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Lithic Typology and Technological Variability at Laua and Tapka Rock Shelter, Sonbhadra District, Uttar Pradesh

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Abstract

Tapka and Laua are two archaeological sites in the Sonbhadra District of Uttar Pradesh. Both sites are located in the same physiographic zone but differ in type; one is a rock shelter site, and the other is an open-air site. The rock shelter at Tapka contains various rock paintings and lithic artefacts, whereas Laua is represented solely by lithic artefacts. These archaeological sites came to light during the latest survey conducted by the team. This paper describes the typological and technological variability of lithic materials based on data collected from the archaeological sites of Tapka and Laua.

Introduction

The Middle Ganga Plain constitutes one of the most significant regions for understanding long-term cultural transformations in the Indian subcontinent, particularly the transition from early foraging communities to sedentary agrarian societies and eventually to early state formation and urbanism. Geomorphologically, the Middle Ganga Plain occupies a central position within the broader Gangetic alluvial system. It extends from the Ganga–Yamuna confluence at Prayagraj in the west to the Rajmahal Hills along the Bihar-West Bengal border in the east, bounded by the Himalayan foothills to the north and the Vindhyan-Kaimur ranges to the south. The region covers an area of approximately 144,000 km² (Singh 1971). The landscape was shaped by tectonic activity during the Miocene epoch and subsequently infilled with thick deposits of Himalayan alluvium. Geomorphologically, it is characterised by dynamic fluvial processes, including meandering river channels, oxbow lakes, natural levees, and floodplains, which together create a resource-rich ecological zone. The Ganga forms the principal river system, supplemented by major tributaries such as the Ghaghara, Son, Gandak, and Kosi (Singh 1971; Tiwari 1971). Within this broader region, Sonbhadra District represents a crucial archaeological zone, particularly due to its location in the hilly southern margins of the Middle Ganga Plain. Situated in southeastern Uttar Pradesh, Sonbhadra shares borders with Bihar, Jharkhand, Chhattisgarh, and Madhya Pradesh and forms a transitional ecological and cultural interface between the Gangetic plains and the peninsular uplands. The present study is based on systematic archaeological surveys conducted in the district, which have documented multiple sites reflecting diverse cultural activities. Among these, the rock shelter sites of Tapka and Laua are particularly significant, yielding evidence of rock art alongside microlithic assemblages, thereby offering valuable insights into prehistoric lifeways (Singh *et al*. 2026).

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Previous Research in Sonbhadra District

Archaeological investigations in Sonbhadra District have revealed a long and continuous cultural sequence extending from the Palaeolithic period onwards. Located between the Vindhyan and Kaimur ranges, the region has attracted scholarly attention since the 19th century, evolving from early antiquarian observations to systematic scientific research that has substantially contributed to the understanding of South Asian prehistory and early metallurgy.

A major phase of systematic research began in the mid-20th century under the Department of Ancient History, Culture and Archaeology at the University of Allahabad, led by G.R. Sharma. Extensive explorations conducted between the 1950s and 1980s significantly advanced the archaeological framework of the region. A landmark interdisciplinary project in the Middle Son

Valley, directed by Sharma in collaboration with Desmond Clark, reconstructed the palaeoenvironmental history of the region and established a stratigraphic sequence comprising five formations: Sihawal, Khunteli, Patpara, Baghor, and Khetaunhi. This stratigraphic framework has since served as a chronological baseline for prehistoric studies in the area (Sharma and Clark 1983). Further contributions by scholars such as V.D. Misra and J.N. Pal, also associated with the University of Allahabad, included detailed excavations at rock shelter sites like Baghaikhor and Lekhahia. These excavations yielded important evidence of Mesolithic burials and microlithic industries, highlighting the region's significance for understanding hunter-gatherer lifeways and mortuary practices (Sharma *et al*. 1980; Pal 1986).

Subsequently, archaeological work in the region was carried forward by Rakesh Tewari and his collaborators, and conducted extensive explorations in the Karmanasa valley and adjoining areas (Tewari *et al.* 1995; Tewari 1998; Tewari *et al.* 2000; Tewari and Singh 2002). Parallel investigations in the neighbouring Chandauli District, undertaken by teams from Banaras Hindu University and the Uttar Pradesh State Archaeology Department, further documented a wide range of sites, contributing to a broader understanding of regional cultural continuity (Singh *et al*. 2000; Tewari and Singh 2002). Excavations at key sites such as Malhar, Senuwar, Semar Sadhopur, Latifshah, Sakas, and Nindaur have provided critical insights into technological developments, subsistence patterns, and early metallurgy in the Middle Ganga Plain (Tewari *et al.* 2000; Singh *et al.* 2014; Upadhyay 2017; Singh *et al.* 2020a, 2020b, 2020c, 2024).

The Sonbhadra region is also widely recognised as a major centre for rock art studies. Many scholars have documented and analysed rock art sites in the region and its surroundings, e.g., Varma (1984), Tewari (1990), Neumayer (2013), Tiwari (2014), Singh (2014), Ajay Pratap (2016), Upadhyay *et al*. (2017-2018), and Singh *et al*. (2026). These studies have significantly contributed to understanding the stylistic, chronological, and cultural dimensions of rock art traditions in the Vindhyan region.

Methodology

The present study employs a combination of traditional field survey methods and modern scientific techniques. During fieldwork, a probability sampling approach was used for the collection of artefacts to ensure representative coverage of the archaeological landscape. Recovered lithic materials were subsequently processed in the laboratory, where they were carefully cleaned using water to remove adhering sediments without damaging surface features. The analytical framework is based on a typological and morphological approach to lithic classification, following established methodologies proposed by Bordes (1961), Clark (1961), and Sharma and Clark (1983). This approach facilitates the systematic description and comparison of tool types, technological attributes, and assemblage composition.

Location of the Sites

The study area is centred around Laua village, located in the Robertsganj tehsil of Sonbhadra District. The village is situated atop a plateau formed by a series of low hillocks and lies near the Ghora-Mangar Hill range. The neighbouring villages of Bahera and Baghama are located to the east and south, respectively. The archaeological sites of Tapka and Laua are located within the vicinity of the Laua village. Tapka Pahari is a forested hillock that contains a rock shelter site with archaeological deposits. The Laua site, situated closer to the village settlement, is associated with a seasonal or hilly stream that traverses the landscape. Both sites occupy ecologically strategic locations and preserve important evidence of prehistoric occupation, including lithic assemblages and rock art.

Tapka Pahari (24.5772° N; 83.1108° E)

The site is located approximately 20 km south-east of Robertsganj in Sonbhadra District. It can be accessed by taking a left onto the Robertsganj-Chopan Road (SH-5) at Ghurma Mod, then proceeding southeast via Meena Bazar for about 11 km to reach the location. This archaeological site is located at a higher altitude than the surrounding area in the hilly region. Currently, the site is situated approximately 2 km southwest of the Laua village and the Sati Mata temple. The archaeological site of Tapka is in the form of a rock shelter. This site features a remarkable rock shelter adorned with well-preserved and elaborately detailed rock paintings. The artwork vividly depicts scenes of hunting, group hunting, a man sitting on an animal, a man on horseback, trees, animals, birds, groups of people, and a mythological figure. The paintings are executed in white, ochre, and black, with some human figures filled with geometric patterns (Singh *et al*. 2026).

Inside the rock shelter, microliths, including blades, cores, and flakes, have been found. Additionally, microliths, cores, blades, and flakes were also found scattered along the path to the shelter and at the top of the site, about 50 metres beyond the rock shelter. The materials used for making these stone tools are mainly chert and chalcedony. This available evidence indicates that the tools were probably manufactured by the inhabitants of the painted rock shelter (Singh *et al*. 2026).

The archaeological site of Laua is located approximately 20 km south-east of Robertsganj in Sonbhadra District and about 3 km south-east of the previously documented site of Tapka Pahad (Singh *et al*. 2026). From the Laua village settlement, the location lies about 1.2 km south-east, on the way towards Ghormangar Hill. The site has yielded a significant density of stone tools, including microliths, blades, flaked cores, and small

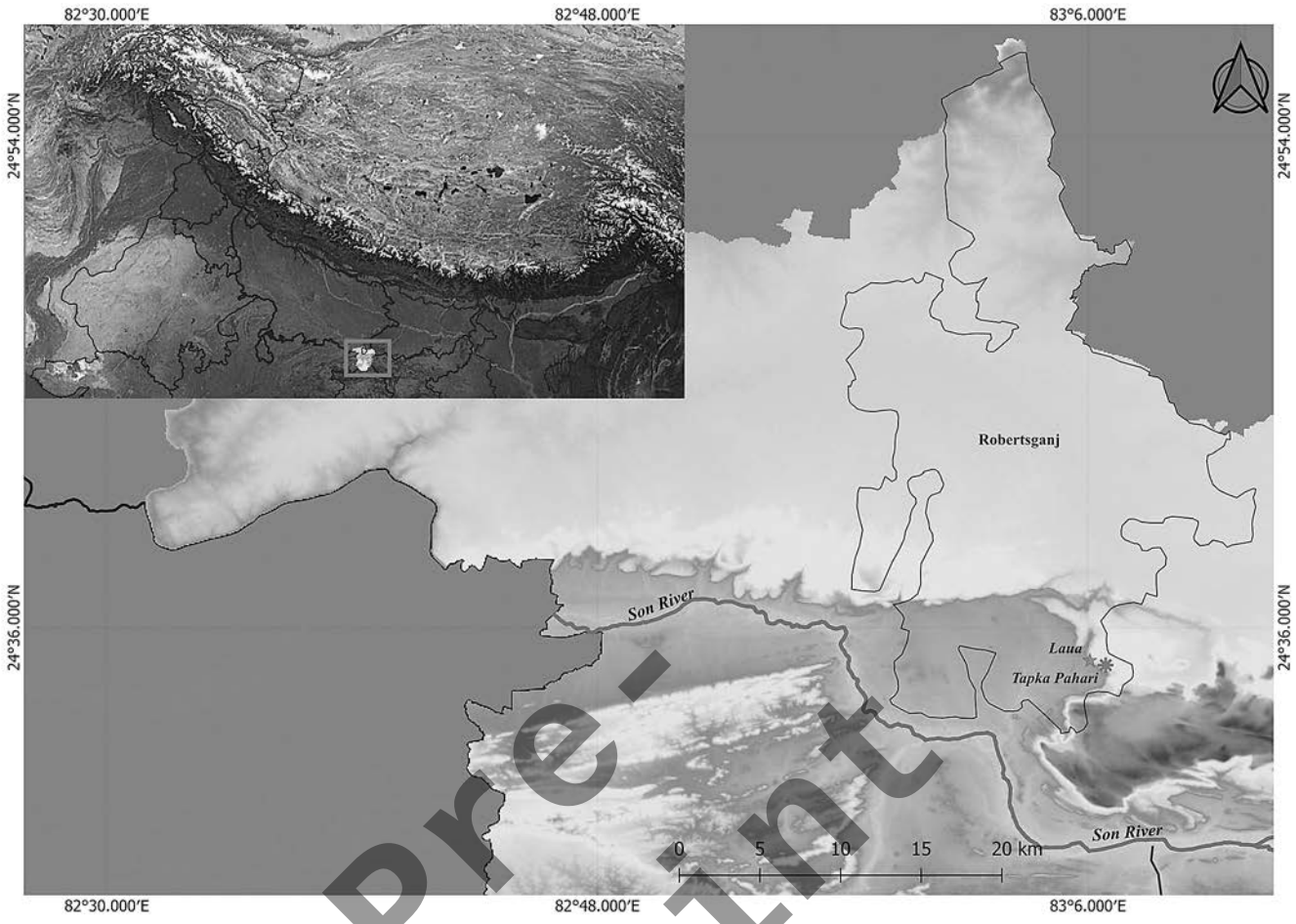

Fig. 1: Location of the archaeological sites of Tapka and Laua, Robertsganj, Sonbhadra

Fig. 2: General view of the Tapka Pahari, Robertsganj, Sonbhadra District

Fig. 3: Rock paintings and stone tools from Tapka Pahari (*in situ*)

Fig. 4: General view of the archaeological site of Laua, Robertsganj, Sonbhadra District

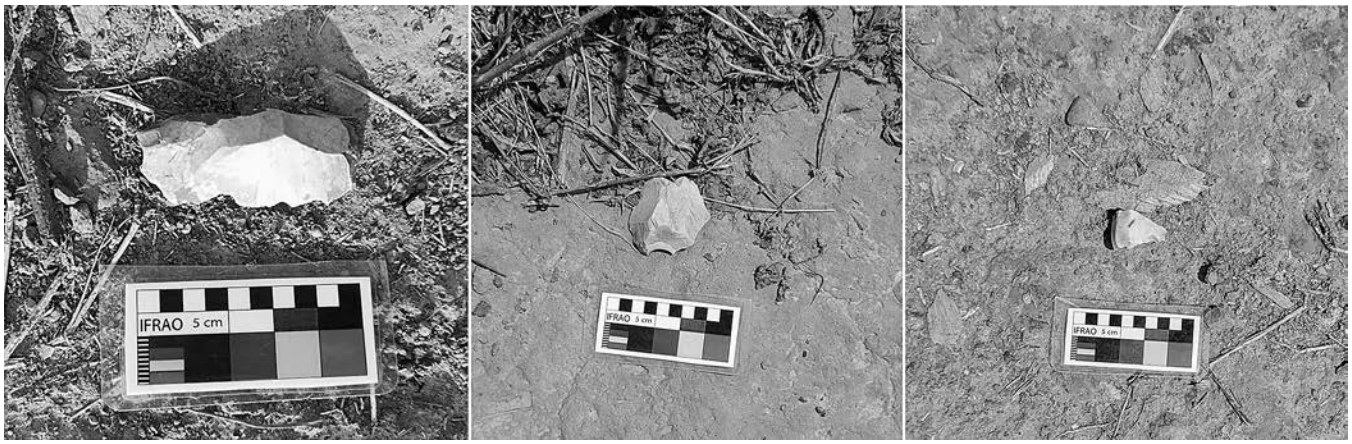

Fig. 5: Stone artefacts from Laua (*in situ*)

scrapers, indicating prehistoric human activity. Several painted rock shelters were reported from Ghormangar Hill, which is very near to this location, suggesting that the artefact-makers likely inhabited there. A seasonal rain-fed stream flows nearby, locally known as Gobar Dahwa Nadi, and local residents continue to use this water source for drinking and other daily purposes.

Stone Artefacts

Stone artefacts were scattered on the top of the shelter, under the shelter and near the rock shelter, as well as in the farms near the village and riverbed. A number of stone artefacts were collected through a probable sampling method for further study and identification of the nature of the archaeological sites. Metrical and morphological analysis of these stone artefacts was conducted in the Archaeological Laboratory of the Department of Ancient Indian History, Culture and Archaeology, Banaras Hindu University, after basic cleaning (Figs. 6-9, Tables 1-4).

Field Ethics, Observations, and Discussion

The lithic artefacts examined in this study were collected solely for research purposes. Although a substantial number of artefacts were observed scattered across the sites, only a carefully selected representative samples were retrieved for detailed analysis. Throughout the exploration, deliberate efforts were made to preserve the integrity of the archaeological context; consequently, most photographic

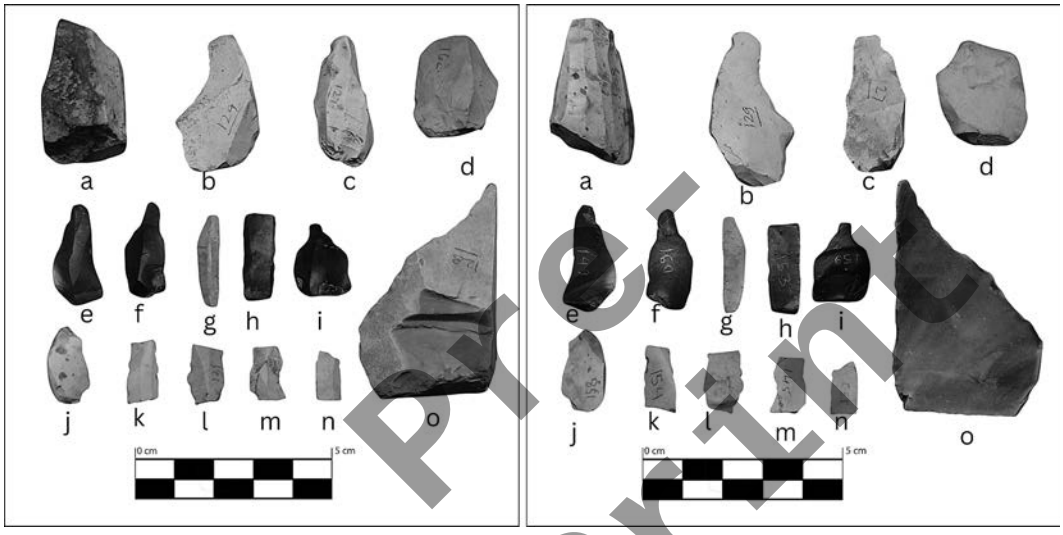

Fig. 6: Tools from Tapka, Dorsal view (Left) and Ventral View (Right)

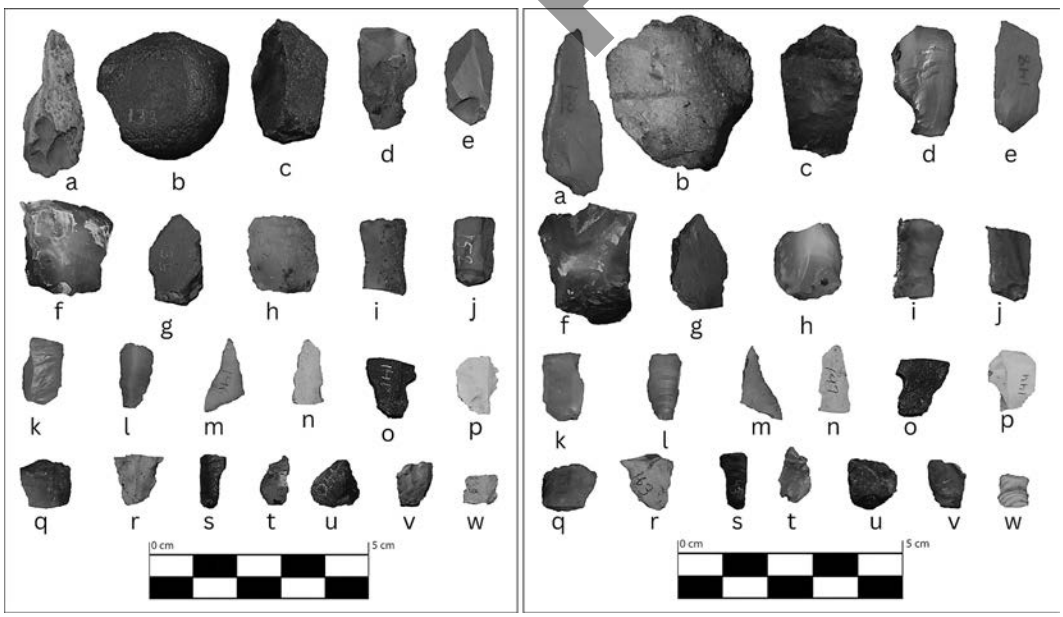

Fig. 7: Artefacts from Tapka, Dorsal view (Left) and Ventral View (Right)

Table 1: Description of Stone Tools recovered from Tapka (Fig. 6)

Art. No.	Tool Type	Raw Material	Dimensions* (in mm)	Remarks/Description
(a)	Core	Chert	27.51 x 21.88 x 18.37	It has several flaking scars and cortex on one side (removed flakes with the fluting core technique).
(b)	Concave Scraper	Chert	38.32 x 21.98 x 9.9	It is a flake tool. The dorsal side of the tool has two ridges converging at the mid of the tool, forming a prominent ridge towards the distal end. The proximal end is a little thicker and modified, while the distal end is pointed but broken. The left edge is semi-straight and semi-concave, and retouched. The right edge is convex and partially retouched.
(c)	Core Rejuvenation Flake	Limestone	34.54 x 15.11 x 9.72	A flake core with several flaking scars on the dorsal (removed flakes with fluting core technique) and almost flat ventral (except for a few crests). This flake was removed from the original core to maintain the platform for further removal.
(d)	Flake	Limestone	27.86 x 22.6 x 9.68	A flake with multiple flaking scars on the dorsal side. The ventral side is almost flat and has several scars. Left edge (from dorsal) is retouched, right edge is partially damaged and partially modified at distal margins.
(e)	Blade	Chert	27.61 x 13.47 x 4.06	A blade with multiple ridges on the dorsal. Ventral is concave and has some scars and damage. The proximal end is thicker and has a cortex, and the distal end is pointed but has a broken tip. Both edges are straight, sharp and converging at the distal end.
(f)	Borer	Chert	25.68 x 11.9 x 4.84	A blade with a crested ridge and some scars on the dorsal and almost flat ventral. The proximal end is a little thicker, while the distal end is pointed.
(g)	Bladelet	Chert	24.35 x 6.39 x 1.59	A bladelet with two ridges on the dorsal side converging at the middle of the tool and slightly concave ventral. The right edge (from dorsal) of the tool is straight, and the left is convex
(h)	Blade	Chert	22.88 x 8.89 x 3.44	A blade with three ridges on the dorsal and a flat ventral. Both ends of the tool are broken. The left edge of the specimen (from dorsal) is retouched, and the right edge is sharp and straight.
(i)	Borer	Chert	21.11 x 15.02 x 6.61	A flake with two ridges and a deeper scar on the dorsal side. The ventral side is bulbar and has a curvy ridge towards the distal end of the tool. The proximal end is thicker, wider and almost straight, while the distal end is retouched and pointed.
(j)	Core Rejuvenation Flake	Chert	21.02 x 10.86 x 5.08	A flake core with multiple flaking scars on the dorsal side. The ventral side of the artefact is slightly concave. The proximal end is thicker, while the distal end is modified and pointed. Both edges are straight, sharp and modified at the distal margins to make the distal end pointed. The flake has several flaking scars on its dorsal surface, suggesting that it was removed from the original core to maintain the platform for further removal.
(k)	Trapeze	Chert	17.7 x 8.75 x 2.46	A blade with two parallel ridges on the dorsal side. The ventral side is almost flat except at the distal margins, whether it has a ridge. Both ends are broken and truncated. Both edges are straight, retouched, and widening towards the proximal end.
(l)	Convex Blade	Chert	16.57 x 10.14 x 3.13	Fragmented blade with two ridges on the dorsal side and a slightly bulbar ventral side. The distal end is broken and truncated. The left edge (from dorsal) is convex and fully retouched, and the right edge is straight and retouched.
(m)	Blade	Limestone	14.9 x 9.68 x 3.3	Fragment of a blade with both ends broken. The dorsal side of this tool has a prominent and straight ridge and some scars. The ventral side of the tool is flat. The left edge (from dorsal) is straight and sharp, while the right edge is semi-concave and retouched.

Art. No.	Tool Type	Raw Material	Dimensions* (in mm)	Remarks/Description
(n)	Bladelet	Chert	13.66 x 7.13 x 2.28	A bladelet with a broken proximal end and a semi-truncated distal end. The dorsal side of the tool has two parallel ridges, while the ventral side is flat. Both edges are straight and almost parallel, but the right edge (from dorsal) is broken at the distal margins.
(o)	Triangle	Chert	64.8 x 42.87 x 13.67	A flake having cortex, multiple ridges and scars on the dorsal side, while the ventral side is bulbar, slightly concave, and has several chipped scars along both edges. One edge is straight and retouched with a notch towards the distal end. The other edge is semi-straight, angular, concave, and retouched. The distal end is pointed due to the retouching of both edges.

*All the dimensions are in L x W x T format.

Table 2: Description of stone tools recovered from Tapka (see Fig. 7)

Art. No.	Tool Type	Raw Material	Dimensions* (in mm)	Remarks/Description
(a)	Point	Chert	34.08 x 13.78 x 5.20	A blade with a pointed and broken distal end. The dorsal side is fully covered with cortex, with a crested ridge and several scars. The ventral side is almost flat. The proximal end is partially broken, thicker, and convex. Both edges are sharper, straight and converging at the distal end.
(b)	End Scraper	Chert	30.87 x 29.7 x 11.45	A discoid-shaped flake. The dorsal side of this tool is fully covered with cortex, and the ventral side is bulbar. The distal end is convex and retouched to make it an end scraper.
(c)	Flake	Chert	26.48 x 17.06 x 9.04	A flake with cortex along the right edge (from dorsal) and a curvy crested ridge on the dorsal side. The ventral side is slightly bulbar towards the proximal and slightly deeper towards the distal end. The left edge is convex, and the right edge is straight but truncated from the distal margins to the end. Both edges converge at the distal end and are retouched at the margins.
(d)	Core	Agate	22.73 x 13.14 x 6.65	A core with several flaking scars on one side and cortex and some scars on the other side (removed flakes with fluting core technique).
(e)	Truncated Flake	Chert	22.32 x 10.96 x 5.61	A flake with truncation at the distal end. Multiple ridges are present on the dorsal side. The ventral side is almost flat. Both edges are almost straight and parallel. The proximal end is angular and modified towards the dorsal side.
(f)	Core Rejuvenation Flake	Carnelian	23.54 x 20.11 x 9.99	A flake core made of a carnelian (heated agate) nodule. The dorsal side of the tool has multiple flaking scars and cortex towards the proximal end. This flake has been removed to clear the platform of the original core.
(g)	Flake	Chert	20.25 x 11.98 x 4.19	A flake with cortex on the dorsal side at the proximal end. The proximal end is thicker, and the right margins are abrupted. The distal end of the tool is pointed due to partial retouching of the right edge (from dorsal) towards the distal margins. The right edge is backed, while the left edge is partially retouched towards proximal margins, and the remaining part is convex and sharper.
(h)	Flake	Chalcedony	16.15 x 15.03 x 16.84	A flake core with cortex on the dorsal side. The ventral side is bulbar and has a few flaking scars. Both edges are slightly convex. The left edge of the tool is completely retouched, and the right edge has cortex. Both ends are broken.
(i)	Concave Blade	Chalcedony	17.3 x 10.54 x 3.79	Fragment of a blade with a broken and truncated proximal end. The distal end of the tool is modified (denticulated). Cortex, along with the right edge (from dorsal), and a straight ridge present on the dorsal side. The ventral side is slightly concave and has some ripples. Both edges are semi-concave, but the right edge (from dorsal) is retouched.

Art. No.	Tool Type	Raw Material	Dimensions* (in mm)	Remarks/Description
(j)	Blade	Chert	15.33 x 9.45 x 1.60	Fragment of a blade with a broken and truncated distal end. The proximal end is also modified. Two parallel ridges are present on the dorsal side, while the ventral side is almost flat. Both edges are straight, sharp and parallel, although the right edge (from dorsal) of the tool is completely retouched.
(k)	Core Rejuvenation Flake	Chalcedony	14.47 x 9.4 x 3.37	Fragment of a flake with two parallel ridges and multiple ripples and scars on the dorsal side. The ventral side is almost flat except at the proximal end. The proximal end is thicker, and the distal end is broken. The left edge (from dorsal) is partially damaged and concave towards the distal margins, while the right edge is straight and sharp. This flake is removed for the core rejuvenation.
(l)	Blade	Agate	14.3 x 7.66 x 2.32	Fragment of a blade with a straight and bifurcated ridge on the dorsal side and a flat ventral side. The left edge (from dorsal) is straight and sharp, and the right edge is convex and retouched. Both edges converge at the proximal end and are broken at the distal end.
(m)	Triangle	Quartz	17.31 x 8.13 x 2.44	A triangular blade with two parallel ridges on the dorsal side, while the ventral side is almost flat. The proximal end is broken and truncated, and makes an angle with the right edge and is fully backed. The left edge (from the dorsal) is also backed, while the right edge is straight and sharper and converging at the distal end to make the distal end pointed.
(n)	Blade	Limestone	14.79 x 7.24 x 2.17	A blade with a slightly bulbar dorsal and flat ventral. The proximal end of the tool is broken, and the distal end is modified and pointed. The left edge (from dorsal) is fully backed, and the right edge is partially backed towards the proximal margins.
(o)	Flake	Chert	12.25 x 11.71 x 2.73	A flake fragment with a crested straight ridge on the dorsal side. The ventral side of the tool is almost flat. The proximal end is partially modified, and the distal end is broken. The left edge (from dorsal) is curved and backed, while the right edge has a deeper notch towards the proximal margin.
(p)	Micro Scraper	Chert	13.12 x 9.77 x 2.38	A flake with two parallel ridges on the dorsal side, and has a bulbar ventral side. The proximal end is thicker and narrowed by partial modification, and the distal end is wider. The left edge (from dorsal) is convex and retouched, while the right edge is slightly damaged towards the proximal margins.
(q)	Flake	Chert	10.45 x 11.71 x 4.9	Fragment of a flake with some flaking scars and cortex on the dorsal side. The ventral side of the tool is almost flat. The tool is broken from the proximal end, and the distal end is wider, curvy, and semi-denticulated. Both edges are almost straight and sharp.
(r)	Blade	Chert	12.12 x 11.2 x 4.13	Fragment of a blade with a ridge and some scars on the dorsal side. The ventral side is flat and has some scars towards the edges. The proximal end is slightly bulbar at the ventral side, and partially modified at the dorsal side. The distal end of the tool is broken, making the distal margin pointed. The left edge (from the dorsal) is straight and retouched, while the right edge is slightly convex and has a notch towards the distal margin.
(s)	Bladelet	Chert	11.74 x 6.08 x 1.17	A bladelet tool with a crested ridge and multiple scars on the dorsal side. The ventral side of the tool is slightly concave and has a bulge towards the proximal end. The distal end is broken and hence wider. The left edge (from the dorsal) of the tool is straight and sharp, while the right edge is partially straight towards the distal margins and curved on the remaining part. The curved edge is retouched.

Art. No.	Tool Type	Raw Material	Dimensions* (in mm)	Remarks/Description
(t)	Micro Point	Chalcedony	12.02 x 6.98 x 2.29	A flake with cortex and scars on the dorsal side. The ventral side of this tool is concave, with a bulb and a deep scar near the proximal end. The left edge is convex, and the right edge is semi-straight but damaged towards the proximal margins. Both edges converge at the distal end, making it pointed.
(u)	Flake	Chert	11.37 x 11.4 x 3.13	A flake tool with the dorsal side that has two ridges that converge near the distal end. The ventral side is bulbar, with some scars and a curved ridge. The proximal end is thicker, wider, and modified, while the distal end is pointed. Both edges are convex and partially retouched.
(v)	Bladelet	Chert	11.37 x 8.1 x 1.07	A fragmented chip with two ridges, scars and cortex at the distal margins on the dorsal side. The ventral side is almost flat except near the proximal end. The proximal end is thicker and partially modified. The distal end is wide but abrupted. The left edge (from the dorsal) is straight, and has a notch near the distal margin, while the right edge is convex and has a shallow notch near the proximal margin.
(w)	Bladelet	Agate	6.91 x 7.82 x 2.55	Fragment of a blade fully covered with cortex on the dorsal side. The ventral side is flat and has several curvy bands. Both ends of the tool are broken. The left edge is straight and retouched, while the right edge is straight and has a notch.

*All the dimensions are in L x W x T format.

documentation was undertaken *in situ* to minimise disturbance to the site.

The archaeological sites of Laua and Tapka are located on plateau surfaces formed by the Vindhyan-Kaimur ranges. The region is characterised by dense forest cover and a rich ecological setting, offering diverse vegetation and faunal resources. Such an environment has historically supported both prehistoric populations and contemporary tribal communities. The area is presently inhabited by groups such as the Chero, Baiga, and Agaria, who continue to depend on local natural resources for their subsistence. These communities, despite gradually incorporating modern elements into their lifestyles, yet retain several traditional practices, notably reflected in their house paintings. These artistic expressions bear striking similarities to motifs found in nearby rock shelters, suggesting a possible cultural continuity, as also observed by earlier scholars (Cockburn 1899; Verma 1984; Tewari 1984; Tewari *et al.* 1995).

The Tapka site, represented by a rock shelter, preserves a rich corpus of rock art comparable to other Vindhyan characteristics (Cockburn 1899; Verma 1984; Tewari 1984; Tewari *et al.* 1995; Singh 2013; Neumayer 2013). Multiple panels depict human and animal figures belonging to different chronological phases (Singh *et al.* 2026). The recurrence of similar stylistic and thematic patterns across sites in the region suggests either a shared cultural tradition or sustained interaction among prehistoric groups (Tewari *et al.* 1995; Singh 2013; Tiwari 2014; Upadhyay *et al.* 2017; Mohan 2021, 2022).

Tapka represents a rock shelter context, whereas Laua is situated on an open plain near a seasonal stream. At Tapka, artefacts were recovered from within the shelter, along the access pathways, and in the summit area, suggesting multiple activity zones associated with habitation and tool use. The distributional analysis of the lithic assemblage indicates that chert was the predominant raw material, likely due to its ready availability in the Son Valley. Other raw materials include chalcedony, agate, quartz, and limestone. A notable distinction between the two sites is the higher frequency of limestone cores and tools at Laua, reflecting the local availability of this material. Similar use of limestone has also been reported from other sites in the Son Valley (Tewari *et al.* 1995; Mehra 2018). In contrast, the Tapka assemblage shows a greater reliance on fine-grained materials such as chert, chalcedony, and agate, suggesting a more selective, possibly advanced approach to raw material procurement and tool production.

Typologically, the assemblage spans a broad chronological range, from the Upper Palaeolithic to the early farming phases. Morphological analysis further suggests continuity in tool use extending into the historical period. The availability of suitable raw materials and established core reduction technologies likely facilitated technological adaptability and innovation among prehistoric communities in the region.

The technological characteristics of the lithic assemblage, particularly the prevalence of retouched tools, indicate deliberate modification using fine,

Table 3: Description of artefacts recovered from Laua (see Fig. 8)

Art. No.	Tool Type	Raw Material	Dimensions* (in mm)	Remarks/Description
(a)	Notched Blade	Chert	50.43 x 21.83 x 11.06	A blade with multiple ridges and flaking scars on the dorsal side. The ventral side is slightly concave,and has notched scars towards the right edge (from the dorsal). The left edge (from the dorsal) is half-backed towards the proximal end, and the right edge has one deep and two shallow notches. The proximal end is partially broken, and the distal end shows modification.
(b)	End Scraper	Limestone	52.37 x 36.02 x 13.03	A scraper with a cortex and multiple ridges on the dorsal. Ventral is almost flat but has a curvy ridge towards the proximal margins. Proximal margins are modified to make the proximal end pointed, and the distal end is modified to make an end scraper.
(c)	Core	Limestone	48.6 x 23.13 x 17.1	A flake with flaking scars and ridges on the dorsal side. A curvy ridge also presents on the ventral side. The proximal end is partially modified, and the distal end is wider and thinner. Both edges are almost straight and partially damaged.
(d)	Core	Limestone	39.34 x 16.55 x 12.47	A core covered with cortex as well as a spall towards the right edge (from the dorsal) on the dorsal side. Multiple flaking scars are present on the ventral side.
(e)	Flake	Limestone	31.11 x 20.06 x 10.86	A flake with two converging ridges on the dorsal and almost flat ventral. The proximal end is thicker and has multiple ridges, the distal end is wider, sharper and modified. The left edge (from the dorsal) is partially retouched, and the right edge is abrupt.
(f)	Flake	Limestone	34.33 x 31.53 x 13.17	A discoid flake with partially retouched one edge and a notch at the distal margins. The dorsal side of the tool has several ridges and flaking scars, and the ventral side is abrupted.
(g)	Point	Chert	31.54 x 23.91 x 5.45	A pointed flake with abruptly broken and modified edges at the proximal end. Dorsal has several ridges and multiple scars. The left edge (from the dorsal) is retouched, and the right edge is partially retouched at the distal margins.
(h)	Flake	Chert	27.03 x 18.3 x 9.66	A flake with a prominent straight ridge on the dorsal side and broken at both ends. The ventral side is almost flat, and one edge is abrupted, while the other is straight and partially modified.
(i)	Core	Chert	29.83 x 28.97 x 15.11	A semi-discoid core with multiple flaking scars on both sides and cortex on the dorsal side. Edges are sharp and partially modified.
(j)	Core	Agate	14.48 x 23.87 x 14.61	A single-platformed core with flaking scars and a little part of cortex on the surface of the tool.

*All the dimensions are in L x W x T format.

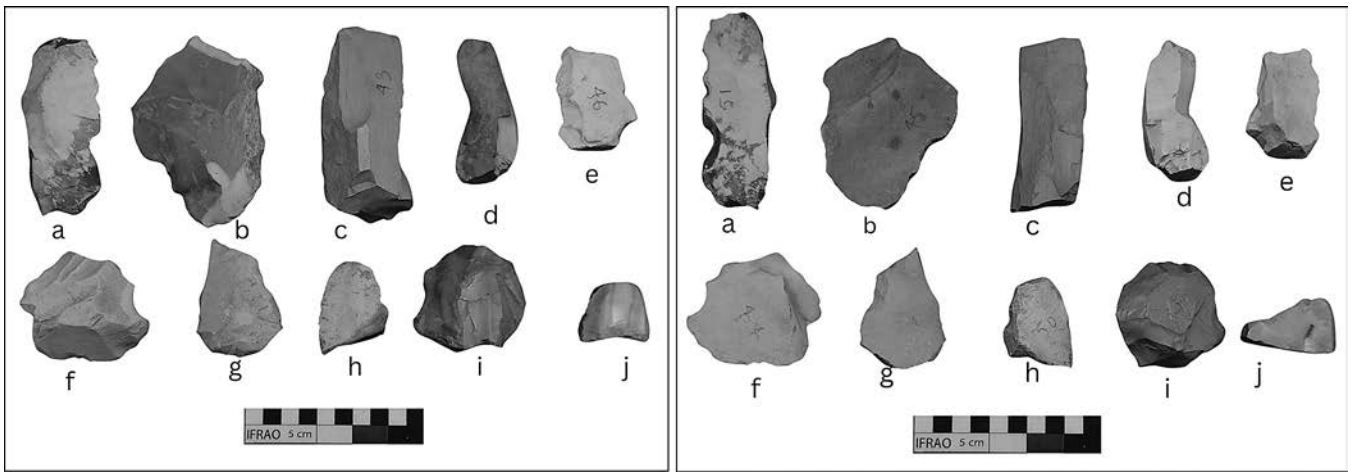

Fig. 8: Artefacts from Laua, Dorsal view (Left) and Ventral View (Right)

Table 4: Description of Stone Tools recovered from Laua (see Fig. 9)

Art. No.	Tool Type	Raw Material	Dimensions* (in mm)	Remarks/Description
(a)	Flake	Agate	24.46 x 15.05 x 10.29	A flake with multiple scars on both sides. A straight ridge from proximal to distal end is present on the dorsal side. A little part of the cortex is also left on the dorsal side towards the proximal end. Both edges are straight and sharp. The proximal end is thicker and damaged at the right margins, while the distal end is wider, thinner, sharper and partially modified.
(b)	Flake	Agate	18.96 x 19.34 x 6.31	A fragment of a flake with a cortex on the dorsal surface along with the left edge (from the dorsal). The ventral is slightly concave and has deeper ripples. The proximal end is modified, and the distal end is broken. The left edge is angular, and the right edge is broken.
(c)	Flake	Chert	18.28 x 15.67 x 6.41	A flake with a cortex on the dorsal. The ventral side is almost flat but has a deep scar in the middle. One edge is fully convex, covered with cortex, and the other is straight and sharp, appearing fresh.
(d)	Core	Chalcedony	21.7 x 14.9 x 9	A core with a cortex and flaking scars on one side and only flaking scars on the other side.
(e)	Flake	Quartz	16.07 x 19.66 x 4.92	A flake with multiple ridges and scars on the dorsal and slightly bulbar ventral. The proximal end is a little thicker and modified, while the distal end is convex and sharper.
(f)	Core	Chalcedony	18.12 x 18.34 x 16.67	A core with a cortex on one surface and several flaking scars on the other.

*All the dimensions are in L x W x T format

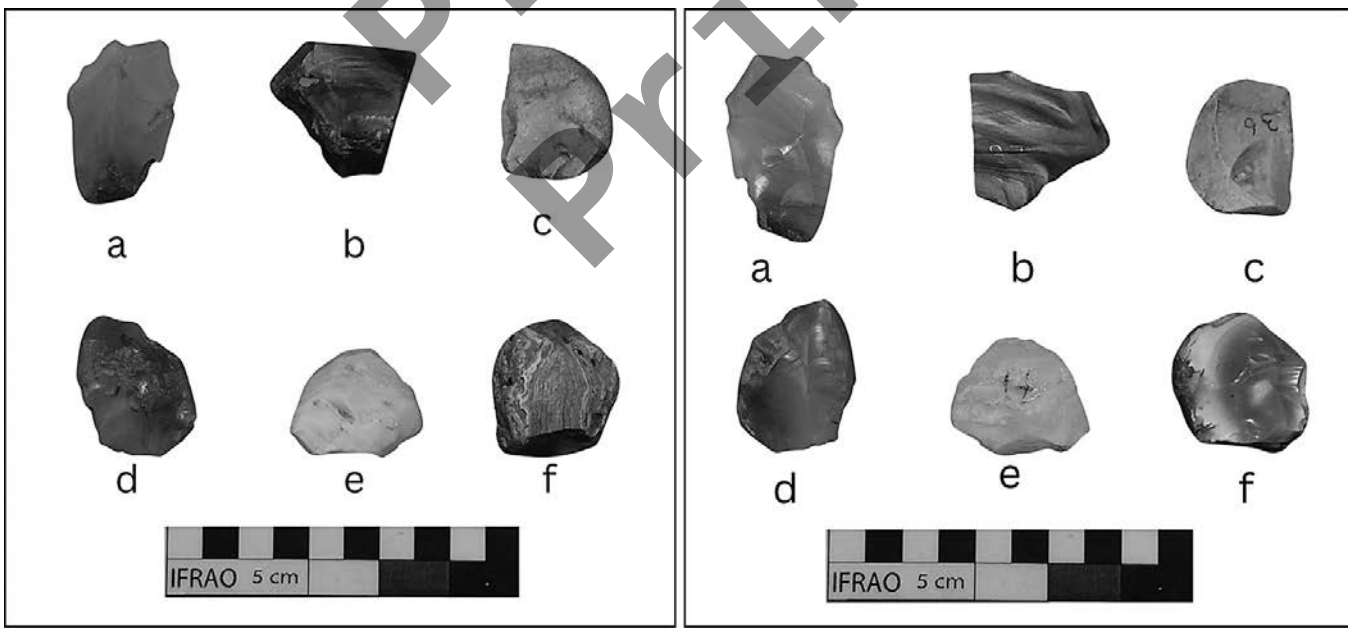

Fig. 9: Artefacts from Laua, Dorsal view (Left) and Ventral View (Right)

pointed implements, most likely through pressure flaking techniques. Evidence of both major and minor edge damage on several tools suggests repeated use and multifunctionality. Notably, one artefact from Tapka, made of carnelian, appears to have undergone heat treatment. This indicates an advanced understanding of raw material properties and controlled thermal alteration to improve flaking quality.

Further evidence of backing and edge blunting on several tools suggests their use as hafted implements, possibly forming part of composite tools. Such technological behaviour is consistent with Mesolithic microlithic traditions. The geometric nature of many tools reinforces this association, although similar technological patterns continue into later periods, including the Chalcolithic, as observed at sites such as Senuwar (Singh 1990, 2004), Sakas (Singh *et al.* 2020a, 2020b, 2020c, 2024), and Tokwa (Misra *et al.* 2000; Singh *et al.* 2024). The evidence from rock art at Tapka further complements the lithic data. The motifs, engraved and painted on shelter walls and ceilings, reflect behavioural patterns and possibly ritual or subsistence activities of past communities. Depictions of hafted tools in hunting or symbolic contexts reinforce the interpretation that composite tool technology was well understood and widely practised. Moreover, the stylistic continuity of these motifs from prehistoric to historical periods suggests a long-standing cultural tradition in the region (Singh *et al.* 2026).

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