

Radiocarbon dates of the medieval period stone anchors from Dabhol, west coast of India

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Dabhol was an important medieval-period port town on the Maharashtra coast. An archaeological exploration at Dabhol has revealed four stone anchors with remains of wood in fluke hole. These anchors were retrieved from Dabhol creek during a dredging operation for the channel. Two samples of the wood attached to the fluke holes of an anchor were dated using radiocarbon method are 590 ± 90 yrs BP and 600 ± 70 yrs BP respectively. Interestingly, the Loyaleshwar Temple near Dabhol jetty (in Marathi the anchor is called as loyale) has an iron anchor of the British admiralty-type, which is worshipped even today.

Dabhol is situated at the confluence of the River Vashishthi and the Arabian Sea (Figure 1). The River Vashishthi originates from the Western Ghats and takes a narrow and meandering course before joining the Arabian Sea at Dabhol. This was one of the most active ports during the medieval period. Dabhol has been referred to as Palaepatmae by Schoff¹.

Dabhol was of importance in the 14th–16th centuries as a maritime trade centre and used to be the principal port of the South Konkan region, carrying on trade with ports in the Mediterranean, the Red Sea and the Persian Gulf². From the 13th to 15th centuries, Dabhol was ruled by the Bahamani Dynasty and was known as Mustafabad³. Later, it was called Hamjabad and then Dabhol. The Anda Masjid standing close to the port with a dome and minarets, was built during the regime of Yusuf Adil Shah (1489–1511). This

is the only monument of pure Saracenic architecture in the Southern Konkan. Dabhol was the capital of a province of the Bijapur kingdom under Yusuf Adil Shah.

In a popular legend on Dabhol, Crawford⁴ has mentioned that from the port of Dabhol a large number of pilgrims used to undertake voyages to Mecca during the medieval period. Further he mentioned, 'The Mughal had long held the port of Dabhol and built docks and jetties on the bank of the sacred Washisti, and mosques innumerable. Fleets of heavily armed ships left annually for the Red Sea and the Persian Gulf after Gokul Ash-tami, laden with rich merchandise, costly silk and shawls, valuable spices and oils, richly inlaid arms and armour; in a word, all the paraphernalia of a wealthy and luxurious race. The larger craft such as Shibads, Dhows and Gallivats being of

deep draught could not get up above the junction of Jogburi river with the sacred Washisti, but lay at anchor in deep water in the land locked basin at Dabhol'. This reference indicates that Dabhol was an active maritime trade centre along the central west coast of India during the medieval period.

Dabhol has been mentioned along with Chaul as an important port town and trade centre. It has also been referred to as the great meeting place of all nations on the coast of India⁵ during the medieval period. Dabhol was indeed a great commercial mart, with a large volume of trade with Persia and the Red Sea, by which route the whole of the Indian goods designated for Europe then passed⁶. Ships with up to 1200 t of cargo were able to enter into the creek.

Loyaleshwar temple

The term Loyali in Marathi is popularly used by fishermen across the Maharashtra and Gujarat coasts for anchor. This is the first instance of a temple dedicated to the anchor along the west coast of India. The temple is situated on the southern corner of the present jetty of Dabhol. Oral tradition suggests that the temple is at least 200 years old. An iron anchor with a long shank and square section is placed in the 'Garbhagriha' (sanctum) and is under worship. The anchor appears to belong to the British admiralty type. It has a ring at the upper end. The flukes are buried, whereas the shank is exposed and painted red in colour (Figure 2).

This note discusses the discovery of stone anchors in Dabhol creek in 2003 during the dredging of the channel. Interestingly, one of the anchors had the wood remains in the fluke holes and two

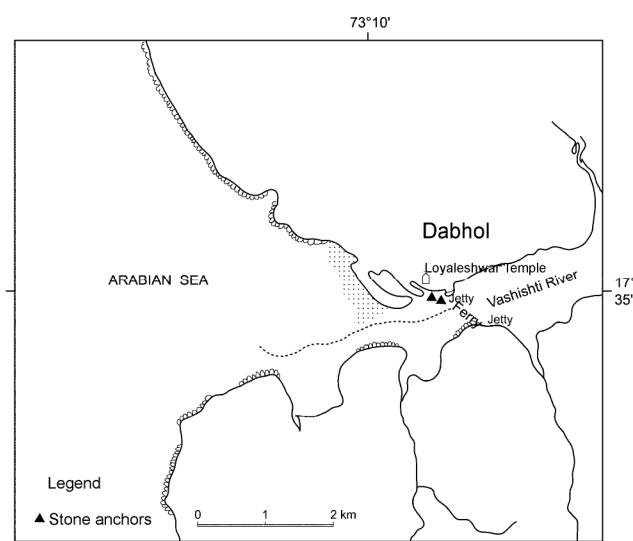


Figure 1. Location of stone anchors adjacent to the river Vashishthi and the Arabian Sea.

Table 1. Detailed measurements of stone anchors from Dabhol (all measurements are in cm)

Sr. no.	Material	Length	Width	Thickness	Upper hole (dia)	Lower hole
1.	Boxite	175	40/30	40/25	NA	13 × 15, 14 × 15
2.	Sedimentary rock	135	50/45	45/44	NA	18 × 20, 17 × 18
3.	Basalt	235	38/30	40/25	NA	15 × 17, 18 × 18
4.	Basalt	192/187	45/30	38/30	9	12 × 14, 12 × 11

**Figure 2.** Loyaleshwar Temple with iron anchor in the sanctum near Dabhol jetty.

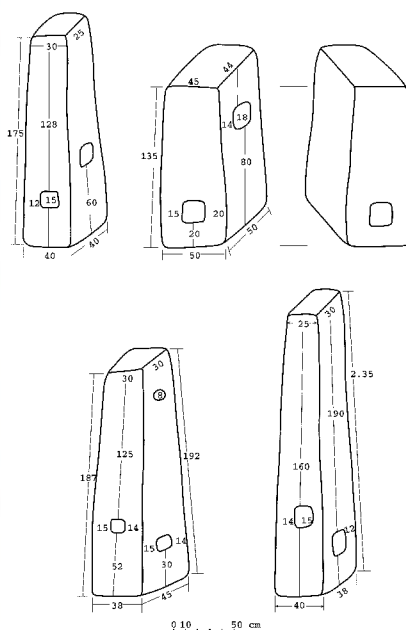
radiocarbon dates of the same were obtained from the Birbal Sahni Institute of Palaeobotany, Lucknow.

Explorations

Onshore and inter-tidal zone explorations were undertaken in and around Dabhol jetty. Towards the east of the present jetty, the remains of an ancient jetty are noticeable⁷. The jetty consisted of basalt block in linear alignment. A few Islamic and Chinese ceramics collected by a resident of Dabhol were also examined. These pottery appear to be of the late medieval period.

Stone anchors

These stone anchors were found during the dredging for the construction of a ferry-boat jetty in 2003 (Figure 3). Since then,

**Figure 3.** Stone anchors recovered during a dredging operation in Dabhol creek.

the anchors are lying in front of the Custom Office of Dabhol. One of the anchors had wooden fluke remains in the holes, which were removed and kept safely by an active social worker at Dabhol. These anchors (Table 1) belong to Indo-Arab type and are similar to those reported from Dwarka, Bet Dwarka, Miyani, Visawada and Mithivirdi on the Saurashtra coast⁸, and also on the Tamil Nadu coast⁹.

Anchor 1 is with lower portion broad and tapers upper side. It lacks an upper hole, whereas the two lower holes are intact (Figure 4). The chisel marks are noticeable on the entire surface, including the holes. The holes are perfectly cut and no indication of any erosion is noticeable. The lower holes of the anchor yielded two pieces of wood, which may be the remains of fluke (Figure 5). Though the surface is rough, it is more or less even with sharp edges. Barnacle growth was noticed over the anchor.

Anchor 2 is unfinished, as one of the lower holes is not a cross hole (12 cm

**Figure 4.** Typical Indo-Arabia type of stone anchor from Dabhol.

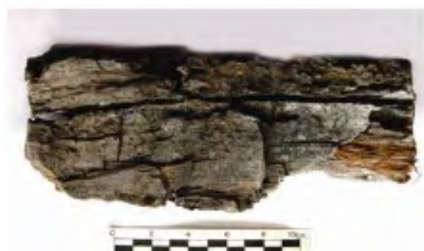
deep) and the second hole is 18 × 20 cm on one side, the other side being smaller in size, 15 × 12 cm. This indicates that the anchor was being manufactured on-board itself.

Anchor 3 is the longest among the four anchors found at Dabhol (Figure 6). It is slightly curved towards the upper side. The most striking aspect of this anchor are the quarry marks, with 18 marks on one of the four edges. The width of mark is 4 cm and the distance between two marks is 5 cm. The anchor has two holes, one each in rectangular and square shapes. It lacks the upper circular hole.

Anchor 4 is complete in shape (Figure 7). The entire surface of the anchor, including all the holes has chisel marks. The anchor has three holes, including an upper circular and two rectangular holes on the lower portion. Barnacle growth is also noticed. It is made of granite/basalt stone.

Table 2. Radiocarbon dates of wood remains collected from fluke holes of stone anchors

NIO sample no.	Material	Lab no. BSIP	¹⁴ C date (yrs BP)	Calibrated date (yrs BP)
DBL/2007/43	Wood	BSIP 2795	590 ± 90	654–524
DBL/2007/44	Wood	BSIP 2796	600 ± 70	653–537

**Figure 5.** Remains of wood from a fluke hole of a stone anchor.**Figure 6.** Quarry marks on a stone anchor from Dabhol.**Figure 7.** Perfectly chiseled stone anchor from Dabhol.

Radiocarbon dates

Two wooden samples collected from the fluke hole of the stone anchor 1 were analysed at the Birbal Sahni Institute of Palaeobotany, Lucknow for radiocarbon dates. The calibrated date of the first sample ranged between 654 and 524 yrs BP, and the second sample ranged between 653 and 537 yrs BP (Table 2).

Discussion

The discovery of anchors from the Dabhol creek is one of the significant findings to support the history of the place as a port/harbour. The anchors are similar to those reported from other places on the coast of India and the other Indian Ocean countries, including Dwarka¹⁰, Bet Dwarka¹¹, Miyani and Visawada¹², Somnath¹³ and Mithivirdi¹⁴ in the Gujarat coast, Vijaydurg¹⁵ and Sindhudurg¹⁶ in the Maharashtra coast, Goa coast¹⁷, Kerala coast¹⁸ and Tamil Nadu⁹. Besides the Indian coast, a large number of anchors are reported from Oman^{19,20}, and the east African coast²¹.

None of the anchors from the Indian coast recorded earlier occurred in the dated context, which made it difficult to assign a particular date to the anchor. Whereas in the Mediterranean Sea, several anchors were found associated with the archaeological context²², besides, a composite stone anchor was found with remains of wood in one of the fluke holes which was dated²³ 840 ± 45 yrs BP. Similarly, in Galle, Sri Lanka²⁴, an Indo-Arab type anchor was found with the remains of a fluke, and radiocarbon date of the same was determined to be 430 ± 80 yrs BP²⁴. These dates are well within the range of the history of the respective ports.

The time bracket of stone anchors from various places along the Indian coast has been determined on the basis of comparative studies and has been dated between the historical period and the medieval period^{10,15,25}, and at places even to the modern times²⁶.

The radiocarbon dates (590 ± 90 and 600 ± 70 yrs BP) of the wood remains collected from two fluke holes from Dabhol have provided an opportunity for the dating of stone anchors in India. Both dates are close to each other, leaving little doubt on their accuracy. As discussed earlier, the stone anchors of Dabhol belong to the Indo-Arab type. These types of anchors have been bracketed between the 8th and the 14th centuries AD along the Indian coast⁸. Wooden flukes were

used in the lower holes of stone anchors and were likely to be replaced with new ones over a period of time. Generally, the preservation of wood remains in marine environment in tropical conditions is poor due to the woodborer activities²⁷. In this condition, the wood remains from Dabhol may be considered the latest phase of the use of stone anchors, i.e. 14–15th century AD, which agrees well with earlier comparative studies. Several literary sources also suggest that Dabhol was an important port town during this period on the Konkan coast. Therefore, the radiocarbon dates are well within the time bracket suggested for stone anchors in India.

The quarry marks on the anchor no. 3 indicate the continuation of traditional quarrying method for obtaining raw material. The chisel marks are clearly visible and the size of the chisel can be estimated. The width of one mark is about 5 cm and distance between two marks is also 5 cm. The raw material of two anchors appears to be the basalt of Deccan traps and remaining two anchors are of some sedimentary rock. One anchor is unfinished, as one of the holes was partially chiseled. This indicates that perhaps the chiseling process continued on-board also or that the anchor was brought in unfinished condition. The presence of wood in the fluke hole confirmed our earlier notion about the wooden fluke in the lower holes of the anchors²⁸.

The Loyaleshwar Temple is a unique tradition of Dabhol. Stone anchors from Mithivirdi¹⁴ in Bhavnagar (locally called Bhima ka Khatiya) are not worshipped like Loyaleshwar of Dabhol. There are instances of anchor worship on the eastern coast of the Mediterranean²⁹.

Conclusion

The absolute dates of wood remains of stone anchor have provided much needed data to determine the time bracket to the stone anchors along the Indian coast. These dates have strengthened the earlier

view on the stone anchors. The dates match closely with history of the port of Dabhol, which was active between the 12th and 16th century AD. The present harbour is built over the older Bandar (port). Therefore, the remains of an earlier jetty are meagre. The discovery of the stone anchors from Dabhol creek has confirmed that Dabhol was once a busy port town on the Konkan coast. Further underwater explorations in the Dabhol creek may yield the remains of some early medieval-period shipwrecks.

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