

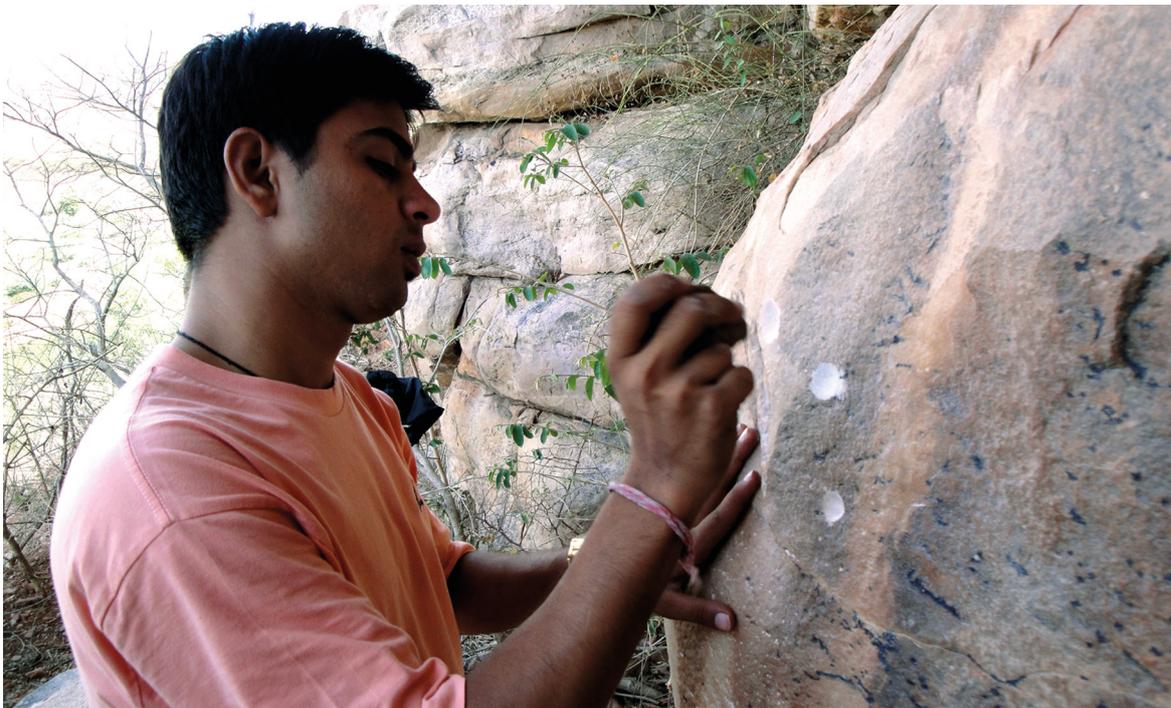
UNDERSTANDING THE CREATION OF SMALL CONICAL CUPULES IN DARAKI-CHATTAN (INDIA)

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The present paper is in continuation of our efforts to understand the creation of cupules in Daraki-Chattan by the process of cupule replication, started in 2002. Daraki-Chattan is one of the richest Palaeolithic cupule sites in the world. It is situated in the heavily metamorphosed quartzite buttresses of Indragarh hill in the Chambal basin in central India. It bears more than 500 cupules executed on both its vertical walls. The excavations carried out at Daraki-Chattan under the EIP Project have produced unambiguous evidence of Lower Palaeolithic petroglyphs. Daraki-Chattan is being studied under the EIP Project. We have identified four categories of cupules at Daraki-Chattan.

1. big circular cupules, saucer-shaped or deeply rounded;
2. circular or oval cupules of conical shape;
3. small smooth cupules of shallow or deep depth;
4. small cupules with angular periphery and deep angular depth.

Circular conical cupules about 30 to 40 mm in diameter and a depth of more than 5 mm represent category 2. We really need to show how hard it is to make a small cupule of 30 to 3 mm in diameter of conical shape and a depth of 9 mm.



Ram Krishna working on the replication of a small conical cupule on an experimental rock by the side of Daraki-Chattan.

In order to understand the creation of cupules and their significance in Daraki-Chattan we did experiments and replicated the cupules of category 1 in 2002 and 2004, and that of category 2 in 2008 and 2009. The vertical wall in a rockshelter by the left side (south) of Daraki-Chattan is our experimental rock and is made of the same hard quartzite like that of the cave. Our experiments in 2008-2009 were focused on showing how hard it was to make a small cupule of 30 to 3 mm diameter with a conical depth of 9 mm.

Our experiment established that in Daraki-Chattan, big circular cupules of category 1, saucer-shaped or deeply rounded, appear to be a work more of strength and commitment and less of mind. They were produced by using a very simple and primitive technology of direct percussion. They appear to represent the earliest stage of cupule production. It also indicates that to produce big cupules of category 1a necessitates two to six hammerstones on cobbles or pebbles, depending on the quality of the stone used and the strength of the person at work. It is a tough and tedious task to produce a cupule on hard quartzite rock. It requires motivation, commitment, strength, endurance and patience for their production. Cupules of category 1b can be produced similarly by using hammerstones with stout and sturdy striking heads. It needs longer and high concentration besides all the above-mentioned qualities. At the same time it requires the use of multiple hammerstones to achieve a deep round and smooth depth.

Cupules of category 2 are comparatively small with a conical depth, particularly of category 2a. In 2008 Ram Krishna created cupule No. RC-6 in 21661 comparatively soft strokes, working 172 minutes over three days. Its depth is conical and it measures $33.5 \times 32.5 \times 9$ mm.

For most of the time he used direct percussion technique, but for 22 minutes he also used indirect percussion technique. We need to use only direct percussion technique. Hence we again did an experiment in June 2009. This time Ram Krishna created a cupule, No. RC-9, by using soft strokes and direct percussion technique only. In the light of the experience we gained while creating RC-6 and RC-7, we used mostly small pebbles with angular heads as hammerstones. Thus, we were able to produce a small cupule with conical depth (RC-9), measuring 32.0×31.5 mm in diameter and 9 mm in depth. It was created in 28327 strokes in 372 minutes over two days. Seventeen unmodified striking heads on ten hammerstones of hard quartzite were used.

RC-9 is the smallest cupule with conical shape we have produced. The comparatively longer duration and greater number of strokes were obvious. In order to go deep into the cupule while keeping its diameter under control we had to maintain the striking end of the hammerstone at a right angle to the striking surface. It required great concentration and changing the striking head / hammerstone at the proper time.

Thus, our experiment has shown that it is incredibly hard to produce such small cupules of conical shape. They appear to be the work of a modified technology of direct percussion, which requires proper planning, immense skill and great precision and patience. The person at work on cupule production cannot afford one wrong stroke, even in a thousand, as it will increase the diameter of the cupule by one millimetre. Replication also showed that cupule creation is definitely not a leisure work or the result of play. It is a very tough job and appears to be closely associated with something special and deeply related with life.





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