

Gogha: An Indo-Arab Trading Post in the Gulf of Khambhat (Cambay), India.

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Abstract

The ancient port of Gogha is situated in the mid-coast of the western bank of the Gulf of Khambhat that is famous for the highest tidal range in India and also has preserved the remains of the oldest Civilization of the subcontinent. The author of the *Periplus of the Erythrean Sea* vividly described the sites of the Gulf of Khambhat and approach to Bharuch (*Barygaza*). Recent marine archaeological explorations on the western coast of the Gulf yielded a large number of stone anchors in inter tidal zone of Gogha and Hathab. Majority of the anchors fall in the group of Indo-Arab type and only one composite type anchor was reported from Gogha. Another anchor similar to those found in Chinese coast also found from Hathab. A large quantity of glazed ware was also found along with the stone anchors from Gogha suggesting a possible date for the anchors between the 10th and the 14th century AD.

Keywords: Indo-Arab, Stone anchor, Gulf of Khambhat, Glazed ware, inter tidal zone

Introduction

The Gulf of Khambhat is famous for high tidal range in India. Interestingly, the coast of the Gulf is also rich in archaeological remains (Figure 1). The famous Harappan site at Lothal is located at the head of the Gulf and was supposed to be approached through the sea route (Rao, 1979:221). A few other Harappan sites namely Padri (Shinde, 1992) and Hanumano-no-Timbo (Sultanpur) are located in the estuary of Shetrunji that debouch in the lower part of the Gulf of Khambhat. A few late Harappan settlements are also located around the Gulf such as Budhel in Bhavnagar district, Bhagatrav (Rao, 1991:149) and Malvan (Allchin and Joshi, 1992) in mainland Gujarat. Bharuch (ancient name Bharukachchh and Baryagaza), Vallabhi and Hathab (Pramanik, 2004) are some of the historical period sites around the Gulf of Khambhat. The Gulf of Khambhat is indentation on the western shelf of India between the Saurashtra peninsula and the mainland of Gujarat. It receives drainage from Narmada, Mahi, Tapi, Purna, Ambica and Damanganga rivers. These rivers discharge a large volume of sediments as also suspended load.

Gulf of Khambhat (formerly known as Gulf of Cambay) and Barygaza (Modern Bharuch) found the longest and the illustrious description in the *Periplus of the Erythraean Sea*. Out of total 66 passages of the book 9 are devoted to the Gulf of Khambhat dealing with its location, piloting, trade and tidal phenomena etc (Schoff, 1912:39-42). The first passage mention as follows:

“Beyond the Gulf of *Barca* is that of *Barygaza* and the coast of the country of *Ariaca*, which is the beginning of the Kingdom of Nambanus and of all India. That part of it lying inland and adjoining *Scythia* is called *Abiria*, but the coast is called *Syastrene*. It is a fertile country, yielding wheat and rice and sesame oil and clarified butter, cotton and the Indian cloths made there from, of the coarser sorts. Very many cattle are pastured there, and the men are of great stature and black in colour. The metropolis of this country in *Minnagara*, from which much cotton cloth is brought down to *Barygaza*. In these places there remain even to the present time signs of the expedition of Alexander, such as ancient shrines, walls of forts and great wells. The sailing course along this coast, from *Barbaricum* to the promontory called *Papica*, opposite *Barygaza* and before *Astacampra*, is of three thousand stadia”.

Gogha is situated on the mid-western bank of the Gulf and about 15 km south of the present port town of Bhavnagar. Gogha was known as the port of Gundigar during Vallabhi kingdom (AD 480-720). The Imperial Gazetteer of India (1908:301) mentions that “the natives of this town are reckoned the best

sailor or lascars in India. The ships touching here may procure water and supplies or repair damages”. A famous proverb about Gogha is “*Lankani Ladi ane Ghoghono var*” (Bride of Lanka and groom of Gogha) which perhaps indicates some kind of direct overseas relations of Gogha with Sri Lanka. According to the historical account, Arabs had established their colony at Gogha in the year 636 AD (Chaukasi, 1989:634). The presence of ancient Jaina temples at Gogha dating back to the 10th –11th centuries suggest that this was a religious center also. The earliest Arabic inscription from Gogha dates to 1170 AD (Oza, 1885). During the British period ships up to 1500 tons were laden here. Pinkerton (1811) mentions that Gogha provided a harbour for the largest ships though they would lie dry on mud at low water. Gogha served as a port for Cambay, cargo being conveyed on small boats from Cambay to Gogha to be loaded on ships, the cargo unloaded from ships at Gogha being similarly transported to Cambay (Ahmad, 1863-64). Cambay was really open only to very small vessels, e.g. boats called *tawri* (Habib, 1982), one of which said to have been 80 tons.

The present paper deals with the findings from the recent marine archaeological explorations undertaken along the western coast of the Gulf of Khambhat. A comparative study of stone anchors and glazed ware has been made. The chemical analysis of glazed ware is also presented.

Archaeological explorations

A coastal exploration has been carried out between Gopnath southwestern point of the Gulf and Vallabhi a northern point. An Indo-Arab type stone anchor was noticed in inter tidal zone and gets exposed during the lowest low tide. Similarly, a few stone anchors were recorded off Hathab a historical period port. There are nearly two dozens of stone anchors recorded in inter tidal zone of Gogha. Interestingly, a large quantity of pottery of glazed ware was also found along with the stone anchors. The brief descriptions of findings are given below.

Stone anchors

The stone anchors have been noticed close to the present lighthouse in inter tidal zone (Figure 2). Being in the high tidal range, the stone anchors that are lying in 5 to 10 m water depth during high tide get exposed during low tide. These stone anchors are found either partially buried or exposed on the gravel bed. The seabed at the finding spot of the anchor comprised of gravel and fine sand. The majority of the anchors are of Indo-Arabia type and one stone anchor falls in the category of composite type (Table 1, Figure 3-4). The Indo-Arabia type anchors of typically made from a vertical stone block with often

square section with two lower holes are rectangular/ square and an upper circular hole (Figure 5). Two anchors in the group of Indo-Arab type are having uniform vertical deep and wide groove on all the four faces of the anchor (Figure 6). The broken single composite anchor is made of a thin limestone block with two lower holes are square and two circular holes are placed randomly on upper side (Figure 7). The detail measurements and drawing could be completed just of 14 anchors due to tidal time and muddy seabed and hence rest anchors were only photographed. Many stone anchors are fragmented in nature (Figure 8). Majority of the anchors are parted with lower 2 holes and sometimes holes also broken which might have been broken during manufacturing stage. The raw material used for these anchors are hard basaltic, sedimentary and a few of conglomeratic material. A fragmentary anchor is the biggest anchor (Figure 9) found from here. Only lower portion is surviving and is very similar to those reported from Mithi Viridi (Gaur et al. 2005). There is a stone block without any holes noticed similar to the Indo-Arabia type anchor (Figure 10).

Four anchors were recorded at Hathab a historical period site about 10 km southwest of Gogha. Three anchors falls in the group of Indo-Arab type and one stone anchor with a wide and shallow grooved provision for the tying the rope around it (Figure 11) similar to those reported from Chinese and Japanese seas was noteworthy discovery.

Glazed ware

During the explorations in inter tidal zone several sherds of the glazed ware (Figure 12-13) were scattered in the vicinity of the anchors. A few of them are also partially buried in the sediments. A few sherds also have the growth of barnacles. Among them a jar with internally and upper half externally glazed are important one and rests of the sherds are glazed only internally (Figure 14). The important colours of glazed on the pots include blue, green and brown (Figure 15).

1. Fragmented plate with green glazed internally. It has a corrugated profile externally.

Well fired and coarse fabric.

2. Plate with blue glazed internally. It has a pitted surface and corrugated profile. It is well fired and has a coarse fabric.

3. Plate with blue glazed internally. It has a corrugated profile externally.

4. Bowl, with a slight outturned rim, has been internally coated with a thick layer of dark green glazed. Externally a wavy line just below the rim is another important feature. The firing and fabric is medium.
5. Basin with a broad outward projected rim, in red ware. A thick coat of cream slip applied both sides of the pot.
6. Small sized vessel with a thickened rim in black ware. It is ill fired and has a coarse fabric.
7. Medium sized jar with an externally projected in-turned rim. A thick coat of cream slip applied both sides of the pot. It is well-fired and medium fabric.
8. Grey ware jar with a bulbous body. Externally treated with a thick black colour slip. Fine fabric and well fired.
9. Medium sized liquid container has a high neck in buff ware (Figure 16). This type vessel is also called as *Surahi* (used for drinking water). Externally, it has been profusely decorated with incised designs. It has a very thin section and light in weight.
10. Small fragment of a Chinese ware with a ring footed base. It has designs on both sides with dark blue colour.
11. Grey ware basin with a beaded rim. Externally it is treated with a layer of black colour slip. It has a corrugated profile.
12. Dish with a broken ring-footed base and has a thick section. A thick coat of a light blue colour glazed applied internally. Externally, barnacles growth also noticed.
13. Bowl with a pedestal base and has a thin section. A thick coat of a light blue colour glazed applied internally. However, glazing is lost due to exposure in inter tidal zone. Externally, barnacle growth also noticed.
14. Bowl with a ring-footed base and has a thin section. A thick coat of a blue colour glazed applied internally. Externally barnacles are noticeable.
15. Bowl/dish with a ring-footed base has a thick section. A thick coat of a light green colour glazed applied internally. It has a corrugated profile. Externally, barnacle growth also noticed.
16. Dish with a ring-footed base has a thick section. A thick coat of a light blue colour glazed applied internally. Externally, barnacle growth also noticed. It has a pitted surface.
17. Bowl with a pedestal base has a thin section. Blue glazed has been applied internally. The sherd was found upside down, that resulted the erosion externally. In spots, the barnacle growth is also noticed. It has a corrugated profile.
18. Shallow dish with a thick ring-footed base and has a thick section. It has a corrugated profile. A thick coat of a light chocolate colour glazed applied internally. External surface has been eroded due to its exposure in inter tidal zone.

Elemental oxides analysis of glazed ware

The results of the elemental oxides analysis indicate that silicon oxide (SiO_2) content of the glazed sherds vary between $\sim 73 - 77\%$ and forms $\frac{3}{4}$ part of total composition and from 42-47.5% in non-glazed. It is more than half in the ordinary sherds. Silicon is a principal glass forming oxide in the glaze and can not be replaced with any other oxide.

Alumina, Al_2O_3 , is low with 4.79 – 5.13 % in glazes and is high with 11.56 – 13.62% in non-glazed sherds. Its concentration in ordinary sherd is 16.93%. Alumina mainly retards the crystal formation and control the viscosity in all type of pottery and give the strength to glaze sherds. A similar trend is seen in FeO concentration being low in glazes and high in non-glazes. Presence of CuO ($\sim 2\%$) is noticed in the glazes and perhaps to obtain the green and blue glazes. Oxides of alkaline earth metals (CaO & MgO) are predominant in non-glazes with concentrations varying from 16.41 – 28.10% and its content is 9.43% in ordinary sherds. Where as glazes have only CaO % and ranges from 1.19 to 8.11 and with absolutely no MgO contents.

Discussion

The Gulf of khambhat is famous for the highest tidal range in India and finds several descriptions in ancient literature (Panikkar and Srinivasan, 1971:39-42). The discovery of several archaeological sites along the Gulf suggest that great tidal phenomena was well known to ancient mariners and they had used it very effectively for trading purpose. The shoreline in this area is changing rapidly and has gone under change since the Harappan times (Gaur and Vora, 1999). For instance Lothal a famous Harappan port town is situated about 26 km from the shoreline (Rao, 1979). Similarly Bharuch and town of Khambhat are no more approachable through sea route, indicating a rapid change in coastline. However, going downward the coastline of the Gulf has not changed so much as a few Harappan sites such as Padri (Shinde, 1992) and Hanuman-no-Timbo (Ghosh, 1989) are located close to the estuary area of the river Shetrunji. Even present day large fishing boats are anchored close to the Harappan site at Hanuman-no-Timbo near Sultanpur.

Though the stone anchors from inter tidal zone are not unknown from the Saurashtra coast as earlier reported from Dwarka (Sundaresh et al., 1999:239) Bet Dwarka (Sundaresh et al. 2002) but the number of anchors found from Gogha are outstanding. Interestingly, the finding of anchors in inter tidal zone are closely linked with the tidal variations. For instance, the area of Dwarka and Bet Dwarka has high tidal

range of 0-5 m and Gogha 0-10 m whereas other sites of Saurashtra such as Miyani, Visawada, Porbandar (Gaur et al. 2007a) and Somnath where stone anchors from inter tidal zone are not reported has tidal range of 0-3 m (Indian Tide Table, 2008). Therefore, the findings of stone anchors or in other words the ancient anchoring system was closely interlinked with the tidal ranges in a particular area (Gaur and Vora, 2007:989).

Another important aspect is the number of fragmentary anchors and the observation of the surface suggests that they were broken during the manufacturing stage and not during the lowering or lifting the anchor. An anchor from Gogha and two from Hathab are without any hole suggests that this region may be a manufacturing center.

Another important find is a stone anchor similar to those reported from Chinese, Korean and Japanese seas (Yang, 1990 and Kapitan, 1990:244) in the context of the 12th-14th century AD (Qin Zhang, 1989) however, the anchor is comparatively smaller in size and also slightly curved. The drawing of a 5th century BC Greek two-armed stone stocked wooden anchor by Kapitan (1986:155, 1990:243) closely resembles to the anchor found from Gulf of Khambhat.

It has been rather first time along the Indian coast where stone anchors have been found associated with the Islamic glazed ware. Earlier a site at Qalhat on Oman coast Islamic glazed ware have been found associated with stone anchors (Vosmer, 1999:301). These are blue green and brown besides a few sherds decorated with incised designs. Noteworthy shapes are ring-footed base bowl, dishes, storage jar and *Surahi* (narrow and high necked water vessel). Similar type of glazed ware has been reported from Kamrej where it has been dated to the 9th -10th century AD (Gupta, 2004:51). Excavations at Sanjan also yielded though in small quantity of glazed ware dating back to the 9th to 12th century AD (Gupta et al. 2004:106). From the east coast of India particularly at Kottapattanam (Sasaki, 2004:16-20) and Mantai (Yamamoto, 2004:62), medieval glazed ware have been found in significant quantity. A large number of archaeological sites in India yielded glazed ware dating back to the 9th and 16th century AD (Bhan, 2006:90-91). However, the Glazed ware of coastal area may be earlier as the Arab traders were active along the Indian coast since the 7th-8th century AD onwards (Hourani, 1975:53). Therefore, the study of glazed ware may suggest that stone anchors could well be connected with Indo-Arab trade along the Indian coast in general and Gogha in particular. The study of chemical analysis suggests that to obtain green and blue colour of glaze copper oxide is used in small quantity where as the same is completely

absent in brown glaze. As usual silica is major component (3/4) in the glaze ware is similar in all the three varieties. The discovery of glazed ware also suggests that this area was used as loading and unloading of cargoes.

The port of Gogha has been active since the 5th century AD and flourished as a major trading post during the 10th to 16th century AD before Bhavnagar took the place of Gogha as trading center. Being located at strategic position in the Gulf Gogha has always been subject of an important trading center. Due to this reason Gogha had been several times attacked and captured by local rulers like Gohel Rajputs and Mohammedans during the medieval period (Bell, 1980:73). Stone anchors have been found from several locations along the Indian coast particularly from early the Medieval period ports such as Dabhol (Gaur et al. 2007b) Sindhudurg (Sila and Gaur, 1997), and Vijaydurg (Sila et al, 1998) which are fairly dated between 8th to 14th century AD.

The comparative studies of such stone anchors along the Saurashtra coast suggest that Indo-Arab trade was very active between during the 10th to 16th century AD before the ultimate arrival of the European power in the Indian Ocean (Gaur et al. 2005:164). Similarly the glazed ware, which are very similar to the glazed ware from the other sites of India suggest a possible time as the Medieval period. Gogha has also been mentioned as a great boat-building center during the Mughal period (Habib, 1982).

Conclusions

Archaeological remains around the Gulf suggest that it has been focal point of the human activities since the Harappan times and its extraordinary tidal phenomena had been major cause of the attraction. Gogha was the important port town during the medieval period and played as transit port between the ports of the upper part of the Gulf of Khambhat and rest of the ports along the Indian Ocean Countries. The discovery of various types of anchors suggests that boats of different origin visited Gogha port. The most important find is an anchor with wide groove on the all four section is probably of the Chinese origin. For the first time glazed ware has been found associated with the stone anchors suggest that these may be dated between the 10th and the 16th century AD. Such a large number of stone anchors in inter tidal zone suggest the correct description provided in the Periplus of the Erythrean Sea.

Acknowledgements

I am thankful to the Director of NIO for the permission to publish the paper. Thanks also due to Shri. K.H. Vora for going through the paper and suggesting valuable point to improve the manuscript. I also thank Shri. Bharat Kumar Bhatt from Devli, Talaja, Bhavnagar for assisting during the fieldwork. Shri. Vijay Khedekar did component analysis of the glazed ware. Shri. R. Uchchil and Shri. S.B. Chitari prepared the line drawings. This is NIO contribution number is.....

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Table 1. Detailed measurements of stone anchors from Gogha.

Sl. no.	Type of anchor	Raw material	Length	Upper section	Lower section	Upper hole	Lower holes
1	Grapnel	Basalt	188	22/23	30/35	8	10X15, 10X15
2	-do-	Basalt?	140	40/35	50/35	-	18X15, 18X15
3	-do-		220	60/50	70/65	-	30X22, 30X22
4	-do-	-	155	30/25	40/35	-	22X15, 22X15
5	-do-	-	175	28/28	40/40	8	-
6	-do-	-	55	38/30	30	-	-
7	-do-	-	63	-	35	-	15X10
8	-do-	-	190	25/25	40/35	5	15X10, 12X10
9	-do-	-	205	30/25	35/35	-	10X12, 10X12
10	-do-	-	110	25	35	12	-
11	-do-	-	105	30	36	-	-
12	-do-	-	78	34	38/35	-	12X12, 12X12
13	Composite	Limestone	80	74 width	100 width	9, 10	10X10, 10X10
14	Grapnel	Basalt	250	40/40	50/50		25X22, 25X22

Table 2. The weight percent of elemental oxides in different pottery sherds

Elemental oxides	Glaze brown	Glaze green	Glaze blue	Unglazed part brown	Unglazed part green	Unglazed part blue	Ordinary sherd
Na ₂ O	6.30	5.35	8.91	2.32	3.10	2.52	1.52
Al ₂ O ₃	5.13	4.91	4.79	13.62	11.56	13.05	16.93
SiO ₂	73.27	73.49	76.92	47.42	46.62	42.45	54.22
K ₂ O	4.76	3.85	4.49	1.49	1.66	1.31	2.48
CaO	7.57	8.11	1.19	6.42	16.52	18.93	5.4
FeO	2.97	2.34	0.70	12.72	15.02	12.57	13.60
CuO	-	1.95	2.31	-	-	-	-
TiO ₂	-	-	0.69	3.98	-	-	1.83
MgO	-	-	-	9.99	5.51	9.17	4.03

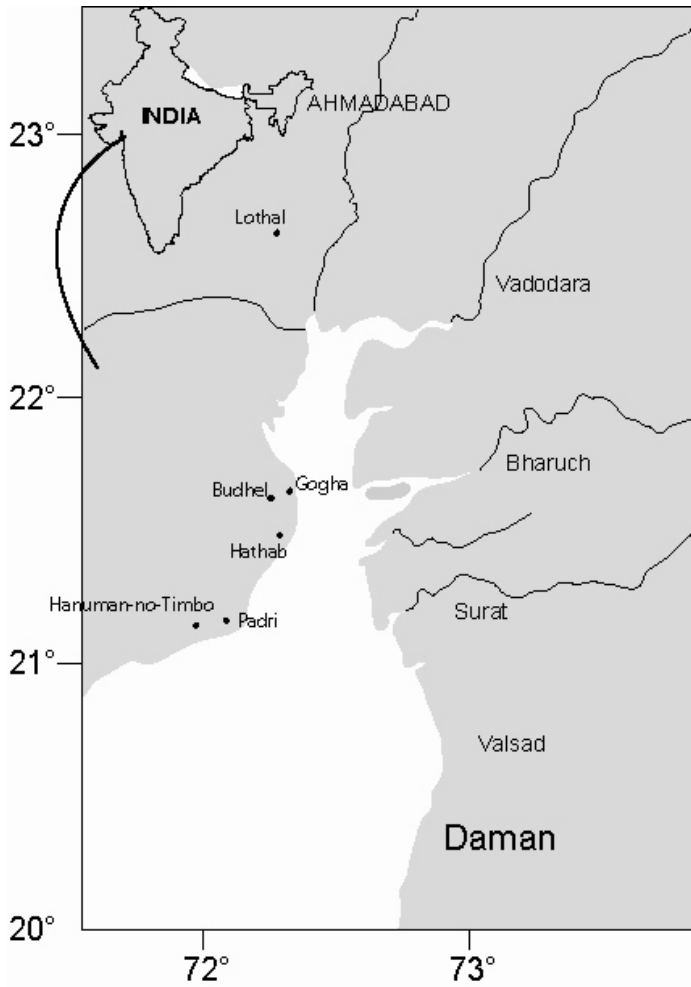


Figure 1. Gulf of Khambhat with important archaeological sites.

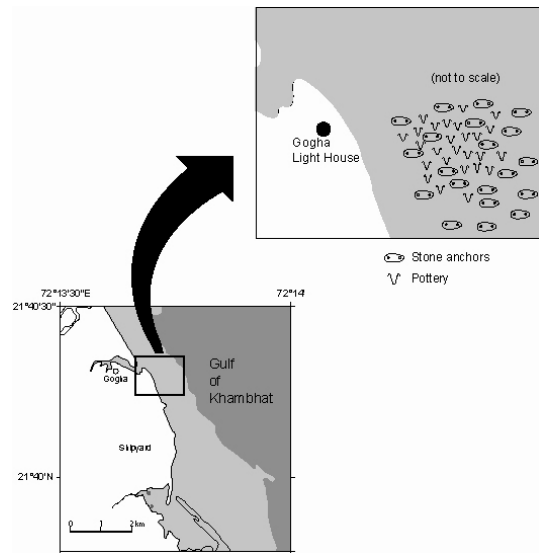


Figure 2. Plan of inter tidal zone of Gogha and approximate locations of anchors and pottery.

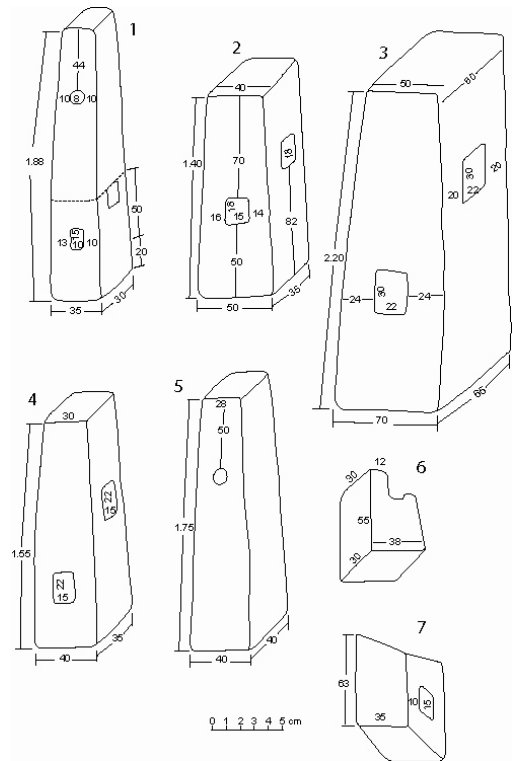


Figure 3. Stone anchors noticed from inter tidal zone of Gogha.

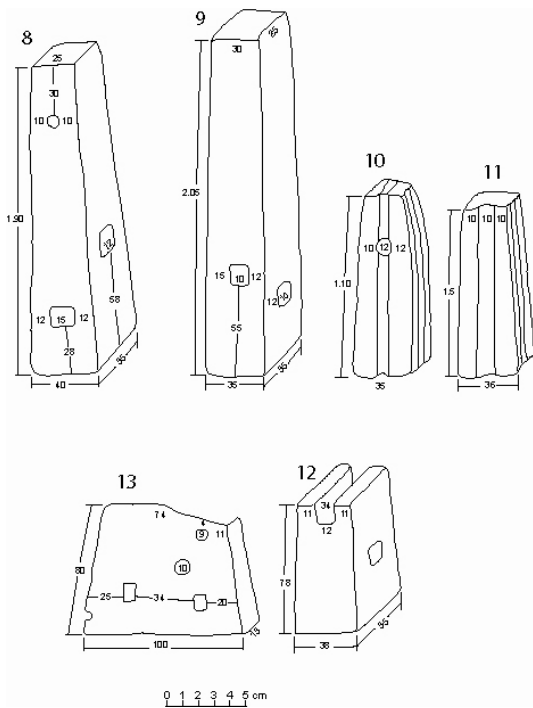


Figure 4. Stone anchors noticed from inter tidal zone of Gogha.



Figure 5. Typical Indo-Arab type of anchor exposed during low tide off Gogha (Scale: 25 cms with 5 cms divisions).



Figure 6. Indo-Arab type anchor with deep groove on the all four sides of the anchor exposed during low tide off Gogha (Scale: 25 cms with 5 cms divisions).



Figure 7. Composite type anchor found in inter tidal zone of Gogha (Scale: 25 cms with 5 cms divisions).



Figure 8. Fragmented anchors were noticed in inter tidal zone of Gogha.



Figure 9. The biggest stone anchor lying partially buried in inter tidal zone of Gogha (Scale: 25 cms with 5 cms divisions).



Figure 10. A dressed stone block lying exposed in inter tidal zone of Gogha, supposed to be used for manufacturing Indo-Arab type anchor.



Figure 11. A stone anchor similar to those reported from Chinese, Korean and Japanese water observed at Hathab near Gogha.

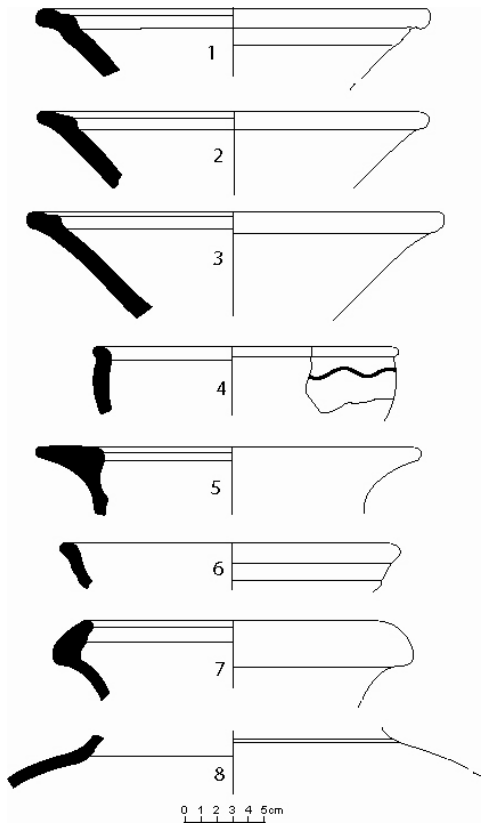


Figure 12. Pottery recovered from the vicinity of stone anchors from Gogha.

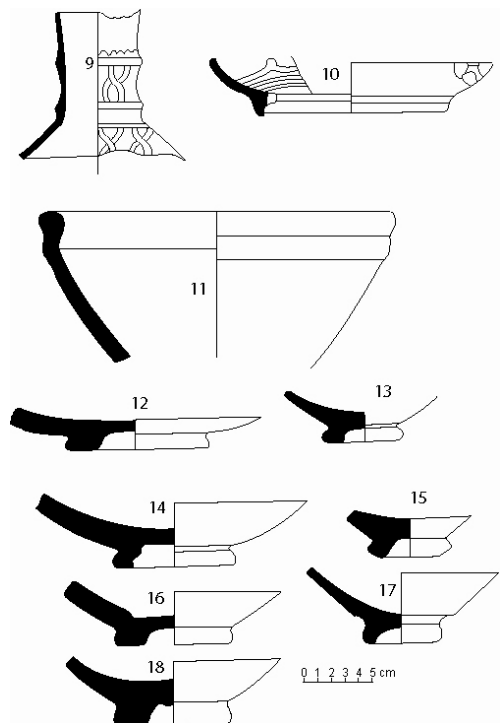


Figure 13. Pottery recovered from the vicinity of stone anchors from Gogha.



Figure 14. Lower half of the glazed ware jar. Internally the jar is treated with blue glaze whereas externally only upper half treated with glaze.



Figure 15. a. Sherds with blue glaze, b. sherds with green glaze and c. sherds with brown glaze.



Figure 16. High necked drinking water jar also known as *Surahi* found from the vicinity of the stone anchors.