Chalcolithic faunal economy at Khambeswarpally, middle Mahanadi Valley, Orissa: A bioarchaeological perspective

One of the poorly understood problems of the archaeology of Orissa is the complexity of early emergence of Neolithic–Chalcolithic culture[1–8]. The Protohistoric sites of the region have mostly been studied in isolation, their relationship to the physical and biological environment has not generally been taken into account. Only recently, with the excavation at Golbai and exploration at Gopalpur, both on the off-shore of Chilika lake in coastal Orissa, the multifaceted aspects of the emergence of early sedentary culture have been highlighted[9,10]. These sites have been viewed as foundations for the beginning of early state formation process in coastal Orissa.

The central and western Orissa (the mid-Mahanadi Valley), characterized by upland and highland topography, appear to have also played a significant role in the overall growth of urbanization during the early historic period. The valley is rich in forest resources and precious stone deposits, and several pockets in the intermediary zones between rivers and hill ranges constitute good fertile lands rich in black cotton soil.

Against this background, an intensive exploration was carried out recently in middle Mahanadi Valley, within the political boundary of modern Suvarnapur district. The exploration has successfully identified a large number of Chalcolithic (12) and early historic settlements (50) on the banks of river Mahanadi and its tributaries. An attempt is made here to study the subsistence economy and exploitation of biocultural environment at Khambeswarpally, Chalcolithic site located in the region.

Khambeswarpally (20°46′N, 83°50′E) is located about 4 km south-west of Birmaharajapur town in Suvarnapur district on the left bank of Mahanadi river (Figure 1). The site, which is orientated SE-NW and represented by a mound (130 × 50 × 7 m), is partly eroded by the river and partly inhabited by the present Khambeswarpally village.

The site was subjected to limited excavation in 1997–1998 by Sambalpur University at three spots on the north-western part of the mound. The complete culture sequence of the site could be derived only from KSP-I and KSP-III. The sequence of cultures begins with Neolithic, Chalcolithic and early historic periods. The cultural phases have been classified into four periods, viz. Periods Ia and b, Period II and Period III. Periods Ia and b and period II, can be relatively dated to 2nd millennium BC until such time till absolute dating results become available.

The major findings of Periods I and II are a variety of white painted black-and-red pottery, plain and white painted red slipped ware, black burnished ware and cord impressed red ware and bone tools, besides a few copper objects, semi-precious stone beads, an ivory bangle and terracotta beads in Period Ib.

Bones of domesticated and wild animals have been tentatively identified from the faunal collection (about 100) made during the trial digging. These are shown in Figure 2.

Bos indicus (cattle) is represented by II and III phalanges, rib fragments, lachrymal bone, limb bone fragments, tibial ends, vertebrae, isolated upper and lower premolars and molars, patella and fragments of skull. It is quite possible that after scrutiny of the entire collection some of the bones, here assigned to *B. indicus*, may have to be reassigned to *Bubalus bubalis* (buffalo).

Ovis orientalis vignei/Capra hircus is represented by upper third molar, lower molars, incisor, lower jaw, enamel fragments, rib fragments, proximal and distal ends of tibia, head of humerus, metapodia, limb bone fragments, and several unidentifiable fragments can be seen in the collection. A more complete collection of sheep/goat bones or those frag-

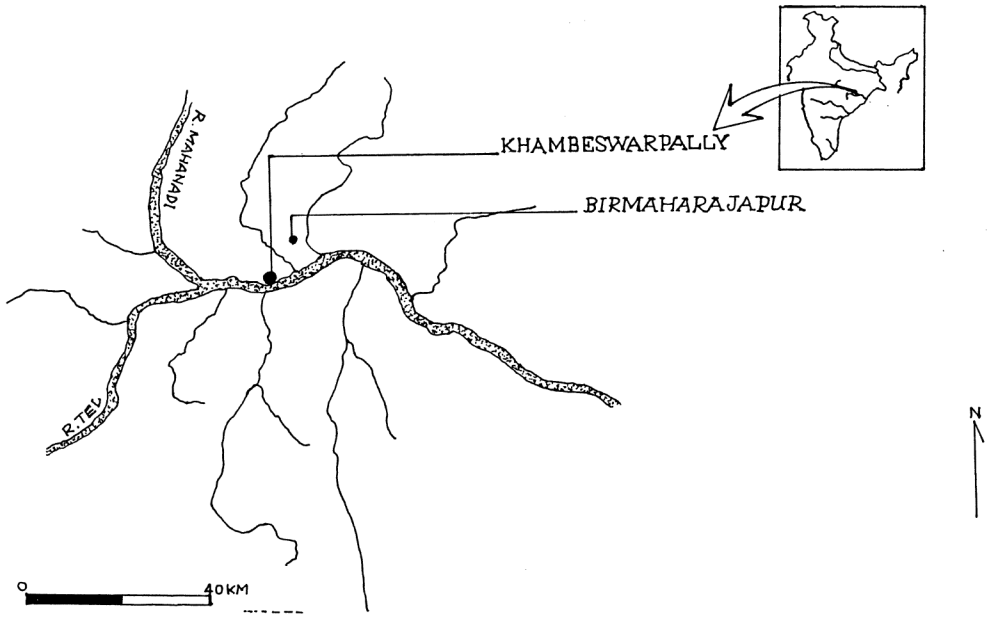

Figure 1. Location of middle Mahanadi Valley.

ments with diagnostic characteristic features will help us in a precise identification of the species.

Antilope cervicapra is represented by the head of humerus, occipital region of skull, pelvic girdle, tooth fragments, lower jaw and enamel pieces. Here also more complete skeletal elements would help to confirm our identifications, though the presence of blackbuck during the 2nd millennium BC cannot be disputed.

Tetraceros quadricornis is represented by distal end of radius, patella, horncore and other fragments.

Cervus sp. is represented by isolated lower tooth, part of pelvic girdle, limb bone fragments, etc.

In addition to the above species there are, in the collection, several small and big rib fragments, limb fragments, spines of vertebrae, canine fragment and fragments of freshwater bivalve molluscan species. Also, there are a few bones of rodents, which could not be identified at this stage. On the whole, the collection is fairly preserved, in some cases with a carbonate covering (which can be cleaned only after the initial acid treatment) which has helped in a better preservation of some bones. Many of the bones are charred, giving evidence of being roasted on fire for consumption (e.g. 3rd phalanx: *B. indicus* KSP-IA, depth 165–170 cm, proximal part of tibia with cavity of shaft; *Ovis*/*Capra* KSP-IA, depth 85–90 cm; rib fragment and lachrymal bone; KSP-IA, 125–130 cm, bovid; KSP-IB, depth 35–40 cm, proximal end of tibia shaft, small mammal; KSP-IA, depth 70–75 cm, rib fragment of small mammal; KSP II, depth 0–5 cm, spongy end of limb bone; *B. indicus* KSP-IB, depth 35–40 cm, part of pelvic girdle; *Ovis*/*Capra* KSP-IA, 195–200 cm, a big mammal). Some of the bones depict evidences of bone modifications as on the long bone fragment of *B. indicus*, as also on those of small mammals (KSP-IA, 165–170 cm and KSP-IB, 115–120 cm). In another case, KSP-IB, 35–40 cm, step (double) flaking of cortex of a limb bone has been successfully attempted. Head of a humerus of a small mammal (KSP-IB, 35–40 cm) has been eroded and rolled, giving evidence of some degree of abrasion, may be due to water, wind or any other activity. KSP-IA, 70–75 cm yields an interesting case of fracture break along bone fibre, which may be natural or intentional and in any case, secon-

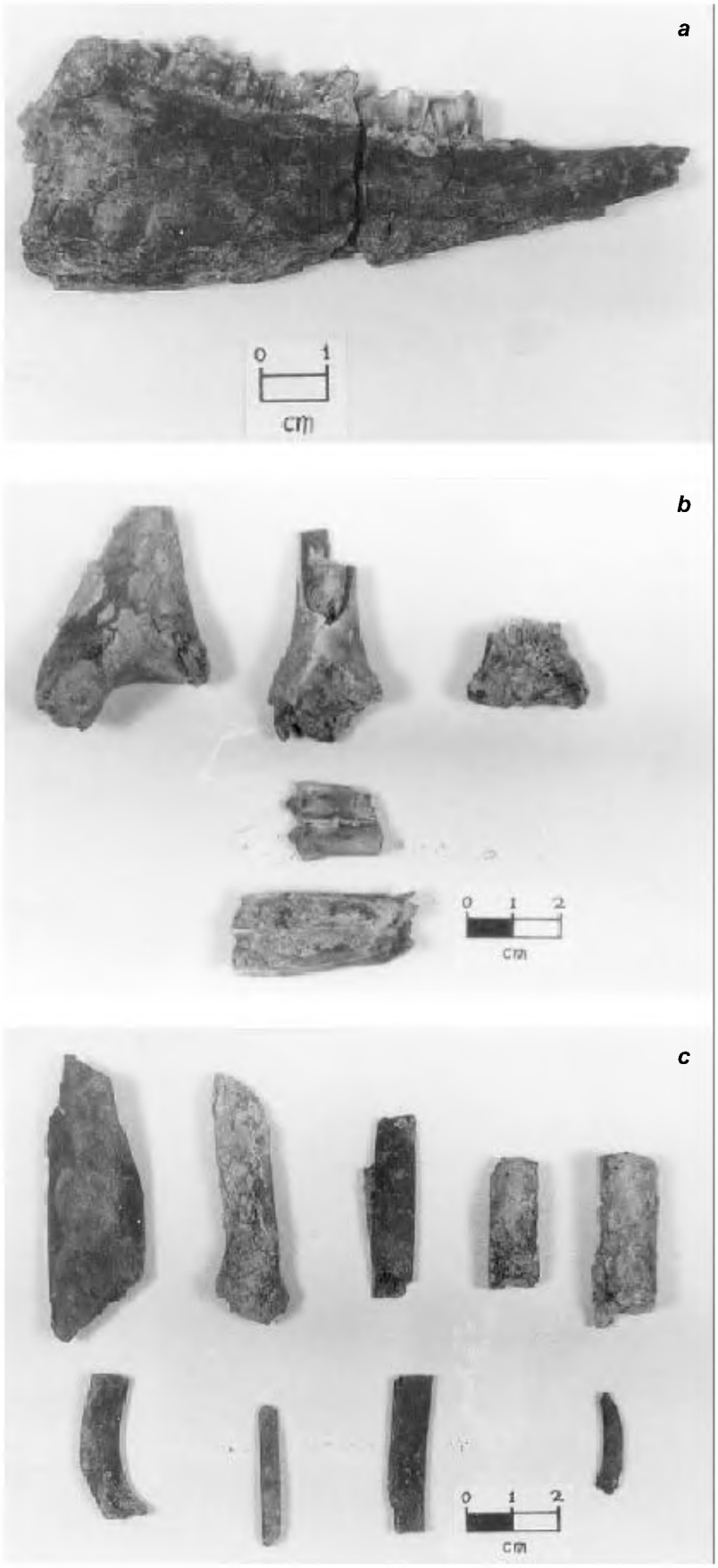

Figure 2 ***a–c.*** Animal bones from Khambeswarpally.

darily modified. One fragment of bone (KSP-IB, 130–135 cm) has evidence of biogenesis or additional growth on its cortex, which needs a detailed inspection. It may be a case of osteo-malachites (bone pathology). KSP-IA, 195–200 cm has a bone of a big mammal which has also been chopped along with charring, to such an extent that the outer cortex of the bone and its connective tissues have also been exposed. In addition, there are several bone tools (points, needles arrowheads, etc.) which provide an interesting insight into the modifications of the bones for various purposes.

Since the collection is fragmentary or incomplete, which is the case with any archaeological excavated material, it is difficult to calculate the minimum number of individuals, unless the entire collection is examined. Moreover, it is impossible to decipher whether all or part of the collection belongs to one or several individuals of a species. But from the study of modern analogue, the area even now abounds in cattle, deer, four-horned antelope, spotted deer, blackbuck, sheep, goat, pig, tiger, elephant, and smaller animals, both of wild and domesticated varieties.

Based on the parallel evidence of habitat, a fairly good estimate of the palaeoecology of middle Mahanadi Valley can be formed. *Antelope cervicapra* is one of the important groups of oriental species which is found in a variety of habitats. It also has the habit of going to a particular spot to deposit its faeces, thus marking the territory and indicating its presence to other members of the same species. This animal is generally of medium size; males have long slender horns twisted spirally. This character helps us to confirm the presence of male blackbuck in our collection, even though the possibility of some of these belonging to females cannot be ruled out . In the past these animals frequented relatively settled regions and open countryside. Several early explorers have mentioned these animals in their travelogues. These animals, primarily grazers, generally avoid forest areas, but do survive in semi-arid tracts. They do not inhabit mountainous terrain. They form groups of 20–30 and feed on grass and several cereal crops.

B. indicus is the most extensively found animal in the Quaternary deposits of India. It is well known that cattle have a tendency for successfully exploiting open and/or dry habitats. However, they do frequent several habitats, but are generally characterized by only one dietary pattern. Foraging is the major factor that affects the geographical movement of these animals. They also possess adaptive capabilities to varied microenvironments.

Deer species, reported in the collection, frequented swampy environment and had a wide range of habitats, generally inhabiting the humid parts of India.

Finally, we envisage the presence of considerable floral heterogeneity, abundant grasses surrounding parts of the site and grasslands generally associated with riverine environment. Such a habitat in the valley must have governed the distribution of the above-mentioned animals in the Chalcolithic period.

The forest material of the present and neighbouring areas includes Sal, *Shorea robusta*; Tal, *Borassus fiabellifer*; Khajuri, *Phoenix sylvestris*; Mahua, *Bassia latifola*, etc., which indicates good rainfall in the area (with mean temperature: max. 41.4°C and min. 27.8°C). The flora in general indicates savannah grassland, medium-sized trees, with a good supply of water. On the whole, this part of the valley experienced favourable ecological conditions that provide suitable habitat to the fauna that is found in the collection.

In conclusion, it can be stated that the site of Khambeswarpally provides an ideal example of subsistence economy based on a variety of animals, some of them being worshipped. Molluscan shells also provided an important dietary item for the inhabitants and/or were used for sharpening of the pottery. During certain rituals, the tribals of the region sacrificed probably a large number of domesticated animals, including sheep, goat and buffalo. After the sacrifice, the meat of the animal was offered to the presiding deity of the tribal hamlets and later distributed among the inhabitants. In coastal Orissa, this practice of sacrifice and distribution of meat is also prevalent today selectively, on the basis of caste (sheep, goat amongst the upper caste and buffalo amongst the scheduled castes). It is not improbable that the same practice might have been followed even during the archaeological past.

It may also be added that several sites of the same period have been reported from neighbouring areas in Orissa which await a detailed study. Only then would it be possible to make a comparative study of the food economy practices in relation to cultural evolution and taphonomy in the entire region.

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