Vita Antiqua № 14 2023 p. 184-210

Fishes in the economy of ancient Greek colonies (600 BC — 300 AD) on the Northern Black Sea coast — new touches to an old portrait

Volynskiy Tyt

MSc student, Department of Archaeology and Museology, Taras Shevchenko National University of Kyiv, 60 Volodymyrska St, Kyiv 01033, Ukraine, e-mail: titvolynskiy@gmail.com, ORCID: 0009-0004-1744-2371.

Kovalchuk Oleksandr

DSc, Leading Researcher, Department of Palaeontology, National Museum of Natural History, National Academy of Sciences of Ukraine, 15 Bogdan Khmelnytskyi St, Kyiv 01054, Ukraine; Associate Professor, Department of Palaeozoology, Faculty of Biological Sciences, University of Wrocław, 21 Sienkiewicza St, Wrocław 50-335, Poland, e-mail: biologiest@ukr.net, ORCID: 0000-0002-9545-208X.

The article presents the results of a thorough study of fish remains recovered during the excavations of three ancient Greek cities (Olbia, Berezan and Chornomorka) in the northern part of the Black Sea coast. These materials are dated in the range of 600 BC — 300 AD (in the case of Olbia and Berezan), and 600–400 BC for Chornomorka. Fish bones were processed for the identification of species used by the inhabitants of these ancient cities for food. The remains of about ten fish species are present in the studied sample. Of them, sturgeons (*Acipenser* spp.) were the most numerous in the region at that time. The other species which were usually caught in these ancient Greek cities are mostly represented by carp fishes (roach, common bream, white bream, blue bream, common carp, and crucian carp), but also European catfish *Silurus glanis*, pike *Esox lucius*, and pikeperch *Sander lucioperca*. The weight and size of some fish individuals were reconstructed based on complete bones. Comparison of the specimens from individual samples (series) showed no significant differences in their total length and weight.

Keywords: Olbia, antiquity, Berezan, archaeozoology, fishing, ancient Greeks, Black Sea.

Introduction

The economic activity of ancient settlements of the Northern Black Sea region is of interest to archaeologists for a long time. Many of the aspects of this activity, such as agriculture, crafts, and architecture, have been explored quite well (e.g., Christodoulou 2016 and references therein). At the same time, fishery, an important direction of the economy of coastal cities providing a valuable animal protein, often falls out of the scope of research interests. A significant amount of materials collected by archaeologists in the north of the Black Sea coast during the 20th century is still not processed and remains unpublished. Therefore, it is difficult to create a holistic picture of the economy of ancient Greek cities.

A valuable information about fishing and fish consumption in ancient cities of the Northern Black Sea region according to archaeological data and osteological collections is presented in Lebedev (1960), Zhiteneva (1964), Hojte (2005), Morales et al. (2007) and Odrin (2010). A few recent publications (Katerini 2004; Bylkova & Yanish 2010; Yanish & Antipina 2013; Yanish & Kovalchuk 2013) are focused on the fish osteological material from ancient Greek cities discovered on the Northern Black Sea coast.

Archaeozoological studies can show how important fish was in the diet of people, which species were preferred, and how intensive was fishing in this region in different periods. In addition, it is possible to find out whether there was a fish trade between these cities using the ratio of cranial and postcranial elements of the skeleton. Such studies can prove or disprove the statements of Strabo or Herodotus, who wrote about the culinary preferences of ancient Greeks. Therefore, the aim of this article is to present in detail the results of the study of fish bone samples from Olbia, Berezan and Chornomorka in the range from their formation (600 BC) until the end of the Roman period (300 AD). By comparing data from different periods, it is possible to track the role of fishery in the economy of these settlements and its dynamics over time.

Material and methods

The material for the study is represented by fish remains (1701 specimens, including 1414 diagnostic) which were collected during archaeological excavations of three monuments (Olbia, Berezan and Chornomorka) in 1933–1938 and 1988 (Fig. 1). This sample is housed in the Department of Palaeontology of the National Museum of Natural History (NMNHU-P), National Academy of Sciences of Ukraine.

Most of the fish remains considered come from Olbia (829 specimens) and Berezan (839 specimens) and represent the interval of 600 BC — 300 AD. Only 33 bones are available from Chornomorka, and they were dated on 600–400 BC. Fish remains analysed come from different localities and differ in age. Therefore, the general sample was subdivided into nine parts (series) reflecting both geographic and chronological characteristics of the studied material. Those series are the following: Olbia (600–400 BC, 300–100 BC, Hellenism–Rome, 100–300 AD, uncertain age), Berezan (600–400 BC, 1–300 AD, uncertain age), and Chornomorka 600–400 BC. The Hellenism–Rome period is quite extensive and covers the time span of 336 BC — 400 AD.

Fig. 1. *Google Earth map showing the studied localities.*

Рис. 1 *Карта Google Earth із зазначенням досліджуваних поселень.*

Such initial archaeological dating is recorded on the surface of some of the bones considered and/or on the labels placed in boxes with them. Since there is no certainty as to which exact century this material belongs to, fish remains with such a dating were placed in a separate series.

Anatomical determination of skeletal elements and taxonomic identification of fish remains were carried out using the comparative osteological collection of the NMNHU-P, and illustrations presented by Radu (2005). The fish systematics in this paper follows Nelson et al. (2016). The nomenclature of skeletal elements is presented according to Thieren et. al. (2015) for sturgeons (Acipenseridae) and Radu (2005) for other families. The measurements were taken with a digital caliper, with an accuracy of 0.1 mm. A total of 349 bones from the general sample were considered suitable to reconstruct body size and estimate the weight of fishes. Each bone in the sample was considered to be an equivalent of a single fish individual (Lebedev 1960), albeit such estimation seems to be oversimplified and should be considered with caution.

We also paid attention to the ratio between the number of cranial and postcranial elements, because it can indirectly indicate the tradeship involving fish products (Yanish & Antopina 2013; Kovalchuk 2014).

To establish these approximate parameters, several special publications were used. Those are Radke et al. (2000) for approximation of the total length (TL) of cyprinids based on

pharyngeal teeth, Brinkhuizen (1989) and Tarkan et. al. (2007) for the same purpose but using cranial bones (the former also was used to establish the TL of *Esox lucius*). For some cyprinid bones (e.g., maxilla), the direct estimation of TL was impossible, so we used the results of fork length (FL) reconstruction presented by Britton and Shepherd (2005) and Gaygusuz (2006). The TL of *Sander lucioperca* was established according to Askeyev (2013). The TL and weight approximations for *Silurus glanis* were performed based on the known morphometric parameters of specimens from the comparative osteological collection of the NMNHU-P. To establish the weight of some other fish species, we used the following publications: Shuman el. al. (2022) for the roach *Rutilus rutilus*, Khristenko & Kotovska (2017) for the common bream *Abramis brama*, Okgerman el. al. (2012) for the white brean *Blicca bjoerkna*, Vilizzi et. al. (2013) for the common carp *Cyprinus carpio*, Kahraman et.al. (2014) for pike *Esox lucius*, and Pérez-Bote and Roso (2011) for zander *Sander lucioperca*.

Regarding the sturgeons, osteological material in the comparative collection is quite limited for a proper qualitative identification of particular species. Therefore, all the species from this family (except of those belonging to *Huso*) were identified as *Aciperser* spp. (this genus can be represented in this sample by three species — *Acipenser ruthenus, Acipenser stellatus,* and *Acipenser gueldenstaedtii*). Živaljević et. al. (2021) was used to establish the TL of sturgeons. We implemented formulas from this article for *Acipenser ruthenus* as the smallest species (minimum) and for *Acipenser gueldenstaedtii* as the largest species (maximum). If any bone belonged to *Acipenser stellatus*, its size would lay in between the results obtained for other two species. Margaritova & Uzunova (2020) was applied for weight reconstruction of sturgeons.

Results and discussion.
General characteristics of the sample

The general sample includes 1701 specimens. Of them, 1611 bones were processed anatomically, and it was possible to assign 1414 bones to a particular species, genus or family level. At least 11 species representing five families (Acipenseridae, Cyprinidae, Siluridae, Esocidae, and Percidae) are in the considered material (table 1). The number of species could be somewhat larger due to a more detailed identification of sturgeon remains, although it was impossible at this stage (see above).

A large part of the processed material belongs to *Acipenser* spp. (NISP 875), the remains of which predominate both in the general sample (51.4%) and in each individual series. In addition, there are some bones assigned to *Huso huso*, albeit the remains of this species are much lesser numerous (NISP 34), and almost half of them (15 specimens) comes from a single series — Berezan 600–400 BC (table 11).

The second largest group of remains (NISP 257; 15.1% of the general sample) belongs to carp fishes (Cyprinidae). It was possible to identify the presence of six species, two of which predominate numerically — the common carp *Cyprinus carpio* (NISP 73) and bream *Abramis brama* (NISP 68). Other cyprinids are represented by a smaller number of specimens and mostly confined a series of Olbia 300–100 BC (table 5).

The remains of percid fishes are also numerous in the sample (NISP 193), being represented by zander *Sander lucioperca*) as well as a number of vertebrae and some other bones that were identified only to the family level. Even though there are generally more carp fish remains than those of percids, the second ones are represented more widely and are present in all of the series, while carp fish bones are present everywhere except for two series — Berezan 600–400 BC (table 11) and Olbia Hellenism-Rome (table 8). More than half of carp fish remains (137 of 257 bones) are in the series of Olbia 300–100 BC (table 5). Such a ratio is similar to that in percids, almost half of which belong to the series of Berezan 600–400 BC (table 11).

Catfish bones constitute the fourth group in terms of the number of remains (NISP 51), and they are represented by a single species — the European catfish *Silurus glanis*. Of them, 34 specimens come from the series of Olbia uncertain age (table 10), while only two bones were found in the material from Berezan.

The last and the less numerous group of remains from the studied localities belongs to a pike *Esox lucius*. Only four bones were recognised and all of them come from the series of Olbia 300–100 BC (table 4).

The general sample includes 613 cranial and 909 postcranial elements as well as 89 bones, the anatomical position of which is uncertain (table 2). The first pectoral fin spine is the most numerous: there are 338 specimens including 295 ones of *Acipenser* spp. (table 3). Vertebrae and cleithra are also numerous (n=212 and 142, respectively). As for the cranial bones, the most frequently found among them are subopercles (n=98), mostly belonging to sturgeons, and opercles (n=85), 76 of which belong to cyprinids.

Analysis of individual series

Olbia 600–400 BC

The series consists of 41 bones, 80.5% of which belong to *Acipenser* spp. (NISP 33). All the other bones are either unidentified or represented by a single specimen per family (table 4). Most of the sturgeon remains is represented by postcranial bones (n=23), more precisely by the pectoral fin spine (n=21). It would be too bold to conclude that all these fish individuals have been imported, although such explanation is possible. Inhabitants of Olbia preferred sturgeons compared to other fish (Bylkova & Yanish 2010).

Reconstruction of the body length and weight was only possible for *Acipenser* spp. (table 6). The average weight of sturgeons from Olbia is lesser by approximately 300–700 g (11–26 %) than that from Berezan, and their body size is lesser by 3–6 cm (4–8 %) as compared to the respective value for the latter (table 7). At the same time, the specimens analysed herein are significantly larger than that from the same period described by Yanish & Kovalchuk (2013) from Berezan: the difference in means is 12–24 kg and 19–60 cm. It can be explained by the fact that the sample of the previous study was too small (six individuals vs. 21 ones considered herein). It is also possible that larger specimens got to other researchers by accident. It is not relevant to compare in this respect the samples from Olbia and Chornomorka, because the latter includes only a single specimen suitable for the reconstruction of

body size and weight (table 7).

Olbia 300–100 BC

A total of 335 bones are represented in the series (table 5). Of them, 137 specimens (40.9%) belong to cyprinids. Sturgeons *Acipenser* spp. are also numerous (NISP 98; 29.3%). This series is the most diverse in terms of species composition: it contains all the species identified in this study. For example, such species as *Ballerus ballerus*, *Blicca bjoerkna*, *Carassius carassius*, and *Esox lucius* were found only in this series, and 53.3% of all the processed carp fish remains belong to this site and period. The number of cranial and postcranial skeletal elements is almost equal. For the most numerous *Acipenser* spp., the ratio between them is 1:2 in favor of postcranial remains, 94.2% of which are pectoral fin spines (pinna pectoralis I). The second most numerous species in the series is the common bream *Abramis brama* (NISP 65), followed by zander (NISP 32) and common carp (NISP 22). Other species are represented by a handful number of remains.

Reconstruction of the body length and weight was performed for *Acipenser* spp. and five other species (table 6). If we compare these data with other series, it becomes clear that their average length in 300–200 BC was lesser by 5.2–6.5 cm and weight was lesser by 500–600 g. Individuals of the same species group from 600–400 BC were larger only by 1.1–1.5 cm and heavier by 100–200 g. Comparing the size of carp and pike with those from other series is inappropriate, because these species are either not represented there, or the reconstruction is possible only for one or two individuals. However, if compared to extant fishes, the reconstructed ones fit into the average size typical for modern individuals, but the individuals considered do not reach the maximum values known. However, this does not apply to the white bream *Blicca bjoerkna*, three specimens of which are quite large for modern representatives of this species (Movchan 2011).

Olbia Hellenism–Rome

The series consists of 44 bones, 26 of which (58.1%) belong to *Acipenser* spp. (table 8). Cyprinid bones are completely absent in this series, while the European catfish, zander and the great sturgeon *Huso huso* are represented by a small number of remains (NISP 7, 4, and 2, respectively). It was possible to reconstruct the length and weight for *Acipenser* spp., *Silurus glanis* and *Sander lucioperca* from this series (table 6). Since these data cover the 900-year period, their comparison with those from other periods is not constructive. However, this data can be useful for the general characteristics of different sites.

Olbia 100–300 AD

A total of 66 bones are represented in the series (table 9). Of them, sturgeon remains are the most numerous (NISP 50; 75.8%). The ratio of cranial and postcranial elements equals 1:2 for bony fishes and it is almost 1:4 for *Acipenser* spp. This data can be compared with those presented by Yanish & Antipina (2013) from the same period of Olbia and Berezan. A similar tendency is found that sturgeon remains predominated in this region. All species of the genus *Acipenser* from Olbia are represented by 5,842 bone specimens which is equal to 48.9% of the total number of fish remains (Yanish & Antipina 2013). Our data corroborated with those obtained in this study. Due to

the relatively small number of bones processed from that period (only 56 in total), our findings wouldn't change the conclusions of Yanish & Antipina (2013). We did not found any catfish remains in the material from this period, while according to Antipyna & Yanish (2013) catfish is one of the dominant species in their sample with 1138 skeletal elements.

Using the material from this series, it was possible to reconstruct the length and weight of *Acipenser* spp. and *Cyprinus carpio* (table 6). The latter is represented by a single medium-sized individual. At the same time, almost all sturgeon remains were suitable for reconstructing the size and weight (table 6).

Olbia uncertain age

The series consists of 353 bones, 173 of which (49%) are those of *Acipenser* spp. (table 10). The ratio of cranial and postcranial elements equals 1:2 in the case of bony fishes and almost 1:3 in the case of sturgeons. The European catfish is the second most numerous species (NISP 34) and the third is zander (NISP 21). All other fish species in the series are represented by a much smaller number of remains.

It was possible to reconstruct the length and weight for some fish individuals from this series (table 6). *Cyprinus carpio* was represented by a single large individual. Sturgeons and zanders are also large and heavy. Since this material has not been dated properly, we cannot qualitatively compare it with other series.

Berezan 600–400 BC

A total of 349 bones are represented in the series, and sturgeons also predominate among them (table 11) as in the case of almost all series from Olbia. In addition to representatives of the family Acipenseridae, there are numerous remains of zander (NISP 78). Carp fish bones are completely absent, although at least half of the sample from the same period of Berezan processed by Yanish & Kovalchuk (2013) belonged to cyprinids and the common carp *Cyprinus carpio* was the second most abundant species there. The results of reconstruction the size and weight of fishes from this series are presented in table 7.

Berezan 1–300 AD

This series is the smallest, a total of 16 bones are represented, 7 of which (43.8%) belong to *Acipenser* spp. (table 12). The ratio of cranial and postcranial skeletal elements is 1:1 for sturgeons and almost 2:1 for other identified species. The TL and weight of sturgeons, common bream and zander from this series is comparable with those known for these species and does not differ significantly from other series (table 7).

Berezan uncertain age

This large series consists of 474 bones, including 271 specimens (57.2%) assigned to *Acipenser* spp. (table 13). After sturgeons, the second most numerous group is represented by carp fishes (NISP 96), 42 of which belong to the common carp and 53 specimens are not identified up to species or even genus level.

The series represents a wide range of TL and weight reconstructed for *Cyprinus carpio*, which on average are close to those in extant representatives of this species (Movchan 2011). Quite large individuals are also present, reach-

ing 90 cm TL and weighting 21.5 kg. Regarding the sturgeons, the mean size of individuals is greater than those from all other series considered, except for Olbia (uncertain age). Although the difference is not significant, the average weight of fishes from these two series is identical, and the difference in TL is only 2–3 cm. There is a rather large representative of the common roach *Rutilus rutilus* — 39 cm TL — in this series, and it is even larger compared to modern individuals (Movchan 2011).

Chornomorka 600–400 BC

A total of 33 bones are represented in the series, 18 (54.5%) of which belong to unidentified bony fishes (table 14). It is problematic to draw any conclusions regarding the species distribution. However, if we take only the identified species, sturgeon takes the first place again by the number of remains (24.2%). It is followed by catfish (18.2%). In addition, there is also a single articular which belongs to some percid fish.

Conclusions

The study of fish remains from ancient Greek cities on the northern Black coast (Olbia, Berezan and Chornomorka), dating to 600 BC — 300 AD, revealed the presence of about ten fish species representing the families Acipenseridae, Cyprinidae, Siluridae, Esocidae and Percidae. Sturgeon remains (mostly assigned to *Acipenser* spp.) predominate in the processed material. Carp fishes comprise the most diverse group of species (roach, common bream, white bream, blue bream, common carp, crucian carp), while other families are each represented by a single species. The diversity of percid fishes could have been higher, although majority of their remains is of poor preservation and therefore described in open nomenclature. The weight and size of some fish individuals were reconstructed based on complete bones. Comparison of the specimens from individual samples (series) showed no significant differences in their total length and weight. Pectoral fin spine is the most common element found in the studied sample (n=338), followed by vertebrae (n=212). Subopercle is the most numerous among the cranial bones (n=98). There is no significant difference in the length and weight of fish individuals regardless of the monument and age. We should also note the species that were not detected in this research, but are present in samples from other studies. These are: *Rutilus frisii, Tinca tinca, Scardinius erythrophthalmus, Leuciscus idus, Aspius aspius, Alburnus alburnus, Squalius cephalus, Chondrostoma nasus, Perca fluviatilis.*

If sturgeon bone material cannot be identified for some reason up to the species level, it can be useful first to range the remains between the genera *Acipenser* and *Huso*. By applying the results of length and weight reconstruction, the sample of *Acipenser* spp. could be further partitioned into three subsamples: the largest, medium-sized and smallest individuals. The first of them can be assigned tentatively to *Acipenser gueldenstaedtii*, the second — to *Acipenser stellatus*, and the third one — to *Acipenser ruthenus.*

Based on the previous studies and our results, it can be assumed that inhabitants of ancient Greek cities like Olbia and Berezan most probably have not bought fish from their neighbors. It is indirectly evidenced by the large number of cranial fish bones. The development of lo-

cal fishing is also indicated by the finding of various fishing tools, such as hooks, harpoons, and nets (Morales et al. 2007). Sturgeons were caught both for export and for using in local cuisine since their remains predominate in the processed material. The presence of two fish markets reveals the popularity of this fish among the citizens of ancient Olbia.

References

Askeyev, I. 2017. *Sculpture of the surface of the bones of the skull of Eastern European sturgeon*. http://surl.li/luhbk.

Brinkhuizen, D.C. 1989. *Ichthyo-archelologisch onderzoek: methoden en toepassing aan de hand van Romeins vismateriaal uit Velsen (Nedeland)*. PhD Thesis. University of Groningen.

Britton, R., Shepherd, J.S. 2005. Biometric data to facilitate the diet reconstruction of piscivorous fauna. *Folia Zoologica*, 54, p. 193-200.

Bylkova, V.P., Yanish, Ye.Yu. 2010. "The Borysthenes is the most profitable river": ichthyological data from Bilozerka settlement. *Arheolohiia*, 3, p. 75-81 (in Ukrainian).

Christodoulou, S. 2016. The History of Ancient Olbia in the Northern Black Sea Region. *Balkan Studies*, 51, p. 215-242.

Gaygusuz, Ö. 2006. Conversions of total, fork, and standard length measurements based on 42 marine and freshwater fish species (from Turkish waters). *Turkish Journal of Fisheries and Aquatic Sciences*, 6, p. 79-84.

Hojte, J.M. 2005. The Archaeological Evidence for Fish Processing in the Black Sea Region, p. 133-160. *Ancient Fishing and Fish Processing in the Black Sea Region. Black Sea Studies*. The Danish National Research Foundation's Centre for Black Sea Studies. Aarhus, Aarhus University Press.

Kahraman, A., Göktürk, D., Aydin, E. 2014. Length-weight relationships of five fish species from the Sakarya River, Turkey. *Annual Research & Review in Biology*, 4 (15), p. 2476-2483. https://doi.org/10.9734/ARRB/2014/7513

Katerini, B. 2004. On the issue of the fishing industry of the Northern Black Sea region in antiquity, p. 107-111. In: Borysthenika-2004: materials of the International scientific conference to the 100th anniversary of Berezan Island research by E.R. von Stern. Nikolaev (in Russian).

Khristenko, D.S., Kotovska, G.O. 2017. Length-weight relationship and condition factors of freshwater bream *Abramis brama* (Linnaeus, 1758) from the Kremenchug Reservoir, Middle Dnieper. *Turkish Journal of Fisheries and Aquatic Sciences*, 17, p. 71-80, https://doi.org/10.4194/1303-2712-v17_1_09.

Kovalchuk, O.M. 2014. Fish remnants from the excavations of the Bronze Age barrow near Maryanskoe village (Dnepropetrovsk region, Ukraine). *Visnyk of Dnipropetrovsk University. Biology, ecology*, 22 (2), p. 156-160 (in Russian, with English summary), https://doi.org/10.15421/011422.

Lebedev, V.D. 1960. Presnovodnaya chetvertichnaya ikhtiofauna Evropeyskoi chasti SSSR [Freshwater Quaternary ichthyofauna of the European part of the USSR]. Moscow, University press (in Russian).

Margaritova, B. ,Uzunova, E. 2020. Length-weight relationships and condition factors of three sturgeon species (Acipenseridae) from the Danube

River. *Ecologia Balkanica*, 12 (2), p. 197-201.

Morales, A. Antipina, A., Rosello, E. 2007. An ichthyoarchaeological survey of the ancient fisheries from the Northern Black Sea. *Archaeofauna*, 16, p. 117-172.

Movchan, Yu.V. 2011. *Ryby Ukrainy (vyznachnyk-dovidnyk)* [Fishes of Ukraine (identification guide)]. Kyiv, Zoloti Vorota (in Ukrainian).

Nelson, J.S., Grande, T.C., Wilson, M.V.H. 2016. *Fishes of the World*. John Wiley and Sons, Hoboken.

Odrin, A.V. 2010. Fishing in the Bosporus in pre-Roman times, p. 332-335. In: *Bosporan Readings. Cimmerian Bosporus and barbarian world in the period of antiquity and the Middle Ages. 11. Crafts and trades*. Kerch (in Russian).

Okgerman, H., Mahmut E., Atasagun, S. 2012. The growth and reproduction of white bream (*Blicca bjoerkna* L. 1758) in an oligo-mesotrophic lake in northwest Anatolia (Sapanca, Turkey). *Turkish Journal of Biology*, 36 (1), 15, https://doi.org/10.3906/biy-1012-157.

Pérez-Bote, J.L., Roso, R. 2012. Growth and length–weight relationships of *Sander lucioperca* (Linnaeus, 1758) in the Alcántara Reservoir, south-western Spain: comparison with other water bodies in Eurasia. *Journal of Applied Ichthyology*, 28, p. 264-268,https://doi.org/10.1111/j.1439-0426.2011.01918.x.

Radke, R.J., Petzold, T., Wolter, C. 2000. Suitability of pharyngeal bone measures commonly used for reconstruction of prey fish length. *Journal of Fish Biology*, 57, p. 961-967, http://surl.li/luhcu.

Radu, V. 2005. *Atlas for the identification of bony fish bones from archaeological sites*. Bucureşti, Contrast.

Shuman, L.A., Selyukov, A.G., Nekrasov, I.S., Elifanov, A.V., Yurchenko, V.V. Data on length-weight and length-length relationships, mean condition factor, and gonadosomatic index of *Rutilus rutilus* and *Perca fluviatilis* from the Ob River basin, Western Siberia. *Data Brief*, 42, 108067, https://doi.org/10.1016/j.dib.2022.108067

Tarkan, A.S., Gursoy Gaygusuz, C., Gaygusuz, Ö., Acipinar, H. 2007. Use of bone and otolith measures for size-estimation of fish in predator-prey studies. *Folia Zoologica*, 56 (3), p. 328-336.

Thieren, E. Wouters, W., Van Neer, W. 2015. Guide for the identification of archaeological sea sturgeon (*Acipenser sturio* and *A. oxyrinchus*) remains. *Cybium*, 39, p. 175-192, https://doi.org/10.26028/cybium/2015-393-002

Vilizzi, L., Tarkan, A., Ekmekçi, F. 2013. Stock characteristics and management insights for common carp (*Cyprinus carpio*) in Anatolia: a review of weight-length relationships and condition factors. *Turkish Journal of Fisheries and Aquatic Sciences*, 13, p. 759-775, https://doi.org/10.4194/1303-2712-v13_4_22.

Yanish, Ye.Yu., Antipina, E. 2013. Commercial fish from ancient Olbia (1-3rd centuries AD) and its neighborhood. *Zoological journal*, 92 (9), p. 1190–1200 (in Russian), https://doi.org/10.7868/S0044513413090195.

Yanish, Y., Kovalchuk, A.N. 2013. Reconstruction of the body length and weight of commercial fishes on materials from archaeological excavations of the settlement on Berezan island (VI–V cent. BC). p. 735-736. In: *VIII All-Russian meeting on the study of the Quaternary period: Fundamental*

problems of the Quaternary, the results of the study and the main directions for further research. Rostov-on-Don, Publishing house of SSC RAS (in Russian).

Zhiteneva, L.D. 1964. *Promyslovaya fauna ryb i rybolovstvo basseyna Chernogo morya po arkheologicheskim materialam* [Commercial fish fauna and fisheries in the Black Sea basin based on archaeological materials]. Thesis for obtaining a scientific degree of Candidate of Biological Sciencs. Moscow, Moscow State University (in Russian).

Živaljević, I., Askeyev, I., Shaymuratova (Galimova), D., Askeyev, O., Monakhov, S., Borić, D., Stefanović, S. 2021. Size estimations of sturgeons (Acipenseridae) from the Mesolithic-Neolithic Danube Gorges, p. 422-427. In Borić, D., Antonović, D. and Mihailović, B. (Eds.), *Foraging Assemblages. Vol. 2: Papers Presented at the Ninth International Conference on the Mesolithic in Europe*. Belgrade, Serbian Archaeological Society; New York, The Italian Academy for Advanced Studies in America, Columbia University.

TABLES

Table 1. *Species composition of fish remains in the studied general sample.*

Таблиця 1. *Видовий склад решток риб досліджуваної загальної вибірки.*

Family	Species	NISP[1]	%
Acipenseridae	Sturgeons — *Acipenser* spp.	875	51.4
	Great sturgeon — *Huso huso*	34	2.0
Cyprinidae	Common roach — *Rutilus rutilus*	10	0.6
	Common bream — *Abramis brama*	68	4.0
	Blue bream — *Ballerus ballerus*	2	0.1
	White bream — *Blicca bjoerkna*	5	0.3
	Common carp — *Cyprinus carpio*	73	4.3
	Crucian carp — *Carassius carassius*	3	0.2
	Cyprinidae (unidentified)	96	5.6
Esocidae	Northern pike — *Esox lucius*	4	0.2
Percidae	Pikeperch — *Sander lucioperca*	148	8.7
	Percidae (unidentified)	45	2.6
Siluridae	European catfish — *Silurus glanis*	51	3.0
Unidentified	Bony fishes — Teleostei indet.	287	16.9

1 NISP — Number of indentifiable specimens.

***Table 2**. Anatomical distribution of cranial fish bones in the studied sample.*

***Таблиця 2.** Анатомічний розподіл кісток черепу риб досліджуваної загальної вибірки.*

Skeletal element	Taxon														Σ
	Acipenser spp.	*Huso huso*	*Rutilus rutilus*	*Abramis brama*	*Ballerus ballerus*	*Blicca bjoerkna*	*Cyprinus carpio*	*Carassius carassius*	Cyprinidae indet.	*Silurus glanis*	*Esox lucius*	*Sander lucioperca*	Percidae indet.	Teleostei indet.	
Articular	–	–	–	–	–	–	–	–	–	–	–	12	2	–	14
Basioccipital	–	–	–	–	–	–	–	–	1	–	–	2	1	1	5
Branchiostegal	2	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Dentary	1	–	–	1	–	–	2	1	3	1	–	36	–	1	46
Ectopterygoid	–	–	–	–	–	–	–	–	–	–	1	9	–	–	10
Epihyal	–	–	1	–	–	–	2	–	–	1	–	–	–	2	6
Hyomandibular	8	–	–	8	1	1	14	–	5	–	1	–	–	2	40
Interopercle	–	–	1	7	–	–	1	1	1	–	–	10	–	1	22
Jugal	21	1	–	–	–	–	–	–	–	–	–	–	–	–	22
Ceratohyal	–	–	–	–	–	–	–	–	–	1	2	8	1	–	12
Maxilla	1	–	–	4	–	–	2	–	–	–	–	7	–	–	14
Opercle	–	–	2	24	–	–	25	–	25	7	–	1	–	1	85
Pharyngeal bone	–	–	1	2	–	–	16	–	15	–	–	–	–	–	34
Palatine	–	–	–	–	–	–	–	–	–	–	–	4	–	1	5
Palatopterygoid	2	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Parasphenoid	38	–	2	–	–	–	3	–	–	–	–	4	1	1	49
Postorbital	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Praemaxilla	1	–	–	–	–	–	1	1	–	1	–	3	–	–	7
Preopercle	–	–	–	9	–	–	2	–	6	–	–	8	–	–	25
Vomer	–	–	–	–	–	–	–	–	–	–	–	2	–	–	2
Quadrate	–	–	–	1	–	–	1	–	–	9	–	9	6	–	26
Skull roof element	77	–	–	–	–	–	–	–	–	–	–	–	–	–	77
Subopercle	87	7	–	–	–	–	2	–	1	–	–	–	–	1	98
Urohyal	–	–	–	3	–	1	1	–	–	–	–	3	1	–	9
TOTAL	239	8	7	59	1	2	72	3	57	20	4	118	12	11	613

Table 3. *Anatomical distribution of postcranial fish bones in the studied sample.*

Таблиця 3. *Анатомічний розподіл кісток посткраніального скелету риб досліджуваної загальної вибірки.*

Skeletal element	Taxon												Σ
	Acipenser spp.	*Huso huso*	*Rutilus rutilus*	*Abramis brama*	*Ballerus ballerus*	*Blicca bjoerkna*	*Cyprinus carpio*	Cyprinidae indet.	*Silurus glanis*	*Sander lucioperca*	Percidae indet.	Teleostei indet.	
lcivalCe	84	2	–	–	–	–	–	–	–	–	–	–	86
Cleithrum	72	–	3	9	1	3	–	24	1	28	–	1	142
Dorsal scute	7	1	–	–	–	–	–	–	–	–	–	–	8
Dorsal fin spine	–	–	–	–	–	–	–	3	–	–	3	–	6
Pectoral fin spine	295	14	–	–	–	–	–	1	27	–	–	1	338
Pterygiophore	–	–	–	–	–	–	–	10	–	–	–	5	15
Scapula	–	–	–	–	–	–	–	1	–	–	–	–	1
Supracleithrum	26	1	–	–	–	–	1	–	–	2	–	–	30
Scute (unidentified)	49	3	–	–	–	–	–	–	–	–	–	–	52
Ventral scute	19	–	–	–	–	–	–	–	–	–	–	–	19
Vertebra	–	–	–	–	–	–	–	–	3	–	30	179	212
Unidentified bone	84	5	–	–	–	–	–	–	–	–	–	–	89
TOTAL	636	26	3	9	1	3	1	39	31	30	33	186	899

Table 4. *Species composition and anatomical distribution of fish remains from Olbia 600–400 BC.*

Таблиця 4. *Видовий склад та анатомічний розподіл решток риб з Ольвії 600–400 рр. до н.е.*

Skeletal element	Taxon					Σ
	Acipenser spp.	Cyprinidae indet.	*Silurus glanis*	Percidae indet.	Teleostei indet.	
Cranial skeleton (CRA)						
Articular	–	–	–	1	–	1
Basioccipital	–	1	–	–	–	1
Hyomandibular	5	–	–	–	–	5
Parasphenoid	4	–	–	–	–	4
Quadrate	–	–	1	–	–	1
Postcranial skeleton (PCRA)						
Clavicle	1	–	–	–	–	1
Cleithrum	1	–	–	–	–	1
Pectoral fin spine	21	–	–	–	–	21
Vertebra	–	–	–	–	1	1
Unidentified bone	1	–	–	–	4	5
TOTAL	33	1	1	1	5	41

Table 5. *Species composition and anatomical distribution of fish remains from Olbia 300–100 BC.*

Таблиця 5. *Видовий склад та анатомічний розподіл решток риб з Ольвії 300–100 рр. до н.е.*

Skeletal element	Taxon													Σ
	Acipenser spp.	*Huso huso*	*Rutilus rutilus*	*Abramis brama*	*Ballerus ballerus*	*Blicca bjoerkna*	*Cyprinus carpio*	*Carassius carassius*	Cyprinidae indet.	*Silurus glanis*	*Esox lucius*	*Sander lucioperca*	Teleostei indet.	
Cranial skeleton (CRA)														
Basioccipital	–	–	–	–	–	–	–	–	–	–	–	2	–	2
Dentary	–	–	–	1	–	–	2	1	3	–	–	–	–	7
Ectopterygoid	–	–	–	–	–	–	–	–	–	–	1	9	–	10
Epihyal	–	–	1	–	–	–	2	–	–	1	–	–	2	6
Hyomandibular	–	–	–	8	1	1	2	–		–	1	–	–	13
Interopercle	–	–	1	7	–	–	1	1	1	–	–	9	1	21
Jugal	2	–	–	–	–	–	–	–	–	–	–	–	–	2
Ceratohyal	–	–	–	–	–	–	–	–	–	–	2	–	–	2
Maxilla	1	–	–	4	–	–	2	–	–	–	–	5	–	12
Opercle	–	–	2	23	–	–	5	–	1	2	–	–	–	33
Pharyngeal bone	–	–	–	–	–	–	–	–	1	–	–	–	–	1
Palatine	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Palatopterygoid	1	–	–	–	–	–	–	–	–	–	–	–	–	1
Parasphenoid	8	–	2	–	–	–	–	–	–	–	–	1	–	11
Preopercle	–	–	–	9	–	–	2	–	2	–	–	–	–	13
Premaxilla	–	–	–	–	–	–	1	1	–	–	–	–	–	2
Quadrate	–	–	–	1	–	–	1	–	–	–	–	–	–	2
Skull roof element	9	–	–	–	–	–	–	–	–	–	–	–	–	9
Subopercle	5	–	–	–	–	–	–	–	–	–	–	–	–	5
Superopercle	–	–	–	–	–	–	2	–	1	–	–	–	1	4
Urohyal	–	–	–	3	–	1	1	–	–	–	–	3	–	8
Postcranial skeleton (PCRA)														
Cleithrum	1	–	3	9	1	3	–	–	12	–	–	2		31
Vertebra	–	–	–	–	–	–	–	–	–	–	–	–	29	29
Supracleithrum	3	–	–	–	–	–	1	–	–	–	–	1		5
Pterygiophore	–	–	–	–	–	–	–	–	10	–	–	–	3	13
Pectoral fin spine	65	6	–	–	–	–	–	–	–	–	–	–	1	72
Unidentified bone	3	–	–	–	–	–	–	–	–	–	–	–	17	20
TOTAL	98	6	9	65	2	5	22	3	31	3	4	32	55	335

Table 6. *Total body length and weight of fishes reconstructed based on the samples from Olbia.*

Таблиця 6. *Загальна довжина та маса тіла риб, реконструйованих за вибірками з Ольвії.*

Species	n	Total length, cm			Weight, kg		
		min	max	median	min	max	median
600–400 BC							
Acipenser spp.	21	44.0–61.3	101.8–116.9	72.3–83.3	0.3–1.0	6.50–6.90	2.00–2.50
300–100 BC							
Acipenser spp.	65	34.0–120.9	52.6–120.9	65.8–78.1	0.12–0.66	5.80–13.00	1.40–2.00
Rutilus rutilus	2	29.1	31.8	30.5	2.40	2.80	2.60
Abramis brama	9	26.9	56.8	42.0	0.20	2.26	0.85
Blicca bjoerkna	3	24.4	31.9	26.3	0.18	0.45	0.20
Cyprinus carpio	7	20.9	60.6	45.4	0.14	5.50	2.00
Esox lucius	1	49.6	49.6	–	1.00	1.00	–
Hellenism–Rome							
Acipenser spp.	7	39.9–57.9	114.0	81.5–85.5	0.25–0.87	6.00–10.50	2.70–3.00
Silurus glanis	4	130.9	219.4	200.3	21.40	35.80	32.70
Sander lucioperca	1	77.4	77.4	–	4.90	4.90	–
100–300 AD							
Acipenser spp.	39	18.9	123.2–130.8	66.9–79.6	0.04	9.00–14.00	1.60–2.20
Cyprinus carpio	1	52.8	52.8	–	3.40	3.40	–
Uncertain age							
Acipenser spp.	31	54.8	176.7	87.0–92.8	0.75	21.30	3.10–3.40
Cyprinus carpio	1	80.1	80.1	–	14.40	14.40	–
Silurus glanis	15	110.4	163.0	131.6	18.00	26.60	21.50
Sander lucioperca	16	40.5	88.8	60.5	0.65	7.60	2.30

Table 7. *Total body length and weight of fishes reconstructed based on the samples from Berezan and Chornomorka.*

Таблиця 7. *Загальна довжина та маса тіла риб, реконструйованих за вибірками з Березані та Чорноморки.*

Species	n	Total length, cm			Weight, kg		
		min	max	median	min	max	median
Berezan 600–400 BC							
Acipenser spp.	74	39.1	171.1	78.6–86.6	0.20–0.28	19.40	2.70–28.00
Sander lucioperca	9	45.8	73.4	65.3	0.95	4.20	2.90
Berezan 1–300 AD							
Acipenser spp.	1	51.1	67.1	–	0.60	1.50	–
Abramis brama	2	40.7	57.7	49.2	0.80	2.40	1.60
Sander lucioperca	1	57.9	57.9	–	2.00	2.00	–
Berezan uncertain age							
Acipenser spp.	71	50.1–118.7	50.6–128.9	84.1–90.5	0.50–0.60	8.60–12.10	3.10–3.40
Rutilus rutilus	1	39.1	39.1	–	4.20	4.20	–
Cyprinus carpio	12	22.8	90.1	60.6	0.20	21.50	5.50
Sander lucioperca	2	68.7	72	70.4	3.40	3.90	3.70
Chornomorka 600–400 BC							
Acipenser spp.	1	66.9	78.8	–	1.50	2.10	–

Table 8. *Species composition and anatomical distribution of fish remains from Olbia Hellenism–Rome.*

Таблиця 8. *Видовий склад та анатомічний розподіл решток риб з Ольвії періоду Еллінізму-Риму.*

Skeletal element	Taxon					Σ
	Acipenser spp.	*Huso huso*	*Sander lucioperca*	*Silurus glanis*	Teleostei indet.	
Cranial skeleton (CRA)						
Dentary	–	–	–	1	–	1
Palatine	–	–	–	1	–	1
Premaxilla	–	–	1	2	–	3
Skull roof element	1	–	–	–	–	1
Subopercle	1	1	–	–	–	2
Postcranial skeleton (PCRA)						
Clavicle	10	–	–	–	–	10
Cleithrum	3	–	–	–	–	3
Dorsal scute	1	–	–	–	–	1
Pectoral fin spine	2	–	4	–	–	6
Scute (unidentified)	3	1	–	–	–	4
Supracleithrum	1	–	–	–	–	1
Ventral scute	1	–	–	–	–	1
Vertebra	–	–	1	–	4	5
Unidentified bone	3	–	–	1	1	5
TOTAL	26	2	6	5	5	44

Table 9. *Species composition and anatomical distribution of fish remains from Olbia 100–300 AD.*

Таблиця 9. *Видовий склад та анатомічний розподіл решток риб з Ольвії 100–300 р. н.е.*

Skeletal element	Taxon						Σ
	Acipenser spp.	*Abramis brama*	*Cyprinus carpio*	Cyprinidae indet.	Percidae indet.	Teleostei indet.	
Cranial skeleton (CRA)							
Hyomandibular	1	–	–	1	–	–	2
Opercle	–	1	1	–	–	–	2
Palatopterygoid	1	–	–	–	–	–	1
Parasphenoid	8	–	–	–	1	–	9
Preopercle	–	–	–	3	–	–	3
Postcranial skeleton (PCRA)							
Pectoral fin spine	37	–	–	–	–	–	37
Vertebra	–	–	–	–	–	2	2
Unidentified bone	3	–	–	1	1	5	10
TOTAL	50	1	1	5	2	7	66

Table 10. *Species composition and anatomical distribution of fish remains from Olbia (uncertain age).*

Таблиця 10. *Видовий склад та анатомічний розподіл решток риб з Ольвії (невизначений час).*

Skeletal element	Taxon								Σ
	Acipenser spp.	*Huso huso*	*Cyprinus carpio*	Cyprinidae indet.	*Sander lucioperca*	Percidae indet.	*Silurus glanis*	Teleostei indet.	
Cranial skeleton (CRA)									
Articular	–	–	–	–	2	–	8	–	10
Basioccipital	–	–	–	–	–	–	–	1	1
Dentary	1	–	–	–	18	–	–	1	20
Hyomandibular	–	–	1	–	–	–	–	–	1
Opercle	–	–	7	–	–	–	1	1	9
Pharyngeal bone	–	–	–	4	–	–	–	–	4
Parasphenoid	2	–	–	–	–	–	–	–	2
Premaxilla	–	–	–	–	1	–	–	–	1
Skull roof element	16	–	–	–	–	–	–	–	16
Subopercle	17	3	–	–	–	–	–	–	20
Postcranial skeleton (PCRA)									
Clavicle	31	–	–	–	–	–	–	–	31
Cleithrum	25	–	–	–	–	–	–	1	26
Dorsal scute	3	–	–	–	–	–	–	–	3
Pectoral fin spine	4	–	–	–	–	–	24	1	29
Pterygiophore	–	–	–	–	–	–	–	1	1
Scapula	–	–	–	1	–	–	–	–	1
Supracleithrum	13	–	–	–	–	–	–	–	13
Unidentified scute	16	–	–	–	–	–	–	–	16
Ventral scute	8	–	–	–	–	–	–	–	8
Vertebra	–	–	–	–	–	5	1	69	75
Unidentified bone	37	2	–	–	–	–	–	27	66
TOTAL	173	5	8	5	21	5	34	102	353

Table 11. *Species composition and anatomical distribution of fish remains from Berezan 600–400 BC.*

Таблиця 11. *Видовий склад та анатомічний розподіл решток риб з Березані 600–400 рр. до н.е.*

Skeletal element	Taxon					Σ
	Acipenser spp.	*Huso huso*	*Sander lucioperca*	Percidae indet.	Teleostei indet.	
Cranial skeleton (CRA)						
Articular	–	–	10	–	–	10
Dentary	–	–	14	–	–	14
Jugal	7	1	–	–	–	8
Ceratohyal	–	–	7	1	–	8
Maxilla	–	–	2	–	–	2
Opercle	–	–	1	–	–	1
Palatine	–	–	2	–	–	2
Parasphenoid	4	–	2	–	1	7
Preopercle	–	–	7	–	–	7
Vomer	–	–	2	–	–	2
Premaxilla	1	–	–	–	–	1
Quadrate	–	–	7	–	–	7
Skull roof element	18	–	–	–	–	18
Subopercle	28	1	–	–	–	29
Postcranial skeleton (PCRA)						
Clavicle	22	–	–	–	–	22
Cleithrum	15	–	24	–	–	39
Dorsal scute	2	–	–	–	–	2
Pectoral fin spine	95	–	–	–	–	95
Unidentified scute	15	–	–	–	–	15
Ventral scute	1	–	–	–	–	1
Vertebra	–	–	–	10	28	38
Unidentified bone	15	2	–	–	4	21
TOTAL	223	4	78	11	33	349

Table 12. *Species composition and anatomical distribution of fish remains from Berezan 1–300 AD.*

Таблиця 12. *Видовий склад та анатомічний розподіл решток риб з Березані 1–300 р. н.е.*

Skeletal element	Taxon						Σ
	Acipenser spp.	*Abramis brama*	Cyprinidae indet.	*Silurus glanis*	*Sander lucioperca*	Teleostei indet.	
Cranial skeleton (CRA)							
Dentary	–	–	–	–	1	–	1
Ceratohyal	–	–	–	1	–	–	1
Opercle	–	–	1	–	–	–	1
Pharyngeal bone	–	2	1	–	–	–	3
Preopercle	–	–	–	–	1	–	1
Skull roof element	1	–	–	–	–	–	1
Subopercle	1	–	–	–	–	–	1
Postcranial skeleton (PCRA)							
Cleithrum	1	–	–	–	–	–	1
Pectoral fin spine	1	–	–	–	–	1	2
Vertebra	—	–	–	–	–	1	1
Unidentified bone	3	–	–	–	–	–	3
TOTAL	7	2	2	1	2	2	16

Table 13. *Species composition and anatomical distribution of fish remains from Berezan (uncertain age).*

Таблиця 13. *Видовий склад та анатомічний розподіл решток риб з Березані (невизначений час).*

Skeletal element	Taxon									Σ
	Acipenser spp.	*Huso huso*	*Rutilus rutilus*	*Cyprinus carpio*	Cyprinidae indet.	*Silurus glanis*	*Sander lucioperca*	Percidae indet.	Teleostei indet.	
Cranial skeleton (CRA)										
Basioccipital	–	–	–	–	–	–	–	1	–	1
Branchiostegal	2	–	–	–	–	–	–	–	–	2
Dentary	–	–	–	–	–	1	2	–	–	3
Hyomandibular	2	–	–	11	4	–	–	–	1	18
Interopercle	–	–	–	–	–	–	1	–	–	1
Jugal	12	–	–	–	–	–	–	–	–	12
Ceratohyal	–	–	–	–	–	–	1	–	–	1
Opercle	–	–	–	12	23	–	–	–	–	35
Pharyngeal bone	–	–	1	16	9	–	–	–	–	26
Palatine	–	–	–	–	–	–	1	–	–	1
Parasphenoid	10	–	–	3	–	–	1	–	–	14
Postorbital	1	–	–	–	–	–	–	–	–	1
Preopercle	–	–	–	–	1	–	–	–	–	1
Quadrate	–	–	–	–	–	–	2	6	–	8
Skull roof element	32	–	–	–	–	–	–	–	–	32
Subopercle	35	3	–	–	–	–	–	–	–	38
Urohyal	–	–	–	–	–	–	–	1	–	1
Postcranial skeleton (PCRA)										
Clavicle	20	1	–	–	–	–	–	–	–	21
Cleithrum	26	–	–	–	12	–	2	–	–	40
Dorsal scute	1	1	–	–	–	–	–	–	–	2
Dorsal fin spine	–	–	–	–	3	–	–	3	–	6
Pectoral fin spine	73	8	–	–	1	–	–	–	1	83
Supracleithrum	6	1	–	–	–	–	1	–	–	8
Unidentified scute	18	–	–	–	–	–	–	–	–	18
Ventral scute	9	–	–	–	–	–	–	–	–	9
Vertebra	–	–	–	–	–	–	–	15	38	53
Unidentified bone	24	1	–	–	–	–	–	–	14	39
TOTAL	271	15	1	42	53	1	11	26	54	474

Table 14. *Species composition and anatomical distribution of fish remains from Chornomorka 600–400 BC.*

Таблиця 14. *Видовий склад та анатомічний розподіл решток риб з Чорноморки 600–400 рр. до н.е.*

Skeletal element	Taxon				Σ
	Acipenser spp.	Percidae indet.	*Silurus glanis*	Teleostei indet.	
Cranial skeleton (CRA)					
Articular	–	1	–	–	1
Hyomandibular	–	–	–	1	1
Opercle	–	–	4	–	4
Parasphenoid	2	–	–	–	2
Postcranial skeleton (PCRA)					
Cleithrum	–	–	1	–	1
Pectoral fin spine	3	–	–	2	5
Supracleithrum	3	–	–	–	3
Vertebra	–	–	1	7	8
Unidentified bone	–	–	–	8	8
TOTAL	8	1	6	18	33

Vita Antiqua № 14 2023

Риба в господарстві давньогрецьких колоній (600 р. до н. е. — 300 р. н. е.) у північному причорномор'ї — нові штрихи до старого портрета

Тит Волинський

Магістр кафедри археології та музеології КНУ імені Тараса Шевченка, вул. Володимирська, 60, Київ 01033, Україна, e-mail: titvolynskiy@gmail.com, ORCID: 0009-0004-1744-2371.

Олександр Ковальчук

Д.б.н., старший науковий співробітник відділу палеонтології Національного науково-природничого музею НАН України; 01054, м. Київ, вул. Богдана Хмельницького, 15, Україна; Доцент кафедри палеозоології факультету біологічних наук університету м. Вроцлав, вул. Сенкевича 21, Вроцлав 50-335, Польща, e-mail: biologiest@ukr.net, ORCID: 0000-0002-9545-208X.

У статті наведено результати дослідження кісткових решток риб, знайдених під час розкопок трьох давньогрецьких міст-колоній (Ольвія, Березань і Чорноморка) у межах Північного Причорномор'я. Ці матеріали датуються 600 р. до н.е. — 300 р. н.е. (у випадку Ольвії та Березані), а також 500–400 рр. до н.е. у випадку Чорноморки. Досліджуваний матеріал був зібраний у період між 1933 і 1938 роками, а також у 1988 році. Було проведено ідентифікацію кісток і встановлено їхню видову й анатомічну належність. У досліджуваній вибірці встановлено наявність решток близько десяти видів риб. З-поміж них осетрові (*Acipenser* spp.) представлені найбільшою кількістю елементів скелета. В улові жителів давньогрецьких міст присутні також коропові риби (плітка, лящ, плоскирка, синець, короп, карась), сом *Silurus glanis*, щука *Esox lucius* і судак *Sander lucioperca*. Найчастіше у зборах траплялися промені грудних плавців (більшість із яких належали осетровим рибам) та ізольовані хребці. Маса тіла та розмір окремих особин буди реконструйовані за цілими кістками. У випадку виникнення складнощів у визначенні решток осетрових риб до рівня виду, що виникають з різних причин (наприклад через відсутність порівняльного ма-

теріалу), можна використовувати метод, описаний у статті. Порівняння зразків із Ольвії, Березані та Чорноморки не показало суттєвих відмінностей у загальній довжині та масі тіла представників відповідних видів, охоплених промислом.

Ключові слова: Ольвія, античність, Березань, археозоологія, рибальство, давні греки, Чорне море.