

*Mithad Kozlić*

**Adriatic Sailing Routes as reported  
in the 14th and 15th century Pilgrims and Travel Reports**

The Adriatic Sea has always been considered the shortest connection between Europe (via Mediterranean) and the Near East markets (Africa - Asia)<sup>1</sup>. Such a consideration was also present with the 14th-15th and later centuries pilgrims, who travelled to Palestine to pay reverence to Jesus' tomb, as well as with other travellers<sup>2</sup>. They used land routes to reach Venice from inner parts of Europe. Since passenger ship travels were not developed then they had to wait for a favourable ship connection for a month and even more. Once they found the ship whose captain agreed to get their group aboard, under a favourable price, they still had a lot of problems to face, not only in Palestine but at sea as well. That is why these voyages present extraordinary historical evidence of various aspects of human life in the 14th and 15th centuries.

Furthermore, preserved reports on these voyages are of considerable interest to a historian to discover the then sailing routes over the Adriatic. Little has been published on this problem; particularly on the ancient world<sup>3</sup> and the first centuries of the Middle Ages<sup>4</sup>. Later periods, including the 14th and 15th centuries, have not been enlightened although the pilots from that period have been preserved<sup>5</sup>. This is why we

1. Kojić, B., 1967, 1-32; Stražičić, N., 1986, 15-36.

2. Part of these reports together with the necessary commentary has been published. Cfr. Jurić, Š., 1978, 274-283; Kostić, V., 1972; Levental, Z., 1989; Vinja, V., 1958, 89-100.

3. The latest papers: Brusić, Z., 1970, 549-568; *Idem*, 1991, 225-240; Čečuk, B., 1968, 383-415; Glušević, S., 1994, 13-32; Jurkić, V., 1979, 253-261; Kozlić, M., 1990c, 689-697. Basic data can be found in the following books: Kozlić, M., 1990a; *Idem*, 1990b; *Idem*, 1990d. The bibliography of the earlier date is to be found in these books.

4. Badurina, A., 1992, 7-9; Brusić, Z., 1989, 111-119; *Idem*, 1993, 223-233; Glušević, S., 1994, 13-32; Gunjača, Z., 1986, 124-134; Tomićić, Ž., 1989, 28-31; *Idem*, 1992, 29-53; Zaninović, M., 1994, 125-146. These papers contain bibliography of the earlier date.

5. Cfr. Kretschmer, K., 1909; reprinted in 1962. Some of these pilots were published in Croatia, too: Muljačić, Ž., 1971, 131-154.

decided to carry out this research. From very rich fundus of 14th-19th c. pilgrims and other travel reports we decided to start our research with the period between the end of the 14th c. and the first half of the 15th c. The obtained research results are presented in the following text.

# I

Ogiera, a French feudalist, the owner of Anglura Castle, wrote one of the oldest pilgrims voyage reports in which he described his sailing over the Adriatic<sup>6</sup>. He started his journey together with a group of pilgrims on 16 July 1395<sup>7</sup>. Taking land and partly river routes they arrived in Venice on 9 August. They set out "on Monday" 30 August. They reached Pula which is a "hundred miles" far from Venice the following day (31 August). They left Pula port on 1 September and anchored near the Island (*Insule*), i.e. Brijuni islands<sup>8</sup>. Inspection of sailors by gallies commander was made there. It was the last insight into shipping conditions, equipment and crew before a long voyage. They sailed on immediately and reached the port of Corfu the following Monday, 6 September. Obviously, the 600 miles distance between Pula and Corfu was covered in continuous sailing. Further on they left for Rhodos and finally reached Jerusalem on 4 October. Having visited Jesus' tomb they started back on 21 December. That day they took ship in Alexandria and set out in the direction of Cyprus. They passed Cyprus (Limasol) on 26 December and welcomed the New Year in Nicosia. On 23 February they were in Rhodos from which, on 9 April, they continued their voyage in the direction of the Southern Adriatic aboard a greek galleon. They were at sea up to Saturday, 6 May, when they reached the island of *La Monte*, i. e. Koločep<sup>9</sup>. Having provided some food there they continued the voyage due NW, on Monday, 9 May, "and we were at sea all the time, we did not sail into any port until Tuesday, after Pentecost, 23 May,

6. A little is known about this feudalist. He was born in 1360 and he died in 1412. He was a feudal master of Anglura in northern France. Cfr. Vinja, V., 1958, 93.

7. The original and translation into Croatian is given by Vinja, V., 1958, 93-94 (Venice - Jerusalem) and 95-97 (Jerusalem - Alexandria - Venice). The original has not been published. The author used Vinja's paper together with quotations.

8. Vinja, V., 1958, 98, where he gives argumentation.

9. Vinja, V., 1958, 99-100, he rejects rightly the identification *La Monte* = *Molonta* (Molunat) and proposes *La Monte* = *Calamota* (Koločep) instead.

which day we sailed into the port of Venice". After a rest in Venice they set off back home on 29 May. Taking land routes they were back in the castle of Anglura on 29 June 1396, for dinner time<sup>10</sup>.

We should point out that the report contains very detailed descriptions of Pula and Dubrovnik ports as well as of other ports and anchorages they visited. Of course, besides being interested in sacral buildings, the master of Anglura showed a particular interest for holy relics and therefore the report contains interesting observations from that aspect. However, it is of major importance, and this is obvious from the description, that seaborne itinerary to the South Adriatic and the Ionian Sea was marked by the following points: Venice - Pula - Corfu. On their way back they sailed by Corfu but the stops were compulsory for food and water provision. So the route was the following: (the island of Corfu) - Dubrovnik - (Pula) - Venice. In other words the sea area near Pula is the place from which they took supplies for sailing due SE, while for NW navigation such a place was Dubrovnik. From the above it results the following: 1. they sailed exclusively along the East Adriatic, 2. the type of navigation is long coastal navigation. The master of Anglura did not tell us why this was so. The reason might be that the relationship between time spent and distance covered over the Adriatic is more or less in accordance with common relations characteristic for sails navigation<sup>11</sup>.

10. This and other travel reports appeared before the reform of the julian calendar, i.e. before the introduction of the gregorian calendar. Namely, in 1582 after 4 October there comes 15 October trying thus to "correct" the up to then lack of coordination of the calendar with the astronomic phenomena. The article by Randić, L., 1976, 430-434, together with basic information on pages 433-434 gives a nice table that can be used to check the concordance of dates and days of the week.

11. Venice - Corfu voyage lasted from 30 August to 9 September 1395. With a rest in the port of Pula which was no longer than 12 hours it lasted effectively about 7.5 days. Since the route of the voyage was: Venice - Pula - the cape of Kamenjak - Sedmovrač (sea passage among Ilovik, Premuda, Škarda, Ist, Molat and Silba which after the navigation near Lošinj, leads to south Kvarnerić, i.e. the north part of the Zadar channel) - Zadar channel - Žirje - Hvar channel - Pelješac channel - Mljet channel - the cape of Oštro (at the entrance to Boka Kotorska) - Budva - Drač - Corfu, its length was 530 M. In that case 530 M : 7.5 days = 70,67 M per day, which with the 12 hours navigation per day results with the speed of 5.89 knots (nautical miles per hour). As this speed is too high it is to be assumed that they navigated also by night, at least between Venice and the Istrian coast and between Dubrovnik and Corfu, so the daily navigation would be longer and the speeds lower and more appropriate. (This was the practice in the ancient times - cfr. Kozličić, M., 1990c, 689-697.) If we

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William Wey was one of the first Englishmen to travel to Holy Land for paying reverence to Jesus' tomb<sup>12</sup>. He took part in pilgrimage twice. On his first pilgrimage in 1458 he travelled from England through France, Belgium, Neatherlands, Germany, Austria and Northern Italy to Venice. He left Venice on 15 May and on the 19th of the same month his ship passed by Poreč channel "in the land of Istria", which is a hundred miles from Venice. He arrives in Dubrovnik, "the town in Slavonia", on 24 May where he spent several days and then they passed Drač on 31 May.

During his second pilgrimage which he started on 13 March 1462, he travelled through Belgium, Germany, Switzerland, Austria and the North Italy. After an almost two-month journey on land he left Venice on 26 May to reach Jesus' tomb. First they sailed up to "venetian towers" which are out of town and the ships remained there obviously waiting for favourable wind. On 1 June they "put ... sails up about midnight" and reached Poreč, a town about 100 miles far from Venice, on 3 June. They continued up to Rovinj, a town 10 miles far from Poreč, where they landed. They continued their voyage on Ghosts, and arrived in Zadar on 8 June where they spent a few days. They set out in the direction of Sušac on 11 June, passed by it as well as by the island of Korčula (with a short rest) and were finally in Dubrovnik on 16 June. They reached Corfu on 21 June. The rest of the voyage was along Zante, Rhodes and Cyprus, Jafa (13 July) and Jerusalem 19 July 1462.

Wey did not give itinerary of the voyage back either. NW-SE voyage direction is dealt with again in his recapitulation in which he pointed out the basic characteristics of the area through which he sailed.

take the whole voyage as a 24-hour navigation the speed would be 2.94 knots which is too low, so this leads us to the conclusion that they did not constantly sail only by day but by night partly. On the way back the voyage was defined on the route Koločep - Venice, i.e. from 9 to 23 May 1396. So they sailed 15 days the way which was 296 M long therefore:  $296 \text{ M} : 15 = 19.73 \text{ M per day}$ , with the average speed of 1.64 knots with 12-hour navigation and 0.82 knots with 24-hour navigation. Such speeds lead us to the conclusion that on their way back stops were frequent and long, although this is not explicately stated in the report. For nautical miles (M) and knots (kn) see Note 17.

12. Levental, Z., 1989, 33-34 (travel record), 302-303 (biographical data). Original: Wey, W., 1857. About Wey and the earliest English pilgrims travels see Kostić, V., 1972, 278-281.

The description of the eastern Adriatic coast is given as well. Besides Venice, he showed a particular interest for Grado and Acquileia in Furlania, then for Poreč a hundred miles far from Venice, then Rovinj and the town Pula. In Dalmatia he found the following towns interesting: Zadar, Šibenik, Split, Trogir and Kotor. In (venetian) Albany towns of interest were Budva, Bar, Ulcinj and Drač and in Greece it was Corfu.

It can be concluded that Wey's report is important because in it NW-SE navigation is presented with additional details in comparison with the description of the master of Anglura. The itinerary of this sailing was the following: Venice - Malamocco or Lido (where the venetian towers out of town were)<sup>13</sup> - Poreč - Rovinj - Zadar - Sušac - Korčula - Dubrovnik - Corfu. He does not tell us if he used the same itinerary on his way back but this would be done by other pilgrims. The relationship

13. The navigational features of Malamocco (*Porto di Malamocco*) are presented in detail in the Peljar, 1964, C-IX, 404-405; also for *Porto di Lido*, Peljar, 1964, C-IX, 407-410. The importance of these two ports at the approach to Venice at the beginning of the 19th century is clearly shown by Carta, 1824, Foglio II, scale 1:176, 000, especially its scale plan 1:35,000 entitled "I. Porto di Lido / II. Porto di Malamocco". The plan is placed along the left edge of the chart, its surface takes almost one third of the available area. Since Wey mentions only "venetian towers that are out of town" it is difficult to know whether he refers to *Porto di Lido*, about one nautical mile far from Venice, or to *Porto di Malamocco*, five miles far from it. In later reports the position of this starting point of the voyages to west Istria would be thus specified to lead us to the conclusion that it was Malamocco rather than Lido. In any case, as can be seen in Carta, 1824, Foglio II, respectable fortifications existed there as early as at the beginning of the 19th century. Besides these ports Caorle, more than 15 M to the north, should also be taken into consideration since it was an important starting point of the voyages to the Istrian coast, very early defined by name. For example, Rosaccio, G. 1606, fol. 5. It was also defined as a starting point of voyages to Istria in *The Rizo pilot* (point 194.) published in 1490. Cfr. Kretschmer, K., 1909, 498; Muljačić, Ž., 1971, 148 (*Da chaurle a Piram vardasse entro leuante e siroco mia 50*). In any case, the outer anchorage should be dealt with for each source since it was not always the same. The choice mostly depended upon hydrographic and oceanographic features of this changeable part of the Adriatic coastline (the influence of the river Po), as well as on the navigation routes with reference to the winds on the day of navigation. Namely, one should keep in mind that the winds, when sailing from Venice to Istria, are never favourable. In summer (June - August) soft winds regularly interchange. By day from 10-11.00 to 20.00 they regularly blow from NE and NNE, while by night, from 20.00 to 10-11.00 in the morning they blow from SSE direction slightly turning in the third quadrant, i.e. to the S-W winds or medium SW that is more favourable (Peljar, 1964, C-X, 402). This is also the reason why voyages from Venice in the direction of Istria, according to all reports, started early in the morning, even before day-break. On then Venice cfr. Lane, C. F., 1977, *passim*.

between time spent and covered distance is within acceptable limits<sup>14</sup>.

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Sir Richard Guylforde started his pilgrimage in 1506<sup>15</sup>. The pilgrims left England on 8 April and via France and north Italian towns reached Venice on 16 June. They spent a month and a half in Venice during which period they had a rest, visited religious places and hired a ship. They set out on 3 July. The galley anchored at landing place IV, i.e. "five miles" far from the foundation which is at the entrance to the mentioned port, so in Malamocco port<sup>16</sup>. There they spent the night and on 4 July in the morning, they sailed "with not much wind" to Poreč in Istria (5 July, about 2 hours a.m.), which is a hundred miles far from Venice. So they sailed 18 hours on 4 July, supposing they started at 6 o'clock, and 14 hours on 5 July, which makes 32 hours altogether. This implies the speed of something more than 3 Venetian miles or about 2.9 knots<sup>17</sup>.

14. The first passage, from the NW to the SE, used the route denoted in Note 11 and it was only to Drač. They put out to sea on 15 May 1458, stayed at Malamocco up to 18 May and were in Poreč on 19 May, waiting thus for a favourable wind for at least three days. They stayed in Dubrovnik from 24 to 29 May, since the passage to Drač, with a favourable wind, lasted for two days it means that they lost there another six days. The real navigation lasted 9 days, out of 17. As the passage from Venice to Drač is 418 M long, we have:  $418 \text{ M} : 9 \text{ days} = 46.44 \text{ M per day}$ . So the speed of the daily, 12 hours long navigation was 3.87 knots. This shows that they did not navigate much by night since the 24 hours navigation was at the speed of 1.94 knots. However, other delays, not mentioned in the report, should also be taken into consideration as well as the night navigation on the routes Venice - West Istria and Dubrovnik - Drač. The second passage, from Venice to Corfu has the element of swerving after Žirje up to Sušac, which means that it is at least 30 M longer than the usual route and it totals 560 M. They were at sea from 1 up to 21 June 1462. The days on which they were not sailing can be identified in Rovinj, at least 2.5 days, two days in Zadar, about a half day in Korčula, two days in Dubrovnik which means that they were not navigating for about seven days altogether. They spent 16 days in actual navigation thus we have:  $560 \text{ M} : 16 \text{ days} = 35 \text{ M per day}$ , which with 12-hour navigation results with the speed of 2.92 knots, and with 24-hour navigation only 1.46 knots. So, incidental stays were longer especially if we take into consideration the assumption that a part of the passage was realized in night navigation.

15. The report of this voyage was not written by this nobleman, since he died under sad circumstances in Jerusalem on 6 August 1506, but by his anonymous currate who accompanied him. Levental, Z., 1989, 36-38 (travel-record). Original: Anonimus, 1851.

16. For this report that place can be identified positively as Malamocco. See note 13.

17. Here the length of the Venetian mile is taken to be 1,748 m, as defined by Herkov, Z., 1977, 210-211. The length of 1,400 meters as given by Muljačić, Ž., 1971, 136, is not accepted. Muljačić's opinion is probably based on the definitions of Italian mile, which in literature up to the 16th century was considered to be 1,484 meters long while later on its length of 1,855 m would be accepted. Herkov, Z., 1977, 201, 208-209, informs on this with

This proves the cited observation of the navigation with slight wind which logically resulted in low speed.

They set out from Poreč on 7 July, again “early in the morning”. They passed by Pula which is “about” 30 miles far from Poreč, then by the Gulf of Senj which probably refers to south Kvarnerić (route: Kamenjak cape - Unije - Lošinj - Sedmovraće)<sup>18</sup>. By night, on Wednesday, 8 July, they reached Zadar, a port 100 miles far from Poreč. On Thursday morning, 9 July, they did some sightseeing of Zadar and about 3 o'clock in the afternoon they continued their voyage. They sailed to Vis. They reached this island on Saturday, 11 July, where they “stayed that night” which indicates that they entered the port of Vis at dusk or even later. On Sunday morning, 12 July, they set off leaving on their “left” the island of Hvar which they did not reach due to the “contrary wind”. Hvar is 100 miles from Zadar. On Wednesday, 15 July, they reached Dubrovnik, “the most powerful and fortified town” on this side of the Adriatic coast, in the land of Slavonia and Dalmatia, which is a region of the Kingdom of Croatia. Dubrovnik is 500 miles far from Venice. They continued their navigation in the morning on 17 July, and on Saturday, 18 July, they approached the island of Corfu. Due to the weak wind they did not arrive in the port of Corfu until noon, July, 20, “the eighteenth day of voyage”. Following anonym, Corfu is undoubtedly the “key gate and safety point for venetian galleys and ships”. It is 300 miles far from Dubrovnik.

Following the voyage description we learn that the pilgrims stayed shortly in Crete and Cyprus and they arrived in Jaffa on 18 August. There

valid arguments. So, Muljačić does not calculate with the *venetian mile* and that difference is of significant importance. The terms for a mile found in pilots are the following: *il miglio*, venetian *mia*, Latin *milliaria*, *millia* and *milja*. Cfr. Muljačić, Ž., 1971, 136. In the above and all other calculations we use a nautical mile per hour (1 M/h) for kn (abbr. for knot), a unit of speed. This nautical mile refers to the sea mile adopted in the modern SI measuring system. Its new simbol is M, its length is 1.852 m, on the geographical latitude of 45°, the average Adriatic latitude.

18. Upon leaving Sedmovraće and entering the south part of Kvarnerić, it can be turned to the direction of Senj. This is also shown by Rosaccio, G., 1606, who shows Osor (fol. 9b) and then Rab (fol. 10a) and Pag (fol. 11a). The term the *Bay of Senj* (classical: *Golfo di Segna*) is not known in the then cartography, at least the author of this paper has not come across it. In addition, we are uncertain what it really stands for. Yet, it can be assumed that it stands for Kvarnerić rather than for the Podgora channel. Cfr. Kozličić, M., 1995a, 300-366.

they had negotiations regarding their entrance to Jerusalem and had great problems which resulted with Guylforde's death in the Holy city on 6 September, 1506. However, the real problems were still to come when the pilgrims started back home, particularly on the Corfu - Venice itinerary. Namely, they reached Corfu only on 30 December, i.e. in winter period. It was not only *the silence* (the lack of wind) but opposite winds (bora) and "ungovernable storm" that affected the navigation. The writer made thorough description of rough weather which is quite usual on the Adriatic in winter period. Simultaneously, he also informed us about the navigation route. Namely, they were sailing along the Albanian coast. When they passed by Budva the galley managed neither to enter the port of Dubrovnik nor to find shelter near Mljet. Finally they found shelter by Lopud. Further, they sailed by Korčula where they were caught in continuous storms. Near Hvar they were almost shipwrecked. The damaged rudder was hardly repaired by "divers". Losing their patience the pilgrims tried to continue their voyage aboard a smaller rowing ship but they gave up and came back aboard the galley. They were near Zadar on 18 January 1507, and continued in the direction of Pula, Poreč and Novigrad. Finally, they were in Venice on 25 January and left for England.

So, Venice - Malamocco - Poreč - Zadar - Vis - Dubrovnik - Corfu itinerary lasted 18 days in summer (3-20 July 1506). The navigation in the opposite direction (Corfu - Budva - Lopud - Korčula - Hvar - Zadar - Pula - Poreč - Novigrad - Malamocco - Venice) lasted much longer: from 30 December 1506 to 25 January 1507, i.e. 27 days. It must also be remarked that summer NW-SE and S route was being interrupted because of sightseeings, trade and supplies provision. The third of July is not to be taken into account since a short navigation from Venice to Malamocco took place that day, the latter being the starting point for sailing in the direction of Istria. They arrived in Poreč on the 5th and continued the voyage on the 7th of July which means another day and a half without navigation. On 8/9 July due to their stay in Zadar they did not sail almost the entire day. Because of spending the night in Vis, on 11/12 July, they did not navigate for half a day. In Dubrovnik they lost another day and a half since they were in this town from 15 July until 17 July early in the morning. The days lost when entering the port of Corfu are not to be counted as lost days since they were navigating all the



same. It is to be concluded that effective summer navigation was not longer than 12 days which presents more than 50% shorter time period than in winter period even when we take into account, for later navigation (SE-NW), the stops which occurred not because of visiting religious objects and supplies provision but because of perils avoidance. This is an important observation since the anonym's report testifies that even in the worst weather, such as winter time, there was navigation along the eastern Adriatic coast<sup>19</sup>.

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Sir Richard Torkington left England on 20 March 1517 to pay reverence to Jesus' tomb<sup>20</sup>. Like other pilgrims the priest from Norfolk visited places in which he could see holy relics, precious christian objects about which he reported very thoroughly. A journey to Venice had already been established: through France and northern Italian towns. In Venice he got numerous offers by captains who wanted him to hire their ships. He started his voyage on 14 June 1517. A boat transported pilgrims to the ship which was four miles "out of port fortifications", i.e. in Malamocco. Torkington reported that on Tuesday, 16 June 1517, about five o'clock in the morning "we set off" with weak wind. They reached Rovinj on Thursday, 18 June. Torkington did not report the time of their arrival there. Rovinj is 10 miles far from Poreč and 110 miles far from Venice. They stayed in Rovinj until Sunday since the wind was blowing "in the opposite direction". However, on Sunday, before equinox "about seven in the morning" they continued the voyage. They sailed by Pula, 30 miles far from Poreč, then through the Gulf of Senj and they passed Zadar on Monday, 22 June<sup>21</sup>. On "equinox" and that was on

19. For the first voyage, 3-20 July 1506, of the length 530 M, taking stays into consideration, we have: 530 M : 12 days = 44.17 kn. So, the speed for the 12-hour navigation was 3.68 knots and for the 24-hour navigation 1.84 knots. The second voyage, from 30 December 1506 to 25 January 1507, of the same length, has the following values: 530 M : 27 days = 19.63 knots. So, the speed for the 12-hour navigation was 1.64 knots, while for the 24-hour navigation it was only 0.82 knots. In both cases the speeds are too low. This fact leads us to the conclusion that there were some stops not mentioned in the report, so the same remarks mentioned in notes 11 and 14 are valid here.

20. Levental, Z., 1989, 40-41 (travel-report). About Torkington Kostić, V., 1972, 282. Original: Torkington, R., 1884.

21. Here the problem is not with the *Bay of Senj* (see note 18) but with the fact that the navigation route: Kamenjak cape - Kvarner - Under Velebit channel - and farther towards

23 June according to Torkington's report<sup>22</sup>, they sailed near Dubrovnik, 500 miles far from Venice. On Thursday, 24 June, a day after "equinox" about four o'clock in the afternoon they passed by Corfu. But, "since the wind was favourable for us we did not stop in any of the above mentioned ports"<sup>23</sup>.

Although the back route was not recorded, the report is valuable all the same. The data are almost identical with the ones in Guylforde's report, with some additional details<sup>24</sup>, the most interesting being the one which finally informs about the exact time of putting out to sea in the morning: they left Malamocco at five and Rovinj about seven o'clock. Furthermore, Torkington did not fail to point out that they had sailed on equinox. Obviously, he heard this piece of information from ship officers or maybe the captain himself.

Zadar through the Ljubačka vrata (Ljubačka gate), has no sense with the long coastal navigation which was a characteristic of pilgrims voyages. Rovinj - Zadar passage through Sedmovraće is 94 M long and the one through the channel below Velebit 154 M. The navigation on the latter route, which lasted two days (21-22 June) means:  $154 \text{ M} : 2 \text{ days} = 77 \text{ M per day}$ . With the 12-hour navigation the average speed would be 6.42 knots which is too high a speed. Since this area is very difficult for navigation, and this is also true of the area through Sedmovraće, the navigation could only take place by day and therefore, due to the high calculated speed, we cannot take this passage as possible. The passage through Sedmovraće has the following figures:  $94 \text{ M} : 2 \text{ days} = 47 \text{ M per day}$ , i.e. for the 12-hour navigation the speed is 3.92 knots. Such speed is within the average for sailing boats navigation and thus proves the navigation through Sedmovraće logical.

22. Equinox, i.e. the time of the year when day and night are of equal length, each lasting 12 hours, is at the turn of spring to summer. It can in no way be on 23 June, but usually on 21 and 22 June. This refers to the mentioned "lack of coordination" between the calendar and astronomical phenomena. Cfr. note 10.

23. Here the course design is the same as in note 19. The voyage lasts from the morning of 16 June to 16.00 of 24 June 1517. The stays were on 18 June (second half of the day), 19 and 20 June, the entire days and on 21 June, a quarter of a day, which makes about 3 days altogether. In such case the navigation lasted only 6 days, thus we have:  $530 \text{ M} : 6 \text{ days} = 88.33 \text{ M per day}$ , i.e. with the 12-hour navigation the speed is 7.36 knots and with 24-hour navigation it is 3.68 knots. Since the first speed is too high, and the second is at acceptable level we should conclude that with this voyage the navigation was done partly by night.

24. This and other reports were not published immediately upon their writing but at the end of the 19th century, while some of them were published during the 20th century. Therefore it is hard to assume their mutual influence. Similarities should probably be attributed to a certain common level of general knowledge available to the authors on which they would, further, during the voyage or upon the return to Venice, build the rest. But certain influences should not be excluded. They present a problem per se that could be dealt with by anglists. Cfr. Kostić, V., 1972, *passim*.

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Having left England John Locke did not follow the same pilgrimage route as his predecessors<sup>25</sup>. Instead of crossing La Manche to reach France and northern Italy he sailed up to Livorno, with a lot of problems and a change of ship in Cadiz. He was in Livorno on 1 June although he had left England on 26 March 1533. To reach Venice from Livorno he used a land route. In Venice he got ready to embark a reverence ship. With a group of pilgrims he put out to sea on 17 July. They weighed anchor early in the morning and sailed in the direction of Istria, to the port of Rovinj. He did not explicately write that they had entered the port of Rovinj but that can be concluded from the text. They got supplies of fresh food and did some sightseeing of the basilica of St. Euphemia in Rovinj. They continued navigation the following day, on 20 July. The visibility must have been good, due to bora weather, since Locke wrote that "about noon" they saw at the same time the contours of the mountains near Ancona and the hills in Dalmatia, i.e. Slavonia, which were, "as he reported", more than hundred miles far from each other<sup>26</sup>. Furthermore, this remark tells us that they were sailing along Kvarner towards Lošinj and Sedmovračé since that part of the Adriatic surface could be the only observation point, regarding the route and its characteristics. Further, it also tells us the time of setting out from Rovinj: probably an hour or two before dawn since they reached the above mentioned position about noon and it should have taken them at least five or six hours to get there<sup>27</sup>. Anyhow, the wind was favourable,

25. Levental, Z., 1989, 42-44. Original titled *The voyage of M. John Locke to Jerusalem*, published in: Hakluyt, R., 1959, 101-102.

26. The visibility on the Adriatic is said to be good when it is 20-30 kilometers. However, the statement is not unacceptable since the identification of horizon, the most frequently used category of distance, is not dealt with here. In case Locke himself, out of curiosity, climbed into the basket, i.e. to the height of at least 30 m above the sea surface, he could have seen the horizon at the distance of at least 13.16 M. But the object on the horizon, 500 meters high above the sea surface, keeping in mind that both mountain ranges are higher, could be seen from the distance of 56.8 M (Nautical tables, 1969, NT-8 and NT-10). According to this his observation was correct. Of course, it was not possible when the south wind was blowing, so it probably happened when bora was blowing and eliminated humidity which is the greatest obstacle to the good visibility. On the weather on the Adriatic and visibility in detail: Frleta, I., 1957, 217-230; Penzar, B., 1964, 111-157; *Idem*, 1968, 99-124; Sijerković, M., 1988, 636-655.

27. In regard of the known navigations in the ancient world and the Middle Ages as well

as it is obvious from the context of Locke's report, and a little bit before noon on 21 July, they caught sight of a rock, named Jabuka. Then they saw Sv. Andrija (also: Svetac = St. Andrew). They reported Sv. Andrija was on their left. This proves good observation of these islands since it is so when sailing NW due SE. They observed the island of Vis on their left, too. Locke reported the distances between Jabuka and Sv. Andrija (18 miles), Sv. Andrija and Vis (10 miles) and Vis - Hvar (10 miles). He also reported that they had to stop there because there was no wind. Although he does not name the place at which they found protection it was probably a lee-side south of the island of Vis or near the port of Komiža. This assumption is based not only on the data on previous navigation (Rovinj - Jabuka - Sv. Andrija) but on its continuation on 22 July, since lull did not last long<sup>28</sup>. This day they left Sušac on their "left" and a very dangerous island called Palagruža on their "right". They reported to have seen Lastovo on their "left", probably 12 miles far from Sušac in eastern direction. Further, they sailed near Mljet. They sailed without interruptions on 23 July, so they were only seven or eight miles far from Dubrovnik "before night". Since it was night they did not

as in the first centuries of the New age the speed as high as 5 knots should be assumed here. Taking this into consideration as well as the distance of 25 M between Rovinj and the Kamenjak cape (the farthest south cape of Istria) such a position should be assumed not farther than just few miles SE from Kamenjak because the distance between Kamenjak and the port of Mali Lošinj is 25 M. Therefore, the latter mileage together with the previous one would require the whole day navigation. On these relations in antiquity cfr. Kozličić, M., 1990a, *passim*; *Idem*, 1990b, *passim*; *Idem*, 1990c, 589-597; *Idem*, 1990d, *passim*.

28. In accordance with what was mentioned in the previous note we should conclude that the passage from Rovinj to Komiža is about 200 M long, when sailing by the route: Rovinj - Pula - Kamenjak - Lošinj - Sedmovrač - Silba - Virsko more (the Vir sea) - Srednji kanal (the Middle channel) - Murtersko more (the Murter sea) - Žirje - between Sv. Andrija and Jabuka - to Komiža. Such a route would indicate that the wind, undoubtedly bora, diverted them too much under Žirje and, thus, unnecessarily extended the navigation for thirty miles. Nevertheless, Locke recorded such a route. They started their voyage on 20 July, early in the morning, and sailed in a continuous navigation to the island of Vis. They very likely had no wind in the dusk of 21 July. These facts indicate that the navigation lasted at least 18 hours per day, or 36 hours altogether. When 200 M is divided by 36 hours we get the average speed of 5.56 knots. This speed is in complete accordance with what was stated in the previous note. The statement is of major importance since it proves that we have read the original well, i.e. that its context can be understood from modern points of view. The statement also shows that the original is reliable which further indicates that Locke himself wrote down the maritime data, heard probably by the captain and ship officers. Finally, it proves the originality of the data.

enter the port. Their intention was to visit Dubrovnik the following morning but due to the strong wind that was blowing in the direction opposite to their sailing they did not manage to do that. This enables us to conclude that weather conditions near Vis were just a short lull between two boras. There follows quite a long description of islands and ports. Unlike in previous descriptions here he identifies the pause point as “near” Mljet. Meanwhile the strong wind weakened and turned into a favourable wind so they put their sails up at once and continued navigation. Since they left Mljet on their “right” and Šipan on their “left” it can be concluded that they had rested somewhere in the Channel of Mljet, near the north coast of the island of Mljet. Later in his description, having provided information on other Elaphiti islands, he himself affirmed the above conclusion. Namely, he wrote that the channel between Mljet and Šipan was not wide more than 4 or 5 miles but it was very deep so they had had to drop anchor at the depth of 40 fathoms, i.e. almost 80 metres<sup>29</sup>. Nevertheless they continued their voyage on 24 July and about noon they could vaguely see Herceg-Novi, which means that they sailed near the entrance to Boka Kotorska Bay then. By sunset they were near the hills of Bar in Sclavonia. On July, 27, they were still on the Adriatic. Only on the 28th they left the Adriatic and sailed close to Apulia to be farther from “the tempers”, as they wrote. They probably referred to Turks and their piracy<sup>30</sup>.

On their voyage back from the Holy Land the itinerary was more or less the same. They set out from Corfu on 22 November and were near Bar on 25, probably in the morning since they sailed by Dubrovnik the same day. At three o'clock a.m. they anchored near Mljet again. Then

29. The venetian fathom (*pertica veneta, cavazzo*) is 6 feet long. Up to the 19th century its length in the metric system was 2.080,15 mm, i.e. 2.08015 meters - Herkov, Z., 1971, 100-101. In his reports on hydrographic measuring of the east Adriatic coastline, from Piran to Split (in 1806), C. F. Beutemps-Beaupré used this unit very much. He used it for measuring not only sea depths but shorter distances as well. Cfr. Kozličić, M., 1995c, 259-279; *Idem*, 1995d, 41-138.

30. Komiža - Otrant voyage lasted from 22 to 28 July 1517. The navigation lasted about 6 days because on 24 July they rested for half a day near the island of Mljet. The sea distance between Komiža and Otrant is 250 M. So we have: 250 M : 6 days = 41.67 M per day, i.e. with the 12-hour navigation the speed is 3.47 kn and for 24-hour navigation it is 1.74 kn. We conclude that these speeds are much lower than the speeds on the first part of the voyage.

they sailed in the channel of Pelješac, i.e. near Korčula and continued navigation somewhat closer the coast than when navigating to the Holy Land. They reached Kvarner on 28 November and sailed by Kamenjak at noon the same day. They anchored in the port of Rovinj that evening to get a pilot for navigation to Venice. Namely, pilots were in Rovinj in summer time while in winter they were in Poreč<sup>31</sup>. Therefore, they did not precede directly to Venice but sailed to Poreč first, 18 miles "to the west" as reported (to the north would be more correct). They arrived there on 29 November, and obviously having taken the pilot, went on to Venice. They had a compulsory checkup and as they were healthy they were not kept in quarantine. Locke got off the ship in Venice, on 2 December and started his inland journey to England<sup>32</sup>.

So, this report provided us with a lot of new pieces of information which completed the previous picture of seaborne routes on the Adriatic Sea.

## II

From the above it can be concluded, although not all available data have been analysed<sup>33</sup>, that in the period dealt with the east Adriatic Sea was most frequently used for sea traffic, particularly for long coastal navigation. Why this was so was not explained in later navigation manuals, e.g. of the 16th and 17th c.<sup>34</sup>, but by hydrographs and seamen from the first half of the 19th c. The first among them was C. F. Beaupré who did the first hydrographic measurement of the eastern

31. On pilotage along the west coast of Istria, particularly in Rovinj and Poreč, in detail, with earlier references, Barbačić, R. F., 1962, 1522-1523.

32. Corfu - Venice, Locke's return voyage, from 22 November to 2 December 1517, was 530 M long and lasted 11 days. According to the context not more than one day should be taken away because of delays. So, 530 M : 10 days = 53 M per day or the average daily speed of 5.3 knots. As the voyage took place in winter time when daylight is much shorter than in summer, night navigation should also be assumed, on the routes mentioned above.

33. Cfr. Jurić, Š., 1978, 274-283; Kostić, V., 1972, *passim*; Petricioli, I., 1966, 205-208. Earlier references mentioned as well.

34. Some of such fundamental works are: Crescenzo, B., 1601; Medina, P. da, 1554; *Idem*, 1609; Michelot, E., 1806 (the second edition first published in 1686); Nuovo portolano, 1633. In the course of the 18th century more such works were published: Atkinson, J., 1698; Bassi, D. G., 1812; Brunacci, V., 1795; Formalèoni, V., 1788; Gorgoglione, S. G., 1705; Introduzione, 1715.

Adriatic in 1806 and 1808-1809<sup>35</sup>. His work was followed by other scientific and research works which finally resulted with the first Adriatic Pilot published in Milan by captain Giacomo Marieni<sup>36</sup>.

Explaining sailing routes on the Adriatic both Beautemps-Beaupré and Marieni focused their attention on winds. Winds are, besides geographic, oceanographic and hydrographic features of the sea, decisive factors for navigation rules on the Adriatic<sup>37</sup>. The first in importance is bora, a wind blowing in the north (N-E). Like scirocco, this wind is a prevailing wind on the Adriatic and the one of which seamen are afraid in this area. Extremely strong bora originates on the east coast and blows diagonally to the sea extension. It is most frequent in winter. Bora is particularly strong below mountain saddles above the coastline. According to Beautemps-Beaupré the reasons why all seamen sailing in Venetian Bay are afraid of bora lie in two facts: first, bora blows extremely strongly and second, it blows in squalls in the direction vertical to the Bay coast which extends from southeast to northwest<sup>38</sup>. Captain Marieni wrote similarly. In his opinion seamen were not afraid of bora because of its strength, although this fact was not to be neglected, but because of its ways of blowing: suddenly and with gusts. It would fall down from mountain saddles, through straits between the islands, producing unpleasant frequent, short and changeable waves, he wrote. The ship which lost maneuvering abilities could find itself on the other side of the sea where anchorages and shelters were scarce<sup>39</sup>.

According to these two authors scirocco causes less troubles to seamen than bora. Beautemps-Beaupré's terse thoughts on this wind are much clearer than Marieni's. He defines scirocco as a wind which blows along the Adriatic<sup>40</sup>. It causes troubles to sailing boats because of its strength, duration and high waves. Nevertheless, scirocco blows at constant speed and thus enables ships to find shelters at the anchorages

35. Original: Beautemps-Beaupré, C. F., 1807. Published in: Beautemps-Beaupré, C. F., 1849, 32-121. Scientific analysis of the Adriatic sea in Kozličić, M., 1995c, 259-279. The same for the west coast of Istria: Kozličić, M., 1995d, 41-138.

36. Marieni, G., 1830; *Idem*, 1845.

37. Marieni, G., 1830, 9-12.

38. Beautemps-Beaupré, C. F., 1807, 2-5; *Idem*, 1849, 33-35.

39. Marieni, G., 1830, 9.

40. Beautemps-Beaupré, C. F., 1807, 5; *Idem*, 1849, 35.

along the east coast. It is more frequent in winter when it exchanges with bora. Since it blows along the Adriatic the sea level continuously rises and it gets awful, visibility becomes so poor that a seaman cannot get sight of the coast on which he could be thrown<sup>41</sup>.

However, in spite of such statements, Beautemps-Beaupré and Marieni advocate east Adriatic navigation. Although, according to Marieni, bora presents a good reason for east coast avoidance just because of safety reasons it is suggested to navigate along it first, rather than at open sea or along the west coast. The east coast offers safer ports protected against all kinds of winds as well as numerous anchorages that ensure protection not only against bora but scirocco as well. If a seaman is surprised by bora, says Marieni, he should look for shelter in the nearest port or at the nearest anchorage. In case this is not possible and a seaman is forced to navigate with reefed sails very soon he will find himself along the west Adriatic coast where he will have to seek for shelter at a bad anchorage<sup>42</sup>.

In other words Marieni advocates navigation along eastern coast when sailing from the south due north (i.e. SE-NW) regardless the season. However, for NW-SE navigation he suggests the west coast only in calm weather, i.e. in summer or spring. He points out that a cautious and serious seaman will navigate along eastern coast against the stream due to bora. Thus he would be able to use many shelters and anchorages as opposed to the west coast where he could get seawrecked due to the lack of shelters, protected ports and large anchorages in particular<sup>43</sup>.

Consequently, higher frequency of eastern Adriatic navigations proved by some pilgrims and travel reports from the 14th and 15th c., found its scientific and experiential foundation only in the 19th c. It is of particular interest that out of a number of factors that determine sailing boats navigation winds are given particular importance. This is not surprising since in the 14th and 15th centuries as well as in the later period up to the 19th century wind was the propulsion strength for the ships. Simultaneously wind was most often the cause of their catastrophes.

41. Marieni, G., 1830, 10.

42. Beautemps-Beaupré, C. F., 1807, 5; *Idem*, 1849, 35; Marieni, G., 1830, 11-12.

43. Marieni, G., 1830, 12.



Results obtained by this paper indicate the need for further investigation of other periods, based on similar scientific methodology. This particularly refers to other pilgrims reports which proved to be extremely valuable historic sources for determination of Adriatic sailing routes.

## REFERENCES

- Anonimus, 1851, *The Pilgrimage of Sir Richard Guylforde to the Holy Land. A.D. 1506*, London 1851.
- Atkinson, J., 1698, *Epitome of navigations; or a short and easy methodical way to become a complete navigator*, London 1698.
- Badurina, A., 1992, "Bizantski plovni put po vanjskom rubu sjevernih jadranskih otoka". [Byzantine sailing on the outer edge of the north Adriatic islands], *Radovi Instituta za povijest umjetnosti u Zagrebu*, Vol. 16, Zagreb 1992.
- Barbalić, R. F., 1962, "Pomorstvo Istre". [Navigation of Istria], *Pomorski zbornik*, Vol. 2, Zagreb 1962.
- Bassi, D. G., 1812, *Costiere del Mare Adriatico*, Venezia 1812.
- Beautemps-Beaupré, C. F., 1807, *Rapport sur les rades, Ports et Mouillages de la Côte Orientale du Golfe de Venise. Visites en MDCCCVI. Par ordre de sa Majesté l'Empereur et Roi Sous les Ministères de Leurs Excellences Le Vice Amiral Decrès Ministre de la Marine et des Colonies de l'Empire Français et de général de division Caffarelli Ministre de la Guerre et de la Marine du Royaume d'Italie. Par Charles François Beautemps-Beaupré Membre de la Légion d'Honneur, Hydrographe, sous Chefs du Dépôt général des Cartes et Plans de la Marine et des Colonies.* (Sveučilišna i nacionalna knjižnica - Zagreb, Department of Cartography, sign. A-III-S<sup>18</sup>-9).
- Beautemps-Beaupré, C. F., 1849, "Rapports sur les rades, ports et mouillages de la côte orientale du golfe de Venise. Visitées en 1806, 1808 et 1809, par ordre de l'empereur", *Annales hydrographiques* 1849, Paris 1849.
- Brunacci, V., 1795, *Nuovo trattato di navigazione che contiene la teoria e la pratica del pilotaggio*, Livorno 1795.
- Brusić, Z., 1970, "Problemi plovidbe Jadranom u prethistoriji i antici". [The problems of Adriatic navigation in prehistory and antiquity], *Pomorski zbornik*, Vol. 8, Zadar 1970.
- Brusić, Z., 1989, "Kasnoantička utvrđenja na otocima Rabu i Krku". [Fortifications of late antiquity in the islands of Rab and Krk], in: *Arheološka*

- istraživanja na otocima Krku, Rabu i Pagu i u Hrvatskom primorju*, Zagreb 1989.
- Brusić, Z., 1991, "Nalaz posuda od niskometamorfne stijene na otočiću Frmiću kod Biograda i značenje ovog otočića u režimu plovidbe Pašman-skim kanalom". [Find of low metamorphose stone containers in the islet of Frmić near Beograd and the importance of this islet for the regime of navigation in the Pašman channel], *Diadora*, Vol. 13, Zadar 1991.
- Brusić, Z., 1993, "Starokršćanski sakralni objekti uz plovidbenu rutu istočnom obalom Jadrana". [Old christian sacral objects on the sailing route on the east Adriatic coast], *Diadora*, Vol. 15, Zadar 1993.
- Carta, 1824. = *Carta di cabottaggio del mare Adriatico*, Milano 1824.
- Crescenzo, B., 1601, *La Nautica Mediterranea*, Roma 1601.
- Čečuk, B., 1968, "Jadran u prethistoriji (u svjetlu arheoloških istraživanja)". [Adriatic in prehistory (in the light of archeological researches)], *Pomorski zbornik*, Vol. 6, Zadar 1968.
- Formalèoni, V., 1788, *Saggio sulla nautica dei veneziani*, Venezia 1788.
- Fox, 1940, *Mr. Harrie Cavendish his Journey to and from Constantinople 1589 by Fox, his Servant*, London 1940.
- Frleta, I., 1958, "Vjetrovi kao nosioci tipova vremena na našem dijelu Jadrana". [Winds as weather type determiners on our part of the Adriatic], *Hidrografski godišnjak 1956-1957*, Split 1958.
- Glušćević, S., 1994, "Brodolomi na Jadranu u antici i srednjem vijeku". [Shipwrecks in the Adriatic in antiquity and the Middle Ages], *Adrias*, Vol. 4-5, Split 1994.
- Gorgoglione, S. G., 1705, *Portulano del Mare Mediterraneo ...*, Napoli 1705.
- Gunjača, Z., 1986, "Kasnoantička fortifikacijska arhitektura na istočnojadranskom priobalju i otocima". [Late antique fortificational architecture on the east Adriatic coastline and in the islands], in: *Materijali 22*, ed. Savez arheoloških društava Jugoslavije, Beograd 1986.
- Hakluyt, R., 1959, *The Principal Navigations Voyages Traffiques and Discoveries of the English Nation*, Vol. II., London 1959 (First Edition Glasgow 1903).
- Herkov, Z., 1971, *Mjere Hrvatskog primorja s osobitim osvrtom na solne smjere i solnu trgovinu*. [Measures of the Croatian maritime region with special regard to salt directions and salt trade], Rijeka 1971.
- Herkov, Z., 1977, "Prinosi za upoznavanje naših starih mjera za dužinu i površinu". [Contributions to the introduction to our old measures for length and surface], *Zbornik Historijskog instituta JAZU (= HAZU) u Zagrebu*, Vol. 8, Zagreb 1977.

- Introduzione, 1715 = *Introduzione all'arte nautica per uso de piloti e capitani di nave, e per il migliore servizio de commandanti sopra il mare*, Venetia 1715.
- Jurić, Š., 1978, "Putovanje jednog Nijemca duž dalmatinske obale 1569 godine". [A voyage of a German along the Dalmatian coast in 1569], *Zadarska revija*, No. 2-3, Zadar 1978.
- Jurkić, V., 1979, "Promontore antica", *Atti del Centro di ricerche storiche di Rovigno*, Vol. 9, Trieste - Rovinj 1979.
- Kojić, B., 1967, "Značenje Jadranskog mora kao svjetskog plovnog puta". [The importance of the Adriatic as a world crossing], *Pomorski zbornik*, Vol. 5, Zadar 1967.
- Kostić, V., 1972, *Kulturne veze između jugoslovenskih zemalja i Engleske do 1700 godine*. [Cultural relations between Yugoslav countries and England up to 1700], Beograd 1972.
- Kostić, V., 1975, *Dubrovnik i Engleska*. [Dubrovnik and England], Beograd 1975.
- Kozličić, M., 1993, *Hrvatsko brodogradništvo - Croatian Shipping - Le navi croate*, Split - Zagreb 1993.
- Kozličić, M., 1990a, *Historijska geografija istočnog Jadrana u starom vijeku*. [Historical geography of the east Adriatic in the ancient world], Split 1990.
- Kozličić, M., 1990b, *Istočni Jadran u Geografiji Klaudija Ptolemeja*. [East Adriatic in Claudius Ptolemaeus' Geography], Zagreb 1990.
- Kozličić, M., 1990c, "Peripl - najstariji sačuvani peljar istočnog Jadrana". ["Periplus" - the oldest preserved pilot of the east Adriatic], *Mornarički glasnik*, No. 5-6, Beograd 1990.
- Kozličić, M., 1990d, *Plovidba antičkim Jadranom*. [Antique Adriatic navigation], Beograd 1990.
- Kozličić, M., 1995a, *Monumenta cartographica maris Adriatici Croatici. Kartografski spomenici hrvatskog Jadrana. (Izbor karata, planova i veduta do kraja 17. stoljeća)*. [Monumenta cartographica maris Adriatici Croatici. Cartographic Monuments of the Croatian Adriatic. (Choice of maps; plans and sights until the end of the 17th century)], Zagreb 1995.
- Kozličić, M., 1995b, "Neke naznake uz splitski primjerak Barentsove karte Jadrana". [Some notes with the Split copy of Barents' chart of the Adriatic], *Radovi Filozofskog fakulteta u Zadru*, Vol. 34 (21), Zadar 1995.
- Kozličić, M., 1995c, "Beautemps-Beaupré o Jadranu 1806 godine". [Beautemps-Beaupré on the Adriatic in 1806], *Pomorski zbornik*, Vol. 33, Rijeka 1995.

- Kozličić, M., 1995d, "Risultati delle ricerche sull'Istria del 1806 del Beaupré". (Contributo alla storia della marineria e della cartografia della costa occidentale dell'Istria), *Atti del Centro di ricerche storiche di Rovigno*, Vol. 25, Trieste - Rovinj 1995.
- Kretschmer, K., 1909, *Die italienischen Portolane des Mittelalters. Ein Beitrag zur Geschichte der Kartographie und Nautik. Mit einer Kartenbeilage*, Berlin 1909 (reprint: Hildesheim 1962.)
- Lane, F. C., 1977, *Venice. A Maritime Republic*, Baltimore 1977.
- Levental, Z., 1989, *Britanski putnici u našim krajevima od sredine XV do početka XIX veka*. [British travellers in our region from the mid-15th century up to the beginning of the 20th century], Gornji Milanovac 1989.
- Marieni, G., 1830, *Portolano del Mare Adriatico*, Milano 1830.
- Marieni, G., 1845, *Portolano del Mare Adriatico*, Milano 1845.
- Medina, P. da, 1554, *L'Arte del navegar*, Venetia 1554.
- Medina, P. da, 1609, *Arte del navigare*, Venetia 1609.
- Michelot, E., 1806, *Portolano del mare Mediterraneo ossia Guida dei piloti costieri. Nuova edizione corretta ed accresciuta ...*, Marsiglia 1806.
- Muljačić, Ž., 1971, "Naša obala u najstarijim talijanskim portulanima". [Our coastline in the oldest Italian pilots], *Pomorski zbornik*, Vol. 9, Zadar 1971.
- Nautičke tablice, 1969 = *Nautičke tablice*. [Nautical tables], Split 1969.
- Nuovo portolano, 1633 = *Nuovo portolano non più spampato molto particolare del Levante e del Ponente*, Vinegia 1633.
- Peljar, 1964 = *Peljar Jadranskog mora*. [The Adriatic pilot], Split 1964.
- Penzar, B., 1964, "Neki podaci o tipovima vremena uz istočnu obalu Jadrana". [Some data on the types of weather along the east Adriatic coastline], *Hydrografski godišnjak 1963*, Split 1964.
- Penzar, B., 1968, "Neke osobine tipova vremena na Jadranu". [Some data on the types of weather on the Adriatic], *Hydrografski godišnjak 1967*, Split 1968.
- Petricioli, I., 1966, "Opis Zadra iz godine 1494" [Description of Zadar from 1494], *Zadarska revija*, No. 3, Zadar 1966.
- Randić, L., 1976, "Kalendar". [Calendar], *Pomorska enciklopedija*, Vol. 3, Zagreb 1976.
- Rosaccio, G., 1606, *Viaggio da Venetia a Costantinopoli. Per Mare, e per Terra, & insieme quello di Terra Santa*, Venetia 1606.
- Sijerković, M., 1988, "Karakteristike olujne bure na sjevernom Jadranu". [Characteristics of stormy bora on the north Adriatic], *Pomorski zbornik*, Vol. 26, Rijeka 1988.

- Stražičić, N., 1986, "Mediteran. Prirodno-geografski i pomorsko-ekonomski aspekt". [Mediterranean-natural and geographical/navigational and economic aspect], *Pomorski zbornik*, Vol. 24, Rijeka 1986.
- Tomičić, Ž., 1989, "Sv. Juraj iznad grada Paga, ranobizantski kastron". [St. George above the town of Pag, an early Byzantine castron], *Obavijesti Hrvatskog arheološkog društva*, No. 1, Zagreb 1989.
- Tomičić, Ž., 1992, "Arheološka svjedočanstva o ranobizantskom vojnom graditeljstvu na sjevernojadranskim otocima". [Archeological finds of the early Byzantine military constructing in north Adriatic islands], *Prilozi Instituta za povijesne znanosti Sveučilišta u Zagrebu*, Vol. 5-6, Zagreb 1992.
- Torkington, R., 1884, *Ye Oldest Diarie of Englysshe Travell: being the hitherto unpublished narrative of the pilgrimane of Sir Richard Torkington to Jerusalem in 1517*, London 1884.
- Vinja, V., 1958, "Starofrancuski opis Pule i Dubrovnika iz godine 1395". [Old French description of Pula and Dubrovnik from 1395], *Zbornik Instituta za historijske nauke Filozofskih fakulteta u Zagrebu i Zadru*, Zadar 1958.
- Wey, W., 1857, *Itineraries of William Wey, fellow of Eton College to Jerusalem. A.D. 1458 and A.D. 1462, and to Saint James of Compostella, A.D. 1456.*, Vol. I.-II, London 1857.
- Zaninović, M., 1994, "Ranokršćanske crkve kao postaje plovnog puta duž istočnog Jadrana". [Early Christian churches as navigation stops along the east Adriatic], *Vjesnik za arheologiju i historiju dalmatinsku*, Vol. 86, Split 1994.

Faculty of Philosophy  
Department of History  
Zadar, Croatia