

# **The Maritime Trade Network of Lycia in the Context of Mediterranean Merchant Shipping – a Bottom-up Approach to the Ancient Economy**

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At least since the discovery of the Bronze Age shipwrecks of Cape Gelidonya and Cape Uluburun, the Lycian coast has been recognized as an important interface of the Mediterranean trade routes and has become the focus of scientific interest. From the Hellenistic period, the Lycian cities connected by a dense network of harbors at both the local level and with the entire Mediterranean world.

Field archaeological research and the results of underwater archaeology show a flourishing trade from the Hellenistic to the Byzantine period. This paper gives an overview of the role of individual port facilities in the Lycian trading network and of trade relations, which can be reconstructed using the underwater archaeological findings. Based on certain parameters, it raises the question whether individual port facilities were particularly predestined for international trade and whether the results of field archaeology reflect the underwater archaeological findings. Modifications of the maritime network, which are accompanied by changes in political, religious or economic factors, will also be discussed. Finally, regional trends that can be observed on the Lycian coast are placed in an overall Mediterranean context.

## **Shipwrecks and Amphorae as Indicators of Trading Activities**

Since the publication of Parker's often quoted catalogue of the ancient shipwrecks of the Mediterranean and the Roman provinces,<sup>1</sup> the importance of the book for Roman economic history has been repeatedly emphasized and questioned at the same time.<sup>2</sup> A major focus was on the statistical distribution of shipwrecks through the centuries, from the Bronze Age to the Byzantine period. In particular, the increase of shipwrecks at the end of the Roman Republic and in the Roman Imperial period, as well as the changes in the Byzantine period were discussed under historical and archaeological aspects. On the one hand, the shipwrecks that could be detected archaeologically mainly consisted of amphorae, roof tiles and other goods, which are well preserved in underwater archaeological contexts. Ships with a cargo of organic materials, such as grains or textiles, or wooden warships are very difficult or even impossible to detect in the archaeological record. On the other hand, the transport of wine from Italy to Gaul, as well as the supply of Rome boosted the economy and thus shipping in the Roman Empire. Reasons for the obvious decline of shipping in late antiquity arise, among other things, in the imperial crisis of the 3<sup>rd</sup> century, the division of the Roman Empire at the end of the 4<sup>th</sup> century and the emergence of wooden barrels as transport containers.<sup>3</sup>

Wooden barrels and ancient ship hulls belong to the organic materials that are rarely preserved in underwater sites. Already Sealey has stressed that even in the 1<sup>st</sup> century BC, in addition to amphorae, the use of wooden barrels for wine trade was common in the western Mediterranean.<sup>4</sup> In the East, wine, oil and fish sauce were still usually transported in amphorae.

When interpreting trading activities based on shipwrecks, it must always be kept in mind that the available data are dependent on and influenced by numerous factors. These include the type of cargo (amphorae or barrels, inorganic or organic products), the route of the ship (coast or open sea, hazard zones and busy trade routes), technological advances in shipbuilding and the accessibility of the site (depth, tourist development of the coast, divers, etc.). Nonetheless, shipwrecks and their cargo, which often consists of commercial amphorae, offer great potential for the reconstruction of Mediterranean trading networks. Especially in comparison to the results of harbor excavations, they provide information on the nature, duration and intensity of trade relations.

### **The Big Picture versus Regional Developments**

Meanwhile, the publication of Parker's catalogue goes back almost 30 years and the discovery of a new, previously unknown shipwreck is reported almost weekly. Current projects, such as the Oxford Roman Economy Project, The Digital Atlas of Roman and Medieval Civilizations or the research of the author are engaged in updating the catalogue and include more than 2000 entries now (fig. 1, 2).<sup>5</sup> Notably, we have the highest wreck density along the southern coast of France, on the Italian west coast and along the Croatian coast. Not surprisingly, these countries are also traditionally among the popular holiday destinations for seaside holidays and divers. In contrast, we still have major research gaps in large parts of the eastern Mediterranean and along almost the entire North African coast.

Due an increasing amount of data and improved visualization, we can see slight changes in the histogram of the chronological distribution of shipwrecks in the Mediterranean (fig. 3).<sup>6</sup> The most striking difference is the peak of shipwrecks in the 1<sup>st</sup> century AD in contrast to Parker's histogram, which has a maximum value in the 1<sup>st</sup> century BC. For the illustration of the chronological distribution of shipwrecks through the centuries, Parker still uses the midpoints of the dating periods of the wrecks. This means that wrecks that are dated over several centuries are not displayed evenly over several centuries in the graph. Instead, the mean value was used, which is one of the biggest criticisms of Parker's analysis.<sup>7</sup> An improved presentation already suggested by Wilson<sup>8</sup> contains the even distribution of the dating period over the histogram. The visualization method used here is based on Boolean values, which characterize a date as "true" or "false" ("1" or "0") in the predetermined time intervals (here 100 years).<sup>9</sup> It resembles the aoristic analysis but refrains from weighting the dating probabilities.

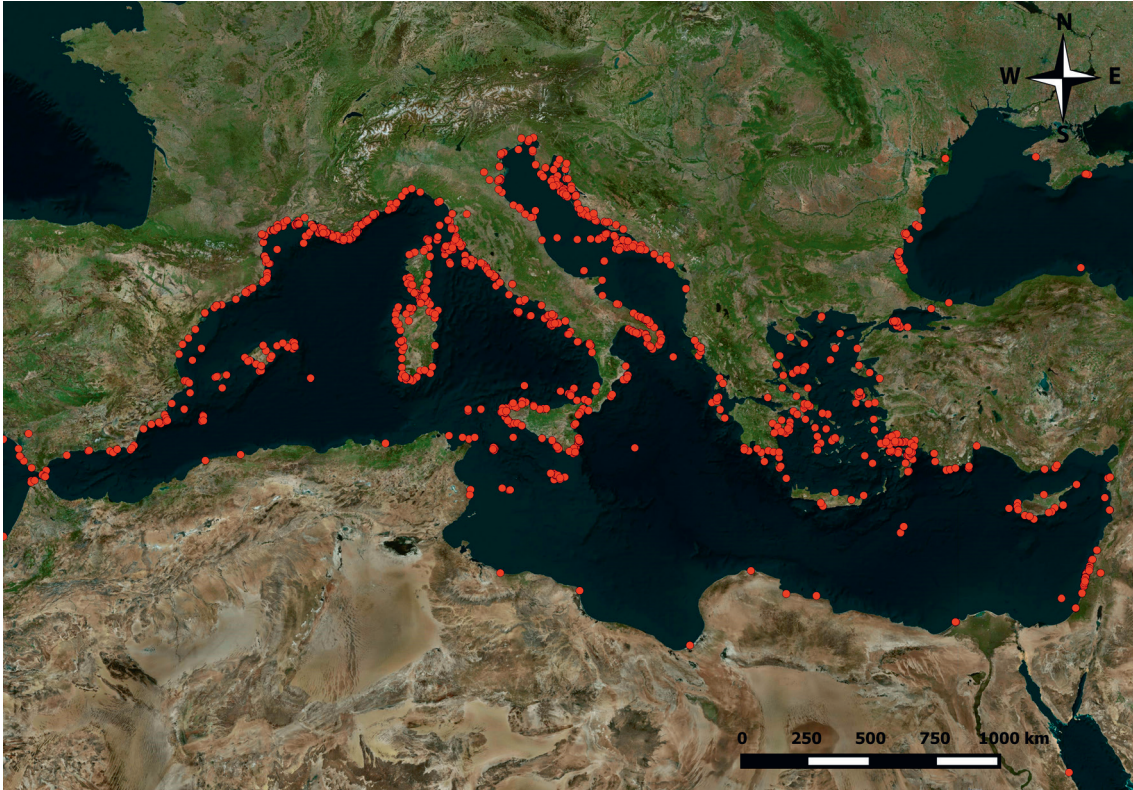


Fig. 1: Map of ancient shipwrecks in the Mediterranean and Roman Provinces.

Furthermore, the large discrepancy in the available data volume for the western and eastern Mediterranean shows that regional studies for understanding maritime human activities are essential (fig. 4). On the one hand, we have much more data available for the western Mediterranean than for the eastern Mediterranean, on the other hand, these data differ greatly both in their quantity and in their quality. This becomes apparent, for example, in a comparison between Croatia and Turkey (fig. 5). The 131 shipwrecks along the Croatian coast show a similar chronological distribution to our graph of shipwrecks of the entire Mediterranean. Again, we have a tremendous increase in wrecks in the 1<sup>st</sup> century AD. In contrast, the 122 wrecks on the Turkish coast show a very different distribution with peaks in the 1<sup>st</sup> century BC, the 6<sup>th</sup> century and at the end of the first millennium.

Thanks to the increasing importance of maritime archaeology, the establishment of new research institutions, the organization of large-scale deep sea and coastal surveys or NGOs involved in the underwater archaeological exploration of coastal and inland waters, more and more data for microregions and landscapes are slowly becoming available.<sup>10</sup>

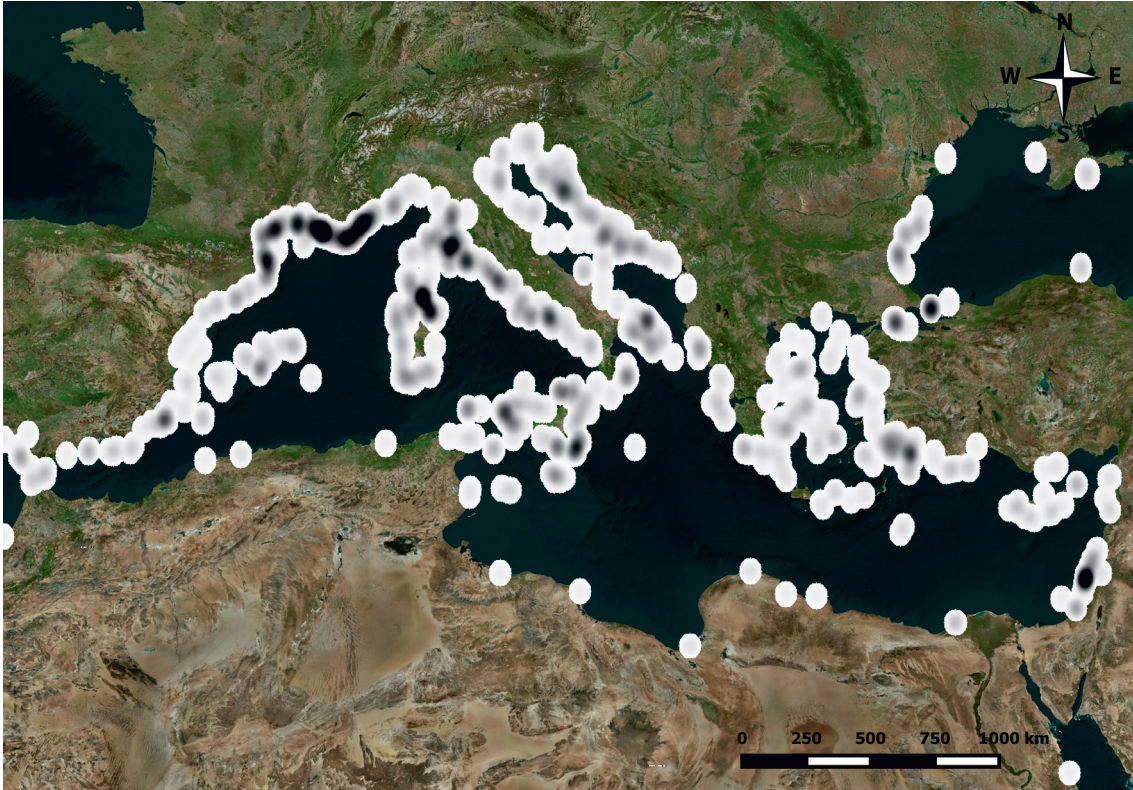


Fig. 2: Density map of ancient shipwrecks in the Mediterranean and Roman Provinces. Dark areas indicate a very high, light areas a low wreck density.

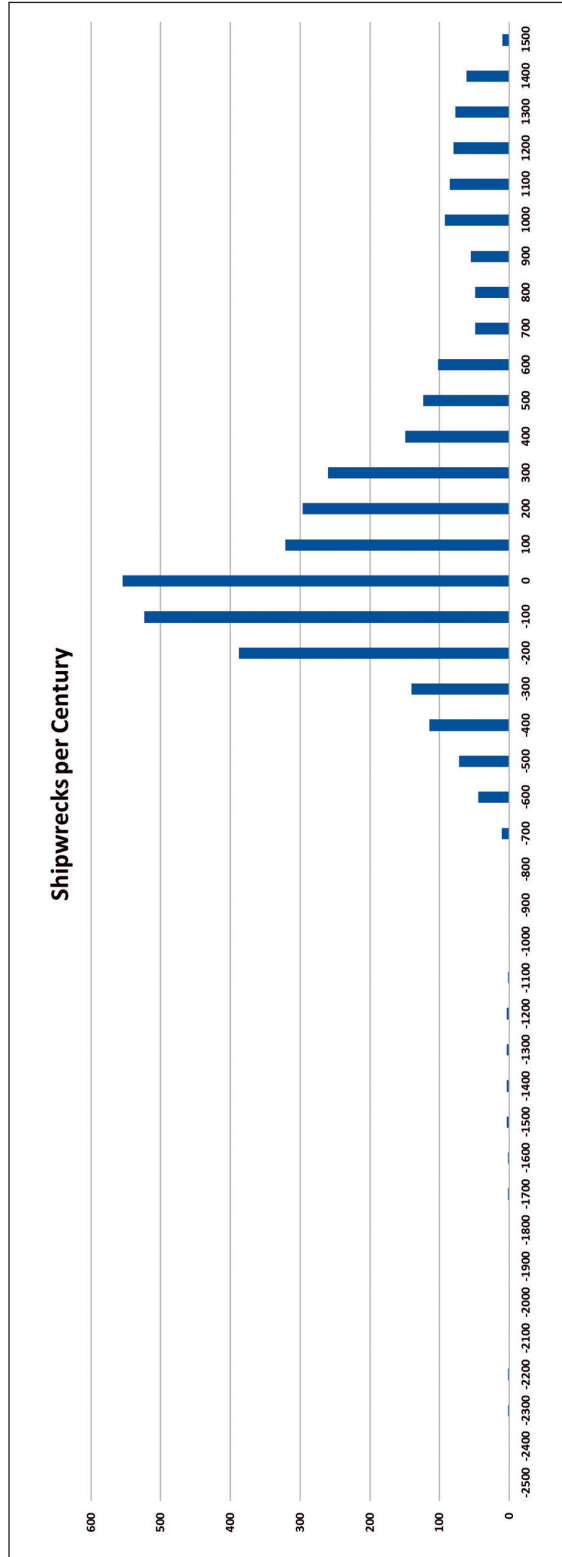


Fig. 3: Histogram of ancient shipwrecks in the Mediterranean and Roman Provinces.

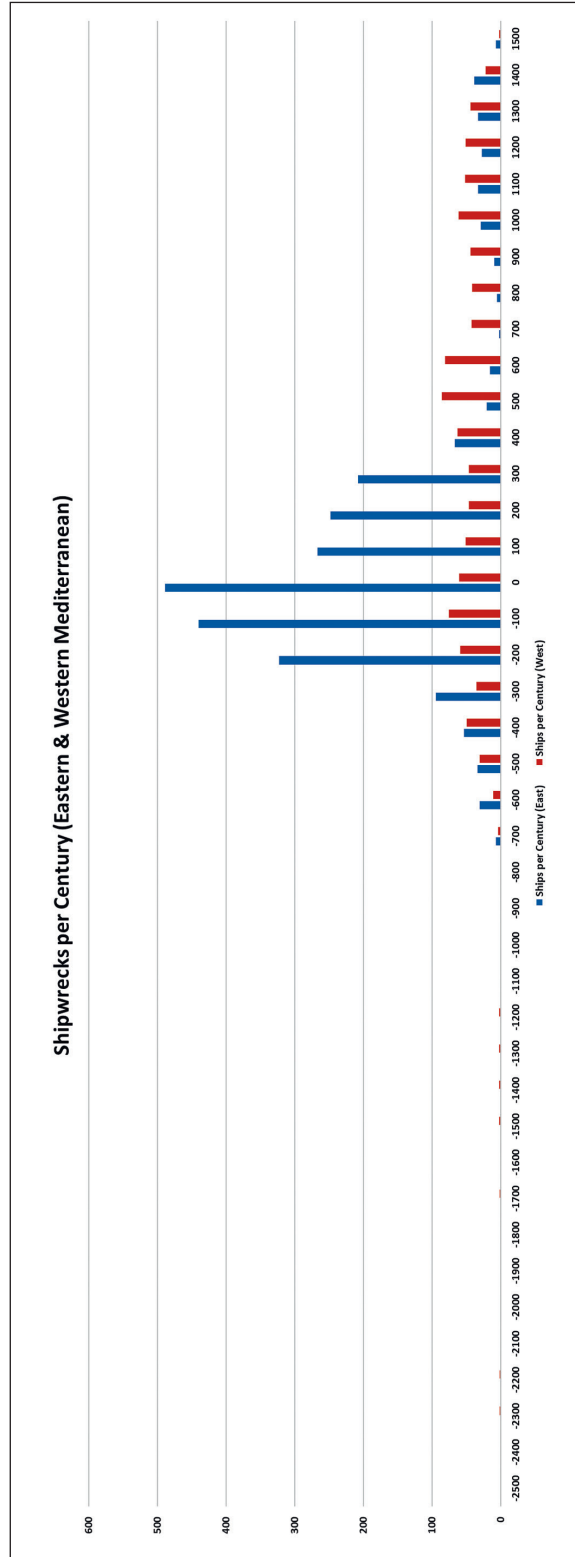


Fig. 4: Ancient shipwrecks of the western and eastern Mediterranean in comparison.

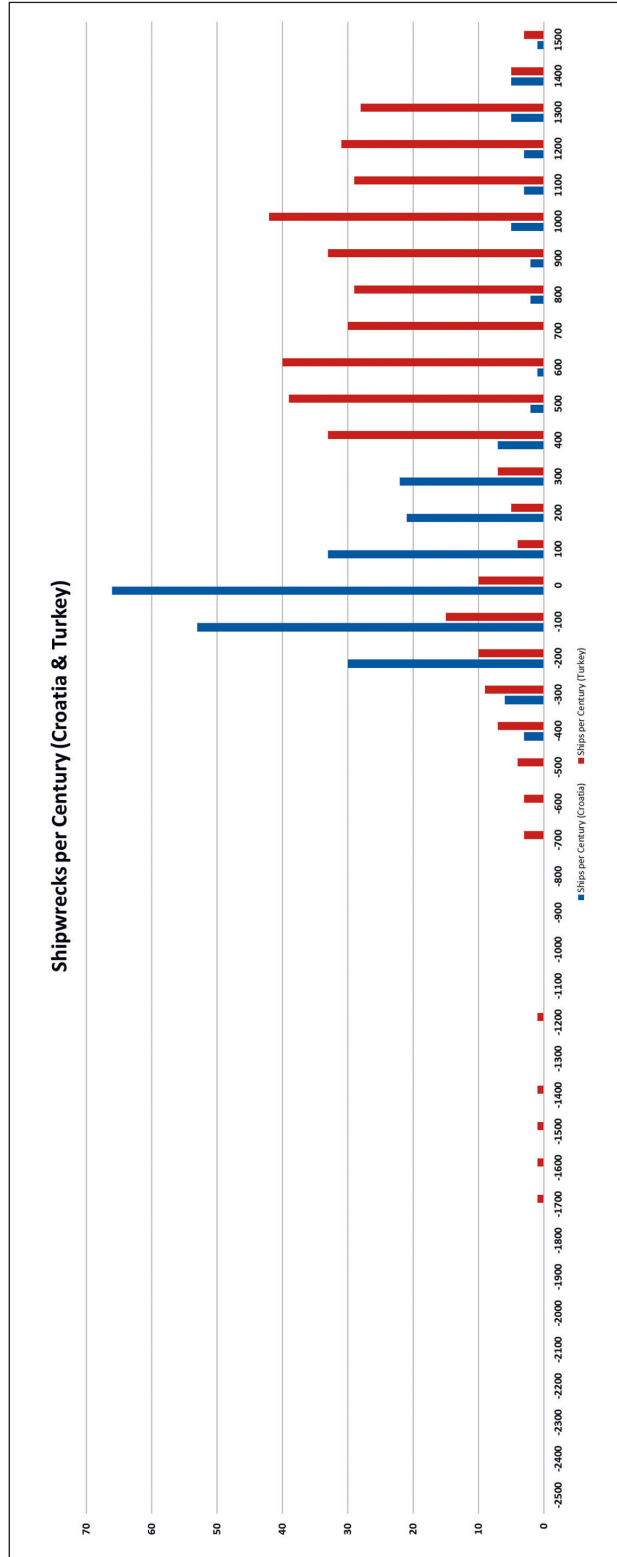


Fig. 5: Ancient shipwrecks of Croatia and Turkey in comparison.

### Seafaring and Trade along the Lycian Coast

In particular, the Lycian coast of Turkey is suitable for a study of the trading networks based on shipwrecks, as at least since the discovery of the Bronze Age shipwrecks of Cape Gelidonya and Cape Uluburun the Lycian coast has been recognized as an important interface of Mediterranean trade routes. Above all, the geographic location and topographical conditions underline the importance of the seaborne trade connections. Foothills of the Tauros form the Lycian Peninsula and provide natural harbors in many places. Strabo already describes Lycia as “rugged and hard to travel but is exceedingly well supplied with harbors and inhabited by decent people”.<sup>11</sup> Therefore, an investigation of the underwater archaeological sites makes sense only in the context of a consideration of the Lycian harbors.

As the most important harbors of the Hellenistic period, Telmessos, Patara, Antiphellos, Teimiussa, Andriake, Korykos (Olympos) and Phaselis were probably involved in the Mediterranean long-distance trade network.<sup>12</sup> Literary sources, inscriptions and papyri demonstrate the importance of Lycia for the Mediterranean trade network and shipping routes. An important economic factor was the trade in cedar and cypress wood, which was obtained in the Lycian hinterland until modern times. Other natural products included olive oil, fish products, herbal oils, Lycian ham, goat hair for ropes, chalk and glance coal, as well as panthers and gazelles for the Roman amphitheaters. The Lycian seaport Patara was known for the production of gilded sandals and medical tools. Purple dye was sought-after throughout the Roman world for the production of precious textiles and was won from sea snails from the harbour cities Aperlae and Andriake. Particularly large sponges are found in great numbers off the Lycian coast, and sponge divers, who have been active here since Antiquity, have found numerous shipwrecks too. In particular, the sponges from the area of the seaport of Antiphellos were considered to have had a healing effect.<sup>13</sup> Unfortunately, the popular Lycian exports known from the written sources are no longer preserved in the archaeological record.<sup>14</sup> In contrast, the transport containers for liquids, fruits, nuts and other products, the commercial amphorae, are better preserved.

Only a few excavations and research projects dedicated to the maritime trade history of the Lycian harbor cities have taken place to this day. A notable exception is the seaport of Patara, whose trading networks were exemplary analyzed by Erkan Dündar, based on amphorae from the Archaic to the end of the Hellenistic period.<sup>15</sup> As one of the major harbors along the Lycian coast, Patara maintained trade relations with the entire eastern Mediterranean and was a hub for the Xanthos Valley, as well as the surrounding harbors and landing places. In the Archaic period, Patara established trade contacts in the eastern Aegean, to the Ionian mainland and to Corinth or Corcyra. Obviously, the Persian conquest of Lycia had a positive impact on both the economy and trade, as well as the cultural and artistic development of the region. Sporadic contacts with Cyprus may indicate that Patara, and probably all of Lycia, covered its olive oil needs



mainly through local cultivation.<sup>16</sup> The Classical period is characterized by the appearance of the Lycian amphora, a new type, which was probably used for the transport of olive oil. The continuation of trade links with Greece and new relations in the northern Aegean indicate closer contacts with the region, which probably resulted from the at least short membership in the Delian League. In the Hellenistic period, under Ptolemaic and Rhodian domination, Patara experienced a veritable economic boom, building trade relations with the northern and South-East Aegean and the Anatolian mainland. More contacts with Cyprus, which also appears as a wine producer, suggest that Cyprus covered the increased demand for wine imports, too.<sup>17</sup> Fortunately, underwater archaeological surveys supplement the good archaeological field research at Patara now.<sup>18</sup>

### **Underwater Archaeological Research in Front of the Seaport Antiphellos (Kaş)**

Quite different to Patara is the situation in the harbor city Antiphellos, modern Kaş (fig. 6). Here, a relatively well-explored underwater coastal region coincides with a harbor city whose ancient remains were destroyed by modern building activities, and the pottery finds are still awaiting publication.<sup>19</sup> Numerous dangerous rocky islands and reefs surround the harbor city. This is in contrast to the much more important harbor city of Patara, which could be reached easily by ship. Due to the popularity of diving tourism and intense underwater archaeological exploration of the coastal region, numerous ancient sites are already known off the coast of Antiphellos.<sup>20</sup>

Since 2007, the Turkish Underwater Research Group SAD (“Sualtı Araştırmaları Derneği”) carried out systematic surveys on the 60 km wide coastal stretch between Kalkan and Kekova.<sup>21</sup> A total number of 32 scattered underwater archaeological sites,



Fig. 6: Modern Kaş with its offshore islands and reefs.

dating from Classical Antiquity to modern times, have been documented in the project Underwater Cultural Heritage of Turkey (“Türkiye Sualtı Kültür Mirası”). The results of the underwater archaeological surveys complement and extend the research results of terrestrial archaeology. In particular, they help in the investigation of maritime trade routes and the ports involved.<sup>22</sup>

Careful analysis by the author of all available published and unpublished information resulted in a dataset of 80 ancient shipwrecks found along the Lycian coast (fig. 7). The analysis was complicated by the fact that alleged new finds of shipwrecks were already known and even published, so that imprecise information about the location of the site and missing references could successfully conceal any duplications.<sup>23</sup> In addition, single finds of amphorae or even anchorages were defined as shipwrecks. However, these can be considered rather as an indication of the presence of ships and trade relations, and not as evidence of a shipwreck. The chronological distribution of shipwrecks by century shows an increase in shipping activities in the 1<sup>st</sup> century BC, which is most likely related to trade connections with Rhodes and the Aegean. In the 5<sup>th</sup> and 6<sup>th</sup> century AD, shipping activities reach their peak. This corresponds to the period after the division of the Roman Empire and the foundation of Constantinople as the new capital of the Eastern Roman Empire. A connection between these two developments is not unlikely, because the increased demand for food, daily and luxury goods of the new capital Constantinople, could only be covered by maritime trade.

High concentrations, which is from some five to more than ten shipwrecks, can be found in the areas of Cape Gelidonya, Andriake, Antiphellos and Patara (fig. 8). A relationship between the shipwrecks and the nearest harbor city can only be assumed based on the proximity of the site to the harbor or, in the case of Patara, due to similar assemblages. Based on the wreck sites off the Lycian coast, some conclusions can be drawn about the Mediterranean trading networks of the Lycian harbors.<sup>24</sup> From the Archaic period to the end of the Rhodian supremacy in Lycia, the trade relations of the Lycian ports correspond approximately to the observations made by Erkan Dündar on the transport amphorae from Patara. In the Hellenistic period, under Ptolemaic and Rhodian supremacy, Patara and the other Lycian seaports experienced an economic boom. However, this development can also be seen after the incorporation of Lycia into the Roman Empire.

On the one hand, established shipping routes to the Aegean that already existed remained. On the other hand, trade ties with the western Mediterranean, Italy and the Iberian Peninsula, as well as with Egypt and the Black Sea, prove economic prosperity until the beginning of Late Antiquity. Only then, with the division of the Roman Empire and the rise of Christianity, do the trade contacts of the Lycian harbors focus on the eastern Mediterranean, the Aegean, Cilicia, Cyprus and the Palestinian coast again.<sup>25</sup>

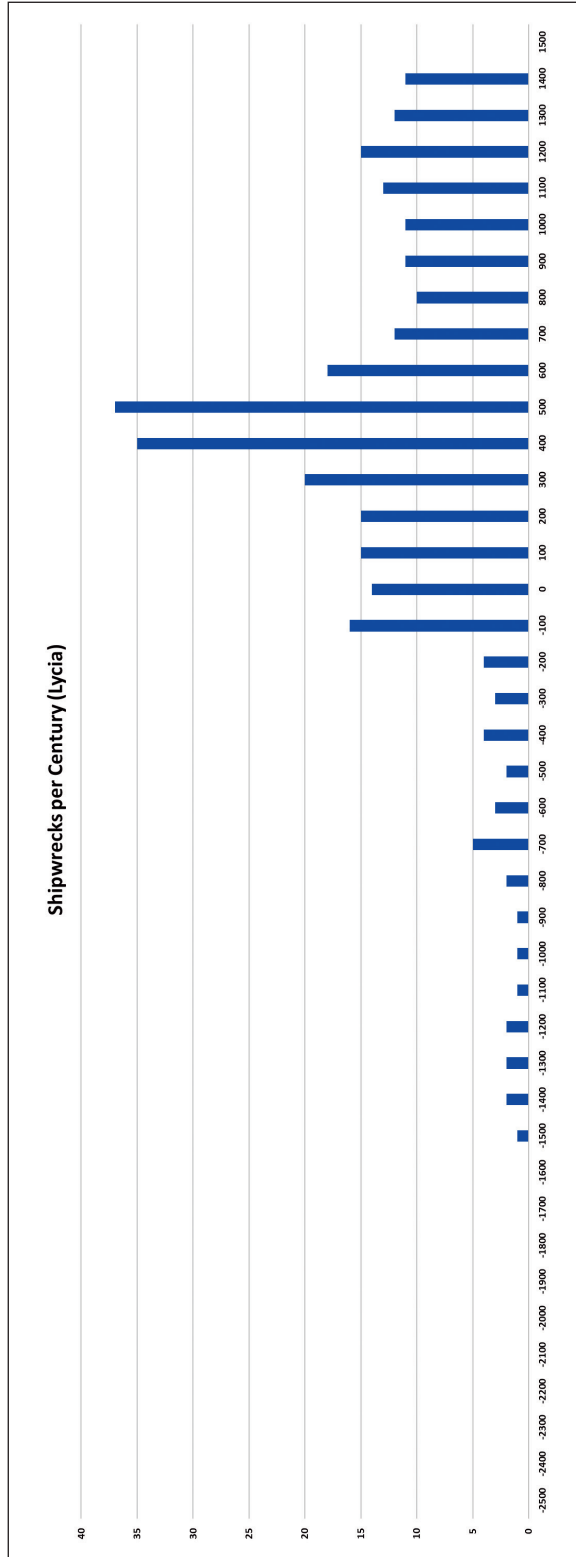


Fig. 7: Histogram of ancient shipwrecks off the Lycian coast.



Fig. 8: Density map of ancient shipwrecks off the Lycian coast.

### The Maritime Trade Network of Lycia

From the Archaic to the Byzantine period, the Lycian maritime trade network focused on the eastern Mediterranean, especially the Aegean and the Anatolian mainland. By the integration of Lycia into the Roman Empire, this network expanded into the western Mediterranean and the Black Sea. Place names in the Black Sea region and grave inscriptions testify that these contacts were not only sporadic. Lycian traders who ventured the long and dangerous journey to the shores of the Black Sea were able to gain both financial wealth and social status, as well as hold political functions.<sup>26</sup> Wilhite described this type of trading network as a “small-world network”, which is characterized by the connection of local markets by a few traders or crossover agents. By connecting local markets with distant local markets through new trade routes, individual long-distance traders, the crossover agents, can generate great wealth. These traders are not only members of their local trader group, they also become part of another trader group that serves the distant market.<sup>27</sup> The grave inscription of the ship owner and trader Eudemos from Olympos suggests the close connection of individual Lycian traders to distant local markets. The close relationship between Eudemos and the seaport Kalchedon, at

the entrance to the Bosphoros, is characterized by honors, perhaps even the granting of citizenship.<sup>28</sup>

With the division of the Roman Empire and the rise of Christianity, a political, cultural and religious transformation took place, which also influenced Lycia's maritime trade network and caused a change in the maritime shipping routes. The trade relations of the Lycian harbor cities were now again limited to the eastern Mediterranean, but had a strong focus on the Palestinian coast, from where the 'holy wine' was imported.<sup>29</sup>

### Conclusion

The Lycian coast was involved in the maritime trading network of the Mediterranean early. Therefore, it is even more interesting to reconstruct the history of seafaring using shipwrecks and terrestrial excavations in harbors. The chronological distribution of shipwrecks along the Lycian coast shows a special development that can only be explained by the historical events and political transitions in the eastern Mediterranean. In addition, the chronological distribution of the wrecks of the Lycian coast, or of the entire eastern Mediterranean, differs distinctively from the chronological distribution of the western Mediterranean or individual coastal areas (e.g. Croatia).

The small number of shipwrecks from the eastern Mediterranean in comparison to the western Mediterranean also leads to a concealment of maritime history in the East. Regional studies, such as the example of Lycia, enable a reconstruction of the maritime and trade history of micro-regions and, in addition, contribute to the understanding overall Mediterranean developments.

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### Notes

<sup>1</sup> Parker 1992.

<sup>2</sup> Critical remarks: Whittaker 1989, 537–539; Gibbins 2001, 273–283 and Wilson 2009, 219–226. Parker also advises caution in interpreting shipwrecks as a proxy for maritime trade: Parker 2011, 445.

<sup>3</sup> Parker 1992, 8f.; Wilson 2009, 219–226.

<sup>4</sup> Sealey 1985, 125–126.

<sup>5</sup> McCormick 2012; McCormick et al. 2013; Strauss 2013; McCormick et al. 2017.

<sup>6</sup> cf. Parker 1992, 549 fig. 3.

<sup>7</sup> Parker 1992, 8; Wilson 2009, 222.

<sup>8</sup> Wilson 2009, 222. Wilson uses the aoristic analysis without naming it as such. The aoristic analysis determines the probability (as a fraction of 1 or 100%) of the occurrence of an event over a certain period. For an explanation of the methodology, see: Ratcliffe 2000; Ratcliffe 2002; Johnson 2004 and Mischka 2004.

<sup>9</sup> Nakoinz 2012; Kennedy – Hahn 2017, 73–78.

<sup>10</sup> An important project is the Shipwreck Inventory Project of Turkey, led by Harun Özdaş – Özdaş – Kızıldağ 2017, 108–109.

<sup>11</sup> Strab. geogr. 14, 3, 2; cf. Jones 1960, 312–313.

<sup>12</sup> Brandt – Kolb 2005, 101.

<sup>13</sup> For agricultural production in the Yavu Highlands see: Kolb 2008, 310–313; Dündar 2017, 383. For the production of purple dye in Aperlae: Hohlfelder – Vann 1998; Hohlfelder – Vann 2000 and Hohlfelder 2011. A list of all Lycian commercial products with the corresponding ancient written sources can be found at Brandt – Kolb 2005, 100–101.

<sup>14</sup> An exception are the purple snails, which were detected in large heaps in the seaport Aperlae (literature above). For Andriake, the production of purple is evidenced by the excavation of murex workshops dating back to the middle of the 6<sup>th</sup> century AD. See: Çevik – Bulut 2011, 62–63; Akyürek 2016, 475. 485 fig. 9.

<sup>15</sup> Dündar 2014; Dündar 2017.

<sup>16</sup> See above for the export hits of the Lycian coast.

<sup>17</sup> Dündar 2017, 77–79. 377–390.

<sup>18</sup> Özdaş – Kızıldağ 2014, 284–288.

<sup>19</sup> At least, the stamped handles of the Rhodian transport amphorae of the 2<sup>nd</sup> century BC from the Hellenistic temple of Antiphellos are fortunately published by Erkan Dündar. The amphora handles were found as part of the excavations of the Archaeological Museum of Antalya in 2012. See: Dündar 2017, 389.

<sup>20</sup> Reinfeld – Varinlioğlu 2012.

<sup>21</sup> Varinlioğlu 2011; Varinlioğlu 2014.

<sup>22</sup> A complete evaluation of the underwater archaeological sites is part of the dissertation project of the author. See also: Reinfeld 2017.

<sup>23</sup> A problem that can also be seen in the shipwreck databases of Parker, Strauss and McCormick. Nonetheless, the occasional errors do not change the overall picture.

<sup>24</sup> The two Late Bronze Age wrecks of Uluburun and Cape Gelidonya were not included in this analysis because they cannot be associated with the Lycian harbour cities.

<sup>25</sup> A now outdated presentation can be found in: Reinfeld 2017.

<sup>26</sup> Adak – Atvur 1997, 11–27.

<sup>27</sup> Wilhite 2001, 54–63.

<sup>28</sup> Adak – Atvur 1997, 20.

<sup>29</sup> Riley 1975, 30; Claude 1985, 81–82; Kislinger 1999, 144–147; Kingsley 2001, 45. 56–58; Reinfeld 2017, 142–143.

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Fig. 1: Map by M. Reinfeld, based on the data of: Parker 1992; Strauss 2013; McCormick et al. 2013 and McCormick et al. 2017. – Fig. 2: Map by M. Reinfeld, based on the data of: Parker 1992; Strauss 2013; McCormick et al. 2013 and McCormick et al. 2017. – Fig. 3: Histogram by M. Reinfeld, based on the data of: Parker 1992; Strauss 2013; McCormick et al. 2013 and McCormick et al. 2017. – Fig. 4: Comparison by M. Reinfeld, based on the data of: Parker 1992; Strauss 2013; McCormick et al. 2013 and McCormick et al. 2017. – Fig. 5: Comparison by M. Reinfeld, based on the data of: Parker 1992; Strauss 2013; McCormick et al. 2013 and McCormick et al. 2017. – Fig. 6: Photo by M. Reinfeld. – Fig. 7: Histogram by M. Reinfeld. – Fig. 8: Map by M. Reinfeld.

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