Lower Palaeolithic petroglyphs and hammerstones obtained from the excavations at Daraki-Chattan Cave in India

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Abstract: *Daraki-Chattan in the Chambal basin is the richest known Pleistocene cupule site in the world. Here excavations were conducted by the Rock Art Society of India in collaboration with the Archaeological Survey of India under the EIP Project for five seasons from 2002 to 2006. The excavations established that the site was in use mostly in the Lower Palaeolithic. The excavations also yielded twenty-eight cupules on exfoliated rock slabs, two still lying in the trench, and ten hammerstones from different levels of the excavated sediments right from close to bedrock. Besides, a stone block bearing two linear petroglyphs was discovered from layer three. The paper presents the contextual study of the cupules and hammerstones excavated from this site.*

Cupules are a simple form of human expression that has been in use from some of the earliest cultural periods to, in some parts of the world, modern times. They are of hemispherical form, usually circular, sometimes oval, elongate or conical. Their creation is easy on soft rocks, but it becomes a very tedious and time-consuming task when executed on very hard rocks like quartzite and quartz (Kumar 2007; Kumar & Krishna 2009; Krishna & Kumar 2010).

Early petroglyph sites have been discovered in the Vindhyas, Aravallis and in the Chambal basin in central India during the last twenty years. Mention may be made of those in Auditorium Cave, Bhimbetka (Bednarik 1993a), Daraki-Chattan, Bajanibhats (Kumar & Sharma 1995), Moda Bhata (Bednarik & Kumar 2002) and other hill series in greater Ajmer (Kumar & Prajapati 2005), and Indragarh Hill, Chanchalamata Hill, Modi, Kanwala, Arnyabhau and Pola Bhata in the Bhanpura region (Kumar *et al.* 2006). Out of these, Daraki-Chattan is the most important and has been excavated under the EIP project for five seasons from 2002 to 2006 (Kumar *et al.* 2005; Kumar, 2006).

For the first time in the history of world archaeology, excavations at Daraki-Chattan Cave have produced confirmed evidence of Lower Palaeolithic cupules and some of the hammerstones used for their production (Kumar *et al.* 2005). This finding endorsed the occurrence of Lower Palaeolithic petroglyphs (a large cupule and a meandering line) from the excavation carried out in the Auditorium cave, Bhimetka, by V. S. Wakankar in the 1970s, which were recognised in 1990 (Bednarik 1993). This refuted the Eurocentric view of the origin of art and culture in the Upper Palaeolithic period. It strongly supported the view that Pleistocene rock art is a global

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phenomenon and that non-iconic rock art precedes iconic palaeoart in the Pleistocene period. In Australia, hundreds of thousands of petroglyph motifs are considered to be of 'Middle Palaeolithic' age (*sensu* Foley & Lahr 1997) on technological grounds, having been made by societies of Mode 3 production. Even in Europe itself, we have at least one instance of Middle Palaeolithic rock art in the form of eighteen cupules executed on the underside of a large limestone slab placed on top of La Ferrassie burial No. 6, the grave of a Neanderthal infant (Peyrony 1934). This, however, is an isolated case, whereas in other continents, pre-Upper Palaeolithic rock art and portable palaeoart are much more common (Bednarik 1992a, 1993a, 1994a, 2001a, 2002a, 2003). While we have huge numbers of Middle Palaeolithic rock art motifs, mostly from Australia and southern Africa, the incidence of Lower Palaeolithic cases remains very rare, and confirmed cases of it are limited to India.

Daraki-Chattan

Fig. 1. Daraki-Chattan Cave, a Lower Palaeolithic cupule site in the quartzite buttresses on Indragarh Hill near Bhanpura, Chambal basin, Madhya Pradesh.

Daraki-Chattan is a small, narrow and deep cave in the upper strata of quartzitic buttresses of Indragarh Hill, which are broken into big blocks by vertical fracturing (Fig. 1). With more than 500 cupules on both its vertical walls it is an extraordinary Palaeolithic cupule site, located in the Chambal basin, Bhanpura-Gandhisagar region, Mandsaur district, Madhya Pradesh in India (the exact location is not given

because of protection concerns; Kumar 1996, 2002). It is located at an elevation of 420 m a. m.s.l. and is among a complex of painted rockshelters in Indragarh Hill which on its top bears a fort of the Rashtrakuta period (seventh century C.E.), and close to its base has yielded remains of an early Historic period habitation. This Historic site was excavated by H. V. Trivedi and V. S. Wakankar in 1959-60 (1958-59: 27-28; 1959-60: 22-24). Indragarh Hill is a part of the Pariyatra Hill valley system, which comprises further rock art and Stone Age sites.

Daraki-Chattan is facing almost due west, with an entrance orientation at 10° NE and 190° SW. It is overlooking a 1.5 km-wide beautiful and fertile valley of the river Rewa which is bounded on both the sides by Vindhyan escarpments. Deccan trap escarpments with laterite cap at places are overlapping the Vindhyans on the north-western side of the valley. Through the valley flows the small perennial river Rewa. The valley is still a forest reserve, which provided sanctuary to tigers and other fauna up to the 1960s.

The cave floor slopes 1.4 m over a distance of 6.7 m (21 %), then it suddenly dips to 60 cm lower. From there it slopes down at about 20%. The cave floor is covered by quartzite rubble forming a 10 to 20 cm-thick deposit, together with fine sediment and humus. Some of this deposit might have been washed in by rainwater from above. The thickness of the deposit appears much greater at the mouth of the cave, until the floor suddenly slopes down outside the entrance dip.

Daraki-Chattan Cave was discovered by Ramesh Kumar Pancholi in 1993 (Pancholi 1994: 75) and was scientifically studied by Giriraj Kumar assisted by his son Ram Krishna in 1995 (Kumar 1996). It has been studied under the EIP Project by Indo-Australian scientists since 2001.

The EIP Project

Excavations at Daraki-Chattan have been the major aspect of the EIP Project. The EIP Project (Early Indian Petroglyphs: scientific investigations and dating by international commission) is a joint venture by the Rock Art Society of India (RASI) and the Australian Rock Art Research Association (AURA) under the aegis of the International Federation of Rock Art Organisations (IFRAO). Established in 1999, its work has enjoyed the support of the Archaeological Survey of India, the Indian Council of Historical Research and the Australia-India Council. The EIP commission is to thoroughly investigate all matters concerning the very early rock art of India, including that of Daraki-Chattan, using methods such as carbon isotope analysis, optically stimulated luminescence dating, microerosion analysis, uranium-thorium analysis and archaeological excavation. The commission consists of geologists, geochemists, archaeologists, rock art scientists and archaeometrists from India and Australia. The fieldwork of the EIP Project was commenced in 2001 by GK and several colleagues and accelerated in the following years with an intensive campaign involving several specialists. A project web-page was established by RGB at http://mc2.vicnet.net.au/home/eip1/web/index.html. The first tangible findings were presented at the RASI-IFRAO Congress in Agra in November 2004 and have been published in 2005 (Kumar *et al.* 2002; Kumar *et al.* 2005; Bednarik *et al.* 2005), but fieldwork has continued and will take several more years to complete.

Excavations at Daraki-Chattan, 2002 to 2006

Daraki-Chattan was excavated under the EIP Project and the direction of GK from 2002 to 2006 (Kumar 2002, 2003, 2004, 2005, 2006; Kumar *et al.* 2005; Bednarik *et al.* 2005). NV was the official representative of the Archaeological Survey of India and was nominated as the co-director of the excavation. The area excavated from 2002 to 2006 is 33 m^2. The major excavations were carried out just in front of the cave and in the associated rockshelter immediately to its north (Fig. 2). The initial objectives of the excavations and explorations at and around Daraki-Chattan were as follows:

1. To establish the stratigraphy of the sediments and palaeoclimatic and cultural history of Daraki-Chattan.
2. To find evidence related to the production of cupules in the cave, and other art objects and artefacts, if any, from the sediments.
3. To obtain scientific dates for different levels of sediments exposed in the excavations and containing artefacts, and to date cupule production by using various archaeometric methods.
4. To establish the occupation sequence and Pleistocene history of the region.

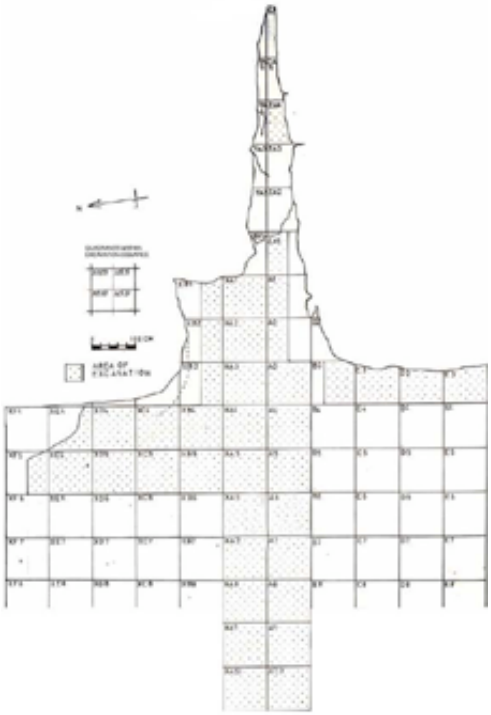

Fig. 2. Floor plan of Daraki-Chattan Cave, with excavation squares indicated and the extent of the excavation shown.

Stratigraphy

In the excavation at Daraki-Chattan during five season’s work (2002 to 2006), we have exposed sediments up to a depth of -311 cm from A1 in the main trench (Fig. 3-4). The sediments slope towards west by 150 cm over a distance of 5 m, i.e. up to XB6(2). The nature of the sediment so far exposed in the excavation is fairly uniform in respect of gradations of colour and size of the exfoliated flakes and sediment clasts. However, to facilitate study the sediments have been divided broadly in two parts, a lower deposit with pseudo-layers 6, 5 and 4; and an upper deposit with pseudo-layers 3, 2 and 1 (see Table 1).

Fig. 3. Section facing south exposed in the excavation of Daraki-Chattan Cave, 2006.

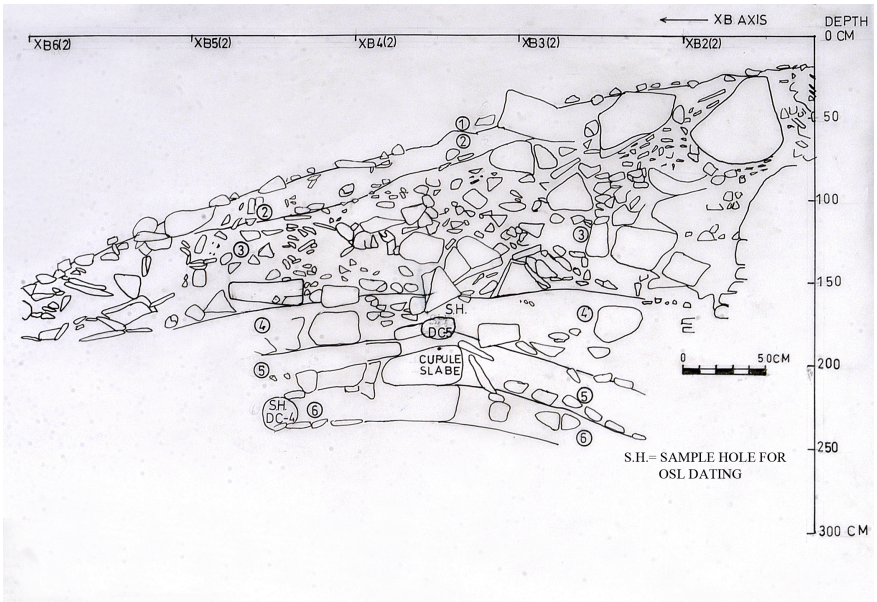

Fig. 4. Daraki-Chattan excavations: section map facing south, with pseudo-layer markings, 2005.

Layer No.	Sediment thickness	Nature	Associated cultural material
1	A few to 10 cm	Surface humus	Artefacts representing transitional phase from Lower Palaeolithic to Middle Palaeolithic
2	15-24 cm including layer 1	Loose brown soil	
3	37-110 cm	Loose brown soil with exfoliated flakes and stones	Lower Palaeolithic flake artefacts, some on pebbles and cobbles (Fig. 5)
4	26-50 cm	Compact calcareous yellowish brown soil	Lower Palaeolithic flake tools along with artefacts on pebble and cobble tools. Cupules, petroglyphs and arranged stones
5	25-28 cm	Compact brownish red soil	Lower Palaeolithic. More artefacts on quartzite cobbles, pebbles and thick nodules, some also on natural flakes, split pebbles and manmade flakes on quartzite, a few on chert also. Rare occurrence of handaxe-like artefacts, only one cleaver, some hammerstones and slabs bearing cupules. Patinated chert flakes and artefacts continuing. Hammerstones found from the upper part of the red laterite soil, layer 6, overlain by layer 5.
6	25-76 cm	Comparatively loose lateritic red soil	Artefacts on quartzite cobbles and pebbles (Fig. 6), some also on natural and manmade flakes and split pebbles on quartzite, a few on chert also were obtained from the upper part of the red laterite soil, layer 6, overlain by layer 5. Otherwise most of the lower portion of this lateritic red soil is devoid of stone artefacts. It corroborates the evidence of Lower Palaeolithic artefacts obtained from only upper layer of laterite deposit at Barodia-Navali crossing on Gandhisagar road.

Table 1. Stratigraphy and tool typology, section facing south, main trench. Layers 1 and 2 are visible only in the area of XB3 and XB4 and are almost indistinguishable.

Fig. 5. Lower Palaeolithic artefacts from Daraki-Chattan excavations.

1. **Lower deposit:** The lowermost sediment is lateritic red soil, grading into the following compact brownish red soil and again into compact calcareous yellowish-brown soil. These sediments also comprise fallen large slabs and stone blocks. Most of these clasts have been weathered deeply and become highly patinated with dark-brown mineral accretion. These sediments contain Lower Palaeolithic artefacts. Their stratigraphic-typological variation has been given in Table 1.
2. **Upper deposit:** It is composed of loose brown sediment with exfoliated flakes and clasts, generally of comparatively small size and progressively of lower number. It consists of the upper three pseudo-layers. The top 20-24 cm sediment grades into greyish-brown pseudo layer (2) and thin humus layer (1). Locally pseudo-layers 1 and 2 have been washed away by rainwater.

Observations on the stratigraphy

1. From the very beginning of the excavation in 2002, the artefact assemblage represents a transitional phase from the Lower Palaeolithic to the Middle Palaeolithic. However, the proportion of Lower Palaeolithic typology increases with depth.
2. Polyhedrons and discoid cores of quartzite are found from the lower level of layer 3. Cobble artefacts, like spheroids, were also found from the lower part of layers 3 and 4. Layers 5 and 6 revealed artefacts mostly of quartzite cobbles and thick nodules (cobble tools, discoids and spheroids). Patinated chert flakes and artefacts of chert nodules are found even up to the last level of the excavated sediment but their number decreases with increasing depth. Microliths of chalcedony and chert are rarely found in the loose sediments of the upper layers.
3. Tiny granules of haematite were found throughout the depth of the sediments.
4. The humus layer 1 and following layer 2 contain some pottery shards, brick fragments, microliths and chert and chalcedony flakes.
5. In layer 3, the size and number of the stone blocks increase with the depth of the sediment. Huge blocks were found lying at a depth of -135 cm from A1 (-85 cm from surface) and continuing up to the depth of -177 cm from A1 (-127 cm from surface). Besides the huge collapsed boulder in the centre of the trench, a big block measuring 104 × 46 × 21 cm was lying at a depth of -135 cm from A1 in A3 and XA3. Lower Palaeolithic artefacts of quartzite are numerous, mostly in mint condition, only a few bearing abrasion marks. Patinated chert flakes and nodules are also found. The concentration of Lower Palaeolithic artefact assemblage is greatest in its lower half. Highly patinated utilised chert flakes and nodules occur there.

Fig. 6. Chopper on quartzite cobble lying in situ on bedrock.

Excavated cupules

Cupules obtained in the 2002 excavation

The excavation in 2002 yielded many slab pieces from squares A2, XA2, XA1 and A1, distributed mostly around point A2 at depth -26 cm to -43 cm from A2 (-38 cm to -55 cm from A1). Out of these, seven fragments joined perfectly to form a slab measuring 95 × 50 × 5-10 cm (Fig. 7). Its three big pieces bear seven cupules. The dimensions of the cupules range from 26.1 × 29.0 × 1.85 mm to 50.5 × 51.9 × 7.4 mm. Stone artefacts representing the transitional phase from the Lower Palaeolithic to the Middle Palaeolithic were discovered both above and below these slabs

Fig. 7. Exfoliated cupule slab assembled from seven fragments, which were found in pseudo-layer 3 in the excavations at Daraki-Chattan in 2002.

Another slab piece, bearing three cupules, was discovered from A2(2) at the time of collecting soil sample No. DC-1 for OSL dating on 27 September 2002. The soil sample was collected at a depth of -50 cm from the surface. The cupule slab fragment came out while digging horizontally into the section facing north. This fragment is roughly rectangular in shape, with one corner curved and another side obliquely cut towards the end. The maximum dimensions of the slab are 22.0 × 13.5 × 5.5/2.6 cm. The upper surface of the slab is sloping, while its lower surface is almost plain with a shallow depression in the centre. The slab piece bears three cupules:

1. At the 'left' side, 45.8 × 37.7 (broken) × 6.7 mm.
2. In the 'right' half of the slab, 41.0 × 35.0 (broken) × 8.8 mm.
3. At the extreme end of the 'upper right' corner. The cupule is broken, only one-quarter of it remains. It is 16.0 mm deep.

Cupules obtained in the 2003 excavation

1. A piece of cupule-bearing slab was found in XB(3) at depth -63 cm to -70 cm from A1. It is 18 × 16 cm in size and was inclined towards north. It bears two deep cupules and two shallow ones. It comes from slightly below the level from which cupule slabs were obtained from the Daraki-Chattan excavation in 2002. Stone artefacts obtained from around it were of quartzite. In the month of December 2003 a team of Stone Age archaeologists, consisting of S. B. Ota, R. K. Ganjoo, GK and AP, studied the material. The team came to the conclusion that the assemblage obtained in the excavation up to 2003 represents a late Acheulian tradition.
2. A small piece of cupule slab was found lying upside down in XB2(2) at a depth of -72 cm from A1 (Fig. 10). Two stone artefacts of quartzite were obtained close to it.

3. Another small slab piece with two broken cupules was obtained from XA2(1) at a locus 55 cm from XA2, 81 cm from XA3, at a depth of -85 cm from A1 (-55 cm from surface) (Fig. 11).

Cupules obtained in the 2004 excavation

The following cupule-bearing slabs were discovered in the excavation in 2004:

1. A slab piece of quartzite bearing two cupules was found upside down in XC5(1) in the adjacent rockshelter at a locus 36 cm from XC5 and 74 cm from XB5, at a depth of -17 cm from the surface (-127 cm from A1 datum), in a Lower Palaeolithic context. The cupule surface is weathered, the cupules' dimensions are as follows: cupule 1, 31.0 × 25.0 mm (broken) x 4.7 mm; cupule 2, 40.6 × 36.8 mm (broken) x 5.0 mm.
2. A small cupule slab piece of quartzite was found in XC4(1) at a locus 59 cm from XB5, 59 cm from XC5, at a depth of -36 cm from XC4 (-142 cm from A1 datum). The cupule surface is smooth and patinated. It was found in the Lower Palaeolithic level. The dimensions of the cupule slab piece are 70 × 69.4 × 20.7 mm, and those of the cupule are 30.7 × 19.2 mm (broken) x 6.4 mm.
3. An irregularly broken thick slab was found lying along the slabs of the floor along the section facing south in XA3(1)/XB3(2) on 28 May 2004. The locus of the slab is 79 cm from XB4(2), 110 cm from XA4, depth -93 cm from surface and -164 cm from A1 datum. The sediment covering it yielded four Lower Palaeolithic artefacts; out of these three were of quartzite and one of highly patinated chert. When we removed this slab we observed two broken cupules on its patinated and slightly weathered surface. The cupules are smooth and appear to be equally patinated with a little light-brown encrustation on them. The dimensions of the slab are: upper surface 13 × 13 cm, lower surface 26 × 17 cm. It bears two cupules: cupule 1, 42.5 mm × 42.7 mm (broken) × 7.8 mm, ovoid in shape; cupule 2, 41.7 mm × 30.7 mm (broken) × 7.0 mm.

Cupules obtained in the 2005 excavation

Cupules on slabs still lying in the main trench of 2005.

On 19 June 2005 we observed a cupule on a quartzite slab projecting from the section facing south in XB3(2). The locus of the cupule is 39 cm from XA3, 70 cm from XA4, 119 cm from A3, depth -129 cm from XB4 and -184 cm from A1 datum. The dimensions of the cupule are: 32 mm (broken) × 29 mm × 6 mm. The thickness of the cupule-bearing slab is 20 cm and its visible size is 49 × 45 cm. It is still resting on another slab, thus making the cupule-bearing surface 32 cm above bedrock in layer 5 (early phase). So far it represents the earliest cupule from the Daraki-Chattan excavation (Fig. 8-9). Soil sample No. DC-5 for OSL dating was collected just above this slab on 9 and 10 December 2004.

Another cupule was observed on a very big and thick fallen slab, slanting NW, in 2004. It is still lying in the trench in A2, A3 and A4 in layer 4. The visible size of the slab is 118 × 93 × 34 cm. The cupule is slightly diagonal, with dimensions 32 (broken) × 34 × 16 mm. It is located just close to the section facing north, at locus 83 cm from A3, 124 cm from A4 and at depth -58 cm from surface of section facing north and -240 cm from A1 datum.

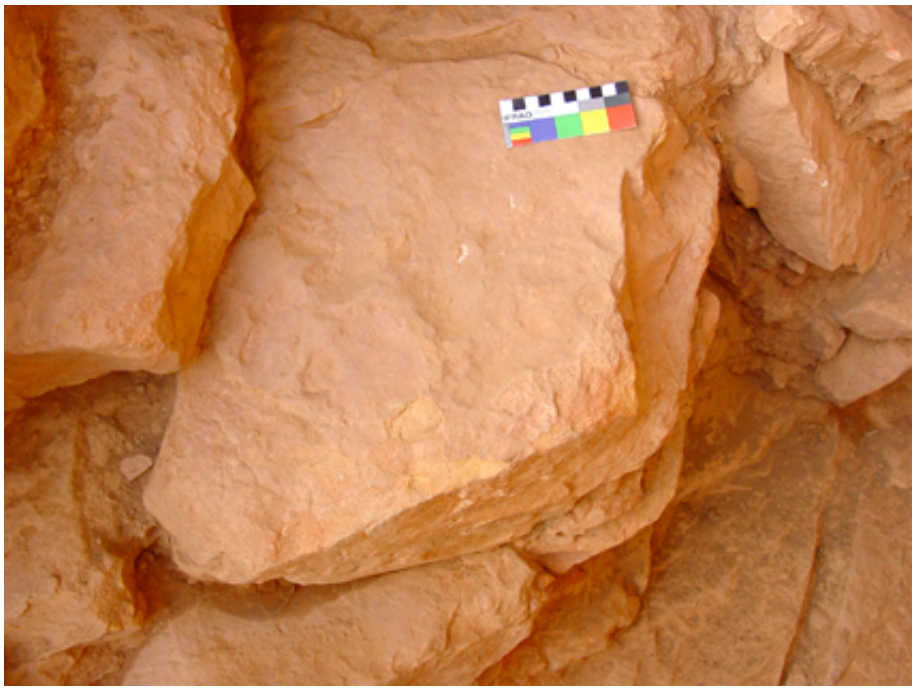

Fig. 8. Daraki-Chattan excavations, 2005-06: Cupule made in situ, lying close to bedrock.

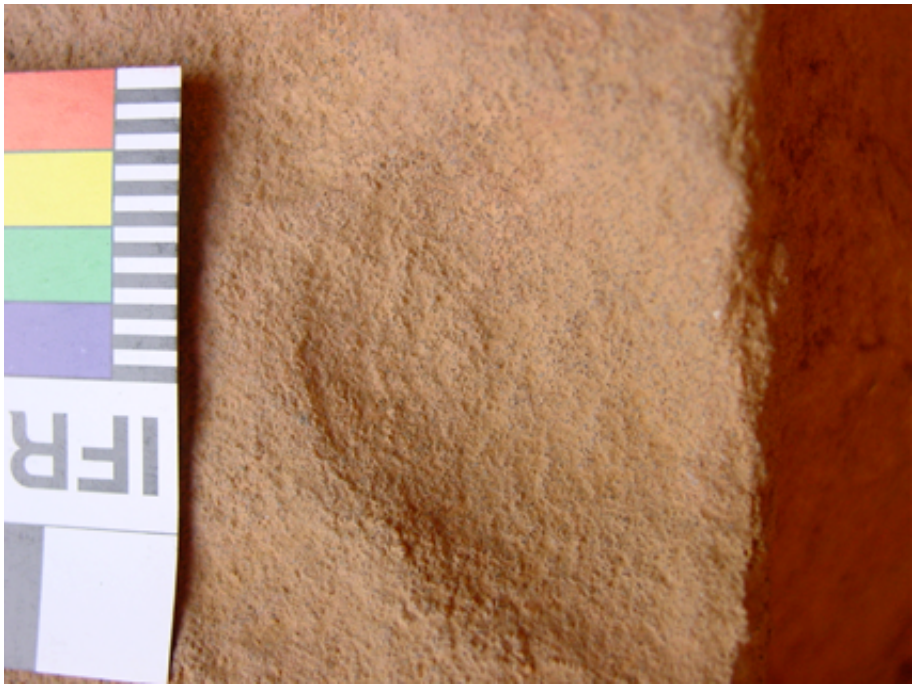

Fig. 9. Close up of the in-situ cupule on cupules lab of Fig. 8.

Hammerstones

Hammerstones used for the production of cupules were obtained from the excavation at Daraki-Chattan. A hammerstone fragment of a quartzite river cobble in XA2 (2) is from a locus 53 cm from XA2(3), 28 cm from XA2(2), at depth -37 cm from A1. It has a broad striking surface, which has been worn smooth by impact, obtained just 5 cm below the two major Acheulian artefacts in the same quadrant. It was found on 8 June 2002. The same kind of smooth crushed surface facet on hammerstones has been produced in the replication of cupule production.

A big sturdy hammerstone of quartzite from XA1(2) at a locus 50 cm from XA1, 50 cm from XA2, at depth -63 cm from the surface and A1 datum was discovered on 28 May 2003. In the same year, a second hammerstone of quartzite used for cupule production was found. It had been split after use to produce a secondary artefact, and occurred in XA1(2), 70 cm from XA1, 85 cm from XA2, at depth -127 cm from A1 (Fig. 10). It was lying just on the bedrock, hence it represents one of the earliest evidence of cupule production in the cave. It was discovered on 16 June 2003. This level yielded a rich concentration of Lower Palaeolithic artefacts.

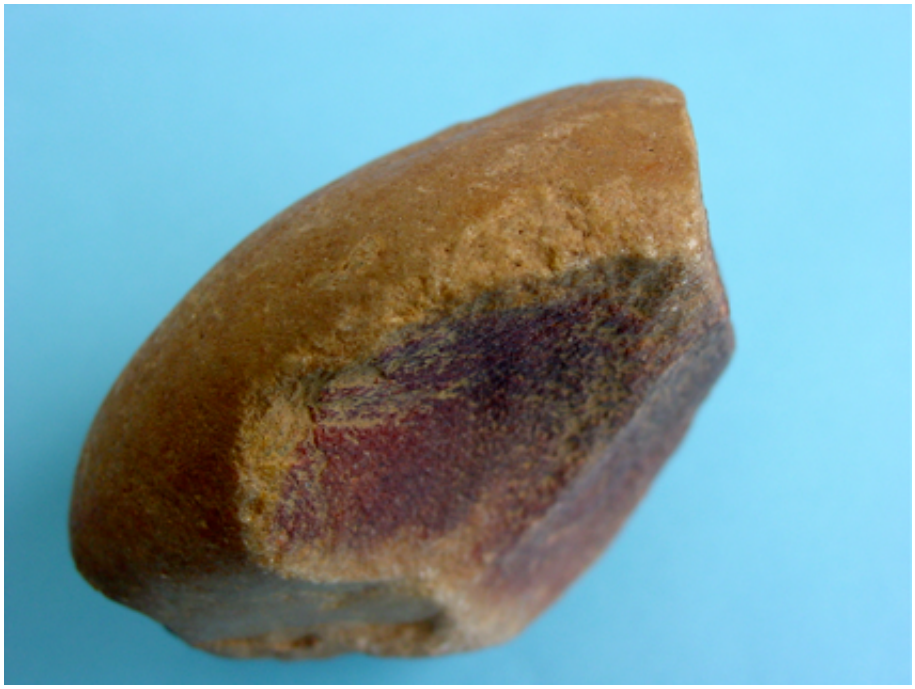

Fig. 10. An early hammerstone obtained from close to bedrock in the eastern part of the trench in Daraki-Chattan, Lower Palaeolithic.

Five more hammerstones were recovered in 2004. In XA3(1), a pointed hammerstone of quartzite from the Lower Palaeolithic floor level was left in its position in the trench for inspection by members of the EIP Commission, and removed in their presence. It was found 5 cm from XA3, 96 cm from XA4, at depth -111 cm from surface (-164 cm from A1 datum). In XA3(4)/XA4(1), a quartzite hammerstone was obtained from the extended trench at 30 cm in line from XA4 towards A4, at depth -107 cm from A1 datum. Another specimen was found in

association with large Lower Palaeolithic artefacts of quartzite in XA4(1), at a locus 86 cm from A4, 65 cm from XB4(2), at depth -42 cm from the surface in XB4(2). A long quartzite hammerstone was excavated in XA3(2), in association with Lower Palaeolithic quartzite artefacts at 51 cm from XA3, 51 cm from A3, at depth -145 cm from surface (-190 cm from A1 datum). The fifth specimen found in 2004 came from XA5(1). It was a long hammerstone of quartzite, Lower Palaeolithic, also left in its position for reference. It was found 60 cm from XA5, 85 cm from XA6, at depth -67 cm from XA5.

Finally, three further hammerstones were discovered in the lower strata in 2005. The first was an example with a good battering facet obtained from XA4(3) at a depth of -10 cm to -20 cm from surface, found in loose sediment on 30 May 2005. This was followed by a hammerstone of a quartzite cobble from XC4(2) at a locus XB4 -42 cm, XC4 -80 cm depth, -40 cm from surface, found 14 cm towards south of the fallen big rock in the rockshelter and 8 cm below it (obtained on 3 June). The most recently secured hammerstone, also a quartzite cobble, was found in XB4(4) at locus XB4 -80 cm, XA5 -80 cm, on 18 June. It occurred at a depth of -140 cm from XB4, where the sediment changes from lateritic red to brownish red soil. Its dimensions are 97 × 81 × 64 mm. It was found along with a Lower Palaeolithic artefact made from a quartzite cobble, a haematite pigment nodule and another cobble tool. All of these four objects come from an area measuring 17 × 16 cm in XB4(4), at -132 to -140 cm depth from XB4. One more artefact of a quartzite flake, Lower Palaeolithic, comes from nearly 20 cm away from the hammerstone. All these artefacts were found surrounded by decomposed quartzite stone blocks (barbarya bhatas).

Engraved grooves on a boulder

In the excavations of Daraki-Chattan a big boulder was found bearing two engraved lines. It was lying in the lower part of layer 3 (Kumar *et al.* 2005). It bears two engraved lines (Fig. 11-12). When this boulder was removed twenty Lower Palaeolithic artefacts were found from above it and along its sides.

The longer groove one is 293 mm long and almost straight. Its width ranges from 14 mm to 21 mm, but in general it is very consistent at an average of 19 mm. The groove section is U-shaped, and its execution by abrasive process is emphasised by the tendency of a slight increase in depth and width across the two surface rises along the groove's course. The maximum difference between the two rises and the intervening depression along its course is 7.4 mm. The actual depth of the groove ranges from 2.0 mm to 6.9 mm, but, as there is extensive ferromanganeous accretion along the margins and at places inside of the groove where preferential deposition occurred, these measurements are deceptive. Without removing the accretion, the true depth of the groove can only be estimated, but it seems to range up to about 4.5 mm at rises, and was close to 2.0 mm in the depressions. The second, shorter groove, 83 mm long, is comparatively narrower, which is clearly caused by accretionary deposit emphasising the margins by preferential deposition. Its present width is around 14 mm, and the original width appears to have been 17 mm or 18 mm. The depth ranges from 2 to 3 mm.

Fig. 11. Quartzite boulder with two linear petroglyphs found in pseudo-layer 3 but resting on pseudo-layer 4, Daraki-Chattan.

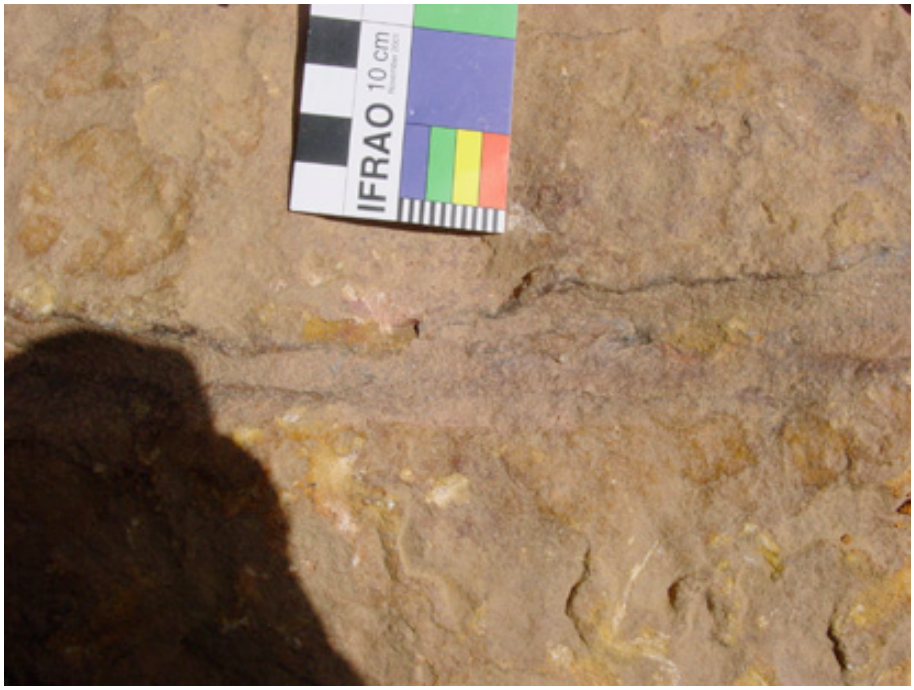

Fig. 12. Close up of the engraved petroglyph of Fig. 11, with scars of sample collection for U-Th dating.

The execution of these grooves by abrasion required great patience and very long hours of work. The ferromanganeous accretion deposited on these linear petroglyphs is being subjected to U/Th dating at Physical Research Laboratory, Ahmedabad.

Study and observations

Daraki-Chattan is a Lower Palaeolithic site, yielding Lower Palaeolithic artefacts from throughout its sediment section. From the top humus and to some extent from the following brown soil layers we also found recent debris and microliths. These appear to be intrusions introduced by rainwater and trampling. The major activity area in front of the cave and in the shelter, as revealed by the concentration of the Lower Palaeolithic artefacts obtained in the excavations, appears to be the area covered by squares XD4 and 5; XC4 and 5; XB3, 4 and 5; XA1, 3, 4 and 5; and A1, 4 and 5; in 11.5 m^2.

In the early phase of the Lower Palaeolithic, the cave was a tool manufacturing site. It yielded cobbles used as cores, flakes, unfinished tools (from XB5(4) at depth -161 cm from XB4, red lateritic soil), reused artefacts etc. A few artefacts from layer 3 upwards, particularly from the squares in the rockshelter and from the western part of the main trench were also re-utilised. In the upper part of the stratigraphy, XA4 (4&3) and XA4(1) yielded a good number of fine Lower Palaeolithic artefacts at depths of -20 to -40 cm from the surface. Lower Palaeolithic patinated chert flakes and chert artefacts also occur right from the base of the excavation to its uppermost horizon. They also include a patinated chert artefact from XA3(2), 64 cm from XA3, 45 cm from A3, at -127 cm depth from surface (-180 cm from A1); and a utilised and retouched knife-like artefact of a patinated Acheulian chert flake from XA5(3), 44 cm from A6, 75 cm from A5, at -10 cm from the surface (-166 cm from A1).

The excavation at DC has yielded definite evidence of human palaeoart creation from the Lower Palaeolithic in the form of petroglyphs, both cupules and engraved lines, and also through the hammerstones used for producing cupules. This is evident from the discovery of slabs bearing cupules and engraved lines, and of hammerstones right from the lowest layer onwards. Although many hammerstones used for the production of the cupules were found, they are not in proportion to the very numerous cupules present in the cave. Acheulian floors of stone slabs or stone structures such as that found in pseudo-layer 4 are rare features in the Lower Palaeolithic.

Detailed study of the excavated material is continuing.

Conclusion

The present preliminary report of the excavations at Daraki-Chattan provides the unambiguous evidence of petroglyphs, mostly cupules, from archaeological occupation strata of Lower Palaeolithic age. It endorses the similar evidence from the Auditorium Cave at Bhimbetka. At Daraki-Chattan petroglyphs recovered from the excavations consist of a total of 28 cupules exfoliated from the cave wall, and two linear grooves. The lack of cupules on exfoliation scars on the cave walls implies that the remaining wall cupules are of ages broadly similar to those in the excavation. The actual age of the cupules must have been much greater than the time of their stratigraphic deposition, as they must have been exfoliated much later than the time of their production on the cave wall. The same relationship has been suggested for the cupules above ground in Auditorium Cave (Bednarik 1996).

Recent research has shown that our understanding of art origins is rapidly changing. More than any other evidence presented before, the evidence produced by the EIP

Project, especially from the excavations at Daraki-Chattan, has shown that we have misjudged the time depth of palaeoart and human cognition, creative ability and symbolism. The time has come to change our mindset. This evidence is so significant that it is set to affect not only our concepts of Pleistocene hominin development in southern Asia, but it will influence the way we view cognitive evolution generally.

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