UDC: 903.4(23.0Велебит)(497.5)“638“

8

SOUTHERN VELEBIT COMMUNITIES ON THE CROSSROADS: TRAILS, RESOURCES AND CHALLENGES

Morana VUKOVIĆ
Archaeological Museum Zadar
mvukovic@amzd.hr

Zrinka SERVENTI
University of Zadar
Department of History
zserventi@gmail.com

Abstract. – Velebit, a large mountain range running parallel to the Eastern Adriatic coast, has always been a place of communication and separation, forming, in most instances, an insurmountable obstacle with only a few mountain passes as lifelines for the local communities. However, southern Velebit was – and still is – more hospitable and, as such, it had great importance in the communication between the lowland and the highland zones (e.g. the territories of Bukovica and Ravni Kotari with Lika and the deeper hinterland). This territory was often used by mobile cattle-breeders who were crucial for setting up first important trails over the mountain as well as for establishing trade hubs, and founding settlements situated on the higher zones of Velebit. However, since these communities lived in resource-scarce areas, they had to acquire many necessities from other territories, even distant settlements, creating a culture with a distinct identity, open to foreign influences. Unfortunately, this territory remained poorly researched for a long time and has only recently attracted more intense scientific scrutiny. Among the more notable research is the site of Gradina-Kneževići hillfort, situated near one of the mountain passes and the still inhabited hamlet, attesting to the resourcefulness and resilience of the societies living on this territory during the Iron Age. Therefore, this paper, based both on ancient sources and archaeological excavations, will present the Iron Age communities living in the area of southern Velebit, the interactions they had with other cultures, particularly in the context of continuities of roads and trails, and the resources they used to survive in this environment. As a case study we shall also present recent findings at the Gradina-Kneževići hillfort, which have provided an insight into the modalities of trade, transport, and life in this harsh environment.

Key words. – southern Velebit, communication, resources, Iron Age, protohistory, Gradina-Kneževići hillfort.

Introductory remarks on the territory of southern Velebit

The Velebit mountain range, running parallel to the Eastern Adriatic coast, has always been a clear separation space between coastal and continental Croatia.[1] It stretches approximately 150 km, from the Kvarner region in the north to the Zrmanja region in the south, and is one of the most unforgiving Croatian mountains to pass.[2] However, since it divides two major territories, the native peoples had to find ways to overcome this obstacle in order to conduct trade and interact with other regions and with one another, in doing so tracing the first trails across the existing unforgiving terrain. With the Roman expansion, the first proper roads were often laid over the existing Iron Age road network – a practice that continued into later periods, meaning that several modern roads, and even highways, still follow these ancient paths. The use of the same trails throughout history is not surprising, since Velebit is a karst area with only a few mountain passes viable for more extensive transit, which means that these routes are usually the simplest and most logical paths over the mountain.[3]

The native societies of the Eastern Adriatic that were most affected by the existence of Velebit Mountain were the Liburni and the Iapodes, and, to some degree, the Ditiones (Fig. 1). All three were neighbouring pre-Roman societies that occupied a significant part of the coastal area of present-day Croatia and its broader hinterland. Despite some recent scientific discussions on the "character" of these societies and the expanse of their territories,[4] the general scientific consensus remains that the Liburni encompassed the territory from the Raša to the Krka rivers, including the adjacent islands, the Iapodes lived north of the Liburni, sharing the "border" line along the Velebit range and stretching throughout Gorski Kotar and Lika, as well as parts of present-day Slovenia and the Una river in Bosnia and Herzegovina, and the Ditiones were, in a sense, wedged between the aforementioned Liburni and the Iapodes, as well as between the Delmatae and the Pannoni.[5] Each of these societies was distinct in its own

---

[1] A shorter and significantly different lecture on this topic was presented at the International Conference "EAA Budapest: Reintegration", which took place in Budapest in 2022. Since proceedings of this Conference were never planned, and as this topic is rarely discussed and published, the authors have decided to expand on it with a specific focus on the resources available and used in southern Velebit, and publish the research in a scientific journal.

[2] Černicki, Forenbaher 2016, 13 ff.; Magaš 2013, 49; Pejnović, Vujasinović 1998, 29.

[3] Serventi, Vuković 2023, 63ff. For more on the paths leading across Velebit and the continuity of their use, see also Černicki, Forenbaher 2016, 13ff., for more on the communities living on the Velebit territory, see Glavaš 2015, for the general geomorphology of Velebit, see e.g. Bognar 1994, 1ff., and for the climate, see Perica, Orešić 1999, 2ff., all with accompanying literature.

[4] For these discussions, see e.g. Barnett 2017; Blečić Kavur 2010, 367, 378–379; 2014, 154; Džino 2011, 197ff., with accompanying literature.

[5] Kurilić, Serventi, in print. Much has been written on the issue of the identity and territory of the said populations, but for the most essential information, see: for Liburni Batović

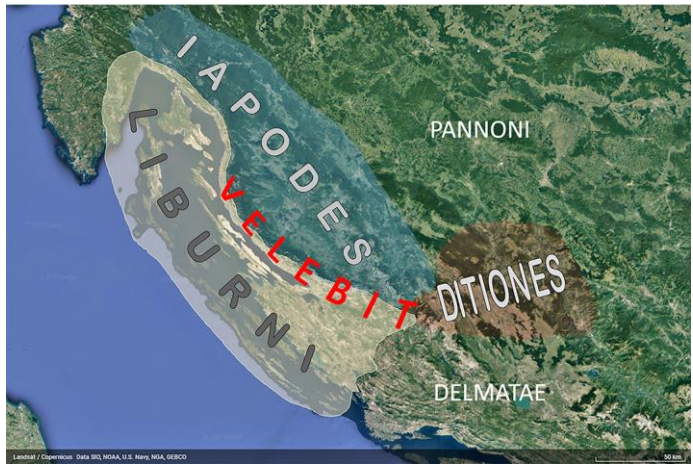

Fig. 1. Assumed territories of Iapodes, Liburni and Ditiones in respect to the Velebit mountain range (base: Google Earth, made by Zrinka Serventi and Morana Vuković)

way, developing local products, but also trading with neighbouring societies as well as distant trading posts. However, they eventually all met the same fate – following the Roman expansion, they were incorporated into the provincial organisation of Rome. Consequently, each of them accepted Roman culture in a different way, resulting in variations in material culture, burial rituals, resource use, and urbanisation.[6] Nevertheless, in all of these historical changes, southern Velebit played a significant role in the lives of these societies, as the trails that facilitated communication and trade criss-crossed the region, and the mountain's expanses provided resources vital to their survival. In addition, the location of the settlements in the southern Velebit region reflects the significance of these routes, as most were situated in their vicinity – often at strategic points overlooking the wider area.[7]

Relevant routes on Velebit

In comparison to other parts of the mountain, southern Velebit is more hospitable, which led to it being used throughout the centuries, es-

1987, 339; Dimitrijević, Težak-Gregl, Majnarić-Pandžić 1998, 306; Kurilić 2008, 9; Matijašić 2009, 37; Wilkes 1969, 159–162, for Iapodes, see Dimitrijević, Težak-Gregl, Majnarić-Pandžić 1998, 283; Drechsler-Bižić 1987, 391; Matijašić 2009, 38; Wilkes 1969, 157–159, for Ditiones, see Bojanovski 1988, 262; Matijašić 2009, 37, 45; Wilkes 1969, 168, all with accompanying literature.

[6] For more on the Roman expansion in the Eastern Adriatic and its deep hinterland, and the subsequent changes in the territory, see e.g. Bojanovski 1988, 36ff.; Kurilić 2008, 14ff.; Matijašić 2009, 87ff.; Milivojević 2021; Šašel-Kos 2005; Wilkes 1969, 13–77, all with accompanying literature.

[7] Serventi, Vuković 2023, 64ff.

pecially by mobile cattle breeders, who laid down the first trails across the mountain. These were also crucial for establishing trade hubs and settlements on the higher zones of Velebit, which were locations where the aforementioned societies interacted and traded. Although the entire Velebit has been poorly researched, some more recent excavations and field surveys have defined a number of strategically important trails in southern Velebit which connected the coast with the hinterland.[8] All of them have been attested by numerous archaeological sites, prehistoric hillforts, burial mounds, and remains of road structures from various periods (Fig. 2).[9] Furthermore, what is clearly evident from this research is that the communities inhabiting southern Velebit relied both on maritime and land routes for many resources, and especially for the more exclusive items. In terms of the issue in question, Liburnia was crucial, as many of the items which reached the hinterland were transported through Liburnian ports. This is not surprising since one of the highly important sea routes, the eastern Adriatic maritime route, passed along this territory making use of the safe anchorages, coves, and favourable currents, which the other side of the Adriatic lacked.[10] Land routes naturally connected to these maritime routes in various trade hubs and, in this context, mountain passes were of strategic importance since they were in direct contact with the settlements on the coast. Such was the case with Senia (present-day Senj), which was crucial for the northern parts of Liburnia and Iapodia, being connected to the Vratnik pass, the Veliki Alan pass connected to ancient Ortopla (present-day Stinica), the Baške Oštarije pass connected ancient Vegium (present-day Karlobag) with the hinterland, and the Mali Alan pass was crucial for most of southern Liburnia. These coastal trade hubs also had their counterparts in the hinterland (e.g. Medak, Velika and Mala Viničica (ancient Metulum), Kompolje (ancient Avendo), Prozor near Otočac (ancient Arupium), etc.), and these trails then connected to even larger and more important roads leading to the greater Balkan area on one side and the Alps and central Europe on the other.[11]

Therefore, the aim of this paper is to present the development of the southern Velebit communities, their living conditions, trade routes,

---

[8] For more recent research, see e.g. Dubolnić Glavan 2006; 2007; 2008a; 2008b; 2009a; 2009b; 2019; 2022; Dubolnić Glavan, Glavaš 2011; Glavaš 2014; 2018; Glavaš, Borzić 2022; Glavaš, Glavičić 2017; Glavaš, Grlj 2016; Glavaš, Stepišnik 2018; Konestra et al. 2018; Kriletić, Vuković, Carić 2021; Radman-Livaja, Tonc 2016; Serventi, Vuković 2023; Tonc, Radman-Livaja 2015; 2017; Tresić Pavičić 2020; Vuković 2018; 2019a; 2019b; 2019c; 2019 in print; 2020 in print.

[9] Kurilić, Serventi, in print; Serventi, Vuković 2023, 63ff.

[10] For more on the eastern Adriatic trade route, see e.g. Brusić 1970; 1993; 2007; Gluščević 1994; Kozličić 1990; Kozličić, Bratanić 2006; Serventi 2012; Vrsalović 1979, all with accompanying literature.

[11] Serventi, Vuković 2023, 63ff.; see also Glavaš, Glavičić 2017, 123ff.; Kurilić, Serventi, in print; Pejnović, Vujasinović 1998, 30.

and the various resources they used at such high altitudes, both from the historical standpoint of ancient sources, as well as from archaeological data and available archaeological excavations. The topic will be presented particularly through the prism of the Gradina-Kneževići hillfort site.

1. Veliki Sikavac
2. Silna gromila
3. Gradina Malo Rujno
4. Gradinica Malo Rujno
5. Sv. Trojica
6. Šilježetarica
7. Gradina Veliko Rujno
8. Cave in Zub Buljme
9. Zaskok
10. Vaganačka pećina
11. Kojići - Milovac
12. Argyruntum area
13. Gradina Marasovići
14. Visoka gradina
15. Paklarić
16. Gradina Seline
17. Mitrova gradina
18. Sv. Jakov
19. Zekića gradina
20. Kusača
21. Bucići
22. Gradina Kneževići
23. Sv. Ivan
24. Sopnjača
25. Velika gradina
26. Nadgradina
27. Gradina Modrič
28. Gradac
29. Razvršje
30. Dračevac
31. Jurčeviča gradina
32. Križ
33. Gradina Šibenik
34. Bojnik
35. Pržunac
36. Zelenikovac
37. Visoka glavica
38. Razvršje
39. Kraljičina vrata
40. Fratarska glavica
41. Gradina Modrići
42. Muškovci

Fig. 2. Some of the most important southern Velebit trails leading to mountain passes, and the most important archaeological sites next to them[12]
(Serventi and Vuković 2023, 67, Fig. 2)

The Gradina-Kneževići hillfort site

When we consider all the peculiarities of Velebit, we can conclude that life in these places was preconditioned by certain characteristics like access to water, fertile land, communication possibilities and the ability to control the surrounding area. All of these prerequisites were favourable on the territory of Malo Libinje and the Gradina-Kneževići hillfort, a site that has been recently scientifically and archaeologically researched by the Archaeological Museum Zadar and has provided valuable insight into the life of its inhabitants, their trading practices, their use of materials and resources, as well as their burial rituals.[13]

[12] Many of the sites listed on the map (Fig. 2) already carry "determinatives" in their name, which clearly define the character of the site. For example, caves often contain the integrated noun "pećina" (cave) in their name, such as Vaganačka Pećina, while other sites are simply called Gradina, Gradinica or Gradac, which literally means hillfort. For this reason, the names in the list have not been translated.

[13] The wider territory has been thoroughly surveyed by the author of this paper and the conclusions are based on this research. The first archaeological excavations at the Gradina-

The Gradina-Kneževići hillfort is situated on the Malo Libinje karst plateau at 800 masl, at the end of a series of hills rising between the Orljača canyon and the Donje polje field, next to a key trail leading from the coast to the hinterland. This trail (Fig. 3), attested by a whole array of archaeological sites from various periods, starts with the Modrič hillfort, which is situated on the seacoast, and was a strategic location that visually controlled both the surrounding land and the sea. This was the furthest point where the Velebit canal and the aforementioned sea route reached the inland territory, and from this point various land routes led towards the highland plateaus. In the area around the Modrič hillfort there are several

Fig. 3. Communication network of the hill-fort Gradina-Kneževići with the most important trails and possible directions of communication (base: Google Earth, made by: Morana Vuković)

Kneževići site were carried out at the end of the 1970s, when two Iron Age graves were discovered near the hillfort (Glavičić 1982, 7ff.). The area was surveyed at the beginning of the 21st century (Dubolnić Glavan 2009, 54ff.), and the first systematic archaeological excavations began in 2018 under the supervision of Morana Vuković, a curator at the Archaeological Museum Zadar. These excavations encompassed both the area of the settlement and the flat necropolis in the base of the hillfort, as well as the nearby burial mound. Also, this is one of the few settlements that has been excavated at such a high altitude on Velebit, and the only one that has been recently researched (Serventi, Vuković 2023, 74). Apart from that, a field survey of the wider territory of Malo Libinje has been conducted by the Archaeological Museum Zadar and the sites and potential locations have been mapped and documented (Vuković 2019a, 621–623; 2019 in print; 2020 in print; 2021 in print; see also Serventi, Vuković 2023, 74).

prehistoric sites (hillforts and burial mounds), as well as natural resources, like fields and springs in the nearby coves.[14] The trail towards Malo Libinje from this point on is quite steep, but is still used by modern-day inhabitants, primarily for the passage of livestock. This is why the trail is now partially underpinned, and several serpentines have been constructed to facilitate movement along the slope. After the serpentines, the trail continues along a gentler slope, passing through valleys surrounded by karstic crags. Sopnjača, the cave near the trail, at 500 masl, contains archaeological finds dating from the metal periods up to recent times, and was most likely used as a temporary hideout.[15] The trail then reaches the Gradina-Kneževići hillfort and leads to the next plateau of Gornje Polje, where remains of a dry-stone-walled shepherds' church of Sv. Ivan (St. John) have been found, built on one of the largest prehistoric burial mounds and near a water source called Ivanjska Lokva. The trail is also lined with numerous burial mounds and continues toward the communities around Sveti Rok and Lovinac, as well as Raduč on the other side of the mountain.[16]

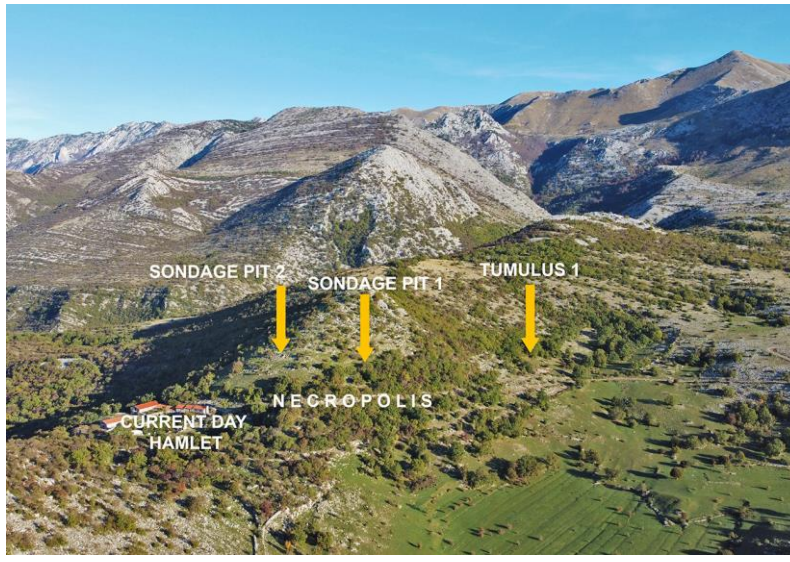

Fig. 4. Positions of archaeological excavations in the settlement and the necropolis (photo: Robert Maršić, made by: Morana Vuković)

Moreover, not only was Malo Libinje reachable by this trail, but it could easily be reached by trails both from the west and the east, and all of these routes created a unique communication network that was used by

[14] Dubolnić 2006, 22ff.; 2007, 12ff.; Serventi, Vuković 2023, 72–75.
[15] Dubolnić 2007, 12; Serventi, Vuković 2023, 74.
[16] Dubolnić 2006, 23; Glavičić 1982, 39ff.; Serventi, Vuković 2023, 74.

the inhabitants of Velebit as far back as early prehistory.[17] For example, north of the hillfort was the Orljača canyon, through which it was possible to reach the Mala Paklenica canyon, and this path could be used to continue further to the west, over the Velika Paklenica canyon, towards the Veliko and Malo Rujno plateaus. Another trail, leading towards Kraljičina Vrata, extended east of the hillfort, and on the north and north-east there was a trail that led over the Gornje Polje field and further on to the summit, which was, in time, laid over with a more recent shepherd's trail and a mountaineering track. The routes leading to the peak areas of the mountain also branched out at the aforementioned area of Gornje Polje.[18] Therefore, the Gradina-Kneževići hillfort was situated at a proper crossroads and held significant strategic importance, enabling greater control over the surrounding territory and the nearby trails.

Apart from that, the surrounding area offered this community a rare opportunity for more extensive cattle breeding and agriculture in an otherwise very unforgiving environment. It is, thus, not surprising that this area remained inhabited until recently and actually represents a rare example of a year-round permanent settlement at such high altitudes in this part of Velebit.[19] The longevity of use has been attested by the habitation remains uncovered during recent archaeological excavations at the hillfort, as well as by the burials found at the foot of the hill,[20] and the site clearly illustrates the environmental benefits, as well as resources, which enabled habitation.

The hillfort was naturally protected by its elevated position and a nearby cliff, as well as by a dry-stone rampart, the remains of which were visibly scattered almost in its entire perimeter. The southwestern part of the rampart, located at a very steep slope, is missing, and the northern and southern side is barely visible due to the thick vegetation which diminishes the line of sight and makes a proper documentation of the site quite problematic.[21] The southern slope is also steep, but it has natural terraces, surrounded by sharp bedrock (Fig. 4 and 5).

In order to determine the characteristics of the habitation at the Gradina-Kneževići site, two sondage pits were opened within the hillfort, placed on the two most distinctive positions. The position on the first plateau, above the rampart in the southeastern part of Gradina-Kneževići,

---

[17] Marković 1980, 28ff.; Serventi, Vuković 2023, 75.

[18] Serventi, Vuković 2023, 72ff.

[19] Usually, permanent settlements were located at elevations up to 500 masl, while areas above that were used only seasonally (Lemić 2013, 37–39).

[20] The site has been well known from the beginning of the 20th century, but the settlement had not been excavated until 2018, when the Archaeological Museum Zadar began its excavations (Vuković 2019a, 621–623; 2019 in print; 2020 in print; 2021 in print). See also n. 13.

[21] This part of the site will be thoroughly documented and researched in future archaeological excavations.

was chosen for the first sondage pit (2 x 4 m). At this location, a slightly wider grassy area indicated that it might provide more substantial archaeological strata. However, the bedrock here was actually near the surface and the finds were quite limited – only several fragments of prehistoric pottery were discovered, along with numerous fragments of charred clay, and possible remains of a fire pit or house flooring.

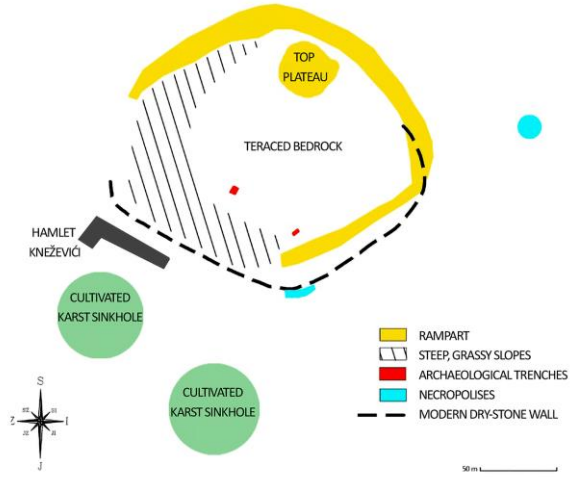

Fig. 5. Map of the site Gradina-Kneževići with marked area of the prehistoric settlement, necropolises and current day hamlet (made by: Morana Vuković)

The second sondage pit (4 x 5 m) was placed further to the west, on one of the more dominant terraces on the southwestern slope of the hillfort. The stratigraphy at this location was also quite simple – the first layer of brownish earth was filled with fragments of Iron Age pottery, both "local" and imported (Fig. 6 and 7),[22] along with smaller lumps of burned

[22] "Local" pottery found during these excavations has characteristics of Iron Age pottery both in the specific forms of the vessels, as well as of the handles and decorations, while in terms of the clay composition and in some of the handle forms it seems like it could even be attributed to the Late Bronze Age. The excavated pottery is extremely fragmented and, therefore, its attribution is very difficult; however, according to the preliminary analysis, pots, jugs and cups, which have forms characteristic for the Iron Age, can be identified among the excavated fragments. Some of the pottery was made from clay with organic additives, some with inorganic additives, and some had a mixture of both. Generally, regardless of the vessel type, all the pottery was evidently fragile and of lesser quality, which could be attributed to the substandard clay available for its production. That would also point towards the possibility that the pottery was locally produced, although for a definitive conclusion, additional analyses will have to be conducted. For more on the Iron Age pottery of the Liburnian territory, see Vuković 2014; 2024. Also, imported, most likely "Hellenistic" pottery (amphorae), has been identified among the pottery fragments. We are grateful to Assistant Prof. Lucijana Šešelj for her preliminary analysis of the imported pottery found in this sondage pit.

clay, which were present throughout the sondage pit.[23] In the southern part of the sondage pit, this layer extended to the bedrock and/or the layer of sterile red soil, while in the northern part of the sondage pit, the situation was slightly different. Namely, here the bedrock was, again, near the surface, it was criss-crossed with crevices, and looked modeled (terraced) on one side, which reflected the general configuration of the terrain. On that bedrock "terrace", beneath the first layer of brown soil, a layer of small pebbles mixed with archaeological material and a lot of burned clay had been found. Some of the burned clay fragments are fairly large and could have been a part of a fire pit or the house flooring. In the eastern corner, there are visible marks of levelled bedrock (Fig. 8). The crevices in the bedrock were filled with small rocks, some of which were greenish, soft and breakable, and they appeared to have been burned. With clearing of the crevices, numerous fragments of prehistoric pottery were found beneath the aforementioned layer of stones. This pottery is, however, different from the one found in the upper strata – it is more porous and fragile, and it contains chunky and dense inorganic additions to the clay. Apart from the "local" and imported pottery, a whole iron knife with a curved blade, a dull point, and a tang for hafting the handle was discovered in this sondage pit, along with fragments of animal bones, another iron knife, and some stone tools. It can be concluded that the remains of a house were excavated within this sondage pit and that it was placed on one of the two largest terraces of the hillfort, which was levelled by shaping the bedrock and filling up the crevices. The bedrock was also used as a base for the back wall of the excavated room of the house, and the walls were, at least on the base level, made of stone without any mortar or binder material, while the upper levels were most likely constructed using clay daub (which was found at the site) (Fig. 7, No. 4).

Numerous pottery fragments and animal bones were discovered within and outside of the context of the graves, excavated in several locations around the hillfort. Namely, the tombs were discovered at the very bottom of the steep slope, at the southern base of the hill, and they most likely belonged to the flat necropolis,[24] while the tumulus is located further away to the east of the hillfort, on a more levelled area. In total, three graves were excavated at the southern location, two at the beginning of the 20th century, and another grave in 2020.[25] Since the slope above it is

[23] Vuković 2019a, 621–623; 2019c; 2019 in print; see also Serventi, Vuković 2023, 74ff.

[24] The area where these graves were found is a terrace at the bottom of the slope of the hill, and the outer perimeter of this area is surrounded by a long dry-stone wall. There were no visible remains on the surface that would indicate the existence of a burial mound, although the graves themselves did have some dry-stone constructions, which are hard to interpret or attribute.

[25] During the 20th century, two graves have been excavated in two instances. The first excavation was conducted at the beginning of the 20th century and it was led by an anony-

so steep, the material found outside of the context of the graves could have been, at least partially, transferred to this area by erosion, which is present throughout the area of the hillfort.

Fig. 6. Several fragments of local prehistoric pottery typical for the period from the Middle Bronze to Late Iron Age, found at the site during excavations in 2019 (made by: Morana Vuković)

mous engineer who excavated a classical Iron Age grave made of stone slabs. A more detailed documentation of this find has been lost, however, the same grave was excavated again during the 1970s by A. Glavičić from the Museum in Senj, and he also excavated the grave next to it, which contained several small finds like pins and fibulae, all dated to the 6th and 5th century BC (for more, see Glavičić 1982, 41–42; Glavičić 1984, 7–10). A revision of these excavations was conducted in 2020 under the supervision of M. Vuković from the Archaeological Museum Zadar, and these graves (Grave 1 and Grave 2) were detected and excavated again, together with the surrounding area. The bones had been displaced, which was expected, and the soil inside and around the graves was filled with fragments of prehistoric pottery, animal bones, and shellfish. During this time, west of these two graves, another grave (Grave 3) was excavated. It was constructed from amorphous stones stacked in an elongated rectangular form and within it the remains of five individuals were discovered, buried in the fetal position, with their heads facing east. The construction of Grave 3 is similar to the two graves excavated by Prof. Glavičić.

Fig. 7. Several fragments of pottery attributed to Greek-Italic and "Hellenistic" imported pottery and fragments of clay daub, found at the site during excavations in 2019 (made by: Morana Vuković)

Fig. 8. Aerial view of the sondage pit 2 with a marked area of a nivelated bedrock (photo: Robert Maršić, made by: Morana Vuković)

The excavations of a complex burial mound began in 2020, as well. The tumulus was located over 50 m from the eastern boundary of the hillfort and it contained several inhumations, as well as incineration-type graves.[26] Within it, numerous fragments of pottery, bronze objects, pins, fibulae, amber, and various beads were discovered (both in and outside of the graves), as well as animal bones and seeds.[27]

The animal bones found during the first two campaigns have undergone preliminary analysis, and they mostly belonged to livestock such as sheep and goats. However, remains of cattle were also found, all of which were in all probability local resources.[28] All of the finds indicate that the hillfort was used for an extended period of time and that it had great importance for the broader region.[29] It is also evident that the local population used various resources to survive, and these resources – available locally (such as water, livestock, stone, timber, wild and domesticated plants and animals), as well as acquired from the broader area (such as salt, fish/shellfish, olive oil, wine, metal objects, finer pottery, amber, glass, etc.) – had to be managed carefully.

Resource management in southern Velebit

Agricultural resources

Given this, what information do ancient sources and archaeological excavations provide about the management of resources in these territories, and how does that relate to the discoveries at the Gradina-Kneževići hillfort?

The karstic landscape of southern Velebit would point towards animal husbandry as the primary source of food and economy, particularly of smaller animals such as sheep and goats. These animals were better suited for the climate, their upkeep was cheaper, they were able to survive with

---

[26] Two cist graves made of stone slabs with stone slab coverings were discovered in Tumulus 1. Six younger individuals were buried in Grave 1, while two adults were buried in Grave 2. In these graves, the deceased were placed in the fetal position, with their heads facing northeast. Apart from these two graves with skeletal remains, at least five other graves containing incinerated remains were discovered as well, out of which one was preserved in its entirety, while the rest were destroyed during the construction of the subsequent burial mound. Consequently, the remains of these older, destroyed graves were discovered in the bottom layers of the burial mound (Vuković 2020, 2021). The excavations of this burial mound are still ongoing.

[27] The bones of several individuals from both locations (flat necropolis and tumulus) were sent for anthropological analysis and C14 dating. We are grateful to associate Prof. Renata Šoštarić from the Department of Biology, Faculty of Science, University of Zagreb, who conducted the preliminary archaeobotanical analysis, and the detailed analysis of these finds, together with the C14 dating of the discovered seeds will be published soon.

[28] We are grateful to Maja Grgurić Srzentić from the Department of Archaeology, University of Zadar, who conducted the preliminary analysis of the animal bones from this site.

[29] Vuković 2020; 2021.

less food and water, and they were quite agile and able to traverse Velebit's narrow and steep trails. Apart from that, their products were quite versatile – they were used for their meat and milk, as well as for their hide and wool.[30] This is also indicated by the predominance of sheep and goat bones in the stratigraphy of the Gradina-Kneževići site, and it fits well into the narrative established by the ancient sources, like Pliny, Varro,[31] and many others, who are quite vocal when it comes to cattle breeding, the animals used and their purpose (both for the Romans and the native peoples in various areas). For example, Pliny praises the goats that were bred on the islands of central Dalmatia,[32] while Hecataeus[33] and Pseudo Scymnus[34] mention that the eastern Adriatic is quite suitable for sheep herding and that these animals are quite numerous and highly fertile there. It is also quite evident from the sources that the diet of these communities rarely consisted of meat – the animals were predominantly used as either working animals (oxen) or for their milk and wool (cows, sheep and goats), and were killed only when they could be of no further use.[35] It is logical to conclude that the Iron Age communities of southern Velebit held the same philosophy – that a live animal was more valuable than a dead one, which made milk and cheese staple foods. Although definitive evidence of cheese and other dairy production has not yet been found at the Gradina-Kneževići hillfort, the ancient Roman sources do attest to their importance in the local economy. For example, Pliny says that butter was the favourite food of barbarians,[36] and some analogies could perhaps be drawn with more distant populations, like the Germanic peoples, who were, according to Caesar,[37] among other things, fond of milk and cheese. It has been hypothesized that the "secondary products revolution" could be traced back to the metal periods, and that it entailed an increase in the consumption and use of secondary animal products (like milk and cheese). Italian sites have also shown that the introduction of such secondary products did not lead to an increase in consumption of animal meat but that it most likely led to a change in dietary practices, milk, in all probability, substituting meat on many occasions.[38] Moreover, even in recent history, sheep bred in coastal areas were breeds that were used more for milk production than for their meat,[39] and it is logical to conclude that the animals used in Iron Age (and probably Bronze Age) southern Velebit were

[30] Garibović et al. 2006, 510ff.
[31] Plin. *HN.* 8; Varr. *Rust.* 2.1.11.
[32] Plin. *HN.* 3.30.
[33] FrGrHist. Step. Byz. 1 F 90.
[34] Ps.-Scym. 361.
[35] Alcock 2006, 66; Ožanić Roguljić 2019, 33.
[36] Plin. *HN.* 11.26.
[37] Caes. *BGall.* 7.22.
[38] Farese et al. 2024, 14.
[39] Šmalcelj 1952, 2; Garibović et al. 2006, 519.

adapted to the dietary needs of the communities raising them, as well as to the climate and geomorphology of the area.[40]

As previously mentioned, besides milk, wool was another secondary resource gained from animal husbandry. Clothing made of wool was crucial for the survival of the people in southern Velebit, and the whole of Dalmatia, throughout the centuries,[41] not only because it was easily available, but also because it had characteristics that made it well-suited to the temperature changes present in these territories.[42] Ancient sources also mention that the eastern Adriatic produced high-quality wool garments (e.g. a type of wool *cucullus*, which is a cape with a hood), so much so that even some types of Roman clothing were named after the territory of Dalmatia (e.g. *Dalmatica* was a simple bell-shaped tunic made from wool or flax, which became a staple Christian liturgical dress).[43] Generally speaking, archaeological remains of clothing are quite rare, especially in the climate of the eastern Adriatic, and the most common attestations of these activities are whorls, spools, and weights, used in spinning and weaving.[44] Furthermore, finds from contemporary sites like Pula and Rat have shown that a large number of bones belonged to old domesticated animals, which would be in line with the aforementioned "secondary products use".[45] Kill-

[40] For example, indigenous breeds of livestock, adapted to the resource-poor environment, sub-optimal vegetation and free-range grazing have been attested for historical periods in Lika (Zavodny et al. 2019, 1056). Also, according to the size of the bones, beef that was used in Tilurium might have belonged to the autochthonous smaller cattle, which has been attested for the area during the Iron Age (Radović et al. 2021, 345).

[41] Jakšić 2022, 101ff.; Vojnović Traživuk 2021.

[42] Dundović, Vinčić 2017, 248ff. Wool has particular thermoregulation characteristics as it cools the body in hot weather and keeps it warm in low temperatures.

[43] Schönauer 2000, 226ff.

[44] Mihovilić 2014, 300; One of the closest attestations of such traces of textile production can be found at the Sveta Trojica hillfort, situated on the slopes of Velebit, where remains of various types of whorls, spools, and weights were discovered, with particular concentration in one of the sondage pits, indicating the possible location of a weaving loom. For more, see Tonc, Livaja, 2021.

[45] Brajković et al. 2011, 72ff.; Gaastra et al. 2014, 16; Mihovilić 2014, 294; at the Rat hillfort, changes in the age-at-death patterns were observed for sheep, which indicates changes in the management of these animals, particularly for secondary products, and fluctuation of management strategies from the Early, Middle and Late Bronze Age and Iron Age are consistent with the changing importance of primary and secondary products. Namely, there seems to be a shift from the Bronze Age into the Iron Age towards a greater use of ovicaprid animals for wool and milk, attested by the lesser number of pre-adult animals in Iron Age strata, as well as a far greater proportion of males surviving into adulthood in the Middle Bronze Age and Iron Age, indicating that during these times herds were being exploited more intensively for cheese, milk, and wool (Gaastra et al. 2014, 20ff.). Furthermore, even many Roman sites have shown the dominant use of older animals – for example, in Tilurium a dominance of older, fully grown animals is evident among the ovicaprids and cattle, while among pigs the situation is different, the number of younger animals is dominant. This is a clear reflection of primary/secondary uses of animals – sheep, goats and cattle could have various uses, which made them more valuable alive than dead, while for pigs that reach their maximum before they are fully adult, the situation is reversed (Radović et al. 2021, 341ff.).

off patterns at the Iron Age site of Klisura-Kadića Brdo in Bosnia and Herzegovina show the same tendency, i.e., ovicaprids show a heavy emphasis on secondary products, while cows show both primary and secondary product use, and pigs were kept for meat.[46] Due to the numerous ovicaprid bones, it can be expected that the community in the Gradina-Kneževići hillfort used wool for their clothing, and the predominance of transhumance in the southern Velebit region would indicate the same for the entire area as well.

Sources also say that the only animals that were reared exclusively for meat were pigs, and Pliny mentions that they were kept on the territory of Illyricum,[47] but they were not used in transhumance, which should make these animals less appealing (although not impossible) for the Velebit communities. This is attested at the Rat hillfort site, where ovicaprids were killed as older animals, but pigs were killed predominantly as immature animals (since they were used only for meat),[48] as well as by the isotope analysis conducted on animal bone samples from several sites in Lika, where pig husbandry most likely remained under household control, i.e. they were kept confined and were fed different fodder than ovicaprids and cattle (most likely scraps and millet).[49]

The dominance of sheep and goats at the Gradina-Kneževići hillfort site is somewhat expected. Namely, although archaeozoological research of contemporary sites from the Velebit area is, for the time being, scarce, the comparison to other sites shows the same pattern of animal usage. For example, the finds from the Vrčevo hillfort have shown the presence of sheep bones in 66,7% of the collected samples dated to the Iron Age.[50] Another distinctive and contemporary Liburnian hillfort, Nadin, shows the dominance of the same animals, followed by cattle and pigs, although horses are present as well.[51] A tentative comparison could also be made with the territory of Istria (although the climate there is different from that in southern Velebit). Namely, over 50% of the bones of domesticated animals from Nesactium belonged to sheep and goats (bones of cattle and pigs were present as well), and something similar has been observed in Pula.[52] A si-

---

Similar evidence has been established in Burnum, as well – the majority of the animal bones belonged to animals between 2 and 6 years old (Campedelli 2007, 60).

[46] Lightfoot et al. 2015, 377.

[47] Plin. *HN.* 11.46.

[48] Gaastra *et al.* 2014, 19. The same has been found for the aforementioned site of Klisura-Kadića Brdo in Bosnia and Herzegovina (Lightfoot et al. 2015, 377), and has been attested in Roman sites, as well, like in Tilurium (Radović et al. 2021, 341ff.).

[49] Zavodny et al. 2019, 1063. A similar situation has been attested in Italy, i.e., isotopic analyses have suggested more closely supervised feeding strategies for domesticated omnivores (Farese et al. 2024, 7).

[50] Grgurić Srzentić 2021, 118.

[51] Lightfoot et al. 2012, 545.

[52] Brajković et al. 2011, 72ff.; Mihovilić 2014, 294.

milar situation has been attested further south, on the Rat hillfort situated on the island of Brač, where over 80% of the animal bones belonged to ovicaprids, with a 4:3 ratio in favour of sheep for the Iron Age period.[53] Although the results are from the Roman villa, which have their own peculiarities when it comes to economy and food production, due to its geomorphological and climatic similarity to the southern Velebit communities, a comparison could be made with the Lički Ribnik site, where archaeozoological analyses have shown a dominance of sheep and oxen bones, with marks that could be connected to cooking.[54] Therefore, from all of these sources, it is more than evident that sheep and goats were the species most commonly reared during the Iron Age in the eastern Adriatic,[55] and, accordingly, southern Velebit could certainly be included in such a pattern.

The importance of livestock in this environment (and basically in the whole of Liburnia) has been attested in various historical contexts as well. Namely, the upkeep of livestock was so crucial for the survival of the local communities that the use of certain pastures (along with water) led to conflicts.[56] This is not surprising, since the territory of southern Velebit was an environment that made any type of agriculture and animal husbandry challenging. Also, it must be kept in mind that livestock was not only used for food, but was vital for Iron Age trade and exchange, particularly for products the local communities lacked, so much so that cattle was

---

[53] Gaastra et al. 2014, 16.

[54] Ožanić Roguljić 2019, 33; Reed et al. 2019, 56ff. Animal bones were collected from several pits in the villas, and many of them had chop or hack marks, as well as traces of burning (Reed et al. 2019, 58). Similar marks have been found in Tilurium (Radović et al. 2021, 335ff.), but also in Rat (Gaastra et al. 2014, 13ff.). However, although a similar ratio has been detected in Roman times for several eastern Adriatic sites, e.g., the majority of the bones found at the sites in Istria belonged to sheep and goats (Matijašić 1998, 357), it must be noted that the predominance of certain animals varied in Roman times, according to economic activities, types of settlements, territory, etc. Accordingly, the results of the animal bone analyses from the *villae rusticae* or workshops from the coastal areas can show a prominence of other livestock, like cattle (see e.g. Miculinić 2018, 81ff.; Radović 2020, 345ff.), and variations are present even at the sites that are contemporary and have the same function. For example, Roman military camps of Tilurium and Burnum show different dietary preferences – Tilurium has a dominance of older cattle, followed by older ovicaprids and then domesticated pigs (for more, see Radović et al. 2021), while in Burnum a dominance of bones of older ovicaprids has been established (Campedelli 2007, 58ff.). In comparison, in military camps in Britain, Germania and Retia, soldiers would predominantly consume cattle, and the same can be said for the dietary habits of the soldiers in the Danube and Balkan regions (Radović et al. 2021, 345). Furthermore, preferences vary according to territories, so in Italy the diet was heavily reliant on pigs, in Hungary cattle was more popular, and in the Roman Provence sheep/goats were dominant (Reed et al. 2019, 60). It has also been noted that dietary preferences changed over time (see e.g. Countryman et al. 2024; Gaastra et al. 2014; Lightfoot et al. 2015, 382ff.; Radović 2020, 345ff.).

[55] Radović 2020, 345ff.

[56] This is attested by the border walls and the stones/inscriptions dating to Roman times, and one of the closest ones, quite recently discovered, can be found on the territory of Golubić. For more, see Vrkić 2015; Wilkes 1974 and literature cited there.

most likely, at that time, the basic measurement of wealth. This all led to the development of specific survival strategies, one of which was transhumance. This way of life existed throughout the ages on the territory of southern Velebit, and is still maintained today, albeit to a much lesser extent (Fig. 9).[57] Moreover, the climate conditions in Liburnia – with warm and dry summers in the coastal areas, and harsh winters in the mountainous regions – made transhumance the only viable method for managing larger herds of livestock. Therefore, the communities of not only the greater Velebit and sub-Velebit region, but also Bukovica and even the greater Zadar area, used Velebit for summer pastures, which could have led to disagreements that needed to be resolved.[58] In addition, the end of the Bronze Age and the beginning of the Iron Age saw a rapid change in the production of tools and the use of various materials, which all led to the intensification and diversification of animal husbandry (and agriculture), and was, in the end, reflected in economic and social transformations.[59] However, not all communities adapted to these new changes in the same way and their implementation was contingent on the available resources and the flexibility of the society to adapt. We can expect that the changes in the southern Velebit area arrived via routes we have previously described, in part in the context of transhumance, and it is quite likely that they were faster on the coast than in this mountainous area, primarily due to the variations in resources. Consequently, the Libinje was most likely not only used by the inhabitants of the Gradina-Kneževići hillfort but also by the various coastal and continental communities, who used it for transhu-

[57] Belaj 2004, 9ff.; https://np-sjeverni-velebit.hr/www/hr/novosti/456-tradicionalna-ispa-%C5%A1a-u-nacionalnom-parku-sjeverni-velebit-2. In the last decade, cattle breeding has been revitalised on the territory of southern Velebit. However, the transhumant type that includes moving large herds of animals to mountain pastures is present only among the inhabitants of the village of Mataci near Ljubotić, some of whom, during the summer, take their livestock to the high pastures of Bili Sinokos (720 masl), while others move their livestock to the area between Kraljičina Vrata and Vilinski Kukovi above Jasenice and Zaton Obrovački. The same can be said for some families from Kruševo that, instead to the high zones of Velebit, lead their goats and sheep over the mountain to Lika. In recent years, besides sheep and goats, cows have been reared in Modrič, on Prosenjak, and in the small villages under Crnopac, in the southeastern part of Velebit. Cows graze in the vicinity of the villages, which can be seen in the hamlets Čabrići near Golubić, or Gornji Javornik and Matijevića Stanovi in the outermost southeastern part of Velebit. Cows and horses have also been reared in the larger mountain plateaus, like Malo Libinje and Veliko and Malo Rujno, and they remain there during the entire year, despite the high elevation and the winter conditions (this information was obtained during visits to specific areas of Velebit and from interviews with the locals conducted during the field surveys of south and southeastern Velebit, led by the Archaeological Museum Zadar from 2018 to the present).

[58] More recent written sources attest that issues concerning the distribution and exploitation of territory, as well as those on the use of trails, woodlands and water, were resolved by oral agreements, which were passed down through the generations in such communities. For more, see Marković 1980.

[59] Zavodny et al. 2019, 1055.

mant pastoralism, as well as for the collection of resources. This has also been indicated by isotopic analyses conducted on samples of animal bones from the Lika territory, which have shown the seasonality of animal grazing at certain locations. In all probability, during the Iron Age even the communities in Lika exploited the non-local grazing areas and seasonal mountain pastures, partly due to the climate but also possibly because they wanted to keep their livestock away from the crops they were growing.[60]

Fig. 9. Sheep in summer pastures on Bili Sinokos (720 m) (photo: Morana Vuković)

Agriculture represented another vital source of nutrients for the Iron Age communities. However, the area of southern Velebit is a mountainous region, with a karstic terrain, susceptible to erosion and drought, and top areas that have frequent sub-zero temperatures, which all leads to poor soil quality and brief growing seasons.[61] As a result of all this, agriculture was extremely demanding, and the unforgiving climate of Velebit made the growing of many plants extremely difficult. Nevertheless, in order to survive, it must have been crucial for the local communities to grow at least some crops adapted to the local climate, like spelt and millet, which are hardy, high-yield crops, resistant to drought, and with shorter growing seasons (for example, for millet it takes three months from sowing

[60] Zavodny et al. 2019, 1062.

[61] For more on the geomorphological characteristics of Velebit, see Bognar 1994; and for karstic terrain, see Matas 2009.

to harvest, and it requires minimal cultivation).[62] We can only speculate on the extent to which the community in the Gradina-Kneževići area used agriculture, but they must have known about and used elementary types of grains and legumes, and the remains of the seeds found in the tumulus, though they belong to a sepulchral context, as well as a fragment of a small quern found in the greater hillfort area, prove that agriculture was present in the local economy. A lack of archaeobotanical analysis for the contemporaneous sites in southern Velebit makes it difficult to reach any clear conclusions and draw comparisons. Still, some information on the diet of the local population can be found in ancient sources. The most informative is Strabo,[63] who writes that the Iapodic land is poor and that the people survive mostly on spelt and millet. Other sources also stress the importance of millet in people's everyday diet, and the most detailed is Pliny, who lists various uses for it, like porridge, several types of bread, for the production of yeast by fermenting it in wine, and even for beer,[64] and various medicinal concoctions.[65] Sources also mention that this crop could be stored for longer periods, that it needed fewer seeds for sowing, and that it was the one crop that would survive even when all the other crops had failed.[66] In recent times, significant debate has arisen about its arrival into these territories and its inclusion in the local diet, and the general consensus is that it was present in the territory of Croatia from the Bronze Age, although different communities utilized it in different ways and amounts.[67] Furthermore, archaeobotanical analyses have been conducted for some lowland sites and they show a variety in the plants grown and used for consumption. For example, Iron Age Nadin shows the presence of cereal crops like spelt wheat, barley, and broomcorn millet,[68] remains of carbonised seeds of wheat and millet were discovered within graves at the necropolis in Pula, and barley was found at Nesactium.[69] Comparisons could also be made with Bronze Age Monkodonja in Istria and Čauševica in Dalmatia, which attest to the use of emmer and einkorn wheat, barley, millet, bitter vetch, and broadbean, and the archaeobotanical analysis for the sites of Tomašanci-Palača, Crišnjevi-Oštrov, Orubica-Veliki Šeš and Mačkovac-Crišnjevi in Pannonia attest to the use of various wheats, barley, oats, millet, and lentil.[70] We could, perhaps, despite its limitations, com-

[62] Zavodny et al. 2017, 255ff.; 2019, 1056; Lightfoot et al. 2015, 377, 384.

[63] Strab. 7.5.4.

[64] Plin. *HN.* 14.19.2, 18.10.3, 18.26.1.

[65] Plin. *HN.* 20.89.1, 22.62.1–2.

[66] Columella, *Rust.* 2.9.17–18; Strab. 5.1.12.

[67] Lightfoot et al. 2015, 376; Toyne et al. 2022, 7; Zavodny et al. 2017, 251. The presence of millet from the Bronze Age has been established for other countries as well, see e.g. Italy (Farese et al. 2024).

[68] Lightfoot et al. 2012, 545; also grape, dock, fat hen, cabbage and pink family were found.

[69] Mihovilić 2014, 293.

[70] Lightfoot et al. 2015, 377, see also accompanying literature.

pare this information with the finds from the Lički Ribnik site, where remains of millet have been found in large quantities.[71] Isotopic research has also indicated that sometimes significant variations can be detected between sites and periods. Consequently, it seems that millet was not that commonly consumed in Nadin and Dragišić, rather they based their diet on wheat and barley,[72] although archaeobotanical evidence from Nadin shows a consistent presence of millet remains in the strata.[73] Therefore, it is logical to conclude that consumption of millet differed at some sites, and that this variation could even be connected to the individual's social status, since, even in more recent times, millet was considered to be a "poor man's crop".[74] However, the differences might have also reflected the geomorphology of the territory, the lowlands being more suitable for the growth of such plants like wheat and barley, which were more appetising, while those communities living in harsher environments, like Velebit and Lika, had no choice but to grow what could succeed there. This has been clearly indicated by the finds from Lika, as well as other sites from inland, continental Croatia, which suggest a regionalized variation in cultivated crops and dietary strategies,[75] with a greater focus on millet among the inland populations (in comparison to the coastal ones).[76] In addition, most animals from Croatian sites did not consume significant quantities of millet, which leads to the conclusion that it was reserved for human consump-

---

[71] Ožanić Roguljić 2019, 31. Reed et al. 2019, 56ff. The archaeobotanical sample was collected from a stove in the kitchen and it gave over 300 broomcorn millet grains, a possible pea, 10 weed seeds, a corn cockle, and two seeds from the buckwheat/knotgrass family. The sample was dated to the second half of the 2nd and first half of the 3rd century AD (Reed et al. 2019, 56). Millet has been discovered in other Roman sites in Croatia, like Veli Brijun, Osijek-Silos, Aenona, Virovitica Kiškorija, Ilok and Ščitarjevo. For more on this, see e.g. Reed et al. 2019, 59, Šoštarić et al., 2006, 2015, see also accompanying literature.

[72] Lightfoot et al. 2012, 549. In Nadin there is a decrease in the abundance of cereals, legumes and other field crops from the Iron Age into the Roman period. There is also a shift in species and in the number of tree fruits and nuts, and Roman deposits are distinguished by the large quantities of olive remains, as well as the use of cherries, plums and walnuts. Essentially, there is a change from the Iron Age diversified cereal agriculture to a large-scale production of olives and other domesticated fruits in Roman times (Countryman et al. 2024, 98ff.).

[73] Toyne et al. 2022, 11.

[74] Lightfoot et al. 2012, 551; 2015, 377. Burials from the Nadin necropolis would suggest that millet was consumed by people of lower social status. Namely, analyses of burials in simple pits or single graves indicate that these individuals consumed more millet than those found in stone cists or in multiple graves (Lightfoot et al. 2015, 385).

[75] Lightfoot et al. 2012; cf. Toyne et al. 2022, 14; Zavodny et al. 2017, 255ff. There is large variation in isotope values suggesting varying proportions of millet in the diet between coastal and inland sites (Lightfoot et al. 2015, 382). For example, in Lika, the samples analyzed indicate that for most individuals approximately 20% of their diet was comprised of millet, and the percentage increases in the Iron Age, with some individuals whose diet comprised 40% or even 50% of millet (Zavodny et al. 2017, 255).

[76] Lightfoot et al. 2015, 382ff.; Zavodny et al. 2017, 258. Although there might have been a rise in the popularity of millet among the coastal communities in the Iron Age, perhaps even in connection to climate change, i.e., a period of colder and more arid climate.

tion,[77] and the rise in the popularity of millet coincides with a lower consumption of meat.[78] Therefore, it seems that millet was not only a "poor man's crop" in Lika, but that it was available and consumed by all social strata,[79] and perhaps this conclusion could be extended to the Velebit territory as well.

Legumes like pea, lentil and bitter vetch, as well as chickpea and broad beans, were also common foods during the Iron Age,[80] attested by the finds from Nadin that show a common and widespread use of legumes in the period from the 6th to the 2nd century BC,[81] as well as by the previously-mentioned finds from Bronze Age Monkodonja, Čauševica, Tomašanci-Palača, Crišnjevi-Oštrov, Orubica-Veliki Šeš and Mačkovac-Crišnjevi,[82] while sites in Italy have shown the growth in popularity of legumes during the Middle and Late Bronze and Iron Ages.[83] Ancient sources would also point towards their common and quite early use – for example, Pliny wrote in detail about their cultivation and consumption,[84] and also noted that beans were crushed and mixed with flour to make bread,[85] while Apicius dedicated a whole chapter to legume recipes.[86] Furthermore, legumes were very often grown in combination with cereals, and prehistoric people might have, at a subconscious level, understood that legumes maintained and improved soil fertility.[87] In addition, legumes had shorter vegetation cycles, and could adapt to most types of soils, so even in Roman times little care was given to the sowing and maintaining of the legume crops and generally, apart from some weeding, they were left to their own devices until it was time to harvest them.[88] However, legumes were often sensitive to cold weather, as well as drought, and as a result, at least some might have been challenging to cultivate in the higher altitudes of Velebit. Nonetheless, the Lički Ribnik site is proof that even peas, which are known to be more sensitive and difficult to grow, were used and quite li-

---

[77] Lightfoot et al. 2015, 382ff.; Zavodny et al. 2017, 255ff. Something similar has been established for Italy as well (Farese et al. 2024, 6).

[78] Zavodny et al. 2017, 255.

[79] Zavodny et al. 2017, 255.

[80] Spurr 1986, 103. From the paleobotanical evidence from the Near East it has been attested that legumes were domesticated around the same time as cereals and they spread concurrently across the Mediterranean. Also, peas, lentils and bitter vetch appeared at the earliest sites in the ancient Near East and in Greece, and chickpeas followed closely behind, while the broad beans appeared substantially later (generally during the Bronze Age) (Spurr 1986, 104).

[81] Countryman et al. 2024, 98ff.

[82] Lightfoot et al. 2015, 377, see also accompanying literature.

[83] Spurr 1986, 104ff.

[84] Plin. *HN.* 18.30.37.

[85] Plin. *HN.* 18.30.

[86] Apic. 5.

[87] Spurr 1986, 104ff.

[88] Spurr 1986, 109.

kely produced there,[89] which suggests that the Gradina-Kneževići area could be considered suitable for the growth of at least some types of legumes.

In general, grains and legumes must have been a staple food for any community living in the southern Velebit area. Even so, the Velebit plateaus were better suited for pastures than for agriculture, which most likely led to only the smaller areas closer to the settlements or the smaller sinkholes being used for such purposes – basically, they were easier to cultivate and maintain in this harsh environment (Fig. 10). The lack of arable land also meant that the same locations and spaces were cultivated throughout the ages, although the crops and agricultural practices varied, and the same can be said for the majority of karstic Dalmatia.[90] This can perhaps be compared with the situation today. Namely, at the base of the hillfort there is a hamlet today, the existence of which can be dated to the 17th century.[91] This community cultivated many fields on the greater territory of Malo Libinje and Lički Dolci, but the most significant were the sinkholes (vrtače) in the immediate vicinity of the houses, where hardy crops and plants (like types of cabbage) were grown.[92] The sinkholes in the vicinity of the hillfort are even today surrounded by dry-stone walls and many are terraced, although it is hard to establish when these structures were built. However, since such structures were known means of preventing soil erosion and extending the available arable land, and dry-stone walls were early on used to delineate arable fields,[93] it is not far-fetched to expect that the Iron Age communities of Velebit were acquainted with them. Furthermore, since arable land was so limited, it most likely had to be protected from free-grazing livestock in order to maximize harvest,[94] which is why these dry-stone walls were also critical.

In Antiquity agriculture was considered to be the most esteemed form of production, which enabled autonomy of the household and its self-sustainability, and was more reliable than trade or handicraft. Cato the

---

[89] Ožanić Roguljić 2019, 32.

[90] For more on the continuous land use, see e.g. Countryman et al. 2024, 94.

[91] The information was obtained during interviews conducted from 2018 to 2023 with a local inhabitant, Petar Knežević (whose ancestors lived in this hamlet for at least 300 years) and his wife Marijana. We would like to express our gratitude for their kindness and willingness to share their memories, family traditions and legends, which gave us a valuable insight into the life on the mountain in the more recent history. See also Lemić 2013, 32–35, 587; Rogić 1966, 316–321.

[92] The information was obtained by interviewing inhabitants of the hamlet, Marijana and Petar Knežević, in the period from 2018 to 2023.

[93] For example, well-documented dry-stone-walled parcelization of fields, dating to the 4th century BC, has been established on the island of Hvar, next to the Greek colony of Pharos, it has survived up to the present and is used for the same purposes. For more on that parcelization, see e.g. Kirigin 2004, 102ff.; https://msg.hr/en/stari-grad-plain-stari-grad-unesco-world-heritage/

[94] Zavodny et al. 2017, 257.

Fig. 10. Karstic landscape of Malo Libinje with natural sinkholes ("vrtače") (photo: Morana Vuković)

Elder, for example, emphasised the need to produce for one's own needs and sell only the excess, while buying should be kept to a minimum, to items which could not be produced in the household.[95] The same philosophy and principles must have been applicable for the pre-Roman communities – produce what is necessary for your needs and then sell the excess (if any). This was crucial, especially if we consider that in pre-Roman communities food was the most important produce, and the majority of people produced it for their personal use, which emphasised the need for planning and storing the excess, and actually made these communities, at least in all important aspects, self-reliant.[96] In such a context, extensive agriculture was hard to maintain, and it is logical to expect that during the Iron Age such areas were cultivated primarily with simple tools, like small hoes and mattocks (although more complex tools like ploughs have been attested in contemporary lowland sites, like in Istria).[97] It should also be considered that rustic methods in farming and the relative isolation of the territory of southern Velebit meant that production (in every aspect) was quite primitive, relied heavily on weather conditions, and was not monetized. In recent studies another process has been noted and that is the "feralization" of agrarian locations, i.e., the abandonment of previously-used arable lands and their slow return to the wilderness.[98] Since the Romans had quite defined policies and attitudes towards land mana-

[95] Cato, *Agr.* 1–4; Aubert 2001, 94.
[96] Garnsey 1999, 23; Wilkes 1969, 181.
[97] For more on tools, see e.g. Mihovilić 2014, 291ff.
[98] Countryman et al. 2024, 95.

gement and boundaries, which shaped the subsistence system and trade and economy networks, it is questionable how the communities in southern Velebit adapted to the change. It has been shown on other territories that during the Roman period, despite the optimal climatic conditions, the high-lands were less inhabited, which is explained by the change in the general attitude towards the highlands and them being seen as marginal and insufficiently productive areas.[99] As such, this process is certainly possible for the territory of Velebit, including the Gradina-Kneževići area, especially if the settlements were abandoned with the expansion of the Roman influence and way of life, and with it the previously-established arable lands were no longer cultivated.

Since the climate at the altitudes of Velebit was not conducive to agricultural reliance, the local populations had to reduce the risk of food shortages by diversifying crops and resources, expanding storage capabilities, and extending their communication and exchange networks.[100] Consequently, for many other resources, including plants that could not be grown in the altitudes and climate conditions of southern Velebit, the local populations must have relied on trade and exchange, and the aforementioned trade routes were of great importance. Attestation of such trade is visible in finds from the Gradina-Kneževići hillfort, particularly in the form of foreign pottery, predominantly Greek-Italic and "Hellenistic", which was found in the settlement and had to be transported from the coast inland. Some fragments found at the site were clearly attributed to vessels primarily associated with the consumption of wine (Fig. 7, nos. 1 and 2). Since the site of Libinje is not particularly suitable for grapevine growth, such resources were most likely transported from the coast inland.[101] Strabo also mentioned that the mountainous parts of the Dalmatian hinterland were snowy and lacked viticulture,[102] while the coastal area was suitable for extensive wine (and olive oil) production. The Greeks and the Romans were well known for their (sometimes even excessive) love of wine, and the local communities emulated them, though the consumption of some types of beer cannot be disregarded, particularly among the Iron Age communities on Velebit, since the Roman sources mention that the inland "barbarians" preferred that beverage.[103] In comparison, remains from Iron Age Nadin show a high percentage of *vitis* remains, as well as rema-

---

[99] Beck, Quinn 2021, 80.

[100] For more on such strategies in the Lika area, see e.g. Zavodny et al. 2017, 250ff.

[101] The same can be said for the Žuta Lokva site, see Ožanić Roguljić 2019, 34.

[102] Strab. 7.5.10.

[103] Batović 1974, Fig. 8; Čače 1985; Zaninović 1976, 261–272; Čondić, Vuković 2017, 56, 84–99. The beer in Pannonia was called *sabaium*, and was rather scorned by the Romans who were used to drinking wine. See e.g. Ammianus Marcellinus (1.26.8) and St. Jerome (*Comm. ad Isaiam*, 7.19) on that. Also, Cassius Dio (49.36.2–4) mentioned that the Pannonians did not have viticulture but rather ate and drank barley and millet.

ins of cornelian cherries, both of which were most likely used for making alcoholic drinks.[104] The Greek colonies of Issa and Pharos had a well-established wine production, which was exported to the mainland (and hinterland),[105] and some of that production could have reached the local Velebit communities. When we take into consideration the aforementioned imported pottery, such trade is quite possible for Gradina-Kneževići as well.

Another commodity that was most likely transported to this site was olive oil, since the climate of Velebit was too harsh for olive trees as well. This type of commodity was also predominantly transported in amphorae, which were discovered at the Gradina-Kneževići hillfort. As with wine, the coastal area was near and suitable for olive oil production and this product did not have to come from distant territories.[106] However, recent analysis of archaeobotanical remains from Nadin indicate that olea fragments were quite rare prior to the 1st century AD and that they increased exponentially in Imperial Roman times,[107] so there is the question as to how frequent and how extensive the use of olive oil was during the Iron Age, and whether this product was considered to be a luxury item, particularly in the Velebit area.

Of course, these trade routes were not only used to transport food and pottery but also numerous other items. Therefore, amber and metal items found at the Gradina-Kneževići hillfort were most likely not produced there but had been transported from both the coast and the area of Lika. Namely, the Iapodes were well-known for their production and trade of amber jewellery, and the two iron knives discovered in the settlement have no analogies as of yet, but they, or at least the ore, must have been traded from other territories, since Velebit is not rich with metals. The bronze jewellery has some characteristics that can be connected both to coastal and Iapodic production and, therefore, such trade must have been active and used by the inhabitants of the hillfort.[108]

Natural resources

Among the natural resources, water was the most critical one for the territory of southern Velebit, as it was scarce and hard to find. Namely, water in karst areas is usually quickly soaked into the porous rock, and

---

[104] Countryman et al. 2024, 99. Interestingly enough, there is a higher percentage of grape remains in the Iron Age context than in those dated to Roman times.

[105] Zaninović 1976, 266ff.

[106] Olive oil production in more recent periods has been among the most frequent economic activities in the sub-Velebit areas, attested by the remains of stone oil presses, though viticulture was common as well. Lemić 2013, 81.

[107] Countryman et al. 2024, 100.

[108] For more on the amber and metal production among the native societies see Batović 1974, 185–186, Map 1; Težak Gregl 1981; Batović 1976, 11–94; Čelhar, Vujević 2013; Dimitrijević, Težak-Gregl, Majnarić-Pandžić 1998, 293. The metal finds from the Gradina-Kneževići site are still undergoing conservation and scientific analysis.

that permeability is the reason why even rivers tend to disappear into the ground. The problem is so evident that it has been considered that lack of water was one of the main reasons why the communities in these areas were unable to grow beyond a certain size. Also, isotopic analysis conducted on human skeletal remains from the area of Ravni Kotari has shown the importance of water in ancient societies, and indicated that many factors led to variations in water consumption.[109] However, the people of southern Velebit, both in prehistory and in modern times, found ways to use available water sources and preserve water. In places where water streams were unavailable, they skilfully used the existing (or extended) depressions in the limestone, which are nowadays called "kamenice", and in such a way collected water. Another possible way of preserving water was to wall up areas to ensure water collection, which is also used today, but with modern materials like concrete. Livestock used natural shallow pools, some of which are in use even today, and evidence of continuous human intervention can be often seen in such areas. Of course, the use of wells was quite common in the southern Velebit area. It is hard to identify precisely what methods of collecting water the prehistoric communities living on Velebit used, but it is evident that the majority of archaeological sites are found in the vicinity of some source of water, which was then perpetually used by generations of inhabitants. In the case of Gradina-Kneževići, a larger water source is available in the nearby canyon of the Orljača River, as well as in Mala Paklenica, which is further away. Apart from that, there are several depressions in the immediate vicinity of the hillfort, which flood during rainy periods, as well as several ponds which the locals still manage and keep in use, and on the way to the mountain peak there is a natural spring called Pečica.[110]

We must also consider the use of wildlife – like boars, deer and even bears – as a resource for the inhabitants of the Gradina-Kneževići hillfort. The hunting of wild animals is indicated by some finds from the site. Namely, among the finds from Tumulus 1, apart from remains of objects made of animal bones (like items which were most likely jewellery separators), a bear's tooth has been found (Fig. 11).[111] Of course, hunting and foraging can be expected, particularly from the transhumant cattle breeders, since they were continuously on the move and conducted such activities during that time. Perhaps a comparison can be made with the finds from the Vrčevo hillfort, where remains of deer, rabbits and even a fox were found,[112] as well with Beram in Istria, where remains of deer were excava-

[109] Lightfoot et al. 2014, 535ff.

[110] The information was obtained during interviews with inhabitants of the hamlet, Marijana and Petar Knežević, in the period from 2018 to 2023. See also Trošelj 2021.

[111] The bear's tooth belonged to the older graves, although, due to the destruction, it cannot be attributed to a specific grave with certainty.

[112] Grgurić Srzentić 2021, 119.

ted,[113] and Pula, where, besides the bones of deer, rabbits and wild birds, remains of a fox, a dog or a wolf, and a badger were found.[114] At the site of Rat, on the island of Brač, the most common wild taxa present were red deer and roe deer, detected in all strata of the site (both in prehistory and in the Roman period), indicating that they were a stable and consistent part of the diet of this community.[115] Nevertheless, on all of these sites the remains of domesticated animals significantly outnumber the remains of wild animals,[116] and the same can be said for the Gradina-Kneževići hillfort, attesting to the fact that, though wild animals were used as a resource in these communities, the primary source of food was, in all likelihood, domesticated animals.

Fig. 11. A bear's tooth found in Tumulus 1 (photo: Morana Vuković)

The use of local wild plants for food and medicine is attested in ethnological contexts, and even the Roman sources mention the *Iris Illyrica* as a crucial medicinal plant originating from this territory (Fig. 12). It was used for stomach pain, cough, swelling and numerous other ailments, as well as for the production of perfume.[117] We could also expect the local inhabitants to forage for wild fruits, berries, mushrooms, and acorns, which were great sources of nutrients, particularly for the poorer members of the

[113] Mihovilić 2014, 294.

[114] Brajković et al. 2011, 74ff.; Mihovilić, 2014, 324. Many bones found at these sites had cut marks. A similar situation has been attested on Roman sites, as well, e.g. in Crikvenica – Igralište, at the site of a pottery workshop, remains of red deer and boar were found, as well as a badger (Miculinić 2018, 85ff.).

[115] Gaastra et al. 2014, 15.

[116] Cf. Radović 2020, 350.

[117] Plin. *HN.* 13.2.4, 20.71.1, 21.19.1; Diosc. 1.1.

community.[118] Acorns have been found in the lowland communities, like in Iron Age Nadin, where notable quantities have been identified within 6th to 2nd century BC contexts.[119] These nuts were often perceived as animal feed because their preparation for human consumption, due to their high tannin content, was a time-consuming process, which included leaching, boiling, roasting, or complex detoxification techniques involving the use of clay. However, since they provided an affordable source of nutrition, their use as human food has been attested in the rural Mediterranean

Fig. 12. Endemic *Iris Illyrica* on the slopes of Debelo brdo (1100 masl), east from Malo Libinje (photo: Morana Vuković)

throughout the ages.[120] Acorns have been mentioned by many ancient sources as well – for example, Pausanias and Herodotus described Arcadians as "the acorn-eaters",[121] attributing their dietary choices to their primitiveness and poverty; Xenophon[122] described the ways the Mossynoecians stored acorns on the upper floors of their houses and used them in a

[118] Garnsey 1999, 36ff. Even today Velebit is rich with plant life, many of which are endemic to this area, which is one of the reasons why this territory is protected with two national parks and a natural park (https://www.pp-velebit.hr/hr/).

[119] Countryman et al. 2024, 99.

[120] Zocchi et al. 2022, 2ff. Acorns are usually used to fatten up pigs since they can process such foods in great quantities, and humans, apart from boiled or baked, ground them into flour and used them in the preparation of bread or porridge.

[121] Paus. 8.1.6; Hdt. 1.66.

[122] Xen. *An.* 5.4.27–30.

type of bread, which he also considered to be a sign of a lack of sophistication, and Strabo[123] attributed the same type of bread to the Lusitanians on the Iberian peninsula. Plutarch mentioned that oak was used to feed people,[124] and Pliny highlighted the importance of acorns as a food source,[125] especially in times of famine, so much so that the Twelve Tables already stipulated that it was lawful to gather acorns, even if they had fallen on the land of another. Pliny also mentioned types of acorn,[126] preparation techniques (roasting to make them sweeter, boiling, grounding them into flour, etc.), and he even said that Pannonia was "acorn-bearing" territory.[127] Since *Quercus ilex* is a common tree in Dalmatia and *Quercus pubescens* is prevalent on southern Velebit,[128] it is not far-fetched to assume the use of acorns among the communities of southern Velebit, including that of Gradina-Kneževići.[129]

In terms of the local diet, natural resources from the coast were certainly used, attested by the remains of shellfish at the Gradina-Kneževići site. This is not surprising, since a fit person could traverse the previously-described trail from the coast to the hillfort under two hours, so there was more than enough time for the locals to go to the coast, collect or catch what was needed, or trade with the coastal communities, and return on the same day. Salt and fish must have come on the same route, although their remains have not yet been discovered at the hillfort. However, recent isotopic research has indicated that, despite being a seafaring people, the Liburni were not that fond of fish in their diet, and that such dietary preference changed only with the arrival of Romans. The reason for such isotopic results is still unclear, although culture and dietary preferences, along with climate change and a significant increase in population size during the Roman period, which could have reduced the availability of some common food sources, have been considered. Consumption of fish during that time might have even had a significance in the context of social standing, perhaps being regarded as the food of the poor.[130] On the other hand, salt was undoubtedly used by the ancient inhabitants of Velebit. Namely, salt was from early times utilized for preserving food, in the producti-

---

[123] Strab. 3.3.7.

[124] Plut. *Vit. Cor.* 3.4.

[125] Plin. *HN.* 16.6–9.

[126] Plin. *HN.* 16.6.

[127] Plin. *HN.* 3.28.

[128] Škvorc et al. 2021; https://np-sjeverni-velebit.hr/www/hr/priroda-i-kulturna-ba%C5%A1tina/ziva-priroda-2/biljke.

[129] Various oak groves can be found today in the vicinity of Gradina-Kneževići.

[130] Lightfoot et al. 2012, 546ff. Other explanations have been proposed, among which it has been found that fish from the Mediterranean present less enriched nitrogen values as compared to fish found in the Atlantic Ocean, which makes them harder to detect in isotopic analyses. Fish from areas where freshwater and saltwater mix could also cause problematic results (Farese et al. 2024, 7).

on of cheese and butter, and was necessary for the health of the livestock and the people. Since it was expensive and relatively easy to transport, it is considered to be one of the most common resources traded from the coast to the hinterland.[131] This resource could have been acquired (and produced) in various ways – through mining, natural evaporation, or "forced evaporation".[132] Apart from the natural evaporation and surface collection, the prehistoric production of salt in the sub-Velebit territories has been attested on several sites in the form of tools for "forced evaporation".[133] In the Gradina-Kneževići area remains of such tools have not been found, but it is quite likely that salt was produced in the coastal area and transported to the hillfort. Namely, the coast closest to Malo Libinje is situated near the coastal hillfort Modrič, and this area has several shallow coves, which could have been used, if not for a wider production, then, at least, for the basic collection of salt, which formed there naturally. From the conversation with the local inhabitants, it is clear that salt was crucial for the local economy in the previous century and quite likely in the centuries before that. Essentially, even in more recent times salt was produced by boiling sea water and was one of the main resources transported and traded at markets (like those held in Bukovica and certainly in Lika).[134] It is evident that the exploitation of sea and salt production were a key part of everyday life in the sub-Velebit areas, particularly among the transhumant and generally cattle-breeding communities, and most likely the inhabitants of Gradina-Kneževići acquired those resources from the nearby coast.

And finally, among the local resources we must also include stones, timber, and clay, which were abundantly used for the construction of houses, shelters, walls, and boundaries, attested also by the finds from the Gradina-Kneževići hillfort. As previously mentioned, one of the most characteristic aspects of Velebit is the use of dry-stone building, a technique that was used up to recent times. Dry-stone walls were also used to define space, usually for agriculture, livestock-usage or for property delineation, and timber was one of the resources which was used both in this area and transported to the lowlands. The importance of this resource is attested in the Roman sources, which mention expansive local/coastal ship-building, but also sources from later times, like the Venetian ones, which clearly prove intense logging, to such an extent that it led to significant deforestation, prompting a law which restricted the use of timber as a construction material.[135] Since many of the pottery finds at the Gradina-Kneževići site are of poor quality, it is possible they were not transported from distant

[131] Grisonic 2023, 21ff.

[132] For more, see Forenbaher 2013, 182; Grisonic 2023, 9ff.

[133] Domines Peter, Parica 2021; Forenbaher 2013, 180, Fig. 1.

[134] Information obtained through interviews with a local inhabitant, Petar Knežević, in 2023. See also Lemić 2013, 83–86.

[135] Rukavina 1990, 281ff.

regions but were locally produced, either in the area of the hillfort or in the communities near it, consequently making clay another local resource. Such types of pottery, most likely of local production, have been attested on many Iron Age sites in the eastern Adriatic (e.g. Asseria, Cvijina Gradina, Aenona, Radovin, Iader, Nedinum, Povljana, Zemunik, Sv. Trojica, Gradac Turan, Nesactium, Pola, Varvaria).[136] In addition, a small kiln was discovered in Pula, which was most likely used both for food preparation and for pottery firing,[137] meaning that simpler items could be produced by the families for their own use, without the need for bigger production centres or complex procedures, and this is a practice that could have been used in the southern Velebit areas, including the Gradina-Kneževići hillfort, during the Iron Age, although without further analysis of the consistency of the ceramics, it is impossible to reach more precise conclusions.

Concluding thoughts

Although the belief that Velebit was an unpopulated and barren land through history is quite widespread, the last 20 years of research of this territory proves that this is far from the truth. In fact, Velebit, despite being quite harsh and unforgiving, formed the existence of its local people throughout the ages – the mountain had to be respected, which is why people living there did not significantly change their customs and ways of life. Nature dictated which places were suitable for habitat, which were favourable for food production, and which were used for transport. Among the factors limiting their existence were available resources, like water and fertile soil. Velebit lacks both, but at the same time, provides an opportunity for the exploitation of other elements, with proper ingenuity and management. Consequently, the economy of the southern Velebit communities must have been based on limited agriculture, managed on poor soil and with crops adapted to harsh conditions, as well as on ovicaprid breeding and its secondary products. Millet was most likely used, since it was a grain that was hardy and adaptable, and it represented a staple food in the areas with a harsh climate, consequently reducing the risk of famine and mitigating numerous unforeseeable factors, such as bad weather,

[136] Aserija (Fadić 2007, 330; 2010, 498; 2011, 516; 2012, 528; 2013, 588; Fadić, Štefanac 2016, 538–539; Fadić, Štefanac, Eterović Borzić 2017, 568), Cvijina Gradina (Čondić, Nedved, 2006; Čondić, 2007; 2007a; 2008; 2009; 2009a; Jurjević, Čondić, 2013, 24), Nin (Batović 1968; 1969; 1970; 1970a, 279–281, 283–284; 1973, 273, 277; 1980, 599), Radovin (Batović 1968a, Vuković 2014), Zadar (Čondić 2010, 28; Čondić, Vuković 2019, 53–59), Nadin (Čelhar, Zaro 2016, 545; Čelhar 2017; 2018, 2019), Povljana (Kurilić 2013, 632–633, Serventi, Vuković 2020, 22–26), Zemunik (Čelhar, Borzić 2016, 70–72, T. I – T. IX), Sv. Trojica, Velebit (Tonc 2013, 634–635; Radman-Livaja, Tonc; 2014, 483; 2015, 508–509; 2016, 575; Radman-Livaja 2017, 621–622; Tonc, Radman-Livaja 2017, T. II). For a wider territory of the eastern Adriatic, see also: Nezakcij (Mihovilić 2001), Gradac Turan (Mihovilić, 1997), Bribir (Korošec 1980), central Dalmatia (Barbarić 2011).

[137] Mihovilić 2014, 304.

poor soil, or drought. This crop, together with legumes, was also quite suitable for pastoralists, especially those that practiced transhumance, since it required little to no upkeep and cultivation, it was easily stored and transported, and it had high caloric value. Of course, transhumance was a way of life in the southern Velebit areas, which is attested by both archaeological finds and the continuation of such traditions up to modern times, and sheep and goats were at the core of survival of these mountainous communities. Additional subsistence was most likely also acquired from wild animals and plants, although the scarcity of their remains at various Iron Age sites attests that they had a minor influence in comparison to the domesticated species.

One of the sites that reveals the story about the resourcefulness of the local population is the prehistoric hillfort of Gradina-Kneževići, located near the present-day hamlet of Kneževići, which is one of the rare settlements at such a high altitude that is inhabited year-round. The artefacts indicate a prolonged continuity of settlement, which encompassed the Early and the Late Iron Age (although its origins in the Bronze Age cannot be excluded). Imported finds from this site attest that the community living at this hillfort was active and involved in the broader contacts with other Adriatic communities. Apart from controlling transport routes, which undoubtedly passed near this hillfort for both trade and pastoral transhumance, this settlement had another function – to protect the area in the turbulent times of the Iron Age. Still, these contacts had to have been primarily seasonal (mostly in the summer), due to weather conditions and the dominance of transhumance in these territories. Therefore, the inhabitants of this hillfort had to take care of their resources wisely and systematically in order to survive in this harsh environment – they managed their livestock (primarily sheep and goats), and water, used the available lands for agriculture, timber and hunting, and maintained contacts with the other communities that could provide them with the resources they lacked, such as olive oil, wine, salt, fish/shellfish, and more exclusive metal and amber items. Remains from the Gradina-Kneževići hillfort have clearly proven that life on Velebit was not only possible, but thriving throughout the ages, and that the diverse karstic environment enabled sufficient resources, shelter, as well as communication, which, in turn, facilitated the adaptation of the local communities to this environment. Consequently, they were able to dominate it and create a vibrant network of contacts which relied on the exchange of goods and commodities necessary for the survival of all parties involved.

Finally, we might ask what happened to the community of the Gradina-Kneževići hillfort after the Roman expansion? We still do not have sufficient and clear evidence whether or not this settlement continued on into Roman times. It is possible that the community slowly adapted to life at

lower altitudes, perhaps in the area of the Roman city of Argyruntum (present-day Starigrad, at the base of Velika Paklenica), but the importance of this site and the route that went next to it undoubtedly continued on after the Iron Age. Ultimately, more research will have to be carried out to answer this, and many other questions that have remained open.

REFERENCES

Alcock, J. P. *Food in the Ancient World*, Bloomsbury Academic, 2006.

Aubert, J.-J. "The fourth factor: managing non-agricultural production in the Roman world", in *Economies beyond agriculture in the classical world*, (eds.) D. J. Mattingly, J. Salmon, Routledge, Taylor & Francis e-Library, 2001, 90–113.

Barbarić, V. *Tipologija lončarije iz kasnog brončanog i željeznog doba s područja Dalmacije*, Unpublished PhD thesis, Sveučilište u Zagrebu, Filozofski fakultet, Zagreb, 2011.

Barnett, C. "Promišljanja o identitetu, etnicitetu i 'helenizaciji' predrimske Liburnije", *Miscellanea Hadriatica et Mediterranea* 3, 2017, 63–97.

Batović, Š. "Nin – Željeznodobno i antičko naselje", *Arheološki pregled* 10, 1968, 36–42.

Batović, Š. "Istraživanje ilirskog naselja u Radovinu", *Diadora* 4, 1968a, 53–74.

Batović, Š. "Nin – liburnsko naselje", *Arheološki pregled* 11, 1969, 61–65.

Batović, Š. "Istraživanje liburnskog naselja u Ninu 1969. godine", *Diadora* 5, 1970, 33–45.

Batović, Š. "Rad Arheološkoga muzeja u Zadru od 1967. do 1969. godine", *Diadora* 5, 1970a, 259–298.

Batović, Š. "Rad Arheološkoga muzeja u Zadru od 1970. do 1972. godine", *Diadora* 6, 1973, 245–302.

Batović, Š. "Ostava iz Jagodnje Gornje", *Diadora* 7, 1974, 159–245.

Batović, Š. "Le relazioni culturali tra le sponde adriatiche nell'eta del ferro", *Jadranska obala u protohistoriji*, Dubrovnik-Zagreb, 1976, 11–94.

Batović, Š. "Rad Arheološkoga muzeja u Zadru od 1973. do 1976. godine", *Diadora* 9, Zadar, 1980, 549–617.

Batović, Š. "Liburnska grupa", in *Praistorija jugoslavenskih zemalja*. Vol. 5, (ed.) A. Benac, Sarajevo, 1987, 339–390.

Beck, J., Quinn, C. P. "Living and Dying in Mountain Landscapes: An Introduction", *Bioarchaeology International* 4(2), 2021, 75–88.

Belaj, V. "Tradicijsko planinsko stočarstvo na Velebitu i bunjevačka etnogeneza", *Studia ethnologica Croatica* 16, 2004, 5–32.

Blečić Kavur, M. *Željezno doba na Kvarneru,* Unpublished PhD thesis, University in Ljubljana, Ljubljana, 2010.

Blečić Kavur, M. *Na razmeđu svjetova za prijelaza milenija: Kasno brončano doba na Kvarneru*, Zagreb, 2014.

Bognar, A. "Temeljna skica geoekoloških osobina Velebita", *Senjski zbornik* 21, 1994, 1–8.

Bojanovski, I. *Bosna i Hercegovina u antičko doba*, Sarajevo, 1988.

Bojanovski, I. *Dolabelin sistem cesta u rimskoj provinciji Dalmaciji*, Sarajevo, 1974.
Brajković, D., Radović, D., Oros Sršen, A. "Arheozoološka obilježja", in *Na početku je bila peć. Željeznodobno naselje i nekropola uz temelje Arheološkog muzeja Istre u Puli*, katalog izložbe, (ed.) K. Mihovilić, 2011, 72–76.
Brusić, Z. "Pakoštanska luka i druga priobalna liburnska naselja u Pašmanskom kanalu u odnosu na gradinska naselja u zaleđu i Aseriju", *Asseria* 5, 2007, 11–38.
Brusić, Z. "Problemi plovidbe Jadranom u prethistoriji i antici", *Pomorski zbornik* 8, 1970, 549–568.
Brusić, Z. "Starokršćanski sakralni objekti uz plovidbenu rutu Istočnom obalom Jadrana", *Diadora* 15, 1993, 223–236.
Campedelli, A. "Relazione della campagna di rilievo e scavo nel castrum Romano di Burnum, Drniš (18 – 30 agosto 2006) / Izvješće o kampanji izrade arheološke dokumentacije i arheoloških iskopavanja rimskoga vojnoga logora Burnum, Drniš (18. – 30. kolovoza 2006.)", in *Rimska vojska u Burnumu / L'esercito Romano a Burnum*, (eds.) N. Cambi, M. Glavičić, D. Maršić, Ž. Miletić, J. Zaninović, Drniš-Šibenik-Zadar, 2007, 50–62.
Countryman, J., Zaro, G., Blaće, A., Čelhar, M. "Chapter 9. Feral fields of Northern Dalmatia (Croatia)", in *Finding Fields: The Archaeology of Agricultural Landscapes*, (eds.) M. McLeester, J. Casana, Archaeological Papers of the American Anthropological Association 35, 94–105.
Čače, S. *Liburnija u razdoblju od 4. do 1. stoljeća prije nove ere*, Unpublished PhD thesis, University of Zadar, 1985.
Čelhar, M. *Izvještaj o realizaciji istraživanja arheološkog nalazišta: Nadin Gradina,* izvještaj za Ministarstvo kulture – Uprava za zaštitu kulturne baštine, Konzervatorski odjel u Zadru, Zadar, 2017.
Čelhar, M. *Izvještaj o realizaciji istraživanja arheološkog nalazišta: Nadin Gradina,* izvještaj za Ministarstvo kulture – Uprava za zaštitu kulturne baštine, Konzervatorski odjel u Zadru, Zadar, 2018.
Čelhar, M. *Izvještaj o realizaciji istraživanja arheološkog nalazišta: Nadin Gradina,* izvještaj za Ministarstvo kulture – Uprava za zaštitu kulturne baštine, Konzervatorski odjel u Zadru, Zadar, 2019.
Čelhar, M., Vujević, D. "Prilog poznavanju metalurške djelatnosti Liburna", *Archaeologia Adriatica* 7, 2013, 113–132.
Čelhar, M, Zaro, G. "Nadin – Gradina", *Hrvatski arheološki godišnjak* 12, 2015, Zagreb, 2016, 543–545.
Čelhar, M., Borzić, I. "Gradina u Zemuniku Donjem, nalazi željeznog i rimskog doba", in *Zemunik u prostoru i vremenu*, (ed.) J. Faričić, Z. Dundović, Zadar, 2016.
Černicki, L., Forenbaher, S. *Starim cestama preko Velebita*, Zagreb, 2016.
Čondić, N. "Cvijina gradina", *Hrvatski arheološki godišnjak* 3, 2006, Zagreb, 2007, 331–333.
Čondić, N. "Cvijina gradina u Kruševu kod Obrovca", *Obavijesti Hrvatskog arheološkog društva* 39(1), Zagreb, 2007a, 73–81.
Čondić, N. "Cvijina gradina", *Hrvatski arheološki godišnjak* 4, Zagreb, (2007) 2008, 390–393.
Čondić, N. "Istraživanja na Cvijinoj gradini u Kruševu kod Obrovca", *Diadora* 23, Zadar, 2009, 9–22.
Čondić, N. "Cvijina gradina", *Hrvatski arheološki godišnjak* 5, Zagreb, (2008) 2009a, 484–486.
Čondić, N. "Liburnski grobovi na zadarskom poluotoku", *Diadora* 24, Zadar, 2010, 27–55.
Čondić, N., Nedved, B. "Cvijina gradina", *Hrvatski arheološki godišnjak* 2, Zagreb, (2005) 2006, 299–300.
Čondić N., Vuković M. *U temeljima grada. Iz arheoloških slojeva liburnskoga Zadra*, Arheološki muzej Zadar, Zadar, 2017.
Domines Peter, P., Parica, M. "Podvodno nalazište Sveti Juraj – Lisac i proizvodnja soli krajem brončanog doba", *Archaeologia Adriatica*, 15, 2021, 133–76.
Dimitrijević, S, Težak-Gregl, T., Majnarić-Pandžić, N. *Prapovijest*, Zagreb, 1998.
Drechsler-Bižić, R. "Japodska grupa", in *Praistorija jugoslavenskih zemalja*. Vol. 5, (ed.) A. Benac, Sarajevo, 1987, 391–441.

Dubolnić Glavan, M. "Rezultati rekognosciranja južnog Velebita (okolica Starigrada Paklenice)", *Obavijesti Hrvatskog arheološkog društva* 2, 2006, 51–64.
Dubolnić, M. "Prapovijesna nalazišta na području Starigrada-Paklenice", *Radovi Zavoda za povijesne znanosti HAZU u Zadru* 48, 2006, 1–55.
Dubolnić, M. "Argyruntum i njegov teritorij u antici", *Radovi Zavoda za povijesne znanosti HAZU u Zadru* 49, 2007, 1–58.
Dubolnić, M. "Značaj Velikog Vaganca u prometnoj povezanosti primorske padine južnog Velebita i Like u prapovijesti", *Izdanja Hrvatskog arheološkog društva 23*, Zbornik Znanstvenog skupa "Arheološka istraživanja u Lici i arheologija pećina i krša", Gospić, 2008a, 9–21.
Dubolnić Glavan, M. "Južni Velebit, Općina Starigrad Paklenica – terenski pregled", *Hrvatski arheološki godišnjak* 5, 2008b, 502–504.
Dubolnić Glavan, M. "Gradina Kneževići na Malom Libinju", *Obavijesti Hrvatskog arheološkog društva* 3, 2009, 54–64.
Dubolnić Glavan, M. "Južni Velebit, Općina Starigrad Paklenica – rekognosciranje", *Hrvatski arheološki godišnjak* 6, 2009b, 534–537.
Dubolnić Glavan, M. "Rekognosciranje trase plinovoda na prostoru južnoga Velebita i Bukovice (Grad Obrovac) tijekom 2009. godine", *Diadora* 29, 2015, 23–51.
Dubolnić Glavan, M. "Južni Velebit (Starigrad Paklenica, Jasenice) – terenski pregled", *Hrvatski arheološki godišnjak* 16, 2019. (*in print*)
Dubolnić Glavan, M. "Starigrad-Paklenica – Arheologija krškog krajolika", in *Starigrad-Paklenica*, (eds.) A. Uglešić, Z. Šikić, M. Tomić, 2022, 204–231.
Dubolnić Glavan, M., Glavaš, V. "Prilog poznavanju najstarijeg opticaja novca na prostoru južnog Velebita", *Prilozi Instituta za arheologiju u Zagrebu* 28, 2011, 95–121.
Dundović, A., Vinčić, A. "Vuna – zapostavljena sirovina u Hrvatskoj", *Tekstil* 66(9–10), 2017, 243–254.
Džino, D. "Indigene zajednice zapadnog i središnjeg Balkanskog poluotoka i 21. stoljeće: metodološki problem", *Godišnjak CBI* 40, 2011, 197–206.
Fadić, I. "Asseria", *Hrvatski arheološki godišnjak* 3, Zagreb, (2006) 2007, 329–331.
Fadić, I. "Asseria", *Hrvatski arheološki godišnjak* 6, Zagreb, (2009) 2010, 497–500.
Fadić, I. "Asseria", *Hrvatski arheološki godišnjak* 7, Zagreb, (2010) 2011, 515–517.
Fadić, I. "Asseria", *Hrvatski arheološki godišnjak* 8, Zagreb, (2011) 2012, 527–529.
Fadić, I. "Asseria", *Hrvatski arheološki godišnjak* 9, Zagreb, (2012) 2013, 586–588.
Fadić, I., Štefanac, B. "Asseria", *Hrvatski arheološki godišnjak*, 12, Zagreb, (2015) 2016, 537–539.
Fadić, I., Štefanac, B., Eterović Borzić, A. "Asseria". *Hrvatski arheološki godišnjak* 13, Zagreb, (2016) 2017, 567–569.
Farese, M., Soncin, S., Robb, J., Tafuri, M. A. "Prehistoric Italian foodways: Meta-analysis of stable isotope data from the Neolithic to the Iron Age", *Quaternary Science Reviews* 345, 2024, https://doi.org/10.1016/j.quascirev.2024.109056.
Forenbaher S. "Pretpovijesni tragovi proizvodnje soli u podvelebitskom primorju", *Senjski zbornik* 40, 2013, 179–194.
Gaastra, J. S., Cristiani, E., Barbarić, V. "Stočarstvo i gradine na istočnom Jadranu u brončano i željezno doba: rezultati iskopavanja na gradini Rat 2007.–2010.", *Vjesnik za arheologiju i historiju dalmatinsku* 107, 2014, 9–30.
Garibović, Z., Pavić, V., Mioč, B., Prpić, Z., Vnučec, I. "Važnost ovčarstva u hrvatskim priobalnim područjima", *Agronomski glasnik* 68(6), 2006, 509–522.
Garnsey, P. *Food and Society in Classical Antiquity*, Cambridge University Press, 1999.
Glavaš, V., Glavičić, M. "Naseljenost sjevernog i srednjeg Velebita u prapovijesti i antici",. *Senjski zbornik* 44, 2017, 117–128.
Glavaš, V., Grilj, A. "Rekonstrukcija ozemelj prazgodovinskih skupnosti na prostoru severnega in srednjega Velebita z uporabo GIS-ov", *Dela – Odelek za geografijo Filozofske fakultete v Ljubljani* 45, 2016, 65–81.
Glavaš, V. "Prometno i strateško značenje prijevoja Vratnik u antici", *Senjski zbornik* 37, 2010, 5–18.

Glavaš, V. "Analize vidljivosti u prapovijesnom krajoliku Velebita", *Archaeologia Adriatica* 8, 2014, 1–26.
Glavaš, V. "The Legends of Rock: Stories, Landscape, and Boundaries in the Central Velebit Mountain", in *Landscape in Southeastern Europe. Studies on South East Europe*, (eds.) L. Mirošević, G. Zaro, M. Katić, D. Birt, Zürich, LIT Verlag, 2018, 15–33.
Glavaš, V. "Kulturna krajina Severnega Velebita", in *Dinarski Kras: Severni Velebit*, (ed.) U. Stepišnik, Ljubljana, 2018, 64–96.
Glavaš, V. "Transformation of Prehistoric to Historic Landscape: The Example of *Civitas Lopsica*", *Senjski zbornik* 46, 2019, 119–136.
Glavaš, V. *Romanizacija autohtonih civitates na prostoru sjevernog i srednjeg Velebita*, Unpublished PhD thesis, University of Zadar, 2015.
Glavaš, V., Stepišnik, U. "Splošne geografske in zgodovinske značilnosti Severnega Velebita", *Dinarski kras: Severni Velebit*, (ed.) U. Stepišnik, Ljubljana, 2018, 11–20.
Glavaš, V., Borzić, I. "Rezultati arheološkog istraživanja ispred župne crkve Sv. Jurja u Starigrad–Paklenici", in *Starigrad-Paklenica*, (eds.) A. Uglešić, Z. Šikić, M. Tomić, 2022, 146–163.
Glavičić, A. "Nalazi kamenih gromila na Velebitu (I.)", *Senjski zbornik* 9, 1982, 33–43.
Glavičić, A. "Arheološki nalazi iz Senja i okolice (VI.)", *Senjski zbornik* 10(11), 1984, 7–28.
Gluščević, S. "Brodolomi na Jadranu u antici i srednjem vijeku". *Adrias* 4–5, 1994, 13–32.
Grgurić Srzentić, M. "Stočarstvo i ritual na gradini Vrčevo u brončano i željezno doba", *Archaeologia Adriatica* 15, 2021, 113–32.
Jakšić, I. "'Pregalaštvo' – Pregače iz Zbirke nošnji Dalmatinskoga zaleđa Etnografskog muzeja Split", *Ethnologica Dalmatica* 29, 2022, 93–134.
Jurjević, M., Čondić, N. *Cvijina gradina, Tragom zaboravljene prošlosti*, Obrovac – Zadar, 2013.
Kirigin, B. "Faros, Parska Naseobina. Prilog proučavanju grčke civilizacije u Dalmaciji", *Vjesnik za arheologiju i historiju dalmatinsku* 96, 2004, 9–301.
Konestra, A., Glavaš, V., Tonc, A., Androić Gračanin Paola and Šegvić, Nera. "Kulturni krajolik Velebita – Terenski pregledi na području Podvelebitskoga primorja u 2017. godini", *Annales Instituti archaeologici* 14, 2018, 148–152.
Korošec, J., Korošec, P. "Istraživanje na Bribirskoj glavici u Bribiru", *Diadora* 9, Zadar, 1980, 95–164.
Kozličić, M., Bratanić, M. "Ancient Sailing Routes in Adriatic", *Les routes de l'Adriatique antique. Geographie et economie*. Actes de la Table ronde du 18 au 22 septembre 2001 (Zadar) / Putovi antičkog Jadrana. Geografija i gospodarstvo. Radovi s Okruglog stola održanog u Zadru od 18. do 22. rujna 2001., (eds.) S. Čače, A. Kurilić, F. Tassaux, Bordeaux-Zadar, 2006, 107–124.
Kozličić, M. *Historijska geografija istočnog Jadrana u starom vijeku*, Split, 1990.
Kurilić, A., Serventi, Z. "Routes and Interactions – Liburni, Iapodes and Ditiones", *Proceedings of the International conference "CISA Adriatic networks: people, goods, ideas", Macerata, 23–25 June 2022*, (in print).
Kurilić, A. *Ususret Liburnima: Studije o društvenoj povijesti ranorimske Liburnije*, Zadar, 2008.
Kurilić, A. "Lokalitet: Stara Povljana – Glavice", *Hrvatski arheološki godišnjak* 9, 2012, Zagreb, 632–633.
Lemić, A. *Sela i stanovi na Velebitu: svjedočanstva života od nastanka do nestanka*, Gospić, 2013.
Lightfoot, E., Šlaus, M., O'Connell, T. C. "Changing Cultures, Changing Cuisines: Cultural Transitions and Dietary Change in Iron Age, Roman, and Early Medieval Croatia", *American Journal of Physical Anthropology* 148(4), 2012, 543–556.
Lightfoot, E., Šlaus, M., O'Connell, T. C. "Water Consumption in Iron Age, Roman, and Early Medieval Croatia", *American Journal of Physical Anthropology* 154(4), 2014, 535–543.
Lightfoot, E., Šlaus, M., O'Connell, T. C. "Metals and millets: Bronze and Iron Age diet in inland and coastal Croatia seen through stable isotope analysis", *Archaeological and Anthropological Sciences* 7, 2015, 375–386.
Magaš, D. *Geografija Hrvatske*, Zadar, 2013.

Marković, M. "Narodni život i običaji sezonskih stočara na Velebitu", in *Zbornik za narodni život i običaje Južnih Slavena (1949–1991)*, (ed.) A. Mohorovičić, Jugoslavenska akademija znanosti i umjetnosti, Zagreb, 1980, 5–139.
Matas, M. *Krš Hrvatske: geografski pregled i značenje*, Split, 2009.
Matijašić, R. *Gospodarstvo antičke Istre*, Pula, 1998.
Matijašić, R. *Povijest hrvatskih zemalja u antici do cara Dioklecijana*, Zagreb, 2009.
Miculinić, K. "Animal exploitation at the Roman site of Crikvenica – Igralište", in *Pottery Production, Landscape, and Economy of Roman Dalmatia*, (eds.) G. Lipovac Vrkljan, A. Konestra, Archaeopress Publishing Ltd, 2018, 81–88.
Mihovilić, K. "Fortifikacija gradine Gradac-Turan iznad Koromačna". *Izdanja HAD-a* 18, Zagreb, 1997, 39–59.
Mihovilić, K. *Nezakcij. Prapovijesni nalazi 1900.–1953.*, Pula, 2001.
Mihovilić, K. *Histri u Istri: željezno doba Istre*, katalog izložbe, Pula, 2014.
Milivojević, F. *Cezarov Ilirik*, Zagreb, 2021.
Ožanić Roguljić, I. "Crtice o prehrani u rimsko doba na prostoru Like", *MemorabiLika* 2, 2019, 31–38.
Pejnović, D., Vujasinović, B. "Prometna valorizacija Velebita – povijesno-geografski prikaz", *Geografski horizont* 44(1), 1998, 29–50.
Perica, D., Orešić, D. "Klimatska obilježja Velebita i njihov utjecaj na oblikovanje reljefa", *Senjski zbornik* 26, 1999, 1–50.
Radman-Livaja, I., Tonc, A. "Šibuljina – Gradina Sv. Trojice", *Hrvatski arheološki godišnjak* 10, Zagreb, (2013) 2014, 482–484.
Radman-Livaja, I., Tonc, A. "Šibuljina – gradina Sv. Trojice", *Hrvatski arheološki godišnjak* 11, Zagreb, (2014) 2015, 508–510.
Radman-Livaja, I., Tonc, A. "Šibuljina – gradina Sv. Trojice", *Hrvatski arheološki godišnjak* 12, Zagreb, (2015) 2016, 573–576.
Radman-Livaja, I., Tonc, A. "Rezultati probnih iskopavanja na Gradini Sv. Trojice 2015. godine", *Annales Instituti archaeologici* 12, 2016, 152–154.
Radman-Livaja, I. "Šibuljina – gradina Sv. Trojice". *Hrvatski arheološki godišnjak* 13, Zagreb, (2016) 2017, 620–23.
Radović, S. "Archaeozoology of Classical Antiquity in Croatia", in *Studia honoraria archaeologica*, Zbornik radova u prigodi 65. rođendana prof. dr. sc. Mirjane Sanader, (eds.) D. Tončinić, I. Kaić, V. Matijević, M. Vukov, FF Press, Zagreb, 2020, 345–356.
Radović, S., Tončinić, D., Buljubašić, I. "Arheozoološka analiza životinjskih ostataka iz slojeva SJ 13, SJ 14 i SJ 32 sonde D", in *Tilurium V. Arheološka istraživanja 2010. – 2018. godine*, (ed.) Mirna Vukov, FF PRess, Zagreb, 2021, 329–348.
Reed, K, Ožanić Roguljić, I., Radović, S., Kolak, T. "Daily Food Consumption in a Rural Roman Villa: Excavations at Lički Ribnik, Croatia", *Interdisciplinaria Archaeologica* 10(1), 2019, 53–63.
Rogić, P. "Antroponimija i porijeklo stanovništva u naseljima srednjeg velebitskog Podgorja", *Hrvatski dijalektološki zbornik* 2, 1966, 303–23.
Rukavina, A. "Još žive velebitske šume". *Senjski zbornik* 17, 1990, 281–90.
Serventi, Z., Vuković, M. "Keramički nalazi s lokaliteta Glavice – Stara Povljana u kontekstu prapovijesnih naselja na otoku Pagu", *Miscellanea Hadriatica et Mediterranea* 7, Zadar, 2020, 11–42.
Serventi, Z., Vuković, M. "The importance of Velebit Mountain in connectivity and trade of Southern Liburnia", in *Archaeologies of roads,* (ed.) T. Kalayci, The Digital Press at the University of North Dakota, 2023, 63–90.
Serventi, Z. "Važnost otoka Ilovika i Sv. Petra za plovidbenu rutu duž istočne obale Jadrana u svjetlu novijih istraživanja", *Histria Antiqua* 21, 2012, 401–412.
Schönauer, S. "Odjeća, obuća i nakit u antičkoj Dalmaciji na spomenicima iz Arheološkog muzeja u Splitu", *Vjesnik za arheologiju i historiju dalmatinsku* 93, 2000, 223–515.
Šašel-Kos, M. *Appian and Illyricum*, Ljubljana, 2005.

Škvorc, Ž., Lisica, L., Zorić, V., Bačurin, M. Sever, K. "Funkcionalna diferencijacija provenijencija hrasta crnike na istočnoj obali Jadranskoga mora", *Šumarski list* 145(9–10), 2021, 415–420.

Šmalcelj, I. "Ovca kao proizvođač mlijeka", *Mljekarstvo: časopis za unaprjeđenje proizvodnje i prerade mlijeka* 2(4), 1952, 2–3.

Šoštarić, R., Dizdar, M., Kušan, D., Hršak, V. Mareković, S. "Comparative Analysis of Plant Finds from Early Roman Graves in Ilok (Cuccium) and Šćitarjevo (Andautonia), Croatia – A Contribution to Understanding Burial Rites in Southern Pannonia", *Collegium Antropologicum* 30, 2006, 429–436.

Šoštarić, R., Radović, S., Jelinčić Vučković, K., Ožanić Roguljić, I. "Diet at the Roman Village of Virovitica Kiškorija South, Croatia", *Collegium Antropologicum* 39(4), 2015, 829–842.

Težak-Gregl, T. "Certosa fibule na centralnom japodskom području", *Vjesnik Arheološkog muzeja u Zagrebu* 14(1), 1981, 25–46.

Tonc, A. "Šibuljina – gradina Sv. Trojice", *Hrvatski arheološki godišnjak* 9, Zagreb, (2012) 2013, 633–635.

Tonc, A., Radman-Livaja, I., Bertol, A. "Rezultati probnih iskopavanja na gradini Svete Trojice 2014. godine", *Annales Instituti archaeologici* 11, 2015, 83–86.

Tonc, A., Radman-Livaja, I. "Il materiale ceramico da Gradina Sv. Trojica: analisi preliminare", in *Zbornik III. međunarodnog arheološkog kolokvija Rimske keramičarske i staklarske radionice: proizvodnja i trgovina na jadranskom prostoru,* Zbornik Instituta za arheologiju 12, (eds.) G. Lipovac Vrkljan, B. Šiljeg, I. Ožanić Roguljić, A. Konestra, Crikvenica, 2017, 365–385.

Tonc, A., Radman-Livaja, I. "Tragovi tekstilne proizvodnje na Gradini Svete Trojice", *Annales Instituti archaeologici* 17, 2021, 104–111.

Tresić Pavičić, D. "Arheološko istraživanje Donje Cerovačke (Turkaljeve) špilje", *Subterranea croatica*, 18(2), 2020, 60–74.

Trošelj, M. "Vilinska i bapska toponimija i topografija Nacionalnog parka Paklenica i šire okolice", *MemorabiLika* 4, 2021, 39–62.

Vojnović Traživuk, B. "Tekstilno rukotvorstvo u Dalmaciji", *Ethnologica Dalmatica* 28, 2021, 19–49.

Vrkić, Š. "Novi nalaz rimskog međašnog zida u Golubiću kod Obrovca", *Archaeologia Adriatica* 8, (2014) 2015, 101–122.

Vrsalović, D. *Arheološka istraživanja u podmorju istočnog Jadrana. Prilog poznavanju trgovačkih plovnih putova i privrednih prilika na Jadranu u anti*ci, Unpublished PhD thesis, University of Zagreb, 1979.

Vuković, M. "Razmatranja o liburnskoj keramici iz sonde 63 s Beretinove gradine kod Radovina", *Diadora* 28, 2014, 21–52.

Vuković, M. "Preliminarni rezultati rekognosciranja jugoistočnog Velebita", *Diadora* 32, 2018, 49–88.

Vuković, M. "Malo Libinje – gradina Kneževići, istraživanje", *Hrvatski arheološki godišnjak* 15, (2018) 2019a, 621–623.

Vuković, M. "Velebit – južni i jugoistočni dio, rekognosciranje", *Hrvatski arheološki godišnjak* 15, (2018) 2019b, 677–680.

Vuković, M. "Gradina Kneževići, Malo Libinje, južni Velebit, istraživanje", *Hrvatski arheološki godišnjak* 16, 2019, (*in print*).

Vuković, M. "Gradina Kneževići, Malo Libinje, južni Velebit, istraživanje", *Hrvatski arheološki godišnjak* 17, 2020, (*in print*).

Vuković, M. "Gradina Kneževići, Malo Libinje, južni Velebit, istraživanje", *Hrvatski arheološki godišnjak* 18, 2021, (*in print*).

Vuković, M. "Liburnska keramika s prostora južne Liburnije", Unpublished PhD thesis, Zadar, 2024.

Wilkes, J. J. *Dalmatia*, London, 1969.

Wilkes, J. J. "Boundary Stones in Roman Dalmatia. I. The Inscriptions", *Arheološki vestnik* 25, 1974, 258–274.

Zaninović, M. "Iliri i vinova loza", *Godišnjak CBI* 13, 1976, 261–72.
Zavodny, E., McClure, S. B., Welker, M. H., Culleton, B. J., Balen, J., Kennett, D. J. "Scaling up: Stable isotope evidence for the intensification of animal husbandry in Bronze-Iron Age Lika, Croatia", *Journal of Archaeological Science: Reports* 23, 2019, 1055–1065.
Zavodny, E., Culleton, B. J., McClure, S. B., Kennett, D. J., Balen, J. "Minimizing risk on the margins: Insights on Iron Age agriculture from stable isotope analyses in central Croatia", *Journal of Anthropological Archaeology* 48, 2017, 250–261.
Zocchi, D. M., Bondioli, C., Hamzeh H., Seyed, D. M., Mohamed et al. "Food Security beyond Cereals: A Cross-Geographical Comparative Study on Acorn Bread Heritage in the Mediterranean and the Middle East", *Foods* 11, 2022, 3–39.