SUBSISTENCE BASED ON ANIMALS IN THE HARAPPAN CULTURE OF GUJARAT, INDIA

Pappy K. THOMAS*, Pramod P. JOGLEKAR*, Yoshiyuki MATSUSHIMA*, Seema J. PAWANKAR* and Arati DESHPANDE*

Summary

Based on the composition of animals identified at a couple of Harappan sites excavated recently in Gujarat and also considering the earlier faunal studies of other Harappan sites, here is an attempt to build up a hypothesis for the Harappan subsistence pattern. However, an ambiguity is unavoidable due to the comparison of earlier studies with the recent ones, pertaining to species, stratigraphy and quantification. Faunal assemblage from Shikarpur and Kuntasi has brought to light interesting perspective on ancient subsistence based on animals and to a certain extent the environment of the region during Harappan times. In spite of the limited nature of some of the excavations, an astounding number of animal species are reported and a majority of them have contributed to the food economy of the people. The bones of rhinoceros, wild buffalo and probably the wild cattle suggest that conditions were more congenial for animal life, particularly for large herbivores, during the protohistoric period in Gujarat. The wild cattle reportedly missing from the Holocene period of India may have existed somewhere in this region. Representation of horse in the Harappan context possibly indicates that some of these sites were industrial and or trade centers. The faunal assemblage reveals a wide spectrum of animal exploitation from terrestrial to aquatic fauna. The evidence suggests the possible existence of husbandry practices related to the functional aspect of the site. The preponderance of cattle and their utilization for various purposes; sheep, goat and pig husbandry purely for meat; horse and ass as beasts of burden; dog as watch animal and the exploitation of other aquatic, avian and

Résumé

Subsistance animale dans la culture harappéenne de Gujarat, Inde.

À partir du spectre faunique de deux sites harappéens fouillés récemment dans le Gujarat, et en tenant compte des précédentes études de faunes d'autres sites harappéens, nous nous proposons ici de présenter une hypothèse sur le modèle de subsistance harappéenne. Cependant, on ne peut éviter une certaine ambiguïté due à la comparaison d'études anciennes avec les études récentes, en particulier en ce qui concerne les espèces, la stratigraphie et la quantification. Les assemblages fauniques de Shikarpur et Kuntasi ont mis en lumière une perspective intéressante sur la subsistance animale dans le passé, et, jusqu'à un certain point, sur l'environnement de la région à l'époque harappéenne. En dépit de la nature limitée de certaines fouilles, un nombre incroyable d'espèces animales a été identifié, dont une majorité a contribué à l'économie alimentaire des habitants. Les os de rhinocéros, de buffle sauvage et probablement les bovins sauvages suggèrent que les conditions étaient plus propices à la vie animale, en particulier pour les grands herbivores, pendant l'époque protohistorique à Gujarat. Les bovins sauvages absents à la période holocène de l'Inde ont pu exister dans cette région. La représentation du cheval dans le contexte harappéen indique peut-être que certains sites étaient des centres industriels ou commerciaux. L'assemblage faunique révèle un large spectre d'animaux exploités, depuis la faune terrestre jusqu'à la faune aquatique. Les données suggèrent l'existence possible de pratiques d'élevage liées à l'aspect fonctionnel du site. La prépondérance des bovins et leur utilisation à différentes fins, l'élevage du mouton, de la chèvre et du porc pour la viande, le cheval et l'âne

Zusammenfassung

Die auf Tieren basierende Subsistenz in der Harappa-Kultur von Gujarat, Indien.

Ausgehend von der Artenzusammensetzung in einigen neu gegrabenen Siedlungen der Harappa-Kultur in Gujarat wird unter Berücksichtigung früherer Studien versucht, ein Subsistenzmodell der Harappa-Kultur zu erstellen. Vergleiche mit älteren Ergebnissen können bezüglich Artbestimmmung, Mengenangaben und der Stratigraphie nur mit Vorsicht vorgenommen werden.

Faunenzusammensetzungen in Shikarpur und Kuntasi haben einige interessante Aspekte bezüglich der auf Tieren basierenden Subsistenz und bis zu einem gewissen Grade der Umwelt zur Zeit der Harappa-Kultur ergeben. Trotz der geringen Flächenausdehnung einiger Grabungen konnte eine erstaunliche Anzahl von Arten festgestellt werden. Ein Großteil kann mit der Ernährung des Menschen in Zusammenhang gebracht werden. Knochen von Rhinozeros, Wildbüffel und möglicherweise Wildrind deuten an, daß die Lebensbedingungen in Gujarat in prähistorischer Zeit für große Pflanzenfresser günstiger waren. Das Wildrind, welches es - wie bisher angenommen wird - im Holozän Indiens nicht gegeben hat, könnte in dieser Region gelebt haben. Das Vorkommen von Pferden im Kontext der Harappa-Kultur kann darauf hindeuten, daß einige dieser Siedlungen Industrie- und Handelszentren gewesen sind. Die Faunenzusammensetzungen offenbaren ein breites Spektrum der Nutzung von Tieren des Landes und des Wassers. Es deutet sich an, daß die Art der Tierhaltung mit der Funktion einer Siedlung zusammenhängt. Das Überwiegen von Rindern und ihre Nutzung für verschiedene Zwecke, die Haltung von Schafen,

-an College Postgraduate and Research Institute, Pune-411006, India.

terrestrial resources for food and industrial purposes, point to the planned economic strategy of the Harappans in Gujarat.

utilisés comme bêtes de somme, le chien comme animal de garde et l'exploitation d'autres ressources aquatiques, aviennes ou terrestres, à des fins alimentaires ou industrielles mettent en évidence une stratégie économique plannifiée par les Harappéens de Gujarat.

Ziegen und Schweinen zur Fleischgewinnung, Pferden und Eseln als Lasttiere, Hunden als Wachtiere und die Nutzung von anderen Land- und Wassertieren und Vögeln deuten auf eine durchgeplante Wirtschaftsstrategie der Harappa-Kultur in Gujarat hin.

Key Words

Gujarat, Harappan, Fauna, Animal husbandry, Subsistence, Environment.

Mots clés

Gujarat, Harappat, Faune, Elevage, Subsistance, Environnement.

Schlüsselworte

Gujarat, Harappa-Kultur, Fauna, Haustierhaltung, Subsistenz, Umwelt.

Introduction

In spite of the large number of excavations of the Harappan sites (fig. 1), precious little is known at present about the Harappan subsistence pattern based on animals. Although the earlier Harappan faunal studies have provided valuable information about the animals associated with this culture, the full scientific potential of the faunal remains has not been exploited, because of several reasons. This creates an ambiguity when the modern studies are compared with the older ones pertaining to the species, stratigraphy and the quantification. Here is such an attempt of comparison based on recently analysed faunal material from a couple of Harappan sites: Kuntasi and Shikarpur from Gujarat.

Kuntasi

Kuntasi is located almost at the boundary between Kutch and Saurashtra, on the right bank of river Phulki (Rajkot District, Gujarat). The present landscape here is essentially a flat alluvial plain with scrub vegetation on the black soil. The area is classified as semi-arid since the annual average rainfall is less than 600 mm, which is mainly the southwestern precipitation. At present there is very little forest cover in this district. Among the vegetation, accacia trees are common in the whole of the district. The wild fauna is highly diverse, where the mammals are ass, panther, hyena, wolf, jackal, fox, badger, wild pig, spotted deer, nilgai, blackbuck, gazella, porcupine, hedgehog, mongoose, rabbits, etc., and the birds such as bulbul, partridge, cotton teal, egret, king crow, hawk, flamingo, ibis, stork, etc. are reported (Anonyme, 1965).

The excavation at Kuntasi has brought to light mainly two cultural phases: the mature Harappan (c. 2300-1900 bc) and the late Harappan (c. 1900 - 1700 bc). Faunal material amounting more than 100,000 bone fragments were collected, however the present report is based on a part of this collection comprising mainly the material from the 1987-88 excavation.

The bones from different parts of the site show various modes of preservation, possibly because of water logging and other taphonomical factors. Nine domestic and 22 wild species of animals belonging to mammals, reptiles and birds have been identified at Kuntasi (tab. 1). In addition, a variety of fish and crabs, which could not be identified to the species level, were also found. The large quantity of molluscan shells collected at Kuntasi is being studied in detail and, so far, about 50 molluscan species have been identified.

Fig. 1: Map showing some of the important Harappan sites.

Table 1: Layer-wise distribution of animal species at Kuntasi.

+ = Present, – = Absent, ? = Species doubtful

Cultural Period	PERIOD II Late Harappan						PERIOD I Mature Harappan											
Phase	D						C			B		A						
Layer	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
Domestic animals																			
Felis domesticus (Cat)	–	–	–	–	–	+	–	–	–	–	+	–	–	–	–	–	–	–	–
Canis familiaris (Dog)	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–
Equus caballus (Horse)	+	+	–	–	+	–	–	+	–	+	–	+	–	–	–	–	–	–	–
Equus asinus (Ass)	+?	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–
Bos indicus (Humped cattle)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bubalus bubalis (Buffalo)	+	+	+	+	+	–	+	+	+	+	+	+	+	+	+	+	–	+	–
Bos/Bubalus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	–	+	+
Capra hircus (Goat)	+	+	+	+	+	+	+	+	+	+	+	–	+	–	+	–	–	–	–
Ovis aries (Sheep)	+	+	+	–	+	+	+	–	+	–	–	–	+	–	+	+	–	–	–
Capra/Ovis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	–	–	–	–
Camelus dromedarius (Camel)	–	–	–	–	–	–	?	–	–	–	–	–	–	–	–	–	–	–	–
Sus domesticus (Domestic pig)	+	+	–	+	+	–	+	+	–	+	+	+	+	–	–	–	–	–	–
Wild animals																			
Presbytis entellus (Common langur)	–	–	+	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Felis chaus (Jungle cat)	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Canis lupus (Wolf)	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Hyaena hyaena (Hyena)	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Lepus nigricollis (Hare)	+	–	–	+	–	–	+	+	–	–	–	+	–	–	–	–	–	–	–
Hystrix indica (Porcupine)	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Herpestes edwardsi (Mongoose)	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Equus hemionus (Onager)	+	+	–	–	–	–	–	+	–	+	–	+	–	–	–	–	–	–	–
Equus sp.	+	+	+	–	+	–	+	+	+	+	+	+	+	–	+	–	–	–	–
Rhinoceros unicornis (Rhinoceros)	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Bos sp. (Wild cattle)	+	–	+	–	+	+	+	+	+	–	–	–	–	–	–	–	–	–	–
Bubalus arnee (Wild buffalo)	–	–	–	–	–	–	–	–	+?	+?	+?	+?	–	–	–	–	–	–	–
Boselaphus tragocamelus (Nilgai)	+	+	+	+	+	+	+	+	+	+	–	+	+	+	–	–	–	–	–
Antilope cervicapra (Black–buck)	+	+	+	+	+	+	+	+	+	+	–	+	+	+	+	–	–	–	–
Gazella bennetti (Chinkara)	–	+	+	–	+	+	+	+	–	+	–	–	–	+	–	–	–	+	–
Tetracerus quadricornis (Chowsingha)	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cervus unicolor (Sambar)	–	+	+	–	–	+	–	+	–	–	–	+	+	–	–	–	–	–	–
Cervus duvauceli (Barasingha)	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–
Axis axis (Chital)	+	+	+	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Axis porcinus (Hog deer)	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
Muntiacus muntjak (Barking deer)	–	–	–	+	+	–	–	–	–	–	+	–	–	–	–	+	–	–	–
Sus scrofa (Wild pig)	–	–	+	–	+	+	+	–	–	–	–	+	+	+	–	–	–	+	–
Sus sp.	–	+	+	+	+	+	+	+	+	–	–	+	+	–	–	–	–	–	–
Pavo cristatus (Peacock)	–	–	–	+	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Birds	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Turtle/Tortoise	–	+	+	–	–	+	+	+	–	–	–	+	–	–	+	–	–	–	–
Crocodylus sp.	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Fish	+	+	+	+	+	+	+	+	+	+	–	–	+	+	+	–	–	–	–
Crab	–	+	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–

Shikarpur

Locally known as Valamiya Timbo, Shikarpur, located in the Bhachu Taluka of Kutch District, is about 5 km southwest of modern Shikarpur village. The excavation has revealed Harappan cultural debri of more than 3 m thick consisting of 19 layers. Though the excavation was of a limited frame, more than 15,000 bones were unearthed from the site.

The faunal assemblage here revealed (tab. 2) more than fourty five species of animals: twenty one species of mammals, three species of birds, two species of reptiles, five types of fish, thirteen species of molluscs, and one crustacean species.

A comparative study of the faunal material from Kuntasi and Shikarpur with that of the other Harappan sites of this region is essential to understand the different strategies adopted by the people depending on the nature of the site, location, economic conditions, ecological factors and social aspects. Table 3 gives a list of 16 Harappan sites for which the animal remains were reported, which includes a few sites outside Gujarat. The absence/presence/additional species in some of the sites cannot be taken seriously into consideration, since these studies were of an incomplete nature. For instance, at Rupar, Nath (1968) mentions horse and domestic ass in addition to the species listed in table 3. However, Dutta (1984), Sahu (1988) and Sharma (1989) do not mention the occurrence of these equids in the Harappan levels. According to them, these animals are represented in the succeeding Painted Grey Ware and Northern Black Polished Ware periods. Nath (1962-63) mentions presence of dog, ass, and sambar from period III, the Lustrous Red ware period at Rangpur. However, in his later report (1968) he mentions the presence of dog from the earlier cultural phase and the species of the deer in this report is *barasingha* in place of *sambar*. These two species of deer have different habitats. In an earlier report on the faunal remains of Surkotada (IAR, 1971-72: 21), animals like hyena, wild pig, nilgai and blackbuck were reported, whereas in the final faunal report (Sharma, 1990), there is no mention of these animals. This is only the tip of the iceberg of problems which illustrate the kind of discrepancies one often finds in the faunal reports, and the possible fallacies they may generate in interpretations.

Domestic animals

Cattle bones accounted for more than 70% (fig. 2) in the total collection of faunal remains from almost all protohistoric sites (Thomas and Joglekar, 1990). Like in other protohistoric cultural phases, cattle pastoralism was one of the main occupations for the Harappans of Gujarat, although there were industrial and trade centres among these sites. The utility of cattle as an economic strategy may have been manifold. In addition to the substantial contribution in the form of meat, these animals may have supported in agricultural operations and also as draught animals (Thomas, 1989). Their by-products like the milk, hide and dung were probably of economic value even though there are no direct evidences for their use at these sites. Thus the very docile nature of the animal may have been the reason for their over exploitation.

Cattle were slaughtered at different ages; however, the maximum representation was noticed of adult animals of 3-8 years old. This demonstrates that the secondary products of this animal were also significant in the Harappan economy. The presence of numerous first phalanges, as compared to the second and third in the collection, suggests the use of animal hide at the site. While removing the hide from the carcass, the third phalanges (and occasionally the second) were removed along with the hide. The qualitative sex determination was difficult on the bones since they were fragmentary. It may be possible at a later stage when all the measurements of cattle bones are statistically analyzed. Since both meat-bearing and non-meat bearing parts were equally represented in the collection, it can be presumed that cattle were butchered and consumed at the site (Thomas, 1979, 1984). So the importance of this animal in the general economic and social framework of the site may have been multiple.

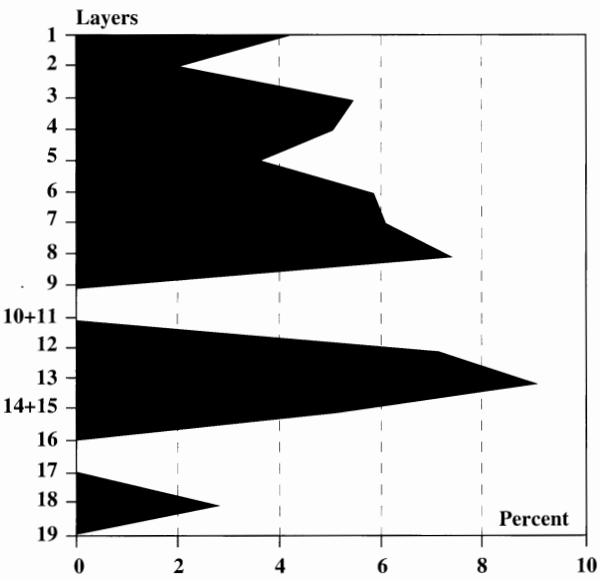

Fig. 2: Contribution of the aquatic fauna at Shikarpur.

Table 2: Animals in different layers at Shikarpur.

+ = Presence, – = Absence, * = Possibly wild cattle

SPECIES / LAYERS	1	2	3	4	5	6	7	8	9	10+11	12	13	14+15	16	17	18	19
Domestic animals																	
Bos indicus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	–	+	+
Bos/Bubalus	+	+	+	+	+	+	+	+	–	+	+	+	+	+	+	+	+
Bubalus bubalis	+	+	+	+	+	+	+	+	–	–	+	–	–	+	+	–	–
Capra hircus	+	+	+	+	+	+	+	+	–	–	–	–	–	+	–	–	–
Capra/Ovis	+	+	+	+	+	+	+	+	+	+	+	–	–	+	+	+	–
Ovies aries	+	+	+	+	+	–	+	–	–	–	–	–	–	+	–	–	–
Sus domesticus	+	+	+	+	+	+	+	–	–	–	–	–	–	–	–	–	–
Equus caballus	+	+	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
Canis familiaris	+	+	+	–	–	+	+	–	–	–	–	–	–	–	–	–	–
Gallus domesticus	+	–	+	–	–	+	–	–	–	–	–	–	–	–	–	–	–
Wild animals																	
Bubalus arnee	–	–	–	+	+	–	+	–	–	–	–	–	–	–	–	–	–
Bos sp.*	+	+	+	+	+	+	+	–	–	–	–	–	–	–	–	–	–
Boselaphus tragocamelus	+	+	+	+	+	+	–	+	–	–	–	–	–	–	–	–	–
Tetracerus quadricornis	+	+	+	+	+	+	+	–	–	–	–	–	–	–	–	–	–
Antilope cervicapra	+	+	+	+	+	+	+	+	–	–	–	–	–	+	+	–	–
Gazella bennetti	+	+	+	+	+	+	+	+	–	–	–	–	–	–	+	+	–
Axis axis	+	+	+	+	+	+	–	+	–	–	–	–	–	–	–	–	–
Axis porcinus	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Axis sp.	+	+	+	+	+	+	+	+	–	–	+	–	–	–	–	+	–
Cervus unicolor	+	+	+	+	+	+	+	+	–	–	–	–	–	+	–	–	–
Cervus/Axis	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Muntiacus muntjak	+	+	+	–	–	–	–	–	–	–	+	–	–	–	+	–	–
Sus scrofa	+	+	+	+	+	+	+	+	–	–	+	–	–	–	–	+	–
Canis aureus	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Rattus rattus	+	–	+	–	–	–	–	–	–	–	–	+	–	–	–	–	–
Lepus nigricollis	+	–	–	+	–	+	–	–	–	–	–	–	–	–	–	–	–
Equus hemionus	+	+	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Rhinoceros unicornis	+	–	+	+	+	+	+	–	–	–	–	–	–	–	–	–	–
Pavo cristatus	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Grus grus	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–
Trionyx gangeticus	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Crocodylus porous	+	–	–	–	–	+	+	–	–	–	–	–	–	–	–	–	–
Lamellidens sp.	–	+	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
Cerithiidae sp.	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Indoplanorbis exustus	+	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–
Paphia gallus	+	+	+	+	+	+	–	+	–	–	–	–	–	–	–	+	–
Thias (Cymia) carinifera	+	–	–	+	+	+	–	–	–	–	–	–	+	–	–	–	–
Telescopium telescopium	+	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–
Anadara rhombea		–	+	–	+	–	–	–	–	–	–	–	–	–	–	–	–
Monetaria moneta	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Chicoreus ramosus	–	+	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Ellobium aurisjudae	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–
Polinices didyma	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Dentalium sp.	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
Turbinella pyrum	+	+	+	+	+	+	+	–	+	–	–	+	–	–	–	+	–

The overall representation of buffalo bones, though sparse, was similar to those of cattle and have been represented in a majority of Harappan sites. Often from the fragmentary faunal collection it is challenging to separate out certain bones and dentition of cattle from those of buffalo because of close morphological similarities (Thomas, 1977). Buffalo bones may represent about 5-10% in the total collection at Kuntasi and Shikarpur.

Mutton was usually the second most important item preferred in the food economy since bones of sheep and goat are found at all the sites. Again from the archaeological faunal samples it is often difficult to distinguish between these two species. However, the clues on some of the bones (Boessneck, 1969) suggest that, at least at Kuntasi and Shikarpur, goat bones were more numerous in the collection than those of sheep. Unlike cattle, sheep and goats were killed relatively at a younger age which shows that they were preferred for meat rather than for their secondary products like milk, wool, etc. The collection comprises both meat-bearing and non-meat bearing parts in almost equal proportion, which indicates rearing and slaughtering of these animals within the settlement.

Pork consumption was common among the Harappans. At Kuntasi and Shikarpur domestic and wild pigs were in the ratio of 2:1. The piglets killed probably belonged to the domestic species, identified thanks to a large number of their dentition. The presence of more meat-bearing parts of the wild pigs in the settlement area suggests that the kill-site was located away from the habitation area and only the parts having meat were carried into the settlement.

Dog bones were identified at almost all the Harappan sites and were devoid of any human activity on them. These bones got mixed with the kitchen refuse probably because of the scavenging and predatory activities (Thomas, 1975). Domestic cat was reported from a couple of sites, however, its role in the diet of Harappans is not certain, and unlikely.

Camel bones are reported from six of the Harappan sites mentioned in table 3. Their convincing association with the typical Harappan culture is a matter of controversy (Meadow, 1984; Sathe and Atre, 1989). A calcaneum of a camel is reported from the slope of the eastern side of the main mound at Kuntasi. At present it is difficult to establish its cultural context, since the sample had no stratigraphical control. The identification of camel at Rojadi is also enigmatic (Kane, 1989).

Ass and horse are reported from the mature and late Harappan phases of some of the sites. The presence of these beasts of burden probably accelerated the mobility of the people and helped them in trade as well as in transport. However, the level of contribution of this animal in the diet of the Harappans is not known, since only very few bones of these animals are found in the Harappan faunal materials. The presence of other species of equids like *Equus asinus* and *Equus hemionus* in this region and bones of which in the collection, makes the precise species identification rather difficult and they are misinterpreted when one is working without the reference skeletons of modern animals. Horse bones found in the Harappan context are often the lower limb extremities. From Kuntasi as well as from Shikarpur bones of wild ass with cut marks and charring have been found in the collection suggesting hunting of these animals for food purposes.

Another domestic species which is usually associated with the Harappan culture is the domestic fowl and is reported from quite a few sites. At Khanpur and Babarkot the species identification is not certain.

Wild animals

In addition to the domestic stock of animals the Harappans exploited numerous species of wild mammals for food as shown in table 3. Generally the ratio of bones of domestic to wild animals is approximately 4:1. The composition of the wild fauna differs from site to site. Bones of elephant, rhinoceros, wild buffalo and probably wild cattle and several species of antelopes, deer, carnivores, primates and rodents were reported from a majority of Harappan sites from Gujarat. Furthermore, the aquatic and avian resources were not spared. Bones of various birds, turtle, fish, crab and molluscs were associated with the kitchen refuse. The coastal sites have yielded abundant fish remains. Some of these sites are also known for their shell industry. Hence the molluscan species have been exploited for industrial as well as for food purposes.

Numerous shell fragments were collected at Kuntasi and Shikarpur belonging to three major classes of phylum Mollusca such as Bivalvia, Gastropoda and Schaphopoda. They were represented by various families and at least 50 species. Shells in general show good preservation, although the external designs and colour were obliterated to a greater extent due to taphonomical factors.

Bivalve species such as *Anadara rhombea, Trachycardium enode, Paphia gallus, Meretrix meretrix, Marcia recens, Lamellidens marginalis, Crassostrea cuttackensis,* etc. were represented in almost all the layers in large quantities. A majority of these species could have been utilized for food purposes, although further ethnographic investigation is necessary for confirmation. Among the gastropods, the marine species like *Turbinella pyrum, Pugilinus bucephalus, Telescopium telescopium, Erosaria lamarkii,*

Table 3: Faunal account of mammals at Harappan sites.

MHJ: Mohenjodaro (Sewel and Guha, 1931); HPA: Harappa (Prashad, 1936; Meadow, 1991); KLB: Kalibangan (Sahu, 1988); RPR: Rupar (Sharma, 1989); BAR: Bara (Nath, 1968); AGR: Alamgirpur (Sahu, 1988); BKT: Babarkot (Ryan, in press); RGR: Rangpur (Nath, 1963); LTL: Lothal (Nath, 1968); KTS: Kuntasi (present authors); SKD: Surkotada (Sharma, 1990); NGR: Nageshwar (Shah and Bhan, 1992); SKR: Shikarpur (present authors); OTB: Orio Timbo (Rissman, 1985); KPR: Khanpur (Thomas, 1977); RJD: Rojdi (Kane, 1989); MVN: Malvan (Alur, 1990); PDR: Padri (Joglekar, in press). + = Presence; – = Absence, ? = Species doubtful.

	MHJ	HPA	KLB	RPR	BAR	AGR	RGR	LTL	KTS	SKD	NGR	OTB	KPR	RJD	MVN	BKT	SKR	PDR
Domestic animals																		
Canis familiaris	+	+	+	+	–	+	+	+	+	+	+	–	–	+	+	+	+	+
Felis domesticus	–	+	–	–	–	–	–	–	–	–	–	–	–	+?	–	–	–	–
Camelus dromedarius	+	+	+	–	–	–	–	–	+	+	–	–	–	+?	–	–	–	–
Equus caballus	+	+	+?	–	–	–	–	+	+	+	–	–	–	–	+	–	+	–
Equus asinus	–	+	+	–	–	–	+	–	+	+	–	–	–	–	–	–	–	–
Sus domesticus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	–	+	+	+
Bos indicus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bubalus bubalis	+	+	+	+	+	+	+	+	+	–	+	+	+	+	–	+	+	+
Ovis aries	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Capra hircus	–	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Wild animals																		
Presbytis entellus	–	–	–	–	–	–	–	–	+?	–	–	–	–	–	–	–	–	–
Cuon alpinus	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
Canis aureus	–	+	–	–	–	–	–	+	–	+	–	–	–	+	–	–	+	+
Canis lupus	–	+	–	–	–	–	–	–	+?	+	–	–	–	–	–	–	–	+
Hyaena hyaena	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–
Felis chaus	–	–	–	–	–	–	–	–	+?	–	–	–	–	–	–	–	–	–
Felis libyca	–	–	–	–	–	–	–	–	–	–	–	–	–	+?	–	–	–	–
Elephas maximus	+	+	+	+	+	–	–	+	–	+	–	–	–	+?	–	–	–	–
Rhinoceros unicornis	–	+	+	–	–	–	–	+	+	+	–	+?	+	–	–	–	+	–
Equus hemionus	–	–	–	–	–	–	–	–	+	+	–	–	–	+	–	–	+	–
Sus scrofa	–	–	–	–	–	–	–	–	+	–	–	–	+	+	+	+	+	+
Bos sp.	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	+	–
Bubalus arnee	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	+	–
Muntiacus muntjak	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	+	–
Cervus unicolor	+	–	–	–	–	–	+	+	+	–	+	+?	–	+?	–	–	+	–
Cervus duvauceli	–	+	+	–	–	+	–	–	+?	–	–	–	–	+?	+	–	–	–
Cervus elaphus hanglu	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Axis axis	+	–	+	–	–	+	–	+	+	+	+	–	–	+	+	+	+	+
Axis porcinus	+	–	–	–	–	–	–	–	+	–	–	–	–	+	–	–	+	–
Boselaphus tragocamelus	–	–	–	–	–	–	–	+	+	–	+	+	–	+	–	+	+	+
Gazella bennetti	–	–	–	–	–	–	–	–	+	–	+	+?	+	+?	–	+	+	–
Tetracerus quadricornis	–	–	–	–	–	–	–	–	+	–	–	–	–	+?	–	+	+	–
Antilope cervicapra	–	–	–	–	–	–	–	–	+	–	+	+?	–	+?	–	+	+	+
Hystrix indica	–	–	–	–	–	–	–	–	+	–	–	–	–	+	–	–	–	–
Suncus stoliczkanus	+	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–
Lepus nigricollis	–	–	–	–	–	–	–	+	+	+	+	+	–	+	–	+	+	+
Herpestes edwardsi	+	+	–	–	–	–	–	+	+	+	–	–	–	–	–	+	–	+
Rattus rattus	+	+	–	+	–	–	–	+	–	+	+	–	–	+	–	+	+	+
Bandicota indica	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+

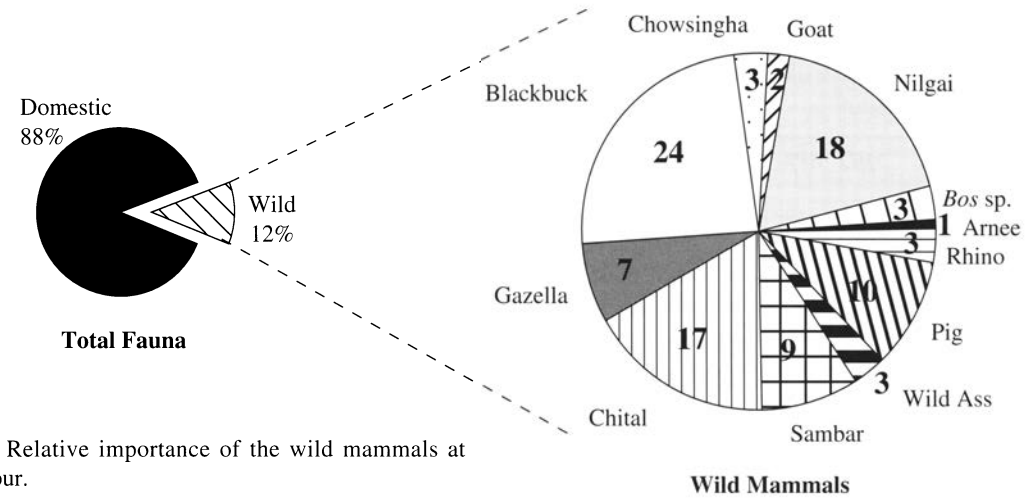

Fig. 3: Relative importance of the wild mammals at Shikarpur.

Aqaronia nebulosa, Lophiostoma sp. and the fresh water *Melania striatella tuberculata* and *Zootecus insularis* were most common. Their occurrence could be partially attributed to the manufacture of shell objects. Shell bangles made out of *Turbinella pyrum* and *Pugilinus bucelaphus* and beads made out of *Aqaronia nebulosa, Erosaria lamarkii*, etc. were collected in large number at Kuntasi. The vast amount of complete shells, finished and unfinished shell objects, and waste products of shell manufacture at the site would indicate a well developed shell industry at Kuntasi. The role of shell industry and its extent in the general framework of the site cannot be judged at this juncture as the study is still in progress (Ms. Arati Deshpande's doctoral dissertation programme).

Both at Kuntasi and Shikarpur, a few bones of cattle such as humerus, astragalus and metapodials revealed characters which were uncommon in domestic cattle. Apparently some of these bones were also larger in size suggesting the possibility of some affinity with their wild counterparts or that these animals were in the early stage of domestication. However, the impact of individual, functional and/or breed differences cannot be ruled out at this stage (detailed investigation in this regard is being carried out by Y. Matsushima for his doctoral degree).

However, the role of the big mammals like the elephant, rhinoceros, etc. in the food economy is doubtful as the number of bones of these animals are sparse in the collection and probably the bones were brought into the site for other functions such as making bone tools and bone objects. Such bone objects have been reported from a number of Harappan sites.

Conclusion

In general, the representation of wild animals in the northern group of Harappan sites shows slight variation from those sites in the Saurashtra Kutch group. The typical semi-arid animals like the blackbuck, gazelle, nilgai, etc. are not identified from the northern group of sites like Harappa, Kalibangan, Rupar, Alamgirpur, etc. Probably this can be attributed to the different ecological settings of these sites. A majority of the deer species and the domestic animals like cattle, sheep, goat and pig are common at all the sites. The Harappans were well aware of the multiple utility of cattle. The importance of this animal can be further deduced from its depiction in terracotta and seals, unearthed from a majority of archaeological sites. Horse, an important animal in the Harappan context to the archaeologists and historians, was identified at Mohenjodaro, Harappa, Rupar, Lothal, Kuntasi, Surkotada and Malvan. More than anything else, the representation of horse and ass in the Harappan sites probably indicates that some of these sites were industrial and/or trade centers, as these animals can accelerate the mobility of the people. On the other hand, at least a few of the other contemporary sites where horse has not been represented were primarily agro-pastoral settlements catering to the food requirements of the industrial/commercial centers.

Elephant bones and ivory were reported from a number of sites; however these were associated with craftsmanship and probably were trade items acquired through commercial activities. Rhinoceros was also reported from a number of Chalcolithic and Harappan sites in Gujarat. This animal inhabited a major part of the Gujarat plains in the protohistoric period and in the medieval period it was restricted to certain ecological niches. The strips of grass land along the banks of the rivers may have supported the habitat of animals like rhino and wild buffalo during the Harappan cultural period (Chitalwala, 1977, 1990).

Interestingly the aquatic and avian resources were also exploited by the population to supplement the food economy. Fishing, hunting and snaring of birds and exploitation of molluscan species for food and industrial purposes assumed greater importance in the Harappan and late Harappan periods. From the type of activities identified, it can be presumed that social stratification and division of labour prevailed during Harappan cultural phase. Shell industry was one of the major activities in some sites followed by animal husbandry, arable farming, pottery making, hunting and fishing.

The fauna represented at Kuntasi in different cultural periods (tab. 1) reveals some interesting features. Only a few animal species were represented between layers 14 to 19, while a moderate increase has been noticed between layers 9-13. However, the maximum representation of animal species is found between layers 1-8. According to the archaeozoological evidences for subsistence strategies, the whole cultural deposit at Kuntasi can be divided into the above mentioned three major units. The maximum exploitation of wild fauna was noticed in the late Harappan period. Similar pattern of animal exploitation has also been noticed at Rangpur, Surkotada, Nageswar, Mohenjodaro, etc. Culturally the late Harappan period marks the decline of the Harappan culture at these places and probably the culture degenerated to a greater extent. This could be noticed in their economy, agriculture, industrial and commercial activities and social aspects. The failure in agriculture may have been due to environmental degradation caused by the prolonged human interference with the nature and also due to the erratic behaviour of the monsoon rains. Another reason for the over-exploitation of the animal world in the late Harappan period may have been due to the pressure of population. In such conditions the people had to depend more on animal food for sustenance (Thomas, 1988).

Climatically there may not have been much of change in the area under study. Animals like nilgai, gazelle, and blackbuck are typical semi-arid species and their bones have been found in abundance at Kuntasi. A few bones of other animals like wild buffalo, rhinoceros, probably wild cattle, etc. have also been identified. The grass land along the river banks suited these animals and the conditions may have been much more congenial for animal life in the prehistoric times. It is quite possible that some of these animals, especially the wild cattle, reportedly missing from the Holocene period of India, may have existed somewhere in this region in the pre- and protohistoric periods (Joglekar and Thomas, 1992).

This preliminary observation on the faunal remains from Harappan sites reveals a wide spectrum of animal exploitation from terrestrial to aquatic fauna. The evidence from excavation has amply demonstrated the possible existence of husbandry practices related to the functional aspect of the site. The dominance of cattle and their utilization for various purposes, domestication of sheep, goat and pigs purely for meat, horse and ass as beasts of burden, dog as a watch animal and the exploitation of other aquatic, avian and terrestrial resources for food and industrial purposes, point to the planned economic strategies of the Harappans in Gujarat.

Bibliography

ALUR K. R., 1990.– *Studies in Indian archaeology and palaeontology*. Dharwad : Shrihari Prakashana.

ANONYME, 1965.– *Rajkot District Gazetteer, Gujarat State 1965*. Ahmedabad : Government of Gujarat.

BOESSNECK J., 1969.– Osteological differences between sheep (*Ovis aries* Linnaeus) and goats (*Capra hircus* Linnaeus). *In* : E. Brothwell and E. Higgs eds., *Science in Archaeology*. London : Thames and Hudson, p. 331-358.

CHITALWALA Y. M., 1977.– Harappan and post-Harappan settlement patterns. *In* : D. P. Agrawal and M. Pande eds., *Ecology and archaeology of Western India*. New Delhi : Concept Publishers, p. 93-98.

CHITALWALA Y. M., 1990.– The disappearance of Rhino from Saurashtra : a study in palaeoecology. *Bulletin of the Deccan College Post-Graduate and Research Institute*, 49 : 79-82.

DUTTA B. C., 1984.– *Rupar : Ancient cultural complex of India*. Calcutta : B. C. Dutta, p. 53.
IAR, 1971-1972.– *Indian archaeology : a review*. New Delhi : Archaeological Survey of India, p. 21.
JOGLEKAR P. P., in press.– Faunal remains from Padri : a second preliminary report. *Bulletin of the Deccan Post-Graduate and Research Institute.*
JOGLEKAR P. P. and THOMAS P. K., 1992.– Ancestry of *Bos* species : myth and reality IV. The origins of humped cattle. *Man and Environment*, 17 (1) : 51-54.
KANE V. S., 1989.– Animal remains from Rojdi. *In* : G. L. Possehl and M. H. Raval eds., *Harappan Civilization and Rojdi*. New Delhi : Oxford and IBH, p. 182-184.
MEADOW R. H., 1984.– A camel skeleton from Mohenjodaro. *In* : B. B. Lal and S. P. Gupta eds., *Frontiers of the Indus civilization*. New Delhi : The Indian Archaeology Society, p. 133-139.
MEADOW R. H., 1991.– Faunal remains and urbanism at Harappa. *In* : R. H. Meadow ed., *Harappa excavations 1986-1990*. Madison : Wisconsin Prehistory Press, p. 89-106.
NATH B., 1962-1963.– Animal remains from Rangpur. *Ancient India*, 18-19 : 153-160.
NATH B., 1968.– Advances in the study of Prehistoric and Ancient animal remains in India : a review. *Records of the zoological survey of India*, 61 : 1-63.
PRASHAD B., 1936.– Animal remains from Harappa. *Memoirs of the archaeological survey of India*, 51 : 1-60.
RISSMAN P., 1985.– *Migratory pastoralism in western India in the Second Millennium B.C. : the evidences from Oriyo Timbo (Chiroda)*. Ph. D Dissertation, University of Pennsylvania, USA.
RYAN K., in press.– Faunal analysis. *In* : G. L. Possehl and M. H. Raval eds., *Report on the excavations at Babarkot; 1990-1991*. New Delhi : Archaeological Survey of India.
SAHU B. P., 1988.– *From hunters to breeders*. New Delhi : Anamika Prakashan.
SATHE V. G. and ATRE S., 1989.– The problems of camel in the Indus civilization. *Bulletin of the Deccan College Post-Graduate and Research Institute*, 47-48 : 301-306.
SEWELL R. B. S. and GUHA B. S., 1931.– Zoological remains. *In* : John Marshall ed., *Mohenjodaro and the Indus civilization. II*. London : Arthur Probsthain, p. 649-673.
SHAH D. R. and BHAN K. K., 1992.– Faunal remains. *In* : K. T. M. Hegde, K. K. Bhan, V. H. Sonawane, K. Krishnan and D. R. Shah eds., *Excavation at Nageswar, Gujarat : a Harappan shell working site on the gulf of Kutch*. Baroda : M.S. University Archaeology Series No. 18, p. 145-47.
SHARMA A. K., 1990.– *Animal bone remains. Excavations at Surkotada 1971-1972 and explorations in Kutch*. Memoirs of Archaeological Survey of India : New Delhi : Archaeological Survey of India, p. 372- 383.
SHARMA Y. D., 1989.– Rupar. *In* : A. Ghosh ed., *An Encyclopaedia of Indian Archaeology, 2*. Delhi : Munshiram, p. 377-381.
THOMAS P. K., 1975.– Role of animals in the food economy of the Mesolithic culture of western and central India. *In* : A. T. Clason ed., *Archaeozoological studies*. Amsterdam : North Holland Publishing Company, p. 322-328.
THOMAS P. K., 1977.– *Archaeological aspects of the Prehistoric culture of western India*. Ph. D. Dissertation, University of Poona (Pune).
THOMAS P. K., 1979.– Archaeozoological aspects of the prehistoric culture of Prabhas Patan. *In* : M. Kubasiewicz ed., *Archaeozoology, Vol. I.* Szezecin, Poland : Agricultural Academy, p. 176-86.
THOMAS P. K., 1984.– Faunal background of the Chalcolithic culture of Western India. *In* : J. Clutton Brock and C. Grigson eds., *Animals and Archaeology, 3*. England : British Archaeological Review 202, p. 355-61.
THOMAS P. K., 1988.– Faunal Assemblage. *In* : M. K. Dhavalikar, H. D. Sankalia eds., *Excavation at Inamgaon, I, Pt ii*. Pune : Deccan College Postgraduate and Research Institute, pp. 822- 961.
THOMAS P. K., 1989.– Utilization of Domestic Animals in Pre-and Protohistoric India. *In* : J. Clutton Brock ed., *The Walking Larder : Patterns of Domestication, Pastoralism and Predation*. London : Unwin Hyman, p. 108-112.
THOMAS P. K. and JOGLEKAR P. P., 1990.– Faunal Remains. *In* : M. K. Dhavalikar, V. Shinde and S. Atre eds., *Excavations at Kaothe*. Pune : Deccan College Postgraduate and Research Institute, p. 233-264.