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LOCAL PRODUCTION OF OLIVE OIL AND WINE IN ROMAN DALMATIA (1ST–7TH CENTURY AD) – AN OVERVIEW OF THE CURRENT STATE OF RESEARCH

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This paper brings a new overview of archaeological finds connected with the production of olive oil and wine in Dalmatia. It also shows that this production was larger in scope than originally thought and recorded in old archaeological literature. Archaeological sites with confirmed production of olive oil and wine from the north (the island of Krk, Croatia) to the south (Petrovac, Montenegro), together with sites located in present day Bosnia and Herzegovina (BA), are presented for the first time, regardless of the present-day state borders.

Keywords: olive oil, wine, Roman province of Dalmatia, pressing device, Late Antiquity / *Ključne riječi: maslinovo ulje, vino, rimska provincija Dalmacija, tijesak, kasna antika*

1. Introduction

The olive tree and grape vine were probably brought to the Eastern Adriatic area by Greek settlers in the 6th century BC; unfortunately, there is no archaeological evidence for the production of olive oil and wine from the Greek colonies in Dalmatia.[1] The planting of olive trees and grape vines slowly broadened, and the production increased through the centuries leading up to the Augustan period. Nevertheless, the plantation *en masse* began on the newly created *villae rusticae* in the 1st half of the 1st century AD. These *villae* were established by colonists mostly from Italy; a vital proportion of these new inhabitants were veterans from the Imperial army.[2]

1 Matijašić 1993, 247.

2 Zaninović 1995, 89; Oreb 1989, 71.

The drinking of wine and the use of olive oil in everyday life are symbols of Roman culture. The production of olive oil and wine was very important for the Dalmatian economy and trade, although the scale of production was not as high as e.g., in Hispania or Italia, based upon the number of confirmed production centres. The production centres established in Late Antiquity (4th–7th centuries AD) show extensive changes, e.g., very different construction methods (including low-quality building materials, occasionally parts of old architecture or funeral monuments in secondary use) and different locations (pressing devices could also be found in urban areas at that time). This phenomenon is called the *rustification* of urban life.[3] With great changes in religion came a significant change in the concept of the use of wine and olive oil. Both products were now part of Christian liturgy. Wine was the symbol of Christ's blood and was used during mass, while olive oil began to stand in for the Last Sacrament. The consumption of wine and olive oil increased, and the demand for new production centres rose; thus pressing devices were built near churches or other religious buildings as well.[4]

2. Production Process

Both olives and grapes had to be prepared before the pressing could begin. In the case of olives, they first had to be crushed in an olive mill.[5] There were three types of olive mills – *trapetum*, *mola olearia* and "*rouleaux et cuves*" type. The olive pulp rich in oil was separated from the pits by the rotation of a millstone in a mill base. Without the crushing of olives, oil could not be extracted. In Dalmatia, *mola olearia* (**fig.1**) was used most frequently, and in all probability one "*roleaux et cuves*" mill was discovered (the site of Miri near Kaštel Novi) [6], but no *trapetum*. The diameter of *mola olearia* base usually varies from one to two metres.

In the case of grapes, they first had to be trodden (stomped) on a dedicated surface called a *calcatorium*. When the first must (pulp) was separated, the remaining grapes (skins with seeds and the rest of the flesh, pedicels) were pressed. So far only one *calcatorium* has been confirmed in Dalmatia (the site of Muline on the island of Ugljan).[7]

3 Matijašić 2008a, 278.

4 Rendić-Miočević 1953, 208–209.

5 Cech 2012, 150.

6 Izvještaj treće glavne skupštine Bihaća 1897, 145.

7 Ilakovac 2003, 54–56.

Fig. 1. Mola olearia and the millstone, Kupinovik (photo: J. Kopáčková) / *Sl. 1. Mola olearia i mlinski kamen (fotografija: J. Kopáčková)*

The process of pressing was the same for grapes and olives. One pressing device could have been used for the production of olive oil and also for wine. Many different types of presses existed in Antiquity.[8] The lever press was the most widespread, and there were several construction types, depending on the method of fixing the lever beam (*prelum*) and on the types of mechanisms used to lower the *prelum*. The direct screw press was more efficient but because of frequent failures it was not used so often; the direct screw press has only been confirmed at one Late Antique site in Dalmatia (the site of Škrip on the island of Brač).[9]

8 Cech 2012, 145–149.

9 Faber, Nikolanci 1985, 4.

The only preserved parts of pressing devices in Dalmatia are these components: the *area*, the base for *arbores* and a pair of *stipites* (**fig. 2**). The press-bed, *area*, is circular or quadrangular in shape and made of a stone monolith (**fig. 3**); in Late Antiquity a material similar to *opus cementicium* was used as a cheaper solution at one site.[10] The diameter of the circular *area* usually varies from 80 to 100 cm; the dimensions of the quadrangular area usually vary from 130 x 130 to 170 x 170 cm. The base for the *arbores* is a massive stone base with two quadrangular slots for wooden columns (*arbores*), which support a wooden *prelum*. Dimensions of the base for the *arbores* are various – from 100 x 45, 140 x 45 to 150 x 60 cm; also the dimensions of slots for the arbores diverse from square 30 x 30 to rectangular 36 x 23 cm. At the other end, with the help of a different mechanism, the *prelum* was exposed to vertical pressure. The pressure could be reduced by different methods: by the hand, using a stone counterweight, with a winch fixed into the floor, further by a combination of a screw with a counterweight, etc. A pair of stone *stipites* served as winch supports and counterweights. They were in the shape of quadrangular columns and rounded on their upper end. By the turning of a winch, the *prelum* was lowered and the pressure was applied to an *area* with a basket filled with fruits. The height of *stipites* usually varies from 160 to 230 cm (**fig. 4**).

After the pressing, the fresh liquids needed to be processed immediately. A decantation basin served in the production process of both olive oil and wine (**fig. 5**). The basins had a very special construction: the walls were covered with multiple layers of waterproof mortar and the floors were built of ceramic tiles (*spicae*, in different construction type: *opus spicatum*, *opus isodomum*), stone pavement, or waterproof mortar. Some decantation basins had a small hemispherical decantation bowl (carved in a stone monolith or made in waterproof mortar) in the middle of the floor. It served for the settling of *amurca* (inedible dark liquid present in olives besides oil) or the rest of the grape skins and seeds. When the decantation bowl was placed there, the surface of the floor lowered to the bowl, simplifying the interflow. The dimensions of decantation basins vary form extra small (wall length under 1 m) to very large (wall length more than 2.5 m).

When the decantation process had ended, olive oil and wine were stored in specialized storage rooms – *cella olearia* or *cella vinaria*. *Amphorae*, *pithoi* and *dolia* were used as storage vessels. So far, only one large storage room has been discovered in Dalmatia (the site of Donje Čelo on the island of Koločep).[11]

10 Jeličić-Radonić 2001, 202, fig. 4.

11 Mirnik 2011, 37–58.

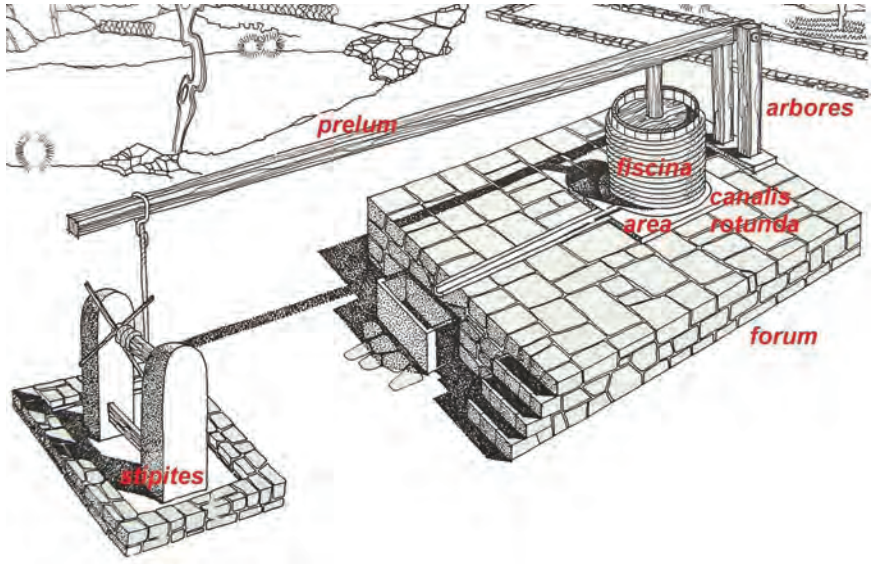

Fig. 2. Reconstruction of the pressing device, Mogorjelo (after Bojanovski 1969, fig. 1) /
Sl. 2. Rekonstrukcija tijeska, Mogorjelo (prema Bojanovski 1969, sl. 1)

Fig. 3. Area, Podstrana (photo: J. Kopáčková) / *Sl. 3. Area, Podstrana (fotografija: J. Kopáčková)*

Fig. 4. Stipites, Salona, workshop near the site Pet mostova (photo: J. Kopáčková) / *Sl. 4. Stipites, Salona, radionica kod lokaliteta Pet mostova (fotografija: J. Kopáčková)*

Fig. 5. Decantation basin, Sabunike – Privlaka (after Dubolnić Glavan 2015, fig. 149) / *Sl. 5. Dekantacijski bazen, Sabunike – Privlaka (prema Dubolnić Glavan 2015, sl. 149)*

3. History of Research

The production of olive oil and wine in Histria and Dalmatia was described by R. Matijašić in the article "Oil and wine production in Istria and Dalmatia in classical antiquity and the early middle ages" published in 1993; this article describes 11 sites in Dalmatia.[12] In the book *Archéologie du vin et de l´huile dans l´Empire romain*, published in 2004, J.-P. Brun enumerated 14 sites in Dalmatia.[13] Besides these two more extensive works, there is no other overview focused on the production of olive oil and wine in Dalmatia.

A quarter century after the article of R. Matijašić, this paper attempts to bring a new summary and aims to present a group of 110 archaeological sites connected with the production of olive oil and wine in Dalmatia. All sites were found as published individually in archaeological reports and research/articles. On the islands only 28 sites are situated, and 82 sites on the mainland. However, this number is only preliminary because the research is ongoing.[14] Below is the list of archaeological sites connected with the production of olive oil and wine in Dalmatia.

The mainland (north to south): Sabunike (Privlaka), church of St. Vid (Privlaka), Glavani (Privlaka), Kopana gomila (Privlaka), Tiraboškovića bay (Privlaka), peninsula of Brtalić (Privlaka), Primorje –Tokička (Kožino), Puntamika (Zadar), Rašica building complex (Zadar), church Stomorica (Zadar), unknown site (Archive of AMZd), Kumenat, Manastirine (Kašić), Veleševo (Benkovac), Ivinj (Tisno), Dedića punta (Bilice), Ždrapanj, Mate Stanić›s field (Piramatovci), Gajčina – Jelača ograde (Piramatovci), church of St. Lovre (Grušine), Mišine (Kosore), Šematorij (Danilo), Peluća – Otok (lake Prukljan), Špire Škubonje's field (Sonković), Dumanjšćine (Kaštel Štafilić), Sadine (Kaštel Štafilić), Miri (Kaštel Novi), near Miri (Kaštel Novi), Gomile (Kaštel Stari), church of St. Marta (Bijaći), Križice (Bijaći), Doci (Kaštel Gomilica), Glavica – Mandrać (Kaštel Sućurac), Varoš – Lučac (Kaštel Sućurac), Paraćev dvor (Solin), Manastirine (Salona), Episcopal quarter – pressing device (Salona), Episcopal quarter – shop (Salona), Forum (Salona), near «*horreum*" (Salona), Pet mostova / Five Bridges (Salona), Kapljuč (Salona), Vranjic (Solin), Crikvine (Rupotina), Stipetuša (Rupotina), Ilijin potok (Rupotina), Voljak hill (Rupotina), Cellars of Diocletian's Palace (Split), Western *thermae* of Diocletian's Palace (Split), monuments in the Cellars of Diocletian's Palace (Split), Riva (Split), Lukačićeva street (Split), Smrdečac (Split), church of St. Martin (Podstrana), Ravnice, church of St. Ciprijan (Gata), Milošići (Donji Dolac), Crkvina (Ostrvica), Ploćje (Kučiće), Seoca, church of St. Mihovil (Donji Proložac), Garci (Zmijavci), church

12 Matijašić 1993, 247–261.

13 Brun 2004, 50–64.

14 The research is taking place within the work on the Author's PhD thesis.

of St. Jurje (Tučepi), Mala Duba bay (Živogošće), church of St. Barbara (Zaostrog), church of St. Andrija (Baćina), Orebić, Karmen (Orebić), Sutvid, Pučje (Sreser), Mogorjelo (BA), Crkvine (Čerin, BA), Višići (BA), Crkvine (Borojevići, BA), Struge (Metković), Plantaža (Ljubuški, BA), Crkvina (Kuti – Mostar, BA), Skelani (BA), Metale (Gornji Molunat), Mirine (Bihovo, BA), Trebinje (BA), Mirišta (Petrovac, Montenegro).

The islands (north to south): Krk (island of Krk), Osor (island of Cres), Caska – economic complex (island of Pag), Caska – residential complex (island of Pag), Gradina (island of Žirje), Muline (island of Ugljan), Pašman (island of Pašman), Grohote (island of Šolta), Studenac (Donje Selo, island of Šolta), Pod Mihovil (Donje Selo, island of Šolta), Bunje (island of Šolta), church of St. Jelena (Donje Selo, island of Šolta), Bunje (island of Brač), Škrip (island of Brač), Kupinovik (island of Hvar), Stanjica (island of Hvar), St. Luka bay (island of Hvar), Grahovišće (island of Hvar), Ivončeve njive (island of Hvar), Vrbanj (island of Hvar), Maslinovik (island of Hvar), Blatsko polje (island of Korčula), Bradat – Mirje (island of Korčula), Prapratna – Mirje (island of Korčula), Žrnovska banja (island of Korčula), island of Majsan, Ubli (island of Lastovo), Donje Čelo (island of Koločep).

The number 110 in comparison with 14 sites described by J.-P. Brun is relatively high, but still insufficient for the entire Dalmatian coast. If we compare the density of the production centres in Dalmatia with the density of the production centres in Histria (more than 80), we clearly see how small it is. The question is whether the scale of production in Dalmatia was the same as in Histria or not. If yes, where are all these sites? Undoubtedly, they are missing partially due to the state of research, as not the whole of the Dalmatian coast was systematically researched. Another reason is the way of publication, as some sites are poorly described in the literature. The question of the climate and suitable land must also be considered, e.g. high mountains such as Velebit were not an option for viticulture and olive tree cultivation. Only future excavations and research will bring more light into these issues.

All 110 sites have been established based on the archaeological evidence, that is, the preserved stone components of specialized mechanism – olive mill, *calcatorium*, pressing device; remains of specialized architecture – pressing room, basin for decantation, storage room; or based on the combination of both. The sole presence of *amphorae* or *dolia* at the archaeological site was not considered as a sufficient proof of olive oil and wine production.

4. Selected production centres

The limited extent of this paper does not allow describing all sites with documented production of olive oil and wine in Dalmatia, so only the most interesting

of them are highlighted and put into a broader chronological or geographical context.

4.1. Sites with more than one pressing device

Only five sites where more than one pressing device was in function at the same time, are documented in Dalmatia: Miri near Kaštel Novi with two pressing devices, Muline (the island of Ugljan) with five pressing devices, Kupinovik (the island of Hvar) with two pressing devices, Stanjica (the island of Hvar) with two pressing devices and Ubli (the island of Lastovo) with three pressing devices.

In comparison to some sites with multiple pressing devices in Histria, a lesser scope of production in Dalmatia is clearly visible. For example, in Histria, at the site Kolći (Brijuni Islands) four pressing devices were in one room; at the site Dobrika Bay (Brijuni Islands) there were two rooms each holding three devices, with another three added in Late Antiquity.[15] At the site Barbariga, the largest production centre on the eastern coast of Adriatic, at least 12 pairs of pressing devices were in function at the same time.[16]

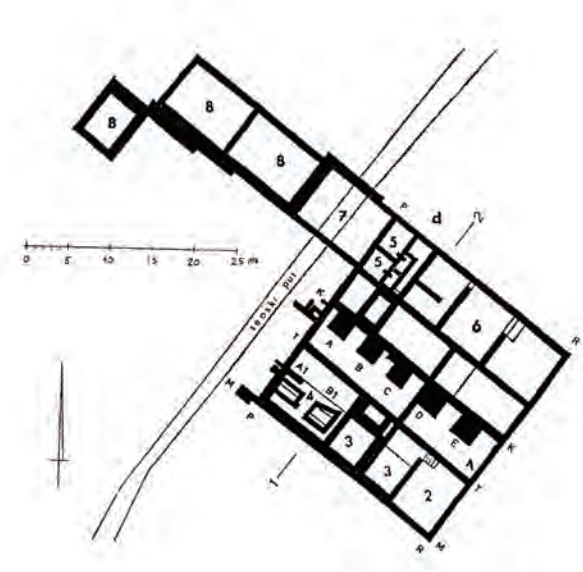

Fig. 6. Muline, ground plan (after Ilakovac 1998, fig. 4) / *Sl. 6. Muline, plan (prema Ilakovac 1998, sl. 4)*

15 Matijašić 2008b, 291–297; Begović, Schrunk 2009, 229–233.

16 Matijašić 1982, 58–59.

Fig. 7. Muline, stipites (after Suić 1960, T. VII, fig. 1) / *Sl. 7. Muline, stipites (prema Suić 1960, tab. VII, sl. 1)*

Fig. 8. Muline, calcatorium (after Suić 1960, T. VIII, fig. 2) / *Sl. 8. Muline, calcatorium (prema Suić 1960, T. VIII, sl. 2)*

At the site of Miri[17] two parallel pressing devices were excavated by the Antiquarian Society "Bihać" at the end of the 19th century. Two press-beds (*areae*) were situated on a high *forum*. There was an olive mill of possible "*rouleaux et cuves*" type. Exact dating of this site is quite problematic due to the lack of proper publication; two pressing devices were probably part of a *villa rustica***,** which was rebuilt in Late Antiquity or the Early Middle Ages.

Excavations in Muline were conducted by Mate Suić in 1953–1962. Unfortunately, this site, which is so significant for the production of olive oil and wine in Dalmatia, is very summarily published.[18] In the partially excavated building (**fig. 6**) were remains of at least five pressing devices (A–E). Two pairs of recessed *stipites* were entirely preserved (A1, B1), but only fragments of the third pair were found. At least one pair of *stipites* were made of architectural components from an unknown earlier building – traces of an inscription are visible on one of them (**fig. 7**). Presses used no *arbores*; the *prelum* (around 11 m long) was held by the massive wall K–K (width almost 2 m) instead of wooden columns.[19] Rooms in section 5 were used for the production of wine; a *calcatorium* was situated there (**fig. 8**). Grapes were trodden on two separated surfaces and must have flowed into two basins beneath.[20] Room 7 was a storage room with preserved *doliae*. The production centre in Muline has been the largest in Dalmatia so far, but its exact dating remains problematic because it was never properly published.

In the *villa rustica* at the site Kupinovik[21] two pairs of *stipites* were found but with no press-beds preserved (**fig. 9**). All four *stipites* were made of architectural components from an unknown building. Very interesting is an inscription dated to the 1st century AD, preserved on one of the *stipites* (**fig. 10**). An olive mill of the type *mola olearia* and one millstone remain perfectly intact (fig. 1). In this production centre as many as five basins were used. According to a hemispherical bowl, a large double basin was used for the decantation of olive oil. This site is dated 1st–4th centuries AD.

The sites of Muline and Kupinovik are very significant because we know the actual situation and placement of all the important elements connected to the production centre. Thus, it helps us significantly with reconstructions at other, only partially excavated sites.

17 Izvještaj treće glavne skupštine Bihaća 1897, 146–149.

18 Suić 1960, 235.

19 Ilakovac 1998, 3–11.

20 Ilakovac 2003, 54–59.

21 Zaninović 2006, 15–22.

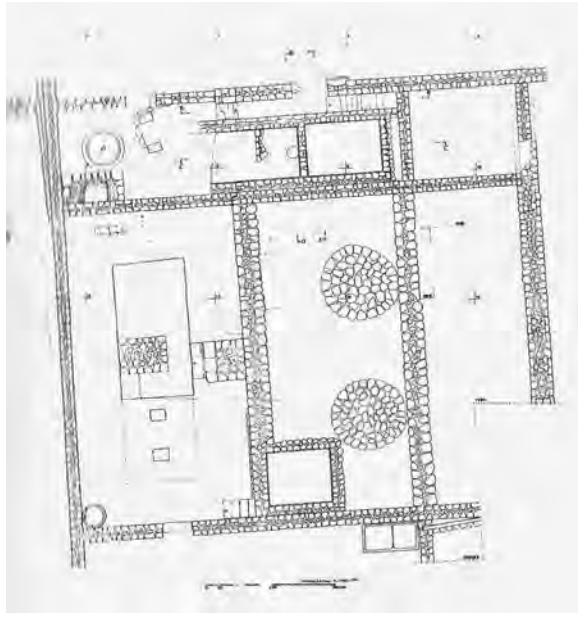

Fig. 9. Kupinovik, ground plan (after Zaninović 2016, p. 21) / *Sl. 9. Kupinovik, plan (prema Zaninović 2016, str. 21)*

Fig. 10. Kupinovik, stipites (photo: J. Kopáčková) / *Sl. 10. Kupinovik, stipites (fotografija: J. Kopáčková)*

In Ubli, three pressing devices were found, two from the Early Imperial period[22] and one with a quite unique construction from Late Antiquity. Its quadrangular *area* was made of *opus cementicium* mixed with stones, while the stone base for *arbores* had been replaced by two simple quadrangular slots. It was located in an older residential building in a room right next to the baths.[23]

4.2. A direct screw press

In Škrip (the island of Brač) a pressing device of a very unusual shape is situated next to the western wall of the Late Hellenistic *heroon*.[24] The circular press-bed (*area*), two slots and the basin were cut into the bedrock.[25] Such an unusual construction is clearly the evidence for a Late Antique or an Early Medieval establishment. This is so far the only direct screw press discovered in Dalmatia.

4.3. Storage rooms

In Donje Čelo (the island of Koločep) there was a monumental storage building – *cella olearia/vinaria*. Its dimensions (60 x 9 m) testify to an extensive production on this small island. The floor was constructed with a high level of sand – *amphorae* were stored stabbed into it. There were ceramic sherds of many *pithoi*, *dolia*, and *amphorae*, and a large collection of *amphorae* lids. Unfortunately, no pressing device was found.[26]

4.4. Bosnia and Hercegovina

A significant group of nine production centres located in present day Bosnia and Hercegovina have been, for long time, excluded from the archaeological literature about Dalmatia. Those sites formed a very important economic area in the Dalmatian hinterland. Only at the sites of Mogorjelo[27] and Mirine[28] near Bihovo pressing devices were found in their original position within a building complex. At the sites of Plantaža near Ljubuški,[29] Crkvina near Čerin,[30] and Višići,[31] only a

22 Jeličić-Radonić 2001, 207–208.

23 Jeličić-Radonić 2001, 202–203.

24 Cambi 2013, 61.

25 Faber, Nikolanci 1985, 4.

26 Mirnik 2011, 37–58.

27 Bojanovski 1969, 33–36.

28 Busuladžić 2002, 194; Paškvalin 1976, 289–293.

29 Dodig 2012, 33.

30 Dodig 2012, 33.

31 Čremošnik 1965, 168–169.

stone press-bed (*area*) was found. In Borojevići (Stolac)[32] a secondarily used gravestone (2nd/3rd century AD) was found. According to two quadrangular slots, it was used as a base for the *arbores.* At the site of Crkvina in Kuti near Mostar[33] there is a large pressing device within the remains of an unspecified building, probably an Early Christian basilica.

4.5. Production of olive oil and wine in Late Antiquity[34]

Another significant group includes pressing devices established in Late Antiquity, or old pressing devices still in function at that time, located in cities and in association with the Church. In the city of Salona (the seat of the bishop in the 4th century and the seat of the Dalmatian metropolitan bishop from the early 5th century) or very near it, six production centres were established in Late Antiquity. Four pressing devices were located inside the city walls (north of the city *forum*,[35] near the "*horreum*",[36] in the Episcopal quarter,[37] and near the site of Pet mostova – **fig. 4**), while two were outside the city walls (Manastirine[38] – **fig. 11**, Kapljuč[39] – **fig. 12**). All pressing devices in Salona were closely associated with Christian religious buildings (churches, basilicas, *oratoria* etc.), leading to the conclusion that these production centres formed part of the new ecclesiastical economy in the 4th–7th centuries.

In the broader surroundings of Salona, four sites with the production of olive oil and wine running in Late Antiquity can also be associated with the Church. Within earlier established *villae rusticae* with functional production centres, religious buildings were built. *Villae rusticae* at the sites Doci near Kaštel Gomilica,[40] Miri near Kaštel Novi,[41] Crikvine – Rupotina near Solin,[42] and the island of Majsan[43] were transformed into monasteries or churches, with the pressing devices remaining in a continuous use in a new religious context.

32 Dodig 2003, 237–238.

33 *ALBiH* 1988, 292 (site 24.39).

34 For a detailed description of the production of olive oil and wine in Dalmatia in Late Antiquity with comprehensive literature see Kopáčková (in press).

35 Rendić-Miočević 1953, 206–210.

36 Kirigin *et al.* 1987, 15.

37 Forschungen in Salona I 1917, 130–131.

38 Forschungen in Salona II 1926; Rendić-Miočević 1953, 208–209; Salona III 2000.

39 Recherches à Salone I 1928, 103–113.

40 Karaman 1930, 205–216.

41 Izvještaj treće glavne skupštine Bihaća 1897, 146–149.

42 Uroda 2008, 70; Dyggve 1951, 62–63.

43 Fisković 1983, 67.

Fig. 11. Manastirine, base for arbores, area and stipites (photo: J. Kopáčková) / *Sl. 11. Manastirine, baza za arbores, area i stipites (fotografija: J. Kopáčková)*

Fig. 12. Kapljuč, stipites, stone channel and area (photo: J. Kopáčková) / *Sl. 12. Kapljuč, stipites, kameni kanal i area (fotografija: J. Kopáčková)*

4.6 Secondary use

At sites where the production of olive oil and wine is confirmed, secondary use of stone monuments is documented quite often. Four types of secondary use can be distinguished: former monuments, such as building inscriptions or tombstones, were secondarily used as parts of a pressing device, or vice versa, parts of a pressing device or mill were used for another purpose (often as building material in the Middle Ages or later). The third type of secondary use is a combination of the previous two. The fourth type is very special – components of a pressing device were moved from one location to another and there the production continued. A secondary use is confirmed at 28 sites of the total of 110.

In the city of Krk (the island of Krk) an olive mill (*mola olearia*) was secondarily used as a base for some type of a reservoir (probably in the Middle Ages).[44] At the site Kupinovik one of the *stipites* was made of a monumental building inscription from the beginning of the 1st century AD.[45] In Muline, s*tipites* B1 are both made of secondarily used stones with inscriptions from some unknown building.[46] In Borojevići a gravestone from the 2nd/3rd century[47] was secondarily used as a base for *arbores*.[48] In the church of St. Vid in Privlaka[49] an *area* made of a funeral monument is used as an altar base. One small room 4B in the basement halls of the Diocletian's Palace in Split served as a house cellar in the Early Middle Ages.[50] Components of a pressing device (**fig. 13**) were moved there probably from Salona. There is a quadrangular stone *area* with a stone draining channel, a stone basin beneath, and a pair of *stipites* (one of them made of a transom with an Early Christian cross decoration). No base for *arbores* was used, because the *prelum* was held by a massive wall directly behind the *area*.

44 Dautovska-Ruševljanin 1969, 206.

45 Zaninović 1982, 149.

46 Ilakovac 1998, 3–4.

47 Dodig 2003, 237–238.

48 R. Dodig (2003, 237) describes it as „secondarily used, probably as an altar *mensa"*.

49 Dubolnić Glavan 2015, 428.

50 Marasović 1984, 112.

Fig. 13. Diocletian's Palace, stipites, stone vessel and area (photo: J. Kopáčková) / *Sl. 13. Dioklecijanova palača, stipites, kamenica i area (fotografija: J. Kopáčková)*

5. Conclusion

The number of sites connected with the production of olive oil and wine in Dalmatia is significantly higher than originally assumed on the basis of the earlier archaeological literature. Although the 110 sites are no longer a negligible number, it still looks inadequate for the entire Dalmatian coastline. Particularly noticeable is the rare occurrence of such sites on the islands (only 28 sites), where the conditions for the planting of olive trees and grape vines were ideal.

This insufficiency is particularly evident in comparison with the high density of production centres in Histria. We can therefore ask whether the scale of production in Dalmatia was similar to the situation in Histria. Already at this stage of the research, it can be assumed that the production of olive oil and wine in Histria was much larger and more widely spread than in Dalmatia. The Histrian

production began several centuries before the Roman conquest of Dalmatia, with much longer local tradition in the former area. Therefore, in Histria production centres with multiple pressing devices were established, and there is no doubt that a large amount of oil and wine was exported.[51]

The current state of research in Dalmatia undoubtedly affects the existing picture, as does the fact that some of the surveyed sites are not properly presented in literature. Only future research, as well as proper publication of new finds, can reduce the uncertainty about this topic. The production of storage and transport material – *dolia* and *amphorae* – is also connected with the production of olive oil and wine. So far only one large ceramic workshop was established in Dalmatia, at the site Crikvenica.[52] No doubt, there were others, but they are yet to be discovered. The integration of nine sites in Bosnia and Herzegovina also contributes to a more precise statistical summary. Due to their location away from the coastal area, they were ignored in the literature about the production of olive oil and wine in Dalmatia, although they are undoubtedly important.

51 Brun 2004, 50–51.

52 Lipovac Vrkljan *et al.* 2016, 144.

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SAŽETAK

Lokalna proizvodnja maslinovog ulja i vina u rimskoj Dalmaciji (1.–7. stoljeće) – pregled trenutnog stanja istraženosti

U članku se donosi pregled arheoloških nalaza vezanih uz proizvodnju maslinovog ulja i vina u Dalmaciji. Ujedno se pokazuje da je ta proizvodnja bila mnogo većih razmjera nego što se pretpostavljalo u starijoj znanstvenoj literaturi. Arheološka nalazišta s potvrđenom proizvodnjom maslinovog ulja i vina od sjevera (otok Krk, Hrvatska) do juga (Petrovac, Crna Gora), zajedno s lokalitetima koji se nalaze u današnjoj Bosni i Hercegovini, predstavljeni su prvi put zajedno, neovisno o današnjim državnim granicama.

Broj lokaliteta u Dalmaciji gdje se proizvodilo maslinovo ulje i vino ipak je bitno veći nego što se pretpostavljalo u starijoj znanstvenoj literaturi. Premda ni 110 lokaliteta nije zanemariva brojka, za prostor veličine dalmatinske obale ona se ne čini dovoljnom. Pogotovo je začuđujuća rijetkost proizvodnih centara na otocima (samo 28 lokaliteta), gdje su uvjeti za sadnju maslina i vinove loze bili idealni.

Oskudnost nalazišta u Dalmaciji posebice je uočljiva u usporedbi s visokom koncentracijom proizvodnih centara u Histriji. Možemo se stoga upitati je li uopće opseg proizvodnje u Dalmaciji bio približno sličan stanju u Histriji. Već i na ovom stanju istraženosti može se pretpostaviti da je proizvodnja maslinovog ulja i vina u Histriji bila znatno veća i raširenija nego u Dalmaciji. Histarska proizvodnja počinje nekoliko stoljeća prije rimskog osvajanja Dalmacije (lokalna tradicija mnogo je dulja), sagrađeni su proizvodni centri s višestrukim tijescima, i nema sumnje da se velika količina ulja i vina izvozila.

Na postojeću sliku nedvojbeno utječe nedovoljna istraženost, kao i činjenica da neki istraživani lokaliteti nisu adekvatno predstavljeni u stručnoj literaturi. Samo nam buduća istraživanja, kao i objave tekućih istraživanja, mogu rasvijetliti trenutne nedoumice u vezi s time. Uz proizvodnju maslinovog ulja i vina povezuje se i proizvodnja skladišnog i transportnog materijala – dolija i amfora. Do sada je na području Dalmacije pronađena samo jedna velika keramička radionica na lokalitetu Crikvenica. Nema sumnje da postoje i druga slična nalazišta, ali njih tek treba otkriti. Točnijem statističkom pregledu doprinosi i uključivanje devet bosansko-hercegovačkih lokaliteta, koje se zbog činjenice što nisu u obalnom području uglavnom nije uzimalo u obzir u stručnim raspravama o maslinarstvu i uzgoju vinove loze u Dalmaciji, mada je nesumnjivo riječ o relevantnim nalazištima.