

Shipwreck archaeology of Goa: Evidence of maritime contacts with other countries

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Shipwrecks contain clues to our maritime heritage. The shipwreck history of Goa is as old as the maritime history, which dates back to 2nd century BC. However, information on shipwrecks prior to the Portuguese period in Goa waters is not available. The NIO has been exploring shipwrecks in the Sunchi Reef and the St George's Reef off Goa since 1989. The findings of the Sunchi Reef include a brass barrel of a handgun, Chinese ceramic, Martaban pottery, bases of glass bottles, elephant tusks, hippopotamus teeth, lead pipe, rectangular and square stone bricks (?) and dressed granite stone blocks. Exploration off the St George's Reef has brought to light the remains of a shipwreck containing various types of artefacts such as bricks, tiles, drum, capital, etc, intended for house construction. The Sunchi shipwreck findings are further compared with other Portuguese shipwreck findings found elsewhere in the world. The findings of the St George's Reef show the trade contact of the Basel Mission Company with other parts of the world and its impact on people of coastal Karnataka, West Coast of India.

'SHIPWRECK archaeology' is the study of the material remains of the ship. It provides many clues of the maritime heritage and information on the culture and life styles of people who lived in a particular segment of time. In a sense, shipwrecks are time capsules, which provide information on history of maritime trade and commerce between many countries during the past. The excavation of the shipwreck reveals detailed design and construction of craft. Subsequent to the wreck, parts of the ship and cargo are washed away while other remains are either preserved on the seabed or start deteriorating over time. The impact of the environment also causes significant damage to the remains. Investigation of a shipwreck is an important component of maritime archaeology; and starts with research into the history of the ship. Marine archaeologists found various artefacts underwater and reconstruct a picture of the past from the remains of the wreck. Many developed and developing countries have made considerable progress in maritime archaeological studies by locating and excavating shipwrecks. Although India has a long history of maritime trade, shipwreck archaeology is still a very nascent area of research in India, making moderate progress. Shipwreck exploration was initiated off Goa waters

in 1989. However, systematic exploration of shipwrecks has been carried out in Goa waters since 1997 and brought to light remains of shipwrecks at the Sunchi Reef and the St George's Reef¹⁻³.

Inscriptional evidences of the earliest shipwreck in Goa waters are datable to the 11th century AD. The inscription of Jayakeshi I (AD 1052) of the Kadamba dynasty states that the ship of King Guhalladeva I (AD 980-1005) separated off and he took shelter in the port of Goa⁴. Similarly, the Hero Stones displayed in the Archaeological Museum (ASI), Old Goa, depicting naval battle scenes (12th-13th century AD) indirectly indicates that there might be shipwrecks of the Kadamba period in Goa waters. Further, Mascarenhas⁵ mentions that a Kadamba period ship has wrecked near St Joao Island at the mouth of the River Zuari. However, details of the wreck are not available. No other information is available on shipwrecks in Goa waters prior to the Portuguese period.

The Marine and Portuguese records, which are housed in the Goa State Archives, Panaji, gives information on the ships which were lost off Goa during the Portuguese period. However, these records do not indicate the exact location of the wrecks. The archival sources indicate that majority of shipwrecks have occurred in the shallow waters mainly due to uneven topography, severe storms, hidden rocky reefs and sandbars. Moreover, the Portuguese records kept at the India House, Lisbon, state that between AD 1497 to 1612 a number of ships were wrecked off the Indian coast during their voyage between Portugal and Goa⁶.

History of shipbuilding in Goa

It is worthwhile to mention in brief the history of shipbuilding activities in Goa during the Portuguese period. One of the desires of Afonso de Albuquerque, who conquered Goa in AD 1510, was to capture the shipbuilding industry of Goa, which was the best during that period⁷. The shipbuilding centres of Portuguese India were at Goa, Bassein, Cochin and Daman. The dockyard at Goa was the most organized naval organization of the Portuguese regime⁸. There were three dockyards in Goa between the city of Goa and the riverbank. The ships that were built in the Goa shipyard were *Nau Cinco Chagas*, *Galeao Bom Jesus*, *Madre de Deus*, and *Nau S. Joao Baptista*⁹. The *Nau Cinco Chagas* served for 25 years and made 9 to 10 trips excluding other voyages before ending her services. Portuguese used oak and pine for construc-

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tion of ships but teak was the best timber ever known for shipbuilding activity in India. Subsequently, Portuguese understood the superiority of teakwood, which was available in plenty in the hinterland of India. In a later period the Portuguese signed treaties with the king of Cochin and Adil Shah of Bijapur to supply timber for construction of ships in Goa.

The ships that plied between India and Portugal usually had a capacity of 400 tons. After AD 1570, the tonnage of ships exceeded up to 600 tons. The historical documents show that those ships lower than 500 tons were seaworthy¹⁰. The *Naus* and *Gales* were more in use in the 14th century, but in the 15th century a great progress was made in the construction of *Caravelas*. The details of the ships used for maritime trade and their tonnages have been referred in the Portuguese documents. The names of some of those vessels were *Albetoca*, *Almada* (80 ft long and 6–7 ft broad), *Barca* 10 to 30 tons, *Carraca* (could carry 2000 people), *Caravela* (below 200 tons), *Fusta* (300 tons), *Gale* (25 to 30 oars on each side), *Galao* (100 to 1000 tons), *Nau* (100 to 120 tons) and *Pinaca*. Some of these vessels were meant for sea voyages and carry heavy guns, artillery for warfare, cargo and horses.

Shipwrecks in Goa waters

In 1651, five Portuguese sailing ships namely the *St. Helena*, *S. Joan*, *Evangelista*, *St. Francisco* and *St. Thome* set sail from Portugal to Goa, but only two ships reached the coast of Goa and they were also wrecked¹¹ in a storm on 10 March 1651. A Portuguese Pataxo *Santa Tereza de Jesus* was ready to sail to Bassein and Chaul in Maharashtra but wrecked in the sandbar off Goa on 18 May 1658. Some cargo was salvaged and the remains were robbed. There was a small bag of precious stones, Royal money and other goods onboard the *Manoel Dias* that went down in the sea¹².

In 1648, 12 Portuguese ships, en route for Calcutta (Kolkata) from Goa sank near the Aguada Bay owing to a severe storm. Further, the Portuguese records housed at India House in Lisbon, state that between AD 1497 and 1612, a number of ships were wrecked during their voyage to and from Portugal to Goa⁶.

Location of shipwrecks in Sunchi Reef and St George's Reef

The Sunchi Reef lies between Marmagao harbour and Cabo headlands (Figure 1). The reef consists of laterite shoals more than 3 m in height; extend in north-south direction, separating Marmagao Bay from the Arabian Sea. The River Zuari is the main supplier of sediments at both the near shore and offshore regions. The seabed is uneven and full of laterite; at limited place sand patches are also noticed and water depth varies from 3 to 6 m. The maximum speed of ebb currents is about 3 knots, whereas during the spring tide it is about 1.8 knots. The currents

along with wave action in the reef region helped to deposit a thin layer of silt on the remains of the wreck.

The George's Reef lies on the south of Marmagao port and eastern side of Grande [Grandi] Island (Figure 2). The reef submerges during the highest spring tide and its surface can be seen clearly during neap tide. The reef has an underwater extension on the southern side. The seabed is loose and comprises coarse sand, varieties of shell and fine silt. On account of the slope, the depth varies on the south and southeast side of the reef.

Underwater exploration

Hand held and boat towed metal detector survey was undertaken at the Sunchi Reef and St George's Reef. Swimline and circular search patterns were followed during visual survey and attention was paid to understand the state of archaeological objects lying on the seabed. Visual survey provides full information on the nature of the seabed and distribution of artefacts at the wreck site. Subsequently, marker buoys were tied to the artefacts and positions obtained. If the artefacts are smaller in size they were recovered for study and analysis. At places hand fanning was also carried out to expose the buried antiquities in the sediment. As the ships have wrecked on the reef, more emphasis was given only on diving and air-lifting. In addition, natural features like rock outcrops, seabed topography, depth and movement of sediments and current direction in the region were noted.

The St George's Reef was probed to understand the extent of the wreck site. Utmost care was taken to prevent



Figure 1. Location of Sunchi Reef.

possible damage to buried archaeological artefacts. Initially 'T'-shaped pegs were fixed nearer the reef, subsequently extended on the east, south and southwestern flanks and connected with rope. At some locations airlifting was carried out to know how deeply artefacts were embedded.

After confirming the distribution of artefacts, documentation and recording were initiated. Positions of shipwrecks were taken by the Global Position Fixing System followed by excavation and recording.

Results

The sea conditions, current pattern, water depth and seabed topography of the Sunchi Reef and the St George's Reef are different. The seabed of the Sunchi Reef is uneven, full of laterite shoal, which has extended up to Dona Paula. The maximum speed of current flow is 3 and 1.8 knots. The water depth ranges from 3 m to 6 m in the region. The St George's Reef submerges during the highest spring tide. The seabed is loose and comprises of coarse sand, fine silt and varieties of shell. On account of the sloppy reef the water depth varies on the south and southeast side.

Sunchi Reef

Explorations revealed four guns, a shot, iron anchor, elephant tusks, hippopotamus teeth, Martaban pottery, Chinese ceramic, bases of glass bottles, metal hook, dressed granite blocks, a brass barrel of a handgun, lead pipe, square and rectangular small stone pieces which appear like bricks(?).



Figure 2. Location of St George's Reef wreck.

Some of these were retrieved for further study and analysis¹³. These artefacts were either buried in the sediment or lying below these laterite boulders and crevices. The gun, rudder and iron anchor were lying on the laterite and prolific growth of marine organisms was noticed on them. A brief description of these finds (Figure 3) is as follows.

Barrel of the handgun: A brass barrel of a handgun was found which was trapped below the dressed granite blocks (Figure 3 a). It is 56 cm in length and 2.20 kg in weight. Its mouth is wide, which measures 4 cm. The thickness of the barrel is more at the back than the front side and it has got screw thread for the fixing of the wooden part of the gun, which is missing. The barrel has two notches, out of these, the front side is intact and the rear one is broken which are meant for fixing screws to the wooden part of the gun. Marine growth is present on its surface. Arms and ammunitions were kept onboard for the safety of the vessel and to fight against pirates and enemies.

Martaban pottery: Survey in the adjoining area brought to light a number of Martaban potsherds. The shapes include bases (Figure 3 b), rims (Figure 3 c), lids and body parts. The pottery is well-fired and is comprised of medium to thick fabric. Due to long exposure to seawater, paint and glaze have been washed out on some sherds while other sherds still have the dark brown glaze coat. Further, they do not show any spalling, cracking or other defects despite a long burial time in marine environment. The size and shape of these sherds indicate that they belong to storage jars. No stamp marks or inscriptions have been noticed on these sherds. Even a lid with a small knob having dark brown glaze has also been recovered during the survey. Both liquid and solid items were brought in Martaban pottery to prevent their damage.

Bases of glass bottles: A number of square and round bases of broken glass bottles were recovered in and around the survey area. Round ones are having conical depression at the base (Figure 3 d). All are dark green in colour except a square base, which is transparent. Marine growth is present on these pieces. In course of exploration a full glass bottle has been recovered with broken rim having round base stamped with 'A 0751' inside the depression¹⁴. In these glass bottles olive oil was imported to India, whereas wine was brought in wooden casks.

Stone bricks: Four stone bricks (?) of different shapes and sizes were recovered from the site (Figure 3 e). Out of the four, two are intact and two are broken. Out of the two intact, one is square and the other is rectangular which measures $10 \times 9.5 \times 6$ cm and $22 \times 8.5 \times 5$ cm respectively. The raw material appears like schist. The two broken bricks are flat, thin and different in sizes.

Chinese ceramic: The exploration led to the recovery of six broken bases, one rim and a lid of Chinese ceramic. Out

of six bases, two are plain while painting is present on four other bases (Figure 3 *f*). These bases belong to medium size jars having raised ring on each of them. Besides the bases, a lid was also recovered which has blue and white designs on the outer side. The lid has knob with floral designs (Figure 3 *g*). Marine growth is present on all sherds. A limited quantity of Chinese ceramics have been found and it appears that these were kept onboard for the daily use.

Lead pipe and pieces: A lead pipe having length 37.5 cm and diameter 36 cm and two pieces have been recovered from the wreck site (Figure 3 *h*). The pieces are very fragile and worn out. The pipe has a few square holes, which are twisted and worn out. It appears that the pieces were used for sheathing and the pipe was used, as an outer cover to protect hosepipe or tube or it is used as a water pipe. The two pieces have teeth-like projections



Figure 3 a–j. Artefacts recovered from Sunchi Reef. *a*, Brass barrel of a handgun; *b*, Martaban Pottery bases; *c*, Martaban Pottery rims; *d*, Broken bases (round and square) glass bottles; *e*, Stone bricks (?); *f*, Chinese ceramic (bases and rims); *g*, Chinese ceramic base and lid; *h*, Lead pipe and pieces; *i*, Elephant tusk; *j*, Hippopotamus teeth.

only at one side, which probably served as groove for better gripping. Marine growth is present on all of them.

Elephant tusks: Eight elephant tusks (ivory) which were different in sizes (65 to 36 cm in length) have been recovered (Figure 3 i). All these tusks were buried in the sediment and only a small portion was visible. Out of the eight tusks two were inscribed, one has 3 English letters 'ICM', of which 'CM' is visible clearly and the first letter 'I' has been worn out. The other tusk has some geometrical designs. As these tusks have been underwater for a long duration, they have become soft, brittle, flaky and degraded. The marks on the tusk signify that these could be the merchant marks. The tusks were the part of the cargo and brought from Mozambique to Goa.

Hippopotamus teeth: Seven different sizes of hippopotamus teeth were partly buried in the seabed, on the east and northeast side of the guns that were noticed and subsequently recovered. Both the hippopotamus teeth and elephant tusks were found close to each other. All these hippopotamus teeth are canines (Figure 3 j). On each canine a straight cut-like mark (depression) is noticed, which is due to the rubbing between lower and upper jaw continuously. Due to the long duration in underwater these teeth have turned brownish. Marine growth is also present on these teeth. Even these teeth were the part of the consignment. Only small artefacts were made out of these teeth.

Metal handle: It is an alloy of brass and copper hence the bronze disease is present on the artefact. It was found on the eastern side of the guns. Its maximum length, width and weight are 12.5 cm, 8 cm and 330.7 g respectively. The artefact was buried in the sediment and a small portion was visible. Marine growth and sand have accumulated on it. The lower holes are at the small projected handles probably meant for screw and a round hole at the upper top. The rear projected handle is bit broader and squarer than the front one which is round and bit smaller than the rear one.

Granite stone blocks: A number of rectangular and square dressed granite blocks were found lying at random on the seafloor and crevices of the laterite. Some blocks are more than $2 \times 0.40 \times 0.10$ m in size. It appears that there could be about 250 blocks, which were probably used as cargo and ballast. Maximum stone blocks are concentrated in and around the guns. These blocks can be categorized into four groups based on their sizes ($200 \times 40 \times 10$, $190 \times 35 \times 15$, $125 \times 35 \times 15$, $75 \times 35 \times 12$ cm). The X-ray diffractometry (XRD) (Philips PW 1840) analysis of the rock sample shows the presence of quartz and feldspar as dominant minerals and the rock could be granite.

Gun and shot: Four iron guns were noticed and each gun is approximately 2 m in length and all are identical. The exterior of the guns is heavily encrusted and overgrown

with calcareous material, barnacles and mussels. The nozzles of two guns were facing the seabed in slanting positions whereas the other two were lying parallel on the seabed. Monogram, inscription, symbols or identification marks are not visible on them because of marine growth. These guns have swivels on both sides. These are also plain without having any lifting dolphins or rings and each gun has two reinforcements and the chase. These guns also showed a distinct cascable button slightly rounded at each end. A cast iron shot having weight 1218 g, diameter 9.54 cm and specific gravity 4.76 was retrieved from the western side of the gun. The shot is slightly conical at the top and flat at the base with uneven surface. No stamps or other identification marks were noticed on the shot. During the 17th and 18th centuries, there were frequent battles between the European powers in the Indian Ocean, hence cargo ships also kept guns for their safety.

Iron anchor: A two-fluked iron anchor was found between crevices of lateritic. One fluke of the anchor was on the laterite and other was lying in the crevices of the laterite. The shank has a hole at the end meant for either metal ring. Barnacle and other marine growth were noticed on it. It appears that the wooden stock of the anchor might have decomposed.

St George's Reef

The reef slopes towards the south and southeast. Exploration yielded a large number of terracotta artefacts, such as chimney bricks, roof, ridge and floor tiles, hollow column drum, a Corinthian type column capital, drainage pipes and the timber from the ship (Figure 4). All these artefacts are intended for house construction³. Environmental conditions helped biological growths such as coral and orange-coloured sponge, which are notable on the findings. Artefacts were scattered over a large area and more were observed on the south and southeast of the reef. The metal detector survey did not reveal any metal anomalies, thereby indicating that the ill-fated ship could be a country craft built of wood. Airlifting operations were carried out near the reef. The surface of the seabed revealed more broken roof tiles than floor tiles. Bigger pieces of tiles were encountered in the upper layer, whereas fragments were noticed in the lower layer of the seabed. These artefacts have turned black owing to long burial in the seabed.

The findings have been described briefly here. Floor tiles ($220 \times 220 \times 20$ mm) are square and have four deep grooves at regular intervals. Some are stamped at one corner. These grooves are meant to provide a grip to the floor. Floor tiles are more numerous than bricks, roof tiles and other terracotta artefacts. Bricks ($230 \times 115 \times 60$ mm) are made of white clay and are used either for the chimneys or industrial purposes. The words 'Basel Mission Company 1865' are stamped only on one side of the bricks and roof tiles. All bricks have a frog. Roof tiles (400×230 mm)

are lighter than other artefacts and hence are more broken. The word's 'Basel Mission Company 1865' are stamped on the lower side of all the roof tiles. The column drum is a hollow and its height and circumference are 300 mm and 900 mm respectively. It is fluted, partly broken and fitted below the capital. The Corinthian type column capital is hollow inside and one end is closed (Figure 5). Four supports were fixed inside it to provide additional strength and appear to intersect. Prolific marine growth was noted on the outer surface. The lower end of the capital, which would rest on a fluted column, is circular while the top on which the lintel was to be placed is square. The drum and column were retrieved for further study.

The maximum length, width and thickness of the timber are 200, 180 and 160 mm respectively (Figure 6). Its 'U' form and longitudinal rabbets suggest that it is part of the keel of the ship. The rabbets are 50 mm deep and the hog between is 100 mm wide. One end is well preserved and has the remains of a carefully worked scarf with incuts from a chisel and nail holes. There are two nails on the lower side, suggesting that a false keel or sheathing was fitted to it. Woodborers have destroyed the other end. This timber survived because it was partly buried in sediment within the reef and was not affected by current action. From the timber it is possible to infer that the ship was not large and had a wooden hull with 50 mm (2 inch) planking. It is assumed that the wreck broke up and all the other timber and organic material were either washed away or destroyed by woodborers. The radiocarbon dating of the timber is $114.3 \pm 1.5\%$ years old (measured ^{14}C age $T_{1/2} = 5570 \pm 30$ years). The timber belongs to the *Lagerstroemia lanceolata* species, for which the trade name is bentek.

Discussion

From the inscriptions, literature and marine records it is clear that several ships have wrecked in Goa waters due to various reasons. The Sunchi Reef wreck is not mentioned either in the Hydrographic Charts or marine records. The cause of its loss is still unknown. One of the possible reasons for shipwrecks in shallow waters could be the inadequate knowledge about the sea bottom topography. The non-availability of proper navigational charts of the area showing the submerged rocks, shoals and reefs could also be the causes for wrecks in the region. The Sunchi Reef wreck could have been caused by the grounding on the shallow submerged rocks due to human error in navigation.

As the ship wrecked in rocky and shallow waters, survival of perishable and light material is also negligible. The objects, which were either heavy or fell in the crevices of the laterite, have only survived. None of the ship's parts have been noticed so far. Until the bell and other parts of the ship where the name is inscribed are found, the name of the ship may remain mystery. However, during the Portuguese rule in Goa only wooden hulled vessels were plied, hence it is certain that the wrecked ship is wooden hulled.

Generally, the ships place anchors at the foredeck and guns on the starboard and portside. As the anchor is lying on the north and guns at the centre of the site, it is inferred that the ship was sailing from south to north direction. All the four guns are lying close to each other and are *in situ*. It appears that guns were kept on board at one place; if these were kept on board at different locations then their findings underwater would have been at various places.

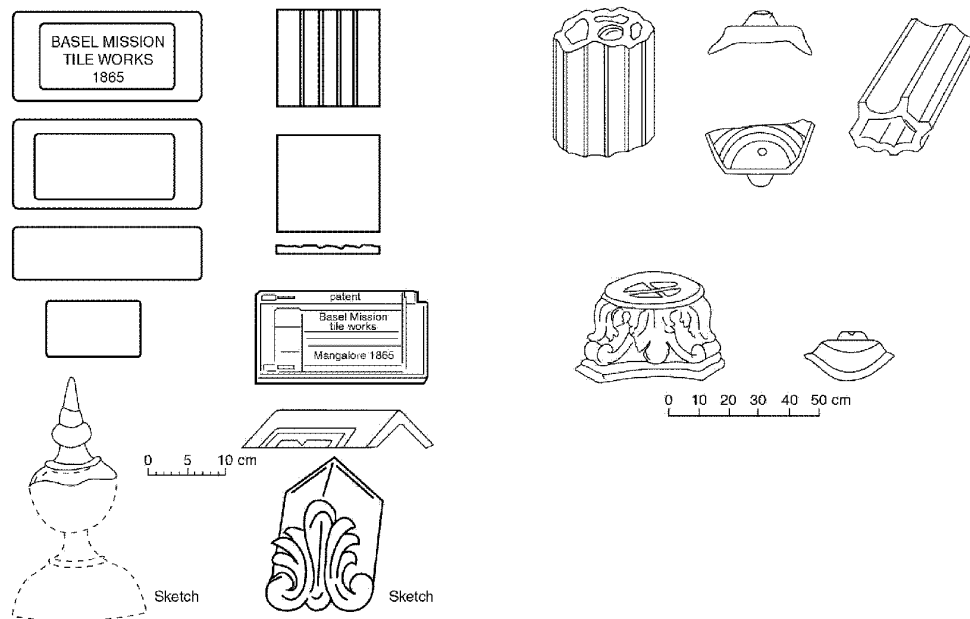


Figure 4. Terracotta artefacts of the Basel Mission Company.

Similar types of Martaban pottery have been reported from *Nossa Senhora dos Martires* 1606 off Lisbon¹⁵, *Santo Antonio de Tanna* 1697 off Mombasa¹⁶ and the VOC *Risdam* wreck off Malaysia¹⁷. All these jars have loop handles to tie rope during transportation, and a ring was placed at the base, which gives greater balance. Oils, water, food grains, etc were transported in these jars¹⁸.

The Chinese ceramic sherds probably belong to the items used daily onboard. Comparatively, the Martaban sherds are more in number than the Chinese ceramics. The bases of glass bottle pieces indicate that either olive oil or wine was imported from Portugal to Goa. The metal handle could be used as a handle and also as a hook. The size and shape of the iron anchor resembles that of anchors, which are kept in the Archaeological Museum at Old Goa, the one kept at the Marine Archaeology Centre at NIO and others found in Aguada bay. In these types of iron anchors wooden stocks were used, however the stock of the anchor is missing¹⁹.

The hippopotamus teeth and ivory were imported from Mozambique and used for carving, handles, chess pieces, dices, sculptures, etc. These were the items of trade and were part of the cargo of the ill-fated ship. Granite blocks are lying randomly on the seabed. It appears that these dressed granite stone blocks initially fell on the rock and in course of time slipped down and fell in the crevices of laterite. These blocks probably could be the main cargo and also served as ballast. On the basis of radiocarbon dating of ivory and thermoluminescence dating of the Martaban pottery (360 ± 40 years old), we suggest that the wreck could be dated to the early 17th century AD and belongs to the Portuguese period. Further, the shipwreck

findings in the Sunchi Reef show the evidence of the Indo-Portuguese trade and commerce.

The discovery of the wreck has elucidated the history of the Basel Mission Company and its trading activities in the past century. The wreck could have been caused when the ship struck the shallow submerged reef, as a result of human error in navigation or inclement weather. The concentration of artefacts on the south and south-eastern side of the reef suggests that the ill-fated vessel was coming from the southern side of Goa (Mangalore or Calicut) when it struck the reef and foundered.

Although the stamp Basel Mission Company was not found on all the artefacts, it is presumed that all were the products of this company. Similar artefacts can still be seen in the old Portuguese houses in Goa. The keel timber found on the site indicates that the ship did strike the reef and foundered. Manual exploration and metal detector survey did not yield any metallic anomalies such as a propeller or boiler, so the vessel appears to have been a sailing ship.

Since the cargo belongs to the Basel Mission Company, it is important to trace its origin and other activities. The Basel Mission started its work from 1834 onwards in India at Mangalore. The Basel Mission established industrial enterprises in Malabar and south Canara for the converts. The Basel Mission Company established its first tile factory at Jeppo, Mangalore in 1865, and subsequently at Calicut, Kudroli, Malpe, Codacal, Palghat and Feroke (Figure 7). Easy access to raw materials and transport facilities made the company set-up tile factories in these areas. This was their first industrial venture on the Malabar Coast of India²⁰. Initially, bullock carts transported the tiles; subsequently boats were used for transportation²¹.

The raw material for manufacture of tiles, namely clay or feldspar, was abundantly available on the banks of the River Netravati in Mangalore. The company introduced further technical changes in the manufacture of tiles; these included salt glazes and gas-fired kilns in order to obtain uniform temperatures. Tiles were transported throughout



Figure 5. Corinthian column capital from the shipwreck on St George's Reef.



Figure 6. Remains of timber from the wrecked vessel on St George's Reef.

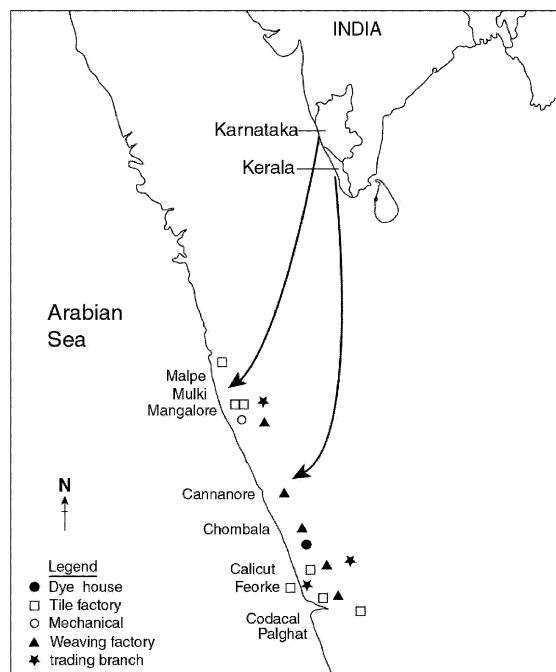


Figure 7. Map showing the location of Basel Mission industrial activities along the Karnataka and Kerala coasts of India.

India, British East Africa, Aden, Basra, Sumatra, Borneo and Australia²¹. From Bombay (Mumbai) the company exported to other parts of the India, including Ghana, Borneo and China, but their industrial base remained the strongest on the western coast of India because of low investment costs and ready availability of manpower. On the basis of radiocarbon dating of timber ($114.3 \pm 1.5\%$ years old) it is suggested that the wreck could be dated to the mid-19th century AD and belongs to the Basel Mission Company. Further, the shipwreck findings in the St George's Reef show the existence of trade and commerce between India and Basel Mission Company.

Conclusions

The Sunchi Reef wreck is the oldest wreck in the Indian waters and the first Portuguese wreck. The wrecked ship of the Sunchi Reef could be a wooded-hulled ship, because during the 16th and 17th century all Portuguese ships were wooden hulled cargo sailing ships. As the ship was wrecked in the rocky area, survival of perishable material is ruled out. The currents might have also washed out the remains of the ship and some other antiquities. Except granite blocks, hippopotamus teeth and tusks, no other cargo has so far been found. No other detail of the ship such as its length, width, masts, decks and its other history is known. Many shipwrecks are not explored in Goa waters, hence the findings of this survey are valuable in reconstructing the maritime contact between Goa and Portugal.

The impact caused by the Basel Mission industrial efforts in terms of transfer of techniques is undeniable. This resulted in the systematic application of new technical knowledge to indigenous industrial activities. The systematic offshore exploration of the St George's Reef has brought to light an undocumented wreck of the company. This is the first wreck of the Basel Mission Company located during underwater excavations and datable to the mid-19th century. The findings of these shipwrecks helped in confirming the trade and commerce of Goa with other parts of the world as mentioned in the literature. No ancient and medieval shipwrecks have been located in Goa waters, but the present findings are breaking new ground in maritime archaeology of India and the explorations suggest that the Goa waters has rich potential for the shipwreck archaeology.

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