

## Fossilized bamboo curtain from the Quaternary gypsum deposit of Thar Desert at Jamsar mine near Bikaner, Rajasthan, India

The present study reports the discovery of a fossilized artifact collected from the gypsum deposit of Jamsar near Bikaner, Rajasthan (Figure 1). The artifact (Figure 2a) composed entirely of gypsum, at first sight gives an impression that it could be part of a basket made of sticks, possibly of bamboo; it is in fact, a man-made curtain of sticks, possibly bamboo sticks, used to cover doors and windows. The curtain was irregularly rolled on when deposited along with gypsum layers. On close examination of the sample from either sides, irregular pattern of rolling of the curtain is clearly visible (Figure 2b). Its discovery from the gypsum deposit of Jamsar indicates the existence of an older civilization in the northwestern part of India.

The artifact is in fact a rolled down door or window curtain made from chopped sticks, possibly bamboo, neatly woven with the thread or string (Figure 2a). The entire material of the curtain, including sticks (possibly bamboo) and thread/string was completely decomposed during the process of fossilization; only its moulds and casts were preserved. The bamboo sticks were held together

with the help of thread/string in a systematic manner (Figure 3a). The man-made structure was deposited along with gypsum in the lake and later got fossilized. The sample is 37 × 26 cm in size. The organic matter was completely replaced by fine gypsum crystals during fossilization. The partly preserved moulds and casts of the bamboo sticks in the sample are about 26 cm long, which originally might have been much longer. The impressions of the casts of the bamboo sticks are not perfectly rounded, but are slightly angular in cross-section. Their diameter ranges from 4 to 5 mm. The distance between two thread or string lines varies from 3.5 to 4.5 cm. The diameter of the thread/string is about 2 mm. The two supporting sticks at the top and bottom of the structure are slightly flat and are about 5 mm thick.

The present discovery indicates that the region to the west of the Aravalli Mountain range, presently covered by the Thar Desert, was possibly once occupied by bamboo forests – the source for such artifacts. The artifact has been preserved at the Department of Geology, Jai Narain Vyas University, Jodhpur.

Quaternary gypsum deposits in northwestern Rajasthan<sup>1–3</sup> occur as younger massive, powdery or nodular pedogenetic crusts of alluvial origin<sup>4</sup> and as older horizontally bedded lacustrine evaporite deposits. Gypsum deposits of the area form two NE–SW trending linear belts; one extending from Suratgarh to Pungal and the other from Jamsar to Pokaran<sup>5</sup>. They occupy two different stratigraphic levels<sup>6</sup>. The older ones associated with calcareous silty sand and clay of the second cycle of the Quaternary sedimentation are exposed in Barmer, Churu, west of Jhunjhunu, Jaisalmer (Kanod), Jodhpur (Phalodi and Bap-Malar) and Nagaur (Didwana) districts of western Rajasthan. Whereas the younger ones associated with silty sand and clay forming a part of the third cycle of the Quaternary sedimentation in the region are traceable in Barmer, Bikaner (Lunkaransar and Jamsar), Churu, Jaisalmer, Jhunjhunu, Jodhpur (Phalodi and Shergarh), Nagaur (Bhadwasi) and Shri Ganganagar (Suratgarh) districts<sup>6</sup>. Paliwal<sup>7</sup> discovered fossil bones of *Elephas* sp. from the gypsum deposit of Bhadwasi, Nagaur District, Rajasthan. The gypsum layer at Bhadwasi in which fossil bones of *Elephas* sp. were found embedded, has recently been

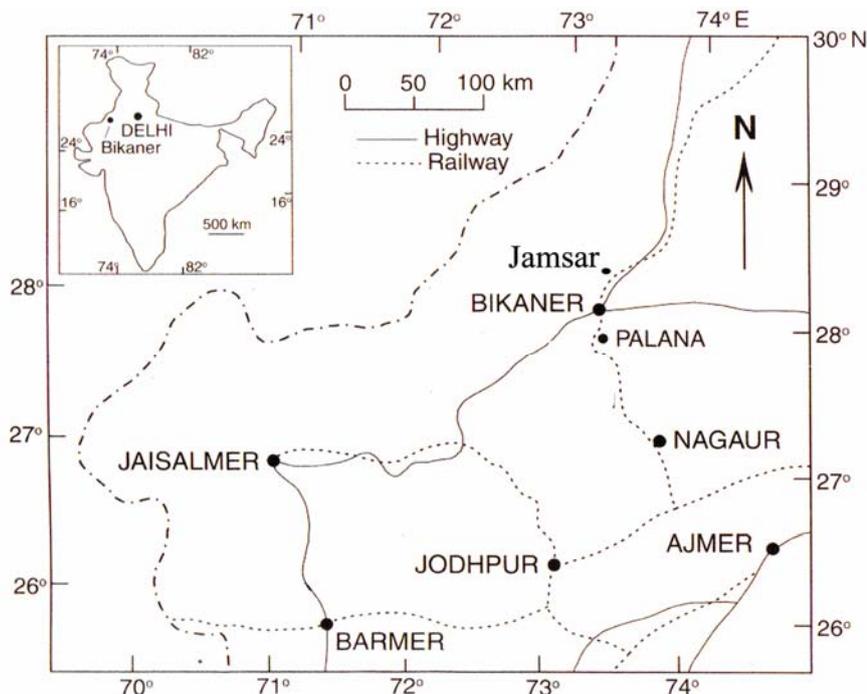


Figure 1. The location of Jamsar gypsum deposit.

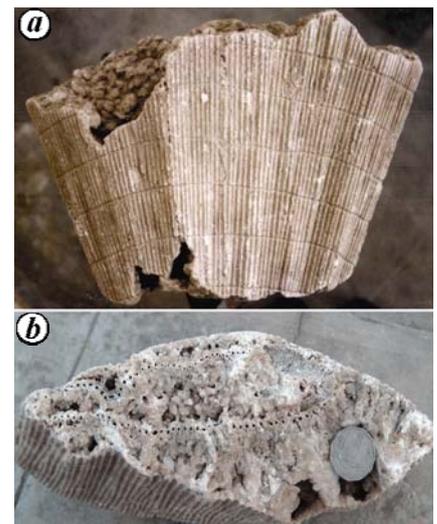
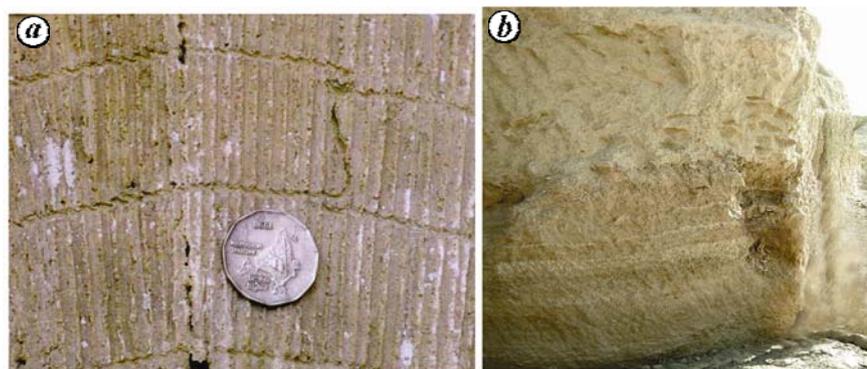


Figure 2. a, Fossilized bamboo curtain composed of gypsum showing moulds and casts of sticks, possibly bamboo, woven by thread or string (sample size 37 × 26 cm). b, Side view of the artifact showing rolling of the fossilized curtain (coin size = 2.6 cm).



**Figure 3.** *a*, Enlarged view of the fossilized bamboo curtain showing moulds of bamboo stick neatly woven by a thread or string (coin size = 2.6 cm). *b*, Section showing bedded gypsum in the sequence at the Jamsar gypsum mine.

**Table 1.** Lithological succession of the Jamsar gypsum deposit (after Sundaram and Rakshit<sup>5</sup>)

Facies	Depth (m)	Lithology	Structure
Upper	0.0–2.0	Fine powdery and friable calcrete	Massive
Middle	2.0–4.5	Brownish-yellow, fine to coarse sand with gypsum crystals	Trough and planar cross beddings
	4.5–6.0	Intercalation of coarse sand with impure gypsum	Trough and planar cross beddings
Lower	6.0–9.0	Bedded gypsum crystals up to 1 cm in diameter	Bedded
Base	+9.0	Greenish-grey fine to medium-grained calcareous sand	Subcrop

dated at 6800 yrs BP using the thermoluminescence (TL) method at the Physical Research Laboratory, Ahmedabad.

Gypsum deposit at Jamsar, Bikaner District, is located in a former lake basin situated at the junction of two lineaments trending in the NW–SE and NE–SW directions. The artifact – a bamboo blind or curtain was found embedded within horizontally bedded gypsum at a lower level in the Jamsar gypsum mine (Figure 3 *b*). Table 1 shows the lithological succession of the Jamsar gypsum deposit.

It is generally believed that during the Holocene a sudden warming event took place in the region<sup>8</sup>. The sea level that was low at 100 m depth during 14,500 yrs BP rose to above 80 m during 12,500 yrs BP and continued to rise with a high rate during 10,000–7500 yrs BP (ref. 8). It is also believed that Bap-Malar (Jodhpur) and Kanod (Jaisalmer) playas originated at about 15,000 yrs BP (ref. 9) and both

these playas host thick bedded gypsum deposits at the lower levels. At Kanod<sup>9</sup>, sediments from a depth of 180 cm have been dated at 8701 ± 198 yrs BP and others from a depth of 250 cm have been dated at 9567 ± 159 yrs BP. Here gypsum occurs from 176 to 250 cm. Even if the gypsum deposit of Jamsar is coeval of the Kanod gypsum, the artifact should be at least of this age.

There is a possibility that extreme aridity occurred during the Terminal Pleistocene and the Holocene, resulting in the development of hyper-saline conditions in the playas, formed by tectonic activity in the region that caused the deposition of older gypsum deposits like that in Jamsar.

The present findings point towards the existence of an older civilization that used curtains made of sticks, possibly bamboo, woven by thread or string to cover doors and windows. Dating of the sample

may prove to be fruitful in the search of such a civilization in the region. There is a possibility that the above civilization could be even older than the Mesolithic sites of the early Holocene with ceramic tradition in the Thar Desert of India and Pakistan<sup>9</sup>, or that of Mehrgarh settlements at the foot of the Kirthar Hills dating back to 9000–5500 yrs BP (ref. 10).

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