

# Marine Archaeological Surveys off Tranquebar, Tamilnadu Coast – Preliminary Results

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Preliminary investigations comprising of Echosounder, Magnetic and Side Scan Sonar surveys have been carried out in May, 1989 in the offshore regions of Tranquebar, the erstwhile Dutch Port on Tamilnadu Coast. The surveys were mainly confined between 5 and 15 m water depths where possible existence of sunken shipwreck and submerged structure is reported. Investigations were also undertaken along the beach and intertidal zone to get some possible indications of ancient culture in this region. The Chola, Pandyan and Dutch coins are found in abundance in the intertidal zone near Masalamani (Chola) temple and terrakotta ring wells of 3rd Century A.D.

The bottom topography is perfectly smooth and gentle covered with fine sands and muds. No single outcrop has been recorded between 5 and 15 m water depths. Incidentally there are no outcrops even on the coastline. The Side Scan Sonar recorded several interesting features opposite to Masalamani temple, Chinnavanigiri and Chinnakudi. Most of these features are present between 9 and 11 m water depth while very few objects were recorded at about 5 m water depth off Masalamani temple and Tranquebar Fort. Many of the objects recorded from 9 to 11 m appear to be arranged in a fairly systematic pattern either in semicircular and/or circular fashion. The absence of any outcrops on the coastline and the regular arrangement of the object at these depths suggest the possible existence of submerged structures. One or two objects recorded in this area closely resemble to the submerged ship wrecks but none of these objects could be confirmed by diving operations because of rough sea conditions and very poor visibility.

## INTRODUCTION

Tranquebar situated on the eastern coast of India is about 25 km. south of the celebrated port at Kaveripattanam, also known as Pumpoohar; which was a major trading port from the third century B.C. Pumpoohar had attracted traders from all parts of the world especially from the Roman empire. The history of Tranquebar (Tarangambadi) can be traced to the beginning of the Christian era. Ancient Sangam classics such as "Purananooru", "Natrinal" and "Agananooru" refer to Poraiyur which is a port town. It is likely that the sea which originally skirted Poraiyur receded after the second century A.D. Marine Archaeological Unit at NIO, Goa in association with Regional Centre of NIO at Visakhapatnam initiated the exploration and excavation in May 1989 off Tranquebar to throw some light on the pre-Tamil Sangam era civilization. During this period preliminary investigations comprising of Bathymetry, Side Scan Sonar and Magnetic surveys were carried out between 5 and 15 m water depth and about 15 km to the south and north of Tranquebar.

## GEOLOGY

The offshore region of Tranquebar located between Karaikal in the south and Kaveripattanam in the north falls in the drainage basin of Cauvery river. In addition, several other small ephemeral rivers named Nandalur, Virasolanar, Kadalaliyar and Vadiyar which are some of the distributaries

of Cauvery river discharge into the sea near Tranquebar. The coast is almost trending north-south without any prominent bays and hills and is covered with recent alluvium. The total network of Cauvery river system drains largely through the precambrian formation in Karnataka, Kerala and Tamilnadu. The study of LANDSAT imageries and space photography (Gemini II) revealed the presence of series of parallel to enecholon lineations in the drainage area of Cauvery (Srinivasan and Srinivas 1977) which fits into the tectonic setting of southern India as a whole (Katz 1978). The precambrian formation of the drainage basin of Cauvery river comprised of Dharwar system, peninsular gneiss, charnockite and the closepet granite (Krishnan 1968). The entire central zone of Cauvery drainage basin where the present study is undertaken is exposed with alluvium only, whereas the inland basin is running through the rock formations. The beaches and dunes in the study area look blackish as the sands comprise of heavy minerals with the dominance of opaque minerals of ilmenite and magnetite. The continuous vertical cross section of the sediments obtained from the borewell dug by ONGC reveal the succession of layers from Cretaceous to recent formation (S.P. Kumar 1987). Loveson and Victor Rajamanickam (1987) reported from their studies of satellite imageries and aerial photography that the southern coast has undergone prevalent emergence or regression of sea.

The bathymetric charts recorded in the shelf region of Tranquebar reveal gentle topographic variation with fairly smooth ocean bottom. The shelf gradient is slightly more upto 10 m water depth, remaining fairly gentle from 10 to 50

m depth and again becomes more steep upto shelf edge. The width of the shelf is about 32 km. A few sediment samples collected during our investigations indicate that the sea floor upto 5 m depth comprises of medium to fine sands between 5 and 10 m, silty clays from 10 to 15 m and silty clays and clays beyond.

**RESULTS**

The echograms obtained during the present surveys between 5 and 15 m water depth did not record any major undulations of the ocean bottom or any outcrops except one or two submerged river channels. The magnetic data recorded in this region is also fairly smooth and devoid of any significant anomalies. However, the Side Scan Sonar (SSS) records show the presence of several objects of varying sizes in the ocean bottom and also revealed the existence of a series of disjointed structures between Tranquebar and Chinnavanigiri. Some of the features recorded in the sonographs and their possible implication to Archaeological investigation are described in this paper.

The Side Scan Sonar surveys were carried out parallel to the coast between 5 and 15 m water depth and about 15 km along the coast covering the area to the south and north of Tranquebar (Fig. 1). The profiles were placed at about 1 m water depth interval and the scanning range was 100 m either side of the boat. All the surveys were carried out on a mechanised wooden hulled fishing trawler (SONA). There were no navigational aids except the magnetic compass and the locations were noted by visual observations with reference to the objects available on the coastline. During the survey period the sea was rough. As such we could not get the correct plan view of the objects and the noise content of the records is fairly high. While the objects recorded off Masalamani temple near Tranquebar Fort. Near to the north of Masalamani temple disjointed structures (Pls. 41-42) that resemble the fragments of a linear structure parallel to the coast is recorded at about 7 m water depth. These objects each of about 25 m in length extend for more than half a kilometer in length along the coast. The disturbed objects are more or less of equal size with a semitwist in the shape. The arrangement of these objects suggests the presence of a submerged wall which might have been disturbed and the pieces are either thrown apart or got buried under the sediments causing the discontinuity in the main structure.

A long linear feature extending from the coast into the sea (Pl. 40) has been recorded at about 5 m water depth off Masalamani temple near Tranquebar Fort. Near to the north of Masalamani temple disjointed structures (Pls. 41-42) that resemble the fragments of a linear structure parallel to the coast is recorded at about 7 m water depth. These objects each of about 25 m in length extend for more than half a kilometer in length along the coast. The disturbed objects are more or less of equal size with a semitwist in the shape. The arrangement of these objects suggests the presence of a submerged wall which might have been disturbed and the pieces are either thrown apart or got buried under the sediments causing the discontinuity in the main structure.

Off Chinnakudi which is about 7 km north of Tranquebar fort, several objects of varying sizes are recorded (Pls. 43-44). They are mostly concentrated between 9 and 11 m

water depth. In general, they appear to have been scattered objects. But a close look at the records suggest that they are arranged mostly in a semicircular pattern scattered over an area of about one kilometer long. These objects are recorded off a temple near Chinnavanigiri. In the absence of any rock outcrops on the shoreline and beach and the echosounder records being devoid of any outcrops it is tentatively concluded that the objects recorded in the sonographs may correspond to some manmade structures that are subsequently submerged.

In between Chinnakudi and Chinnavanigiri large isolated bodies and patches of small objects are recorded. Off Chinnavanigiri the sonographs revealed presence of several large isolated objects (Pls. 45-46). Some of these objects from their size and shape are suspected to be sunken ship wrecks. The magnetic anomalies over these objects would normally be of very low amplitude. The rough weather conditions prevailed during the surveys produced large background noise which might have possibly masked the low amplitude anomalies produced by these objects.

To the south of Tranquebar, there are not many objects but some submerged river channels associated with some objects are recorded. These river channels are also recorded in the echograms.

Along with these surveys, investigations were also undertaken along the beach and the intertidal zone to get some

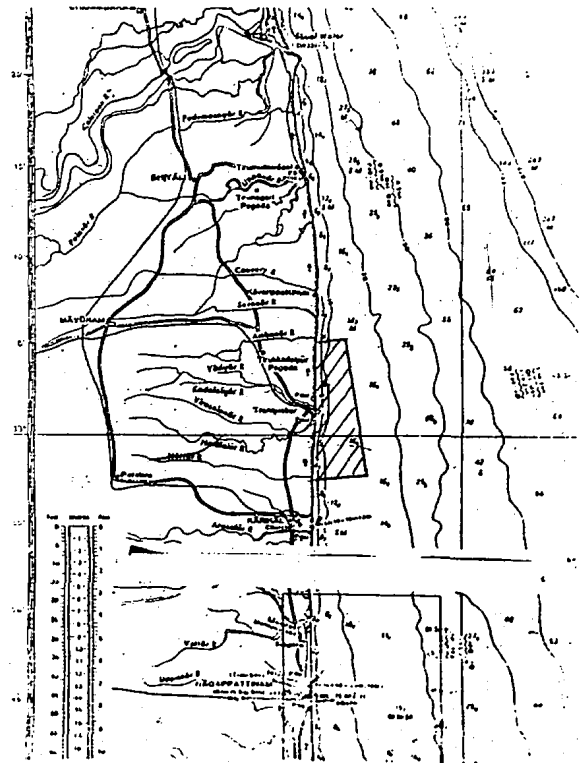


Fig. 1 Location of Survey area off Tranquebar.

possible indications of ancient culture. Pre-Chola, Pandyan and Dutch coins are found in abundance in the intertidal near Masalamani (Chola) temple and there are terrakotta ring wells of 3rd Century A.D. None of the objects recorded in the geophysical surveys could be confirmed by diving operations because of rough sea conditions and very poor visibility. However, from these preliminary surveys it is suspected that many of the objects recorded could be of Archaeological importance which could throw more light and evidence after conducting more detailed and systematic surveys supported by diving operations. Dr. S.R. Rao opines that the submerged structures from 9 to 11 m depth may be of the early historic period while those recorded at 5 to 7 m depth may be of medieval period. The present surveys also revealed the possible existence of one or two sunken ship wrecks off Sinnarpeta.

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