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Early Historic Shipwreck Archaeology of the Indian Subcontinent region

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Abstract

Shipwreck archaeology in South Asian region is rather recent when one compares with the rest of the world and shipwrecks of the Bronze Age are unknown so far. There is also limited information on the shipwrecks of the early historical period. There are however two examples from this region namely Bet Dwarka (in India) and Godawaya (in Sri Lanka). In Bet Dwarka region a large number of antiquities including Roman amphorae, a Roman hand mill, lead ingot and possibly lead anchors have been found close to present a passenger jetty at a water depth of 8 m. The site is located in high energy tidal current thus the chance of survival of any lighter material is low. The quantity of pottery and material indicate the possibility of a shipwreck of foreign origin. Recently a shipwreck of the early historic period has been discovered at Godawaya in Sri Lankan waters and that is lying in 33 m water depth. The important antiquities from this wreck include stone quern, glass ingots, copper nodules and a large number of pottery. The comparative study and a radiocarbon date of this wreck suggest a date to the 1st century CE. The origin of this ship might have been the Indian Subcontinent region.

Introduction

Over 10000 km long coastline of the Indian subcontinent region, played a vital role in transmitting and adopting social, cultural and religious traditions not only to different regions in Asia but also other parts of the world. Maritime history of this region dates back to the early Bronze Age when Harappan sailed to the Mesopotamian region. However, maritime activities increased many folds during the early historic and the medieval period. The remains of these activities have been traced from the several coastal sites in the form of ceramics and other antiquities.

The story of shipwreck archaeology in this part of world is rather recent when one compares with the rest of the world and shipwrecks of the Bronze Age are unknown so far. There is also limited information on the shipwrecks of the early historical period. There are however two examples from this region namely Bet Dwarka (in India) and Godawaya (in Sri Lanka). In Bet Dwarka region a large number of antiquities including Roman amphorae, a Roman hand mill, lead ingot and possibly lead anchors have been found close to present a passenger jetty at a water depth of 8 m. The site is located in high energy tidal current thus the chance of survival of any lighter material is low. The quantity of pottery and material indicate the possibility of a shipwreck of foreign origin. Recently a shipwreck of the early historic period has been discovered at Godawaya in Sri Lankan waters and that is lying in 33 m water depth. The important antiquities from this wreck include stone quern,

glass ingots, copper nodules and a large number of pottery. The comparative study and a radiocarbon date of this wreck suggest a date to the 1st century CE. The origin of this ship might have been the Indian Subcontinent region.

This paper will give an overview of the current knowledge of shipwreck archaeology in the Indian subcontinent region, highlighting the two exceptional finds of the early historical period sites Bet Dwarka and Godawaya (Figure 1).

Location of the sites

Bet Dwarka

Bet Dwarka island is situated in the Gulf of Kachchh about 5 km north of the mainland of Okhamandal and about 4 km to the east of Okha port. Also known as Bet Shankhodhar, it is famous for temples dedicated to Lord Krishna. The island is a narrow, crooked strip about 13 km long and consists of sand and rock. The eastern part of the island is comprised of sand-hills and bushes and is called Hanuman Point. Its south-west half is rocky tableland 50 to 60 feet high. The area has been mentioned frequently in foreign literature such as the Greek sea guide, the *Periplus Maris Erythraei* (1st century CE), which describes it thus: A promontory stands out from this gulf curving around from *Eirion* towards the east then south then west and enclosing the gulf called *Baraca*, which contains seven islands. Those who come to the entrance of this bay escape it by putting about a little and standing further out to sea; but those who are drawn inside into the gulf of Baraca are lost; for the waves are high and very violent and the sea is tumultuous and foul, and has eddies and rushing whirlpools. The bottom is in some places abrupt and in others rocky and sharp, so that the anchors lying there are parted, some being quickly cut off and other chafing on the bottom (Schoff, 1974: 38). However, Ptolemy mentioned Barake as an island in the Gulf of Kanthi, which has been identified as the Gulf of Kachchh (McCrinkle, 1885: 36).

Godawaya

In ancient times Godawaya was known as Godapavata-patanaha that is mentioned in a Brahmi inscription found in Godawaya (Falk, 2001: 328) dated to the 2nd century CE (Roth, *et al.* 2001: 296), and in Mahavamsa the etymological identifiable term 'Gotapabbata' is used (Geiger, 1912: 255). There are two other Brahmi inscriptions reported from Godawaya area. The earliest archaeological evidence from Godawaya traces the history of this region from the Mesolithic period onward. The Mesolithic site is situated on the eastern bank of the river Walawe Ganga, on a raised hillock and a few projected boulders might have served as shelter for prehistoric people. The river merges with the sea immediately after the site.

Godawaya is a small fishing village, situated between Ambalantota and Hambantota near the mouth of the river Walawe Ganga that is the fourth biggest river of the country on the southern coast of Sri Lanka. However, the mouth of the river near Godawaya is blocked by sand deposit and now the river is debouching in the sea at Ambalantota 3 km west of Godawaya. Along the course of Walawe River a number of ancient settlements and monasteries such as Ridiyagama, Mahanavulupura and Ramba monastic complex have been either excavated or thoroughly explored. There are also reports on the discovery of Indo-Roman coins from this area (Burnett, 1998).

The site of the Godawaya shipwreck is situated about 4 km south-east of the Godawaya monastery and water depth varies between 31 m and 33 m. The seabed near the site is comprised of coralline rocky formation, whereas towards the north-eastern part of the site a wide area is covered with thick-grained coralline sand. The maximum height of the reef on the north-western part is approximately 1.5 m. No vegetation growth was observed at the site; however, in a few places gorgonian growth was noticed besides some marine pinkish layer on the rocks.

Archaeological findings

Bet Dwarka

A number of artifacts recovered in the course of exploration include amphorae, lead artifacts, pottery and stone anchors. The brief description of important artifacts is provided below.

Amphorae

There are the remains of seven amphorae (necks and bases), besides a number of other sherds of amphora and other pots. A black encrustation can be seen on the inside of a few amphora sherds. The sherds are of a thick, coarse, gritty fabric with a rough surface. This ware was mainly used for exporting wine and olive oil from the Roman Empire. Since olive oil was in lesser demand in India, and since sherds have been found with a dried resin mixture, it is most probable that the majority of Indian examples are wine amphorae. The shape of this vessel is elongated with a pointed base, a narrow cylindrical neck and two handles attached to the neck and shoulder (Figure 2). The shape could be understood at Nevasa because a few sherds from different parts of the pots were found there (Ghosh, 1989: 315). Most of the sherds have a thick layer of marine growth.

1. Upper portion of an amphora with an outward projecting nail-headed rim. One handle survives on the shoulder and it has a raised neck. The diameter of the mouth is 13 cm. The fabric is pinkish in colour, and the section is red, suggesting that it was fired at a high temperature. Some white

substance is noticeable in the section. It is made of well-levigated clay, well-fired, and of medium fabric. This is very similar to the Roman amphorae of the 4th to 5th century CE.

2. Spike base of an amphora with a narrow base (4 cm in diameter). The body starts flaring at 6 cm from the base. Pinkish surface, gritty pink core (1 cm thick) with white particle inclusions. It has a bulbous body and rough surface, and is of a coarse fabric, well-fired.

3. Spike base of an amphora, with a broader base than the previous one (5 cm diameter). Flaring starts at 5 cm above the base. The outer surface is pale, the interior covered with a layer of black encrustation. The section is 11-mm thick, light colour with small particles of black and a few white. It has a smooth surface compared to the previous one, a bulbous body, and fine, well-fired fabric.

4. Spike base of an amphora, smaller than the outer surface is pinkish in colour and rough, the section thin, and the body bulbous, of a coarse, well-fired fabric with a gritty core.

5. Spike base of a cylindrical amphora. It has a long, narrow and thin base portion, 35 mm diameter, and flaring from 8 cm above the base. The shape is very different from those above. Of coarse, well-fired fabric, the outer surface is pale and smooth, the interior rough.

6. Lower portion of an amphora, with a broken base, very similar to amphora number 2, but with a thin section (1 cm) and bulbous body. Of coarse, well-fired fabric, with a rough interior surface, and a pale section with some black and white bits.

7. Lower portion of an amphora, with a roundish base and bulbous body, very different from the rest of the amphora sherds. The surface is a pinkish colour and rough, a coarse fabric with a gritty core, showing white bits in the very thin (less than 1 cm) section.

Lead objects

Object 1 was lying partially buried in sediment. It has a big axial hole in the centre. The bottom is flat with a few undulating zigzag lines. It tapers upwards, the base diameter being 42 cm, the height 11 cm, and the diameter at the top merges with the hole, diameter 15 cm. The object weighs 70.2 kg.

Object 2 was lying exposed on the sea-bed. The height is 95 mm, the diameter at the base 380 mm, the diameter of the axial hole 170 mm. There is no mark on the bottom, but on the upper surface a deep groove was observed. The weight is 68.5 kg.

Object 3 another circular lead object, was recovered from 7 m water-depth. The obverse is rough, thick in the middle and gradually thinning towards the edges. The reverse is flat and smooth without any marks. The diameter is 23 cm, average height 3 cm, and weight 8.5 kg.

Based on their shapes and sizes, the first two objects are considered to be anchors while the third one is identified as an ingot.

Stone artefact

An unidentified circular granite object with a small axial hole, found near the lead objects, has been tentatively identified as a Roman hand mill-stone (Figure 3). The lower portion is broader and the bottom is flat. The object tapers upwards with a thin wall. A horizontal slit has been noticed on the upper side, narrow on one side and open on the other side. The upper edge of the axial hole has been widened.

Discussion

The discoveries at Bet Dwarka are significant for the maritime history of India. There are at least four sizes of amphora. It is difficult to determine the kind of liquid transported in them, as a thick layer of marine growth was present. It is possible that contents varied as the amphorae are of various types. The finds are concentrated on the eastern side of the tidal channel where except at slack-water the current speed is 2–3 knots, which did not allow lighter material to settle. The pottery was found either partially buried in sediment or trapped in between rocks. These artefacts are not found towards the shallower side. Two lead artefacts with an axial hole appear to be anchors. Although anchors have been found in association with Roman shipwrecks in the Mediterranean and have been termed Roman lead anchors (Raban, 1981), the lead anchors from Bet Dwarka are not similar to them. Similarly-shaped anchors of stone have been reported from nearby areas of Dwarka and Somnath (Gaur *et al.*, 2002) and as far as Oman where they have been described as ring-stone anchors. At present these lead artefacts are associated with Roman contact only through their association with amphora, but this may be purely coincidental. The association and dating of unidentified objects from Bet Dwarka is difficult and risky as this place has been used as an anchorage since historical times and material of different periods can be mixed up.

As stated earlier, finds are concentrated in between 5 to 8 m water-depth, and absence of archaeological finds shallower than this suggests that these artefacts are not from a habitation site. For instance large amounts of pottery have been collected from the south-eastern coast of the island between high-water-line and 5 m water-depth, similarly pottery and other archaeological remains have been traced from the inter-tidal zone to 8 m water-depth off Poompuhar (Gaur and Sundaresh, 1998). The sea-level history along the Indian coast suggests that so much fluctuation has not taken place during the last 2000 years or so. With such evidence the possibility of a habitation site at this depth is ruled out. There are no remains of any timber of a wreck, only amphora sherds,

two lead anchors and an ingot. This may be because the site lies in the mouth of the Gulf of Kachchh where tidal currents are severe and do not allow lighter material to settle, or sediment which preserves organic material, and anything lying exposed on the sea-bed will be destroyed by wood-borers which are very active in India waters. For example not a single piece of wood could be traced from a 17th century Portuguese wreck in Goa waters (Tripathi *et al.*, 2001) because the wreck was exposed on the rocky sea-bed. Similarly, in Poompuhar there is a partially-exposed shipwreck belong to the end of the 18th century (Gaur *et al.*, 1997) where metal objects survive and a buried portion of wood is intact. Such evidence from Indian waters rules out the possibility of the presence of any hull remains of a shipwreck from the early centuries of the Christian era. However, archaeological finds support the hypothesis of a shipwreck of this date.

Indian and foreign classical literature vividly describes active trade between India and northern Mediterranean countries during early centuries of the Christian era. Warmington (1928) believed that in the first two centuries of the Christian era the Roman Empire witnessed the establishment and development of a profitable commerce between two great regions, the Mediterranean countries and India. A number of archaeological sites in India have yielded Roman antiquities including inscriptions, coins and pottery. The first amphorae were recovered from excavations at Taxila, presently in northern Pakistan, dated by Sir John Marshall to the first centuries BCE-CE. Wheeler *et al.* (1946: 45) believed that the Taxila amphorae had travelled overland from Western Asia.

Excavation at Dwarka (very close to Bet Dwarka) brought to light remains of an amphora dating back to the 2nd century CE (Ansari and Mate, 1966). Similarly, a few amphora sherds have been discovered from Hathab dating to the 1st to 4th century CE (Pramanik, 2004). A large number of amphora sherds have been recovered from Elephanta Island dating to the 1st to 7th century CE (Shinde *et al.*, 2002). Likewise several sites on the west coast such as Gopakapattana and Muziris yielded the remains of amphorae dating to the early centuries of the Christian era. Most of those mentioned above lie on the coastal route mentioned in *Periplus Maris Erythraei* and the time-brackets of their connection with the Roman world are more or less the same. Therefore, the date of amphorae from Bet Dwarka may be assigned between 1st to 4th century CE.

Godawaya

Numerous artefacts were observed on the seabed, including varieties of pottery, stone benches/querns, and a large area in the north-western part was covered with the remains of a shipwreck with unidentified cargo (Gaur *et al.*, 2011). There are several potsherds lying on the wreck site area which comprise two huge storage jars, medium sized jars, carinated cooking vessel besides

a number of rims of jars and body parts of other pots (Figure 4). The surviving height of two storage jars was 100 and 85 cm respectively and the diameter of the rims 45 and 40 cm respectively.

Another interesting find from the wreck site includes stone benches or querns (Figure 5). There are four such artefacts and they are of various sizes. A few stone benches were also found attached either to wreck parts or some other encrustation. Therefore, the actual size may be slightly different when measurements are obtained after retrieving the artefacts from the wreck. The benches are rectangular in shape with four legs which serve as a base. The raw material used for these benches appears to be basalt. Due to thick encrustation growth over these artefacts no symbol or designs could be noticed. However, a bench retrieved earlier by local divers has some symbols on the extended front portion.

Other important finds from the wreck are glass ingots. Two ingots were retrieved earlier and are presently displayed in the Galle Fort Maritime Museum. They are blue in color and semi spherical or bun-shaped. As per the report from the earlier investigation, there are about 3 or 4 ingots visible on the surface.

In the north-west part of the site a large area with wreckage was noticed. This area is divided into two separate blocks and appears to be parts of the cargo. From the surface observation they appear to be wooden logs covered with marine growth. One block measures 4.6 m in length and 1.2 m in width. This block is further divided into 2 bunches. The height is about 1 m with at least 4 layers visible. However, the entire wreckage part has been integrated due to being overgrown with marine encrustation, thus making it difficult to identify. Another big block is squarish, 3.9 m long and 3.7 m wide, and further subdivided into four blocks. The height of this block is c. 1.2 m. The measurement of a log is c. 10 x 15 x 200 cm. The blocks appear to be the major part of the cargo of the ship. From their shape and size they at first appear to be wooden planks, but from close observation underwater the material does not appear to be wood. It is possibly metal. This needs to be further investigated.

Though this is the most important part the wreck, no conclusive work, unfortunately, could be done due to limited working time at 31 m depth. The wooden structure at the site has not been identified, the bulk of which is scattered c. 10 m in length and c. 3.5 m in width. Observations underwater, however, initially indicated that this appeared to be bunches of wooden logs. Closer examination, by scraping of some of the material, revealed that it did not look like wood but rather some kind of metal. This part needs a detailed investigation not only on site but also by taking a few samples for analysis.

In published material, the earliest shipwreck in this region that has been investigated is in Belitung Island, Indonesia, and has been dated to the 9th century CE (Flecker, 2001: 335–354). The material

found from this wreck includes Chinese ceramics and has no parallel with the Godawaya wreck in respect of ceramic or other finds. Thus the date of the Godawaya wreck is the pre 9th century CE. Another reason in favour of an earlier date is the absence of any pottery like Martaban, Khmer or Islamic glazed which has been used exclusively for the overseas trade irrespective of the origin of the ship during this period. The age of the wreck is an important point and needs to be discussed in light of the archaeological material found from this wreck as no parallel dated shipwreck has ever been found from this region to date.

Pottery found from the wreck may be crucial in pinpointing the approximate age of the wreck. As stated earlier, large-sized jars have been used in ships for cargo transportation since the Bronze Age (Bass, 1973: 29–38) and continued until the late medieval period. However, the shape of jars significantly changed in the later period. As for the jars from the Godawaya wreck, they have a globular base and must have been placed in a place where some kind of additional base was provided to them otherwise they would roll-down. As of now it is difficult to say if there are other types of jars present in the wreck because of the fact that major parts of the wreck are still buried. Other ceramics, like carinated dishes, may be important to determine the approximate time bracket. Though this variation is available throughout the prehistoric and historical time, the fabric of these pots indicates their association with the later Megalithic period.

At present, the most valuable and prominent finding that has provided substantial information on the possible date of the shipwreck is the stone quern. The stone quern has been reported from various archaeological sites in definite context from India as well as Sri Lanka. Stone querns appear from the Mesolithic period onwards, but the appearance of four-legged querns may be dated to the 4th century BCE in many archaeological sites in India. And, more prolific appearances may be traced during the *Satavahana* period (2nd century BCE to 1st century BCE) (Dikshit, 1968). Thus a date between the 2nd century BCE and the 2nd century CE may be the possible age bracket of this wreck.

Conclusion

The discovery of a large quantity of amphorae sherds suggests that Bet Dwarka Island had international trade contact during the early centuries of the Christian era. The pottery, two lead anchors and an ingot suggest the possibility of a shipwreck in this area associated with Roman trade, though it is unlikely that the remains of the hull of the wreck survive. These finds suggest that the shipwreck might have occurred in this area in a water-depth of 5 to 8 m. The present Bet Dwarka jetty has served as an anchorage since the early centuries of the Christian era as the large number of stone anchors here testifies. During rough weather and cyclones Bet Dwarka could have served as a

sheltered harbour. The archaeological finds from this island indicate that this was a prominent port and the centre of maritime activity since the early centuries of the 2nd millennium BCE. The island of Bet Dwarka may be the 'Baraca' of the *Periplus of the Erythrean Sea* and the 'Barake' of Ptolemy.

There have been reports and publications on the several shipwrecks in and around the Indian Ocean countries during the last two decades or so. However, those wrecks are dated between the 9th century CE and up to the early 20th century CE. Thus the information on the early shipwrecks was virtually zero and the Godawaya wreck site has provided much needed impetus to the maritime archaeology of this region. The seabed observation indicates that a large part of the wreck is buried in the sediment and the extent of the site can only be determined after a complete investigation. The cargo material such as quern and pottery appears to be originally of the Indian subcontinent region; hence, it is very possible that the origin of the ship may be traced to this region. A large number of quern and pottery indicate that these items may also be part of a trading commodity. The major part of the wreckage needs to be identified and that will reveal the kind of cargo ships used to carry at that time. On the basis of current findings from this wreck it is suggested that the origin of the vessel may be traced regionally (more broadly the Indian subcontinent). The comparative study of archaeological findings such as pottery and stone quern indicate a possible date of the wreck between the 2nd century BCE and the 2nd century CE. Hence, a wreck of this period is a lone example from this part of the world. As this is a preliminary report, the dating and cargo identification may change as more evidence is gathered during the future investigation of the wreck site.

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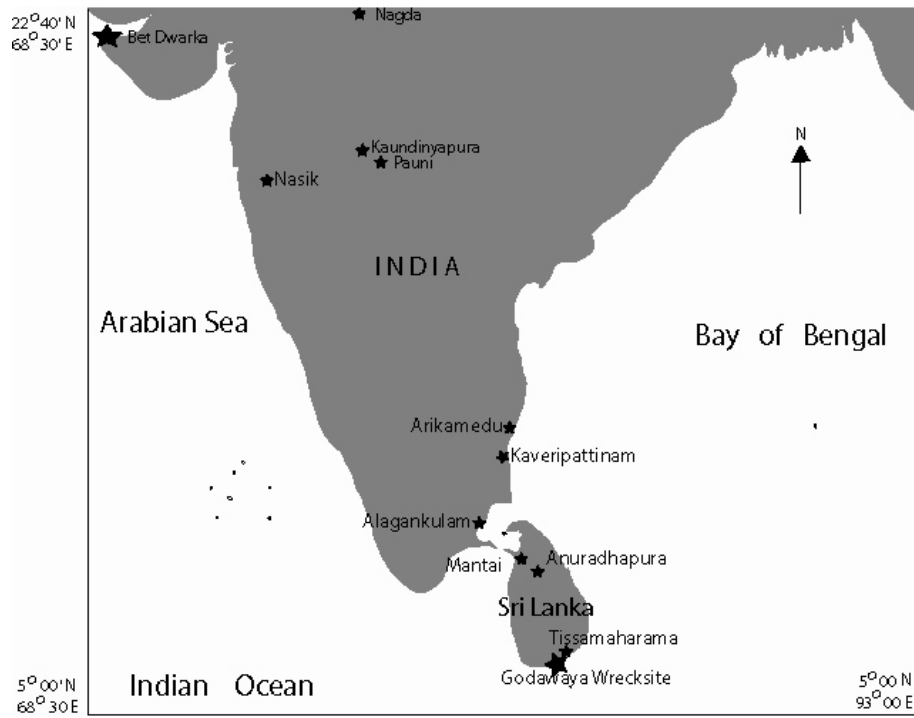


Figure 1. Location of archaeological sites referred in the text



Figure 2. Amphora from offshore region of Bet Dwarka Island



Figure 3. Roman hand mill from offshore region of Bet Dwarka Island



Figure 4. Large size jar noticed exposed in a shipwreck off Godawaya, Sri Lanka



Figure 5. Stone quern noticed exposed in a shipwreck off Godawaya, Sri Lanka