

## Fishing in the Arabian sea : a short note on the prehistoric sites RH6 and R'as al-Jinz 1 in Oman

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### Résumé

L'étude des restes d'animaux issue de sites de RH6 et RHJ1 en Oman, montre l'importance de la pêche dans les activités économiques de cette région. Le site RH6 (VIe millénaire BP) est particulièrement riche. Les espèces de poisson proviennent de divers environnements marins et permettent de supposer l'existence de différentes techniques de pêche. Le second site, plus récent, présente une moins grande variété d'espèces, conséquence d'un mauvais état de préservation, et d'un nombre moindre de restes identifiés. L'activité de pêche, probablement liée à des facteurs climatiques, semble être plus intense au début de la bonne saison, c'est-à-dire dans les mois plus humides et moins chauds.

### Abstract

The study of the faunal remains from the sites of RH6 and RHJ1 in Oman shows the importance of fishing in the economy of this region. The site of RH6 in the 6th millennium BP is particularly rich in remains. The species derive from different marine environments and they suggest the existence of different fishing techniques. The second and later site has fewer species but this may result from the poor state of preservation, and therefore the smaller number of identified remains. Fishing practice was probably connected to climatic factors, and it seems to have been more intense at the beginning of the good season, namely the months with greater rainfall and lower temperature.

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# FISHING IN THE ARABIAN SEA : A SHORT NOTE ON THE PREHISTORIC SITES RH6 AND RA'S AL-JINZ 1 IN OMAN

B. WILKENS

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**Abstract :** *The study of the faunal remains from the sites of RH6 and RHJ1 in Oman shows the importance of fishing in the economy of this region. The site of RH6 in the 6<sup>th</sup> millennium BP is particularly rich in remains. The species derive from different marine environments and they suggest the existence of different fishing techniques. The second and later site has fewer species but this may result from the poor state of preservation, and therefore the smaller number of identified remains. Fishing practice was probably connected to climatic factors, and it seems to have been more intense at the beginning of the good season, namely the months with greater rainfall and lower temperature.*

**Résumé :** *L'étude des restes d'animaux issue de sites de RH6 et RHJ1 en Oman, montre l'importance de la pêche dans les activités économiques de cette région. Le site RH6 (VI<sup>e</sup> millénaire BP) est particulièrement riche. Les espèces de poisson proviennent de divers environnements marins et permettent de supposer l'existence de différentes techniques de pêche. Le second site, plus récent, présente une moins grande variété d'espèces, conséquence d'un mauvais état de préservation, et d'un nombre moindre de restes identifiés. L'activité de pêche, probablement liée à des facteurs climatiques, semble être plus intense au début de la bonne saison, c'est-à-dire dans les mois plus humides et moins chauds.*

**Key-Words :** *Fish, Prehistory, Oman, Seasonality.*

**Mots Clefs :** *Poissons, Préhistoire, Oman, Saisonnalité.*

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The material studied here derives from the excavations in north-eastern Oman, directed by P. Biagi of the University of Venice, Italy. The excavation of Ra's al Jinz is one of the Joint Hadd Project's campaigns, an international project that planned both the excavation of certain sites in the area of Cape el Hadd and the survey of parts of the region.

Studying fish remains from excavations in the Arabian peninsula is particularly difficult due to the large variety of species that live in the area, and also to the lack of comparative collections of fish species currently present in the Indian ocean. For this work we used a small collection composed of fish bought at the market of Salalah (Oman), which also helped for the study of remains from the nearby city of Sum-

hram<sup>1</sup>. The collection is clearly far from complete and in many cases it was not possible to take identification as far as the species level..

Another problem regards periodic growth marks, visible on the vertebrae. In a temperate climate with well-defined alternation of seasons, the more compact line corresponding to a block in growth is formed in winter when the temperature is lower and food is scarce, while the wider line forms from the spring onwards. In a tropical climate such as that of the Arabian peninsula, the range of temperatures is slight and other factors, such as wind and rainfall are of greater impor-

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1. WILKENS, 2002 : 271-322.

tance. In order to understand the mechanisms of growth in this climate, a comparative collection of fish from the coast of Dhofar was used. According to J.B. Sale<sup>2</sup>, maximum rainfall is in July and August, the time of the passage of the monsoon from the south-west.

By studying the comparative specimens it has been observed that those fished in November are in a phase of growth (phase B), corresponding to the middle of the good season, while those fished in March correspond to a phase of bad season, most probably its end (phase D) (see table 2).

The greater rainfall brought by the monsoon from May/June to August/September leads to the growth of plants and to larger volumes of water in rivers that are rich in food. This marks the beginning of the good season whereas the progressive increase in dryness at the end of this phase results in lower volumes of water in rivers, and a reduction in the growth of fish around the end of March.

The region of Muscat, and generally the northern area in which the sites under study are located, is not affected by the monsoon today, and consequently it is notably more arid. There is greater rainfall from November to March as a result of occasional storms coming in from the Mediterranean. In these rainier months temperatures are also slightly lower.

It may therefore be concluded that for the material from the Muscat area, the good fishing season is to be placed in the rainier and cooler period, *i.e.* phase A, in November/December, and in Phase D. This may be complicated by possible migrations of some species from different climatic areas. It is also possible, at least for RH6, that the climate did not tend towards an excessively arid phase.

## SHELL MIDDEN RH6

The site lies in the mouth of the Wadi Aday, in the Qurm national park (fig. 1). The stratigraphy displays a series of anthropic levels alternating with natural sand deposits. Dating varies from 5 992±80 BP at the lower level, to 5 569±60 BP in the upper levels. The start of a climatic change towards the current arid climate can be dated to c. 6 500 BP<sup>3</sup>. The remains from this site are abundant – even though the state of conservation is not optimal –, it is nevertheless better than that of the material recovered from the later site Ra's Al-Jinz 1. Besides

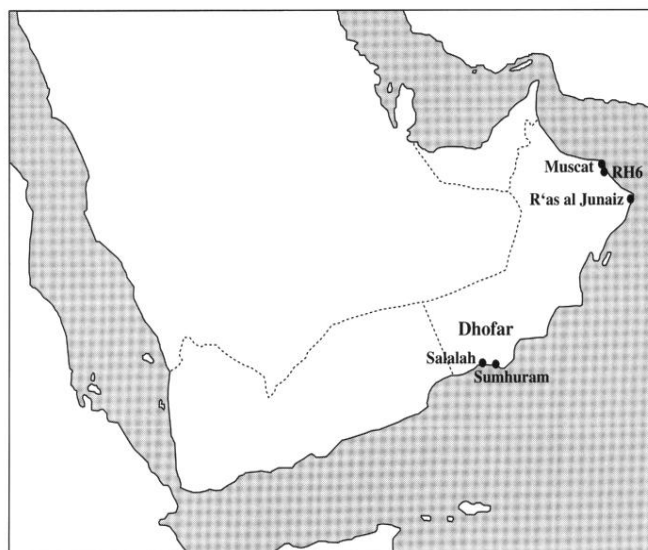


Fig. 1 : Oman, location of the sites.

fish, the remains of other species were also found, such as dog, sea-snake, turtle (*Chelonia mydas*) and numerous shells, amongst which *Terebralia palustris*, a species linked to the presence of mangroves<sup>4</sup>, which are more common in the lowest level. There is also a large quantity of remains of hooks and bone and shell tools that might have been used for fishing.

The presence of species from different environments can be seen on table 3 : they probably reflect a certain variability in fishing techniques according to the different habits of the fish. Two groups are more plentiful. The first one is available in shallow waters with both rocky or soft bottom. This group comprises mainly Lutjanidae, Lethrinidae and Sparidae. These families are common today in the local markets. Fish living in a mud bottom such as the rajiformes are scarce, as are also the small-sized species which are mainly used today for bait. The second important group includes species that can live near the coast but also in the open sea. Some of these species can migrate seasonally. It is worth noting that even if the state of preservation did not allowed us to take measurements, the sizes are medium. This also applies to such species as tunas, that can reach great dimensions and may reflect the fishing techniques which were in use.

The study of the vertebrae growth rings shows that a small number of fish were caught in the bad season (phase D), while the prevalence of captures in phase A corresponds to the beginning of the good season. Only one fragment corresponds to a later period in the good season (phase B).

2. SALE, 1980.

3. BIAGI, 1999.

4. *Ibid.*

**Table 1 :** RH6, identified fragments.

RH6 – Fish remains	Number of fragments	% of fragments
Pisces	4790	89,36
Rajiformes	7	0,13
<i>Caranx ignobilis</i> (Forsskål)	74	1,38
<i>Lethrinus nebulosus</i> (Forsskål)	4	0,07
<i>Lethrinus mahsena</i> (Forsskål)	10	0,18
<i>Lethrinus</i> sp.	5	0,09
Sparidae/Lethrinidae	7	0,13
<i>Lutjanus coeruleolineatus</i> (J.Randall)	1	0,01
<i>Lutjanus</i> sp.	1	0,01
<i>Pristipomoides multidens</i> (J.Randall)	1	0,01
<i>Pristipomoides</i> sp.	22	0,41
<i>Diplodus sargus capensis</i> (Smith)	8	0,14
<i>Acanthopagrus berda</i> (Forsskål)	5	0,09
<i>Acanthopagrus bifasciatus</i> (Forsskål)	11	0,20
<i>Acanthopagrus latus</i> (Houttuyn)	10	0,18
<i>Argyrops spinifer</i> (Forsskål)	13	0,24
<i>Epinephelus</i> sp.	49	0,91
<i>Epinephelus radiatus</i> (Day)	3	0,05
<i>Epinephelus epistictus</i> (Temminck & Schlegel)	4	0,07
<i>Umbrina ronchus</i> Valenciennes	1	0,01
<i>Acanthurus mata</i> Cuvier	1	0,01
<i>Scarus</i> sp.	2	0,03
<i>Mugil</i> sp.	3	0,05
<i>Scomber</i> sp.	5	0,09
<i>Sarda orientalis</i> (Temminck & Schlegel)	16	0,29
<i>Scomberomorus/Thunnus</i>	290	5,41
<i>Sphyraena</i> sp.	17	0,31

**Table 2 :** RH6, seasonality.

Season of death	Start of good season	Middle of good season	End of good season	Bad season
	A	B	C	D
Pisces	19			3
Rajiformes				1
<i>Scomberomorus/Thunnus</i>	4	1		1
<i>Sphyraena</i> sp.	1			

The study of the habits of the identified species, most of which are brackish species, shows that fishing was carried out mainly in the estuary near the site. The presence of some migratory and pelagic species indicates that the intensification of fishing in some periods of the year was linked to the arrival of schools of fish close to the coast.

## RA'S AL-JINZ 1

This locality is located close to the easternmost tip of the Arabian peninsula (Ra's el-Hadd) and the site, resting on a coastal terrace, is formed of numerous stone structures, amongst which n. 5 was excavated in the years 1986/1987/1988. A date from room 2 (3 450+-70 BP) and two dates from the courtyard (3 290+-60 and 3 450 +-60 BP) indicate that the site was inhabited in the first centuries of the second millennium BC<sup>5</sup>.

Besides fish remains, traces of numerous shells from species inhabiting different environments, were also found<sup>6</sup>. Other products recovered from the sea are turtles and small cetaceans.

Fish remains are scarce, very damaged and partly burnt. For this reason the majority of the fragments were not identified or were only identified to the family level. Pelagic and migratory fish seem to prevail.

Remains from all parts of the body were recovered.

Given the scarcity of well preserved remains, vertebrae, which are useful for seasonality studies, are very rare. Here also captures began in the bad season (phase D) and carried on in greater numbers at the beginning of the good season (phase A).

## CONCLUSIONS

The main difference between the two sites is essentially the greater variety of species in the earlier site (RH6), indicating an intensive exploitation of different environments. It is worth noting that site RH6 was located at the mouth of a wadi and was rich in species that can adapt to different degrees of

5. BIAGI *et al.*, 1989.

6. *Ibid.*

**Table 3 : Ethology.**

Ethology	Habits	Environment	Sea bottom	Depth
Rajiformes		Marine	Muddy	
<i>Caranx ignobilis</i>	Solitary when adult	Marine, brackish	Rocky	10/100 m
<i>Lethrinus nebulosus</i>	Sedentary	Marine, brackish	Rocky, coral reef, seaweed, mangroves	10/75
<i>Lethrinus mahsens</i>	Sedentary	Marine	Rocky, sandy, seaweed	2/100 m
<i>Lutjanus coeruleolineatus</i>	Solitary or in small groups	Marine	Rocky, coral reef	10/20
<i>Pristipomoides multidentis</i>	Gregarious	Marine	Rocky	40/245 m
<i>Diplodus sargus capensis</i>		Marine, brackish	Rocky, seaweed	0/50 m
<i>Acanthopagrus berda</i>	Migratory	Marine, brackish, freshwater	Muddy	10/50 m
<i>Acanthopagrus bifasciatus</i>	Small groups	Marine, brackish	Rocky	2/20 m
<i>Acanthopagrus latus</i>	Gregarious	Marine, brackish, freshwater		-50 m
<i>Argyrops spinifer</i>		Marine	All types	-150 m
<i>Epinephelus radiatus</i>		Marine		18/383 m
<i>Epinephelus epistictus</i>		Marine	Rocky or muddy	71-291
<i>Umbrina ronchus</i>		Marine, brackish, freshwater	Rocky or muddy	20/200 m
<i>Acanthurus mata</i>	Sedentary	Marine	Rocky or coral reef	5/100 m
<i>Scomber</i> sp.	Gregarious, migratory	Pelagic		
<i>Sarda orientalis</i>	Gregarious, migratory	Pelagic		1/30 m
<i>Sphyraena</i> sp.	Gregarious	Pelagic		

**Table 4 : RJ1, identified fragments.**

RJ1 – Fish remains	Number of fragments	% of fragments
Pisces	27	50,00
Rajiformes	2	3,70
<i>Scomberomorus/Thunnus</i>	25	46,29

**Table 5 : RJ1, seasonality.**

Season of death	Start of good season	Middle of good season	End of good season	Bad season
	A	B	C	D
Pisces	10			7
<i>Scomberomorus/Thunnus</i>	2			

salinity, from marine, to brackish, to freshwater environments. There were also pelagic and migratory species, which testify to fishing activities in the open sea.

On the contrary, fishing seems to have been mostly specialized in migratory and gregarious species at RJ1. This dif-

ference could reflect several factors, such as different fishing techniques, or a sedentary or seasonal occupation of the site, or the geographical position of the site and the possibility that other resources of terrestrial origin were exploited.

It can be observed that in both sites fishing seems to have been a seasonal activity undertaken by the inhabitants from the bad season to the start of the good season which, as already stated, could coincide with the rainier phase, from November to April. This seasonality may be confirmed by the alternation of anthropic levels and natural deposits at RH6, whereas stable structures were found at Ra's Al-Jinz.

Given the poor state of conservation, it was not possible to take measurements of the remains ; however, they all belong to medium-size fish. Neither was it possible to make comparisons with other Omani localities.

The large tuna fish that were very frequent in the historical period site of Sumhuram<sup>7</sup> are not found here. This may be due to the different geographical locations and to less elaborate fishing techniques that only allowed the capture of smaller fish as well. In fact, for the present day equivalents of some of the identified species, the older and hence larger animals pre-

7. WILKENS, 2002.

fer deep waters and only younger individuals are found in shallow waters.

The presence at Sumhura of a large number of migratory fish such as tuna may also be attributed to the marine currents induced by the monsoon, that favour the movements of schools of fish. The monsoon current affects only Dhofar, not the parts of Oman that are further east. The south-west monsoon induces a current which is directed towards Dhofar from April to October and then flows away towards southern India. A return current from the east flows in the opposite direction from November to March<sup>8</sup>.

In conclusion we may say that the study of fishing techniques and fish fauna in the region is still in a preliminary phase, because few sites have been studied so far, which are chronologically apart. It is therefore neither possible to understand the evolution of this activity, nor to recognize techniques and modalities. Given the environmental characteristics of the area and the limited possibilities of exploiting other kinds of resources, fishing was no doubt as important to the economy of local people in prehistorical and historical times as it is nowadays in modern Oman.

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