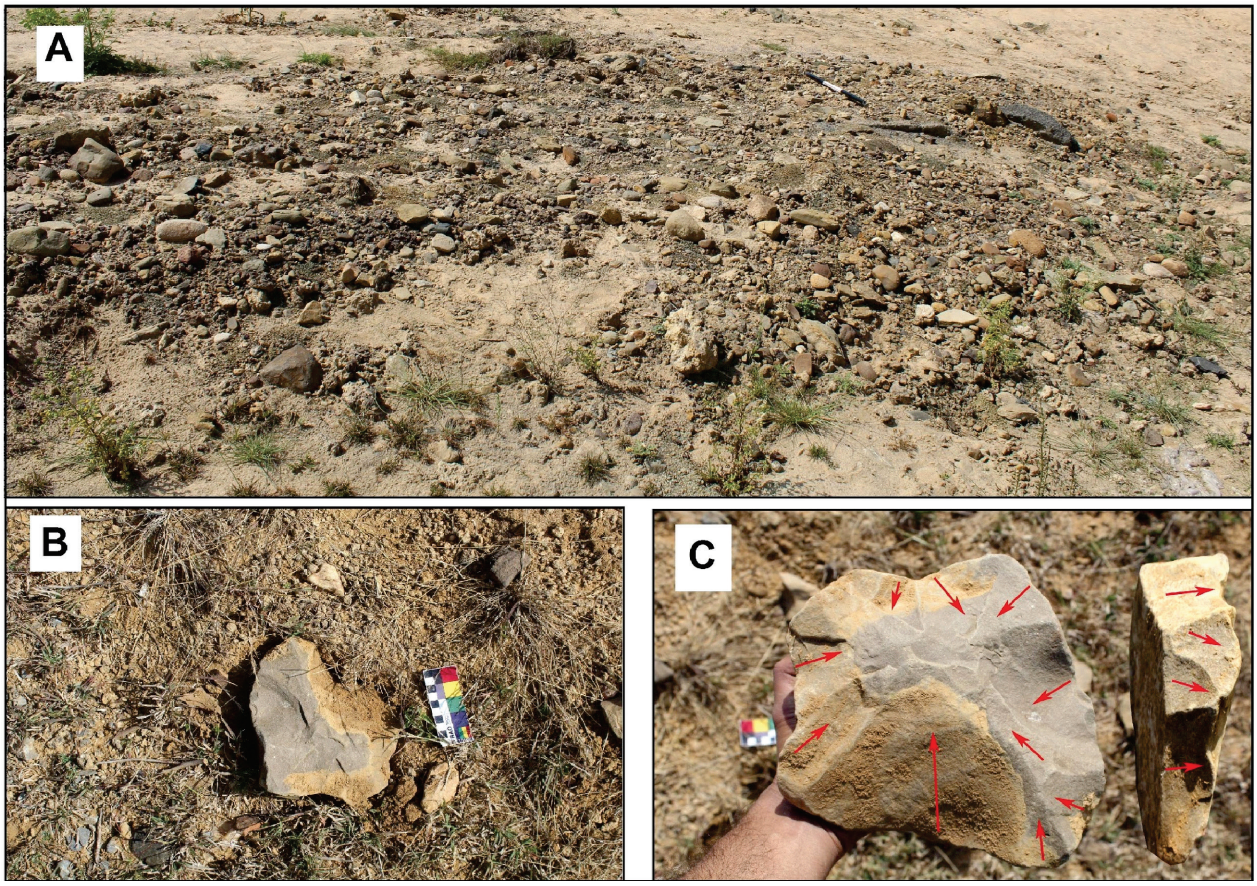

Figure 7: A) lithic scatters on the river bed B) large recurrent core on the surface context C) close view of a large recurrent core with prepared platform

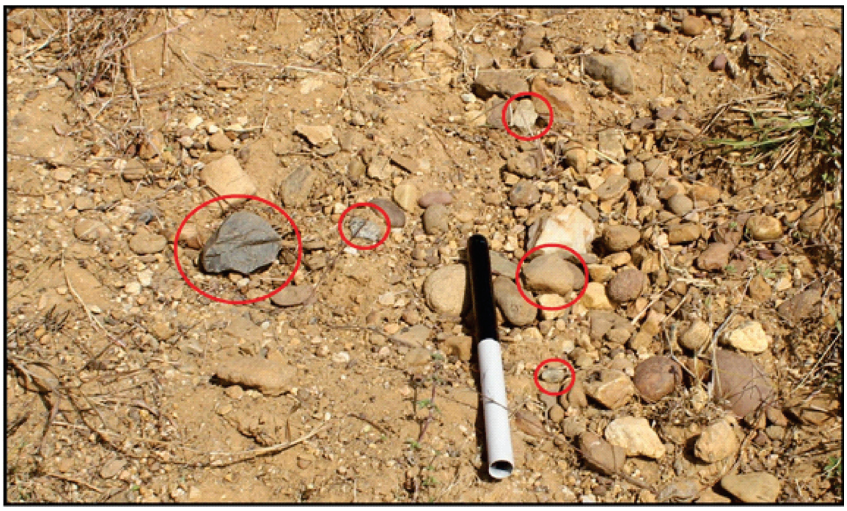

Figure 8: Lithics scatter near the river section (red circle showing artefacts)

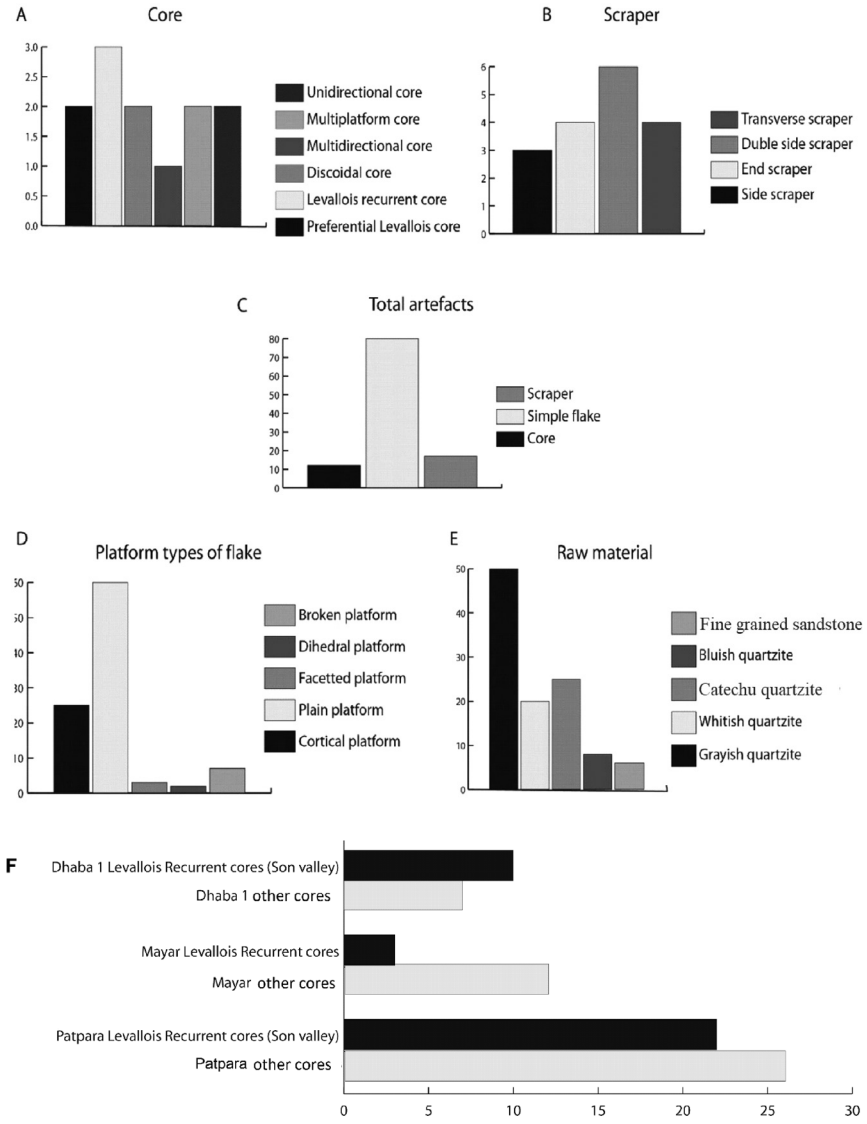

Figure 9: Basic overview of the Mayar Middle Palaeolithic artefacts. A) types of the core B) types of the scraper C) total amount of artefacts D) platform types on the flakes E) raw material type and amount of utilization F) amount of Levallois recurrent cores in the Mayar and the Son valleys

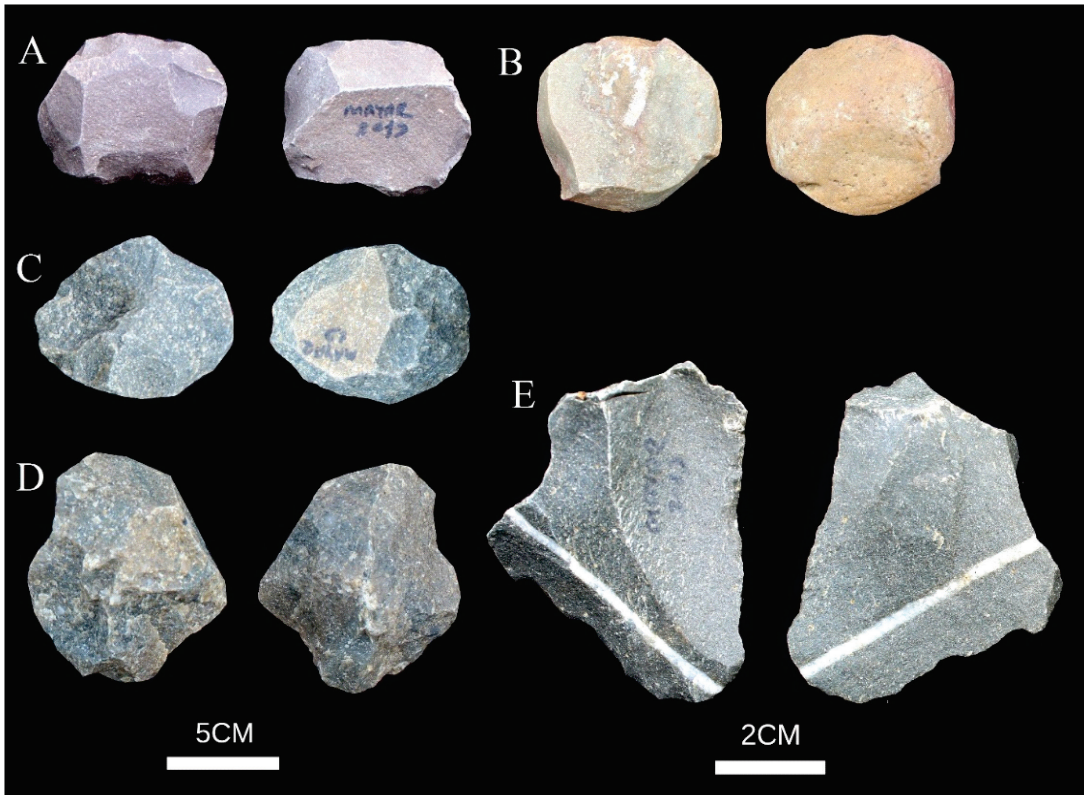

Figure 10: A&B) preferential Levallois core. C) Levallois recurrent core D) Discoidal core E) large flake

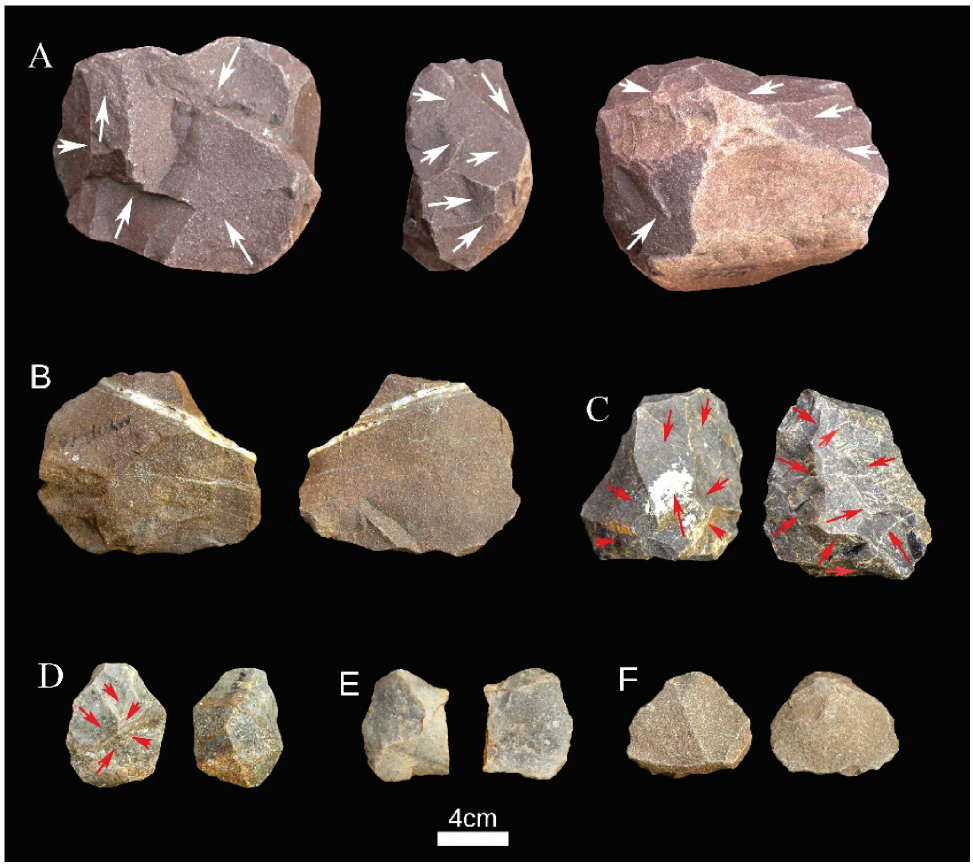

Figure 11: A) Multidirectional core with prepared platform B&E) simple flake (Semi cortical flake) C) multiplatform core D) Levallois recurrent core F) end scraper

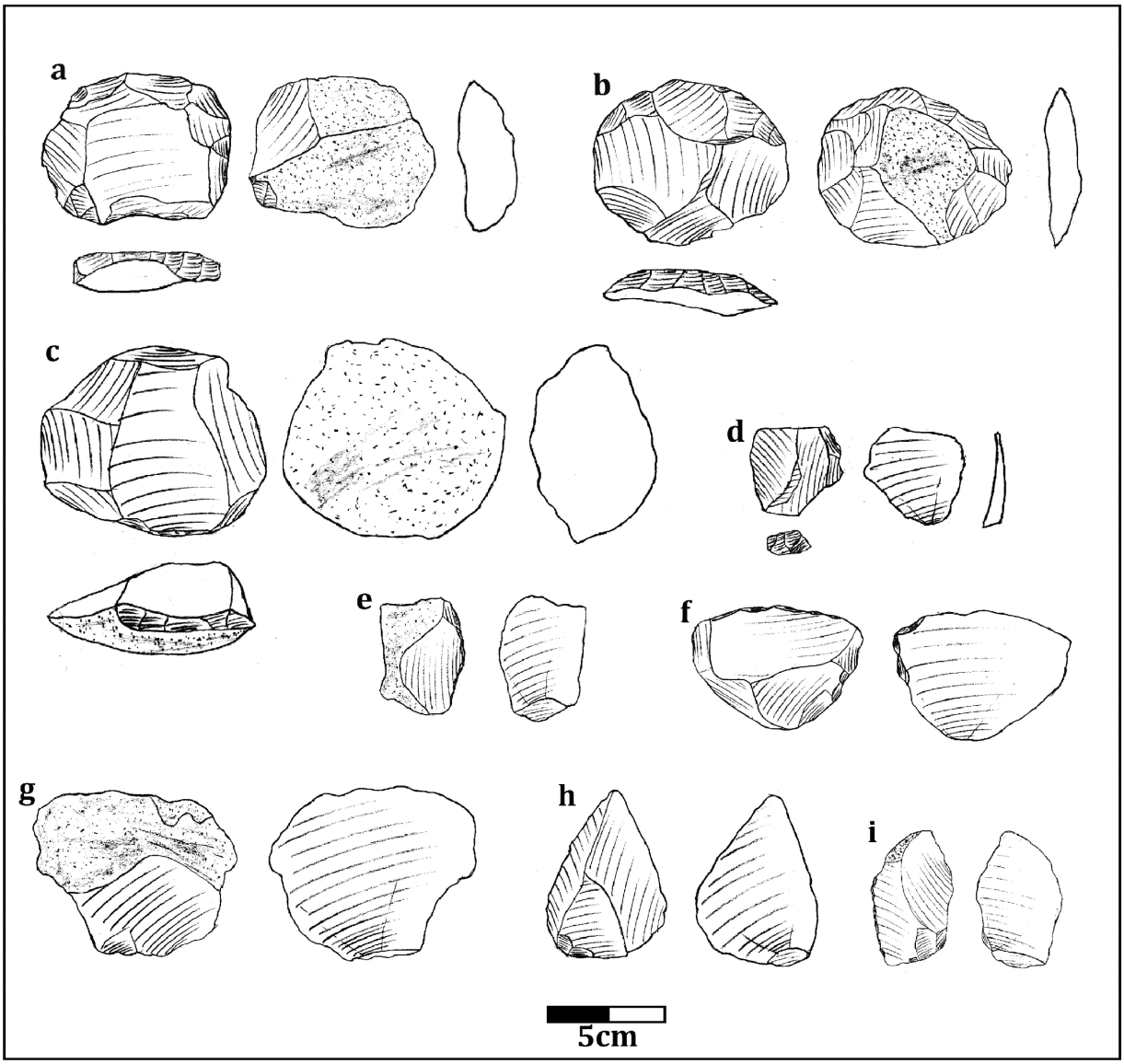

Figure 12: a & c) Preferential Levallois core b) Levallois Recurrent core, d) flake with facetted platform i & e) side scraper f) end scraper g) semi cortical flake h) pseudo-Levallois point (drawing by Praveen Kumar)

Conclusions

Previous research at the Singrauli region has yielded a large number of Lower Palaeolithic artefacts (Chopper–chopping and biface) and only very few Middle Palaeolithic artefacts (a few Levallois flakes) associated with the Sohan (Levallois) flaking technique have been reported (Krishnaswami and Soundarajan 1951). Why this early 1950s survey had failed to identify a true phase of the Middle Palaeolithic culture in this region is inexplicable. It may be because, in the 1950s, this phase was still not widely recognised in India. The current explorations in the Mayar river revealed the presence of Middle Palaeolithic industry, and most of the artefacts of this period were found from the gravel formation (Unit MU5). The explorations resulted in the retrieval of various types of prepared cores and flake tools. For preparing the cores, different sizes of raw material nodules were used to get the predetermined size of the flakes. Most of the cores are related to Levallois and Discoidal cores, and among Levallois cores, a high number of recurrent cores have been observed. The lack of scientific

dates from the Mayar river formation constrains a correct assessment of chronology of the Middle Palaeolithic in the valley. However, the Middle Palaeolithic sites dated between MIS 5 to MIS 4 in the neighboring Middle Son valley provide a minimum age of the Middle Palaeolithic culture in this region. The Middle Son valley Late Acheulian and Middle Palaeolithic sites are dominated by recurrent Levallois cores (Shipton *et al.* 2013; Haslam *et al.* 2011; Haslam *et al.* 2012 and Clarkson *et al.* 2020). This is closely comparable to the Mayar Middle Palaeolithic artefacts in terms of the high number of recurrent Levallois cores which shows that in both the river valleys this core reduction method was applied in high intensity than other Levallois cores reduction strategies (Figure 9, F). The hominin species responsible for the manufacturing of the Middle Palaeolithic in this region is debatable because of the lack of hominin fossils dated before MIS 4 in the South Asian context. In this whole scenario, the geographical location of the Singrauli district is crucial to get more valuable information about the nature of Palaeolithic sites around the Son valley region in north-central India.

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