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The faunal remains from several sites at Jebel Shaqadud (Central Sudan): a preliminary report

The present report deals with the faunal remains collected in three sites at Jebel Shaqadud, excavated by the Joint University of Khartoum/Southern Methodist University Butana Archaeological Project (Marks *et al.* 1982; 1983). The sites are located some 13 km east of Meroitic Naga at the southern end of an irregular, elongate sandstone outcrop, approximately 50 km into the Butana. Most of the remains were obtained from three occupation stages: S-21, a site on the plateau that surrounds the valley of Shaqadud Cave; S1-B, in front of the cave; and S1-A, the cave itself. The C-14 dates, obtained by charcoal analysis, range from approximately 7,400 B.P. for the older deposits (S-21) to $\pm 3,600$ B.P. for the younger ones (S1-A, upper unit). More detailed information concerning the geology, lithology, C-14 dates, pottery and botanical remains can be found elsewhere (Magid 1984; this vol.; Mohammed-Ali and Marks 1984; Marks *et al.* 1985; Hays, this vol.; Marks, this vol.).

Most of the molluscs, turtle and bird remains were analysed respectively by T. Pain (London), F. de Broin (Paris) and D. Mathiessen (Gainesville). All other identifications could be made with the aid of comparative collections available to us.

The faunal remains consist primarily of mammalian bone fragments (Table 1). Most of these accumulated through human intervention and can therefore be considered kitchen offal. The Shaqadud site catchment included the adjacent sandstone outcrops, a considerable wadi separated from the Nile by low undulating hills and a part of the western Butana plain. The absence of fish, freshwater turtles such as Nile soft turtle, crocodile, hippopotamus, kob and sitatunga (typical for the Nile, *cf.* Gautier, this volume, Table 1) clearly indicates that the Nile and its alluvial plains were not included in the site catchment. The presence, however, of certain bivalves such as *Aspatharia* suggests some form of contact with the Nile, for this river is the nearest suitable habitat where these clams could be collected.

The faunal sequence at Shaqadud can be divided into two stages. The first comprises S-21 and the midden (except for S-1-B/IV, representing a mixed sample) and reflects hunting-gathering practises. Game animals are dominated by small

and large antelopes such as oribi, greater kudu, roan antelope and alcelaphines, as well as warthog, porcupine and giraffe. Turtles and the freshwater gastropod *Pila* were also collected. Except for one incomplete long bone of a goat (S1-B/III), livestock seems to be absent. Two hypotheses can be put forward to explain this isolated find. First, the Shaqadud people may have had connections with pastoralists from whom they obtained a goat. Second (small) livestock was already incorporated in the economy of the site, but it was limited in number and kept mainly for dairy products.

The second stage, confined to the cave, reflects a mixed economy during which hunting-gathering as well as livestock herding were practised. Gazelle and giraffe were hunted most frequently, but large antelopes, porcupine, hare and aardvark were added to the hunters' bag. Livestock never exceeds 15% of the total number of mammalian remains.

The composition of the subsequent assemblages underwent considerable changes in the course of time. On the basis of the ecological requirements of the species encountered, we can assume that between 7,400 B.P. and 3,600 B.P. the Shaqadud environment shifted from a rather humid grass savanna with tree stands, requiring an annual rainfall of some 450 - 500 mm, towards a dry savanna with an estimated average rainfall of 350 mm at the time the cave sediments were deposited. This shift can be ascribed to deteriorating climatic conditions, perhaps combined with the negative effects of livestock on the vegetation.

The faunal spectrum also reflects that the environment provided different resources, enabling people to adopt a diffuse economy *sensu* Cleland (1976). Such economies are characterized by a careful scheduling in time and space to maximize the exploitation of the available resources. However, the available evidence for resource scheduling in time and space is rather inconclusive. We can assume that turtles as well as the freshwater gastropod *Pila* were most easily harvested at the end of the dry season or at the beginning of the rainy one since their habitats were then most easily accessible. Antelope and giraffe hunting may have been especially rewarding towards the end of the dry season when these animals tend to concentrate near water. The presence of large numbers of landsnails such as *Limicolaria cailliaudi* and *Zonitarius cf. cailliaudi*, which lived and aestivated at the sites, furthermore indicate that these were probably abandoned from time to time, suggesting scheduling in space.

On the basis of the foregoing, several exploitation models can be put forward to explain the encountered assemblage. The first model sees Shaqadud as a dry season camp, re-occupied for a long period. For the older deposits (S-21, S1-B) *Pila* and perhaps turtle gathering might then represent dry season activities, while game hunting may have been rewarding especially towards the end of the dry season, as mentioned above. The presence of livestock in the younger cave deposits (S1-A) and probably also in the midden (a goat radius) could provide an additional argument for a dry season occupation. If livestock herding would be practised all year

round at Shaqadud, the grazing pressure on the vegetation may easily have exceeded its capacity for regeneration, resulting in overgrazing. Prehistoric herdsman could avoid such ecological disturbance by dispersing during the wet seasons and returning to places where the presence of water is predictable during the dry season. Such an exploitation model suggests the involvement of a Butana based group rather than a Nilotic group, since the latter were probably moving away from the Nile during the wet season (Gautier 1983).

The second model interprets Shaqadud as a wet season camp in which much of the *Pila* and turtle gathering took place at the beginning of the rainy season. Rainfall, moreover, certainly resulted in a rich grass cover and abundant flowering of plants and trees, attractive to hunter-gatherers as well as to pastoralists. If this hypothesis is accepted, Nilotic or Butana based groups could be involved.

The third alternative sees Shaqadud as a site that was regularly re-used for prolonged periods unrelated to the seasonal cycle. The large size of the sites, the thickness of the deposits and the considerable amount of potsherds and lithics could be adduced to defend this view. Moreover, as noted by Gautier (*ibid.*), site permanence does not exclude resource scheduling in the site catchment itself by smaller groups abandoning the settlement from time to time for activities at appreciable distance from it. However, things may have been more complicated and periods of occupation may have changed in the course of time, with, for example, wet seasons occupation or site permanence during the first stage and dry season occupation during the second one.

More detailed knowledge of the ecological requirements, habits and life cycles of the various potential biological resources as well as careful research on other prehistoric sites along the Nile and in the Butana plain are needed to establish which of the proposed exploitation models or combinations thereof is to be preferred.

A comparison of the archaeofaunas from the Central Sudanese Nile (Gautier this volume, Table 1) with those from Shaqadud bears out two important facts. First of all, the Nile environment provided more varied resources because of its higher ecological diversity. This is well illustrated by the importance of fish which are completely absent at Shaqadud. Second, remains of livestock are restricted in the Shaqadud sequence and make their appearance later than along the Nile. If the people occupying Shaqadud were not coming from the Nile, the foregoing implies that pastoralism was adopted later and to a lesser degree than along the Nile. If they were coming from the Nile, we can assume, as has been argued above, that occupation was in the wet season and that the pastoralists relied primarily, if not almost completely, on hunting for their meat supply.

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Absolute frequencies of animal remains from three sites at Jebel Shaqadud (Central Sudan), based on specimen counts

ANIMAL GROUP/SPECIES		SITE OR EXCAVATION UNIT								
		S-21	S1-B				S1-A			TOTALS
			I	II	III	IV	I	II	III	
MARINE GASTROPODS	<i>Strombus gibberulus</i>	1	-	-	-	-	-	-	-	1
	Cowrey (<i>Cypraea annulus</i> or <i>C. moneta</i>)	-	-	-	1	-	-	-	-	1
FRESHWATER GASTROPODS	<i>Pila</i> sp. (including <i>Pila werneri</i>)	FF	F	F	F	R	R	R	-	FF
	<i>Cleopatra bulimoides</i>	-	-	-	1	-	-	-	-	1
FRESHWATER BIVALVES	<i>Aspatharia</i> sp.	-	3	7	5	-	-	-	-	15
	Large bivalve	7	±30	±45	±30	2	3	±15	1	±130
	<i>Caclatura aegyptiaca</i>	-	-	1	-	-	-	-	-	1
	<i>Corbicula consobrina</i>	-	-	-	-	-	1	-	-	1
LAND SNAILS	<i>Zooteucus insularis</i>	±120	2	2	3	1	8	3	-	±140
	<i>Limicolaria cailliaudi</i>	F	FF	FF	FF	R	R	R	P	FF
	<i>Zonitarius</i> sp., probably <i>Z. cailliaudi</i>	-	±35	±60	±15	-	-	-	-	±110
AMPHIBIANS	Frogs and/or toads	-	3	17	55	2	-	-	-	77
REPTILES	Terrapin (<i>Pelusios</i> sp.)	-	2?	-	-	-	-	3	-	5
	Hinged tortoise (<i>Kinixys</i> sp., probably <i>K. belliana</i>)	-	-	-	3	-	-	-	-	3
	African spurred tortoise (<i>Geochelone sulcata</i>)	-	-	-	-	-	-	74	-	74
	African spurred? tortoise (<i>Geochelone</i> sp., probably <i>G. sulcata</i>)	-	-	-	-	-	13	-	3	16
	True tortoise (Testudinidae <i>indet.</i>)	-	-	-	-	-	-	1	-	1
	Cape monitor (<i>Varanus exanthematicus</i>)	4	2	2	27	-	1	1	-	37
	Snakes (Serpentes <i>indet.</i>)	1	1	-	6	-	-	-	-	8
BIRDS	Pelican (<i>Pelecanus</i> sp.)	-	-	-	1	-	-	-	-	1
	Clapperton's francolin (<i>Francolinus clappertoni</i>)	-	-	-	1	-	-	-	-	1
	Helmeted Guineafowl (<i>Numida meleagris</i>)	4	1	-	7	-	1	2	-	15
	Dove (<i>Streptopelia</i> sp.)	-	-	-	1	-	-	-	-	1
	Owl (Strigidae <i>indet.</i>)	-	1	-	-	-	-	-	-	1
	Crow (<i>Corvus</i> sp.)	-	-	-	-	-	-	1	-	1
	Birds (Aves <i>indet.</i>)	1	-	-	-	-	-	2	1	4
	Ostrich (<i>Struthio camelus</i> ; egg shell fragments)	2	3	3	10	-	19	58	28	123
WILD MAMMALS	Bats (Chiroptera <i>indet.</i>)	-	-	-	2	-	-	-	-	2
	Small cercopithecoid (<i>Cercopithecus</i> sp.)	-	-	-	2	-	-	-	-	2
	Hare (<i>Lepus</i> sp.)	-	-	-	1	-	5	7	-	13
	Striped ground squirrel (<i>Euxerus erythropus</i>)	-	-	-	1	-	-	1	-	2
	Nile (grass) rat (<i>Arvicanthis niloticus</i>)	-	-	-	1	-	-	-	-	1
	Large gerbil (<i>Tatera</i> sp.)	-	-	-	2	-	-	-	-	2
	North African porcupine (<i>Hystrix cristata</i>)	4	3	2	25	-	3	24	2(1)	64
	Cane rat (<i>Thryonomys</i> sp., probably <i>T. gregorianus</i>)	2	-	-	-	-	-	-	-	2
	Small rodents	-	-	-	7(2)	-	-	1	1(2)	13
	Medium rodents	-	1	-	2	-	2	-	-	5
	Honey badger (<i>Mellivora capensis</i>)	-	-	-	1	-	-	-	-	1
	Slender mongoose (<i>Herpestes sanguineus</i>)	-	-	-	2	-	-	-	-	2
	Genet (<i>Genetta</i> sp.)	-	-	-	3	-	1	-	-	4
	Medium viverrids	1	-	1	3	-	1	-	-	6
	Striped hyena (<i>Hyaena hyaena</i>)	-	-	-	-	-	-	4	1	5
	(African) wild cat (<i>Felis silvestris</i>)	5	-	-	-	-	2	-	-	7
	Medium felids	-	-	-	4	-	-	-	-	4
	Small carnivores	1	-	-	2	-	1	1	-	5
	Medium carnivores	-	2	-	-	-	-	-	-	2
	Aardvark (<i>Orycteropus afer</i>)	-	-	-	-	-	-	5	2	7
	African elephant (<i>Loxodonta africana</i>)	4	-	-	-	-	-	-	-	4
	Warthog (<i>Phacochoerus aethiopicus</i>)	1	-	-	2	-	-	-	1	4
	Suid(a), probably warthog	5	-	-	4	-	-	-	-	9
	Giraffe (<i>Giraffa camelopardalis</i>)	1(1)	-	2	1	-	2	4(2)	29(3)	81
	Common bush duiker (<i>Sylvicapra grimmia</i>)	-	-	-	1	-	-	-	-	1
	Oribi (<i>Ourebia ourebi</i>)	11(1)	-	1	8(3)	-	-	-	-	24
	Small antelopes	45(15)	4	5(2)	4 1(10)	-	3	-	-	125
	Gazelle, mainly red-fronted gazelle (<i>Gazella rufifrons</i>)	-	-	-	-	2	18	43(3)	13(1)	80
	Medium antelopes	6	-	2(1)	6	1	12	28	4	60
	Greater kudu (<i>Tragelaphus strepsiceros</i>)	-	-	-	15	-	-	-	-	15
	Roan antelope (<i>Hippotragus equinus</i>)	3	-	1	-	-	-	-	-	4
	Topi and/or hartebeest (<i>Damaliscus lunatus</i> / <i>Alcelaphus buselaphus</i>)	11	1	-	2	-	-	-	-	14
	Large antelopes	32(4)	1	1	24(4)	1	2(1)	9(1)	1	81
DOMESTIC MAMMALS	Domestic donkey (<i>Equus africanus</i> f. <i>asinus</i>)	-	-	-	-	-	-	-	1	1
	Sheep (<i>Ovis aegagrus</i> f. <i>aries</i>)	-	-	-	-	-	-	1	-	1
	Goat (<i>Capra aegagrus</i> f. <i>hircus</i>)	-	-	-	1	-	-	-	-	1
	Small livestock (sheep and/or goat)	-	-	-	-	-	-	2	3	5
	Cattle (<i>Bos primigenius</i> f. <i>taurus</i>)	-	-	-	-	-	(1)	4	-	5
WILD OR DOMESTIC MAMMALS	Jackal and/or dog (<i>Canis</i> sp.)	-	-	-	2(1)	-	6	11(1)	4	25
	Small bovids	-	-	-	-	-	4(2)	10	4	20
	Large bovids	-	-	-	-	-	-	5(2)	2(1)	10
TOTAL NUMBER OF IDENTIFIABLE BONE FRAGMENTS		163	22	37	286	6	81	294	82	964

F: frequent; FF: very frequent; R: rare; P: present. Numbers between brackets indicate separately bone fragments derived from subadult (or in a few cases juvenile) animals; they are not included in the first numbers.