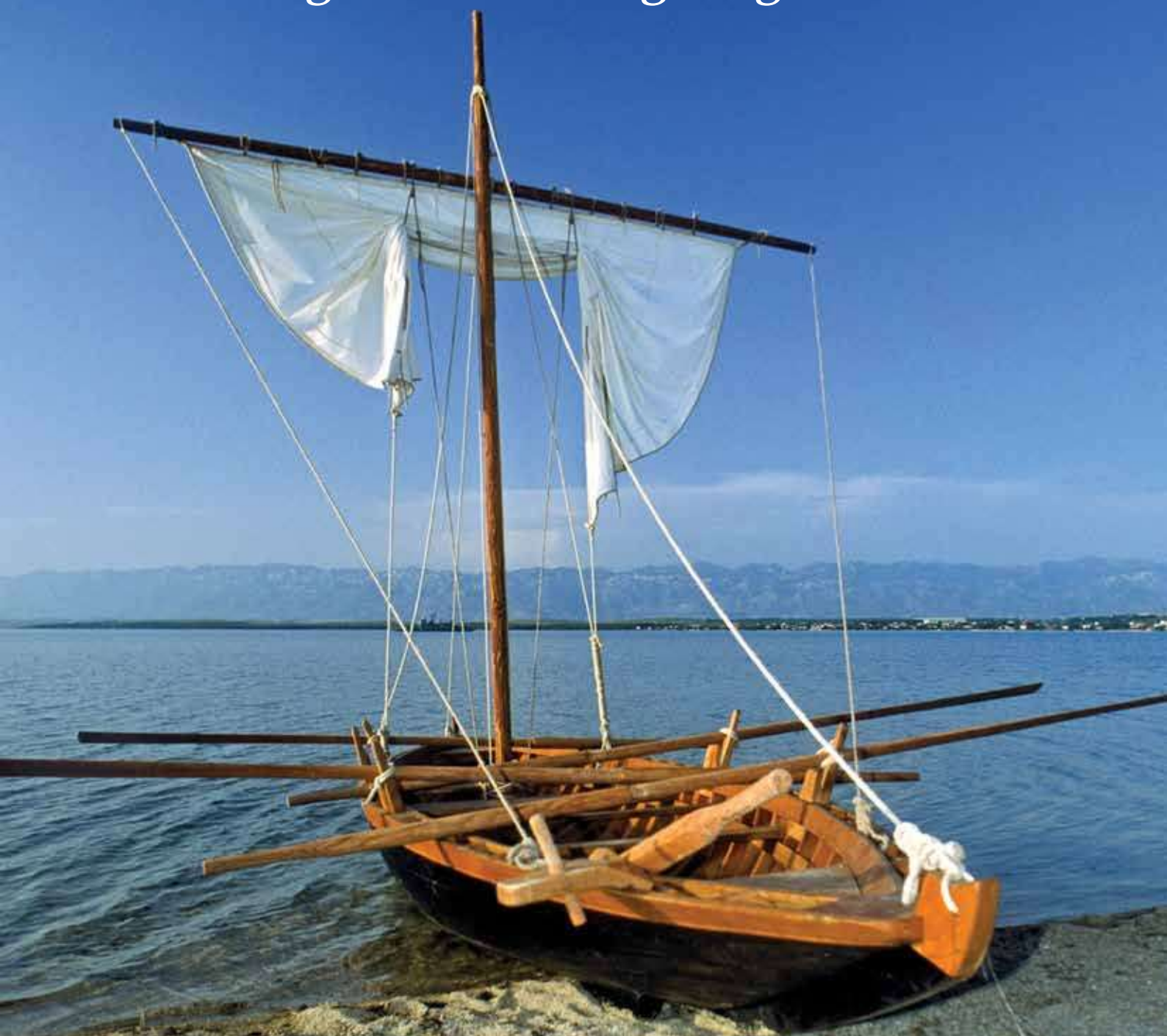


# Sailing through History

*Reading the Past – Imagining the Future*



**Proceedings of the 16<sup>th</sup> International  
Symposium on Boat and Ship Archaeology  
Zadar 2021**

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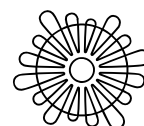
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Cover: Reconstruction of the mediaeval ship from Nin, Croatia (photo: Ivo Pervan)



# The columns shipwreck of Kamarina (2<sup>nd</sup> c. AD) – New data from the Kaukana project, Sicily

Massimo Capulli

**Abstract :** The shipwreck of the Columns, dated at the end of the 2<sup>nd</sup> c. AD, lies on a sandy bottom at a depth of 2.5 to 4 m in the bay that opens south of the promontory on which the Syracusans, at the beginning of the 6<sup>th</sup> century BC, founded the colony of Kamarina. The main cargo consisted of a pair of half-finished columns 80 cm in diameter and approximately 6 m long. The new research on this site, known since the 1970s, is part of an organic program of study of the historical-archaeological evidence preserved along the Ragusa coastline by the University of Udine, in collaboration with the Superintendence of the Sea of Sicily and with the support of the Institute of Nautical Archaeology.

**Keywords:** shipwreck, landscape, Kaukana, Kamarina, anchors, columns

## 1. A brief history of research

The shipwreck of the Columns of Kamarina is located in the bay that opens south of the promontory on which the Syracusans, at the beginning of the 6<sup>th</sup> century BC, founded the colony of the same name (Fig. 1). The underwater site, which owes its name to the main cargo consisting of a pair of columns, has been known to the authorities since the first half of the 1970s, when it was reported to the Kamarina Excavations Office of the Archaeological Superintendence of Syracuse (Di Stefano 2016: 143–148).

After a preliminary investigation by Parker in the same years (Parker 1976: 25–29), the shipwreck was subjected to a more thorough investigation in two campaigns conducted by the company Aquarius in 1989 and 1996, which benefited from a period where the site was naturally exposed, since the morphology of the sandy bottom varies here according to the shifting currents and wave action. In particular, the space between the columns was investigated, then following the portion of the hull which had remained in a southerly direction; during the excavations, in addition to the monumental cargo, numerous lithic slabs and other accompanying goods were also identified such as 21 examples of African IA amphorae, form XXIII of Ostia, and to a lesser extent of the Mid Roman 18 type, form Reley 288 (Di Stefano 2016: 143–148), in some cases still with the cork. To these finds, which are certainly part of the cargo, we must add artefacts that are also representative of refined artistic craftsmanship, such as a pyriform copper vase decorated with plant and geometric motifs and blue glass paste inlays or a thermos decorated with theatrical masks and lion's paws (Di Stefano 1998: 36–43; Di Stefano 2003: 10–31; Di Stefano, Ventura 2012: 633–638).

## 2. The investigations of Kaukana Project

The shipwreck has been located and investigated again in recent times. The new research in Kamarina Bay is part of a larger scientific project, called the Kaukana Project, which was born from Sebastiano Tusa's<sup>1</sup> desire to realize an organic program of study of the historical-archaeological evidence preserved along the Ragusa coastline between the ancient cities of Ispica, Kaukana, and Kamarina. In the period 2017–2020, the Department of Humanities and Cultural Heritage Studies of the University of Udine, in collaboration with the Superintendence of the Sea of the Sicilian Region

<sup>1</sup> The former Superintendent of the Sea and then Councilor for Cultural Heritage of the Sicilian Region, Sebastiano Tusa co-directed the research until his tragic disappearance on March 10, 2019, in the Ethiopian Airlines flight crash while on his way to Malindi, where he was supposed to attend an international conference organized by UNESCO. The research continued on behalf of our missing colleague.

and with the support of the Institute of Nautical Archaeology, thus conducted four research campaigns aimed at the diachronic reconstruction of the underwater landscape of the Ragusa region: the first year the activities focused on the Punta Secca wreck (Capulli 2021: 33–45), the second year a survey was carried out in the waters of Porto Ulisse and those of Kamarina (Capulli, Innocenti 2019: 10–16), and the third and fourth years they returned to Kamarina for an in-depth investigation of the Columns shipwreck.



**Fig. 1** The bay of Kamarina with the Columns shipwreck at the bottom right (photo: D. Innocenti)

Reconnaissance carried out in 2018 in Kamarina Bay, with the aim of expanding the study of known shipwrecks, resulted in the rediscovery and geo-referencing of the wreck of the Columns, as well as a previously unknown anchorage. That site could also be interpreted as a shipwreck area given the chronological-typological consistency and position of the anchors. Specifically, there are four iron anchors that lie at the foot of a vast rocky outcrop and rest at a bathymetry of about -3.7 m along an alignment oriented roughly 70 degrees north. Typologically, the anchors can be traced to the inverted ‘T’ type and generically referred to as Byzantine. Of the four anchors, only three are identifiable: two belong to the D typology of the seriation proposed by Gerhard Kapitän (Kapitän 1984: 33–44), while the third, which orthogonally overlaps one of the D typology anchors, seems to represent a transitional moment between typology C and typology D (Capulli, Innocenti 2020: 6–7).

About 120 m from the anchorage in a direction 10 degrees north, as anticipated, the shipwreck of the Columns was also identified. In fact, in spite of increased silting of the bay, possibly caused by the Scoglitti harbor extension work that had taken place since the previous archaeological investigations, the two column shafts were still partially visible. Thus, the following year a new excavation campaign was conducted<sup>2</sup> aimed at completing the 1996 work, investigating north of the columns as well, and to initiate the study of the hull. Indeed, except for the stone cargo and non-diagnostic and crushed ceramic materials, the cargo had been recovered in previous campaigns.

<sup>2</sup> All activities at sea were coordinated with Fabrizio Sgroi of the Superintendence of the Sea of the Sicilian Region and with the collaboration of the Scoglitti Local Maritime Office of the Pozzallo Port Authority.

## 2.1. The columns shipwreck site

The shipwreck lies on a sandy bottom at a depth of 2.5 to 4 m and a distance from the beach of about 80 to 90 m. The main cargo consisted of a pair of half-finished columns 80 cm in diameter and approximately 6.25 m long (the one on the sea side) and 6.04 m long (the one on the beach side) (Fig. 2). For both, the shafts are smooth and have only a 1/2 cm raised band at both ends, with a height of between 24 and 27 cm. In order to observe and document the hull,



Fig. 2 Part of the hull preserve (keel and the two gardboards) and the columns seen from the south-east (M. Capulli)

it was necessary to make a large trench longitudinal to the axis of the ship. In particular, the underwater archaeological investigation, also carried out for the purpose of a teaching exercise, involved the use of a water dredge to remove a thick layer of sand by proceeding in inclined planes. That is, the sediment was removed by constantly looking for the correct angle of friction, which made it possible to contain the sliding of material along the walls of the excavation. Having uncovered the hull both south and north of the columns (previous investigations had never uncovered the preserved portion of the hull north of the columns), it was possible both to proceed with the execution of a series of direct surveys and to obtain additional documentation to that produced during the 1989 and 1996 excavations. Thanks to the technologies available today and taking advantage of a prolonged period of weather-marine stability<sup>3</sup>, it was possible, for example, to carry out a series of aerial shots, both zenithal and oblique, using a DJI drone, model Mavic 2 Pro. These operations, also aided by the limited bathymetry and generally good water visibility, allowed production of a rich photographic documentation of the shipwreck and the coastal landscape in which it is embedded. In addition, the thousands of high-definition digital images acquired during underwater operations have enabled the construction of a three-dimensional model of the shipwreck (Fig. 3) from the pixel cloud (Balletti *et al.* 2016: 1–8; Yamafune *et al.* 2016: 703–725).



Fig. 3 The 3D model of the Columns shipwreck (author: M. Capulli)

<sup>3</sup> The 2019 campaign lasted 26 days, including nine days of weather stand-by; however the latter were not intermittent, but concentrated from the middle of the third week of excavation to the end of the campaign.

The same methodology was used in the following year, however 2020 saw a short campaign, necessarily with reduced participation and with constraints imposed by actions to contain Covid. Thus, a focused search was opted for, aimed at verifying whether other parts of the hull had been preserved beneath a pile of lithic slabs lying along the outer side of the north end of the land-side column.

## 2.2. New data from the Kaukana project

Originally stowed probably in parallel, the columns (for which a total weight of about 16 to 18 t is estimated) today appear divergent by a few centimeters at the north-northwest end and by about 3 m at the south-southeast end; both shafts, moreover, are broken into two trunks slightly offset from each other. Based on the analyses performed<sup>4</sup>, it can be stated that the columns are of ancient yellow marble, the so-called *marmor numidicum*, although from a strictly petrographic point of view it is a fine-grained limestone composed almost entirely of microsparite grains. In particular, it is noted that the southwest column lies partly above the keel, crushing the keelson against the other column. It is therefore likely that during the sinking the columns moved and one dismantled the bulwark, possibly contributing to unbalancing the ship. From a post-depositional point of view, this explains the observed asymmetrical conservation, in which the ship's center and northeast side are better preserved since they were covered and to some extent protected by the columns<sup>5</sup>.

The hull extends for a length of 15 m, running from one end (northwest) to a Jupiter dart on the keel (southeast). The latter is formed by a beam 28 cm wide and about 26 cm high, suitably shaped at the upper edges to form a rabbet of variable angle into which the garboards were inserted. The width of the planking boards is between 32 and 27 cm, while the measured thickness is 7.5 cm. At the fracture points we were able to document the mortise and tenon joint system peculiar to the ancient age, here atypically secured by a double order of joints (Fig. 4), arranged in a staggered manner in two parallel rows only 1.5 cm apart (Capulli, Innocenti 2020: 12). In contrast, the distance between mortises within the same row is 8.5 cm, which corresponds to the width of the mortises themselves. These, 0.73 cm high, are 7 cm deep and juxtaposed between planks, housing tenons 12.5 cm long, 6.5 wide and 0.72 thick, clamped inside the mortises by pegs, about 1 cm in diameter. Above the planking, sixteen floor timbers have been preserved, attached to the planking by 1.5/1.8 cm diameter treenails, in which there is a single central limber hole. The average width of the floor timbers is 11/12 cm and is slightly less than the distance between them, which is 13 cm; the height measured between those preserved between the columns is 20/22 cm and rises as one proceeds toward the northwest end. It is worth pointing out, however, that almost all of the frames found to be preserved between the columns during the Aquarius excavations are missing today<sup>6</sup>. As anticipated, although offset from the axis of the ship, part of the keelson consisting of a beam 24 cm wide and 22 cm high, suitably shaped in the lower face to intrude on the sideboards, has also been preserved.



**Fig. 4** Detail of the joining system of the planking with mortise-tenons arranged staggered on two parallel rows (photo: M. Capulli)



**Fig. 5** Obverse side of the sestertius of LVCILLAE AVG-ANTONINI AVG F, with the representation of draped bust (photo: M. Capulli)

<sup>4</sup> The petrographic analysis was conducted by Cristina Stefani of the Department of Geosciences, University of Padua, Italy.

<sup>5</sup> This is not only a contact protection, but also resulted in this part of the wreck becoming more silted up.

<sup>6</sup> It is safe to assume that the removal of the cargo left the timbers free and that during one of the many swells that 'hollow out' the wreck these must have been ripped away.

The research conducted in 2020, while quantitatively extending the previous survey area, allowed the acquisition of important new information. In fact, the excavation was conducted at the pile of lithic slabs that lie along the outer side of the north end of the beach-side column. These, consisting of regular blocks<sup>7</sup> of quartzose sandstone<sup>8</sup>, covered and protected the hull parts; thus some ‘tall’ elements of the ship’s framework, such as the half-frames, 8 cm wide and 9 cm high, and a wale consisting of a beam 10 cm wide and 11 cm thick, that is, protruding from the side by about 4 cm, have been identified and documented.

Sample	Essence
Keel	<i>Pinus nigra / Pinus sylvestris</i>
Keelson	<i>Quercus robur</i>
Planking	<i>Pinus cembra</i>
Tenon	<i>Quercus suber</i>
Peg	<i>Quercus suber</i>
Floor timber	<i>Quercus robur</i>
Treenail from floor-timber	<i>Olea europea</i>
Half frame	<i>Quercus robur</i>
Wale	<i>Quercus robur</i>
Floorboards	<i>Pinus cembra</i>
Strand of rope	<i>Poaceae spontanee gruppo</i>
Amphora stopper	<i>Quercus suber</i>

**Table 1** Species identification of materials used, performed by the Centro Agricoltura E Ambiente lab of Crevalcore (BO, Italy)

The chronology of the shipwreck, placed at the end of the 2<sup>nd</sup> century AD, has also been confirmed by a new monetary find<sup>9</sup>. Specifically, this is a sestertius depicting Lucilla, daughter of Marcus Aurelius and sister of Commodus (Fig. 5), datable to AD 164–169<sup>10</sup>.

### 2.3. Open questions

The shipwreck of the Kamarina Columns is preserved about 15 m long and 4.5 m wide, but as with any *relictus* this is only what remains of the original ship. Establishing from the archaeological record what the original dimensions were is not always easy, nor is it sometimes possible. In this case the maximum width can be estimated with an acceptable approximation, thanks in part to the upper part of the side excavated in the 2020 campaign, at no less than 6 m at the center of the ship. Much more doubt remains regarding the length, however, since we have for certain only one of the two ends and precisely the northwest end. This has the characteristic, unusual for the ancient period, of presenting a straight element in place of a curved one, which runs almost orthogonally into the keel (Fig. 6) and which on the basis of comparison with the 1<sup>st</sup> c. AD wreck of Saint-Gervais 3 (Liou *et al.* 1990: 157–264) could perhaps be interpreted as the bow. Conversely, the southeast end, which, as seen, terminates in a Jupiter’s dart, could see the curved post directly engaged, probably aft, as much as continuing with another keel element. Unfortunately, the angle of the keel rabbet observed near the keel fitting is still very open and therefore not entirely resolved.

<sup>7</sup> The five slabs sampled showed identical widths of 25 cm, while lengths ranged from 55 to 73 cm and heights from 8 to 11 cm.

<sup>8</sup> This petrographic analysis was also conducted by Cristina Stefani of the Department of Geosciences, University of Padua.

<sup>9</sup> During the 2020 campaign, a small metal concretion had been recovered that had disintegrated during its long stay in fresh water at the University of Udine’s Water Archaeology Laboratory, from which a coin emerged.

<sup>10</sup> RIC III (Marcus Aurelius) 1756.





**Fig. 6** North-west extremity of the shipwreck with the straight stuck orthogonally in the keel (M. Capulli)

From a constructional point of view, the hull falls into the type known as ‘shell-first’, that is, one in which the planking courses are firmly connected to each other with a structural function, while the frames serve only as reinforcement. As seen, the assembly of the planking in this case is ensured by a double order of joints (mortises and tenons) arranged in a staggered manner in two parallel rows, as if it formed a sort of uninterrupted line of tenons connecting the planks. This peculiarity has also been observed on other important hulls of the Roman period. They present mortises and tenons in two rows, for example, the wreck of Antirrhodos (see Sandrin *et al.* 2013: 51, Fig. 9) and Caesarea (see Derenne *et al.* 2019: 81, Fig. 6), but the spacing is such that they do not constitute a true uninterrupted line. Comparisons with the joinery observed in the Antikythera wreck (see Bouyia 2012: 40) and in southern Italy in that of Punta Scifo A (see Medaglia 2015: 5, Fig. 7) seem decidedly more similar. However, it is still not entirely clear whether this technological choice can be uniquely linked to the vessels that Pliny said were built for the transport of marble: *navesque marmorum causa fiunt*<sup>11</sup>.

### 3. Conclusions

On the basis of these data the shipwreck has been interpreted as what remains of a medium-sized ship, engaged in the transport of a mixed cargo from North Africa, namely from Tunisia, where the quarries of the ‘Ancient Yellow’ of Simitthusu (Lazzarini 2002: 243–244), present-day Chemtou village, are located. That the city Kamarina was the final destination cannot be established<sup>12</sup>, indeed, nothing excludes that its port constituted only a coveted shelter during a storm. What would seem certain, however, is that the ship was wrecked on a semi-submerged sand dune in the late 2<sup>nd</sup> century AD. With a known mechanics in shallow water (Muckelroy 1975: 173–190), the hull must have run aground in the sand, where it lost buoyancy and especially steering by remaining at the mercy of the waves, which over time then broke it up.

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<sup>11</sup> Pliny N.H. 36,1,14.

<sup>12</sup> On the transportation and trade of marble in Sicily, see Pensabene 2003: 533–543; Purpura 2008: 23–44, while for a broader look see Gianfrotta 2016: 341–359; Pensabene 1972: 317–362; Pensabene 2002: 3–67; Russell 2013: 95–140 and especially Pensabene 2013.

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