

Appendix

A review of the historical earthquakes and tsunamis reported in the region of the Eastern Hellenic Arc from antiquity up to the present day. The term *seaquake* does not describe a tsunami but an earthquake felt onboard ship. After the 16th century, dates are given in the New Style (Gregorian calendar).

[1] 227 BC, Rhodes, earthquake

Classical Greek authors, such as Polyvios (202-120 BC) and Pausanias (2nd century AD), to mention only the two closest in time to the event, reported that because of a strong earthquake the greater part of the dockyards, the walls and arsenals in the city of Rhodes were overthrown. The shock caused the collapse and destruction of the famous Colossus of Helios (from the Greek *Ἥλιος* meaning sun). It is likely that there were also human victims. One tombstone (I.G. XII, 1,708) in the ancient city of Camiros, carries the inscription *τῶν κατὰ τὸν σεισμόν τελευτησάντων* (*to those who died because of the earthquake*) but this may refer to a subsequent earthquake that hit Rhodes around 199 BC. Extensive destruction was also reported in the regions of Caria and Lycia, south-west Asia Minor, on the mainland opposite the island of Rhodes. The city of Rhodes was soon rebuilt thanks also to substantial financial aid from foreign powers. The dating of this event is still inconclusive. Date estimates range from 229 to 218 BC; however, the most likely date falls between 229 and 226 BC.

Sieberg²³ stated that a tsunami was associated with the earthquake but this is not justified by the available historical documentation. Very likely he confused the 227

BC earthquake with one of the subsequent tsunamigenic earthquakes occurring in the area of Rhodes, such as that in AD 148.

The earthquake was classified to be of intermediate focal depth³³ but this was later revised to shallow depth.⁸ In fact, there is no evidence of long-distance effects that may indicate intermediate-depth focus. On the other hand, the possibility that this earthquake was non-tsunamigenic does not contradict its shallow nature. In fact, some of the strong shallow shocks in the area of Rhodes were tsunamigenic (*e.g.* 1481, 1609, 1741) while others were not (25th April 1957). This latter 1957 earthquake caused damage in Rhodes and on the opposite side of south-west Asia Minor, and this geographical distribution of its effects resembles that of the 227 BC earthquake.

In conclusion, the available historical information implies that the 227 BC earthquake was of a large magnitude, possibly shallow but a non-tsunamigenic event, rupturing offshore between Rhodes and south-west Asia Minor. A tentative estimate of the maximum intensity felt in the city of Rhodes might be IX-X (modified Mercalli-Sieberg intensity scale, MM).

[2] 199-198 BC, Rhodes, earthquake

According to Justinus (2nd-3rd century AD), an earthquake struck and caused destruction on Rhodes in 199 or 198 BC. This is verified by several inscriptions reviewed by Guidoboni *et al.*³¹ Torr^{1A} dated the event to 196 BC. It appears that it was a very strong earthquake but there were no reports that a tsunami had been generated. The little information available makes it hard to judge the nature of the earthquake, *i.e.* shallow or of intermediate-depth.

[3] AD 148, Rhodes, earthquake and tsunami

Pausanias (2nd century AD) reported that this earthquake destroyed the city of Rhodes. After the earthquake, envoys were sent to other Greek states to ask for assistance as after the 227 BC earthquake. The Emperor Antonius Pius rebuilt the city.^{1A,31} In just a few years after the earthquake, Aristeides Aelius (AD 129-189), in one of the two wearisome orations he inflicted on Rhodians, could again call Rhodes *the fairest of Greek cities*. The island of Cos, Greece, as well as the area of south-west Asia Minor (today south-western Turkey; Figures 1 and 2), had also been affected by that earthquake. However, the Rhodian cities of Ialysos and Camiros, situated on the north side of the island, were in ruins before the earthquake, though Ialysian decrees occur down to the time of the Emperor Titus.^{1A}

The rhetorical speech *Rodiakos* made by Aristides Aelius to the citizens of Rhodes leaves no doubt that the earthquake was associated with a strong tsunami that flooded the city of Rhodes, and that both the earthquake and the tsunami caused great destruction (see passages 19-27): *...and I remember that in that fatal noon, when the calamity that happened to you, started while the sea was calm,...and all the earthquake force was directed against the city ...Then the sea water retreat and the ports dried up.....and they became as a dry land...And everything happened at the same moment: the earthquake of the sea, the clouds, the roaring, the lamentations, the noise of the dead bodies, the ground subsidence...Everything collapsed... .* However, Aelius noted that although widespread destruction was caused in Rhodes and many people were killed, the earthquake was not as devastating as the earlier earthquake events in the cities of Troy in north-west Asia Minor and of Thives on the Greek mainland. In addition, Aelius's speech makes it clear that neither the islands of Karpathos and Kassos nor those of Symi and Serifos (Figures 1 and 2) were destroyed

by the earthquake and were not flooded by the tsunami. Ambraseys,²⁵ Antonopoulos,²⁷ and Papazachos and Papazachou⁸ mistakenly claimed that Symi and Serifos were affected by the earthquake and the tsunami. Very likely these authors misunderstood the passage n. 38 of Aelius's speech, and this misunderstanding was propagated from one author to the other.

We concluded that this was a large-magnitude earthquake occurring offshore between Rhodes and south-west Asia Minor. The tsunamigenic nature of the shock indicated a rather shallow event. A tentative estimation of the maximum intensity gives VIII-IX (MM) in the city of Rhodes. The date of the event is debated but estimates range from AD 141 to 155.

[4] AD 344, Rhodes , earthquake

According to the Byzantine writers Theophanes (AD 760-818) and Cedrenus (late 11th -early 12th century AD) a great earthquake caused destruction on the island of Rhodes.^{1A,31} There was no mention of any tsunami being generated. The little information which is available makes it quite hard to judge the nature of this earthquake, i.e. shallow or of intermediate depth.

[5] AD 515, Rhodes, earthquake

According to the Byzantine writers Malalas (AD 491-578) and Evagrius Scholasticus (AD 536-c.600), the city of Rhodes was destroyed for the third time in AD 515 after the 227 BC and AD 148 seismic destructions.³¹ The disaster occurred at dead of night and Torr^{1A} suggested that the loss of life must have been immense. In fact, Malalas says that it was *a calamity* while Evagrius speaks about *great earthquakes*. After the first earthquake, the Rhodians had received help from their allies to rebuild their city,

and after the second Antoninus Pius had rebuilt it at his own expense. The Emperor Anastasios now made available a large grant to rebuild the city and provide aid for its citizens. In the Syriac version of Abû-el-Faraj it is stated that the island was involved in the earthquake which destroyed Neo-Caesarea in AD 503; but as he mentions a grant from the Emperor Anastasios in connection with this, he was probably thinking of the earthquake of AD 515.^{1A} Nevertheless, accounts of the event contain no reference to a tsunami. We tentatively suggest that the earthquake was a large, shallow-focus but non-tsunamigenic event with an estimated intensity of IX-X (MM).

[6] c. AD 556, Cos, earthquake and tsunami

The Byzantine historian Agathias (c. AD 536-582) happened to visit the island of Cos shortly after a strong earthquake that almost completely destroyed it. The disaster was unprecedented in its scale and complexity. ...*The sea rose up to a fantastic height and engulfed all the buildings near the shore, destroying them together with their contents and inhabitants. The heaving mass was of such enormous proportions that it flung down everything there that its surging crests could not ride over...On top of all their other ills the entire local water-supply had been contaminated with sea-water and rendered undrinkable...* (translation from the original Greek by Guidoboni *et al.*³¹). The date of the earthquake is debated²⁶ but Guidoboni *et al.*³¹ assumed that the event occurred between AD 554 and 558.

That the tsunami wave flooded the city of Cos indicates that the seismic source should be placed off the eastern coast of the island. This is the epicenter reported by Papazachos and Papazachou.⁸

[7] August 8th 1303, Southeast Hellenic Trench, earthquake and tsunami

This is one of the largest earthquakes and tsunamis ever reported in the Mediterranean Sea. It has been documented in a large number of Latin, Arabic and Byzantine documentary sources. An exhaustive investigation of the sources was published by Guidoboni and Comastri.^{34,35} In addition, reviews were published by other authors including Poirier and Taher,^{2A} Evagelatou-Notara,^{3A} Ambraseys *et al.*⁴⁷ and Ambraseys.²⁶ These events are not, therefore, further discussed here. The evaluation of the documentary sources leaves no doubt that this was a big tsunamigenic earthquake that ruptured the segment of the Hellenic trench between the islands of Crete and Rhodes (Figure 2). Many towns and villages were destroyed, particularly in eastern Crete. The earthquake was strongly felt in many places of the eastern Mediterranean basin. A large tsunami violently hit the capital city of Chandakas (modern Heraklion on north coast of Crete). The sea swept into the city with such force that it destroyed buildings and killed inhabitants. In Alexandria and Bab-Al-Bahr, Egypt, the sea flooded the coastal zone and destroyed the port facilities. The wave reached the Palestinian coast of Acre (today Israel), where the sea flooded the shore and people were swept away and drowned.^{4A} According to Ambraseys *et al.*⁴⁷ *There was also widespread destruction and a damaging seismic sea-wave in Rhodes and along the coast of Palestine, particularly off Acre.* However, we were unable to locate any documentary source to show that the 1303 tsunami was reported from Rhodes, suggesting that any tsunami here was without particular significance. A similar conclusion was reached by Luttrell.^{5A} From a geological point of view, the only trace of the 1303 tsunami is represented by the many marine organisms attached to boulders, observed in Cape Punta, SE Peloponnese,^{6A} proving that boulders were

transported inland by extreme wave events, likely tsunamis, at a AMS ¹⁴C date of around 1300 cal AD.

[8] May 3rd 1481, Rhodes, earthquake and tsunami

In 1481, Rhodes was struck by a series of strong earthquakes, not all of which may have occurred from the same source. Original accounts of these earthquakes are reviewed by Torr,^{1A} Poirier and Taher,^{2A} Evagelatou-Notara,^{3A} Ambraseys *et al.*,⁴⁷ Luttrell,^{5A} Vatin^{7A} and Guidoboni and Comastri.³⁵ A key problem is, however, that of separating out the different events and defining their effects. In particular, there is confusion about the effects of the first earthquake on March 18th, 1481. It was felt in Rhodes at around 3 in the afternoon and was followed by a number of lesser shocks, but the amount of actual damage caused is uncertain. Careful analysis of the documentary sources by Guidoboni and Comastri³⁵ shows that no damage was caused in Rhodes, whereas damage elsewhere in the eastern Mediterranean was extensive.

Based upon the account of the Arab writer As Suyuti, Poirier and Taher^{2A} emphasized that the earthquake caused damage of MM intensity VII in Cairo. Ambraseys *et al.*⁴⁷ estimated maximum intensity of VII-VIII but the location to which such an intensity was assigned (Rhodes, Cyprus or Cairo) remains unclear. From several documentary sources we can conclude that widespread destruction was reported from Nicosia (Lefkosia, VIII, MM) and other localities of Cyprus (VIII-IX, MM), while damage was reported as far away as Cairo (VII, MM)³⁵ (Figure 1). Therefore, the solution determined by Guidoboni and Comastri³⁵ that the location of the seismic source should be placed close to Cyprus appears more realistic than previous ones that located the epicenter close to Rhodes. We conclude that the long-distance effects of the 18th March 1481 earthquake resemble those of the 29th June 1896: very strong,

possibly intermediate-depth shock in Cyprus.^{8A} Therefore, it seems that the 18th March 1481 earthquake most likely did not belong to the series of earthquakes that hit Rhodes later in 1481, but instead originated from a separate seismic source near Cyprus. Further earthquake activity in 1481 produced notable effects on Rhodes but was not recorded from many of the places affected by the 18 March 1481 earthquake. The strongest events occurred on May 3, October 3rd and December 17th-19th. The shock of 18th December, occurring at 7:15 local time, was by far the most destructive on Rhodes. This earthquake damaged the Grand Master's Palace and the three great towers by the harbor, and leveled churches to the ground. Many houses survived, but they needed rebuilding, while many people were killed. According to the Arab Al-Samhûdî, who collected information from reports of sailors coming from Rhodes, a great number of victims were buried under the ruins and the victims were found only after removal of the debris.^{9A} Despite the high level of destruction on Rhodes, the records contain no reference to a tsunami, in contrast to the accounts of the May 3rd earthquake.

One of the most important documentary sources describing in detail the 1481 seismic sequence is the text of Caoursin^{10A} according to which on 3rd May *...a wave more than ten feet high threatened death and destruction as it flowed over the town, and then the sea soon flowed back again, descending as many feet as it had risen, and after a certain time it grew calm again, remaining within its established limits.... But the earthquake was not accompanied by any destruction; though one merchant ship which was laying at anchor was thrown on to the rocks by the force of the sea, broke up on impact, and sank.*³⁵ The Bishop of Methoni, Ioannis Plousiadinis (1429-1500), in his ecclesiastic speech *Moaning of Theotokos*, code IV 434, Bibliothèque Royale Albert I^{er}, Brussels, dated between 1488 and 1492, described the 1481 tsunami:

...What happened in Rhodes is that the sea water penetrated inland... And the sea came out of its bounds as it rose up greatly and flooded the city. Then the sea returned to its normal place... (Vassiliou,^{11A} translation from Greek by GP).

In a manuscript of Leonardo da Vinci found at Codex Leicester and written between 1505 and 1510 (or even later), an earthquake and tsunami event was described to have occurred in 1489 in Antalya over 270 km to the east of Rhodes: *In [fourteen hundred and] 89 there was an earthquake in the sea of Adalia [Antalya, south of Anatolia] near Rhodes, which opened the [floor of the] sea, and into this opening such a torrent water poured that for more than three hours the floor of the sea was uncovered by the reason of the water which was lost in it, and then it closed [the sea coming] its former level.*^{12A,25,27,35} This description implies that possibly a tsunami was observed in Antalya (Satalia) because of an earthquake. Both the earthquake and tsunami mentioned by Leonardo da Vinci are questionable in that no strong earthquake was reported to have occurred in Asia Minor in 1489. According to Luttrell,^{5A} Leonardo may, at some distance in time, have made a mistake in the date, since the description recalls the sea-wave of 1481. In addition, this explanation fits quite well with the account that the 1481 tsunami was also reported as far away as the Levantine coasts.^{13A}

We concluded that the tsunamigenic nature of the 3rd May 1481 earthquake, along with the long series of shocks that followed until the end of that year, indicate a large-magnitude, shallow earthquake located off eastern Rhodes.

[9] April 1609, Rhodes, Earthquake and Tsunami

From historical documentation compiled by Ambraseys *et al.*⁴⁷ and Ambraseys and Finkel,³² it results that on spring of 1609 a large earthquake was particularly severe in

the city of Rhodes: *...half of the town, including the castle was ruined, and [an exaggerated figure of] over 10,000 people were reported drowned by a sea-wave... .*

The people of the island of Rhodes were ordered each to give three days labor to help repair *those places of Rhodes castle which are damaged in an earthquake... .* The shock was strongly felt in Lower Egypt, Palestine and throughout most of Turkey. It caused great panic in Cairo and considerable concern but no damage in Alexandria, Rosetta and Damietta, NE Egypt. The tsunamigenic nature of the earthquake indicates a large-magnitude earthquake of shallow source located offshore Rhodes.

[10] 1616, Rhodes, Earthquake

According to Ambraseys and Finkel,³² an earthquake occurring on the island of Rhodes on 1025 a.H. (20th January 1616-8th January 1617) destroyed *the western meadow(?)* and most houses. This earthquake very likely was not of large magnitude.

[11] January 31st 1741, Rhodes, earthquake and tsunami

Historical documents reviewed by Ambraseys *et al.*⁴⁷ and Ambraseys and Finkel³² imply that this was a large tsunamigenic earthquake. In the town and villages on the island of Rhodes, all houses were damaged and many were destroyed; in the town itself more than 100 houses collapsed, and the walls and fortifications of the city of Rhodes were damaged. Damage extended to the mainland northeast of the island, *i.e.* the part of SW Anatolia that includes Dalaman. In addition, a strong tsunami was described: *...As a result of the earthquake, the sea in Rhodes retreated and then flooded the coast 12 times with great violence, submerging the coast opposite the island and destroying five or six villages located a kilometer inland.*³²

The tsunamigenic nature of the earthquake and the occurrence of strong aftershocks imply that it was again a large-magnitude, shallow event located offshore between Rhodes and Asia Minor.

[12] February 13th 1756, Rhodes, earthquake

This was a large-magnitude, intermediate-depth shock which was felt not only along the Hellenic arc but also in remote areas of the eastern Mediterranean region, from Palestine to Naples.³² Papazachos and Papazachou⁸ located this earthquake very close to the epicenter of the large, intermediate-depth earthquake of 26th June 1926.

[13] February 28th 1851, Rhodes and Makre, earthquake and tsunami

A strong earthquake caused destruction in Makre, modern Fethiye (Figure 2), SW Asia Minor, as well as in Rhodes.^{14A,8,26,47} Aftershocks felt in both Rhodes and Makre continued till the middle of 1852, indicating a shallow-focus source. The earthquake caused landslides on the Mugla Dag mountain near Leivesio, Asia Minor, which destroyed 14 villages and *killed many people*. It was also reported that the coast had sunk near Makre. Because of the main shock in Makre, the coast flooded approximately 0.35 m above the normal sea-water level, while flooding in Makre by 1.8 m high was associated with the aftershock of 3rd April 1851. Flooding in Rhodes was observed in association with the aftershock of 23rd May 1851.^{15A}

All evidence suggests that the earthquake was strong with a shallow source located offshore between Rhodes and Makre (Figure 2). Only a small-to-moderate tsunami may have occurred. However, Director Schmidt of the National Observatory of Athens,^{14A} reported no sea disturbances in association with the 1851 earthquake sequence and felt that press reports of the event were rather exaggerated.

[14] October 12th 1856, Rhodes and Crete, earthquake and seaquakes

This is one of the strongest historical earthquakes ever reported in the Mediterranean Sea region. Reviews on that earthquake can be found in Perrey,^{15A,16A} Barbiani and Barbiani,^{17A} Raoulin,^{18A} Schmidt,^{14A} Stavrakis,^{19A} Ambraseys *et al.*,⁴⁷ Papazachos and Papazachou,⁸ Ambraseys.²⁶ The most complete and detailed review was published very recently by Papadopoulos.⁴⁸ The earthquake caused heavy damage primarily on the islands of Crete and Rhodes while lighter damage was reported from other localities of the Aegean islands, on the Greek mainland and in SW Asia Minor. In Crete, great destruction was reported and more than 500 lives were lost in the capital city of Heraklion. It was reported that shaking was felt over a very large area which included remote localities as far away as Malta (The New York Times, 8th November 1856).

Ben-Menahem^{13A} and Amiran *et al.*^{4A} reported that a tsunami wave was observed in Haifa, Israel and on the Lebanese coasts. However, this information has not been verified. Observations published by Perrey^{16A,18A} implied that seaquakes were felt on board ships sailing in the eastern Mediterranean; namely, on the steamer *Adria* sailing 50 miles off Rhodes as well as on the steamer *Saint-Andrew* sailing 300 miles from Malta, both on the way to Alexandria. On the other hand, according to the report of the New York Times from Malta mentioned above, a seaquake was felt on board boats in Valletta harbor: *persons on board ships in the port described the effects of the earthquake, as felt by them, as of letting go the ships-boats from the davits by the run, only much stronger.* Also, a seiche, *i.e.* a standing sea wave, was possibly observed there as the sea receded two and a half feet. We concluded that the 1856 earthquake was a very large, non-tsunamigenic event of intermediate focal depth.

[15] April 22nd 1863, Rhodes, earthquake

This was another large-magnitude, likely intermediate-depth earthquake which was felt throughout the eastern Mediterranean region causing destruction in several localities on the island of Rhodes. Papazachos and Papazachou⁸ located this earthquake very close to the epicenter of the intermediate-depth earthquake of 26th June 1926.

[16] February 22nd 1870, Rhodes and Makre, earthquake

Strong earthquake in Rhodes. In Makre, three houses were pulled down. It does seem to have been an earthquake of large magnitude.

[17] November 16th 1874, Rhodes, earthquake

This earthquake was strongly felt in Rhodes and Asia Minor. There is no evidence that it was a large-magnitude event.

[18] October 27th 1896, Rhodes, earthquake

This was an earthquake that caused some destruction in Rhodes and damage in localities of Asia Minor. It does not seem to have been a large-magnitude earthquake.

[19] June 26th 1926, Rhodes, earthquake and seaquakes

This was a large, intermediate-depth earthquake which was felt over a very extensive area.^{20A,21A,8,23,33,48,49} Destruction was noted in several villages of the island of Rhodes, particularly in Archangelos, where 4 victims were reported, as well as in Kattavia, Trianda, Afantou, Lindos, Pylonas and others, while serious damage was reported from the islands of Karpathos and Kastellorizo.^{22A} On the island of Crete,

extensive damage was caused in many cities and villages. However, no human lives were reported to be lost. Most damage was observed in the province of Malevision, that is on the plain to the WSW of Heraklion.^{23A,48}

Wyss and Baer^{24A} reported that the 1926 earthquake generated a tsunami but did not provide documentary evidence. However, seaquakes felt on board ships were reported. According to contemporary press reports reproduced by Andrikakis,^{23A} the earthquake was felt on board a British steamer sailing to the south of Rhodes. Similar information was cabled from Alexandria where, on the east side of the harbor, the earthquake was felt on board a Japanese and a Portuguese steamer, the *Ussukuma* and the *Vigo*, respectively.

[20] February 9th 1948, Karpathos, earthquake and tsunami

This was a large crustal earthquake which caused extensive damage in 13 settlements of the island of Karpathos (Figure 2).^{25A,26A,8,24} Strong aftershocks were recorded until January 1949. A strong but only local tsunami was documented from press reports.^{25A,24} Field observations and eyewitness accounts collected by Papadopoulos *et al.*³⁹ indicated that the tsunami affected Pigadia bay, the main port of Karpathos, on the SE side of the island, where the water penetrated inland for about 60 m. This tsunamigenic earthquake was generated very close to Karpathos, that is in a source different from the Rhodes seismogenic sources discussed above.

[21] July 9th 1956, Amorgos, earthquake and tsunami

This is one of the largest crustal earthquakes recorded in the region of the Mediterranean Sea in the instrumental period of seismology. It ruptured the submarine trough between the islands of Thera (Santorini), Amorgos and Astypalaea, in the

Cyclades island complex, in the southern Aegean Sea (Figure 2). The main shock was followed by many aftershocks, the largest of them occurring only approximately 13 minutes after the main shock. The earthquake affected many islands around the source causing destruction and 53 human lives were lost on the island of Thera.^{27A}

A very strong tsunami was triggered which affected a large part of the southern Aegean Sea and propagated up to remote coastal zones of the eastern Mediterranean basin, such as Israel and Palestine, where it was recorded by one tide-gauge with an amplitude of approximately 25 cm. Waves up to approximately 30 m high were initially reported in the near-field domain while extensive destruction in several coastal areas was described.^{28A,25} Four people were killed by the wave. However, field observations and interviews with eyewitnesses showed that initial wave heights may have been overestimated.^{29A,30A} In any event, this tsunami was the largest reported in the entire Mediterranean Sea basin over the last century, after the strong tsunami that hit Messina, southern Italy, on 28th December 1908.

From tide gauge records, Galanopoulos^{28A} and Ambraseys²⁵ suggested that the wave was probably produced by co-seismic landslides, a suggestion which remains still open after the analysis of a tide-gauge record in Yafu, Israel, by Beisel *et al.*^{31A}

Submarine geophysical survey showed normal faulting in the banks of the Amorgos basin, sea floor sediment instability and a geologically very recent slump occupying large part of the basin.^{32A} The proximity of the slumped area to the earthquake epicenter implies a much higher seismic ground acceleration than the minimum required to trigger slumping. The slump episode may have occurred in association with the 1956 earthquake. Numerical simulations showed a discrepancy by a factor of from 3 to 10 between the maximum reported (30 m) and the simulated (3-10 m) wave amplitudes at the source region regardless of the tsunami mechanism adopted, that is

tectonic or landslide.^{33A,34A} Part of the discrepancy could be explained by an initial overestimation of the reported wave height.

The 1956 large tsunamigenic earthquake had its source outside the EHA-T but the tsunami affected EHA-T islands. In Finiki bay, on the SW coast of the island of Karpathos, it was reported that many fishing boats as well as 30 cattle were washed away by the water.^{27A} Ambraseys²⁵ reported that the wave was so severe that it demolished the breakwater and anchorage of the harbor. He reported a 20 feet wave height but this is an overestimate. In fact, the first author of this paper conducted a field survey in Karpathos from 8th to 10th August 2004.³⁹ After field inspection and interviewing eyewitnesses in the village of Finiki, he concluded that the wave height was no more than approximately 3 m.^{30A} However, in the city of Rhodes, the tide-gauge showed sea level fluctuations with a maximum range of only 15 cm.^{27A}

[22] April 24th 1957 Rhodes, earthquake

All evidence suggests this was a strong foreshock of the large main shock that followed the next day. No tsunami was reported.

[23] April 25th 1957, Rhodes, earthquake

This was a large-magnitude ($M_s=7.2$), non-tsunamigenic, shallow main shock that caused considerable destruction on Rhodes and in SW Turkey, as reported above.

[24] March 24th 2002, Rhodes, a seismic tsunami

Press reports and eyewitness accounts say that sea-waves 3-4 m high were reported along the coastal zone of the city of Rhodes during the evening of 24th March 2002.³⁹

Waves overtopped a high sea-wall which protects the coast road from sea waves, and

inundated a coastal segment as long as 2 km from near the Grand Hotel to Psaropoula, on the NW side of Rhodes city. Some damage was noted in several stores while small objects drifted inland. In a field survey conducted on 23rd May 2003, the wall height was measured by optical theodolite and found to range between 3 and 4 m a.m.s.l.³⁹ As for the origin of the tsunami, it is worth noting that no earthquake was recorded before or after its occurrence in the broad region of Rhodes, which may exclude seismicity as a possible triggering agent of the waves. In addition, according to the National Meteorological Survey of Greece, wind intensity did not exceed 6 degrees on the Beaufort scale, which may exclude the case of a storm surge. One possible explanation is that seismic submarine slides may have caused the waves. This agrees with reports from local fishermen to the first author that over the days after the event they saw a significant increase in the sea depth at approximately 1 km off the coast where the waves were observed.

Classic and Byzantine sources

Agathias (AD c.536-582): 2.16.1-6 (for the earthquake and tsunami of AD 556).

Aristeides Aelius (AD 129-189): Rodiakos XIII, § 340-374 (for the earthquake and tsunami of AD 148).

Cedrenus (late 11th-early 12th century AD): v.i., p. 522 (for the earthquake of AD 344).

Justinus (2nd-3rd century AD): Epitoma Historiarum Philippicarum Pompei Trogi, XXX.4 (for the earthquake of 199-198 BC).

Evagrius Scholasticus (AD 536-c.600): v. iii, p. 43 (for the earthquake of AD 515).

Malalas (AD 491-578): p. 406 (for the earthquake of AD 515).

Pausanias (2nd century AD): book II, §7.1 and book VIII, §43.3 (for the earthquakes of 227 BC and AD 148, respectively).

Polyvios (202-120 BC): book V, § 88-90 (for the earthquake of 227 BC).

Theophanes (760-818 AD): v.i., p. 56 (for the earthquake of AD 344).

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