



Exploration and Documentation of Rock Art Sites in the Vindhyan hills of Madhya Pradesh (Central India) and implications for their conservation

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Introduction

The author reports on new painted rock shelters from the Vindhyan range, north of the Narmada River, between Salkanpur and Khidiya Kurmi in the Sehore district of Madhya Pradesh. While significant work has been done at nearby sites such as Bhimbetka, Adamgarh, and Pachmarhi complexes, very little work has been done within the central Narmada Basin. The author has tentatively counted over 1,479 individual paintings spread across 75 individual rock art shelters through systematic surveys. These painted shelters are being affected at an alarming rate due to illegal activities such as deforestation, stone mining (and occasional vandalism), and natural factors such as geomorphic degradation and constant exposure to the elements. Therefore, the author conducted these explorations and primary documentation to propose suitable methodologies for interpretation and possible conservation and carry them out for future studies and scientific analysis, contributing to the author's doctoral research.

Previous work

The Sehore District is located in Madhya Pradesh, central India. Sehore City is a part of the Bhopal Division and is the district's headquarters. It stretches around 6,578 square kilometres (2,540 sq mi). Bhopal, Raisen, Hoshangabad, Dewas, Shajapur, Rajgarh, and Harda are the seven districts that surround Sehore. Lacquer bracelets from the district are treasured by the Gond and Bhiala Nad Korku tribes in the area. This tribe's traditional dance, Bhavai, is a beautiful demonstration of their cultural bond. The Bagoria dance, with its loud drum beat, is still performed in the tribal area of Sehore during the Holi celebration of colours ("Profile | District Sehore..." n.d.). Sehore stands in the middle of the Malwa region, in the foothills of the Vindhya Range. Very little work and publishing on rock art sites seem to have been done earlier in the Sehore region. Based on the available literature, rock art has been reported in Bandarjari (Shaik and Chauhan 2013), Saru Maru (Simte 2015), Bayan (Kaur 2018), Joshipur (Chauhan et al. 2015), Naganpur, Talpura and Chandla Kalan/Chikli (Chauhan et al. 2017). More thorough work on these rock art sites must be done, documented, and publicized before permanently gone.

However, previous scholars have done significant work at Bhimbetka, Adamgarh and Pachmarhi. These sites are part of the Narmada Basin, known for its rich preservation of vertebrate fossils and have been studied by various scholars since the 19th century (see Chauhan et al. 2015). This river basin is also home to the only known pre-modern Homo fossil/s in the Indian Subcontinent. It appears to have a long fluvial history spanning at least ~800 years (Rao et al. 1997) and archaeology (Patnaik et al. 2009).

V.S. Wakankar (1975: 17-34) discovered hundreds of painted rock shelters in the Bhimbetka region of central India in 1957 and began a detailed survey of painted rock shelters. Later, V.S. Wakankar and V.N. Misra excavated some of the rock shelters in Bhimbetka and uncovered its

stratified cultural sequences from the Lower Palaeolithic to Historical periods (e.g. Misra 1985: 35-47). Adamgarh site, which is in the Hoshangabad city, closer to the Narmada River, is another well-known rock art site in the area and was well known even before discovering the World Heritage Site, Bhimbetka. In addition to the rock art, preliminary excavations at Adamgarh's rock shelter and nearby regions yielded Acheulean and microlithic stone tools in different sedimentary stratigraphy (Joshi 1978; Shaik and Chauhan 2013). G.R. Hunter, who had excavated at the Pachmarhi site between 1932 and 1935, reported the Pachmarhi site to D.H. Gordon in 1958. These excavations have revealed a proper cultural timeline, starting from Mesolithic to later periods, and the rich rock art site of Churna (Dubey-Pathak 2013). The Pachmarhi region is historically well known for providing numerous rock shelters with various paintings, many of which are regional (see Sharma and Misra 2003).

Many of these South Asian rock art sites show a lot of overlap between different periods, ranging from prehistoric to Medieval, indicating that such locations were geographically, ecologically, and socio-culturally significant for multiple cultures over time. The villagers and the Madhya Pradesh Forest Department assisted with the fieldwork that resulted in the current paper.

The Study Area

The study area covers quartzite rich sandstone hill ranges parallel to the north of Narmada River from Salkanpur site to the border village of Sehore district near Raisen district, i.e. Khidiya Kurmi hills is conducive for the rock shelters due to its geological formation (Fig. 1). Rock art sites in the Sehore district have been reported at Bandarjari (Shaik and Chauhan 2013), Saru Maru (Simte 2015), Bayan (Kaur 2018), Joshipur (Chauhan et al. 2015) and Naganpur (Chauhan et al. 2017) in the past. Talpura is an ASI protected Buddhist site with rock art shelters (Chauhan et al. 2017). After further exploring the site, the author found some more rock art shelters previously unexplored or unrecorded. The author explored Chachmau and Khatpura in 2019, which yielded a fair amount of rock art shelters, including the Historical period hero-stone and Sati-stone on the route close to the sites. Chandla Kalan/ Chikli have been reported earlier (Chauhan et al. 2017). A dozen rock art shelters at Chandla Kalan/Chikli were extensively explored and documented in 2019 by Nupur Tiwari and the author, which will be reported as a complete report elsewhere. In March 2020, the author explored rock art sites at Digambar, Samnapur, Hoda and Khidiya Kurmi. All of the rock art location information can be found on the map (Fig. 2.1 & 2.2). The site's exploration was temporarily halted owing to tigers' sightings at these sites and the novel Covid-19 pandemic.

Aim

The objective was to thoroughly explore the site, record all the new sites at the edge of the Vindhyan range, and figure out the missing link between the known rock



Figure 1. General view of the site, Vindhyan Range, Sehore Dist, MP, India

art sites. The aim is to check the continuity between the known rock art sites of Bhimbetka, Adamgarh, Mandikhoh, and Pachmarhi in the rock art styles, patterns and occurrences. The other aim is to photographically capture and preserve them digitally as site deterioration due to natural and anthropogenic effects is higher. Further work includes a scientific analysis of pigments, creating databases of these findings, and proposing possible conservation-preservation measures for these sites. Sites within the Reserve Forest area have been studied and explored. Sites within the Tiger Reserve have only been identified by employing a village survey for future studies, which will be done after permission has been obtained from the Forest Department.

Methodologies and gadgets used

Initially, a village survey strategy was utilized, as some local people were familiar with specific rock art sites' locations. Villagers from nearby villages opposite their respective hills were hired for exploration and security reasons because of their local knowledge of the forest and animal movements. A customized rock art field form designed in 2019 was used this year with minor updates. It helped in rapid and convenient documentation of the relevant details of all visited rock shelters and the associated rock art. A Nikon Coolpix AW130 camera and Samsung m30s mobile camera was extensively used for photo documentation and digital preservation. These images will be later processed using ImageJ and D-Stretch software to enhance the panels and paintings, obtain comprehensive counts of individual paintings, and interpret superimposition patterns. A mobile version of D-Stretch software 'aD-Stretch' was used on-site for quick results and reference. Each shelter/panel, regardless of visible rock art, has been photographed and spatially documented with the help of a Garmin eTrex 30x Global Positioning System (GPS). LomVum Laser Range Meter - 150

m was used to measure the rock shelters' actual length, height, and depth. Limited surface collections of nearby lithic artifacts were also made for a basic understanding of site utilization, relevance and relative chronology through typology and assemblage compositions. These methods will be continued to be used for the remainder of the fieldwork.

Area covered and time taken

Rock art sites and site complexes that have been explored and documented include Talpura, Chachmau, Katpura and Chandla Kalan/Chikli from Sehore district and Mandikhoh, Morpani from Hoshangabad district, covering 35-40 sq. km. in total and took 90 to 95 hours in June 2019. While rock art sites at the hills of Digambar, Hoda, and Khidiya Kurmi complex from Sehore district covered 13-15 sq. km. in total and took 80-82 hours in March 2020, respectively. For details about the sites in Mandikhoh and Morpani (see Poojari and Chauhan 2020). New rock art shelters were identified and documented at Digambar and Samnapur in the Sehore district and sites such as Chichwani, Kharidev Baba Pahad, Manatekar, Pipariya Khurd, Ranjhi, and Saradeh in the Hoshangabad district. The area covered was 5-6 sq. km. and 40-42 sq. km., respectively, for each district, which took 210 hours in total. Here, the author only mentions the sites found in the Sehore district (Fig. 2.1 & 2.2), (Table 1).

Sites explored and documented

The author will be studying in the Sehore district, from Salkanpur and Saru Maru in Budhni Tehsil (township) to Khidiya Kurmi in Budhni-Khatpura Tehsil, all at the foothills of the Vindhyan range parallel to the Narmada River. In a tabular format, see Table 2 for all the details and data entered from the field rock art forms used on-site for the ease of recording in situ of the newly explored

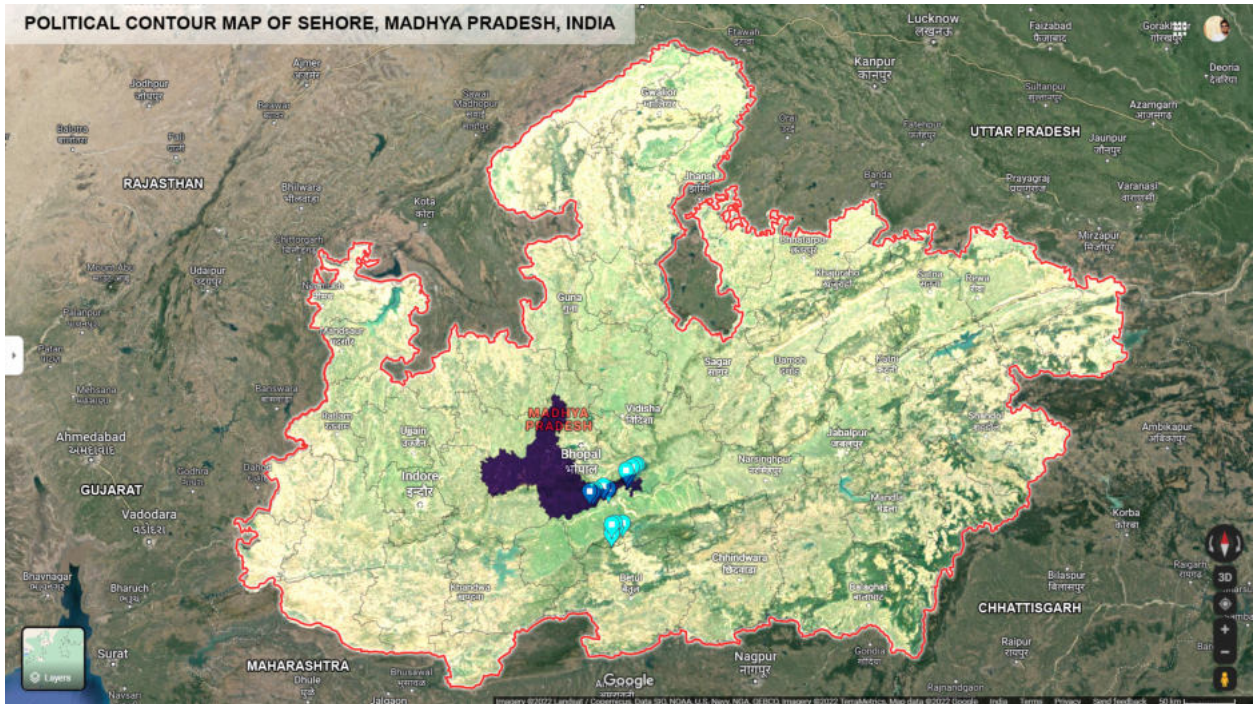


Figure 2.1. Political contour map of the study area - Sehere District, Madhya Pradesh, India

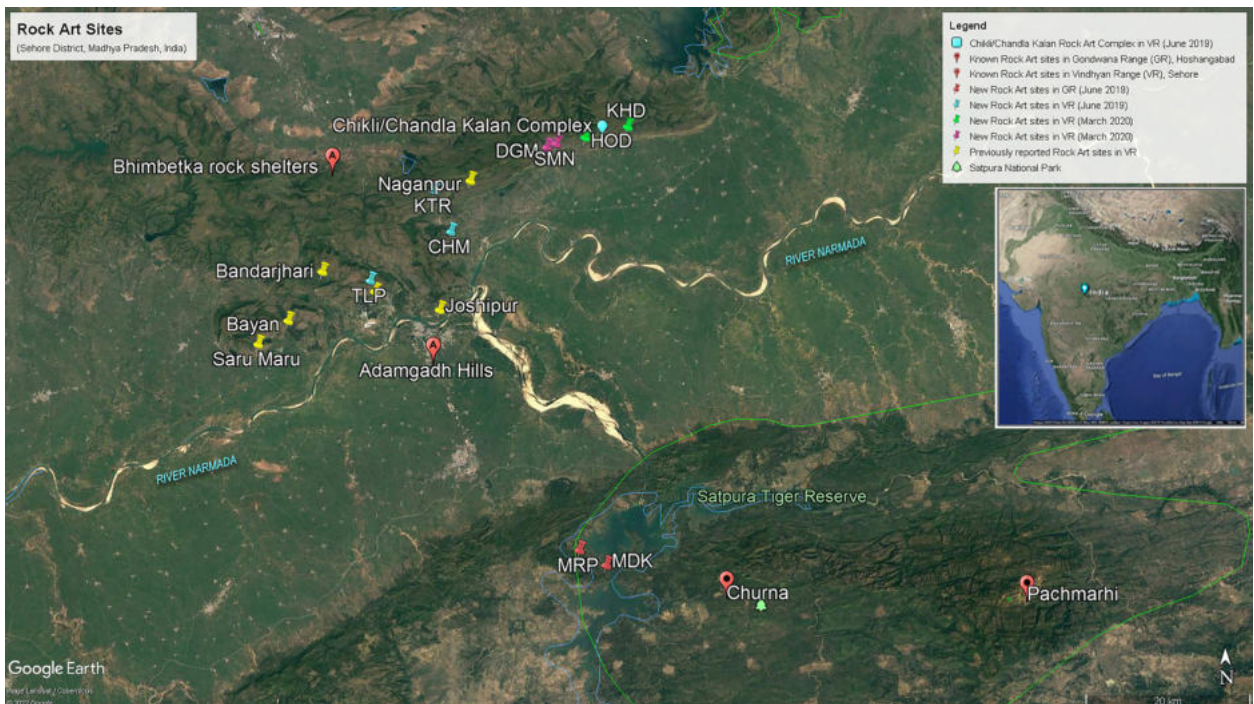


Figure 2.2. Map of the study area - New rock art sites from the Vindhyan Range in Sehere Dist, MP, India



Table 1. Total shelters explored with and without rock art in the Sehore District 2019-2020.

	Sehore District							Grand Total
	Talpura (TLP)	Chachmau (CHM)	Khatpura (KTR)	Digambar (DGM)	Samnapur (SMN)	Hoda (HOD)	Khidiya Kurmi (KHD)	
Total no. of rock shelters	14	5	7	40	27	4	24	121
Painted rock shelters	6	3	5	23	24	3	11	75
Non painted rock shelters	8	2	2	17	3	1	13	46
**Approximate number of paintings	250	20	56	267	644	120	122	1479
Painted canvas area (in meter/s)	-	-	-	L: 2.5, H: 5	L: 20.55, H: 5.00	L: 20, H: 3.7, D: 8.5	L: 30, H: 13	-
Largest rock shelter (in meter/s)	L: 27, H: 4, D: 4.5	L: 60, H: 20, D: 7	L: 15, H: 7, D: 3	L: 15.1, H: 4, D: 10	L: 50, H: 12.66, D: 7.16	L: 20, H: 3.7, D: 8.5	L: 30, H: 13, D: 10	-
Smallest rock shelter (in meter/s)	L: 3, H: 4.5, D: 2	L: 20, H: 2.5, D: 15	L: 4, H: 2, D: 1.75	L: 4.13, H: 1.18, D: 1.62	L: 2.13, H: 1.25, D: 2.71	L: 4.6, H: 1.62, D: 2	L: 18, H: 4, D: 5	-

** The number of paintings is approximate, which the author had counted on the site. The numbers would increase after processing them all in the D-Stretch Image enhancing plug-in under Image J software.

Table 2. Rock Art Form details of Shelters in Sehore 2019-2020.

Rock Shelter No.:	Talpura (TLP)					
	TLP_RS_01	TLP_RS_02 (a)	TLP_RS_02 (b)	TLP_RS_03	TLP_RS_04	TLP_RS_05
Coordinates:	N 22.798389, E 77.655150	N 22.798324, E 77.655179	N 22.798178, E 77.655371	N 22.799219, E 77.654582	N 22.797546, E 77.655616	N 22.796422, E 77.658122
GPS point no.:	Google GPS	Google GPS	Google GPS	Google GPS	Google GPS	Google GPS
Elevation:	-	-	-	-	-	-
Dimensions in meters:	L: 10, H: 2, D: 2.5	L: 27, H: 4, D: 4.5	L: 3, H: 4.5, D: 2	L: 4, H: 1.5, D: 2	L: 20, H: 7, D: 2.5	L: 10, H: 2, D: 2
Painted area in meters:	-	-	-	-	-	-
Direction facing:	South West	South West	South	South	South	South East
Site name/district:	Talpura, Sehore	Talpura, Sehore	Talpura, Sehore	Talpura, Sehore	Talpura, Sehore	Talpura, Sehore
Unique landmarks:	Machlikho at foothills facing Pilikarar.	Machlikho at foothills facing Pilikarar.	Adjacent to TLP_RS_02 (a). Facing Vardaman factory and new railway line on the foothill.	On the right side of TLP_RS_01 and facing Machlikho on it foothill.	On the left side and a little below of TLP_RS_02 (b) facing Vardhaman factory.	On the left side and a little below of TLP_RS_04 facing Budhni.

Table 3. Themes present in Rock Paintings at Sehore 2019-2020.

Rock Shelter Nos.:	Talpura (TLP)					
	TLP_RS_01	TLP_RS_02 (a)	TLP_RS_02 (b)	TLP_RS_03	TLP_RS_04	TLP_RS_05
Animals / Bird Figures	✓	✓	✓	-	✓	✓
Human Figures	✓	✓	✓	✓	✓	✓
Horse Men	✓	✓	✓	-	✓	✓
Warriors	✓	✓	✓	✓	✓	✓
War Activities	✓	✓	-	-	✓	✓
Hunting Activities	-	-	-	-	✓	-
Social Activities	-	✓	-	-	-	✓
X-Ray Figures	✓	-	✓	-	-	-
Geometric/Abstract Figures	✓	✓	-	-	-	-

rock art shelters. See Table 3 for a summary of the broad themes found in the rock paintings at the sites.

Talpura (TLP)

In June 2019, the author started exploring this Buddhist site protected by the Archaeological Survey of India (ASI), where the two rock art shelters were previously reported near the Buddhist stupa (IAR 1975-76; Chauhan et al. 2017) (Figs. 3A-B). Therefore, the author revisited the site to explore further to record and

find more new rock art shelters systematically. Shelter (TLP_RS_02) has two shelters that have previously been counted as one whole shelter, which is naturally divided due to its geological formation and hence it was named (TLP_RS_02 [a] and 02 [b]) respectively for the ease of recording and its study (Fig. 3C-E). Three more shelters were discovered that had rock art in them. One of the shelters (TLP_RS_03) had a dead animal that appeared to have been hunted by a carnivore animal (Fig. 3F). The surveys were then adjusted according to the safety concerns. There were only two paintings in white color

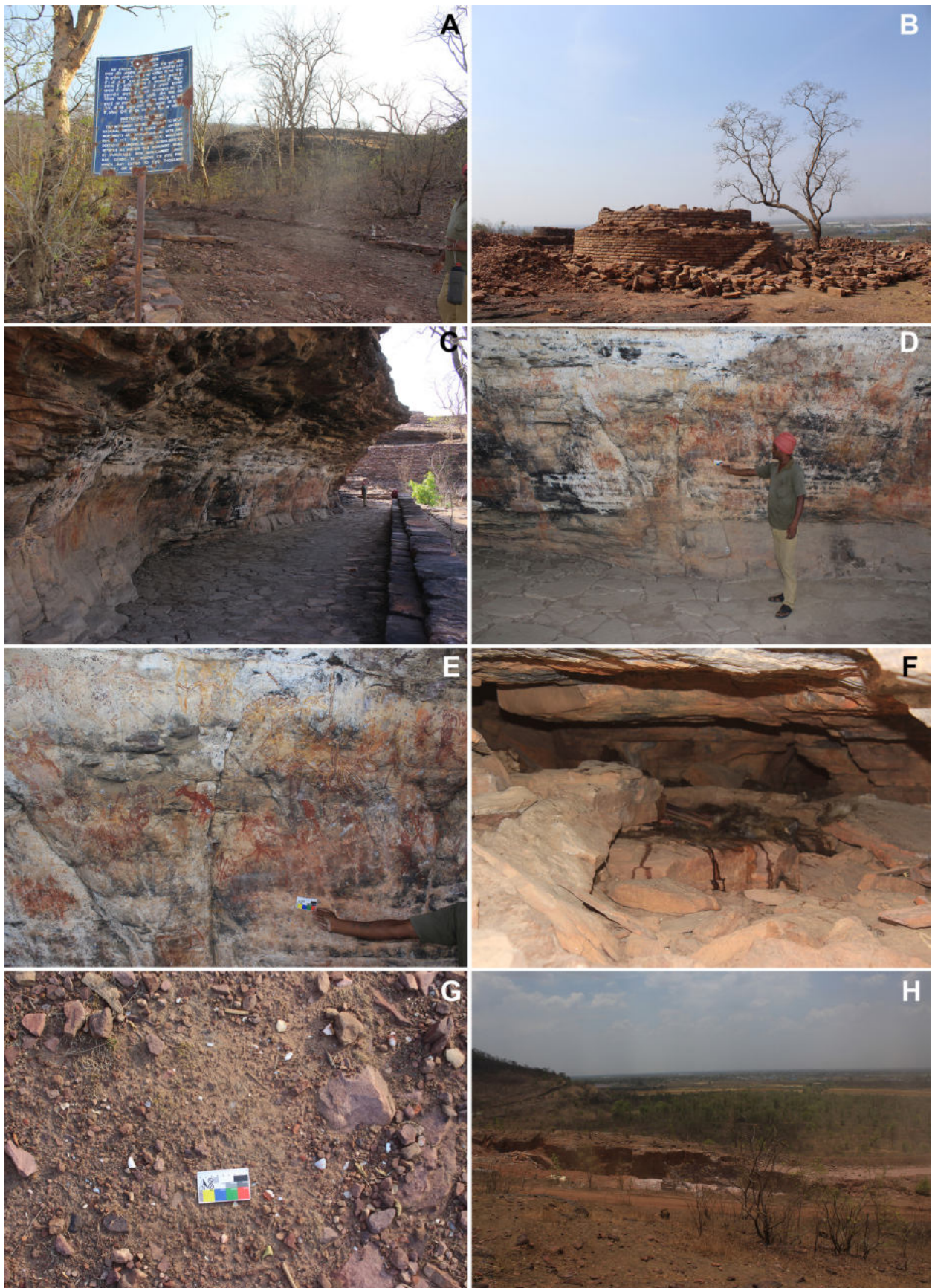


Figure 3. Site Talpura (TLP): A-B) Archaeological Survey of India board at the entrance of the protected site, Stupa structure; C-E) Side view and multiple superimposed rock paintings in the Shelter TLP_RS_02[a]; F) Prey of a wild animal in the shelter; G) Microliths found on the site ground surface; H) Pollution due to the nearby railway track construction.



visible on the wall near the ceiling. Two more rock art shelters were documented (TLP_RS_04) and (TLP_RS_05) from where Machlikhoh village was visible below. Microliths can be found on surfaces all over the site (Fig. 3G). These shelters are in a bad deteriorating condition. Geologically the stone surface is exfoliating and degrading at an alarming rate. Other than the natural effects, the construction of the new circular railway line at the foothill adds dust, dirt, and other pollutants to the air and affects the painted surface (Fig. 3H). Anthropogenic vandalism is also high on this site. More hills on the site's east side appear to have shelters due to the same geological formation and should be explored further for quantification and other research.

Chachmau (CHM)

At Chachmau, three hills were explored, viz. Dohri Danth, Ramtek and Mathada ordered from east to west, respectively. Dohri Danth hill had two large rock art shelters, widely spread width-wise. The villagers believe that the '*Chudail*'- the witches reside here. In addition, the villagers added that *Chudails* are the ones who have painted on the rock surface with the blood of people and animals. On top of the façade of (CHM_RS_02), the author found the S-shaped figures. Two S-shaped figures are easily visible, while the other two to three are faded, mainly due to the natural effects (Fig. 4A-E).

At the hill of Mathada, only one shelter was identified, and it is the only cave shelter recorded by the author in this region. According to an old Chachmau village member, the cave shelter (CHM_RS_03) has known the villagers for nearly a century. The villagers converted this into Lord Shiva's cave temple. Entering the shelter was not possible because of the frequent tiger sighting in the nearby region during the summer season. The cave has a water source inside.

Further detailed exploration and documentation of this shelter are necessary to find any paintings that may have survived inside the shelter, a rare phenomenon in India compared to Europe and other parts of the world. Due to regular accessibility, anthropogenic vandalism is higher. The villagers had whitewashed the shelter, painted their names, and installed a Shiva *Linga* along with multiple metal tridents (Fig. 4F-G). There was reminiscing of two to three faded individual paintings. Though the shelter was photographed and documented with a basic camera, detailed high-end 3D documentation is suggested, which would preserve the heritage and help in learning the depth, the use of this cave shelter and revealing by enhancing the hidden paintings below the whitewashed and soot layer/s digitally.

Khatpura (KTR)

Khatpura is located near Saidganj/Shahidganj, just a kilometre away from Naganpur. On the route to Khatpura, the author came across a Historical hero-stone at the Hathlewa village's junction (Fig. 5A-B), which is noted and photo-documented. This sculpture is a four-sided hero-stone. A historical Sati-stone was also documented in the foothills of Khatpura, and the locals worship the stele as their '*Kuldevi*'- an ancestral

goddess (Fig. 5C). The site comes between the same Vindhyan foot stretches, and this site is beside the old Bhopal highway.

At Khatpura, the author further explored some new rock art shelters near the waterfall. Microliths and quartzite stone flakes appeared in the open fields near the foothills (Fig. 5D). The number of microliths increased near the waterfall. There were many large fallen boulders near the water source, and these had rock paintings in them. The open boulder niche on the height adjacent to the water source (KTR_RS_01) had Historical and Medieval or maybe later period paintings with some older proto indigenous inscriptions painted red (Fig. 5E-F). The surface has a faint, faded appearance to older period paintings. The paintings are in red, orange, black, and white color. Below is the natural pond created due to the seasonal waterfall. There is one massive chunk of quartzite stone from which it is evident that large stone flakes had been flaked out of it (Fig. 5G-H). Another sizeable fallen boulder (KTR_RS_02) that might have had paintings at one point. Only two to three remained visible, and the others faded away due to anthropogenic and natural activities.

Similarly, local god-men occupied two shelters (KTR_RS_02) and (KTR_RS_03) (Fig. 5I-J). A little further near the stream gully (Nala) is another shelter (KTR_RS_04) which has some better-preserved rock paintings. It has at least two paintings of cattle cartwheels (Fig. 5K-L). Another open rock shelter (KTR_RS_05) houses more rock paintings on the higher elevation. The paintings are in the fading condition, and twenty individual paintings were counted that were visible (Fig. 5M). The vegetation was thick here, even during the summer, because of the water source. At (KTR_RS_05), very few microliths were visible on the surface because of the covered dried vegetation, but many microliths at the foothills, as mentioned earlier. The author did not explore further because of the recent sighting of the carnivorous animals around the site, which is the water source during the summer.

Digambar (DGM)

In early March 2020, the author started exploring shelters near the Digambar waterfall. There were two rock shelters. One adjacent to the waterfall has rock art (DGM_RS_01), and the other does not because it is precisely in the midway of the waterfall. However, it had archaeological artifacts like microliths, potsherds, and a terracotta-smoking spout (*chillum*) in the shelter (Fig. 6A-C). This shelter may have had rock paintings at one point, but due to the naturally damp environment and high stone surface exfoliation level, the paintings did not survive. In late March, the author continued exploring the remaining site and explored twenty-two new rock art shelters. There are six shelters (DGM_RS_02 to DGM_RS_07) just above the new Digambar temple at the foothill.

Shelter (DGM_RS_04) has been converted into a shelter shrine with a modern inscription painted in red. As explained by the local villager, these inscriptions are the Sholkas/Mantras dedicated to Lord Shiva. The local God-man has also installed iron tridents and many terracotta lamps in the shelter (Fig. 6D). Shelter (DGM_RS_06) has a section of its ceiling fallen off with paintings on them. The majority of the shelters in the Vindhyan range have been impacted by recent deforestation and exposure to the environment, which has become highly polluted due



Figure 4. Site Chachmau (CHM): A-E) S-shaped figures drawn on the higher facade of the shelter, other geometric patterns and superimposed painting - white on red and stretch of the shelter CHM_RS_02; F-G) Whitewashed shelter walls, installed modern sculptures of deities, anthropogenic vandalism.



Figure 5. Site Khatpura (KTR): A-B) Historical period memorial Hero-stones installed in a village junction; C) Historical period memorial Sati-stone installed at the foothill of Khatpura village; D) Microliths found on the open fields on-site; E-F) Rock paintings and inscriptions found in shelter KTR_RS_01.

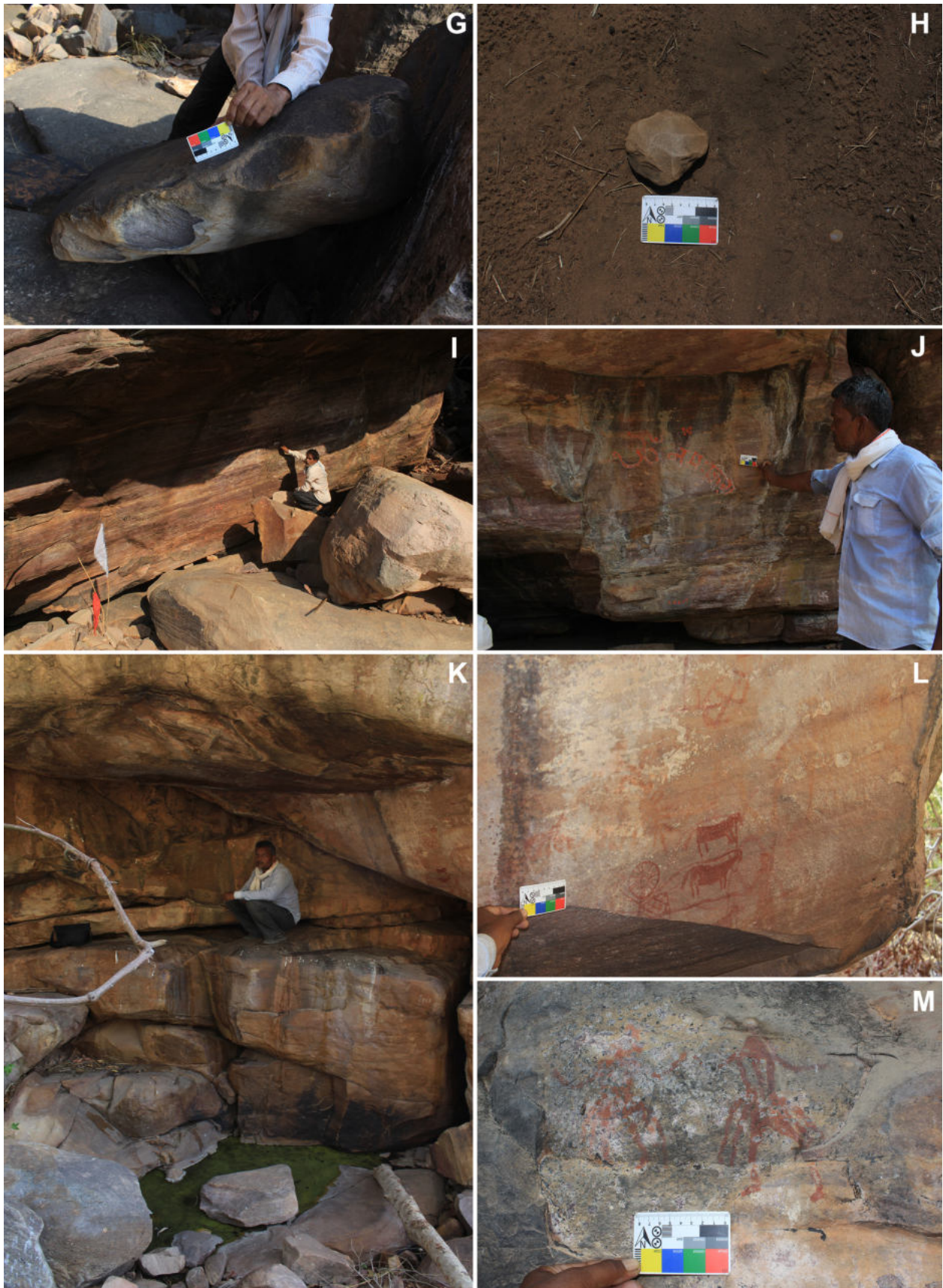


Figure 5. Site Khatpura (KTR): G-H) A large chunk of stone having edges flaked alternatively to remove large flakes, A large stone flake tool found in the open field on the site; I-J) Shelters converted to a modern-day God-man praying space and wall painted with recent religious signs and Shlokas; K-L) Shelter KTR_RS_04 having a painting of cattle cartwheels; M) Anthropomorphs painted doing activities in shelter KTR_RS_05.



to forest grass burning and neighbouring industrial gases. Shelter (DGM_RS_08) is situated on a higher elevation and has paintings in red and white color. Because of anthropogenic activities such as campfire burning, wood burning has accumulated soot on the shelter's walls and ceiling. This soot has also been absorbed by the white color paintings, turning it into paintings made in black color (Fig. 6E). Rock paintings are in bad condition here, and the only remnant can be seen in some shelters like in Shelter (DGM_RS_07, 09, 10, 15 & 16).

Shelter (DGM_RS_18) is on the hilltop adjacent to the old Digambar Temple. The space inside is enough to sit and move around. This shelter has S-shaped anthropomorphic figures (Fig. 6F-G). This shelter is on the edge of the hilltop, due to which some paintings in them have survived. However, people come into the shelter to light lamps and have a stone block wholly covered with orange vermilion, which they offer prayers (Fig. 6H). The only shelter with stone barricading was Shelter (DGM_RS_19) (Fig. 6I). The top façade stone wall has a geometric pattern painted in red (Fig. 6J). Below the geometric design, a stone piece bearing some red pigment was discovered, which could have been used as a grinding tool for a hard lump of dry pigment (Fig. 6K). The stone was documented and collected as an artifact discovered on the surface during surface collection. Other than the geometric pattern design, two animals were painted, and some paintings were faded. Due to natural causes, a portion of the geometric painting has been washed away.

Shelter (DGM_RS_20) is located on the hill's western side, beneath a fallen block of stone. The paintings here had faded, leaving only a few traces that could be seen with naked eyes. The inscription on Shelter (DGM_RS_21) has yet to be deciphered (Fig. 6L). The non-Islamic indigenous forest groups and Hindus make up the vast majority of the village's population. According to the local shepherd, no one in the village could read or write it, implying that it was either medieval or later contemporary period. All over the shelter, microliths were observed. There were scattered microliths and potsherds on the surface (Fig. 6M).

Local people generally do not visit these sites, as they believe such places are haunted. The area is heavily forested, where numerous wild animals roam (e.g. tigers, bears, leopards, wild boars). Villagers and tourists only come during the village festival (*Jatra*), and they always come in large groups for a short period.

Samnapur (SMN)

Samnapur hill is located next to Digambar hill. The people there have designated it the Samnapur hill due to its natural division caused by the waterfall, although the Samnapur hill is geologically connected to the Digambar hill. The author explored twenty-four new rock art shelters here on the Samnapur hills. Some shelters are located under the fallen stone blocks, especially on the Samnapur hill's waterfall. There are no signs of rock painting at the waterfall's source. There are some empty shelters but no traces of any rock art or archaeological materials.

Shelter (SMN_RS_01) is 50 m long and 21 m wide, with all paintings on one side of the wall and not dispersed around the space (Fig. 7A). Red and white are the predominant colors in the paintings. As a surface collection, microliths and potsherds scattered in situ

were collected. The front wall and ceiling are covered in paintings. Shelter (SMN_RS_02) is a more compact shelter with three paintings visible. Six of the paintings in Shelter (SMN_RS_03) are fading. Shelter (SMN_RS_04) sits next to RS_05 and has four paintings partially covered with a layer of calcium carbonate. There are seventy paintings in Shelter (SMN_RS_05). Yellow and red paintings are superimposed on top of one another. This shelter has a low ceiling. In this shelter, one can only sit or lie down. Some of the paintings in this shelter have been drawn over the calcium carbonate layer, while others have been covered by it. In the shelter, no artifacts were discovered.

Shelter (SMN_RS_06) is a large open shelter with a total of one hundred and five red and white paintings. Animals, human figures, horsemen, warriors, scenes of social activities, and abstract geometric designs are among the paintings (Fig. 7B-D). The heavy vegetation and roots of the larger trees are tearing the floor of this shelter apart. Paintings are superimposed on top of one another, such as the red paintings on top of the white ones. Some white paintings have become muddy white due to exposure and water dripping from the ceiling during the monsoon season. RS_04 is next to this shelter. Due to the dense vegetation on the shelter floor, no artifacts could be seen.

The shelter (SMN_RS_07) is located beneath a fragmented boulder. There are twenty paintings in this shelter. Soot has formed on the painted surface as a result of anthropogenic activities. Microliths can be found throughout the shelter. The shelter next to RS_07 (SMN_RS_08) has paintings and a shelter under a boulder. There are just three paintings visible, and the surface is rapidly disintegrating. There were no artifacts identified in this shelter. Shelter (SMN_RS_09) is similar to RS_08; however, the paintings have survived well due to the concave dip in the roof. The mud nest of the bird covers the paintings. There were no artifacts identified in this shelter. Shelter (SMN_RS_10) is a small niche shelter situated on a hillside with red and yellow paintings on the walls. The rate of deterioration is higher here. This shelter is only big enough for two individuals to sit and rest in it simultaneously. There were no artifacts in the shelter, but a terracotta pot lid and a few microliths were identified near the base (Fig. 7E).

Shelter (SMN_RS_11) is an open wall shelter with paintings and microliths. Although the painting has been washed away due to natural factors, only two paintings have survived and are now hidden behind a layer of calcium carbonate. Abstract geometric designs are depicted in the paintings. Shelter (SMN_RS_12) is similar to RS_11, but at the height of 8 metres, only one visible painting of an anthropomorphic figure has remained. The shelter has been weakened because of the growing vegetation and other natural factors. A cave-like chamber on the other side of the shelter has no traces of paintings or artifacts. Tiger pug-marks can be seen here (Fig. 7F). This area serves as a safe place for large wild animals and is near a water source. Shelters (SMN_RS_13-20) are all shelters under fallen boulders along and on the waterfall stream on the waterfall's periphery. Paintings in the colors of red and white, with numbers ranging from four to eighty, can be found here. Animals, humans, warriors, horsemen, abstract themes, and social activities are depicted in the paintings. Hand palms are painted on some shelters, such as RS_17, while social activities are painted on RS_18, with human figures wearing skirts. Paintings cover the niches of these

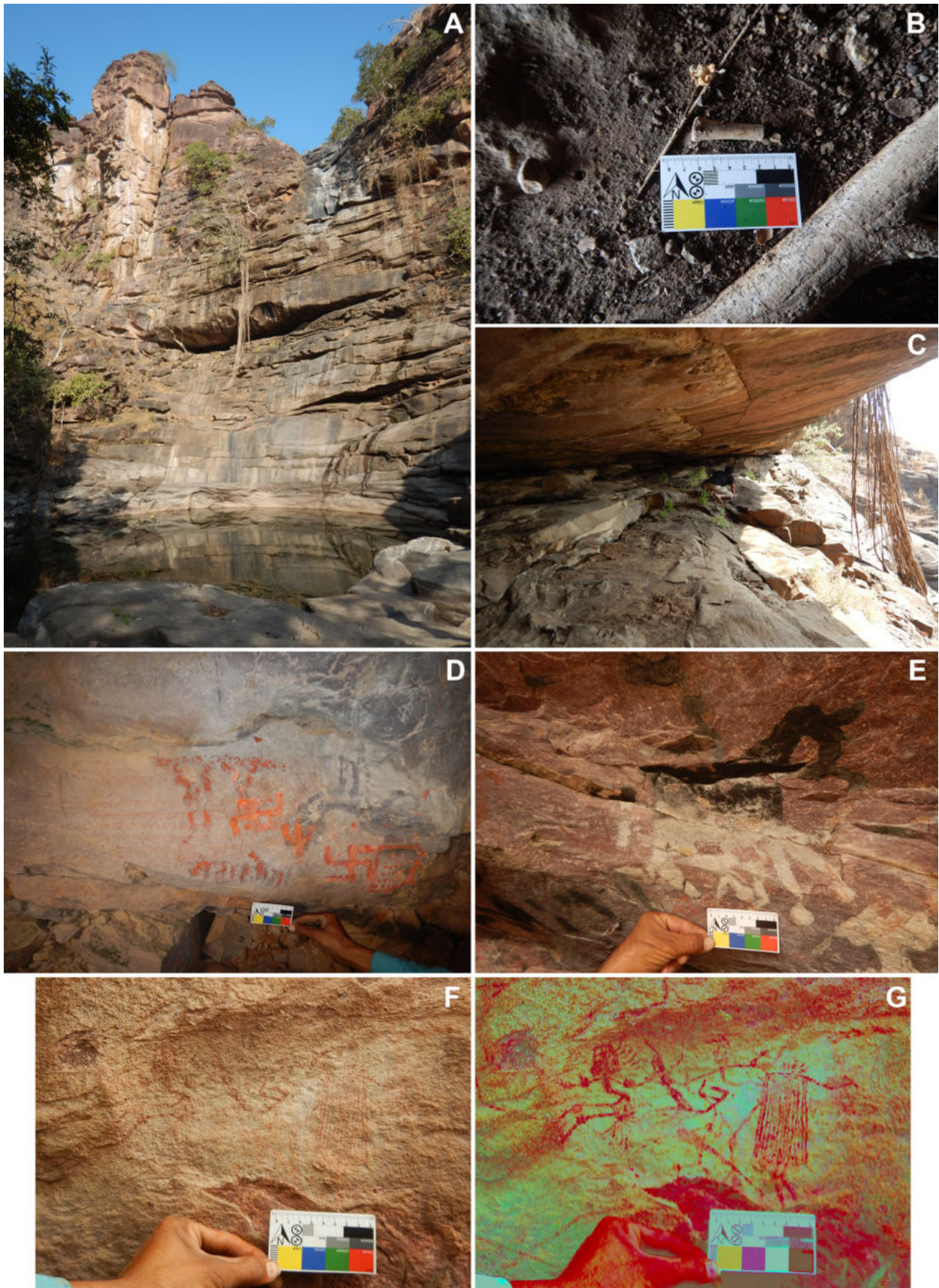


Figure 6. Site Digambar (DGM): A-C) Empty Shelter amidst the waterfall on the hill having archaeological artifacts, Terracota smoking Chillum, view of the empty shelter from the inside; D) Shelters converted to a modern-day God-man praying space and wall painted with recent religious signs and Shlokas; E) Paintings in white pigment turned black due to the soot accumulation on its surface; F-G) S-shaped anthropomorphs with intricate designs painted in the shelter DGM_RS_18.



Figure 6. Site Digambar (DGM): H) A stone block covered with vermilion and terracotta lamps around it; I-K) Shelter DGM_RS_19 with human-made exterior safety walls with stones, geometric design made on the shelter's facade wall, a stone piece found on the surface in the shelter with a lump of red pigment stuck to it; L) Script [Undeciphered] painted in shelter DGM_RS_21; M) Microliths found on site.



Figure 7. Site Samnapur (SMN): A) Long view of Shelter SMN_RS_01; B-D) Various themes painted in colours red, white and superimposed over each other in shelter SMN_RS_01; E) Terracotta lid found in situ; F) Tigers pug-marks near the water source; G) Red ochre nodules found near the shelters and water source.



shelters, and some are painted on all sides due to their accessibility. There are no floor deposits in these shelters because they are near a water source; hence, there are no artifacts. The shelters will be investigated for possible ochre nodules (Fig. 7G), and the results will be presented in subsequent studies. Because of the water and moisture, these shelters are more vulnerable to deterioration. The painted surface is extremely exfoliating, and the paintings would not last long owing to anthropogenic activities like deforestation and forest fire.

Shelter (SMN_RS_21) is an open shelter with forty superimposed red and white paintings on the ceiling and walls. Most red-coloured paintings have turned orange because of the muddy calcium carbonate deposit accumulated over them from the ceiling. Paintings of social activities, honeycomb trees, abstract designs, continuous arch lines, and some warriors can be seen in this shelter. There are potsherds in the shelter but no signs of microliths. This shelter is connected to a cave-like shelter with two entrance and exit openings. There were no traces of paintings or artifacts in that area. They contained the bones of a monkey and cattle that wild animals had hunted (Fig. 7H).

Shelter (SMN_RS_22) is a big, slope-side shelter with seventy red, yellow, and white paintings. Superimposition appears in numerous layers, such as red on white and yellow, yellow on red and white, and white on red. This shelter is painted with a variety of themes. The one that stands out is a warrior decapitating another's head (Fig. 7I-J). The only such depiction found in India is recorded at the Mahadeo Hills in Pachmarhi, Madhya Pradesh (Dubey-Pathak 1995). Paintings can be found in sections of these shelters. One side, for example, has hand palms stamped on the wall, all in yellow (Fig. 7K-L). The red dots are clustered in the central and lower sections of the wall. The wall is covered in animal and tree paintings. Social activities, depicted by huts along the sides of human figures, display their architecture. The colors are solid and thick. Every summer season, wildfires destroy this shelter, either naturally or due to anthropogenic actions. There were no microliths in the shelter, but potsherds were identified in and around it. Shelter (SMN_RS_23) features seven red paintings of a tree with many honeycombs on a single tree and animals surrounding it, as well as a human figure standing a little further away. Every shelter in this region has paintings that are rapidly deteriorating. In this shelter, microliths were identified.

Shelter (SMN_RS_24) is a multi-niche open shelter with multiple niches distributed at regular intervals. It has a length of 34 metres. Around eighty paintings in red and white, which are painted in niches, were recorded and superimposed. Surface sampling of potsherds and microliths was collected and recorded. Compared to potsherds identified in other Samnapur shelters, the potsherds found here were greater. The paintings on this hill are of animals and trees with honeycombs, which are more in numbers in the paintings. Flowers, geometric patterns and abstract designs, social activities, warriors, horsemen, and so on are all examples of this. Soot from the forest fire and calcium carbonate deposits from dripping water from the ceiling had blackened and covered some paintings.

Hoda (HOD)

At Hoda village (*gaon*), two hills are famous for their

names and stories. The first hill is called '*Chudail ki daanth*' or '*Bhootiya gufa*'. The villagers named it after its geological formation, which resembled an open mouth of a witch with two canines extending on both sides on top of the hill. Another reason is that the shepherds and the older locals had seen them having rock paintings in red and white color in the shelters. As mentioned before, the villagers believe that these witches have made the painting with human and animal blood while performing witchcraft. There are only steep ends and no shelters on the way up to the shelter. It was difficult to pinpoint the exact location of the shelter mentioned by the villagers. Shelter (HOD_RS_01) is a large boulder that fell from the top of the hill years ago in the past. It was resting on another boulder, which created a natural shelter like space enough for thirty people to reside in. There are paintings drawn in every possible space (Fig. 8A-B).

However, mainly found on the ceiling and the sidewall surface. Paintings seem mostly from Mesolithic and Historic periods from the types of painting in red, orange, yellow, black, and white. Superimpositions were easily visible. Detailed drawings of animals, anthropomorphic figures, horses, horse riders, trees, monkeys and geometric designs are drawn. The unique painting here was the red pigment splash on the ceiling (Fig. 8C-D). It could be deliberately done as a work of art, or the artist slipped through while painting on the ceiling. The painting's condition seems moderate in a better state because this shelter is not easily accessible, and hardly a shepherd would rest here once in a month or three months. Though this shelter is conserved by nature, it can be further digitally preserved. No artifacts like potsherds and microliths were found on the surface, but that could be revealed in the future through systematic excavations within this shelter. There are more rock shelters on the hill's top, which need to be explored further in the future. The leopard sighting forced the author and the village team to evacuate the area for safety reasons.

The second hill, '*Chikan Patha*', has a shelter, which is very famous in the village and neighbouring village for the Dacoit (*Daaku*) who used to reside here in this shelter. This shelter's location was more difficult to find and pinpoint from the foothill. This shelter (HOD_RS_02) is popularly known as '*Chandi Singh ki gufa*'. To reach here, one needs first to climb up the hill, then go down from the natural stream cut at the edge, and enter this shelter. This shelter is in a safer location regarding safety from animals, and at the top, one could easily see both anthropogenic and animal movements and activities at the foothill. Paintings here are red, orange, yellow, and green in colors mostly painted on the ceiling surface wall. This shelter has the S-shaped group figures painted on the ceiling (Fig. 8E-F). The green painting here is unusual. The scientific analysis would reveal its actual pigment color, binders, and elements for its distinctive green color. The stone's surface is exfoliation because this shelter is near the stream flowing on both sides. Natural features and anthropogenic activities have impacted the paintings in the past. Because the stone surface and the paintings were in bad condition, superimposition was not visible, if there were any.

On the same '*Chikan Patha*' hill, another open shelter (HOD_RS_03) had one painting in its naturally formed niche at the very edge of the hilltop (Fig. 8G-H). There appeared to be two paintings, but after examining the niche on the aD-Stretch android phone software in-situ,

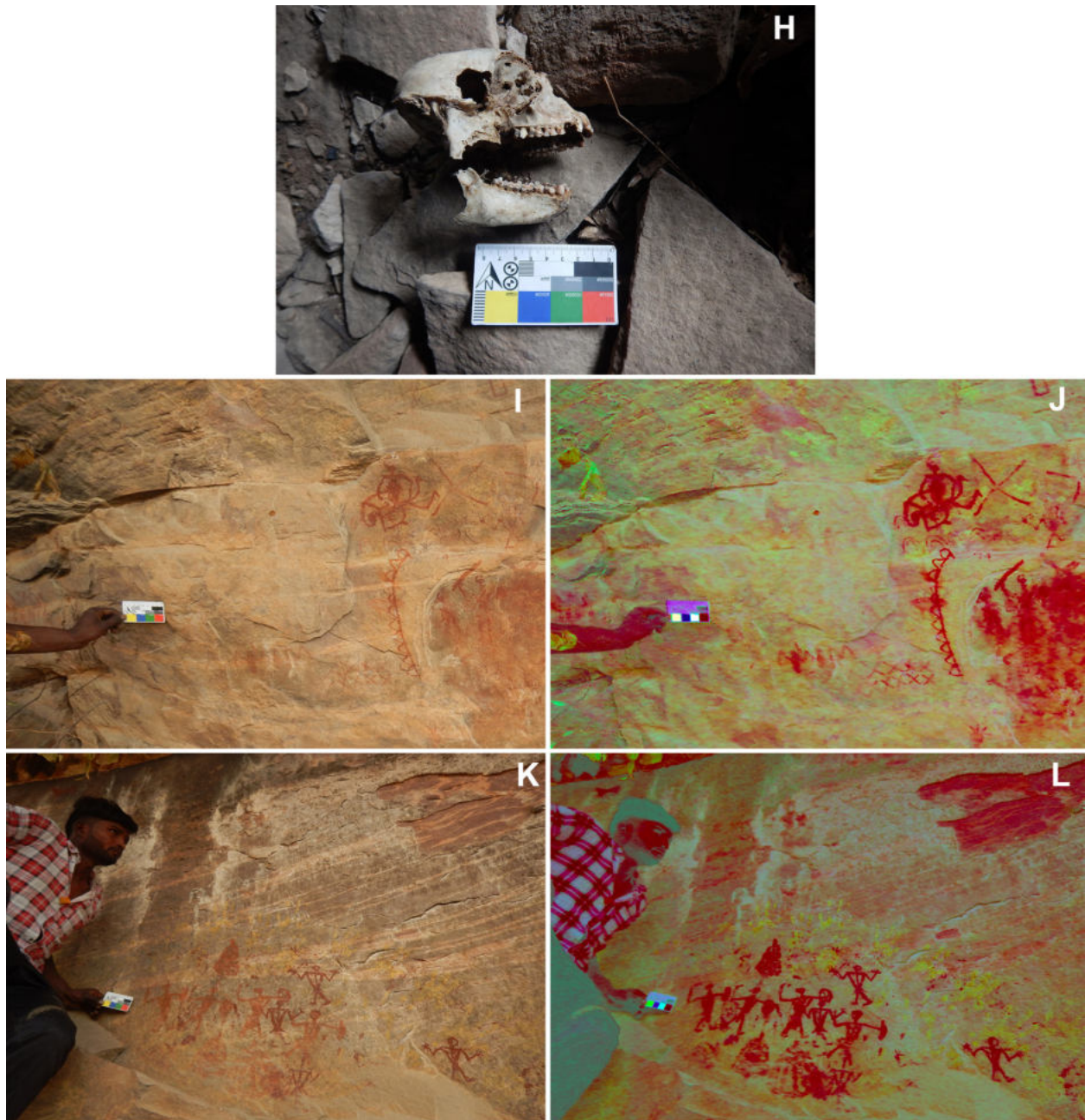


Figure 7. Site Samnapur (SMN): H) Skull remains of a monkey species found in the shelter SMN_RS_21; I-J) A rare depiction of a warrior decapitating the head of another warrior, Image digitally enhanced (YDS) with the help of DStretch software; K-L) Hand palms painted in yellow pigment color, Image digitally enhanced (YDS) with the help of DStretch software.

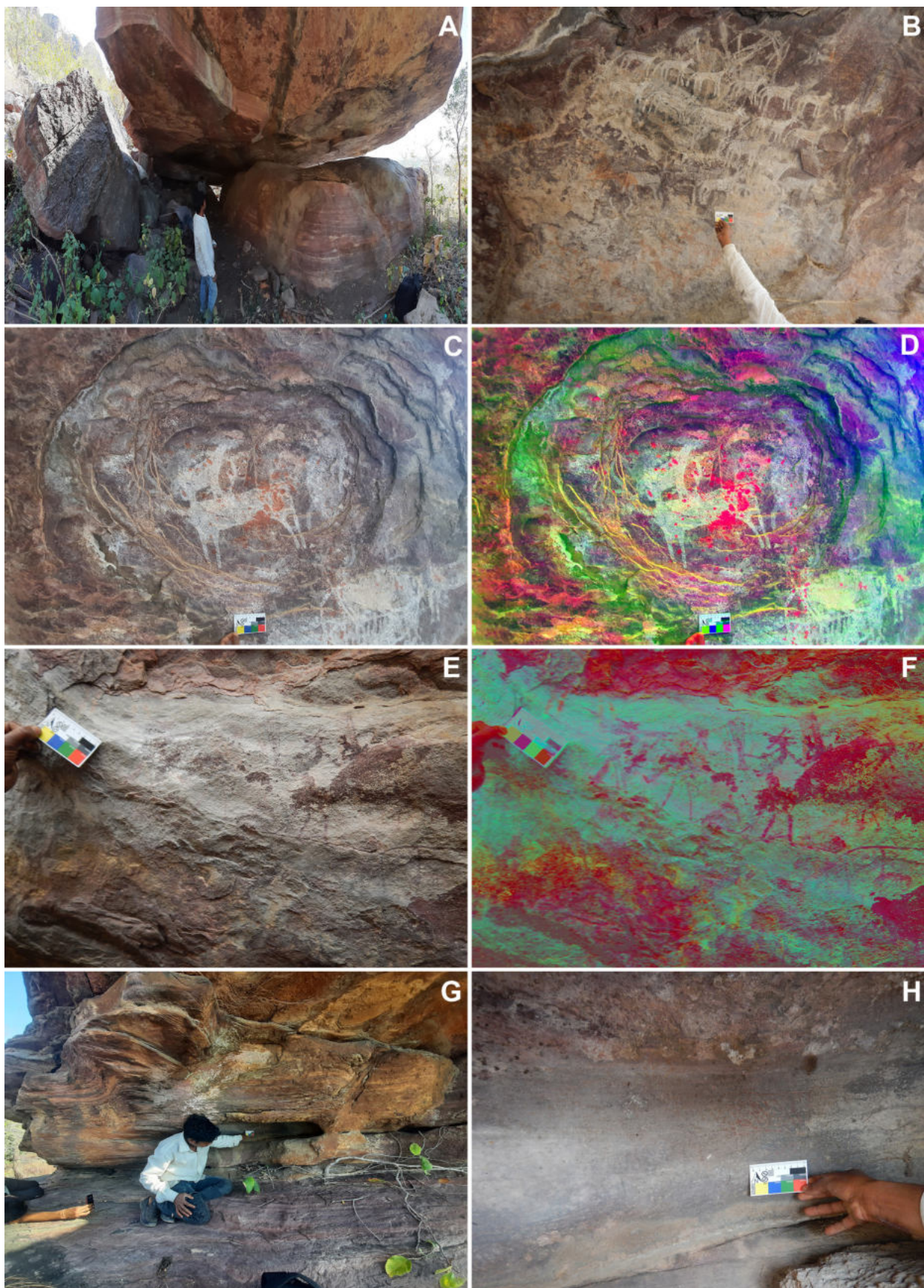


Figure 8. Site Hoda (HOD): A-B) General view of the shelter HOD_RS_01 and paintings in plenty on the ceiling; C-D) Red pigment splash on a white painting, Image digitally enhanced (YDS) with the help of DStretch software; E-F) S-shaped anthropomorphs with intricate clothing painted in the shelter HOD_RS_02; G-H) A small open hilltop shelter HOD_RS_03 with a painting in its niche.



it was determined that the lines were natural rather than painted; therefore, they were considered one. The picture has nearly entirely deteriorated. One or two individuals may lie down to rest in this narrow, exposed rock shelter.

Khidiya Kurmi (KHD)

Two hills were explored, and both are known as '*Khidiya Pahad*'. Twenty-four rock shelters were explored and recorded, but only eleven had rock paintings. There seem to have more shelters on the top, but those were not explored as that would come under tiger reserve, and the area beyond the hill comes under the neighbouring Raisen district. Most of the shelters were easily accessible, while some were very difficult. Also, most of these shelters had cattle bones in them. The carnivore animals would hunt the animals down and prey on them here in these shelters (Fig. 9A-B). Some cattle bones were weeks, months and years old. The shelter (KHD_RS_01) was just some meters above the foothill. Heavily degraded but had some ten paintings with superimposition visible on the surface. The author found potsherds and microliths in situ. Shelter (KHD_RS_02) was above (KHD_RS_01) and was difficult to get in. The condition was almost the same as (KHD_RS_01), but some paintings were better in condition. This shelter had a rectangular patch of red pigment, which was not seen in this area before during the exploration in that whole stretch yet (Fig. 9C-D). It could have been a ground preparation, a surface wash, or a previous drawing cover-up. It could only be confirmed by analyzing the surface under a USB microscope, D-Stretch software, photogrammetry, or Infrared cam-scan. There were animal dropping, suggesting that small animals like porcupines and langur monkeys would reside in this shelter.

Further, the findings were similar at shelters (KHD_RS_03) and (KHD_RS_04), and the conditions were the same for both the stone surface and the paintings. The shelter (KHD_RS_05) was different, like a cavern with a back opening because of the natural water stream inlet. This shelter was deep, but paintings were only found at the entrance. There are fair amounts of paintings, in red, yellow, black and white colors. Superimpositions were also easily visible. The white pigment paintings were thick and were visually looking fresh. Pigment analysis and other scientific analysis would be possible in this shelter. Though conservation would be necessary for this shelter as this shelter is easily accessible, and people could visit and see the paintings. Anthropogenic activities like burnt bonfires and littering are seen here in the shelter.

Because of illegal activities and easy access to such places, some shelters have lost their paintings, while others have deteriorated. The shelter (KHD_RS_06) has a low ceiling with cattle bones and porcupine quills. This shelter had paintings at the entrance and might have had more inside, but it wasn't easy to see through our naked eyes due to the lack of natural light. The shelter (KHD_RS_07) had a smooth floor surface and was big enough for fifteen people to reside. Here the ceiling might have had paintings but was not visible. While on the wall, there was a painting of a tigress and her cubs (Fig. 9E-F). The color of the horsemen was also very thick and looked saturated. Shelter (KHD_RS_08) is an open shelter, and only two paintings of the dears were visible. These were also in the process of fading away soon. Similar issues were also noticed in shelters (KHD_RS_09, 10 & 11). The

common problems in these shelters on the Khidiya Pahad hills are that the stone is deteriorating. The surface is exfoliating and degrading due to anthropogenic illegal and other day-to-day activities, animal rubbings and vegetation. Many potsherds and microliths are found at almost all shelters (Fig. 9G-H).

As per the author's conversation with the local villagers nearby, they had seen a lot of these rock painted shelters when they were younger. They never used to enter the jungle and these shelters because of the stories of the *Chudails*. However, villagers would now go in for the various day to day activities ever since the Khidiya Mata temple was constructed near the foothills. They also added that the newer generation has stopped entering these places because of the recent introduction of new tigers in the jungle that was an addition to the near Tiger Reserves by the forest department/government. They would come face to face with humans at any time, unlike the actual indigenous jungle tigers, which would stay in the wilderness and would only come near the village searching for water and easy food like cattle or dogs during the summers.

The author also explored and assisted at Chikli/Chandla Kalan site to explore and document new rock art shelters there. This site falls between Hoda and Khidiya Kurmi. On the other side, in the south of the River Narmada, in the Gondwana ranges, the author explored Mandikhoh and Morpani. This exploration was necessary to answer the author's research questions to understand the geological setups, conditions, environments, past people's movements, the types, themes of the paintings, and superimpositions (Poojari and Chauhan 2020).

Owing to tigers' sightings on these sites and the novel Covid-19 pandemic, the site's exploration was temporarily halted.

Discussions and future plans

The hills on which the rock paintings are painted in this region belong to the Vindhyan formation. The quartzite rock quality is better here, unlike the Gondwana ranges in the south. However, the rock is deteriorating at an alarming rate due to natural and anthropogenic effects. The rock surfaces are smoother and more suitable for painting. The author has been exploring and documenting rock art sites from the Vindhyan ranges and the Gondwana Ranges. This will aid in the comparative study of the paintings of both ranges, which will aid in understanding the geological variation, shelter selection and occupancy, types of paintings and raw materials used, themes, biodiversity of and near the shelter, and so on. Here the author has only come across petroglyphs, i.e. rock painting, and no traces of petroglyphs or geoglyphs yet. Paintings are in red, orange, yellow, black, white and even green in color. There are variations in the red color from darker to lighter shades. Some may have altered chemically from the original colors when applied from the ochre nodules, similarly for color white. They may have come from different sources in another region.

The stone holding and root grip at the hill slopes on the Vindhyan ranges have become loose from beneath the surface due to anthropogenic activities such as deforestation and stone mining. Due to this, the shelters are in dilapidating conditions at and near the hill slope at a higher rate. While conducting the village surveys, the older generation of the villages brought to the author's

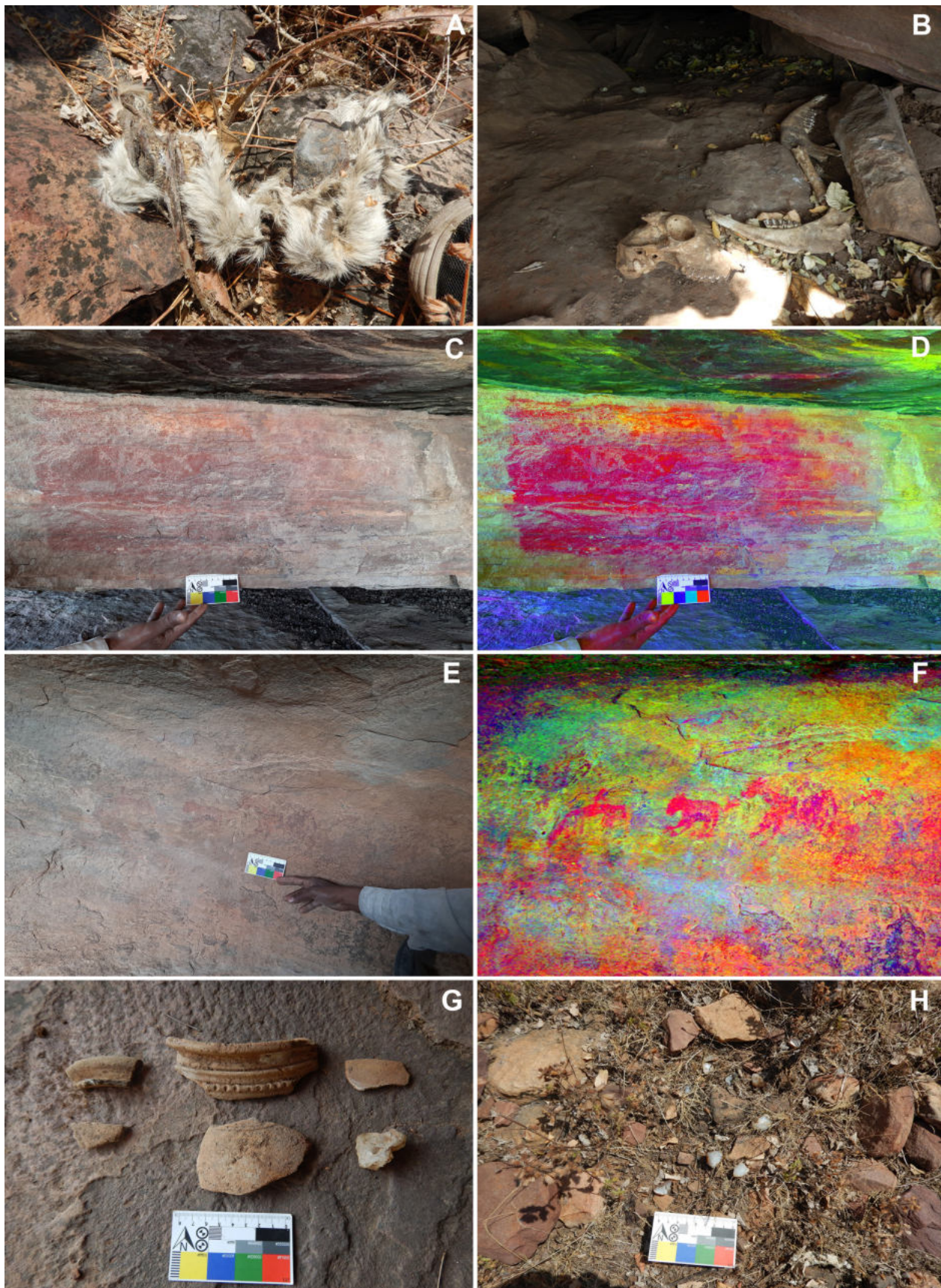


Figure 9. Site Khidiya Kurmi (KHD): A-B) Prey of a wild animal found in the rock art shelters; C-D) Large red rectangular patch painted in red, Image digitally enhanced (YDS) with the help of DStretch software; E-F) Painting of a tigress and her cubs in the shelter KHD_RS_07, Image digitally enhanced (YDS) with the help of DStretch software; G) Terracotta potsherds found in the rock art shelters; H) Microliths found in plenty in and around the rock shelters.



notice that there used to be many more rock paintings when they were in their childhood days. In addition, the exposure increases due to cutting trees and vegetation, and the stone is deteriorating faster. The recent development near the foothills adds more dust and dirt to the rock surface, affecting the painting layer during the heavy humid and monsoon seasons.

Need more scientific research to be done here in this region. There is a need for proper systematic excavation, digital recordings, pigment collection and dating them after analysis if any organic compounds are traced in them. However, based on the archaeological evidence of the microliths on the sites, only the tools can be dated, not the paintings, unless tools are found with the pigments in the same stratigraphy layer or traces on the microliths. However, this microlithic technology is known to extend to at least ~48 Ka and ~45 Ka (Mishra et al. 2013; Wedage et al. 2019), respectively and continues in several Iron Age contexts (Wedage et al. 2019) in the South Asian context. It is also notable that the earliest rock art in South Asia has now been dated to ~45 Ka and includes handprints and hunting scenes (Aubert et al. 2019). Based on preliminary observations, superimposition patterns appear to broadly follow patterns observed at other such sites in central India, such as Bhimbetka, i.e. Mesolithic, Chalcolithic, and Historical, within this sequence (Mathpal 1976, 1984). Paintings from all three periods appear to be present based on style and subject matter in the study area. Caution should be taken when assigning relative chronology based on such subjective parameters in the absence of absolute dates. For example, if some hunter-gatherer groups maintained stylistic consistency overtime periods, a painting that appears Mesolithic in subject matter, style, and color might be much younger than anticipated (Poojari and Chauhan 2020).

It is essential to register and document the majority of shelters at different levels to document and conserve them. Since not all pigments seem to be polluted, and these paintings will be lost soon, the scientific study of the pigments (see Shaik 2015) appears promising and necessary. Based on the themes, the paintings appear to be from different periods, and many are superimposed. Monochrome stick figures to the following Historical era figures of a horseman can be seen in this region. Most animals and birds are the most famous paintings in the study area, accompanied by warriors and other human figures. Geometric/abstract figures, x-ray figures, scenes of social activities, and hunting scenes are the least common/frequent styles. There are more hills in the region with shelters that will be explored and documented in the future. At the same time, some are protected as part of the Tiger Reserve. According to the villagers, the Gondis and Bhils, who live deep within the forest, painted rock art. While some, from Chachmau to Khidiya Kurmi, believe that *Chudails* - the witches - drew these paintings from the blood of the people or animals they had haunted in the area.

How to minimize the problems on the site? Many studies have been conducted in order to preserve our rock art heritage. Around the world, there are some preliminary works on the conservation and preservation of rock art. Unfortunately, with the exception of Bhimbetka, a World Heritage Site, and Adamgarh, both in Madhya Pradesh, there has been no significant effort in India. Although there has been a lot of work done on historical sites such as the Ajanta caves in Maharashtra, they are

wall paintings. Historic wall paintings are created and then painted on a prepared surface. This wall painting is much younger when compared to the thousands of years old rock art. The only way to study them on common ground is through pigments and the very basic layer, i.e. the characteristics and features of the stone. Aside from the stones and pigment, studying the biosystem surrounding these sites is equally important for developing effective conservation, preservation, and protection measures. Another critical aspect is to reduce major illegal anthropogenic activities such as stone and sand mining, deforestation (including tree cutting) and forest fire control.

The rock art shelters are in poor condition, and some of them are in desperate need of restoration and protection for future generations. The younger generations in the surrounding villages are unaware of the rich cultural treasure that exists nearby. As a result, public archaeology, associations with ethnic groups for preservation, site museums, digital documentation and mapping, the inclusion of the subject in the local school and college syllabuses, and other modern methods for safeguarding the heritage may be used to conserve and preserve it. Several historical sculptures in and around the site, such as the hero-stones and Sati-stone, indicate an old route that people have preferred due to its geological setup and other natural sources, at least since the Mesolithic period, if not earlier. These historical sculptures must be documented for further research into this period.

Future studies will include additional explorations and documentation in the study area (Vindhya and Gondwana Hill Ranges) as a long-term research goal of the Narmada Basin Paleoanthropology Project (NBPP). The rock art sites discussed in this paper will be compared to other known and new sites in the area, some of which have only recently been discovered. Following up on this preliminary study, additional tasks include accurately counting all rock art images using D-Stretch software, exploring spatial patterns of specific themes between different shelters, quantifying morphological parameters and styles, interpreting painting behaviour, and comparing with other regional rock arts, and pigment collection. Photogrammetry and high-tech imaging such as 3D documentation; ethnoarchaeological studies are also possible. Propose possible conservation strategies, then publish and disseminate them at various levels.

This is a preliminary report on the rock art sites that have been identified and reported to date. In the future, the areas that could not be surveyed (due to wild animals and the Covid pandemic) would need to be checked. Only the front zone of the Vindhyan Range was studied, not sites deep inside the forest.

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