

OVERVIEW

The work, started as a thesis of the Postgraduate School of Archaeological Heritage of Sassari University, has been focused on the study of an artifact that is located in "Tre Ponti" at the district Ardenza, Livorno. In the stretch of sea off the mouth of the Rio Ardenza, is possible found numerous of mainly Roman-era shipwrecks, belonging to a time span between the I B.C. and III A.D. as transport amphorae, Dolia and stone artefacts. The amount of these findings has raised the hypothesis that the area was present a secondary anchorage, probably part of the largest *Portus Pisanus* port system.



Fig.1 Site general view from Google Earth

As a premise, it is important to add that, in the present state of knowledge, you can only speak of hypotheses, given the absence of scientific literature on the subject and ancient sources. The area of the mouth of the Rio Ardenza, the "Tre Ponti" and the Rotonda di Ardenza, as seen from the satellite, has been subjected to intense anthropogenic processes that altered the original appearance. What remains still readable regarding ancient artifacts, is what remains of a small fishery and under a concrete esplanade built illegally in the '60s, a channel of about three meters wide carved into the bench culminating in a circular tank with a small opening to the sea.

The artifact is partially carved into a shallow marine calcarenitic deposit bank (locally known as "panchina") and partly built of blocks of stone and mortar.

As a premise, it is important to add that, in the present state of knowledge, you can only speak of hypotheses, given the absence of scientific literature on the subject and ancient sources. The area of the mouth of the Rio Ardenza, the "Tre Ponti" and the Rotonda di Ardenza, as seen from the satellite, has been subjected to intense anthropogenic processes that altered the original appearance. What remains still readable regarding ancient artifacts, is what remains of a small fishery and under a concrete esplanade built

METHODS OF ANALYSIS

- ◆ Bibliographical research about roman fishery and maritime installations fishponds.
- ◆ Study of classical, toponomastic and ecclesiastical sources; aerial photos, historical cartography, geomorphological analysis applied to the Ancient Topography.
- ◆ Survey
- ◆ Clean up some parts of the fishery from the benthic organism.



Fig. 2 The tanks area during an exceptional low tide.



Fig. 3 1930 RAF Picture shows the artifact area before the concrete esplanade; is possible see a circular tank with a channel on the top.



Fig. 4 A Quadrangular hole found during the survey in the external part of the artifact

THE ARTIFACT

The Ardenza (Livorno, Italy) fishery is partially excavated in the shallow marine calcarenitic deposit bank and partly built with concrete and mortar; the structure consists of at least six square-shaped tanks of the approximate size of 5x5 m; the top part of the dividing walls has been enhanced by a rudimentary stone masonry (probably made during the excavation of the tanks) connected with mortar. all tanks are connected each others with openings wide between 60 and 75 cm. There are two channels: the main one (Fig.8) is carved in the rocky bench, has a diagonal course, length about 28 m and wide 1 m; the channel preserves a portion of a covering made with sandstone sheets and some fissures made in the rocky bank (Fig.7).

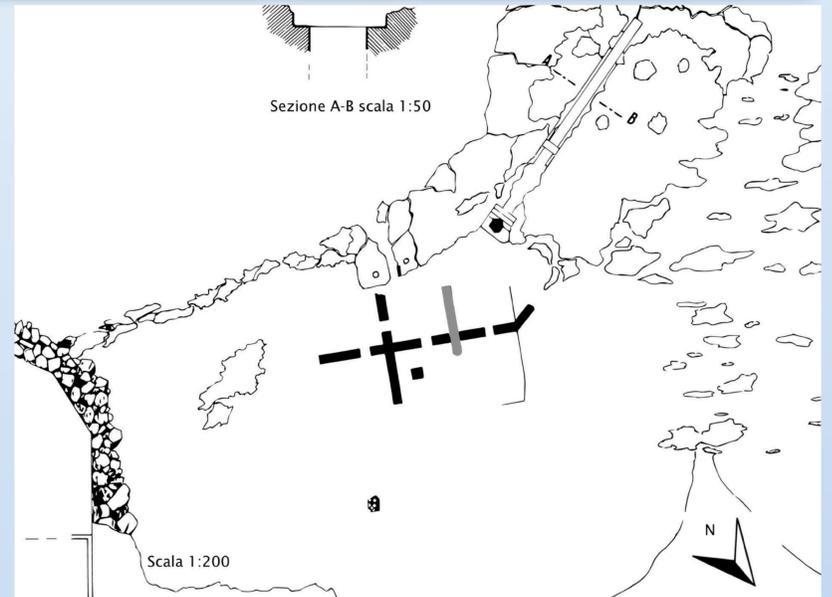


Fig.5 General area map, tanks and channels included.

The secondary channel is shorter than the main one, is just 3 meters and wide about 80 cm, is orthogonal to the tank where has been found a rectangular carved calcarenitic stone 50 x 20 x 15 cm.



Fig. 6 Fissure in the sandstone



Fig. 7 Sandstone sheets covering (particular)



Fig. 8 The main channel

Several significant elements have been found during the survey inside the fishery : Terra Sigillata Italica (Fig. 9) and bricks fragments inside concrete, carved shallow marine calcarenitic stones (57 x 90 cm) read as supporting elements of the partition grilles between the tanks (Fig.9).

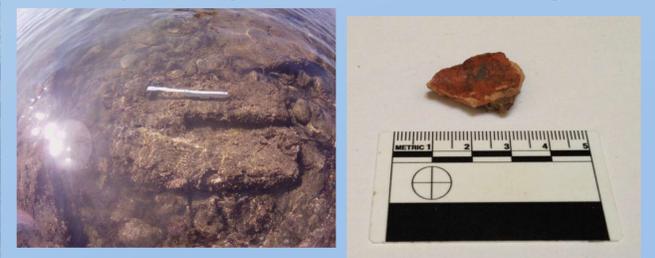


Fig. 9 : From left to right; carved calcarenitic stone; brick; fragment of Terra Sigillata Italica; .

CONCLUSION

The existence of a possible secondary harbour at the mouth of the Rio Ardenza, the presence of a Roman kiln at the parking area of "Tre Ponti", the presence of a fairly large village of the Roman period to about one km distance from the mouth of the Rio, are clues that enable us to assume a large presence of settlements in Roman times. Given the comparisons provided by the other fishery along the Tyrrhenian coast, it is conceivable that the structure present in front of the Rotonda di Ardenza (Livorno) is a fish farm and, perhaps more likely, a fishery for fish conservation before placing on the market, as would be expected of a likely harbor structure in the immediate vicinity. Unfortunately, there are no data that can testify to the presence of ancient structures close to the tanks. More investigation is expected to do light on a interesting piece of Livorno History.

SHORT BIBLIOGRAPHY

- Bargagliotti S. 2002, Rinvenimenti Sottomarini di età Imperiale sulle Secche della Meloria e alla Foce del Rio Ardenza (Livorno), 1993-98, in *Archeologia Subacquea, Studi, Ricerche e Documenti III*, :227-242. Roma.
- Giacomini L., Marchesini B., Rustico L. 1994, *L'itticoltura nell'Antichità*, Roma.
- Higginbotham J. 1997, *Piscinae, Artificial Fishponds in Roman Italy*, The University of North Carolina Press.
- Lambeck K., Anzidei M., Antonioli F., Benini A, Esposito E. 2004, Sea level in Roman time in the Central Mediterranean and implications for modern sea level rise. *Earth and Planetary Science Letter* 224 :563-575.
- Marini S., Genovesi F. 2015, La Necropoli Tardoantica di San Martino in Collinaia (LI), *Rassegna di Archeologia* 2009-2013: 93-127.
- Rustico L. 2004, Impianti marittimi per la piscicoltura in età romana, in *Lezioni Fabio Faccenna : conferenze di archeologia subacquea (III e V ciclo)* :119 – 123.