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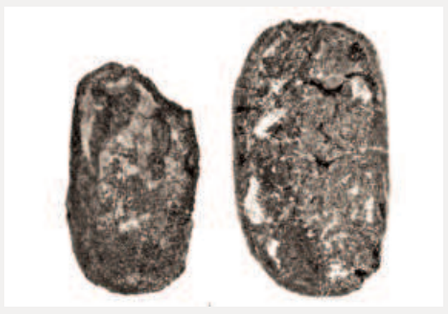
Raghurampura in Vikrampura, Munshiganj, an early Medieval Buddhist monastery complex

The history of Bengal WRITTEN IN GRAINS OF RICE

Ancient seeds, plant remains reveal how people lived, farmed and traded thousands of years ago



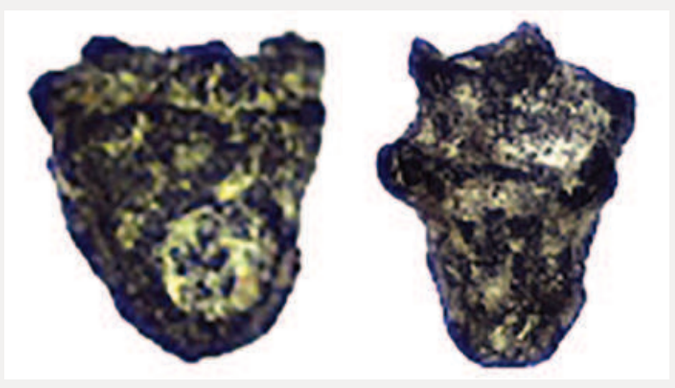
Wari-Bateshwar in Narsingdi, an archaeological site which dates back to Early Historic period



Rice bean remnants from Vikrampura site

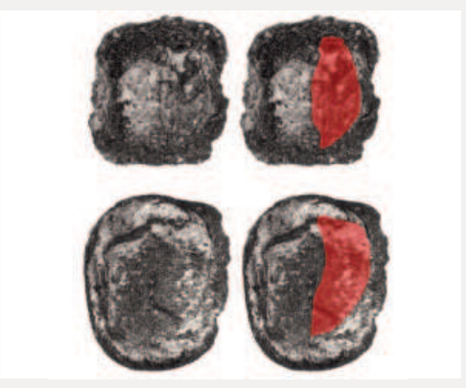


Rice grain remnants recovered from the sites



Rice spikelet bases

PHOTOS: **PROF DR MIZANUR RAHMAN**



Remnants of pulses recovered from the sites

SAKIB AHMED

The history of the Indian subcontinent has largely been told through what its rulers left behind: inscriptions carved in stone, punch-marked coins, royal decrees, and accounts of wars, taxes and temples.

These records tell us much about kings and kingdoms, but remarkably little about the people who sustained them.

What did an ordinary farmer in the Bengal delta eat for lunch 2,500 years ago? What crops did farming families grow while coping with seasonal floods? What did they wear, and how did they organise their daily lives?

Much of what we know about the region's past offers few answers. Throughout the prehistoric and early historic periods, ordinary people left behind almost no written accounts of their lives.

Yet traces of their existence survive beneath the soil: charred rice grains, discarded seeds, fragments of cotton and remains of plants that once grew alongside their crops.

Through archaeobotany, the study of ancient plant remains recovered from archaeological sites, these seemingly insignificant fragments are helping researchers piece together a history that conventional records have largely overlooked.

By examining carbonised seeds, grains and other botanical material, archaeologists are beginning to reconstruct how people lived, farmed and sustained their communities thousands of years ago.

For Bangladesh, shaped by the shifting rivers and fertile floodplains of the world's largest active delta, these discoveries hold particular significance.

"This land is not a static or once-created landmass; rather, it is a living, shifting landscape formed through a continuous process of erosion, transport and deposition that began around 10,000 years ago," said Prof Dr Mizanur Rahman of the archaeology department at Jahangirnagar University, also a research associate at the University of Oxford.

For years, archaeologists assumed that the constantly changing landscape, heavy rainfall, seasonal flooding and biological activity made preserving delicate plant remains particularly difficult.

Recent research, however, is challenging that assumption.

In a collaborative study published in Archaeological and Anthropological Sciences, researchers, including Prof Rahman, used a technique known as bucket flotation to recover ancient botanical remains from two archaeological sites: Wari-Bateshwar in Narsingdi, dating to the Early Historic period, and Raghurampura in Vikrampura, Munshiganj, an Early Medieval Buddhist monastery complex.

Using water to separate organic remains from excavated soil, the researchers recovered thousands of carbonised botanical specimens, offering a rare glimpse into the agricultural foundations of the region's early settlements.

The findings also demonstrated that systematic archaeobotanical investigation is possible in Bangladesh.

The discoveries invite us to imagine an ordinary household in ancient Bengal, where a meal might have consisted of rice and pulses, cooked with mustard or sesame oil.

Although the scene is imagined, archaeological evidence offers clues to what people grew and consumed.

Rice (Oryza sativa) was central to the diet. Analysis of rice spikelet bases showed that around 83.4 percent of the recovered remains belonged to domesticated rice, while another 12.6 percent represented wild or weedy rice types associated with ancient cultivation.

Researchers also identified 14 pulse species, including mung bean (Vigna radiata), black gram (Vigna mungo), moth bean (Vigna aconitifolia) and horse gram (Macrotyloma uniflorum), which provided plant-based protein.

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Prof Dr Mizanur Rahman
Archaeology department at JU

Remains of mustard (Brassica juncea) and sesame (Sesamum indicum) suggest that oil-producing plants were also part of the agricultural landscape.

"Together, the findings suggest that ancient Bengal's food economy was more diverse than a reliance on rice alone. The combination of cereals, pulses and oilseeds points to a varied agricultural system that sustained communities beyond their most basic dietary needs," Prof Rahman said.

The discoveries also shed light on the economic foundations of early settlements.

"Ancient hubs such as Wari-Bateshwar were part of a sophisticated network closely tied to the region's broader socio-economic fabric. Through archaeological excavations, we are uncovering not just artefacts, but the economic and ecological foundations that allowed these early urban societies to thrive," he noted.

Wari-Bateshwar, known for its fortified settlement, ancient roads, silver punch-marked coins and semi-precious stone beads, has often been studied for its urban development and trade connections.

But behind those signs of prosperity lay another story, that of the farmers whose labour sustained the settlement.

A single grain of rice may seem insignificant. Yet before reaching a cooking pot, it passed through several stages of labour: cultivation, harvesting, threshing, winnowing and cleaning. Each demanded time, skill and knowledge.

At Wari-Bateshwar, recovered rice spikelet bases, chaff fragments and weed seeds provide evidence not only of cultivation but also of how crops were processed after harvest.

The weed seeds offer further clues to how farmers adapted to the delta's fluctuating water levels.

Among the specimens was Acmella paniculata, a plant documented in Thailand as a companion weed in rainfed rice cultivation.

"Its presence in the Bangladeshi archaeological record is significant, as it has not been reported from ancient Indian archaeological sites. The finding raises the possibility that farmers in the delta used cultivation methods that differed from those practised elsewhere in the subcontinent," Prof Rahman said.

These seemingly insignificant fragments are helping researchers piece together a history that conventional records have largely overlooked. By examining carbonised seeds, grains and other botanical material, archaeologists are beginning to reconstruct how people lived, farmed and sustained their communities thousands of years ago.

According to him, the discovery could indicate a farming practice known as "decrue agriculture", in which seeds are planted on floodplains as water recedes, allowing crops to grow using the moisture left behind.

Rice cultivation also reshaped the relationship between people and their environment.

"Wetland rice cultivation tied human life permanently to Bengal's fertile soil. Since aquatic rice yields nearly double that of dry rice, it was not just about scattering seeds but demanded organised, continuous labour for land management and preparation, water management, bunding and weeding. This necessity became one of the most powerful drivers of population concentration, community organisation and the development of socio-political life in the delta," Prof Rahman explained.

The history of these settlements, therefore, lies not only in their buildings and artefacts, but also in the fields and farming practices that made permanent communities possible.

The botanical remains offer clues beyond food production, revealing aspects of clothing and connections with distant regions.

Fragments of cotton seeds and capsules, identified as Gossypium arboreum, accounted for around 42 percent of the botanical finds at Vikrampura and 16 percent at Wari-Bateshwar.

"These remains point to cotton cultivation, processing and local textile production at both sites, an economics aspect often difficult to trace through conventional archaeological evidence," Prof Rahman said.

Perhaps more intriguing is what the remains reveal about the movement of crops across geographical boundaries.

By examining the length-to-width ratios of mature, carbonised rice grains, researchers found that rice from Wari-Bateshwar fell predominantly within the japonica subspecies range, characterised by shorter, rounder grains than the long-grained indica varieties commonly associated with the Indian subcontinent.

These findings resemble rice recovered from prehistoric and early historic sites in Thailand, including Ban Non Wat and Khao Sam Kaeo, as well as sites in Myanmar.

The similarities raise questions about the movement of crops, agricultural knowledge and farming traditions between Bengal and Southeast Asia.

Evidence from Vikrampura points to another connection. Researchers identified remains of rice bean (Vigna umbellata), a crop domesticated in mainland Southeast Asia.

According to Prof Rahman, this is the first archaeological record of rice bean in South Asia, offering further evidence of agricultural exchanges between Bengal and Southeast Asia long before such connections appeared in written accounts.

The discoveries challenge the notion of ancient Bengal as an isolated agricultural region, suggesting that its farming traditions were shaped not only by the local environment but potentially by wider networks of exchange across Asia.

Beyond reconstructing ancient diets, farming practices and trade connections, archaeobotany offers a window into how communities responded to changing rivers, floods and climatic conditions.

For a region whose landscape continues to be shaped by water, those lessons remain relevant.

"Understanding how ancient societies adapted their agricultural practices to these environmental challenges offers vital perspectives for our own future in a changing climate," Prof Rahman said.

Despite the promise of such research, he said the lack of well-equipped laboratories and inadequate funding remained major obstacles to advancing archaeobotany in Bangladesh.