

## RESEARCH PAPER

# Plant macro remains from Early Historic Vessel, Gilund, Rajasthan

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*The macrobotanical remains were recovered from the Early Historic vessel from Gilund, Rajasthan by employing dry and wet sieving techniques in the Palaeobotany laboratory. The retrieved archaeobotanical material was in carbonized and semi-carbonized state. It involves cultivated barley grains, a single cut grain of rice and a seeds of weed plant along with a bulk of wood charcoal pieces. These could survive in the carbonized state by being exposed to heat or fire. The impressions of grass leaves were found on well backed brickbats occurred in the vessel. Few molluscan shells were also retrieved during wet sieving.*

## Introduction

At twenty five hectares, Gilund (74°15'E; 25°01'N) is the largest of 104 reported sites of the Ahar-Banas Complex (Possehl and Shinde 2005) (FIG. 1). It is situated in the wide fertile valley of the Banas River, which is about one kilometer north of the modern village of Gilund. The archaeological site is part of the modern village, which is roughly 120 km to the northeast of Udaipur City in Rajsamand district, at the southern end of "Khetri Copper belt." The site has a special place in the Protohistoric Archaeology of India. Nearly five decades ago, one season's excavation by B. B. Lal of the Archaeological Survey of India brought to light previously unknown features of the Chalcolithic culture of South Asia. Since 1999, Deccan College Post-Graduate and Research Institute and the University of Pennsylvania have participated with in a multi-disciplinary collaborative research project at Gilund under the direction of Prof. Vasant Shinde and Prof. Gregory L. Possehl (Shinde and Possehl 2005).

Excavations carried out between 1999 and 2005 in different parts of the site have revealed the following three-fold cultural sequence:

Period I- Mesolithic (Sub-phases: A- Aceramic Mesolithic and B- Ceramic Mesolithic)

Period II- Chalcolithic (Sub-phases: Early, Mature and Late Phases)

Historic (3<sup>rd</sup> cent. BC to Shunga-Kushan period)

A partially intact vessel with some of its contents undisturbed and embedded in original matrix unearthed from Gilund, Early Historic level (GLD 1, Trench 5B, Lot 207619) was excavated in January 2001. The vessel was stored with other archaeological materials at Gilund dig house

in Rajasthan. It was exposed to various elements which results into its drying and cracking but it does not appear to have been water damaged since it was excavated. This vessel was crated in plywood and transported to Deccan College in 2011.

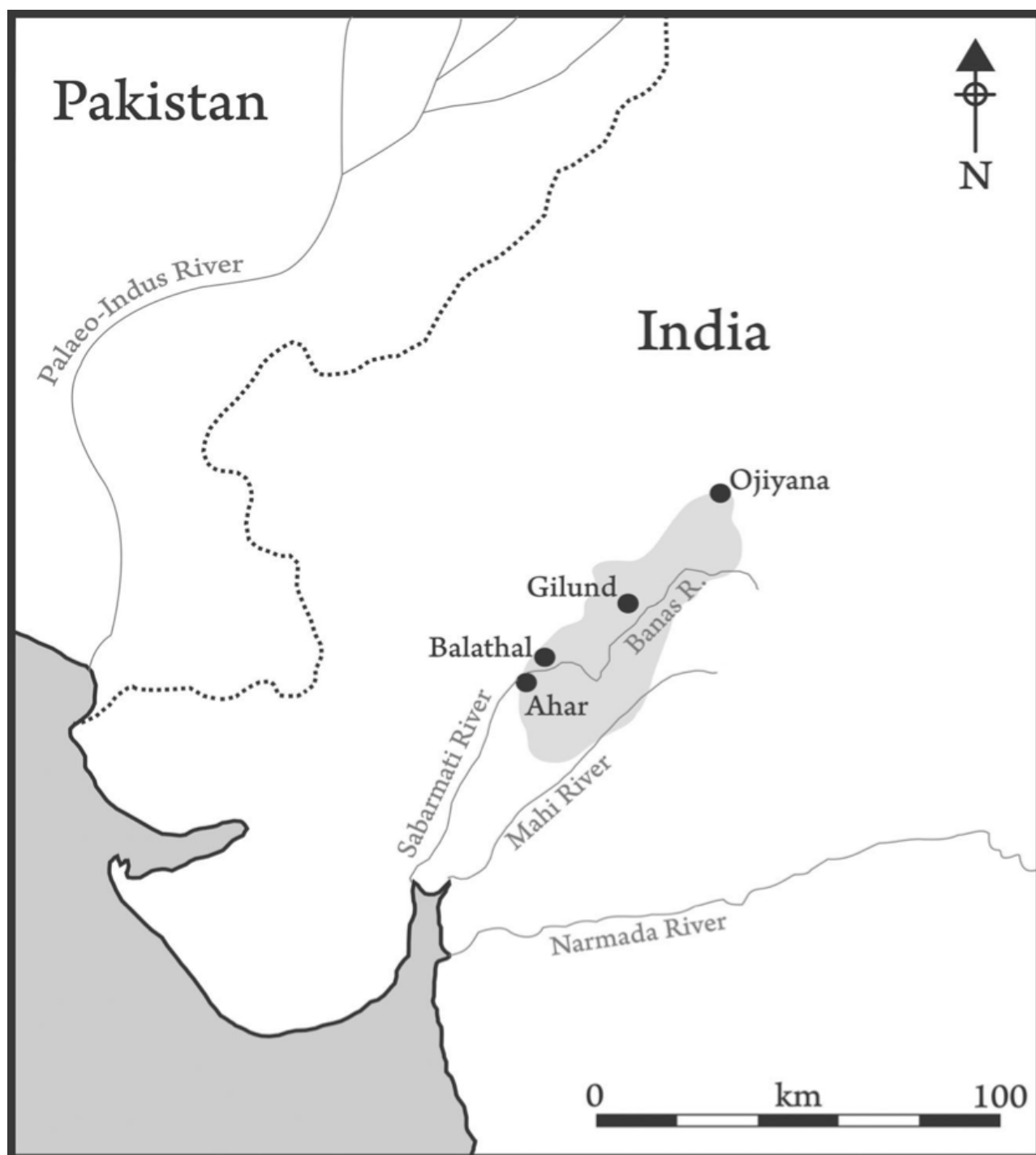
## Context of the vessel

The only extant record for this vessel is a map of floor of 5B which was drawn in February, 2001. The map shows three pits, at least three walls, and several "floors." It is not clear if the pot analyzed here is illustrated on the map. It was most likely removed prior to drawing of the trench floor. Unfortunately, there is no direct indication that the pot/vessel under study here came from the floor or from a pit. However, since it was removed in matrix with contents intact, tied together with twine, and kept in a tagari (metal basin) for further study, it is our current working hypothesis that it did not come from a pit. However, its exact location is unknown beyond these parameters. There is no locus or depth indicated on the lot tag. Since bone fragments and seeds were noticed in the matrix of the vessel and considering the fact that the vessel was found in-situ and removed with great care, it would be reasonable to study the content of the vessel as this might throw some light on the botanical remains from Early Historic level in Gilund.

The vessel was systematically opened in the laboratory (Fig. 2). It has been found that, the vessel kept in tagari was in broken state, the peripheral soil was loose and central portion was hard and compact. It composed of some pottery and animal bone pieces. The central hard and compact soil has been separated with the help of excavation knives into loose material. It has produced three antiquities which involve worked or polished bone fragments, a partial hammer stone and a microlithic quartzite flake. Lot of pottery and animal bones were also noticed in the soil. The same soil samples were used for the analysis of plant macroremains.

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**Fig. 1:** Map showing archaeological sites yielding ancient grains of the Ahar-Banas Complex (after Sarkar, 2011)

### Methodology

1. **Dry Sieving:** The soil samples collected from peripheral and central part of the vessel were passed through the galvanized sieve provided with a mesh of 0.5 cm size. The large sized plant remains has been recovered by this dry sieving technique and the sieved soil samples were taken for wet sieving.
2. **Wet Sieving:** Water flotation technique in the form of wet sieving was employed for soil samples in order to recover the organic plant remains. In

water floatation, a difference in density of organic and inorganic materials is utilized to achieve separation of organic remains from the soil matrix, which greatly enhances both the quantity and range of the botanical material that can be recovered archaeologically. The flotation technique was essentially a modification of process developed by Streuver and adopted by Steward and Robertson (1973).

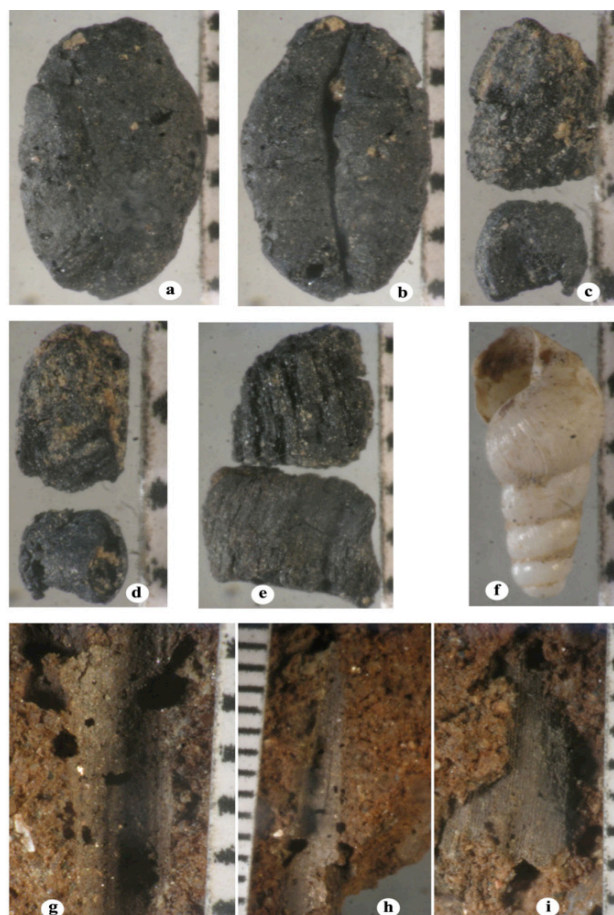
The soil samples were immersed in water containing tub. It resulted in releasing carbonized botanical material



**Fig. 2: Vessel Analysis.** a; Systematic opening of the Vessel kept in plywood box, b; Vessel after opening, c; Inner material, d; Scientific soil sampling, e; Bottom of the Vessel, f; Prof. V. S. Shinde explaining the context and importance of vessel.

from the soil and floating to the surface, where it was scooped out using B.S.S. 72 (200  $\mu$ ) mesh size and hand operated sieves. The special care was taken to see that no organic materials howsoever minute are lost through the mesh. The residual matter was thoroughly examined for grains as well as for other organic material. The recovered carbonized materials were, therefore, sorted out, preserved in cotton wool and dried without directly exposing it to the sunlight and stored in plastic vial to avoid breaking.

All the botanical remains were segregated and categorized under low power Stereo-binocular (LEITZ WETZLAR) microscope in the laboratory. It has been found that, the grains and seeds burnt slowly, retained their shape and fine morphological details. The grains were critically studied and identified on the basis of external morphological features also, photographed satisfactorily under a low power research microscope (WILD PHOTOMAKROSKOP-M 400 1,25x). The features were then compared with wild and cultivated materials to aid the identification. The total numbers of grains and seeds belongs to each species have been noted. The measurements have also been documented with the help of stage micrometer and an ocular disc.



**Fig. 3: Archaeobotanical Remains from Vessel.** a; Dorsal view of *Hordeum vulgare* L. (Barley), b; Ventral view of *Hordeum vulgare* L. (Barley), c & d; Cut grain of *Oryza sativa* L. (Rice) and a Weed; e, Charcoal pieces f; Molluscan Shell g-i; Grass impressions on brickbats.

## Description of the Botanical remains

### 1. *Hordeum vulgare* L. emend. Bowden (Barley; Fig. 3: a & b)

Few elongated complete and few broken grains with eroded husk were recovered from inside the Early Historic vessel. The embryonal cavity lies on a pointed end at the dorsal side and maximum breadth of the grain is found in the central portion, and smaller, somewhat asymmetrical ones with ventro-lateral twists. Wherever the embryonal cavity is well preserved, its vertical extent on the pointed end at the dorsal side is also noted. On the ventral side a deep periclinal groove is noted which twisted symmetrically or asymmetrically suggest their derivation from six-row type of hulled barley. The grains measure 5.00–5.50 mm  $\times$  2.50–3.50mm  $\times$  1.50–2.50 mm ( $L \times B \times T$ ) and have been encountered in the mixture. Few grains were recovered in broken state.

### 2. *Oryza sativa* L. (Cultivated Rice; Fig. 3: c & d)

Few charred cut grains of rice recovered from inside the Early Historic vessel. These are laterally flattened and prominently ribbed without husk. They measure 3.00–3.50 mm  $\times$  2.00–2.50 mm  $\times$  1.00–1.50 mm ( $L \times B \times T$ ). The rice husk impression on some charred cut grains also

observed with characteristic chess board ornamentation pattern of cultivated rice.

### Discussion

The archaeobotanical investigation is exclusively based on the analytical studies of soil samples collected from vessel, excavated at Gilund during the season 2001. The plant macro remains recovered from Early Historic vessel, revealed affinities with agricultural settlements at Gilund, Rajasthan during ancient time. The plant remains comprise carbonized grains of cereals like *Hordeum vulgare* L. (Barley) and *Oryza sativa* L. (Rice), seeds of weed and impressions of grass leaves as well as molluscan shells. The sites in Ahar-Banas complex yielded evidence of plant remains, e.g. Vishnu-Mittre (1969) reported rice remains from Chalcolithic Ahar. Kajale (1996) attested no report of plant remains from Chalcolithic Gilund and Ganeshwar but reported wheat (*Triticum aestivum* L.), barley (*Hordeum vulgare* L.) and rice (*Oryza sativa* Linn.) and other large number of grains from Chalcolithic and Early Historic Balathal. The record of macrobotanical remains from Chalcolithic Ojiyana (Pokharia 2008), provided evidence of grains of barley (*Hordeum vulgare* L.) and rice (*Oryza sativa* Linn.) and important information on the early historic agriculture and food habits of Aha-

rians in Rajasthan. This investigation also proved to be informative and highlights potential for further research work at Gilund.

### References

- Kajale, M. D.** 1996. Palaeobotanical Investigations at Balathal: Preliminary Report. *Man and Environment*, XXI (1): 98–102.
- Pokharia, A. K.** 2008. Record of Macrobotanical remains from the Aravalli Hill, Ojiyana, Rajasthan: Evidence for agriculture-based subsistence economy. *Current Science*, 94(5): 612–623.
- Sarkar, Amrita.** 2011. Chalcolithic and modern potting at Gilund, Rajasthan: a cautionary tale. *Antiquity* 85: 994–1007.
- Shinde, V. S. and Possehl, G.** 2005. A Report on the Excavations at Gilund 1999–2001, *South Asian Archaeology 2001*, edited by C. Jarrige, Paris.
- Steward, R. B. and Robertson, W.** 1973. Application of Flotation Technique in Arid Areas. *Economic Botany*, 27(1): 114–116.
- Vishnu-Mittre,** 1969. Remains of Rice and Millet. In *Excavations at Ahar (Tambavati)* (H. D. Sankalia, S. B. Deo and Z. D. Ansari), Deccan College Postgraduate and Research Institute, Pune, Pp.: 229–235.

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