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Fishing with lure hooks at the Late Neolithic site of Vinča – Belo Brdo, Serbia

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ABSTRACT

The authors present an early evidence for the use of complex fishing techniques for obtaining variable fish resources in prehistoric south-east Europe as recovered at the Neolithic site of Vinča – Belo Brdo in Serbia. In particular, a group of bone artefacts have been analysed through the application of an integrated approach combining technological, use-wear, and residue analyses as well as the comparisons with ethnographic artefacts. The results of the functional analysis indicate that these artefacts were parts of lure hooks, i.e. composite hooks, probably used to catch large predatory fish. On methodological grounds, the discussion proposed in this paper could be relevant for other case studies worldwide where one finds prehistoric communities with evidence of fishing activities.

1. Introduction

The Late Neolithic (ca. 5400–4500 cal. BC) across southeast Europe is well known for the abundant evidence of developed agricultural practices among early farming societies that for the bulk of dietary resources largely focused on cattle breeding (e.g. Russell, 1998; Orton, 2010, 2012; Greenfield, 1986) and small-to medium-scale cultivation of a range of plant resources (e.g. Borojević, 2006; Filipović and Obradović, 2013; Filipović and Tasić, 2012). Hunting game, such as red deer, wild boar and aurochs also seems to peak at certain sites and regions towards the end of the period in the first half of the 5th millennium BC (Russell, 1999). Much less attention has been paid to the importance of fishing during this period, despite the fact that some of the largest sites were found along large fluvial watercourses, such as the Danube, Sava and Tisza Rivers. Some of these sites also contain clear examples of elaborately produced fish hooks (e.g. Bačkalov, 1979). This lack of focus on fishing is partly related to frequent recovery biases in retrieving fish remains from Late Neolithic sites exacerbated by a widespread assumption that the abandonment of fish resources with the beginnings of the Neolithic was a phenomenon of pan-European scale (and beyond) (e.g. Richards and Schulting, 2006; Thomas, 2003; but see Borić et al., 2004; Milner et al., 2004; Craig et al., 2011).

In this paper, the authors present the evidence for the use of lure hooks in prehistoric south-east Europe as recovered at the Neolithic site of Vinča – Belo Brdo in Serbia, which is the type-site of the culture-historical phenomenon known as the Vinča culture (e.g. Chapman, 1981; Whittle, 1996; Borić, 2009). Archaeological artefacts have been interpreted through an integrated approach combining technological, use-wear and residue analysis as well as comparisons with ethnographic artefact collections. The results obtained from the analysis of Vinča – Belo Brdo artefacts are discussed against the available dataset of fishing practices in Late Neolithic southeast Europe and prove the existence of a complex fishing technology for capturing specific fish species.

We suggest that regardless of the extent to which fish resources contributed to the actual diet of Neolithic communities across southeast Europe, fishing practices and fishing techniques were booming and becoming increasingly common within complex social settings of Late Neolithic village.

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2. Fishing in prehistory

The first reliable evidence of fishing can be traced back to the Late Palaeolithic in Europe (Cleyet-Merle, 1990; Richards et al., 2005). Incised and carved motifs, formal fish hooks, osseous harpoons and barbed points suggest that fish played a vital role in the Magdalenian diet (Cleyet-Merle, 1990; Owen, 2005: 145). During the Mesolithic and the Neolithic, fishing tactics are much better documented, thanks to the good preservation of organic fishing-related tools such as nets, traps, harpoons, hooks and faunal remains at a number of sites in northern Europe (e.g. Scandinavia) (Cleyet-Merle, 1990; Sulgostowska, 1999), in the Iberian Peninsula (e.g. in Portugal) (Detry, 2008), Russia (Lozovski et al., 2013a, b) as well as at the lacustrine Neolithic dwellings in the northern fringe of the Alps (e.g. south-east France, Switzerland) (Sauter and Gallay, 1969).

Archaeological data indicate the centrality of fishing as a key subsistence activity in Mesolithic Europe and its important role in human diet during the Neolithic. In Britain, the faunal assemblages and strong marine isotopic signature in skeletal remains emphasise the importance of fishing resources for coastal Late Mesolithic people but a limited, if not non-existent, contribution of marine resources to early Neolithic diet, coinciding with the adoption of intensive dairy farming (Richards et al., 2003; Cramp et al., 2014). Yet, this pattern contrasts to that occurring contemporaneously in the Baltic region where fishing, along with hunting and gathering, continued to be key alongside farming during the Neolithic (e.g. Craig et al., 2011). At the site of Zamostje 2, in Russia, the preservation of Late Mesolithic and Neolithic cultural layers within lacustrine-boggy deposits have allowed the discovery of a rich and diversified techniques and tools used during those periods and enabled one to follow changes over time. During the Mesolithic, the main methods of fishing recorded at Zamostje 2 are fishing from boats, with the use of nets and harpoons, sporadic use of hooks, including those designed to catch predatory fishes and fencing of water reservoirs with the purpose of mass capture of fish. During the Early Neolithic, the use of fishing hooks becomes more regular while the active use of harpoons and construction of fences with traps in low waters is still documented (Lozovski et al., 2013a, b). In southeast Europe, along the Adriatic coastal region, a archaeozoological analysis of the faunal material from Vela Spila indicates the specialised fishing of migratory pelagic species during the Mesolithic. In the Neolithic, opportunistic coastal fishing is reported (Rainsford et al., 2014). The importance of fishing activity is well documented in the central Balkans at a number of sites in the Danube Gorges region, where fish remains, including large species of migratory sturgeon, various aspects of material culture, fish symbolism as well as isotopic data point to the importance of fish resources during the Mesolithic and the Neolithic (e.g. Borić, 2001; Bartosiewicz et al., 2008; Nehlich et al., 2010).

3. The site of Vinča – Belo Brdo: archaeological background

Belo Brdo is a multi-layered, tell-type site situated in the village of Vinča, on the right bank of the Danube River, 14 km downstream from Belgrade (Fig. 1). It is the central and representative site for the Late Neolithic of the region, characterized by a set of material attributes, known as the Vinča culture, which flourished in the central Balkans during the second half of the 6th and the first half of the 5th millennium BC (Garašanin, 1979; Chapman, 1981; Borić, 2009). The depth of cultural levels is approximately 9 m, most of which belongs to the Late Neolithic.

The first archaeological excavations started in 1908 and continued intermittently till the present day. In the first half of the 20th century (1908–1934), excavations were carried out from the top of the tell down to the earliest levels over an area of approximately 2000 m^2. In the second phase of the research at the site (1978–1986) a 300 m^2 excavation area was opened up adjacent to the previous one, and upper horizons relating to a Medieval necropolis, Bronze Age, Copper Age and top most Late Neolithic levels and features were investigated. In 1998, excavations of the Late Neolithic deposits continued in the same area (Tasić, 2005; Tasić and Ignjatović, 2008).

In the first phase of investigation (1908–1934) animal bones were not collected. In the second phase of research at the site, osteological material was systematically collected, and selected samples were dry-sieved. Since 2001, systematic flotation was also performed. Mammal remains from the Vinča culture layer recovered during the second phase of research were analysed by Bökönyi (1990). Fish remains comprise 4.5% (NISP = 995) of the total remains of vertebrates collected in the course of the 1998–2003 campaigns (Dimitrijević, 2008). No concentrations of fish bones were identified in the excavation area, as possible indications of specialized zones for processing fish, with fish remains scattered throughout the settlement along with bones of other vertebrates.

Fishing activities are indirectly documented at Vinča – Belo Brdo site by a repertoire of red deer antler and bone proper hooks and harpoons as well as ceramic discs and weights likely used as weights for nets (Vasić, 1936: 159–166, T. LXVII; Srejović and Jovanović, 1959: Figs. 10–12; Bačkalov, 1979: 28–29, T.XXIX/10–25, T.XXX, 1–19) (Fig. 4). Two main types of harpoons have been recovered: antler uni and biserial harpoons, barbed harpoons and cone-shaped toggle harpoons with perforation at the base (Bačkalov, 1979). This latter type appears on in the final phases of the Vinča culture settlement. Hooks were made from bones and red deer antler and are characterized by a simple tip, or one, two or three fangs. Shanks usually have a round-shaped end with a gorge at the end for binding. The length is variable although some hooks are quite big (from 3 to 16.5 cm) (Bačkalov, 1979). The assemblage comprises also two-sided hooks (so-called anchor hooks) (Srejović and Jovanović, 1959: Figs. 10 and 5).

While fishing equipment is documented also at other Vinča culture sites, such as Gomolava in northwest Serbia, in most of the Vinča culture sites hooks are found either in small numbers (e.g. at Selevac: Russell, 1990; Drenovac: Vitezović, 2007) or are completely absent. Harpoons are known only from sites along the big rivers of the Carpathian Basin and in adjacent regions (e.g. uniserial and biserial harpoons were discovered in large numbers at the site of Čoka-Kremenjak: Banner, 1960).

4. Materials and methods

Forty-one flat bone hook-like artefacts (Fig. 2, Table 1) come from 2002 to 2007 excavation seasons at Vinča – Belo Brdo and were singled out as a new tool type of unknown function. The level that these objects come from represents the topmost 2.5 m of the Vinča stratigraphic sequence (Fig. 3). The artefacts are characterized by a long rectangular base while their upper part consists of a short lateral tip and an elongated shank with usually blunted ends. A deep notch divides these two features. No similar artefacts have been documented in the lower levels of the Neolithic sequence at the site as those remained untouched during the most recent excavations at the site. Such artefacts also remained unrecognised during Vasić's excavations.

All the analysed artefacts show very good state of preservation. No major post-depositional alterations have been identified on the archaeological surfaces, with the exception of sporadic traces of root activity.

The assemblage of artefacts was analysed with the aim of identifying specific criteria of production and the modality of their