Exploring the Technological Characteristics of Microliths in the Sonbhadra Region, Uttar Pradesh, India

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Abstract: *The Soanbhadra region in Uttar Pradesh's Kaimur area boasts numerous prehistoric sites characterized by sandstone formations, rock shelters with paintings, and scattered microliths. Recent explorations in 20 localities, including Khajuri, Lakra, Dighul, and others, revealed varying artefacts. Khajuri, Lakra, Dighul, and others yielded microliths, while Dhanaura revealed two polished stone axes. Within a 15 km radius, these artefacts show variations, likely influenced by the raw materials used. Explored items include microblades, cores, side flakes, end flakes, and debitage, offering insights into the diverse prehistoric activities in the microlithic period in Soanbhadra region.*

Keywords: Sonbhadra, Rock Shelter, Paleolithic, Microliths, Iron Age, Rock Paintings, Ethnoarchaeology

Introduction

Soanbhadra region of Uttar Pradesh is dotted with scores of Prehistoric sites. The region falls in the Kaimur region which has huge availability of Sandstone hills, with cavities and dentures in them. The tectonic activities in these areas along with these cavities and dentures have made a number of rock shelters in these areas. These rock surfaces have numerous rock paintings and the floors of these rock shelters are spawn with microliths. This microliths are found both in rock shelters and in open spaces where their relative proportions vary. The recent exploration from the 20 localities Viz. Shahpur, Salaidh, Ranu, Rajkhad, Piprahi, Kheyuri, Gaddarwa, Dighul, Barhpaan, Barheradol, Narhati, Nakatvar, Majhigawa, Kachnarwa, Harra, Devatan, Gaighat, Chachikala, Tumia, Panduchattan yielded microliths where the sites of Dhanaura revealed two polished stone axes with pointed butt.

The geology plays an important role in the scatter of sites. This area represents mostly high land plateau. In the trans Son/Sonpar Region, Son is the main river flowing from west to east with its tributaries Kanhar, Pandu, Rihand and Vijul, The Pangan, Thema and Lauwa are rivulets of the Kanhar. These rivulets flow towards north. The Son River divides the district into two parts: the Central Vindhyan Plateau and the Son

region. Administratively, Sonbhadra District has been divided into four tehsils i.e., Robertsganj, Ghorawal, Obra and Duddhi. The study area of Duddhi tehsil is located in the southern part of Son Valley, covered with mountains and dense forests. Among these geological areas, the microliths play an important cultural material which represents the Prehistory of the area in a wider prehistoric context. These areas within a radius of 15 KM (Figure 1), the artefacts were found to be showing variations, possibly due to the adaptation to the raw material, mostly silicious material such as Chert and Chalcedony, used for making these artefacts. The small streams (*nalas*) play an important role in revealing these artefacts in some sites. The artefact types in these sites includes microblade, microblade cores, Side flakes, End flakes. Debitage and shatters are also part of the assemblage. The present research paper discusses the possible reason for the similarity and the variability of the lithic technology in different locality of this particular area of Sonbhadra. All the explored sites are mapped and documented using digital Camera and a Global Positioning System (G.P.S.).

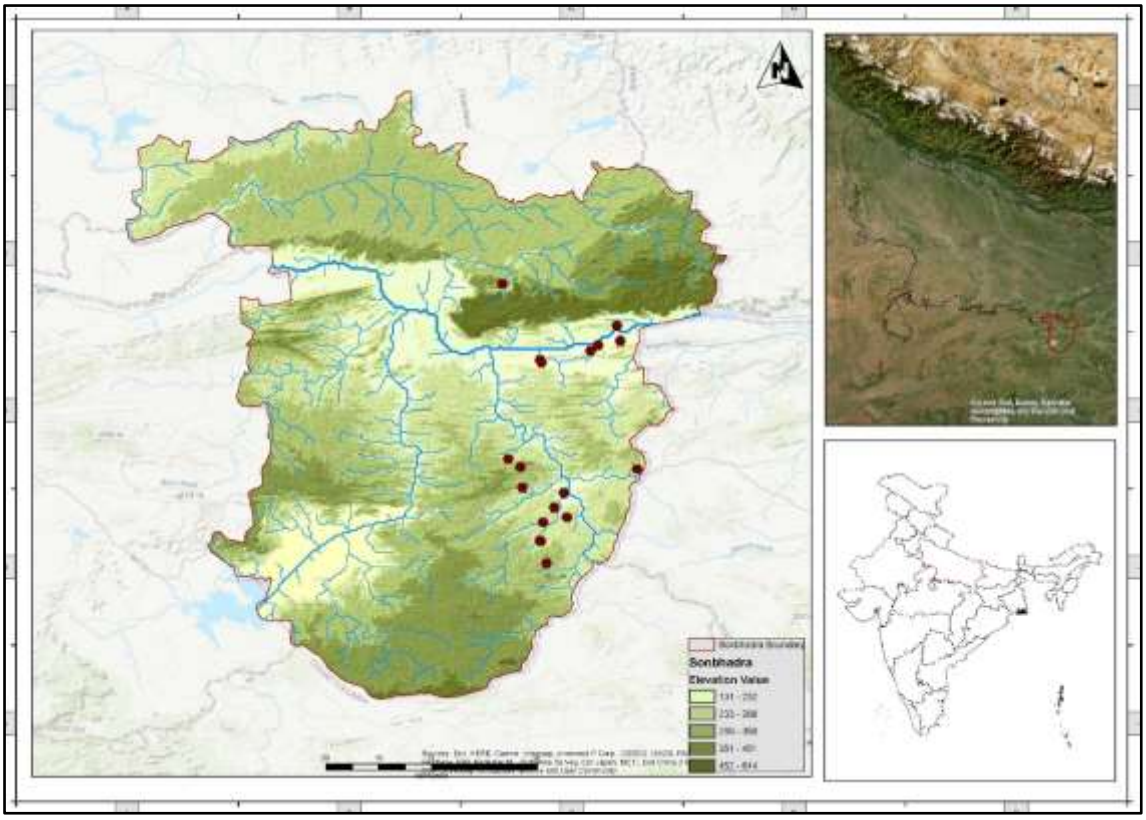

Figure 1: Map of Sonbhadra showing sites

Previous Works

The pioneering work of archaeological exploration in this area is credited to J. Cockburn who laid the foundation of archaeological exploration in the area (1883; 56-64; 1899-97); contributing to the Prehistory and discovered many painted rock shelters. Subsequently G.R. Sharma (1956-57:11-15) discovered Paleolithic, Microlithics and rock art sites in Mirzapur district including the present Sonbhadra. Prof. A.K. Narain and

Shri P.C. Pant (1962-63: 33-34;1964-65: 130-131) of Banaras Hindu University, Varanasi carried out an intensive survey in district Mirzapur especially in Duddhi, Robertsganj and Chunar areas and brought to light fifty-eight sites. Out of these sites, sixteen sites are located in Duddhi area. Radha kant Verma (1964) did his D. Phil on "Stone Age Culture of Mirzapur". He explored several prehistoric sites and rock art sites in Mirzapur including Sonbhadra.

The sites like Ramgarh Pahar and Jhandia Pahari belonging to the middle Palaeolithic period and Bari Ghutara, Chhuhia Ghutara, Khurdhan, Ramgarh Pahar of Upper Palaeolithic sites have been explored by Allahabad University (Mishra 1977: 45-50) in Dudhi-kon region of Sonbhadra. Rakesh Tewari (1985-1990, 1995: 55-131) explored two hundred fifty sites is Chhatra, Chopan, Nagwa, Robertsganj and Ghorawal blocks in district Sonbhadra. The exploration revealed few painted rock shelters along with archaeological sites ranging from Microliths, Megaliths, BRW, NBPW, BSW, GW and RW and early medieval and medieval stone temple sites and sculptures. Rakesh Tewari and his team (1997: 77-95; 1998, 99-105) excavated an important site called Raja-Nal-ka -Tila in district Sonbhadra 1995-1996 and 1996-1997). The excavation brought to light three successive periods: Pd I. BRW (Painted and plain), BSW, RW; GW; Pd II. early Iron, BRW (painted and plain) BSW, GW, RW and period III. BSW, NBPW, BRW and RW. Vibha Tripathi and Prabhakar Upadhyay of Banaras Hindu University also explored Sonbhadra region. They carried out an ethnoarchaeological study of Iron working around sonbhadra region (2013: 323-323). Prabhakar Upadhyay (2013: 146-158) excavated the site of Raipura situated in Ghorawal block, tehsil Roberts Ganj, Sonbhadra district. The excavation revealed three cultural periods: Pd I. BSW, RW, Black ware and BRW (without-metal), Pd II. BSW, Red ware and BRW (Early Iron Age) and Period III. NBPW (Mature Iron Age) Shashi B. Mehra (2018) listed forty-eight sites in Son valley of Ghorawal, Nagwa, Chopan and Kon blocks, Mehra carried out two field seasons and brought to light 09 Middle Paleolithic, 09 Middle/Upper Paleolithic, 08 Upper Paleolithic, 15 Upper Paleolithic/Microlithic, 07Microlithic and 02 fossil sites. Swatantra Kumar (2021: 1-401) has done his Ph.D. thesis on "Archaeology of Sonbhadra Region with Special Reference to Rock Art". The work attempted to interpret the rock paintings with the help of ethnographic support.

The recent field investigation in study area i.e. Dudhi tehsil brought to light several important prehistoric sites which are as follows:

Shahpur

The site of Shahpur ($24^0$13' 24'' N; 83^0 16' 39'' E) is situated 3 km east of Duddhi tehsil. River Kanhar flows near the site. The village of Shahpur is inhabited by the indigenous people of the Mushar and the Gond. The site was initially explored by A.K. Narain and P.C. Pant (1962-63: 33-34 1965-66: 30-131). They found a few microliths from here. The recent site visit has brought to light 84 stone artefacts mostly belonging to microlithic technology. The types are core (16), end flakes (27), flake fragments (36) and Shatters (05). Chert was the preferred raw material for making the tools at the site and

chalcedony was also found as a raw material. Out of these stone tools, the core, side flakes and end flakes are in complete form. The technological features of these sites include the ones which are observed on the surface of the core and the blades. The microblade cores show fine microblades removed from the surface. The microblade cores exhibit the same pattern where one part of the core remains unretouched and the other part is fully exploited to remove the blade. On core 1 (Figure 2) it is clearly showing where the blades get terminated at the impurities at the base of the microblade core. There are no intact microblades found here.

Figure 2: Shahpur, core showing the microblade scar but the production got limited since the comparatively hard surface/ impurities on bottom portion prevent further blade removal.

Salaiyadih

The site of Salaiyadih (24^0 15'25^{-1} N; 83^0 23' 11''E) is located 22 km. east from Duddhi tehsil. A small stream (*nala*)flows adjacent to the site of Salaiyadih. The area is inhabited by Gond, Kharwar and Panika tribes. The exploration yielded 14 microliths consisting blades (03) core (01), end flake (01) and flake fragments. The stone tools are made on cherty material.

Ranu

This site Ranu (24^0 7' 29'' N; $83^0$13'19''E) is situated 13 km away from Duddhi tehsil. A stream named as *Barsati Nala* flows near to the site, which ultimately merges into

Thema River. The area is inhabited by the indigenous population like the Gond, the Panika, the Kharwar and the Baiga. The exploration revealed 28 stone tools made on chert. The Stone tools comprised core (09), end flakes (08), side flakes (01), blade (03), flake fragment (06) and Shatter (01). Of these tools, core and end flakes and blades (2) are in complete condition. There is a multifaceted core where the flake removed is random (Figure 3). No blade scars are visible on the surface of the microblade core. Core no. 9 has microblades removed from all sides, but this core is smaller in size compared to the other core. The reason for this could be that the core is exhausted or exhibits possibly different core exploitation strategies.

Figure 3: An Amorphous core from Ranu where the flakes are removed randomly

Rajkhad

The site of Rajkhad (24^0 13' 58'' N; 83^0 11'' 26'' E) is located 5 km west of Duddhi tehsil. River *Lauva* flows close to Rajkhad site. The River Lauva ultimately meet into River Kanhar. The Kanhar River is the tributary of the Son River. The site is inhabited by the indigenous people Viz. the Panika, the Gond, the Kharwar, the Chero and the Baiga. During exploration, 84 Stone tools have been recovered. The assemblage includes core (13), end flakes (23), side flakes (03), broken blade (10) blade fragment (06) and flake fragments (28). The core tools, end flakes and side flakes are in complete form. The raw materials for making the tools are all on chert.

The core exploitation strategy here also has two different types in it. The fully exploited core ie. the blade was removed from all the sides around and the blade was removed from one side (Figure 4). The blades removed from one side have the presence of a cortex on the other side. All the core has the cortex present on the surface except core 13 where the microblade is removed from all the sides. But in this case, the size of the

complete core is smaller in size compared to all other cores. Core 12 is broken at the proximal end. There are microblades some of them have cortex presence on them others are damaged or incomplete. There are hardly any intact complete microblades from this site.

Figure 4: The microblades are removed only from one side and the other side and not on the other side, Rajkhad

Piprahi

The site of Piprahi (24^0 10' 55'' N; 83^0 13' 15'' E) is located 4 km south of Duddhi tehsil. River Thema flows near to Piprahi site. The area is inhabited by the Mushar and the Gond tribes. The exploration revealed a total of 61 stone tools. The tools are made of cherty material. The stone tools comprised core (02), end flakes (11) side flakes (06), blade (01), micro blades (15) and flake fragments (26). Of these stone tools, the core, end flakes, side flakes, blade, and microblade are in complete shape. Along with these, there are also natural, unmodified pieces. They do not have any cortex on the surface which may be considered as a part of the debitage of the assemblage.

While considering the flake and blade fragments, artefact No. 4 is an end flake which has two previous flake scars on the dorsal side. There is a portion of cortex on the distal end. Hence this could be part of the initial flaking of the core and a core preparation flake. The size of the flake suggests that the core from which this flake was removed is relatively bigger. The flake is patinated and the original colour of the flake is black as evidenced by the differential patination of the flake surface. Chert and chalcedony are frequently used as the raw material with a lot of debitage in the assemblage.

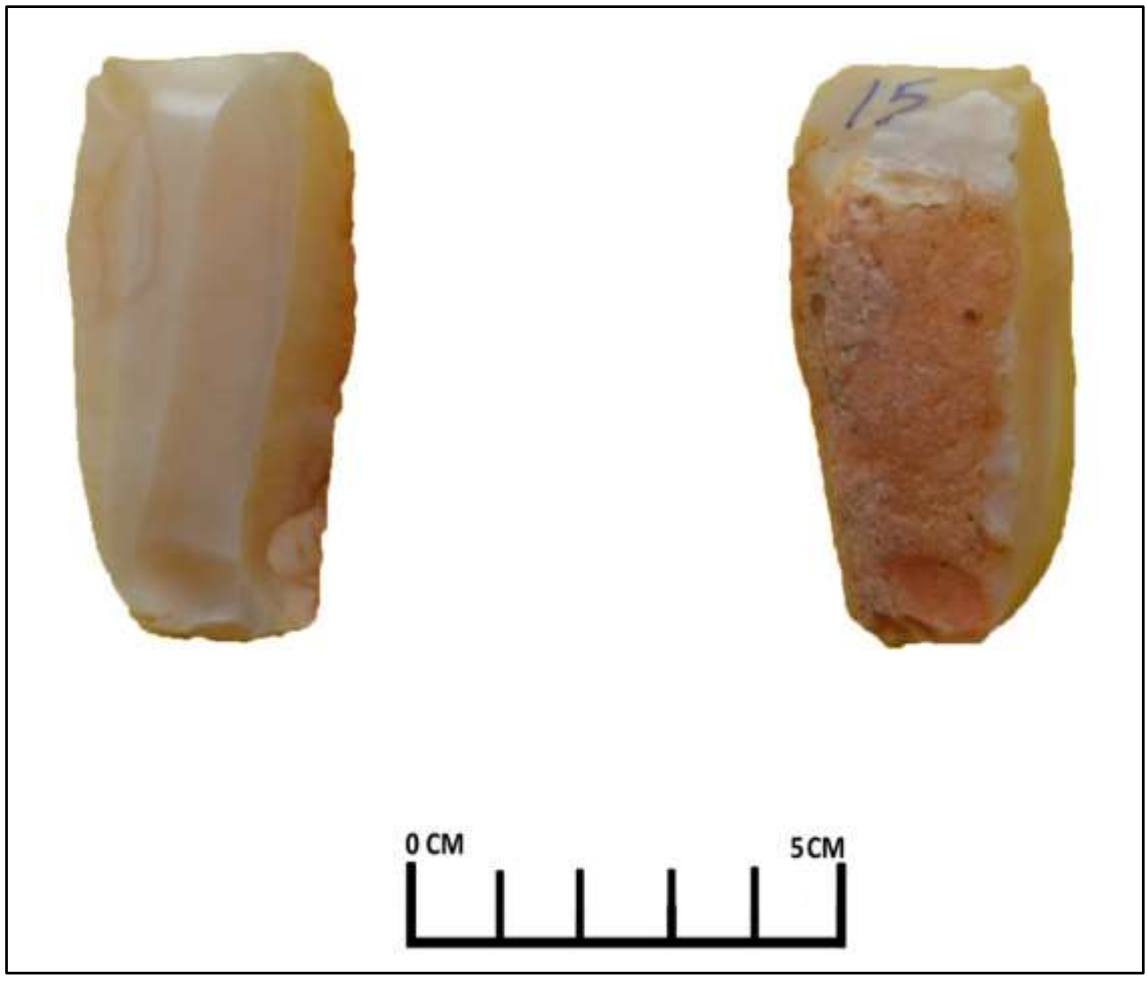

Figure 5: The core on chalcedony where the blades are removed from one side and the other side has the presence of cortex and left unexploited, Gaddarwa

Khajuri

The site of Khajuri (24^{0}11' 30'' N; 83^0 15' 13'' E) is located 3 km from Duddhi development block, under Duddhi tehsil. River Thema flows close to the site. The area is inhabited mostly by the indigenous people the Mushar. The site was earlier visited by A.K. Narain and P.C. Pant of BHU (1962 63: 33-34; 1964-65: 130-131). They suggested that it was an open-air site with microliths. From this site revisited and discovered 125 stone tools. The stone tools comprised core (13), end flakes (23), side flakes (13), microblades (27), and flake fragments (49). Chert and chalcedony are the preferred raw materials at the site. Besides, micro blades and other stone tools are in complete shape. The presence of a high number of end flakes, side flakes, micro-blades and flake fragments indicates that it was a workshop site. Most of these tools are microlithic.

The observed flakes can be categorized into three types: those with 100% cortex on the dorsal side, those with one or two previous flake scars on the dorsal region along with the presence of cortex, and those that may be considered core rejuvenation flakes.

When considering the cores, the wedge-shaped core e.g., Core no. 5, where the microblade scars are removed from all three sides and one side is left unretouched. This technique is also observed in the other sites as well.

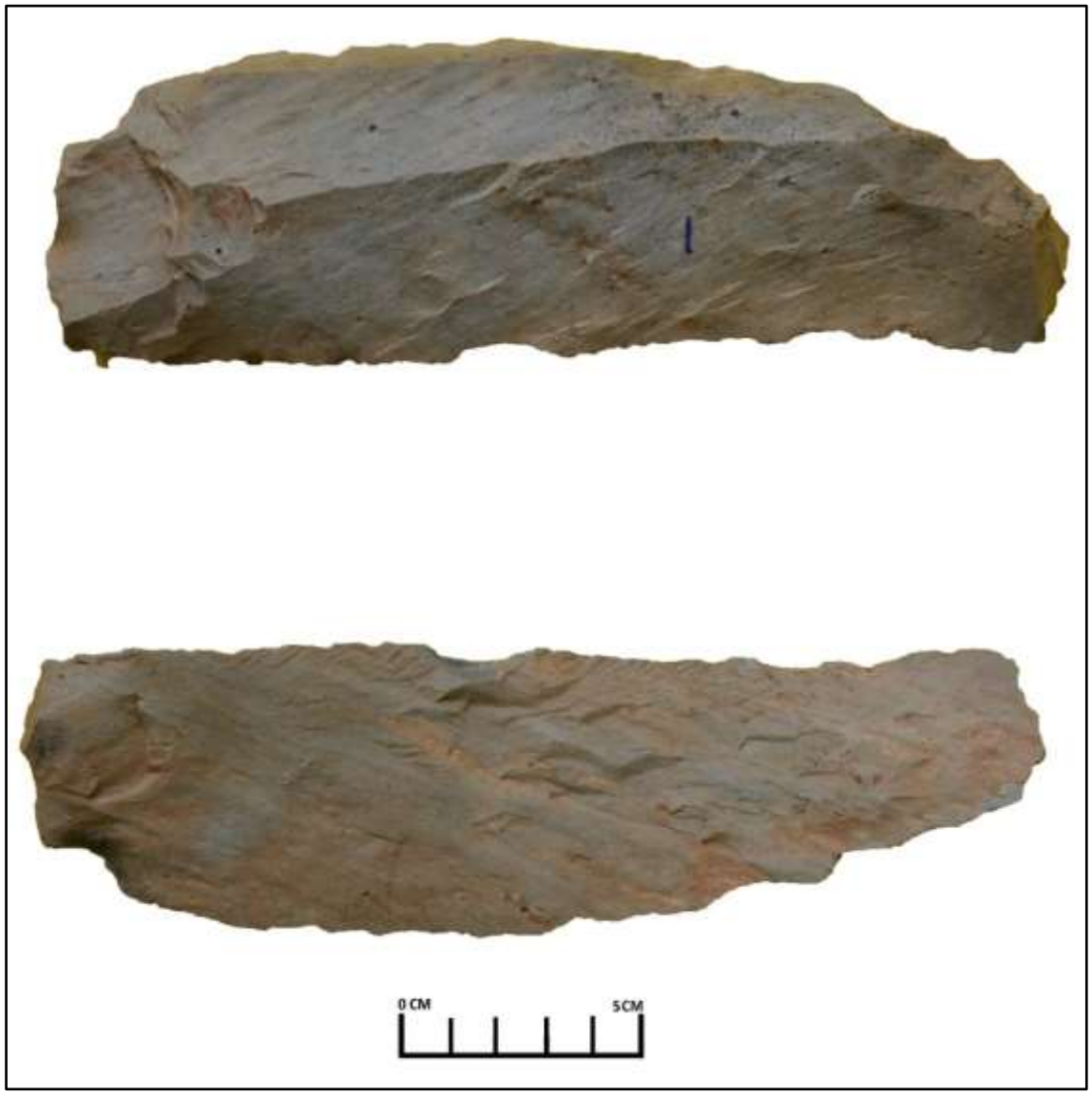

Figure 6: Longer blades from Tumiyon/Tumia where the blades are removed using percussion technique; there is no much cortex on the dorsal side, Tumiyon/Tumia

Gaddarwa

The site of Gaddarwa (24^{0}15' 59'' N; 83^0 10' 83'' E) is located 10 km west of Duddhi development block. River Lauwa flows close to the site. The area is densely forested and inhabited by Gond, Kharwar, Chero and Baiga tribes. At the site, 83 stone tools were found. The stone tools comprised core (17), micro-blades (03), broken blades (03), blade fragments (04), and flakes (56). The stone tools have been fashioned on Chert and chalcedony raw material. All stone tools are found in good physical condition. Core 1 has a microblade removed from the surface. But the core is broken from the distal side.

There are small flakes removed from the broken surface. Here too the microblades are removed from one side and the presence of cortex on the other side. Core 9 has microblades removed from all surfaces and there is a presence of cortex on the distal side. Core no. 15 (Figure 5) also has a similar way of blade removal but from one side and the cortex is present on the other side. Apart from the core, there are also side flakes end flakes and debitage.

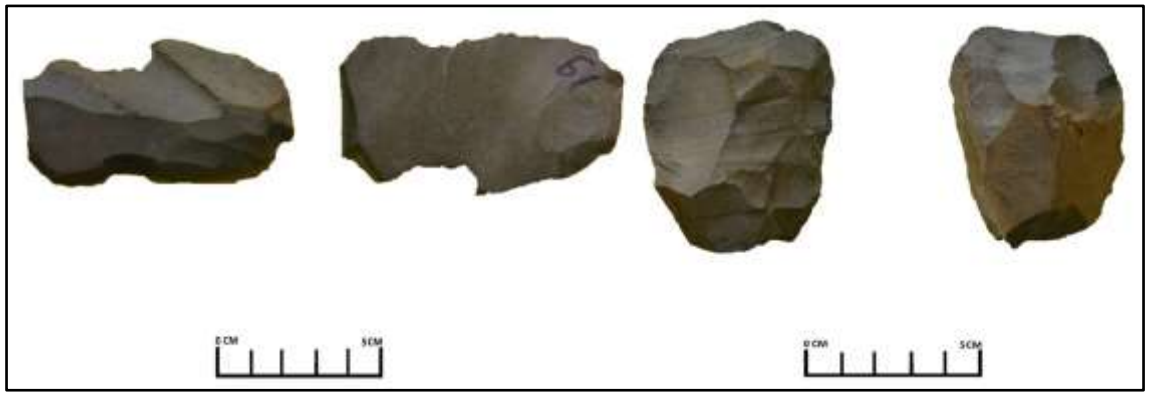

Figure 7: Artefacts made on black chert, technic used on different raw material, Majhigaon

Dighul

The site Dighul (24^0 10' 34'' N; 83^0 15' 41'' E) is situated 5 km south-east of Duddhi development block. A *nala* flows near to the site of Dighul. The village is inhabited mostly by indigenous people such as the Gond, the Kharwar and the Panika. The site was earlier visited by A.K. Narain and P.C. Pant (1962- 63: 33-34; 1964-65: 130- 131). They mentioned that it was an open-air site yielding microliths. The site was revisited and recovered 79 Stone tools. The stone tools comprised core (14), end flakes (36), side flakes (11) end flakes (12), and blade fragments (06). The stone tools are made of Cherty material. The stone tools are in good physical condition. The core, end flakes and side flakes are in complete shape. Artefacts were mainly collected by random sampling. Considering the age of artefacts from the surface, it is noted that there were hardly any finished blades and bladelets. Most of the artefacts are end flakes, side flakes, flake fragments or microblade cores. The end flakes removed have cortex on the dorsal side. The presence of cortex varies from 50% to 10 %. This suggests that those flakes may be part of the initial core trimming flake before the blades have been removed. These end flakes include chalcedony and chert. In the case of bigger flakes, there are multiple flake scars on the surface. They have elongated parallel blade scars and smaller flake scars. This suggests the initial trimming to remove the unwanted cortex parts which are not suitable for the blade removal. There are also comparatively thick flakes which are part of the core renewal/rejuvenation flakes. Among the artefacts artefact no.53 on the dorsal surface there are multiple attempts of removing blades can be observed. It can be due to the weathered cortex, such attempts proved to be futile. Hence, they might have removed a larger portion of core so that the finer inner portion is exposed for much better blade removal.

Figure 8: Chachikalan: The blades removed are relatively longer ie. above 5 cm abruptly ending at the distal end. The end flake 10 resembles the initial stage of flake removal from the core.

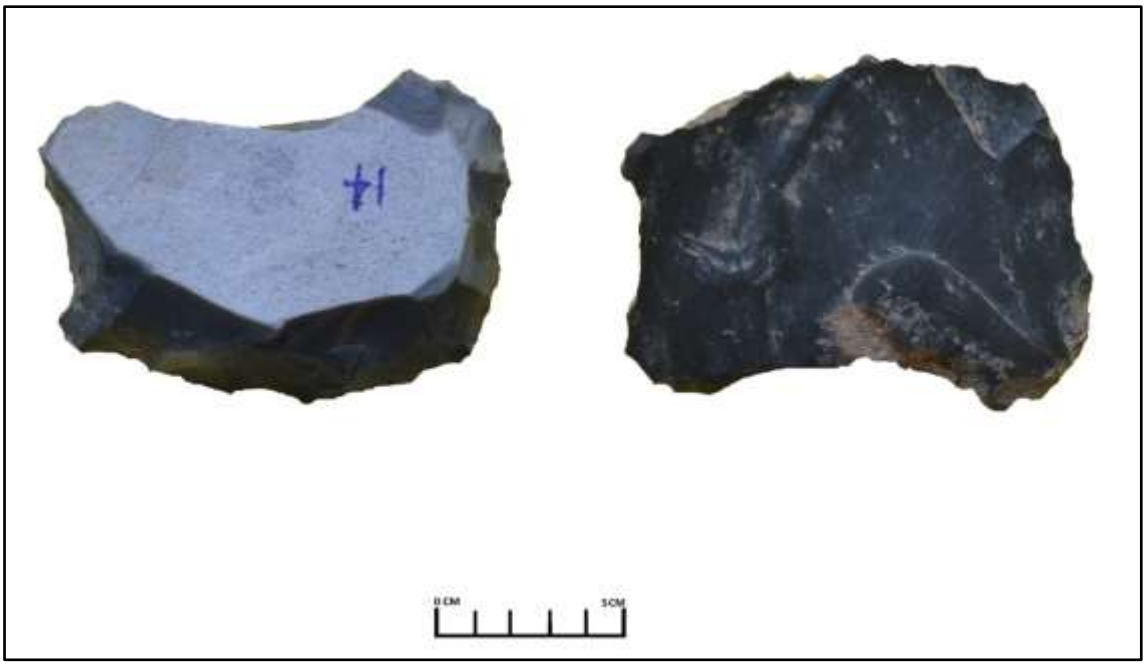

Figure 9: Nakatwar: Flake with retouches on the periphery

Barhpaan

The site Barhpaan (24^0 6' 40'' N; 83^0 13' 19'' E) is situated approximately 15 km away from Duddhi tehsil. The area is inhabited mainly by the indigenous people such as the Korwa, the kharwar, the Gond and the Panika tribes. The stream, Paharinalas flows close to the site of Barahpaan. The exploration revealed 32 stone tools. The assemblage shares core (05), broken blade (04), flake fragments (14), end flakes (01), side flakes (06), and shatters (02). The blades are in broken conditions whereas fakes (14) are fragmented. The core, end flakes and side flakes are in complete shapes.

Baheradol

The site Baheradol (24^0 16' 56'' N; 83^0 9' 58'' E) is situated 12 km away from Duddhi development block in tehsil Duddhi. River Kanhar flows near the site of Baheradol. The village is inhabited by indigenous people such as the Gond, the Kharwar, the Chero, and the Baiga. The exploration revealed 69 stone tools. The stone tools comprised core (26), end flakes (17), side flakes (12) and flake fragments (14). The stone tools are fashioned from cherty material, and the stone tools are found in good physical condition. Of these tools, fifty-five stone tools which are mainly cores, end flakes and side flakes are in complete form. The cores from the locality are mainly of the type where all three sides are exploited to remove the blades. One side retains the cortex there are chert nodules with numerous cavities but the blades are successfully removed. Most of the blade cores here are made on chalcedony. There are hardly any fluted cores. The blades removed from these cores are all microblades. The flakes from here consist of end flakes that may be part of the initial stage of flaking. Some of the flakes have huge amounts of cortex on the surface, suggesting it is part of the initial stage of core preparation on core removal. The shattered piece along with them

suggests it as part of the factory site. End flakes here also have the cortex on the surface.

Panduchattan

The site Panduchattan (24^0 20' 15'' N; 83^0 21' 18''E) is located 12 km away from village Vindhamganj under Duddhi tehsil. The distant from Pandu Chattan to Dudhi development block is 32 km. River Pandu flows adjacent to this site. The exploration brought to light 17 stone tools made on chert material. The stone tools consisted blade (01), blade fragment (01), core (02) end flakes (04), side flakes (04) and flake fragments (05). The end flakes, core and side flakes and one of the blades is in complete shape. The artefacts observed from this site include end flakes, side flakes, and blade fragments. End flakes are longer in size compared to the side flakes. Cortex is visible on the surface on a large scale and could be part of the initial flake removal. The core and core fragments have flakes removed. The core fragments could be part of the core rejuvenation flakes. The cores have more flakes removed from the surface than the blades. These could be exhausted cores after the blade removal.

Tumiyon / Tumia

This site Tumiyon / Tumia ($24^0$18'27'' N; 83021'5'' E) is located 10 km north to the Vindhamgnj under Duddhi development block. The site is locally called as 'Kundava', Pandu River flows west to the site of Tumia. While revisiting the site, it revealed 14 stone tools made on chert material. The stone tools comprised (01) backed blade, micro blade (01), end flakes (06), side flakes (01) and flake fragments (05). The longer blade (Figure 6), is longer than the other blade types. It has a mid-ridge and the sides are sharp and unretouched. There is no cortex on the dorsal side. Another blade has retouching and blunted on one side and sharp on the other side. This may be considered as backed blade type. The other artefacts from this locality are chips and shatters. The artefact no. 4, may be part of the broken blade, the type similar to the artefact no. 1. But it is broken towards the distal side.

Devatan

The site Devatan (24°27' 6'' N, 83 20 13″E) is located on hill top and about 3 km far away from kone development block in Obra tehsil. River son flows north to the Devtan site. The area is inhabited by kharwar tribes. The exploration revealed 68 stone tools. Chert was the preferred raw material for making stone tools at the site. The assemblage includes end flakes (25), core (40), blade (02) and blade fragments (01). Out of these stone tools core, end flakes and blades are in complete form and in good physical conditions. The noticeable artefact types here are Blade core, flake core, and blade core fragment. The blade core with cortex on one side and the blade removed from the other side shows the core exploitation strategies. These types of cores are also noticed in other sites as well. Attempt to remove the blade from different raw materials is also noted. Core no. 6 is a multi-directional core where the blades are removed from different directions taking the maximum utilization of the core implying the core

exploitation strategies. This may be also due to the poor quality of the raw materials present here hence, cores were used to its optimum and attempts made from all possible sides to remove the blade. All the microblades have the cortex present on them. The end flakes from the site could be the attempt to remove the blade core or for preparing the core for the blade removal. No finished microblades are noticed from the site.

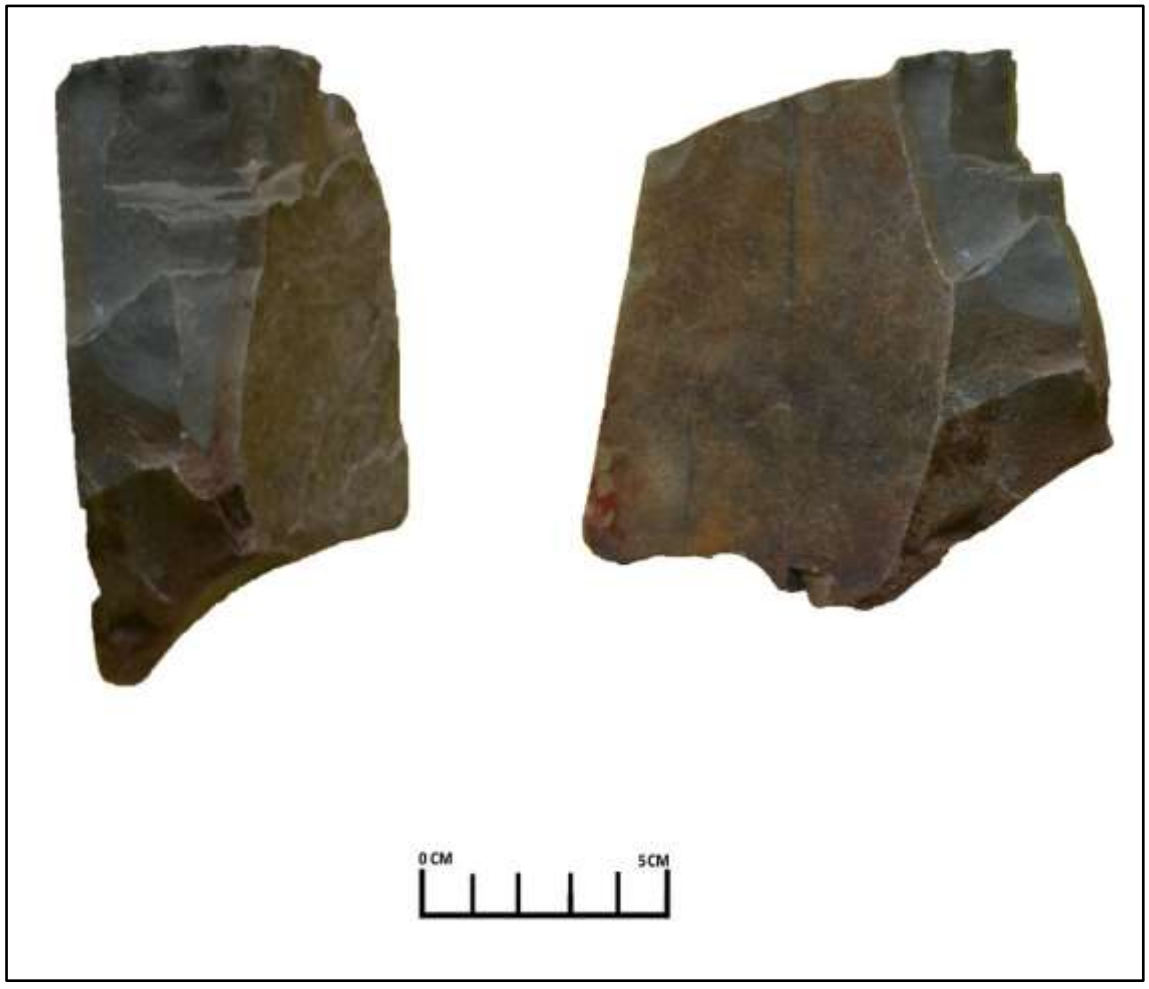

Figure 10: Core 13, a multidirectional core where the flakes are removed from different sides, Narhati

Majhigaon

The site Majhigaon (24°29′ 0″N, 83°21'7″E) is located on a hilly tract, about 10 km away from kone development block in Obra tehsil,near to the border of Jharkhand state. The distance between river Son and Majhigaon site is only 3 km. The Majhigaon village is inhabited by the indegeneous people like kharwar and the Chero. During exploration, we found 20 stone tools. The stone tools are all made on chert. The assemblage shares flake fragment (05), micro blades (03), end flakes (08), side flakes (02) and blades (02). Out of these stone tools, micro blades, end flakes, side flakes and blades are in complete form. In the site of Majhigaon, the flakes removed from the cores appear to be

bigger. The end flakes removed have a mid-ridge. All of the artefacts are made of black chert (Figure 7). There is also considerable patination on the flake scars hence the original colour of the flakes is revealed only when there is recent damage. The core no. 3 has flakes removed from the surface. Many of the flake scars show the tendency to remove long parallel flakes and end flakes. But no clear microblade scar could be traced on the surface. Two broken blades no. 19 and 20 have parallel sides but the blades cannot be considered part of the Microblade technology. These blades could have been part of the initial attempts to remove the microbaldes, or part of the preparation of the surface for removing the series of microblades from the core. The constrain of removing the blades could be because of raw material which is different from many sites.

Chachikalan

The site of chanchikala (24° 20′ 49"N, 83°20'25" E) is situated on hill top and 8 km away from Kone development block in Obra tehsil. Son river flows only 2 km away from the site of Chanchilkala. The area is inhabited by the indigenous people like the Kharwar and the Chero. During explorations, we recovered 64 stone stone tools. The stone tools are all made on chert. The stone tools comprised blade core (02), broken blades (05), micro blades (02), flake fragments (18), end flakes (11), side flakes (11), core fragments (07), shatter (01), blade fragments (07). At the site of Chachikalan, the raw material used is also black chert. There are very fewer micro blades found in this site. But they are flake fragments are plenty. Flake no 10 could be part of the core rejuvenation flake. It has the presence of cortex on the surface. The blade scars on the surface are all parallel. These cores have more refined blade scars compared to the one from Manjigaon. The blades are longer as in blades like 11 and 12 (Figure 8).

Nakatwar

This site Nakatwar (24°29' 35″ N, 83°23' 43'E) is situated 13 km away from Kone development block in Obra tehsil. River son flows adjacent to the site of Naktawar. The village is inhabited by the indigenous people like the Kharwar and the Chero. The exploration brought to light 66 stone tools made on Chert material. The assemblage consists of core (09), flakes (17), core fragment (02), end flakes (10), flake fragments (21), and blades (07). Among these, core flakes and blades are in complete shape and found in a good physical condition.

At the site of Nakatwar, the artefacts resemble the previous two sites. The raw materials used here are also the same black chert. The artefacts are all patinated. The blades are also longer in size and width. These are side flakes with retouches on the edges like Flake No. 10 (Figure 9). These secondary modifications can be part of the retouches or the post depositional damages. The post depositional damages are also visible on the edges of the flakes which has patination on the surface. The black colour gets obvious as the edge gets damage and the original colour of the flake gets revealed; for instance, in the case of the flake no. 14 where the edges get damaged and the black colour is exposed contrast to the light grey colour which is formed of the patination.

Narhati

The site of Narhati (24°27′ 57″N, 83°17'53″E) is located approximately 8.4 km north west to the Kone development block under Obra tehsil. River Son flows only one kilometer away from the site of Narhati. The area is inhabited by the indigenous people of the Kharwar and the Chero. The exploration revealed 64 stone tools. The stone tools are made on Chert and Chalcedony raw material. The stone tool assemblage comprised micro blades (18), end flakes (14), side flakes (12), flake fragments (15), blade fragments (02) and broken blade (01) Of these stone tools, micro blades, end flakes and side flakes are in complete form.

At the site of Narhati the cores are comparatively bigger with long parallel flake scars. Most of the cores are exploited only in on side. The steep fracture visible on the surface of the cores shows that the cores were discarded since they were exhausted and no long flakes or blade could be removed from them. Core 13 (Figure 10) is mainly a multi-directional core it has a blade scar removed from both sides.

Gaighat

The site of Gaighat (24^0 27 43 N; 83° 17'0'E) is located about 10 km north-west to the Kone development block in Obera tehsil. River Son flows close to the site of Gaighat. The area is inhabited by the indegeneous people like the Chero and the Gond. The exploration brought to light 14 stone tools. The stone tools comprising core (05), end flakes (04), broken blades (02), core fragments (02) and flake fragment (01). The stone tools are all made on chert material. Of these stone tools, end flakes are in complete shape.

At Gaighat, flakes belonging to the category of End flake and core are more in number. Apart from this, there are no blades, flakes or blade cores. Flake no. 7 is bigger compared to the other flakes from the site. But there are no significant retouches on the surface. The damages that are on the edges could be part of the post depositional damages.

Harra

The site Harra (24° 26' 32" N, 83°12'2"E) is situated on hill top and 15 km away from Kone development block in Obra tehsil. The site is densely forested. There are several small *nalas* flows near to the site of Harra. These *nalas* are originated from nearby hills. This area is inhabited by the indigenous people like the Kharwar and the Chero tribes. The exploration yielded only 12 stone tools. The stone tools are fashioned on chert material. The stone tools comprised mainly of cores (08) and end flakes (04). These stone tools are in a good physical condition and in complete form. At Harra, the Cores do not have many flake scars or blade scar. The core exploitation strategies here may be different from the other places. The raw material here seems to be almost the same, but the cavities in the raw material might have made the siliceous materal not viable enough for removing the micro blades. Hence the strategy used here to remove the microblades are mainly to avoid the cavities and flaws.

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Table 1: List of Sites and the Number of Artefacts Found at Each Site

Sl. No.	Site Name	Blade	Backed blade	Micro blade	Broken blade	Blade fragment	Flake	Side flake	End Flake	Flake fragment	Core	Shatter	Raw material	Total
1	Shahpur	-	-	-	-	-	-	-	27	36	16	5	chert	**84**
2	Salaidh	-	-	-	2	1			1	6	1	-	chert	**11**
3	Ranu	2	-	-	-	1	-	1	8	6	9	1	chert	**28**
4	Rajkhad	-	-	-	10	6	-	3	23	29	13	-	chert	**84**
5	Piprahi	1	-	15	-	-	-	6	11	26	2	-	chert	**61**
6	Kheyuri	-	-	27	-	-	-	13	23	49	13	-	Chert, chalce dony	**125**
7	Gaddarwa	-	-	3	3	4	56	-	-	-	17	-		**83**
8	Dighul	-	-	-	-	6	-	11	12	36	14	-	chert	**79**
9	Barhpaan	-	-	-	4	-	-	6	1	14	5	2	chert	**32**
10	Barheradol	-	-	-	-	-	-	12	17	14	26	-	chert	**69**
11	Narhati	-	-	18	1	2	-	12	14	15	-	-	chert	**62**
12	Nakatvar	7	-	-	-	-	17	-	10	21	9	-	chert	**64**
13	Majhigawa	2	-	3	-	-	-	2	8	5	-	-	chert	**20**
14	Kachnarwa	1	-	-	-		-	8	27	-	6	-	chert	**42**
15	Harra	-	-	-	-	-	-	-	4	-	8	-	chert	**12**
16	Devatan	2	-	-	-	1	-	5	20	20	40	-	chert	**88**
17	Gaighat	-	-	-	-	2	-	-	4	1	5	-	chert	**12**
18	Chachikala	-	-	2	5	7	-	11	11	18	-	1	chert	**55**
19	Tumia	1	1	-	-	-	-	1	6	5	-	-	chert	**14**
20	Panduchattan	1	-	-	-	1	-	4	4	5	2	-	chert	**17**
Total		**17**	**1**	**68**	**25**	**31**	**73**	**95**	**231**	**306**	**186**	**9**		**1042**

Kachnarwa

The site of kachnarwa (24°20' 7'N', 83° 21'9"E) lies 10 km for away from kone development block. The site is easily approachable from Duddhi - Vindhamganj road. The distance between Vindhamgaj to Kachhnarwa site is only 11 km. Pandu river flows near to the site of Kachnarwa, which originated from Pandu hills. The area is inhabited by the indigenous people like the Dhangar, the Chero, and the Gond. The exploration revealed 64 stone tools. Chert is the preferred raw material. The stone tools comprised core (06), end fakes (27), blade (01), side flakes (08) and broken flakes (22). The site of Kachnarwa shows the presence of high number of flakes. The finished artefacts such as micro blades are hardly seen. The strategy here too remains the same where the finished artefacts such as the microblades have been taken away where the cores, flakes and debitage are left behind.

Discussion and Conclusion

The artefacts from Dighul are all collected by random sampling method. The *chaîne opératoire* here is fragmentary but some sites such as Narhati have finished blades on the sites but are very meagre in number. Most of the assemblage consists of side flakes, end flakes, blade fragments, microblades, microblade cores, microblade core fragments, shatters and flakes below one centimetre which may be classified as chips. The core exploitation strategies in all the sites have so many similarities. However, some sites have some specific characteristics such as Gaighat, Majigaon, and Chachikalan where the artefact size and the raw material is slightly different from the other sites. Whether these sites have a different typo techno complex is a matter of further research. At the site of Kachnarwa too, the microblade cores are exploited in a manner to avoid the flaws and cavities in the raw materials. In this light, the artefacts of the 20 sites of the Dhudi district can be discussed taking particular artefact types (Table 1).

Cores: According to the pattern of blade removal, the core can be categorized into three and a fourth type of core where the micro blades are not removed but smaller flakes are removed from the core surface.

Type 1: These cores are conical or wedge-shaped, characterized by blades being removed from one side while the opposite side remains unretouched. This suggests a deliberate technique where the core is stabilized in a fixed position, allowing flakes to be removed from the side facing away from the toolmaker. The unexploited side, closer to the toolmaker, appears to have been left intact to facilitate the flaking process.

Type 2: In this type, blades are removed from one side, specifically the side facing away from the toolmaker. However, attempts to remove blades from the side closer to the toolmaker were either unsuccessful or abandoned, as evidenced by incomplete or halted flaking marks.

Type 3: These cores are shorter and more distinctly conical, with blades removed from multiple sides, giving the core a fluted appearance. The strategy for stabilizing the core

during blade removal differs from that used in Type 1, indicating a variation in flaking techniques.

Type 4: Amorphous cores fall under this category, where no blade scars are present, but flakes have been removed. Such cores have been recovered from sites like Rannu and Panduchattan.

Type 1 and type 2 may be closely connected since the initial techniques are similar whereas Type 2 has the further attempt to remove micro blades/flakes from the side towards the tool maker. These two techniques of core exploitation are where the core is supported on a fixed object while removing the microblade. Maybe this technique doesn't work when the blade core is turned around to the side of the surface where the micro blades are removed and trying to support the fixed object to remove the flakes from the other side. In the case of type 3, a different technique might have been used which allowed the tool maker to remove the microblade from all the sides. Here it is noticed that the microblade scars are comparatively smaller in size. It may be since the micro blades are removed extensively from the core that the core itself became exhausted and was abandoned.

Fragmented Core: Fragmented microblade core can be noticed from almost all the sites. Unlike the intact microblade cores, these could be part where an attempt is done to rejuvenate the core where the blades are removed from all possible sides but may got accidently broken in this attempt. This points towards a desperation for the maximum utilization of the raw materials to its optimum use before it gets totally exhausted. This point towards a constrain for the raw materials due to its depletion due to its exploitation for a prolonged period of time. The blades removed from these rejuvenated cores are definitely smaller in size. This implies alternate use of the blades along with the micro blades both becoming part of the same assemblage.

Blades: There are not many finished blades found from any of the sites. The fragmentary *Chain Operitoire observed* here suggest that the finished blades are been taken to some other places where they were used and the remaining byproduct is been found here. This activity suggest that the manufacturing areas may be different from the places where the finished tools put into use. Some broken blades were only noticed at Barhpaan and a comparatively longer blades which are just above 5 cm is noticed at Tumiya locality. These baldes seems to be part of the intial flake removal from the cores using percussion technic. Moreover, it has 70 % cortex on the dorsal side suggesting it as the part of the intail core trimming. Whether these comparatively longer blades points towards the existence of the Upper Palaeolithic phase is a matter of further research. But the other tools types belonging to the Upper Palaeolithic are absent here in these sites.

End Flakes: The end flakes form a significant part of the assemblage. The raw material of these artefacts includes chalcedony and chert. The end flakes here may be classified as part of the intial core trimming flakes as most of the flakes have presence of cortex

on the surface. The presence of cortex varies from 10 to 50 per cent on the dorsal surface of the flakes. Some of the end flakes from sites such as Dighul have 100 % cortex on the dorsal surface. These flakes are removed on the longer sides of the core where it creates a smooth surface for the further removal of the blades. This suggests that these flakes may be part of the initial core trimming flakes. The technique used for removing these flakes is percussion technique suggested by the size of the positive bulb on the flakes on the ventral side. In the case of the bigger flakes, there are multiple flakes on the surface, they have elongated parallel blade scars. These suggest the initial trimming phase of the core or removing the unwanted cortex part, unsuitable for blade removal.

There are also thick flakes which could be part of the core removal flake. Among these artefacts the artefact no. 53, multiple attempts of removing blades can be observed on the dorsal surface. But these attempts failed because the weathered cortex does not give a required sturdy platform for the desired flake removal. It can be assumed that the end flakes are in the later stage of flake removal, just before the core is ready for blade removal. Hence there are more previous flake scars on the surface of the end flakes. Whereas the side flakes have almost 90 % of cortex preserved and these flakes that can be part of the core opening flake and in many case the side flakes precedes the end flake removal.

Both the side flake and end flakes are part of the core opening flake since both of them have enough cortex on them. Even the smaller flakes have the remains of cortex on them. This suggests the initial phase of the core trimming. There are no many complete blades or bladelets observed in the collection. The few blade fragments obtained could be the broken one during the process of manufacture of blades. Other materials include broken fragments of flakes and shattered pieces which has an angular shape. Considering the type of activities involved in this site, it can be assumed that this could be a manufacturing site where the raw material is exploited, the initial trimming is done and the finished products are taken away to some different areas.

The similarities in the technique of core exploitation strategies observed here suggest that the then population of these areas shared a similar technique for the removal of the blades. The type of cores suggests the different techniques adopted by the population to remove blades and how it was used on different raw materials and the techniques that are adapted, considering and avoiding the impurities in the raw materials and adopting the technique considering the plasticity of the raw material changes. i.e. when they are changing the raw material from chert to chalcedony the efficiency of blade removal is visible and also with the black chert. While using the same technique on different raw materials, the result obtained may not be the same. The judicious adaptation of these improvised techniques is been considered while flaking. The change in the pattern of the technique of blade removal may be due to the chronological changes that happened during the adaptation of the technique or due to the raw material constraint.

Most of the part of the assemblage are debitage. The micro blades are not found much in these sites which implies that the micro blades are removed from here and taken away to somewhere else for the use. The maximum exploitation of the core and optimum use of the micro blades points to the fact that there were raw material constrains both in terms of quantity and quality. This constraint of the raw material made the hominins to carefully utilize the available resource and utilize and collect the maximum blades removed from the core and use the core to the full potential.

The artefacts of the Dudi area of Sonbhadra region have a diverse core exploitation strategy which points towards the multiple factors determining them. It includes the availability of the raw material, the subsistence strategy of the people who made these microliths, the environment, the inter and intra-site interaction of the then population. The study points towards a dynamic process of the culture augmented by the technological changes partly due to the change of time.

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