

Food worthy of kings and saints:
fish consumption in the medieval monastery
Studenica (Serbia)

Ivana ŽIVALJEVIĆ, Nemanja MARKOVIĆ &
Milomir MAKSIMOVIĆ

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Food worthy of kings and saints: fish consumption in the medieval monastery Studenica (Serbia)

Ivana ŽIVALJEVIĆ

BioSense Institute, University of Novi Sad
Dr Zorana Đinđića 1, 21 000 Novi Sad (Serbia)
ivana.zivaljevic@biosense.rs (corresponding author)

Nemanja MARKOVIĆ

Institute of Archaeology Belgrade
Kneza Mihaila 35/IV, 11000 Belgrade (Serbia)
nemamarkovic@gmail.com

Milomir MAKSIMOVIĆ

Department of History, Faculty of Philosophy, University of Belgrade,
Čika Ljubina 18-20, 11 000 Belgrade (Serbia)
milomir.maksimovic84@gmail.com

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ABSTRACT

The paper focuses on fish consumption and long-distance fish trade in the medieval monastery Studenica in Serbia, from the perspective of archaeozoology and historical evidence. Medieval written sources on the subject suggest that fish was available primarily to particular social classes – the royalty, nobles and monasteries. Preserved muniments indicate that during the 13th-15th centuries the majority of distinguished monasteries had their own fishing ponds, fishing grounds and their own fishermen. Fish consumption occupied an important role in monastic contexts, both in Christian religious practices (e.g. Lent) and in celebrations commemorating the Virgin Mary and the monastery founder, during which high-quality fish was obtained from greater distances. The ichthyoarchaeological remains discussed in this paper originate from waste deposition areas within and outside of the ramparts of the Studenica Monastery, accumulated during the 14th and the first half of the 15th century. Apart from the remains of the species available more or less locally (Wels catfish [*Silurus glanis* Linnaeus, 1758], carp [*Cyprinus carpio* Linnaeus, 1758], pike [*Esox lucius* Linnaeus, 1758]), the faunal assemblage contained the remains of migratory sturgeons (beluga [*Huso huso* Linnaeus, 1758], Russian sturgeon [*Acipenser gueldenstaedtii* Brandt & Ratzeburg, 1833], stellate sturgeon [*Acipenser stellatus* Pallas, 1771]) most likely transported from the Danube area, about 200 km away as the crow flies. Skeletal element distribution, butchering traces and size estimations (of beluga in particular) indicate that large specimens (c. 2-3.6 m in total length) were brought whole to the monastery, possibly dried or salted. Their occurrence is an additional indicator of long-distance fish trade recorded in muniments, and it offers new insights into economic, social and religious practices in medieval Eastern Orthodox monasteries.

KEY WORDS

Medieval fish trade,
ichthyofauna,
sturgeons,
religious celebrations,
Studenica Monastery.

RÉSUMÉ

Une nourriture digne des rois et des saints : consommation de poisson au Moyen Âge au monastère de Studenica (Serbie).

Cet article concerne la consommation et le commerce à longue distance de poisson au monastère médiéval de Studenica en Serbie, du point de vue de l'archéozoologie et des sources historiques. Les sources écrites médiévales sur le sujet révèlent que le poisson était destiné en priorité à certaines catégories sociales – royauté, nobles et monastères. Les vestiges conservés indiquent que du XIII^e au XV^e siècle, la majorité des monastères de haut rang possédaient leurs propres étangs, lieux de pêche et pêcheurs. La consommation de poisson jouait un rôle important en contexte monastique, à la fois dans les pratiques religieuses chrétiennes (par exemple durant le carême) et dans les cérémonies de commémoration de la Vierge Marie et du fondateur du monastère, à l'occasion desquelles des poissons de qualité supérieure étaient acheminés de plus loin. Les vestiges ichtyologiques étudiés dans cet article proviennent de dépôts de détritiques situés à l'intérieur et à l'extérieur des remparts de Studenica, et qui se sont accumulés au cours du XIV^e siècle et de la première moitié du XV^e siècle. À l'exception des restes d'espèces disponibles plus ou moins localement (le poisson-chat [*Silurus glanis* Linnaeus, 1758], la carpe [*Cyprinus carpio* Linnaeus, 1758] et le brochet [*Esox lucius* Linnaeus, 1758]), la faune découverte contenait des restes d'esturgeons migrants (le beluga [*Huso huso* Linnaeus, 1758], l'esturgeon russe [*Acipenser gueldenstaedtii* Brandt & Ratzeburg, 1833] et l'esturgeon étoilé [*Acipenser stellatus* Pallas, 1771]) provenant vraisemblablement du Danube, à environ 200 km à vol d'oiseau. La disposition des squelettes, les traces de découpe et les estimations de taille (en particulier du beluga) indiquent que les grands spécimens (entre 2 et 3,6 m de longueur totale) étaient transportés entiers jusqu'au monastère, probablement séchés ou salés. Leur présence est une preuve supplémentaire du commerce de poisson à longue distance, déjà attesté par les sources, et offre de nouvelles perspectives de compréhension des pratiques économiques, sociales et religieuses dans les monastères orthodoxes orientaux.

MOTS CLÉS

Commerce de poisson
médiéval,
ichtyofaune,
esturgeons,
célébrations religieuses,
monastère de Studenica.

INTRODUCTION

Fish remains from archaeological sites, especially those of “exotic” species (i.e., non-native to the study area) brought as curiosities, delicacies, status symbols, tributes or provisions, offer unique insights into former trade connections, social hierarchy, culinary preferences, and norms and traditions related to specific foods and animals. Long-distance fish trade was particularly status-related and ubiquitous in medieval Europe, supplying royal courts and noble estates with luxurious foodstuffs, the monasteries with Lenten fare, and meeting the demands of the growing urban centres. Recent decades saw an increase of studies (e.g. Barrett 1997; Clavel 2001, 2006, 2013; Hoffmann 2001; Van Neer & Ervynck 2004; Orton *et al.* 2014; Barrett & Orton 2016) concerned with social, economic and ecological aspects of medieval trade in fresh or preserved fish from the Atlantic Ocean and the North, Baltic and Mediterranean seas, namely in the western, northern and central parts of the continent. In these cultural contexts, various species of fish were regarded as commodities, staple food, or typical fasting food in medieval Western Christendom.

In contrast, with the exception of several archaeozoological studies mainly focused on the Black Sea coast and its hinterlands (Haimovici 1999; Bejenaru & Stanc 2002; Bejenaru 2003; Stanc *et al.* 2006, 2009; Stanc & Bejenaru 2008), less attention has been dedicated to fish trade and consumption in Southeast Europe, an area where the Byzantine influence (i.e., cultural and liturgical traditions of the Eastern Orthodox

Church) spread from the early Middle Ages. The Byzantine food culture was rooted in culinary traditions of the Roman world, dietary habits of the Eastern Mediterranean, and biblical food regulations, with the particular rhythms alternating between the periods of fasting, ordinary and festive days (Caseau 2015; see also Talbot 2007; Dalby 2010; Anagnostakis 2013a). In accordance with the high value placed on asceticism and frugality, dietary regulations prescribed by various *typika* (liturgical books determining the order of services and the way of life of Orthodox monastics) were particularly strict, often including complete abstinence from meat or its limited intake. At the same time, monasteries were places of high status and authority, especially those founded by the rulers or their kin, which were often commemorated by lavish feasts. Although the *typika* differed widely (Talbot 2007; Dalby 2010; Anagnostakis 2013b), specific food-related norms and traditions spread across the Byzantine world and the adjacent areas, including the mainland Balkans.

In this paper, we focus on fish consumption in Studenica Monastery, located in the Studenica River valley in south-western Serbia, about 220 km from Belgrade, the present-day capital (Fig. 1). Founded in the late 12th century, it represents one of the oldest, largest and richest medieval Orthodox monasteries in Serbia, added to the list of World Heritage Sites in 1986 by UNESCO. Its exceptional status stems from the fact that it was erected as an endowment of the Grand Prince (*Veliki Župan*) Stefan Nemanja, revered as Saint Simeon after his death, who established the medieval Serbian state



FIG. 1. — The location of Studenica Monastery and other medieval monasteries, sites and fisheries mentioned in the text. **White rectangle**, Iron Gates or the Danube Gorges area; **white ellipse**, location of the Gospodin Vir gorge.

(also referred to as Raška). Within its unique circular walls, the monastery complex contains two principal monuments, the Church of the Virgin and the Church of the King (both built of white marble), along with the Church of St John and the Church of St Nicholas, numerous smaller sacral edifices, residential and economic facilities, and two main gates on the west and east side of the complex (Popović 2015; Fig. 2).

Faunal remains from Studenica, originating from 13th–15th century contexts (cf. Popović 2015), were previously published in two studies – a general overview of the assemblage as a whole (Marković 2015) and a more specialized study concerned with the role of poultry in the monastery economy (Marković *et al.* 2016). Thus, this paper is the first one to present the results of an in-depth analysis of fish bones from Studenica, but also the first one to focus on fish remains

from medieval archaeological sites on the territory of Serbia, and from medieval Orthodox monasteries in the wider area. Moreover, given that all previous knowledge concerning the role of fish in the diet and economy of monastery estates derived from the written evidence (monastery muniments, royal charters and reports by various travellers), our study represents the first interdisciplinary effort to explore the patterns and the strategies of fish procurement and consumption in medieval Serbia (namely in high-status sites such as Studenica) by employing several lines of evidence – the archaeozoological record and relevant historical sources. Ultimately, by using Studenica as a case-study, the aim of this paper is to shed more light on economic, social and religious norms and traditions involving fish in high-profile monastic contexts and in Eastern Orthodox medieval Christendom.



Fig. 2. — Aerial photo of Studenica Monastery (courtesy of the BLAGO Fund).



Fig. 3. — Representation of various fish species, detail of the 14th century fresco from Gračanica Monastery (courtesy of the BLAGO Fund).

ABBREVIATIONS

MNI	Minimum number of individuals,
NISP	number of identified specimens,
TL	total length.

HISTORICAL EVIDENCE OF FISH CONSUMPTION AND TRADE IN MEDIEVAL SERBIA

Historical sources from medieval Serbia offer particular insights into the use of fish (available primarily to the royalty, nobles and monasteries) in the diet of local rulers, their courtiers and Orthodox monks. The best and the most lucrative fisheries belonged to the ruler, who would grant them (along with professional fishermen) to monasteries. Preserved monastery charters suggest that in the period between the 13th and 15th centuries all notable Orthodox monasteries in Serbia had their own fish ponds (Mišić 2007: 89-102). Moreover, the significance of fish in monastic contexts and the multitude of meanings ascribed to it (as a symbol of Christianity, but also as food appropriate and essential for both fasting and feasting) are further attested on the fresco paintings depicting various species of fish and fishing scenes (Figs 3; 4). Fish was also depicted in other media, such as glazed bowls and platters from Studenica Monastery (Bikić 2015a: 341, fig. 4).

Among the monasteries founded by medieval Serbian rulers as their endowments, Studenica (Fig. 2) held a particularly prominent place. It was built at the end of the 12th century by the Grand Prince (*Veliki Župan*) Stefan Nemanja, founder of the influential Nemanjić dynasty and the medieval Serbian state.



FIG. 4. — Fishing with net from a boat, detail of the 13th century fresco from Mileševa Monastery (courtesy of the BLAGO Fund).

In 1196, Stefan Nemanja abdicated in favour of his second son Stefan Nemanjić, took monastic vows and the monastic name Simeon, and retired to his endowment. After his death in 1199 and subsequent canonization as St Simeon the Myrrh-Streaming, his remains were kept in the Church of the Virgin at Studenica, where they became venerated as relics and central to the establishment of the cult of the Nemanjić dynasty (Babić *et al.* 1986: 9-16; Blagojević 1988: 56-61; Koprivica 2017: 148, 149). At the beginning of the 13th century, when his youngest son and the first Archbishop of the Serbian Orthodox Church Sava Nemanjić wrote the *Studenica Typikon* (*Студенички типик*; Anđelković & Rakićević 2018), Studenica was ranked as the principal monastery in Serbia. The typikon provides important information on the organization of all aspects of monastic life, including the regulations on the use of fish in the diet. According to these regulations, fish occupied an important dietary role – not only during the times of fasting, when meat consumption was prohibited, but at all times (Jovanović 1994: 73). Fish is also mentioned in the *Studenica Chrysobull* (*Студеничка повеља*; Mošin *et al.* 2011: 61-62), where Stefan Nemanja instructed that the monastery's Patron Saint Feast day (the Dormition of the Mother of God) should be celebrated by purchasing fish from Zeta, a principality located on the south-eastern coast of the Adriatic Sea and around Lake Skadar (present-day south Montenegro and north-

western Albania; Fig. 1). However, some historians doubt the authenticity of this document, and consider it a forgery made centuries after Nemanja's reign (Mošin *et al.* 2011: 61-63). More reliable information on the procurement of fish for the monastery brotherhood can be found in the aforementioned *Studenica Typikon*, where Sava Nemanjić provided instructions for the celebration in honour of St Simeon the Myrrh-Streaming: "You should celebrate with a feast and all-night vigil service the remembrance [of] our three-blessed and glorious father and consolidator Lord, Monk Simeon, which falls on the month of February, [day] thirteen, which you should celebrate in a splendid manner, with chanting, and candles, with abundance of food and drink. In addition to that, food and drink should be distributed at the gates to whomever happens to be there on that day. **And this we command to the Abbot, he should send off [someone] to the Danube side and to the Zeta side on the days preceding the feast and he should purchase fish: may the feast of our blessed father and the consolidator Sire Simeon be celebrated in abundance.** In addition to that, the ruler of this land shall be invited, as well as other Abbots. You should also be aware of the following, for it frequently happens that this feast occurs on great fasting days [i.e., Great Lent], thus we command that it be celebrated before the fasting days." (Anđelković & Rakićević 2018: 188, 189; bolding ours). As can be inferred from written sources, fish from the two key areas

– Zeta and the Danube – was held in particular regard and considered especially fitting for celebrations commemorating the founder of Studenica and the Nemanjić dynasty.

There is less evidence, however, on the particular species of fish obtained for these purposes. Although Zeta encompassed the south-eastern Adriatic coast and its hinterlands, it exported not only marine but also freshwater fish – primarily from the Bojana River and Lake Skadar (Fig. 1). In the medieval period, best fisheries on Lake Skadar (deep lacustric springs called “oka” or “eyes”, where shoals of fish aggregated in autumn and winter) were controlled by Zeta monasteries, namely Vranjina (Lopičić 1953). A small cyprinid called “ukljeva” (bleak, *Alburnus* sp.¹) was particularly abundant in the lake. It was consumed in monasteries and towns in Zeta, but also exported to southern Italy (Mišić 2007: 97-99), most likely salted and smoked (cf. Ristić 1938). As for Studenica and the continental areas of medieval Serbia, historical records do not specify what kinds of fish were procured from Zeta, but it seems plausible that “ukljeva” was exported to these parts as well.

A particular testimony to the great demand for fish from the Danube, not only in Serbia but also in Constantinople, can be found in the text *An Emissary's Essay* (Πρεσβευτικός; Đurić 1986) by Theodoros Metochites, a Byzantine statesman, author and diplomat. During his stay in Skopje (present-day North Macedonia) in 1299, as the head of a mission sent from Constantinople to negotiate the terms of marriage of Byzantine Princess Simonis Palaiologina to the Serbian King Milutin Nemanjić, Metochites had the opportunity to observe the customs of the Serbian court. He wrote that the king sent them, among other delicacies, “chunks of cooked fish, recently caught **in rivers nearby or far, fresh or salted, of the big oily kind from the Danube** (αἰῖ Ἰστρου) that we [the Byzantine Empire] rarely obtain from this region, and that is sometimes sought after but cannot be found always and everywhere” (Đurić 1986: 114; translation by Čorbić; bolding ours). In other words, Metochites mentioned several kinds of fish consumed at the court – those caught in the nearby rivers and those obtained from as far as the Danube (the latter considered a particular rarity). *An Emissary's Essay* also provides information on the way they were prepared and served at the table – in chunks (cooked), fresh or salted.

Metochites also noted that the food sent to him and his entourage was “more plentiful and superior to what the local inhabitants have” (Đurić 1986: 113, 114). At the same time when this royal emissary feasted on fish at court, an anonymous traveller visiting Serbia observed that “the aforementioned kingdom [Raška i.e., Serbia] is rich in wheat, cattle, and dairy products, but is lacking in fish and wine.” (Živković *et al.* 2013: 123; translation by Čorbić). As he was not a guest of the royal court, and in all likelihood did not stay at a monastery either, his impressions were most likely formed through contacts with common people, whose lifestyle (especially when it came to diet) greatly differed from that of the ruling elite. The largest part of medieval Serbia was covered in mountains and the major rivers

(such as the Danube) were located in border areas, therefore it is not surprising that the majority of its population subsisted on wheat, dairy and beef products rather than fish. Moreover, the most productive fisheries would have been controlled by the rulers, nobles and monasteries, and thus largely unavailable to other members of the society.

Starting from the second half of the 14th century, there is more written evidence on the fish from the Danube, including more information on the best fishing spots. According to the 1381 *Ravanica Charter* (Раваничка повеља), Prince Lazar Hrebeljanović added to his endowment, the Ravanica Monastery, a fishery located in Gospođin Vir (The Lady's Whirlpool) (Mladenović 2003: 91-95). This toponym refers to the second of four narrow gorges interspersed by vast open basins, which constitute the Iron Gates region (or the Danube Gorges; Fig. 1). The Iron Gates environment provided optimal fishing conditions (in particular for catching large sturgeons migrating from the Black Sea) due to abrupt changes in the riverbed, river currents, protruding rocks and strong whirlpools which channeled the movement of fish and drove them to specific locations in the shallows (Petrović 1998a).

After the Ottoman conquest in the 15th century, fishing was under the jurisdiction of the officials of the Sultan, as a regal right. Leasing rights to income from catching beluga sturgeon (*Huso huso* Linnaeus, 1758) was particularly lucrative (Amedoski 2006), a testimony to the quality and demand for this species of migratory fish. Ottoman sources from the 15th and 16th century suggest that the Iron Gates fisheries continued to be in use, with main fishing spots located between the confluences of Poreč and Timok rivers into the Danube (Amedoski 2006; Zirojević 2011; Fig. 1). A couple of centuries later, sturgeon fishing in this particular area (i.e., at the exit of the gorges) was depicted in the natural history work *Danubius Pannonico-Mysicus* by an Italian scholar, naturalist and soldier Luigi Ferdinando Marsigli (1726). Given that the upstream Iron Gates area (the Gospođin Vir gorge) had been explicitly singled out as a productive fishing spot in the 14th century *Ravanica Charter*, and its downstream area (between the Poreč and Timok river mouths) in the 15th-16th century Ottoman sources, as well as in later accounts (Marsigli 1726; Antipa 1916; Zega 1927; Petrović 1998a), these fisheries were most likely exploited in previous centuries as well. Consequently, it might be assumed that some of the fish procured for the feasts and celebrations of St Simeon the Myrrh-Streaming at Studenica also originated from this area.

STUDENICA MONASTERY: ARCHEOLOGICAL AND ARCHAEOZOOLOGICAL BACKGROUND

For a long time historical sources represented the only testimonies on fish consumption and trade in medieval Serbia, due to the scarcity of archaeozoological research. However, during recent excavation campaigns (2010-2014) at Studenica Monastery (Popović 2015), a large number of faunal remains dated to the late medieval period was discovered in four functionally similar areas (Fig. 5), providing opportunities to cross-reference historical and archaeozoological data.

1. At present, two native *Alburnus* species – *Alburnus albolella* (Bonaparte, 1841) and *Alburnus scoranza* (Heckel & Kner, 1857) are reported in Lake Skadar, and the local name “ukljeva” refers to both of them (cf. Mrdak 2009; Milošević & Talevski 2015; Mrdak *et al.* 2015, 2017; Talevski *et al.* 2009).

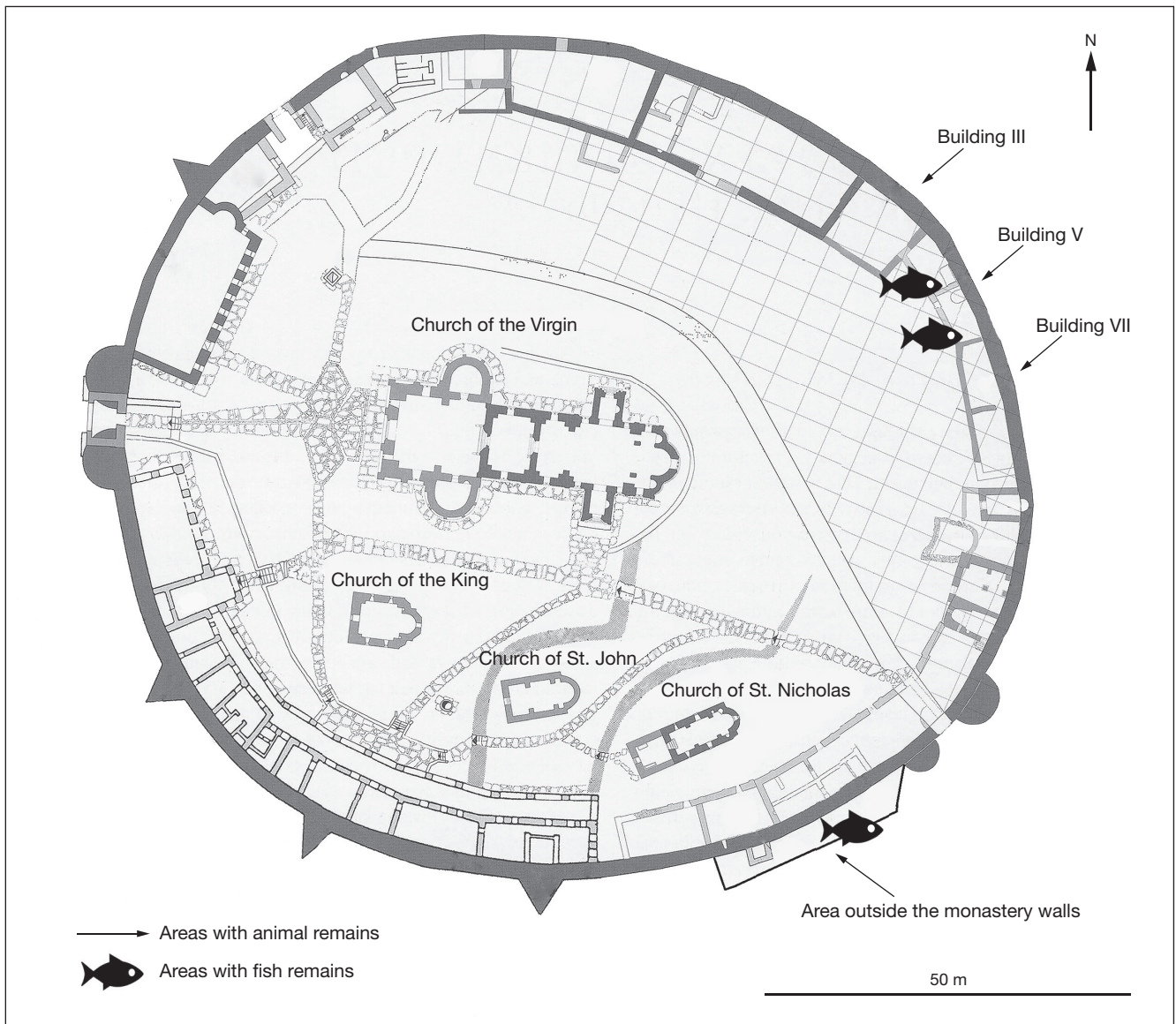


FIG. 5. — Studenica Monastery site plan, with marked contexts with fish remains (below Building V/1, above buildings V and VII, and the area outside the monastery walls) (modified after Popović 2015: 34, fig. 10).

The oldest cultural layer with preserved animal remains was formed as a small midden area, shortly before Building III was erected in the second half of the 13th century. Consequently, this building covered and preserved the layer with animal remains accumulated shortly before this time. Building VII was erected at the same time as Building III, and in the empty space between them a second midden consisting of kitchen waste was formed during the first decades of the 14th century. Building V/1 (i.e., room one of Building V) was erected above that layer during the first half of the 14th century. The third midden area with abundant animal remains was formed on the ruins of the buildings V and VII during the last decade of the 14th century and the first decades of the 15th century. Namely, after the burning of the northeastern residential complex in the last decade of the 14th century, when the entire monastery was heavily damaged in an Ottoman attack, a thick waste area was formed

above the ruins of these buildings. There were no attempts to reconstruct the northeastern residences after this time, and the area was ultimately levelled during the 17th century, when a garden was created in this part of the monastery complex. The fourth midden area in the true sense was formed, as customary, outside the monastery walls. It was 15 meters long and located along the outer face of the extensive rampart, spreading to the west from the east gate. The waste disposal system consisted of a number of rubbish pits of different dimensions and a homogenous waste layer above them, measuring up to one meter in some places. In terms of composition, the outer midden area was similar to the ones formed within the monastery walls, containing fragments of ceramic and glass vessels and numerous animal bones. Its accumulation was dated to a somewhat wider range, spanning from the beginning of 14th to the middle of the 15th century (Popović 2015; Fig. 5).

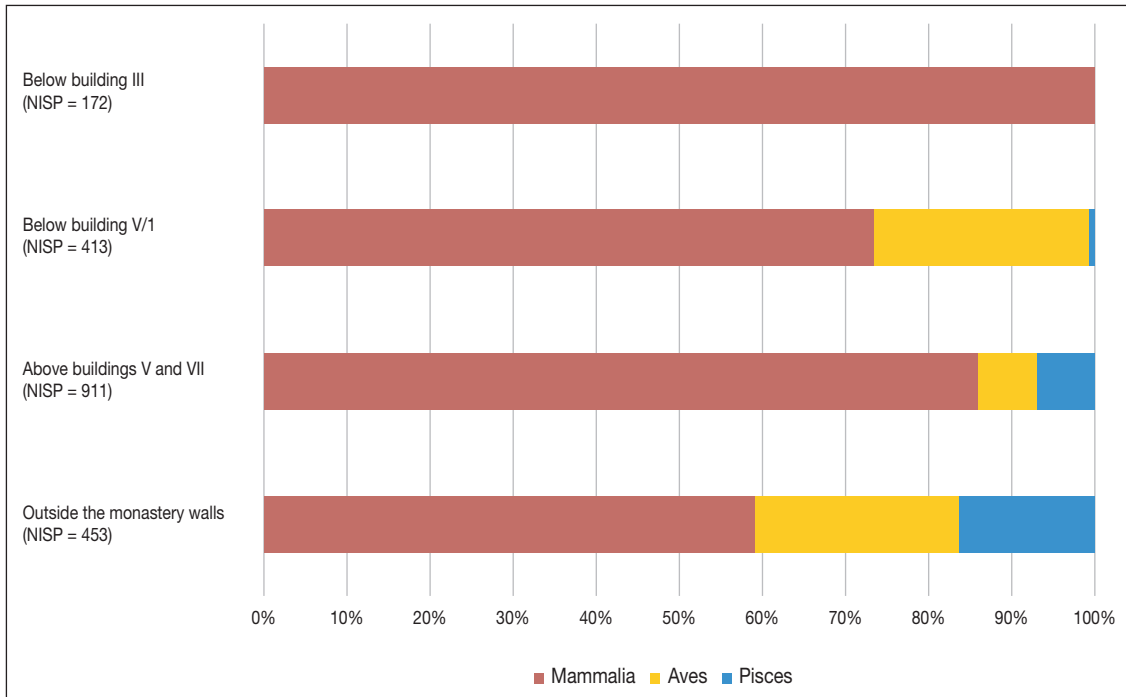


Fig. 6. — The distribution of mammal, bird and fish remains from medieval contexts at Studenica Monastery (after Marković 2015: 396, fig. 1).

Faunal remains from these midden areas were collected manually. Of the total of 1949 identified specimens (NISP), 1527 (78.3%) originate from mammals, 282 (14.5%) from birds, and 140 (7.2%) from fish. The contextual distribution of mammal, bird and fish remains from medieval midden areas at Studenica Monastery is presented on Figure 6. Six mammal species were represented in the assemblage: sheep (*Ovis aries* Linnaeus, 1758), goat (*Capra hircus* Linnaeus, 1758), pig (*Sus domesticus* Erxleben, 1777), cattle (*Bos taurus* Linnaeus, 1758), red deer (*Cervus elaphus* Linnaeus, 1758) and hare (*Lepus europaeus* Pallas, 1778). The majority of the remains (92%) originated from economically important domestic species: sheep, goat, pig, and to a lesser extent cattle. Hare is the best represented game species, whereas only one red deer tine fragment was found within the midden formed above the debris of Buildings V and VII (Marković 2015).

The body part distribution of sheep, goat and pig indicates that whole animals were brought to the monastery and prepared for consumption in the monastery kitchen. Apart from whole animals, there is a possibility that certain meat-bearing parts of cattle were also brought to Studenica. Anthropogenic activity on mammal (sheep, goat, cattle, pig, hare) bones is manifested by butchery marks on 17% of specimens. Based on their shape and location, it can be concluded that two different types of butchering tools were used in food preparation. Short and long cuts on long bones were made by metal blades, whereas chop marks on articular surfaces of long bones, vertebrae, ribs, pelvises, and scapulae were made by massive tools, such as cleavers and axes (Marković 2015). In addition, butchery marks were also observed on chicken bones, as well as on fish bones (discussed in more detail below).

The samples from the midden areas of Building V/1 and Buildings V and VII suggest that sheep and goat were exploited for meat, just as much as for milk and wool, whereas the age profile of these animals from the samples from Building III and the midden outside the walls is typical of intensive meat exploitation. The survivorship curve of cattle primarily indicates dairy production and traction. The majority of pigs at Studenica were slaughtered at the age between 12 and 24 months, once they had reached optimal growth, when meat yield was the greatest and the meat of highest quality.

Given that the *Studenica Typikon* mainly provides information on food regulations during Lent, the archaeozoological data offers additional insights into the daily dietary habits. The results of archaeozoological analysis (the age profiles of animals, butchery and burning marks as a result of food preparation) unambiguously indicate that meat of domestic animals, particularly sheep, goat and pig, had a significant role in the diet at Studenica from the second half of the 13th to the middle of the 15th century (Marković 2015). This feature was probably related to non-fasting days or, perhaps, could be indicative of the varying levels of food abstinence among the monastery brotherhood. Nevertheless, given the strict regulations regarding meat in a monastic community, a more flexible diet could have also been associated with other persons visiting or spending time in the monastery – the nobility, soldiers, local rural population, the pilgrims or the sick.

Bird remains were found in three of the four analyzed midden areas (Fig. 6). Five species were identified in the samples: domestic hen (*Gallus gallus domesticus* (Linnaeus, 1758)), domestic duck (*Anas platyrhynchos domesticus* Linnaeus, 1758), domestic goose (*Anser anser domesticus* (Linnaeus, 1758)), pigeon (*Columba*

TABLE 1. — Taxonomic composition of fish faunal assemblages from three kitchen middens (below room 1 of Building V, above buildings V and VII, and outside the monastery walls) at Studenica Monastery, expressed in NISP (number of identified specimens) frequencies and weight.

TAXON	Below building V/1 (first decades of the 14th century)		Above buildings V and VII (last decade of the 14th - first decades of the 15th century)		Area outside the Monastery walls (14th - mid- 15th century)		Total per taxon	
	NISP	W (g)	NISP	W (g)	NISP	W (g)	NISP	W (g)
Russian sturgeon – <i>Acipenser gueldenstaedtii</i> Brandt & Ratzeburg, 1833	–	–	2	11.2	–	–	2	11.2
Stellate sturgeon – <i>Acipenser stellatus</i> Pallas, 1771	–	–	–	–	1	4.2	1	4.2
Beluga sturgeon – <i>Huso huso</i> Linnaeus, 1758	–	–	10	74.1	5	51.3	15	125.4
Common carp – <i>Cyprinus carpio</i> Linnaeus, 1758	–	–	5	3.6	52	112.1	57	115.7
Cyprinidae indet.	–	–	1	0.6	1	0.5	2	1.1
Pike – <i>Esox lucius</i> Linnaeus, 1758	–	–	1	0.7	–	–	1	0.7
Wels catfish – <i>Silurus glanis</i> Linnaeus, 1758	3	15.2	39	150.1	11	37.1	53	202.4
Pisces indet.	–	–	5	7.3	4	4.1	9	15.4
Total per context	3	15.2	63	247.6	74	209.3	140	476.1

livia Gmelin, 1789), and eagle (*Aquila* sp.), represented by a single bone. Hen remains were particularly frequent in all three midden areas (especially in the midden outside the south-east monastery wall), whereas other poultry (goose and duck) occurred sporadically. The analysis of hen sex and age structure has shown that the remains of older birds were most numerous in all three samples. This implies that hens were exploited primarily for egg production at Studenica from the beginning of the 14th to the mid-15th century (Marković *et al.* 2016).

FISH REMAINS FROM STUDENICA MONASTERY

As previously noted, 140 fish bones (7.2%) were identified in the faunal assemblage from 14th-15th century midden contexts at Studenica Monastery. They originate from the layer below room one of Building V, the midden formed above the ruins of Buildings V and VII, and from the midden area outside the monastery walls (Fig. 5). Fish remains were somewhat more abundant in the midden areas outside the walls (NISP = 74) and above buildings V and VII (NISP = 63), whereas only three specimens were found below room one of Building V (Fig. 6; Table 1).

Given that all faunal remains were collected by hand, mainly large and compact bones of large fish species and/or individuals were represented in the sample. The bones were generally well preserved, ranging from yellow to light yellowish brown in colour. As expected, given their contextual provenance (i.e., kitchen waste areas), a number of them was stained by ash or had lumps of charcoal stuck to them. This is most likely related to processes of food preparation involving hearths and ovens, i.e., the deposition of ash, charcoal and fragments of pottery vessels (exposed to fire during cooking, Bikić 2015b) jointly with food waste. Thirteen fish bone specimens (9.5%) were burnt, all of them originating from the area outside the monastery walls. In addition, one specimen (a catfish hyomandibulare from the midden above buildings V and VII) had fragments of eggshell stuck to it (Fig. 7).



FIG. 7. — Eggshell fragments stuck to a catfish (*Silurus glanis* Linnaeus, 1758) hyomandibulare, from the layer above the floor of Building VII (after Marković *et al.* 2016: 105, fig. 4). Scale bar: 1 cm.

Fish bones have been identified using the reference collection of the Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy in Belgrade, as well as relevant atlases (Lepiksaar 1994; Radu 2005). When possible, they were measured following Morales & Rosenlund (1979), and regression equations from Radu (2003) and Živaljević *et al.* (in press) were employed in order to estimate the total length (TL) of the specimens. The analyzed assemblage

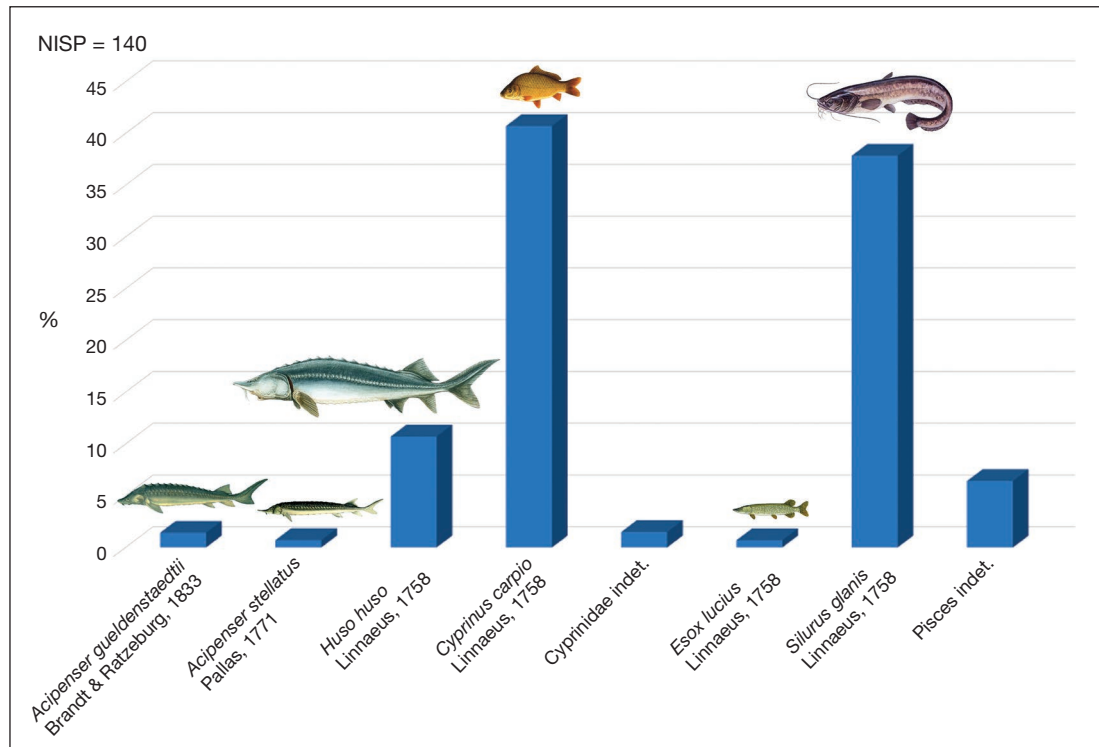


FIG. 8. — Taxonomic composition of the fish faunal assemblage from Studenica Monastery. Abbreviation: **NISP**, number of identified specimens.

contained the remains of three freshwater species – common carp (*Cyprinus carpio* Linnaeus, 1758), pike (*Esox lucius* Linnaeus, 1758) and Wels catfish (*Silurus glanis* Linnaeus, 1758), as well as the remains of three anadromous species of the Acipenseridae family – Russian sturgeon (*Acipenser gueldenstaedtii* Brandt & Ratzeburg, 1833), stellate sturgeon (*Acipenser stellatus* Pallas, 1771) and beluga sturgeon (*Huso huso* Linnaeus, 1758) (Table 1; Fig. 8).

It is particularly striking that none of these species inhabit the waters in the immediate vicinity of Studenica, and, in case of sturgeons, the wider area. Namely, the monastery is located in the vicinity of the homonymous Studenica River, a 52 km-long tributary of Ibar, which springs at an altitude of *c.* 1600 m and slopes down to 629 m. As a cold and swift mountain river rich in oxygen (its name in Serbian means “cold water”), Studenica represents an optimal habitat for salmonid species – mainly brown trout (*Salmo trutta* Linnaeus, 1758) and grayling (*Thymallus thymallus* Linnaeus, 1758) (Ristić 1977; Simonović 2001; Janković 2010), which do not occur in the faunal assemblage. Although this may be a consequence of the preservation bias (given that salmonid bones decompose quickly due to their large organic content and high porosity, Butler & Chatters 1994; Szpak 2011) and hand-collection of animal bones at Studenica, it is indicative that none of the species identified in the sample inhabit the river in the immediate vicinity of the monastery.

Carp remains were somewhat more abundant, namely in the assemblage originating from the area outside the monastery walls. In terms of the skeletal part distribution, the elements of the neurocranium (cranial roof fragments and basioccipi-

tale), branchiocranium (metapterygoideum, hyomandibulare, urohyale, praeoperculare, operculare, interoperculare and suboperculare bones), lower pharyngeal bones, pectoral skeleton (cleithra), vertebra and elements of the dorsal fin (Fig. 9) were present, but their number was not sufficient to draw a firm conclusion on transportation practices, i.e., to determine whether the fishes were processed at catch sites or brought to the monastery whole and processed locally. Eleven carp bones (19.3%) bore cut marks or had parts chopped off by metal tools – activities associated with decapitation (chop marks on a basioccipitale and two cleithra), further detachment of the head and its portioning into smaller pieces (cut marks on the medial side of a hyomandibulare and on the ventral side of a pharyngeal bone, chop mark on an operculare), fin removal (chop marks on dorsal spines), and splitting of the vertebral column (chop marks on abdominal vertebra).

At present, carp is ubiquitous in warmer and slower flowing waters and lower river reaches, especially in the Danube River basin. Its nearest source from Studenica Monastery is the Ibar River (cf. Hristić 1990; Simonović 2001: 150), as the Studenica River drains into Ibar about 10 km downstream from the site, but it could have also been caught in other rivers and lakes. It should be noted that apart from the aforementioned bleak species, carp is one of the most commonly caught fishes in Lake Skadar (Fig. 1), especially during spring, when it spawns in the north-western part of the lake and its floodplains (Drecun & Ristić 1972; Ristić 1977; Mrdak 2009; Mrdak *et al.* 2017). Consequently, there is a possibility that some of the carp fishes were transported from Zeta, which is in accordance with the instructions in



FIG. 9. — Selected carp (*Cyprinus carpio* Linnaeus, 1758) remains with indicated cut and chop marks, from the area outside the monastery walls. Scale bar: 1 cm.

the *Studenica Typikon*. In addition, given the exceptional size of the individuals from the Studenica assemblage, with the largest measuring *c.* 1 m TL (Table 2), it is also possible that carps were cultivated in ponds until they reached optimal size². As previously noted, the existence of fish ponds at Studenica and other notable medieval monasteries in Serbia is mentioned in preserved charters (Mišić 2007: 89-102). Moreover, the cultivation of carp as a typical pond fish is attested in monasteries in other parts of medieval and early modern Europe (Balon 1974, 1995, 2004; Schibler & Hüster Plogmann 1996; Hoffmann 2001; Häberle & Marti-Grädel

2. According to the 1900 study by M. Petrović, carps cultivated in ponds, feeding on aquatic plants and/or fed with manure, cereals, vegetables and fruit, can attain a weight of half a kg in a year, 1 kg in two years, and 2 kg in 4-5 years (Petrović 1998b); a much faster growth rate compared to carps in the Danube and Lake Skadar (Drečun & Ristić 1972; Ristić 1977: 230-234).

2006; Galik *et al.* 2011: 100), and it served as a profitable method to ensure a local fish supply, especially during the periods of fasting.

In addition to carp, pike farming in ponds was also practiced in medieval times (Häberle & Marti-Grädel 2006; Galik *et al.* 2011), as well as large-scale trade in dried pike in Northern and Central Europe (Hoffmann 2001, 2009). A single left dentale of this species (originating from a specimen whose TL was estimated to *c.* 46 cm; Table 2) was uncovered at Studenica Monastery, in the layer above the floor of Building VII (Fig. 10). At present, the nearest rivers inhabited by pike are the Ibar (Hristić 1990) and the West Morava (Simonović 2001: 114), but this species also dwells in other rivers of the Danube basin. Consequently, the pikes consumed at Studenica could have been brought from these areas and/or locally cultivated.

TABLE 2. — Size estimations of fish specimens from Studenica Monastery (size estimations of common carp, pike and Wels catfish following measurements in Morales & Rosenlund (1979) and regression equations in Radu (2003); size estimations of beluga sturgeon following measurements and regression equations in Živaljević *et al.* [in press]). Abbreviations: n, number of measured elements used in size reconstruction; TL, fish total length.

Taxon	n	TL range (cm)	Mean TL (cm)
Common carp (<i>Cyprinus carpio</i> Linnaeus, 1758)	10	48.6-101.2	72.1
Pike (<i>Esox lucius</i> Linnaeus, 1758)	1	46.0	46.0
Wels catfish (<i>Silurus glanis</i> Linnaeus, 1758)	26	52.0-153.4	114.4
Beluga sturgeon (<i>Huso huso</i> Linnaeus, 1758)	6	195.0-358.7	292.7

Wels catfish is the only species occurring in all three midden contexts (Table 1). Similarly to carp, it prefers large and medium sized lowland rivers, backwaters and well vegetated lakes; its present habitat closest to the site include the West Morava River and lower reaches of its tributary the Ibar (Hristić 1990; Simonović 2001: 191; Šorić 2009). The estimated TL of specimens from Studenica ranged from *c.* 50 to 150 cm (the majority of elements originating from individuals whose TL was estimated to 110-130 cm; Table 2), but, due to the small sample size, it remains unclear whether these fishes were brought to the monastery whole. Judging from the presence of elements of the neurocranium (frontale, prae vomer, parasphenoideum, basioccipitale), branchiocranium (maxillare, articulare, dentale, hyomandibulare, ceratohyale, urohyale, operculare), branchial arches (pharyngeal bone, ceratobranchiale), pectoral skeleton (cleithra, pectoral spines), abdominal and caudal vertebra (Figs 7; 11), this could have been the case, at least on some occasions. The processing of catfish included decapitation (as manifested by chop marks on basioccipitale, cleithra and breakage patterns of the latter) and splitting of the vertebral column (chop mark on abdominal vertebra), whereas cut marks on the ventral side of a parasphenoideum and a chop mark on a maxillare bone could have resulted from disarticulation of the cranium from the jaws and further portioning of the head into smaller pieces.

As already noted, the freshwater species in the sample could have been locally cultivated and/or brought to the monastery from greater distances – possibly from Zeta in case of carp. However, without isotopic analyses, it is difficult to determine their origin. Although Zeta is explicitly mentioned as a source of high-quality fish in the *Studenica Typikon*, the scale of import from this region is obscured by fish bone recovery techniques. Namely, the remains of “ukljeva”, the main export from Lake Skadar in the medieval period, would have been easily overlooked during hand collection due to its small size. *Alburnus alborella* (Bonaparte, 1841) and *Alburnus scoranza* Heckel & Kner, 1858, both referred to by this common name, are fairly small fishes, reaching a maximum length of up to *c.* 20 cm (cf. Giannetto *et al.* 2016; Milošević & Mrdak 2016). The absence of marine species from the coastal region of Zeta, i.e., the Adriatic Sea, could also potentially be explained by the recovery bias.



FIG. 10. — Pike (*Esox lucius* Linnaeus, 1758) dentale from the layer above the floor of Building VII. Scale bar: 1 cm.

On the other hand, the presence of anadromous sturgeons is a particular testimony to long-distance fish trade, strikingly corresponding to the *Studenica Typikon* regulations for celebrating the Feast of St Simeon the Myrrh-Streaming. Up until the construction of the Iron Gates dams in the 1970s and the 1980s, several sturgeon species (beluga sturgeon, Russian sturgeon, stellate sturgeon and fringebarbel sturgeon *Acipenser nudiventris* Lovetsky, 1828) were undertaking their bi-annual (spring and autumn) spawning migrations to the Danube from the Black Sea. Sturgeon runs predominantly took place in the main Danube channel (in particular its deep, well aerated parts with moderate to swift current), reaching as far as the Austrian and Bavarian section of the river (Holčík 1989; Simonović 2001; Bartosiewicz & Bonsall 2004; Kottelat & Freyhof 2007). Consequently, the sturgeons consumed at Studenica Monastery most likely originated from the Danube, the area explicitly mentioned in the *Studenica Typikon* and *An Emissary's Essay* as a source of high-quality fish required for major religious celebrations and social and political events.

Given that the skeleton of acipenserids is largely cartilaginous, and only the ossified dermal plates of the cranium, scutes arranged in five longitudinal rows, and selected elements of the branchiocranium and pectoral girdle are likely to survive in the archaeological record (Brinkhuizen 1986), sturgeon remains tend to be significantly underrepresented on archaeological sites (Desse-Berset 1994; Bartosiewicz & Bonsall 2008; Bartosiewicz *et al.* 2008). Consequently, their occurrence in the assemblages from midden areas within and outside of Studenica walls allows for the possibility that the scale of import from the Danube could have been much greater.

Two Russian sturgeon specimens – a parasphenoideum fragment and a ventral scute (Fig. 12) – were identified in the sample. They could have belonged to the same individual, as both were found in the layer above the floor of Building VII. In spite of their modest number, the presence of a cranial fragment and the scute from the ventral side of the body could suggest that the fish had been brought whole to the monastery. Nevertheless, given that this is the only sturgeon scute in the assemblage, there is a possibility that they were commonly sliced off from the body at the catch sites, although scutes also tend to reabsorb minerals



FIG. 11. — Selected Wels catfish (*Silurus glanis* Linnaeus, 1758) remains with indicated chop marks, from the layer above the floor of Building VII. Scale bar: 1 cm.

and become part of the skin, especially in old individuals (Ristić 1977; Brinkhuizen 1986; Bartosiewicz & Bonsall 2008; Bartosiewicz *et al.* 2008).

A single stellate sturgeon bone, a left subopercular, was found in pit two in the midden area outside the walls. This particular specimen bore traces of human manipulation, which could not be interpreted as mere butchery marks. More precisely, the posterior part of the bone had been cut off and the newly formed edge further modified by abrasion

and polishing (Fig. 13), as indicated by numerous transversal marks on the edge. Thus, the semicircular shape of the bone was retained, but its width was reduced. Being fairly durable and large, flat and smooth on its medial side and displaying a pronounced radial pattern of fine grains on its lateral side, sturgeon subopercular could have attracted attention and proved to be suitable for working. Furthermore, it belonged to a fish which was not commonly seen, manipulated and consumed at Studenica, but was brought from great distances – probably



FIG. 12. — Russian sturgeon (*Acipenser gueldenstaedtii* Brandt & Ratzeburg, 1833) ventral scute from the layer above the floor of Building VII. Scale bar: 1 cm.

on specific occasions. It remains unclear whether the bone was modified with the intent to produce some sort of ornament, memorabilia, or simply as a way of passing time; but it was ultimately discarded, along with kitchen waste.

Among sturgeon remains, somewhat more numerous were those of beluga sturgeon, uncovered in the midden formed above buildings V and VII (NISP = 10, MNI = 1) and outside the monastery walls (NISP = 5, MNI = 2) (Table 1). These fishes were most likely brought whole to be processed in the monastery, judging from the skeletal element distribution and observed butchery marks. Beluga remains consisted of cranial fragments (including a fragment of the parasphenoideum) and elements of the branchiocranium (dentale, maxillare, palatopterygoideum and hyomandibulare) (Fig. 14). In both midden contexts, elements of the jaws and mouth cavity displayed a consistent butchery pattern – chop marks on maxillare (three specimens), dentale (two specimens) and palatopterygoideum (one specimen), inflicted by a sharp and massive metal tool.

All fish remains in the sample originated from fairly large individuals, which can be attributed to the recovery bias. Nevertheless, it might also be hypothesized that the best catch would have been selected for consumption at Studenica Monastery, particularly during feasts and important religious and social events. In addition to large carp and catfish, Russian and stellate sturgeon are known to attain considerable size – up to 2–2.4 m TL (Ristić 1977; Shubina *et al.* 1989; Vlasenko *et al.* 1989; Petrović 1998a; Kottelat & Freyhof 2007; Bartosiewicz *et al.* 2008). However, the most impressive catches were certainly beluga sturgeons, the largest representatives of the Acipenseridae family. The estimated total length of beluga specimens from Studenica ranged between *c.* 2 and 3.6 m (Table 2), but these fishes can reach a size of 6 m TL or even more (Ristić 1977; Pirogovskii *et al.* 1989; Petrović 1998a; Simonović 2001; Kottelat & Freyhof 2007; Bartosiewicz *et al.* 2008). The enormous size of belugas probably made their encounters with fishermen particularly memorable, their transport a strenuous enterprise (especially if transported whole) and inspired awe in the consumers. Consequently, their acquisition and serving could have conveyed important messages – a display of reverence and prestige during feasts in honour of the monastery founder, which were attended by the ruler himself according to the *Studenica Typikon*.

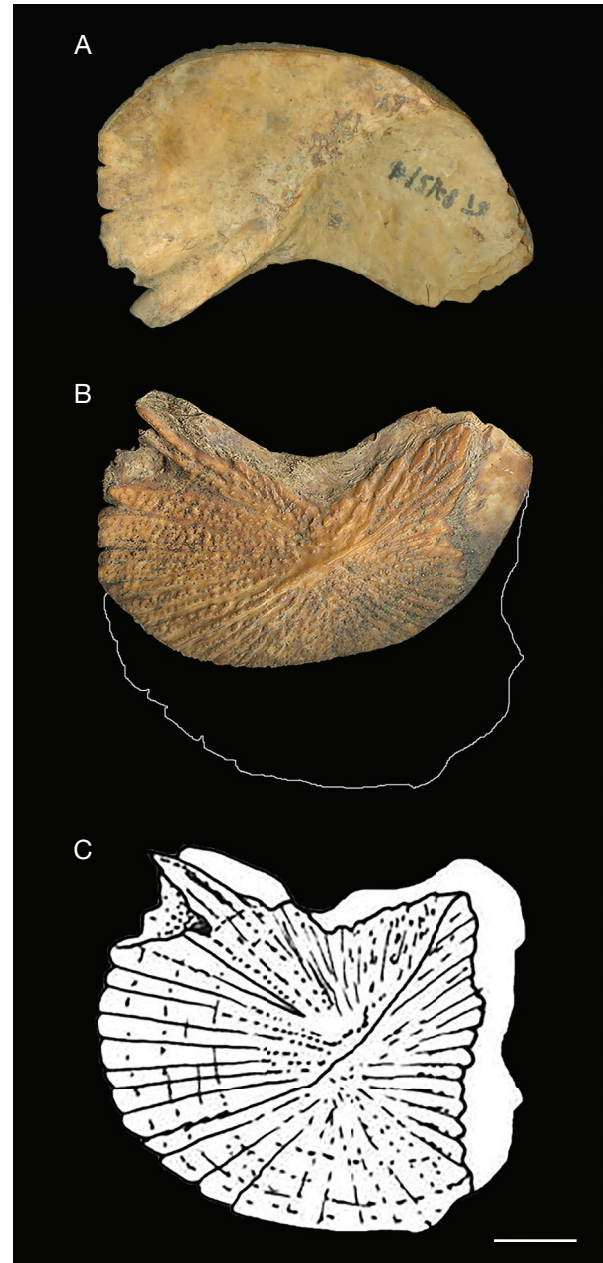


FIG. 13. — Medial and lateral view of a stellate sturgeon (*Acipenser stellatus* Pallas, 1771) subopercular (pit 2, area outside the monastery walls). **A, B**, subopercular modified by cutting, abrasion and polishing; **C**, unmodified subopercular of the same species (drawing after Radu 2003: 263, planche 7a). Scale bar: 1 cm.

STURGEON FISHING, TRANSPORTATION AND PRESERVATION

Apart from their impressive size and tasty flesh, the particular demand for sturgeons and their commodity status could have stemmed from their “exotic”, non-local origin. As previously noted, the *Studenica Typikon* (early 13th century) and *An Emissary’s Essay* (late 13th century) refer only to the broad Danube area as a source of high-quality fish. The late 14th century *Ravanica Charter* and the 15th–16th century Ottoman sources offer more detailed accounts of particular

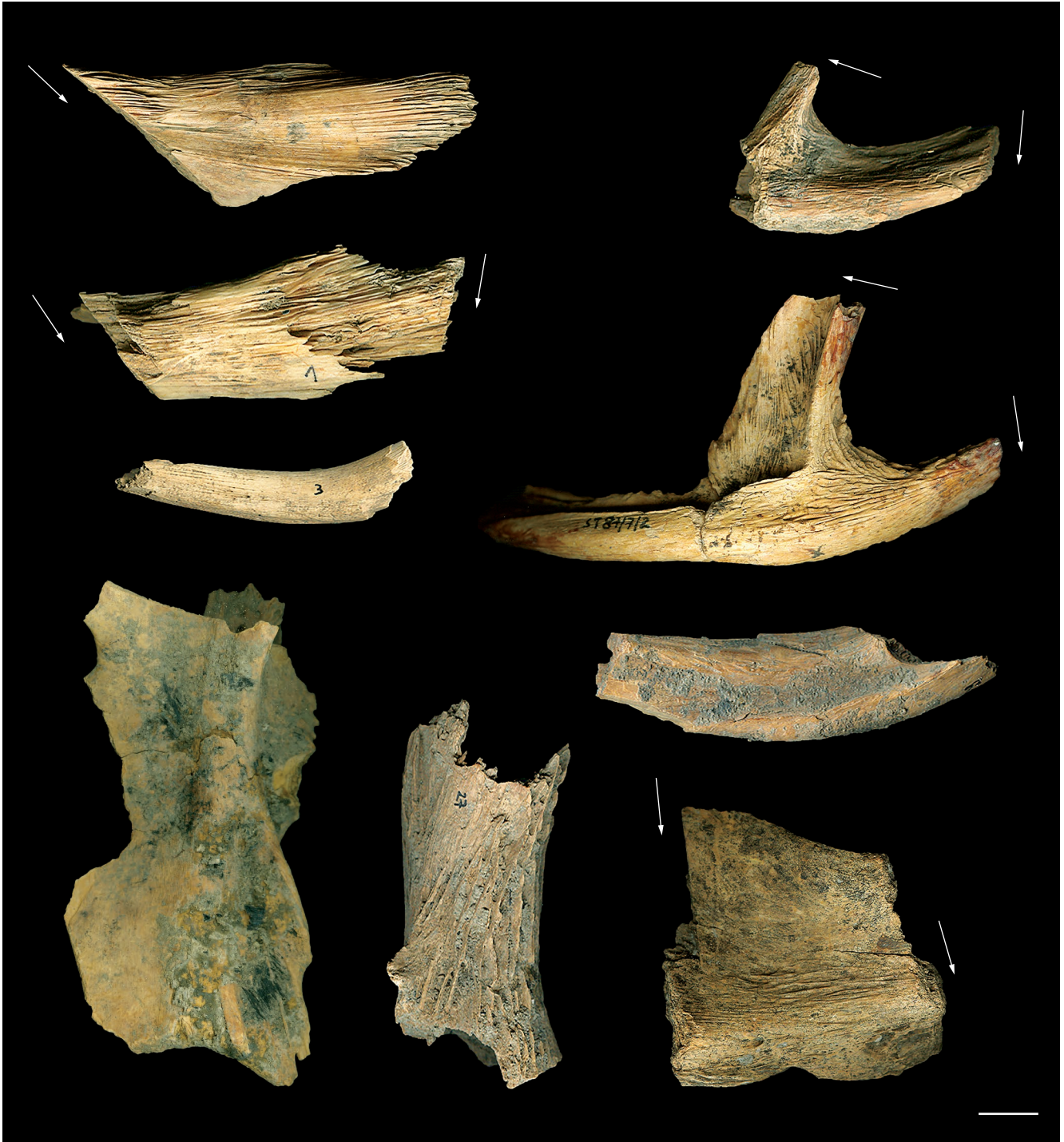


FIG. 14. — Selected beluga (*Huso huso* Linnaeus, 1758) sturgeon remains with indicated cut and chop marks, from the midden areas above buildings V and VII and outside the monastery walls. Scale bar: 1 cm.

fisheries – the Gospodin Vir gorge and the stretch of the Danube between the Poreč and the Timok river mouths, respectively (Fig. 1). The latter explicitly mention that beluga sturgeon fishing was particularly lucrative in this region. It is thus reasonable to assume that the fisherfolk from the settlements in the Iron Gates would have been supplying distinguished monasteries (including Studenica) and royal and noble estates with fish.

At present, the archaeozoological record from medieval sites in the Iron Gates area is limited, save for L. Bartosiewicz's (1996) study of faunal remains from the 9th-12th century contexts at the site of Pontes (located in the fourth, Sip gorge; Fig. 1). The archaeozoological data from Pontes suggests that its inhabitants were fishing carp and large sturgeons (*Acipenser* sp.) in addition to animal husbandry and hunting, and a similar pattern might be presumed in the region as a whole. Namely,

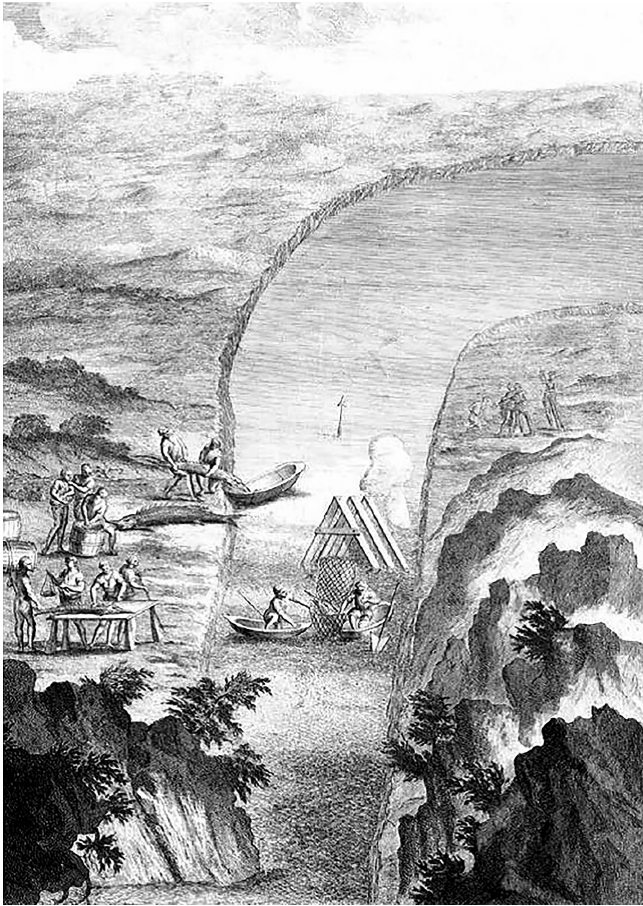


FIG. 15. — Sturgeon fishing at the exit of the Danube Gorges, cover of the fourth volume (*De Piscibus in Aquis Danubii Viventibus*) of L. F. Marsigli's *Danubius Pannonico-Mysicus* (Marsigli 1726).

from prehistory (Borić 2003; Bartosiewicz & Bonsall 2004; Bartosiewicz et al. 2008; Živaljević 2017) to more recent times (Marsigli 1726; Antipa 1916; Zega 1927; Petrović 1998a), the Iron Gates provided particular opportunities for sturgeon fishing, aided by the features of the local landscape. More recent accounts, such as L. F. Marsigli's *Danubius Pannonico-Mysicus* (1726) (Fig. 15), and M. Petrović's (1998a) and N. Zega's (1927) historical and ethnographic works on fishing in the 18th to early 20th century describe various devices (nets, iron hooks strung on ropes, traps, enclosures and weirs), strategically placed in the vicinity of strong whirlpools, islets and river cataracts which were channeling the movement of fish. Local fishing practices, particularly beluga fishing, were also described in the 1777 work *Historische und geographische Beschreibung des Königreiches Slavonien und des Herzogthumes Syrmien* by German royal counsellor and diplomat Friedrich Wilhelm von Taube. According to Taube (1998: 32, 33), once belugas were caught in traps, the fishermen would surround them with strong nets and small boats, scratch them on the head to pacify them³, and

3. Similarly to Iron Gates fishermen in past centuries (cf. Petrović 1998a), Taube believed that sturgeon migrations into the Danube were not driven by spawning instincts; instead, he proposed that these fishes were seeking fast flowing water, rocky riverbeds and even fishing traps to rub against in order to

attach iron hooks under their fins in order to haul them ashore, where they would be clubbed with massive mallets. Needless to say, landing fish as enormous as beluga, as well as the construction of weirs (including the procurement of timber) required extensive communal effort, organisation and investment, affordable primarily to the wealthy (Bartosiewicz & Bonsall 2008; Bartosiewicz et al. 2008). 16th century accounts on fishing on the Tisza River (tributary of the Danube) indicate that entire villages of serfs were engaged in weir construction under the direction of *magister clausurae*; during that time, the serfs had a right to half of the catch – with the exception of sturgeons (Maksay 1959: 703; quoted in Bartosiewicz et al. 2008: 50; Bencsik 1970; quoted in Bartosiewicz & Bonsall 2008: 43).

According to modern ichthyological data (summarized in Table 3), early spring and autumn were the best seasons for sturgeon fishing in the Danube, coinciding with high discharge, low water temperature and increased water velocity, which were optimal for spawning. It is worth mentioning that historical accounts (Bél 1984: 39; quoted in Bartosiewicz & Bonsall 2004: 268; Bartosiewicz et al. 2008: 48) also document spring and autumn as seasons when sturgeon migrations from the Black Sea were most intense. Nevertheless, due to interspecific differences in the start and peak dates and optimal spawning temperature (Table 3), and the possibilities of off-season stragglers, sturgeons could have been actively targeted from January to June as well as from September to December, and opportunistically at other times (Bartosiewicz & Bonsall 2004; Bartosiewicz et al. 2008).

By all means, sturgeons and other fishes from the Danube could have been sought on more than one occasion, to be displayed and served at major feasts. However, the seasons during which two particular events were taking place are recorded – the annual celebration of St Simeon the Myrrh-Streaming at Studenica and Metochites' diplomatic mission to Skopje in 1299. The latter took place in the beginning of March (cf. Đurić 1986: 83, 84, footnote 10, 130, 131, footnotes 95, 97), and Metochites himself stated that he feasted on Danube fish during Lent (Đurić 1986: 114, footnote 68), whereas the former represents the death anniversary of Stefan Nemanja, celebrated on February 13th of the Julian calendar (i.e., February 26th of the Gregorian calendar). February and March would correspond to the earliest season of sturgeon availability; however, Metochites describes the winter of 1299 as exceptionally harsh (“colder than ever, with a lot of snow, and with north winds blowing hard”, Đurić 1986: 87), which could have postponed the spring migration. Nevertheless, late winter fishing would have been possible (at least opportunistically); ultimately, sturgeons could have represented some (or all) of the fishes obtained from the Danube for the feasts described in *Studenica Typikon* (Anđelković & Rakićević 2018) and *An Emissary's Essay*. Sturgeon remains discussed in this paper attest to the established trade routes and connections between Studenica and the Danube area, which could have supplied the monastery with fish for the feast of St Simeon, but also on other notable occasions.

rid themselves of parasitic worms. Consequently, he claimed that “if their heads are scratched, they become calm and appear to feel great pleasure” (Taube 1998: 32; translation by Živaljević).

TABLE 3. — Seasonal availability of Russian sturgeon, stellate sturgeon and beluga sturgeon in the Danube, on the basis of migration and spawning patterns, feeding seasons and optimal water temperature (cf. Ristić 1977; Pirogovskii *et al.* 1989; Shubina *et al.* 1989; Vlasenko *et al.* 1989; Petrović 1998a; Kottelat & Freyhof 2007; Bartosiewicz *et al.* 2008 and references therein). **Light shades**, availability; **dark shades**, peak availability.

TAXON	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Russian sturgeon (<i>Acipenser gueldenstaedtii</i> Brandt & Ratzeburg, 1833)	–					–	–					
Stellate sturgeon (<i>Acipenser stellatus</i> Pallas, 1771)	–	–	–								–	–
Beluga sturgeon (<i>Huso huso</i> Linnaeus, 1758)							–					

Another important factor to be considered is the time necessary for transport, especially to a destination as far as Studenica. This issue raises more questions on fish transportation and preservation methods, particularly in case of large sturgeons which seem to have been brought whole to the monastery. In his 1764 work *Tractatus de rustica Hungarorum* (quoted in Bartosiewicz & Bonsall 2008: 41; Bartosiewicz *et al.* 2008: 51), Hungarian naturalist Mátyás Bél described how sturgeons caught in the Middle and Upper Danube were sometimes kept alive tethered to trees or strong poles on the shore, and towed by boats to the markets in Buda and Vienna. Transport by boats, however, seems unlikely in the case of Studenica, at least for the whole duration of the travel. Sturgeons caught in the Iron Gates area would have had to be transported upstream, to the mouth of the Great Morava, from there south along the Great Morava to the mouth of the West Morava, from there to the north-west along the West Morava to the mouth of the Ibar, and ultimately south along the Ibar to the mouth of the Studenica – more than 400 km in total (Fig. 1). Moreover, the Iron Gates section of the Danube would have been difficult and even dangerous to navigate, due to specific features of the landscape (whirlpools, strong currents and protruding riverine rocks) which provided much joy to the fishermen, simultaneously inducing dread in the bargees (Petrović 1998a). It is more likely that sturgeons were carried to Studenica by land (or primarily by land), although, given that the distance between the monastery and the Iron Gates is *c.* 200 km as the crow flies (Fig. 1), this too would have been a challenging enterprise. Moreover, the transportation of fish and other goods to Studenica could have been hindered by its secluded location. The monastery was situated on a patch of flat land in an otherwise hilly and forested landscape, previously an “uninhabited hunting ground of wild beasts”, remote from major roads (Popović 2015: 255, 256, 323, 324).

An early 18th century copper engraving from Austria shows beluga sturgeons transported by carts to Hohen Markt marketplace in Vienna (Galik *et al.* 2011: 96, fig. 10), and 19th century accounts suggest that specimens caught in the Iron Gates were also transported in a similar manner: “enormous beluga sturgeons [...] were carried by ox carts [...] with their heads tied to the front part of the cart, and their tails dragging behind the cart” (Petrović 1998a: 212; translation by Živaljević). These accounts, however, refer to fish transportation from catch sites to fishmonger shops and markets in the Iron Gates towns; it remains unclear whether sturgeons would have been transported

in this manner all the way to Studenica Monastery. According to the extensive study on medieval long-distance fish trade by R. Hoffmann (2001: 141), preindustrial transport (even with fast horse relays) would limit the overland movement of fresh fish to about 150 km before they spoiled; the consumers farther inland were limited to preserved ones.

Whether by boats, ox or horse carts, the fish transported from the Danube to Studenica would have had to be preserved, in order to reach its destination in an edible state. As previously noted, the earliest evidence on preservation techniques comes from Metochites’ remark that the Danube fish was brought and served at the feast salted. The 18th century report by Taube (1998: 32, 33) mentions that beluga sturgeons, reaching a size up to 6 m, were either sold fresh locally (20 kreutzers per oka, i.e., 1.3 kg) or salted for the export abroad⁴. In the 19th century, high quality fish from best fisheries (e.g. beluga caught in the Iron Gates whirlpools) was exported in wooden crates stacked with ice, as salted and sun-dried fillets (called “batoka”) or salted in large barrels to the Austro-Hungarian Empire, Romania and Bulgaria, and its caviar even farther (Petrović 1998a). In his discussion on fish preservation techniques in the Iron Gates and beyond, M. Ristić (1938) specifies that large fatty fish (such as catfish, large carp and beluga sturgeon) were commonly gutted, and sun-dried prior to salting (100 kg of fish required *c.* 40 kg of salt) or soured with a mixture of water, salt, saltpeter, sugar and spices (“salamura”).

Given the size of sturgeon specimens from medieval Studenica, including the occurrence of skull and jaw bones, possible techniques could have involved salting and transportation in large barrels. In addition, if the fish were indeed obtained for celebrations taking place in late winter, the use of ice could have delayed putrefaction, but only for a limited amount of time (cf. Ristić 1938). Once sturgeons reached their destination, their further processing most likely took place in the monastery kitchen. However, certain preparatory steps (such as gutting, possibly scute and fin removal, and the drying and salting itself) were probably undertaken at the catch site (as shown on Fig. 15) or in fishmonger shops in vicinity.

4. As a representative of the Holy Roman Empire visiting these “unknown” and Other lands, Taube (1998: 32, 33) did not hold local fish preservation techniques in high regard: “[...] they salt [beluga sturgeon] so badly, that the meat becomes rough, tough and gristly. If only [...] they knew how to fish, salt and dry fish properly, belugas, sturgeons and other fish from the Danube could replace [the costly] salted and dried cod [imported from the Netherlands and England] in Austrian lands”. On the other hand, he was more appreciative of roasted beluga meat, which “resembles veal and is very agreeable”.

THE PERCEPTION OF STURGEON IN MEDIEVAL STUDENICA AND BEYOND

Two aspects of fish consumption in medieval societies, as foodstuffs simultaneously associated with a monastic and elite lifestyle, particularly converged in high-status monasteries such as Studenica. Various sturgeon species probably occupied a prominent place in that respect, as embodiments of wealth and power. This was most likely due to their formidable size, meat output and tasty flesh, which were praised by later travellers to the Middle Danube area (e.g. Marsigli 1726; Taube 1998). Apart from size, other features of sturgeon anatomy (their bony plates and “armour-like” scutes), as well as their seasonal migrations, non-local origin (which required well-organized trading expeditions), and unexpectedly placid behaviour⁵ could have also been ascribed particular meanings. Their value could have been further increased by caviar, highly appreciated in the Byzantine Empire at least since the 12th century (Dalby 2010: 27, 66, 67; Anagnostakis 2013b: 84, 85) and at least from post-medieval times in Serbia (Petrović 1998a; Taube 1998). There is no explicit evidence of sturgeon roe processing and consumption in medieval Serbia, although the *Studenica Typikon* notes that roe (of an unspecified fish) should be served on Saturday and Sunday of the first week of Great Lent (Anđelković & Rakićević 2018: 162).

The royalty, clerical and aristocratic upper classes in the Byzantine Empire developed a taste for sturgeon meat and caviar from the Middle Byzantine period, with the expanding focus on Asia Minor and fisheries in the Black, Azov and Caspian seas and their northern tributaries (Dalby 2010: 27, 66, 67; Anagnostakis 2013b: 84, 85). Previously unknown, sturgeon fishes with “strange, northern names” such as *mourzoulin* (or *mourouna*, i.e., *H. huso*) and *berzitikon* (or *ber(t)zitika*, *Acipenser* sp. or *H. huso*) (Dalby 2010: 27, 192, 214) quickly came to be regarded as a delicacy on the tables of the wealthy. Sturgeon caviar (*khabiarin* or *chabiarion*) was particularly sought after. According to the 12th century scholar and archbishop Eustathios of Thessalonike, the wedding banquet hosted by the Byzantine Emperor Manuel I Komnenos included dried and salted fish, and red and black caviar imported from Tanais on the Azov Sea coast (Talbot 2007: 119). One of the *Prodromic Poems*, a contemporaneous satire attributed to Hilarion Ptochoprodromos, a former monk of the Philotheou Monastery in Constantinople, criticizes monastic superiors for indulging in salted sturgeon, caviar and other gourmet food, while the junior monks had to make do with much more modest meals (Talbot 2007: 118, 119; Dalby 2010: 93, 94, 176).

As for sturgeons from the Danube, additional evidence of their high demand comes from Hungary, where a number of 11th to 17th century monastic, castle, urban and manorial

sites, and (to a much lesser extent) rural sites yielded remains of these species (Bartosiewicz & Bonsall 2008; Bartosiewicz *et al.* 2008). The majority of high-status sites were located in the Danube Bend area (a lucrative sturgeon fishery up to the 20th century) and in the broader Buda municipal region. Nevertheless, in spite of their proximity to the Danube (unlike Studenica Monastery), sturgeon remains from the sites were fairly scarce – usually two or three per site. On the other hand, a number of documents designating Royal Fishing Grounds, regulations on fishing and fish selling rights, sturgeon transport records, tax tolls and cookbook recipes attest to extensive sturgeon trade and consumption (Bartosiewicz & Bonsall 2008; Bartosiewicz *et al.* 2008). Given that a greater number of sturgeon bones (including cranial and branchicranial elements with butchery marks) had been uncovered at Studenica, this feature could be indicative of different transportation and preservation methods in medieval Hungary. In addition to taphonomic factors, the scarcity of sturgeon remains in the latter could be attributed to practices involving primary butchery at catch sites and the shipment of eviscerated and processed carcasses to consumption sites (Bartosiewicz & Bonsall 2004, 2008; Bartosiewicz *et al.* 2008).

Historical sources from Hungary indicate that beluga sturgeon was regarded as an exceptional commodity and status symbol, also known as the “Royal Fish”. According to a 1329 customs record from Zsolca, a two Denarii toll had to be paid for beluga sturgeon, whereas other sturgeon species (as well as horse, ox and cow) were half the price (Tóth & Kubinyi 1996: 320, 321; quoted in Bartosiewicz & Bonsall 2008: 37). The records on sturgeon meat distribution reflect the social hierarchy in the country as a whole (with royal, noble and monastery estates controlling the best fisheries, which were off-limits to the serfs), as well as in particular households (indicated by Lent period daily rations). Accordingly, notable sturgeon bone finds originate from the 10th-13th century royal centre in Esztergom, 14th-15th century contexts from the subsequent capital Buda, the 15th century royal residence in Visegrád, and from 14th-15th century monastic centres of various orders – Cistercian (Zirc Monastery and Piliszentkereszt Abbey), Clarissan (Óbuda Monastery) and Dominican (Buda-Vár Monastery) (Bartosiewicz & Bonsall 2008; Bartosiewicz *et al.* 2008).

Further west, other sturgeon species (the common sturgeon *Acipenser sturio* Linnaeus, 1758 and the Atlantic sturgeon *Acipenser oxyrinchus* Mitchill, 1815) were held in similar regard. In medieval Germany, best sturgeon fisheries on the North Sea tributaries and sturgeon trade were controlled by state representatives, who could grant fishing rights to cities, monasteries or particular individuals (Gessner *et al.* 2011 and references therein). Similarly, in medieval France, these fishes were mainly procured by monasteries and the ruling elite. According to 12th century sources from Montmajour Abbey, a Benedictine monastery in the vicinity of Rhone River, the monks had rights to first sturgeon catches of the year, i.e., the first “eggs sturgeon” (female) and “milk sturgeon” (male) (Stouff 1984; quoted in Desse-Berset 2011: 100). Similarly, in the city of Tarascon, the City Lord was presented each year

5. Sturgeon lack of resistance during catch has been a subject of several (18th to 20th century) accounts. Taube (1998: 33) believed beluga sturgeon to be “a stupid fish which does not know its own strength and allows itself to be caught easily”, although “sometimes it defends itself, smashes the boats and hurts fishermen” (translation by Živaljević). Petrović (1998a) speaks of similar attitudes of the Iron Gates fishermen towards beluga sturgeon, stellate sturgeon and sterlet (*Acipenser ruthenus* Linnaeus, 1758), which, once caught in nets, offer practically no resistance.

with the first caught sturgeon, accompanied by musicians and public manifestations. The price of sturgeon was exceptionally high (one fish cost half the price of a horse or a bull), and the city used to offer them to distinguished guests, including the King of France in 1448 (Desse-Berset 1994 and references therein). However, as in Hungary, in spite of ample written evidence, sturgeon bones are fairly rare on archaeological sites, mainly represented by dermal scute fragments (Desse-Berset 1994, 2011).

Although Ottoman sources from the 15th and 16th century were the first to explicitly mention sturgeons from the territory of Serbia, the unambiguous evidence of their consumption at Studenica and the aforementioned records from other parts of medieval Europe provide an interpretative framework to explore possible roles occupied by these fish in Eastern Orthodox monasteries. In the context of medieval Studenica, sturgeons (especially the enormous beluga) could have conveyed a multitude of meanings. First of all, in accordance with monastic ways of life, where one is expected to renounce worldly pursuits to devote oneself fully to the spiritual, refraining from meat placed particular emphasis on fish consumption. Nevertheless, fish was not perceived as a generic category, but rather classified as “lean” or “fatty” – and consumed accordingly. For example, in the *Studenica Typikon*, Sava Nemanjić instructs that the major event requiring fish from the Danube – the Feast of St Simeon the Myrrh-Streaming – should be celebrated strictly before Great Lent (cf. Jovanović 1994: 110, 111; Anđelković & Rakićević 2018: 92, 189). On the other hand, according to Metochites’ testimony, it would seem that these rules were not always strictly followed, at least in non-clerical contexts (Đurić 1986: 114, footnote 68).

This brings us to another question: given the evidence of elite control over the best fisheries in Serbia and other parts of medieval Europe, including the great demand for sturgeon as a commodity and delicacy, who were the consumers of these fishes at Studenica? The Orthodox cenobitic monasticism was based on the principles of “κοινὸβίον” (communal living, food preparation and eating), although some *typika* suggest that certain members of the monastic community could have had access to higher quality foodstuffs, on account of their ancestry, advanced education, virtue, age or contribution to the monastery. The aforementioned *Prodromic Poem* emphasizes the stark differences in the diet of the high monastery officials and ordinary monks, although this account is considered to be greatly exaggerated (Talbot 2007: 117-119).

The *Studenica Typikon* explicitly states that “each shall have the same food and drink, you shall not cook separately, I command you, not to thyself, nor to the Abbot, the steward, the ecclesiarch, nor to any other among the brethren dwelling in the flock” (Anđelković & Rakićević 2018: 183), however the guests of the monastery and the sick in the infirmary could have been served different meals. It should also be noted that the majority of pottery fragments at the site originated from small cooking vessels, indicative of individual meals or meals shared between two or three persons (Bikić 2015b; Popović 2015: 266). On the other hand, the celebrations of major feasts

were exceptional events, involving both the invited elite visitors and uninvited lower-class pilgrims. As previously noted, the *Studenica Typikon* instructions for celebrating the feast of St Simeon state that “food and drink should be distributed at the gates to whomever happens to be there on that day”, whereas the procurement of fish from Zeta and the Danube is mentioned in the next sentence, followed by “the ruler of this land shall be invited, as well as other Abbots” (Anđelković & Rakićević 2018: 189). It remains unclear whether the commonfolk at the gates would have been given similar foodstuffs to those served at the feast. According to various *typika*, the leftover bread from the refectory was commonly distributed to the beggars (Talbot 2007: 122), and, concerning the Dormition of the Mother of God Feast (the other major event at Studenica), the *Studenica Typikon* specifies that bread and wine should be distributed at the gate “as much as we are able, and may our hand [in that] be generous” (Anđelković & Rakićević 2018: 164). On the other hand, sturgeon transport and the fishes themselves were certainly costly, which suggests they were intended exclusively for the guests of honour and the monastery brotherhood. At least in part, the latter also consisted of persons of noble background. However, if the major feast at the monastery was to be an exception, sharing food with common people (who would not normally have the opportunity to eat high-quality fish or see specimens as large as sturgeon), could have served to elevate clerical authority and the cult of St Simeon, the ruler canonized as a saint. More importantly, the presence of subsequent kings of the Nemanjić dynasty and the abbots of other monasteries would have reinforced the role of Studenica as a cradle of this cult; the Feast of Remembrance serving as a locus where particular interconnections – most notably between religious and secular authority – were created and maintained. In other words, social relations and identities were constructed through repetitive performances, such as the annual or seasonal acquisition of high-quality (and often exceptionally large) fish, its display and consumption at important feasts.

CONCLUSIONS

Relevant written sources on fish trade and consumption in medieval Serbia and fish remains from Studenica analyzed within this study show a striking correlation. In addition to possibilities of local farming of certain pond species, they are indicative of complex trading networks supplying the monastery with fish from the wider surroundings (possibly the Ibar and the Morava rivers), but also from rivers as far as the Danube. A steady fish supply would have been of paramount importance in a monastic community, where particular regulations and dietary prohibitions defined daily life. Moreover, given the exceptional status of Studenica, some of the fish procured by the monastery served other purposes apart from Lenten fare. Historical sources suggest that there were various attitudes to different fish species, associated with fasting or specific celebrations, persons and events. Fish from the Danube was especially sought after; a delicacy fit to be served at major religious commemorations

and royal feasts. Species from the Zeta region (possibly both freshwater and marine) were held in similar regard, however there is currently no unambiguous evidence of their consumption at Studenica. A particular understanding and knowledge of fish diversity was also conveyed in the media, such as fresco paintings and glazed ware (cf. Bikić 2015a: 341). A 14th century fresco from Gračanica Monastery (Fig. 3) is particularly significant in this respect, combining the artist's familiarity with aquatic life (or, perhaps, their familiarity with an older iconographic theme which was copied) and images of the supernatural. It depicts various fish species (seemingly both freshwater and marine; one of them, with a pronounced rostrum and possibly rows of scutes bears resemblance to sturgeon), in addition to typical marine organisms (octopuses and bivalves), as well as supernatural beings.

Albeit fairly small and biased against small-bodied fish due to hand collection, the fish faunal assemblage from Studenica suggests that the monastery had access to the best catch. In case of carp, this could have been partly or entirely enabled by local farming, whereas the procurement of large catfish and especially sturgeon required careful planning, adequate preservation techniques and well-organized trading expeditions. As in other parts of medieval Europe, such enterprises (related to status and purchasing power) could be undertaken primarily by clerical and aristocratic upper classes. Moreover, as an endowment and the resting place of a prominent ruler turned saint, Studenica was associated with both political and religious origins of the medieval Serbian state, which were commemorated accordingly. Ultimately, the purchase and display of fish as large as beluga certainly produced a dramatic effect, inspired awe, and brought monastery celebrations to a higher level.

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REFERENCES

- AMEDOSKI D. 2006. — Zakup ribolova dunavske morune u XVI veku. *Mešovita grada* 27: 273-281. [Амедоски Д. 2006. — Закуп риболова дунавске моруне у XVI веку. *Мешовита грађа* 27: 273-281].
- ANAGNOSTAKIS I. (ed.) 2013a. — *Flavours and Delights. Tastes and Pleasures of Ancient and Byzantine Cuisine*. Armos Publications, Athens, Thessaloniki, 231 p.
- ANAGNOSTAKIS I. 2013b. — Byzantine delicacies, in ANAGNOSTAKIS I. (ed.), *Flavours and Delights. Tastes and Pleasures of Ancient and Byzantine Cuisine*. Armos Publications, Athens, Thessaloniki: 81-103.
- ANĐELKOVIĆ M. & RAKIĆEVIĆ T. (eds) 2018. — *Sveti Sava. Studenički tipik. Saint Sava. The Studenica Typikon*. Manastir Studenica, Studenica, 539 p. [Анђелковић М. & Ракићевић Т. (ур.) 2018. — *Свети Сава. Студенички Типик. Святой Савва. Студеницкий типикон*. Манастир Студеница, Студеница, 539 стр.].
- ANTIPA G. 1916. — *Pescăria și pescuitul în România*. Librariile Soces & Comp., C. Sfetea, Pavel Suru, București, 890 p.
- BABIĆ G., KORAĆ V. & ĆIRKOVIĆ S. 1986. — *Studenica*. Jugoslovenska revija, Beograd, Gorenjski tisk, Kranj, 200 p. [Бабић Г., Кораћ В. & Ћирковић С. 1986. — *Студеница*. Југословенска ревија, Београд, Горенски тиск, Крањ, 200 стр.].
- BALON E. K. 1974. — *Domestication of the Carp* *Cyprinus carpio* L. Royal Ontario Museum, Toronto, 37 p. [Coll. Life Sciences].
- BALON E. K. 1995. — Origin and domestication of the wild carp, *Cyprinus carpio*: from Roman gourmets to the swimming flowers. *Aquaculture* 129 (1-4): 3-48. [https://doi.org/10.1016/0044-8486\(94\)00227-F](https://doi.org/10.1016/0044-8486(94)00227-F)
- BALON E. K. 2004. — About the oldest domesticates among fishes. *Journal of Fish Biology* 65 (s1): 1-27. <https://doi.org/10.1111/j.0022-1112.2004.00563.x>
- BARRETT J. H. 1997. — Fish trade in Norse Orkney and Caithness: a zooarchaeological approach. *Antiquity* 71 (273): 616-638. <https://doi.org/10.1017/S0003598X00085367>
- BARRETT J. H. & ORTON D. C. (eds) 2016. — *Cod and Herring: the Archaeology and History of Medieval Sea Fishing*. Oxbow Books, Oxford, 282 p.
- BARTOSIEWICZ L. 1996. — Early medieval faunal remains from Pontes (Iron Gates Gorge, Eastern Serbia). *Acta Archaeologica Academiae Scientiarum Hungaricae* 48: 281-315.
- BARTOSIEWICZ L. & BONSALE C. 2004. — Prehistoric fishing along the Danube. *Antaeus* 27 (2004): 253-272.
- BARTOSIEWICZ L. & BONSALE C. 2008. — Complementary taphonomies: medieval sturgeons from Hungary, in BÉAREZ P., GROUARD S. & CLAVEL B. (eds), *Archéologie du poisson. 30 ans d'archéologie au CNRS. Hommage aux travaux de Jean Desse et Nathalie Desse-Berset*. Éditions APDCA, Antibes: 35-45.
- BARTOSIEWICZ L., BONSALE C. & ŞIŞU V. 2008. — Sturgeon fishing along the Middle and Lower Danube, in BONSALE C., BORONEANŢ V. (eds), *The Iron Gates in Prehistory: new perspectives*. *BAR International Series* (1893): 39-54.
- BEJENARU L. & STANC S. 2002. — La pêche dans certains habitats médiévaux sur le territoire de la Roumanie: données archéozoologiques. *Analele Ştiinţifice ale Universităţii "Al. I. Cuza" din Iaşi* 48: 226-232.
- BEJENARU L. 2003. — *Arheozoologia spaţiului românesc medieval*. Editura Universităţii "Al. I. Cuza", Iaşi, 254 p.
- BÉL M. 1984. — *Tractatus de Rustica Hungarorum: A magyarországi halakról és azok halászatáról (Fordító: Antal András Deák)*. Vízügyi Történeti Füzetek, Budapest, 76 p. [1st ed. 1764].
- BENCsik J. 1970. — Egy jobbágyközség gazdasági, társadalmi élete az úrbérrendezéstől a jobbágyfelszabadításig. *Acta Universitatis de Ludovico Kossuth Nominatae Series Historica* 10: 49-91.
- BIKIĆ V. 2015a. — Hronološki, tehnološki i stilski okvirni gledišane keramike u Srbiji: primer manastira Studenice, in POPOVIĆ M. (ed.), *Manastir Studenica – arheološka istraživanja*. Republički zavod za

- zaštitu spomenika kulture, Arheološki institut, Beograd: 337-360. [Бикић В. 2015а. — Хронолошки, технолошки и стилски оквири глеђосане керамике у Србији: пример Манастира Студенице, у ПОПОВИЋ М. (Ур.), *Манастир Студеница – археолошка истраживања*. Републички Завод за заштиту споменика културе, Археолошки институт, Београд: 337-360.]
- VIKIĆ V. 2015b. — Posuđe i kuvanje u manastiru Studenici u 13-14 veku: analiza tragoва upotrebe. *Arhaika* 3 (2015): 167-190. [Бикић В. 2015б. — Посуђе и кување у манастиру Студеници у 13-14 веку: анализа трагова употребе. *Архаика* 3 (2015): 167-190].
- BLAGOJEVIĆ M. 1988. — Studenica – zaštitnica srpske države, in KORAĆ V. (ed.), *Studenica i vizantijska umetnost oko 1200. godine*. Srpska akademija nauka i umetnosti, Beograd: 56-61. [Благојевић М. 1988. — Студеница – заштитница српске државе, у КОРАЋ В. (ур.), *Студеница и византијска уметност око 1200. године*. Српска академија наука и уметности, Београд: 56-61].
- BORIĆ D. 2003. — *Seasons, Life Cycles and Memory in the Danube Gorges, c. 10000-5500 BC*. Unpublished PhD dissertation, University of Cambridge. <https://doi.org/10.17863/CAM.19085>
- BRINKHUIZEN D. C. 1986. — Features observed on the skeletons of some recent European Acipenseridae: their importance for the study of excavated remains of sturgeon, in BRINKHUIZEN D. C. & CLASON A. T. (eds), *Fish and Archaeology. Studies in osteometry, taphonomy, seasonality and fishing methods*. *BAR International Series* 294: 18-33.
- BUTLER V. L. & CHATTERS J. C. 1994. — The role of bone density in structuring prehistoric salmon bone assemblages. *Journal of Archaeological Science* 21 (3): 413-424. <https://doi.org/10.1006/jasc.1994.1039>
- CASEAU B. 2015. — *Nourritures terrestres, nourritures célestes: la culture alimentaire à Byzance*. ACHCByz, Paris, 345 p. [Coll. Monographies; 46].
- CLAVEL B. 2001. — L'animal dans l'alimentation médiévale et moderne en France du Nord (XIII^e-XVII^e siècles). *Revue archéologique de Picardie* (NS 19): 9-204. <https://doi.org/10.3406/pica.2001.3065>
- CLAVEL B. (éd.) 2006. — *Production alimentaire et lieux de consommation dans les établissements religieux au Moyen Âge et à l'époque Moderne: actes du colloque de Lille, 16, 17, 18 et 19 octobre 2003*. Centre d'archéologie et d'histoire médiévale des établissements religieux, Amiens, 325 p.
- CLAVEL B. 2013. — La pêche et la consommation du poisson en pays d'Aunis (Charente-Maritime) au bas Moyen Âge et au début de l'époque Moderne: premiers résultats des analyses archéozoologiques, in DAIRE M.-Y., DUPONT C., BAUDRY A., BILLARD C., LARGE J.-M., LESPEZ L., NORMAND E. & SCARRE C. (éds), *Anciens peuplements littoraux et relations homme/milieu sur les côtes de l'Europe atlantique. Ancient maritime communities and the relationship between people and environment along the European Atlantic coasts*. *BAR International Series* 2570: 429-435.
- DALBY A. 2010. — *Tastes of Byzantium: the Cuisine of a Legendary Empire*. IB Tauris, London, New York, 268 p.
- DESSE-BERSET N. 1994. — Sturgeons of the Rhône during Protohistory in Arles (6th-2nd century BC), in VAN NEER W. (ed.), *Fish Exploitation in the Past. Proceedings of the 7th meeting of the ICAZ Fish Remains Working Group*. Koninklijk Museum voor Midden-Africa, Tervuren: 81-90. [Coll. Zoologische Wetenschappen; 274]
- DESSE-BERSET N. 2011. — Ancient sturgeon populations in France through archaeozoological remains, from prehistoric time until the eighteenth century, in WILLIOT P., ROCHARD E., DESSE-BERSET N., KIRSCHBAUM F. & GESSNER J. (eds), *Biology and Conservation of the European Sturgeon Acipenser sturio L. 1758*. Springer, Berlin, Heidelberg: 91-115.
- DRECUN Đ. & RISTIĆ M. 1972. — Biologija, morfološke karakteristike i rasteње krapa Skadarskog jezera. *Croatian Journal of Fisheries: Ribarstvo* 27 (2): 21-41.
- ĐURIĆ I. 1986. — Teodor Metohit, in BARIŠIĆ F. & FERJANČIĆ B. (eds), *Vizantijski izvori za istoriju naroda Jugoslavije. Tom VI*. Vizantološki institut Srpske akademije nauka i umetnosti, Beograd: 63-143. [Ђурић И. 1986. — Теодор Метохит, у БАРИШИЋ Ф. & ФЕРЈАНЧИЋ Б. (ур.), *Византијски извори за историју народа Југославије. Том VI*. Византолошки институт Српске академије наука и уметности, Београд: 63-143].
- GALIK A., SCHNEIDER M.-T. & FORSTENPOINTNER G. 2011. — Die tierischen Überreste aus einer spätmittelalterlichen Latrine im Augustiner Chorherrenstift in St Pölten, in RISY R. (ed.), *St Pölten: kompakt. (Band 1). Begleitpublikation zur gleichnamigen Ausstellung im Stadtmuseum St Pölten 2011/12*. Stadtmuseum St Pölten, St Pölten: 91-103.
- GESSNER J., SPRATTE S. & KIRSCHBAUM F. 2011. — Historic overview on the status of the European Sturgeon (*Acipenser sturio*) and its fishery in the North Sea and its tributaries with a focus on German waters, in WILLIOT P., ROCHARD E., DESSE-BERSET N., KIRSCHBAUM F. & GESSNER J. (eds), *Biology and Conservation of the European Sturgeon Acipenser sturio L. 1758*. Springer, Berlin, Heidelberg: 195-219. https://doi.org/10.1007/978-3-642-20611-5_14
- GIANNETTO D. L., POMPEI L., CAROSI A., DOLCIAMI R., GHETTI L. & LORENZONI M. 2016. — Length-weight relationships of three fish species from Trasimeno Lake, Italy. *Journal of Applied Ichthyology* 32 (6): 1273-1275. <https://doi.org/10.1111/jai.13140>
- HÄBERLE S. & MARTI-GRÄDEL E. 2006. — Die Teichwirtschaft vom Mittelalter bis in die Frühe Neuzeit, in HÜSTER PLOGMANN H. (ed.), *Fisch und Fischer aus zwei Jahrtausenden – eine fischereiwirtschaftliche Zeitreise durch die Nordwestschweiz, Forschungen in Augst*, 39. Römermuseum Augst, Augst: 149-159.
- HAIMOVIĆI S. 1999. — Studijal resturilora animaliera, datate în sec. IX-X, descoperite în ruinele unui așezământ monahal paleocreștin de la Dumbrăveni, jud. Constanța. *Acta Moldavie Septentrionalis* 1: 291-310.
- HOFFMANN R. 2001. — Frontier foods for late medieval consumers: culture, economy, ecology. *Environment and History* 7 (2): 131-167.
- HOFFMANN R. 2009. — Strekufusz – A fish dish links Jagiellonian Krakow to distant waters, in GORECKI P. & VAN DEUSEN N. (eds), *Central and Eastern Europe in the Middle Ages: a Cultural History*. I. B. Tauris, London, New York: 116-124.
- HOLČIK J. (ed.) 1989. — *The Freshwater Fishes of Europe. Vol. 1, Part II: General Introduction to Fishes: Acipenseriformes*. Aula, Wiesbaden, 469 p.
- HRISTIĆ Đ. 1990. — Izmjena sastava ihtiofaune reke Ibra pod uticajem zagađenja od dela industrije Kosova. *Croatian Journal of Fisheries: Ribarstvo* 45: 51-55.
- JANKOVIĆ D. 2010. — Serbia – Part of the south zone of the range of distribution of the European grayling (*Thymallus thymallus* L.). *Archives of Biological Sciences* 62 (1): 115-121. <https://doi.org/10.2298/ABS1001115J>
- JOVANOVIĆ T. (ed.) 1994. — *Studenički tipik – Carostavnik manastira Studenice: Upporedni prevod*. Zavod za udžbenike, Beograd, 313 p. [Јовановић Т. (ур.) 1994. — *Студенички типик – Цароставник манастира Студенице: Упоредни превод*. Завод за удџбенике, Београд, 313 стр.]
- KOPRIVICA M. 2017. — “Kraljevski manastiri” u srednjovekovnoj Srbiji, in MIŠIĆ S. (ed.), *Srpska kraljevstva u srednjem veku*. Centar za istorijsku geografiju i istorijsku demografiju Filozofskog fakulteta, Beograd, Filozofski fakultet, Odsek za istoriju, Novi Sad, Centar za vizantijsko-slovenske studije, Niš, Grad Kraljevo, Kraljevo: 147-162. [Копривица М. 2017. — “Краљевски манастири” у средњовековној Србији, у Мишић С. (ур.), *Српска краљевства у средњем веку*. Центар за историјску географију и историјску демографију Филозофског факултета, Београд, Филозофски факултет, Одсек за историју, Нови Сад, Центар за византијско-словенске студије, Ниш, Град Краљево, Краљево: 147-162].
- KOTTELAT M. & FREYHOF J. 2007. — *Handbook of European Freshwater Fishes*. Kottelat, Cornol, 646 p.
- LEPKSAAR J. 1994. — *Introduction to Osteology of Fishes for Paleozoologists*. [3rd ed.]. Göteborg, 96 p.
- LOPIČIĆ J. 1953. — Ceplinski ribolov. *Croatian Journal of Fisheries: Ribarstvo* 8 (5): 97-101.

- MAKSAY F. (ed.) 1959. — *Urbáriumok XVI-XVII. század.* Akadémiai Kiadó, Budapest, 895 p.
- MARKOVIĆ N. 2015. — Ishrana u manastiru Studenici: arheozoološka svedočanstva, in POPOVIĆ M. (ed.), *Manastir Studenica – arheološka istraživanja*. Republički zavod za zaštitu spomenika kulture, Arheološki institut, Beograd: 395-406. [MARKOVIĆ N. 2015. — Исхрана у манастиру Студеници: археозоолошка сведочанства, у ПОПОВИЋ М. (ур.), *Манастир Студеница – археолошка истраживања*. Републички завод за заштиту споменика културе, Археолошки институт, Београд: 395-406].
- MARKOVIĆ N., RADIŠIĆ T. & VIKIĆ V. 2016. — Uloga živine u srednjovekovnoj ekonomiji manastira Studenice, in MILADINOVIĆ-RADMILOVIĆ N. & VITEZOVIĆ S. (eds), *Bioarchaeology in Balkans. Methodological, comparative and reconstructive studies of life in the past. Papers of the Bioarchaeological section of The Serbian Archaeological Society/Bioarheologija na Balkanu. Metodološke, komparativne i rekonstruktivne studije života u prošlosti. Radovi Bioarheološke sekcije Srpskog arheološkog društva*. Srpsko arheološko društvo, Blago Sirmijuma, Beograd-Sremska Mitrovica: 99-116.
- MARSIGLI L. F. 1726. — *Danubius Pannonico-Mysicus: observationibus geographicis, astronomicis, hydrographicis, historicis, physicis perlustratus et in sex tomos digestus*. Comitum, apud P. Gosse, R. C. Alberts, P. de Hondt, Hagae, Uytwerf & Changuion, Amsterdam, 876 p.
- MILADENOVIĆ A. 2003. — *Povelje kneza Lazara*. Čigoja, Beograd, 368 p. [МЛАДЕНОВИЋ А. 2003. — *Повеље кнеза Лазара*. Чигоја, Београд, 368 стр.].
- MILOŠEVIĆ D. & MRDAK D. 2016. — Length-weight relationship of nine fish species from Skadar Lake (Adriatic catchment area of Montenegro). *Journal of Applied Ichthyology* 32 (6): 1331-1333. <https://doi.org/10.1111/jai.13163>
- MILOŠEVIĆ D. & TALEVSKI T. 2015. — Conservation status of native species in natural lakes of Drim system (Prespa, Ohrid and Skadar lake) and dangers of commercial fishing. *Bulgarian Journal of Agricultural Science* 21 (Supplement 1): 61-67.
- MIŠIĆ S. 2007. — *Korišćenje unutrašnjih voda u srpskim zemljama srednjeg veka*. Утопија, Београд, 228 p. [МИШИЋ С. 2007. — *Коришћење унутрашњих вода у српским земљама средњег века*. Утопија, Београд, 228 стр.].
- MORALES A. & ROSENBLUND K. 1979. — *Fish Bone Measurements. An Attempt to Standardize the Measuring of Fish Bones from Archaeological Sites*. Steenstrupia, Copenhagen, 48 p.
- MOŠIN V., ČIRKOVIĆ S. & SINDIK D. (eds) 2011. — Hrisovulja velikog župana Stefana Nemanje manastiru Studenici, in MOŠIN V., ČIRKOVIĆ S. & SINDIK D. (eds), *Zbornik srednjovekovnih čiriličkih povelja i pisama Srbije, Bosne i Dubrovnika, Knjiga I (1186-1321)*. Istorijski institut Beograd, Beograd: 61-63. [МОШИН В., ЋИРКОВИЋ С. & СИНДИК Д. (ур.) 2011. — Хрисовуља великог жупана Стефана Немање манастиру Студеници, у МОШИН В., ЋИРКОВИЋ С. & СИНДИК Д. (ур.), *Зборник средњовековних ћириличких повеља и писама Србије, Босне и Дубровника, Књига I (1186-1321)*. Историјски институт Београд, Београд: 61-63].
- MRDAK D. 2009. — *Environmental Risk Assessment of the Morača Dams: Fish Fauna of Morača River Canyon and Skadar Lake*. WWF MedPO, Rome; Green Home, Podgorica, 67 p.
- MRDAK D., PALLUQI A., FLLOKO A., KAPEDANI E., RADOVICKA B., MIRAKU T., MILOŠEVIĆ D. & DESPOTOVIĆ V. 2015. — Fish monitoring and fisheries. Skadar/Shkodra. Final report, in MRDAK D., PALLUQI A., FLLOKO A., KAPEDANI E., RADOVICKA B., MIRAKU T., MILOŠEVIĆ D. & DESPOTOVIĆ V., *Initial Characterisation of Lakes Prespa, Ohrid and Shkodra/Skadar*. Deutsche Gesellschaft für Internationale Zusammenarbeit, Bonn, Eschborn: 167-233.
- MRDAK D., MILOŠEVIĆ D., DESPOTOVIĆ V., PALLUQI A., FLLOKO A., KAPEDANI E., KAPEDANI R., RADOVICKA B., MIRAKU T., PIETROCK M. & RITTERBUSCH D. 2017. — *Fish and Fisheries Skadar/Shkodra Lake*. Deutsche Gesellschaft für Internationale Zusammenarbeit, Bonn, Eschborn, 87 p.
- ORTON D. C., MORRIS J., LOCKER A. & BARRETT J. H. 2014. — Fish for the city: meta-analysis of archaeological cod remains and the growth of London's northern trade. *Antiquity* 88 (340): 516-530. <https://doi.org/10.1017/S0003598X00101152>
- PETROVIĆ M. 1998a. — Џердапски риболови у прошлости и садашњости, in TRIFUNOVIĆ D. (ed.), *Ribarstvo. Sabrana dela Mihaila Petrovića*. Zavod za udžbenike i nastavna sredstva, Beograd: 175-270. [1st ed. 1941]. [ПЕТРОВИЋ М. 1998а. — Ћердапски риболови у прошлости и садашњости, у ТРИФУНОВИЋ Д. (ур.), *Рибарство. Сабрана дела Михаила Петровића*. Завод за уџбенике и наставна средства, Београд: 175-270].
- PETROVIĆ M. 1998b. — Omanji ribnjaci za gajenje šarana, in TRIFUNOVIĆ D. (ed.), *Ribarstvo. Sabrana dela Mihaila Petrovića*. Zavod za udžbenike i nastavna sredstva, Beograd: 333-339. [1st ed.: 1900] [ПЕТРОВИЋ М. 1998б. — Омањи рибњаџи за гајење шарана, у ТРИФУНОВИЋ Д. (ур.), *Рибарство. Сабрана дела Михаила Петровића*. Завод за уџбенике и наставна средства, Београд: 333-339].
- PIROGOVSKII M. I., SOKOLOV L. I. & VASIL'EV V. P. 1989. — *Huso* (Linnaeus, 1758), in HOLČIK J. (ed.), *The Freshwater Fishes of Europe*. Vol. 1, Part II: *General Introduction to Fishes Acipenseriformes*. Aula, Wiesbaden: 156-200.
- POPOVIĆ M. 2015. — *Manastir Studenica – arheološka istraživanja*. Republički zavod za zaštitu spomenika kulture, Arheološki institut, Beograd, 408 p. [ПОПОВИЋ М. 2015. — *Манастир Студеница – археолошка истраживања*. Републички завод за заштиту споменика културе, Археолошки институт, Београд, 408 стр.].
- RADU V. 2003. — *Exploitation des ressources aquatiques dans les cultures néolithiques et chalcolithiques de la Roumanie méridionale*. Thèse de Doctorat, Université de Provence Aix-Marseille I.
- RADU V. 2005. — *Atlas for the Identification of Bony Fish Bones from Archaeological Sites*. Editura Contrast, București, 77 p.
- RISTIĆ M. 1938. — Konzerviranje slatkovodnih riba. *Croatian Journal of Fisheries: Ribarstvo* 1 (1-2): 11-20.
- RISTIĆ M. 1977. — *Ribe i ribolov u slatkim vodama*. Nolit, Beograd, 330 p.
- SCHIBLER J. & HÜSTER PLOGMANN H. 1996. — Tierknochenfunde aus mittelalterlichen Latrinen als Informationsquelle zur Wirtschafts-, Sozial-, Kultur- und Umweltgeschichte, in KAMBER P. & KELLER C. (eds), *Fundgruben – stille Örtchen ausgeschöpft*. Historisches Museum, Basel: 77-86.
- SHUBINA T. N., POPOVA A. A. & VASIL'EV V. P. 1989. — *Acipenser stellatus* Pallas, 1771, in HOLČIK J. (ed.), *The Freshwater Fishes of Europe*. Vol. 1, Part II: *General Introduction to Fishes Acipenseriformes*. Aula, Wiesbaden: 395-433.
- SIMONOVIĆ P. 2001. — *Ribe Srbije*. NNK Internacional, Biološki fakultet Univerziteta u Beogradu, Zavod za zaštitu prirode Srbije, Beograd, 247 p.
- STANC S. & BEJENARU L. 2008. — Fishing in the territory between the Danube and the Black Sea, in the IV-XVIIth centuries: archaeozoological data. *Analele Științifice ale Universității "Al. I. Cuza" din Iași* (2008): 273-277.
- STANC S., RADU V. & BEJENARU L. 2006. — Fishing in the Byzantine fortress of Oltina: archaeozoological data. *Analele Științifice ale Universității "Al. I. Cuza" din Iași* (2006): 273-279.
- STANC S., RADU V. & BEJENARU L. 2009. — Cyprinid fishing in Dobrudja (Romania) from prehistory to the Middle Ages, in MAKOWIECKI D., HAMILTON-DYER S., RIDDLER I., TRZASKA-NARTOWSKI N. & MAKOHONIENKO M. (eds), *Fishes – Culture – Environment through Archaeoichthyology, Ethnography & History. 15th Meeting of the ICAZ Fish Remains Working Group (FRWG), September 3-9, 2009, Poznań & Toruń, Poland*. Bogucki Wydawnictwo Naukowe, Poznań: 108-113.
- SZPAK P. 2011. — Fish bone chemistry and ultrastructure: implications for taphonomy and stable isotope analysis. *Journal of Archaeological Science* 38 (12): 3358-3372. <https://doi.org/10.1016/j.jas.2011.07.022>

- ŠORIĆ V. 2009. — Ichthyofauna of middle course of the Ibar, tributary of the Zapadna Morava (the Danube system) and comparative review of ichthyofauna of other tributaries with special retrospective view on taxonomic state of species. *Natura Montenegrina* 8 (3): 125-136.
- STOUFF L. 1984. — Saint-Pierre de Montmajour et la ville d'Arles, in VICAIRE M.-H. (ed.), Les Moines Noirs (XII^e-XIV^e s.). *Cahiers de Fanjeaux* 19: 263-286.
- TALBOT A.-M. 2007. — Mealtime in monasteries: the culture of the Byzantine refectory, in BRUBAKER L. & LINARDOU K. (eds), *Eat, Drink, and be Merry (Luke 12:19) – Food and Wine in Byzantium: Papers of the 37th Annual Spring Symposium of Byzantine Studies, in Honour of Professor A. A. M. Bryer*. Ashgate Variorum, Aldershot, Burlington: 109-125.
- TALEVSKI T., MILOŠEVIĆ D., MARIĆ D., PETROVIĆ D., TALEVSKA M. & TALEVSKA A. 2009. — Anthropogenic influence on biodiversity of ichthyofauna and macrophyte vegetation from Lake Ohrid and Lake Skadar. *Journal of International Environmental Application of Science* 4 (3): 317-324.
- TAUBE F. W. VON 1998. — *Istorijski i geografski opis Kraljevine Slavonije i Vojvodstva Srema* (translated from German by Boško Petrović). Matica srpska, Novi Sad, 256 p. [1st ed. 1777]. [ТАУБЕ Ф. В. ФОН. 1998. — *Историјски и географски опис Краљевине Славоније и Војводства Срема* (превео с немачког Бошко Петровић). Матица српска, Нови Сад, 256 стр.]
- TÓTH P. & KUBINYI A. (eds) 1996. — *Miskolc története I. A kezdetektől 1526-ig*. Borsod-Abaúj-Zemplén Megyei Levéltár-Herman Ottó Múzeum, Miskolc, 495 p.
- VAN NEER W. & ERVYNCK A. 2004. — Remains of traded fish in archaeological sites: indicators of status, or bulk food?, in JONES O'DAY S., VAN NEER W. & ERVYNCK A. (eds), *Behaviour Behind Bones: the Zooarchaeology of Ritual, Religion, Status and Identity*. Oxbow Books, Oxford: 203-214.
- VLASENKO A. D., PAVLOV A. V., SOKOLOV L. I. & VASIL'EV V. P. 1989. — *Acipenser gueldenstaedti* Brandt, 1833, in HOLČIK J. (ed.), *The Freshwater Fishes of Europe*. Vol. 1, Part II: *General Introduction to Fishes Acipenseriformes*. Aula, Wiesbaden: 294-332.
- ZEGA N. 1927. — Ribolov na Donjem Dunavu. *Etnolog* 1 (1926/1927): 36-40.
- ZIROJEVIĆ O. 2011. — Ribolov na Dunavu. *Spomenica Istorijskog arhiva "Srem"* 10: 13-31. [ЗИРОЈЕВИЋ О. 2011. — Риболов на Дунаву. *Споменица Историјског архива "Срем"* 10: 13-31].
- ŽIVALJEVIĆ I. 2017. — *Ribolov na Đerđapu u ranom holocenu (10. - 6. milenijum pre n. e.)*. PhD dissertation, University of Belgrade.
- ŽIVALJEVIĆ I., ASKEYEV V., GALIMOVA D. N., ASKEYEV O. V., MONAKHOV S. P. & STEFANOVIĆ S. (in press). — Size estimations of sturgeons (Acipenseridae) from the Mesolithic-Neolithic Danube Gorges, in BORIĆ D., ANTONOVIĆ D. & STEFANOVIĆ S. (eds), *Proceedings of the 9th Conference on the Mesolithic in Europe*. Oxbow Books, Oxford.
- ŽIVKOVIĆ T., PETROVIĆ V. & UZELAC A. (eds) 2013. — *Anonymi Descriptio Europae Orientalis/Anonym's Description of Eastern Europe*. Istorijски institut Beograd, Beograd, 221 p. [ЖИВКОВИЋ Т., ПЕТРОВИЋ В. & УЗЕЛАЦ А. (ур.) 2013. — *Anonymi Descriptio Europae Orientalis/Анонимов опис Источне Европе*. Историјски институт Београд, Београд, 221 стр.]

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