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Animal Exploitation at the Ancient Settlement of Dihar, District Bankura, West Bengal: Insights from the 2008-09 Excavations

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Abstract: The present paper deals with archaeozoological study carried out on the skeletal elements of animals unearthed during the 2008-2009 excavations from the ancient settlement of Dihar, located in Bankura district of West Bengal. This study yielded sufficient evidence for the past exploitation of animals at Dihar. While both domestic and wild animals were exploited, the absence of buffalo at this site is quite an intriguing one. The most exploited animals were cattle. The site also threw light on the evidence of the manufacture of a variety of bone artefacts by using horn cores and antlers.

Introduction

The ancient settlement at Dihar (Lat. 23° 07'10'' N - 23° 08'10'' N and Long. 87° 21' E - 87° 22' E) comprises a series of mounds on the left bank of the river Dwarakeswar within the modern village in Bankura district of West Bengal (Fig. 1). It is located at the confluence of the Chotanagpur plateau and the lower Ganga plain in an essentially iron ore bearing forested lateritic uplands. Dihar is considered to have considerable religious importance due to the presence of two early medieval temples, viz., Sanreswara/Shadeswara and Saileswara on the elevated bank of the Kana river and proximity to Bishnupur town (capital of the ancient Malla dynasty). A few decades ago, field surveys around Dihar by Maniklal Singha, an amateur archaeologist associated with the Vangiya Sahitya Parishad, Bishnupur yielded stone tools, ceramics, figurines, terracotta objects, bones, and stone artefacts indicating the archaeological potential of the site.

Archaeological excavations at Dihar were undertaken by the Department of Archaeology, University of Calcutta during 1982-1985 and 1990-1995 by A.C. Pal (1992), and later by the second author during 2008-09, 2011-12, and 2012-13. Various types of ceramics dominated by black and red ware, terracotta figurines, beads, metal and bone

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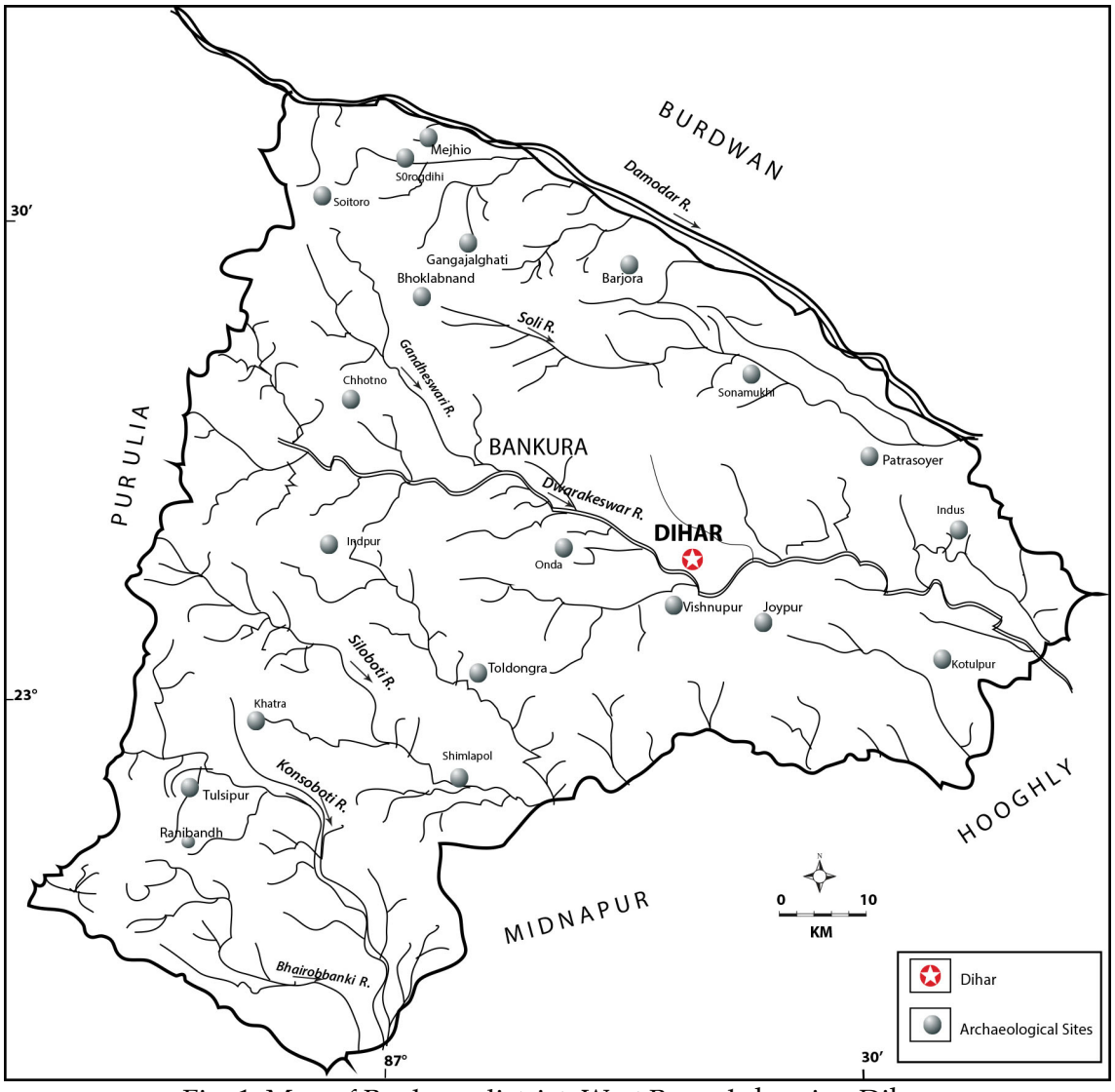

Fig. 1: Map of Bankura district, West Bengal showing Dihar

objects, etc. were recovered from the excavations along with animal skeletal remains and a human skeleton (Chattopadhyay et al. 2014). Beads recovered are mostly of carnelian (spherical), agate (etched with barrel shape, hexagonal), jasper (pentagonal, collared, spherical, short barrel-shaped), and milky quartz (spherical and disc-shaped). The copper objects comprise rings, bangles, beads, copper pieces, copper nodules, arrowheads, and antimony rods. While iron objects include nails, pegs, lumps, nodules of iron and few unidentified objects, the metallic evidence from the site shows the utilization of chalcopyrite and malachite variety of copper ore, hematite, and lateritic ores of iron (Chattopadhyay et al. 2014). The presence of metal artefacts/objects in varying contexts at Dihar has remained one of the most intriguing issues of the BRW bearing the Early Village Farming phase in this region. The terracotta objects unearthed are mostly hand-modelled, cylindrical with pin-hole decorations. Sometimes they are applied with a red slip. Terracotta balls, net sinkers, hopscotches, spindle whorls, beads, skin rubbers, pottery discs, ear studs, terracotta lamps, wheels and game objects were also found during the excavation (Chattopadhyay et al. 2014). The bone industry as

indicated by the worked bones and antlers at Dihar is quite rich. The overall cultural assemblage has revealed the settlement's long occupation which commenced from the Chalcolithic early farming stages and continued till the medieval period (Chattopadhyay et al. 2014).

Since no complete excavation report has been published till now, detailed information regarding the site's excavated animal remains is not available. Hence, presented here are the results of the archaeozoological studies carried out on the bones excavated during the 2008-2009 excavations. A total of six trenches were laid out: four at the Ma Bhavani Tala mound (DHR1), one at the Hirapur Mound (DHR2) and another one at the Manasatala Mound (DHR3) in the southwestern, northeastern and southeastern corners of the village, respectively. The trenches were laid by following the horizontal excavation method. Each trench, measuring 6 m x 6 m with 50 cm baulk on each side of the square area, was further divided into two halves. Trial-digging work in the form of a test pit (3 m x 3 m) was carried out on the high mound of Kalbhairavtala along the dried-up bed of the Kana river (IAR 2008-9).

Faunal material retrieved from the mounds of Hirapur (DHR 2), Manasatala (DHR 3) and trial digging at the Kalbhairavtala mound (DHR4) was submitted to Deccan College Post Graduate and Research Institute, Pune for a detailed study. The analysis was carried out at the Archaeozoology Laboratory, Deccan College, Pune, using the international standard protocols developed in archaeozoological analysis. Both qualitative and quantitative analysis was done. The quantitative method involved the use of NISP counts, and estimates for height, age and sex for domestic animals were also calculated. For taxonomic identifications, the modern animal skeletal reference collection housed in the Archaeozoology Laboratory, Deccan College, Pune, and published literature of Prater (1971), Schimdt (1972) and Driesch (1976) were consulted. Bone measurements were taken using a digital calliper in case of measurable bones by referring to Driesch (1976). Taphonomic observations involved documenting the state of preservation, bone alteration, fragmentation, breakage patterns, signs of human activity such as modification, abrasion, cut marks, chop marks, charring and those of animals like chewing, gnawing, etc.

Results

1. Trial trench at Kalbhairavtala (DHR 4)

This mound area lies in the western part of the village. The trial trench on the Kalbhairavtala mound threw light on a highly disturbed occupational area containing artefacts of different categories. Digging was continued till a depth of 164 cm. Black and red ware, black slipped ware, grey ware, red ware and chocolate ware sherds were found. The presence of BRW sherds in sufficient numbers, copper object (arrowhead), bone tools and other diagnostic types of artefacts of the BRW phase suggests that it was a habitation area of the early village farming communities. Since the context is disturbed, the finds could not be placed into definite chronological order by the excavator.

A total of 106 animal bones were studied from this trial trench (Table 1). In this assemblage, nearly 50% of bones could not be identified due to their fragmentary condition and this made identification to species level difficult for most of the bones. A

Table 1: NISP distribution of fauna from Kalbhairavtala (KVT), Hirapur (HRP), MST (Manasatala)

Species	Common name	Abbreviations	KVT	HRP	MST
Bos indicus/*Bubalus bubalis*	Cow/Buffalo	B/B	42	69	13
Bos indicus	Cow/Ox	Bi	5	5	7
Capra hircus	Goat	Ch	-	1	2
Small ruminant		Sr	6	9	3
Sus domesticus	Pig	Sd	1	2	1
Elephas maximus	Elephant	Em	-	1	-
Axis axis	Chital	Aa	2	1	3
Cervus sp.	Deer	Cu	-	-	4
Boselaphas tragocamelus	Nilgai	Bt	-	3	2
Antelope cervicapra	Black buck	Ac	1	-	-
Sus scrofa	Wild pig	Ss	-	-	1
Rat		Rt	-	1	-
Freshwater Turtle (*Chitra indica*)	Indian narrow-headed softshell turtle	Ci	-	25	1
Unidentified freshwater fish		-	-	-	2
Unidentified fragments		UF	49	27	52
Modified bones/bone tool		-	-	22	8
Total		-	**106**	**166**	**99**

- absence

majority of the bone fragments were broadly grouped as *Bos*/*Bubalus* (cow/ox/buffalo) since these share close similarities in their osteology, and in the absence of skeletal markers, their separation becomes difficult. These formed the major constituents of the faunal assemblage and comprised mostly of ribs, phalanges, mandible, long bone shafts, etc. The cow/ox (*Bos indicus*, n=5) was identified by a part of the pelvis, fragments of the tibia, and one complete astragalus (Fig. 2). No bones of buffalo or goats were recorded in the assemblage. However, a few bones of animals falling in the size range of sheep/goat/antelope/small deer were collectively identified as small ruminants due to their fragmentary condition. The occurrence of a scapula blade revealed the presence of domestic pig (*Sus domesticus*). Besides domestic animals, a few bones of chital (*Axis axis*) and blackbuck (*Antelope cervicapra*) were also identified. The chital (*Axis axis*) is represented by a small-sized antler of a young deer, a complete astragalus and a part of the mandible, while the blackbuck (*Antelope cervicapra*) by a complete calcaneum (Fig. 2). All these animals had contributed to the food economy as is evident from the cut and chop marks along with charred bones. The faunal representation observed here is fairly similar to the other two localities. Some of the bone splinters were being shaped into

tools. A total of ten long bone splinters were found cut lengthwise and five small fragments have a polished/abraded surface suggesting tools in making. Certain bone splinters were modified intentionally by shaping the ends into points. A few also show charring at the tips for hardening them.

2. Hirapur (DHR 2)

The Hirapur mound (DHR2) is situated at the eastern corner of the village, along the main village road. It is closely bordered by modern habitation on its western and northern parts, whereas a fertile flood plain outlines its southern end. At Hirapur, the exposed area suggests that cattle herding was one of the activities carried out, as is evident from the exposure of a cattle-pen (*gosala*/*gowal*) whose floor was prepared by plastering cow dung and by mud on its sides. Burnt fragments of earth and charcoal have been obtained from each habitation area. In addition, hoof impressions preserved in the mud were exposed (IAR 2008-09).

A total of 166 skeletal elements of animals were studied from trench A1. These come from depths ranging between 27 to 237 cm (Tables 1 and 2). Due to their fragmentary condition, only a few bones could be measured. *Bos*/*Bubalus* bones are maximum in the collection, but being fragmentary, many of them could not be identified to the species level. A few bones comprising parts of mandible, tibia, dental fragments were identified as those of cow/ox (*Bos indicus*). Similarly, bone fragments that fall in the size range of sheep/goat/deer/antelope were collectively identified as small ruminants. A very small horn core belonging to sheep/goat was observed. Identification of domestic pig was made from a small mandible with alveoli. Hunting of wild herbivores is attested by the bones belonging to nilgai comprising a glenoid cavity of the scapula with a chop and cut mark, and a complete second phalanx. The latter is uniformly black, probably due to exposure to fire or heating (Fig. 3). The chital was identified by a proximal part of the first phalanx. An interesting find is the identification of a small tusk belonging to a young elephant (Fig. 3).

In the assemblage, fragments from the carapace of freshwater turtle *Chitra indica*, a few showing traces of charring, were found in the mid-levels of the deposit (Fig. 4). It is quite likely that it may have been consumed as food as it is exploited even today in many parts of India. Turtle shell fragments were found at Hirapur. The overall assemblage indicates the common use of cattle, mainly cow/ox (*Bos indicus*), in the food economy, while the use of sheep/goat appears to be negligible. The presence of wild animal species, although few in numbers, indicates that these animals were also exploited by the inhabitants. Similar animals were also recorded at the other two localities Kalbhairavtala (KVT) and Manasatala (MST). Several worked bones, having different stages of modification, were also noted.

3. Manasatala mound (DHR-3)

It has possibly acquired its present name from the modern temple of Manasatala which stands nearby. Topographically, it is relatively oval, situated along the left bank of the river Dwarakeswar flowing towards the north. The location of the mound is a little away from the cultivated land from which it gently rises and outlines the southern and eastern

corners of the village. It is disturbed by the encroachment of modern habitational areas at its northern and western parts, though some of them are now abandoned. The appearance of Rouletted ware, along with two sherds of black slipped ware from the depth of 67 cm, is certainly a piece of important evidence for addressing various issues of the Early Historic period. The occurrence of red ware, BRW, along with early historic pottery, helps date the deposits of the exposed assemblage to the early centuries of the Christian era (IAR 2008-09).

A total of 99 bones were examined from a depth of 25 cm to 112 cm (Tables 1 and 3, Fig. 5). These are also in a highly fragmented condition. Here too, as was the case with Hirapur, most of the cattle bones could not be identified to the species level. However, a few teeth and fragments from the radius, metacarpal, phalanx and ribs were identified

Fig. 2: Bones from Kalbhairavtala: *Bos indicus*-distal tibia; Chital (*Axis axis)* mandible and part of pelvis of *Bos indicus*

Fig. 3: Bones from Hirapur: *Bos indicus*- distal humerus with cut mark; elephant tusk and second phalanx of nilgai (*Boselaphas tragocamelus*)

Fig. 4: Turtle shell fragments of *Chitra indica*

Fig. 5: Bones from Manastala: distal tibia Chital (*Axis axis*); cattle m1/m2; wild pig mandible with m1/m2 and first phalanx of *Cervus* sp.

Table 2: Depth wise distribution of animal taxon at Hirapur (DHR 2)

Depth (cm)	B/B	Bi	Sr	Ch	Sd	Aa	Bt	Rt	Turtle	Fish	UF	Bone tool	Em	Total
27	1		1											2
40	1													1
56							1							1
64			3					1			10			14
67		1												1
68	6				1									7
70	4													4
123	11											1		12
143	1											2		3
155	1			1							7			9
164	21	1	1								1	4		28
167	1										3			4
170	1													1
173												1		1
175	5		2		1	1	1				4	7		21
183	2													2
185	1											1		2
188	3	1										1		5
195	2						1					1		4
206	4	2	1						25			2	1	35
225	1										1	1		3
237	3		1								1	1		6
Total	**69**	**5**	**9**	**1**	**2**	**1**	**3**	**1**	**25**	**0**	**27**	**22**	**1**	**166**

as those belonging to *Bos indicus*. Similarly, certain unidentifiable bone fragments belonging to sheep/goat/antelope size were collectively recorded as small ruminants. The goat (*Capra hircus*) was identified by the presence of a complete astragalus. Remains of sheep/goat, in general, are quite limited at all three localities. The presence of wild herbivores like nilgai, chital and wild pig is attested in this locality where the chital was identified from a distal humerus and tibia, and the nilgai by a part of the left mandible with a cut mark. The *Cervus* sp. was identified only at Manasatala by a first phalanx, mandibular premolar, part of antler and distal part of the metacarpal of a young one. Two charred vertebrae of freshwater fish were recorded whose identification could not be attempted due to their small size and charred condition. Only one turtle shell fragment belonging to *Chitra indica* was found. The overall bone evidence suggests that similar to the other two localities all these animals, along with cattle, pig and wild fauna, had been exploited for their meat. Bone working is also clearly evident from the

Table 3: Depth wise distribution of animal taxon at Manasatala (DHR 3)

Depth (cm)	B/B	Bi	Sr	Ch	Sd	Aa	Bt	Cu	Ss	Turtle	Fish	UF	Bone Tool	Total
27	5											5	1	11
48											2			2
54	1	4	1	2		3		2		1		11	4	29
61					1			1				5	2	9
64	1	3	2									5		11
67	1						1							2
75												3	1	4
82												5		5
93	1													1
97	4							1	1					6
112							1					18		19
Total	**13**	**7**	**3**	**2**	**1**	**3**	**2**	**4**	**1**	**1**	**2**	**52**	**8**	**99**

modified splinters present, some having been polished, and a few with their tips charred.

Discussion

Faunal analysis of the animal remains from the 2008-09 season's excavations at the three localities of Kalbhairavtala (KVT), Hirapur (HRP), and Manasatala (MST) have yielded sufficient evidence for the past exploitation of animals at Dihar (Table 1). Despite their fragmentary conditions, it was possible to carry out taxonomic identifications and reconstruct some aspects of the faunal economy. Most of the bones in the collection have resulted from subsistence-related activities where both domestic and wild animals were mainly exploited for obtaining meat. *Bos*/*Bubalus* bones formed a major component of the bone assemblage which, due to their fragmentary condition, could not be separated. A majority of these bones most likely belong to cow/ox (*Bos indicus*) since no buffalo has been identified. It appears that the Dihar inhabitants had relied mainly on cattle with almost negligible herding of sheep and goats. Cattle had contributed in a major way to the diet as well as had been used in agricultural activities. The absence of buffalo is intriguing, considering the landscape is ideally suited for this animal. In contrast, a near absence of sheep/goats is understandable since these do not inhabit wet, humid landscapes as pigs do. The presence of domestic pig is observed at all three localities indicating it as a commonly kept domestic animal.

The occurrence of a few body parts of wild herbivores like nilgai, chital, blackbuck, and sambar suggests that hunting was carried out both for obtaining meat and horn core, antlers for making bone tools. Of interest is a small tusk of a young elephant at Hirapur (DHR 2). Today elephants are fairly common in the Bankura region and were probably exploited for their ivory in the past.

The presence of deep cuts and chop marks on some of the bones suggests the use of copper/iron knives and saws for butchering the animals. Further food processing methods such as roasting were responsible for the charring noticed on some of the bones. Following meat extraction, the discarded bones were cut and modified into bone tools indicating bone working activities. There was a preference for long bones and deer antlers. This explains the presence of bone splinters in different stages of modification as well as the general fragmentary condition of most of the bones. The presence of antler fragments, horn cores, and polished bone splinters shaped into points whose tips are charred suggests the existence of a bone tool industry during the historic period. Antlers and bone objects, mostly in the form of decorative and utilitarian pieces, were also unearthed from the 2012-13 excavations at Dihar (Chattopadhyay et al. 2014).

Surprisingly even though Dihar is located close to the Dwarkeshwar river, there is a limited representation of aquatic animal resources such as fish, molluscs and turtles. The latter were found from Hirapur and Manasatala. Only two fish vertebrae were found from Manasatala. Often fish remains due to their small size, bad preservation, and lack of proper recovery methods are not systematically collected and hence give an incomplete picture of their use.

The identification of wild animals such as chital, nilgai, and wild pig suggests that a wet, humid open landscape having plenty of grass cover had existed around Dihar in the past, closely similar to that of present-day. These favourable environmental conditions had made it possible for the settlement to sustain its subsistence economy and bone tool industry. Hence cattle rearing, hunting and bone working had constituted some of the commonly carried out activities at Dihar. As this study is confined to the 2008-09 season's excavated animal remains, it is more of a preliminary. Therefore, faunal studies for those from later excavations in the future are hoped to provide a more comprehensive picture of the various aspects of past animal exploitation at Dihar.

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