Special Issue: Personal Ornaments in Early Prehistory

Taking Beads Seriously: Prehistoric Forager Ornamental Traditions in Southeastern Europe

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ABSTRACT

Ornaments are polysemic objects due to different meanings they convey in human societies—self-embellishment, means of exchange, markers of age and gender, indicators of social status, signs of power, non-verbal means of expression and communication. Beads have a privileged place in shedding light on the origins of modern cognition in human societies. While archaeological approaches to ancient symbolism have often been concerned with behavioral modernity of our species, anthropological studies have underlined the role of ornaments in the construction of personhood, identity, and social networks in traditional societies.

Exploring an approach informed by anthropological and ethnographic theory, we discuss Paleolithic and Mesolithic bodily adornments found across southeastern Europe. We present a review of the evidence for long-term regional and diachronic differences and similarities in types of body adornment among prehistoric foragers of the region. Here we look at aspects of cultural transmission and transferability over time. This enables us to reconstruct a series of gestures involved in ornament manufacture and use, and to examine transmissions of technological know-hows, shifting aesthetic values, and demands for specific local and non-local materials, including marine shells transferred across this region over long distances (>400km). This evidence is further discussed by, on the one hand, taking a perspective that draws on emic understandings of ornaments in certain ethnographic contexts and, on the other hand, through a rethinking of the relevance of the structural anthropological mode of analysis championed by Lévi-Strauss.

This special issue is guest-edited by Daniella E. Bar-Yosef Mayer (Steinhardt Museum of Natural History and Institute of Archaeology, Tel Aviv University) and Marjolein D. Bosch (McDonald Institute for Archaeological Research, University of Cambridge). This is article #12 of 12.

> "The ecology is so important to me, and I think it plays such a part in the myth that there are a lot of things that should be not only seen but lived in […] so as to understand them" (Lévi-Strauss in Tom Shandel's film *Behind the Masks*, 1973, cited by Wilcken 2010: 316)

> "The demonstrative itinerary of the *Mythologiques* is effectively that of a generalized heterogeneous transversality wherein the myth of one people transforms another's ritual and the technics of a third, the social organization of one is the body-painting of another (a.k.a., how to shuttle between cosmology and cosmetology without leaving politics…) […] on account of which the transformations appear to leap distant points on the Amerindian continent, spurting up here and there like isolated eruptions of a subterranean lava-sea" (Viveiros de Castro 2014: 203)

INTRODUCTION

When speaking of systems of personal adornment, more than with any other aspect of material culture, we are after the origins of culture, development of symbolic thinking, and very broadly defined modern human cognition. In turn, this highly emphasized dimension of beads'

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significance in our current scholarship can easily lure us into taking a social evolutionary perspective in apprehending beads' role in the advance of behavioral modernity. This has been a dominant narrative in this subfield of archaeological scholarship over the past two decades (e.g., Bouzouggar et al. 2007; d'Errico 1998; d'Errico et al. 2003; 2005). Our theoretical goal in this paper, however, will not be linked to quests for origins and social evolutionary thresholds based on humans' interest in ornaments and body decoration. Instead, we propose broadening of the current theoretical perspectives in the study of early systems of body adornment by introducing elements of ethnographic and anthropological theory. While making ethnographic comparisons in archaeology is certainly not new, here we will suggest that there are aspects of anthropological and ethnographic discussions linked to body decoration that are relatively neglected when thinking through prehistoric ornaments and can be of some value in our archaeological analysis. We believe that there could be alternative ways of looking at ornaments in archaeology that could both remind us of how beads might have been perceived and understood in those past societies we study and help us make an effective use of lateral, geographic and diachronic comparisons when discerning patterns of beads' distributions and frequencies.

To explain what we mean by this, first we would like to sketch with a broad brush, if perhaps not so accurately still sufficiently clear, what we see are the main approaches in the study of ornaments in the current archaeological scholarship. This is then followed by a reminder of how beads work in the context of an ethnographic case study. Admitting that achieving such an emic, cultural anthropological understanding might be out of our reach when dealing with archaeological evidence, we will shift our attention to the merits of approaches that fall under the remits of structural anthropology and the work of Claude Lévi-Strauss. We will show that certain aspects of this brand of structuralism and its mode of analysis, far from being outmoded, could have some significance for archaeologists in enabling comparisons across vast geographical spaces and through time. This is then followed by a survey of the existing evidence of ornamental traditions of southeastern European foragers from the earliest appearance of beads to the very end of the Mesolithic, including a discussion of common features and main trends in body adornment over the Palaeolithic and Mesolithic long-term in this regional context. Finally, we will emerge out of this "thick description" to come back to the issues of wider comparative significance when identifying modes of structural transformation in relation to body ornaments. The presented evidence regarding the modalities of ornamental choices and processes of substitution of particular taxa in the search for desired bead shapes may get us closer to a novel understanding of ornaments' role and significance even if specific meanings elude us.

CURRENT APPROACHES TO EARLY SYSTEMS OF BODY DECORATION

Over the last couple of decades, efforts to date the origin of modern cognition, i.e., mental structures that facilitate self-awareness, metaphoric thinking, and creative expression, have focused repeatedly on beads as one of the earliest forms of symbolic communication and highlighted their ability to unveil cognitive, symbolic, and technological aspects of prehistoric societies (e.g., d'Errico et al. 2003; Kuhn and Stiner 2007; White 1992). The existence of ca. 75 ka year-old shell ornaments in late Middle Stone Age (MSA) layers of Blombos Cave (South Africa) (d'Errico et al. 2005, 2009; Henshilwood et al. 2004) and even earlier appearance of ornaments in northern Africa (Bouzouggar et al. 2007) and western Eurasia (Bar-Yosef Mayer 2005; Bar-Yosef Mayer et al. 2009; Vanhaeren et al. 2006) suggest a significant antiquity of body adornment. While the specific meanings of these earliest surviving forms of human embellishment remain unknown, many archaeologists agree that the appearance and rapid adoption of body ornaments were directly related to the dispersal of Anatomically Modern Human (AMH) cultures, their systems of values, and social identities across Eurasia. Yet, evidence from the Iberian Peninsula also suggests the symbolic use of ornaments and decoration by the Neanderthals (Zilhão et al. 2010).

Beads as an ornamental innovation might have been advantageous to other systems of ornamentation (e.g., pigments) as more functional to the expansion of the human social interaction beyond familiar individuals to larger groups of geographically dispersed but socially connected people (Gamble 1998; Kuhn and Stiner 2007; Stiner 2014). This advantage was due to their "performance characteristics," such as portability, durability, and often striking visual impact. Such an understanding of the role of ornaments can be termed an "information technology" approach, most clearly described by Kuhn and Stiner (2007) and Stiner (2014). These authors underline seven dimensions in which ornaments show different "performance characteristics." They refer to those physical properties of ornaments related to human goals and their specific context of use as well as those physical properties linked to the visual impact and capacity to encode and broadcast social information to wide audiences (cf. Schiffer and Skibo 1987). The properties of ornamental beads that show benefits with regards to other systems of ornamentation (e.g., use of pigments) and are seen as functional to the flow of social information are as follows: (1) durability; (2) standardization; (3) expression in quantity; (4) expression of investment differential (i.e., the amount of human time and effort that they represent); (5) transferability; (6) cost; and, (7) recombinability (Kuhn and Stiner 2007; Stiner 2014). While undoubtedly useful, this is a typical approach of etic type where material culture production is understood as, to cite Marshal Sahlins, "constructed out of practical action and interest, as guided by a kind of super-rationality" (Sahlins 1976: 73).

While many studies of ornaments focused on the origins and evolution of modern cognitive abilities, a number of studies explored social dimensions of symbolic expression (e.g., White 1993, 2007). A popular approach has been to look at ornaments as tokens of groups and possible markers of ethnic or linguistic identities. In forager studies, this approach has some antiquity (e.g., Newell et al. 1990 on Mesolithic ethnic boundaries) but was mobilized most prominently by Marian Vanhaeren and Francesco d'Errico (2006) in the definition of Early Upper Paleolithic groups in Europe. A variant of this approach is the work by Solange Rigaud (2011) and colleagues (Rigaud et al. 2015) in order to make sense of certain regularities in distributions of personal ornaments over the European continental scale in the context of the spread of novel Neolithic bead types and persistence of forager systems of ornamentation.

Another approach has been to look at technological steps of a *chaîne opératoire* in the production sequence of an ornamental assemblage and in this way identify particular traditions of learned gestures (e.g., Bonnardin 2007; White 2007). Other authors focused on diverse material culture trajectories over the long term, in particular, archaeological sequences in order to compare continuities and changes in different material culture assemblages of the same site. The latter approach has been taken up by Catherine Perlès (2013; see also 2018) in her thought-provoking discussion of whether lithics or ornaments could be taken as better indices of stability/change when discerning group identities in the long sequence at Franchthi cave in Greece.

We affirm that all of the mentioned archaeological approaches are useful and complementary with much merit. At the same time, we also think that beyond practical reasons, cognitive and behavioral modernity, identification of ethnic territories, and functional concerns, we could usefully supplement our approaches to early systems of ornamentation with more involved *emic* perspectives that draw on ethnographic evidence—not to casually reach for loose and inadequately problematized ethnographic analogies, but in order to tap into studies that are concerned with a rich texture of social and cultural lives that can provide grounded frameworks for re-thinking the context and role of personal adornment in early prehistory. In other words, we do not believe that the past is an entirely foreign country and while they did things differently there, we believe that points of connection with known and ethnographically recorded examples can productively be made. Discussions within the so-called "Ontological Turn" debates in anthropology and increasingly among some archaeologists are an attempt in this direction (e.g., see papers in Watts 2013). Without going into all the nuances of arguments about relational aspects of personhood, constitution of human and nonhuman worlds, and general aspects of a *corporology* (Sahlins 2008: 23)—discussions to do with the sense of one's body and soul or spirit in a particular cultural context—an illustrative example will suffice.

ORNAMENTS IN AMAZONIA: AN EXAMPLE

In 2009, in an article published in an edited volume entitled *The Occult Life of Things*, Joana Miller, described her work among the Nambikwara-Mamaindê groups of western Amazonia regarding the significance of personal adornment in the lives of these indigenous people. In her text, we learn that body ornaments are closely linked to components of a person and that the body is always adorned by ornaments understood as indices of relationships. In the construction of selves, ornaments make bodies visible. While their ownership defines the subject, there is much more here than a simple post-modern mantra of enmeshed human and material worlds. What is at stake is a specific and yet widely held notion among the Amerindian groups, espoused in numerous mythologies, of the primary humanity in which human culture was in primordial times shared between humans, animals, and things. Hence things, including body ornaments, define subjects and are at the same time subjects themselves (for instance, ornaments can turn into dangerous animals if abandoned "and must be constantly "domesticated" lest they transform into animals" [Miller 2009: 67]).

Miller's Mamaindê believe that visible ornaments on the body and the invisible, interior ornaments that only shamans can see, are both parts of the selves and are intimately linked to the notion of spirit. Illness or even death, understood as a process of transformation, in this context can be caused by the loss of one's ornaments. The role of shamans, who possess the power, i.e., a capacity, is to see through the opacity of bodies in the current state of affairs (the Amazonian cosmogony narrates that in a pre-cosmos an absolute transparency characterized corporeal and spiritual dimensions of beings). In this context, as in many other traditional contexts worldwide, children and infants are especially affected and more vulnerable to losing their human perspective and point of view. Similar to those who fall ill, children are recommended to wear more strings of beads over their bodies. Operating in an ontological universe that can be defined as animic (Descola 2013a) or perspectival (Viveiros de Castro 2004, 2014), the role of ornaments is to affix and prevent a corporeal transformation, which can easily be afflicted by the fundamental instability of the soul.

Finally, Miller makes the point that among the Mamaindê the production of ornaments is directly related to the spirits of the dead—not in a metaphorical way but by assuming their omnipresence and constant dialogue and hence the ornament makers, often shamans, fulfill the desires of the spirits of the dead through the handiwork involved in their beads manufacturing. One of the final messages of this article is that in Amazonia, different from gift and commodity economies, objects do not substitute for persons, and that rather than being understood in terms of sociological exchanges and transactions, they operate at the plane of ontological transactions among different subjectivities—humans and other-than-human beings.

This example is introduced here as we believe that, in a powerful way, it speaks of complexities that we as archaeologists deal with, even if unknowingly, when trying to disentangle prehistoric social and cultural contexts

in which ornaments operate. The choice of the Amazonian example is random, inspired by our familiarity with this ethnographic context, but in other instances of traditional societies ornaments would have both similar and different meanings. Our wider point, however, is to make a call for taking some of such ethnographic complexities seriously when exploring windows of opportunity in our prehistoric case studies with contextual analysis that can provide clues as to similarly complexly constituted past worlds. Differently put, the example serves as a reminder of all that we are missing when thinking about prehistoric ornaments. At the same time, we are well aware that opportunities for such penetrating glimpses into the past use of ornaments will inevitably be rare, and all of the intricacies described in the Nambikwara context would sadly remain forever beyond our reach.

Alongside a cultural anthropological emic approach, there might be an alternative way to utilize productively insights of ethnographic and anthropological theory in the study of ornaments by archaeologists. In the next section, we will go back to the work of Claude Lévi-Strauss and his structural anthropological method of analysis. While this choice might seem strange to some who by now view his work only as a page in the history of anthropology, we believe, along with some other authors who provided a recent re-reading of Lévi-Strauss's thought through a post-structuralist key, especially in relation to his late *Mythologiques* phase (e.g., Viveiros de Castro 2009), that it harbors much promise and relevance when probing the limits of the western epistemology and ontology (cf. Descola 2013b). Moreover, Lévi-Strauss's project is one of the earliest approaches in anthropology that takes into account both the legacy of the Boasian culturalist agenda that argues for the uniqueness of each context *and* explores universal aspects in the cognitive workings of the mind (Bloch 2012: 53–74; cf. Sperber 1996). Here is the author who refused to ignore the problem that recurrent similarities in cultural expression exist in unconnected places, and thus need a satisfactory explanation that is not diffusionist (e.g., Lévi-Strauss 1987). In scalar terms, the application of the structuralist method of analysis could be suitable to a mode of large-scale archaeological comparative analysis. Finally, we will suggest that modes of structural transformations that Lévi-Strauss identified could apply to both myths and ornaments, with homologous processes at play.

ORIGINS OF ORNAMENTS AND MYTHOLOGICAL TRANSVERSALITY

In the early 1960s, the French anthropologist Claude Lévi-Strauss started his decades long project of exploring myths of different Amerindian societies by means of structural analysis. While his starting point was in Amazonia with the reference myth of "Bird-nester," found among the Bororo groups, over the years, his *Mythologiques* project expanded as to encompass both South and North America, spinning a web of relations and connections among different stories and various idiosyncratic cultural expressions that reached even beyond the Americas, especially into Siberia, but often, too, with allusions to similarities found in European folklore tales. This comparative exercise disclosed that "[f]or Lévi-Strauss, Amerindian myth was one vast conversation murmured from campfire to campfire across continents; a to and fro of images and sensations set in logical propositions, which twisted and turned in their passage across the Americas" (Wilcken 2010: 302). Lévi-Strauss suggested that similarities in basic narratives observed between geographically remote groups stemmed from diffusions and borrowings of mythical narratives that must have travelled far and wide, attesting to complex and intense long-distance nested interactions. Yet, narratives were transformed and appropriated according to a set of "universal rules" every time when a certain cultural, linguistic, or ecological boundary was crossed (Lévi-Strauss 1992; cf. Gow 2014).

What Lévi-Strauss was particularly interested in uncovering was the nature of these transformations where he assumed universal modes and sets of operations that the human mind performed every time when narratives were transformed encountering an ethnic or linguistic boundary. According to Lévi-Strauss (1992: 108), the modalities governing these transformations were beyond the control of those listeners, whose minds under the radar of conscious understanding inverted, sometimes symmetrically, elements of different stories, or substituted certain characters and entities, depending on local ecological, social, and cultural circumstances. Yet, in each case there was always much attention paid to details chosen to be emphasized, put in relations of correspondence, or shunned. The rules of such transformations were seen as cognitive universals limited to a number of invariants that this particular brand of structural analysis was interested in uncovering through a thick description and analysis of ethnographic minutiae, combined with a keen naturalist eye interested in identifying "… precisely the plants and the animals known by each society; the different technical uses to which they are put; and, if these plants and animals are edible, how they are prepared—that is boiled, stewed, steamed, roasted, grilled, fried, or even dried or smoked for curing …" (Lévi-Strauss 1992: 102–103). The encyclopedic knowledge of different animal and plant species, or of meteorological phenomena, turned out to be of key importance as the analysis moved from the tropical forests of the Amazon Basin through prairies of the Great Plains of North America to coastal estuaries of British Columbia and beyond, with various animal figures (jaguar, tapir, sloth, salmon, coyote, lynx, etc.) featuring in myths. Idiosyncrasies in the behavior of these species were being substituted in myths depending on the local ecology and species availability, all the while a recognizable narrative core of a story plot was being maintained.

A myriad of different themes and elements were covered in the four volumes of the main *Mythologiques* series and in three later additional volumes of *petits mythologiques*. One of the recurrent themes relates to the genre of myths to do with the origins of ornaments or body adornment: "[t]he passage from the southern to the northern hemisphere had yielded a transformation from a culinary to a vestimentary code" (Wilcken 2010: 301). It is in particular in relation to

the myths of the Pacific Northwest Coast that this group of myths was discussed in Lévi-Strauss's later work entitled *The Story of Lynx* (1995), even though discussions that mention elements relating to the role of ornaments in myths are also found in *Structural Anthropology II* (Lévi-Strauss 1987) and in *A View From Afar* (Lévi-Strauss 1992). The origin of, i.e., the acquisition of, *Dentalium* (tusk shell) ornaments in particular was a recurrent theme among different groups of this region and we shall spend a little time disclosing some interesting ethnographic and mythological detail.

In a series of myths along the Pacific Northwest Coast among people belonging to the Salish linguistic family, there are many variants "… of a complex of myths organized around the tale of a poor, sick, and despised old man, usually called Lynx. By a trick, he makes the daughter of the village chief pregnant. People wonder at this unexplainable pregnancy. A child is born, who points out Lynx as its father; the indignant villagers abandon the couple without fire or food. By himself, or with his wife's help, Lynx recovers his true nature, that of a beautiful young man and expert hunter" (Lévi-Strauss 1987: 257, 1995). The myth continues further, but what concerns us here are oppositions that in various versions of this myth were created between the skin of an old and smelly man covered with wounds and sores who is transformed into a young man with healthy skin covered with shell ornaments. In various versions of this complex of myths, a dichotomy is established between external and internal, wounds and jewels, and Lévi-Strauss suggests that there are important similarities in the conceptualization of "cultural" ornaments and "natural" skin coverings between South and North American groups (Lévi-Strauss 1995: 98, 101): "cooked, clothed preoccupations with the body's innards had transferred to its outer decorations" (Wilcken 2010: 301). Here the dichotomy of inside versus outside in relation to ornaments and clothing seems to have been emphasized and we will later return to this point when discussing a particular archaeological example.

A continuation of this complex of myths speaks of Lynx's son kidnapped by Owl, who adorned the boy with a *Dentalium* necklace. The boy's parents tried to convince him to return to their village but, at first, he refused. Finally, the parents succeeded to convince the boy to come back with them, and while Owl was away, they burnt his hut. Owl chased them but when they reached a footbridge the hero scared Owl away from the other shore by waving fingers armed with goat's horns. The hero came back to the village, fully adorned with *Dentalium* shells, and distributed them to everyone. This is the origin of ornaments from *Dentalium* among the Indians (Lévi-Strauss 1987: 260, 1995: 95–96). In another myth named "The Dentalia Thieves," the protagonists are a man, a great hunter, and his two sisters. While bathing in a stream, the man rubbed his body with pine boughs and needles that fell into the water and were transformed into *Dentalium* shells. The man brought them back to his sisters. He asked the sisters not to visit this spot, but they disobeyed and collected a number of shells from the water after which their brother decided to leave them (Lévi-Strauss 1995: 30). The continuation of this myth rejoins the previously mentioned myth about Lynx, weaving together a unifying and extended mythical narrative.

In relation to *Dentalium* shells and their popularity among the Pacific Northwest Coast groups, Lévi-Strauss also provides an interesting ethnographic insight into dynamics characterizing inland versus coastal groups. He describes a specific mythology of the inland Chilcotin groups, who narrated myths about the terrestrial origins of *Dentalium* shells. The reason for this was the need to mystify the origin of these precious ornaments, attributing to them an exotic and supernatural character. The Chilcotin had an active role in the re-distribution of these objects among groups found further inland, such as the Interior Salish, who called the Chilcotin "Dentalia people," believing that shells originated in their territory. While in reality, the Chilcotin acquired *Dentalium* shells from complex coastal forager groups, such as Kwakiutl, Bella Coola, and Tsimshian, who were uninterested in the origin of *Dentalium* shells and focused their mythical narratives on other features (Lévi-Strauss 1987: 259–261, 1992: 109). This instance speaks of possibly universal dynamics that might have characterized relationships between certain coastal and inland foragers with the existence of various intermediaries involved in transfers of ornaments and their perceived importance.

Finally, let us mention a group of myths from the same region in which ornaments are compared to testicles. In these myths, apart from a character of a smelly old man covered with sores, Moon or Sun are found interchangeably in the role of a cannibalistic monster, sometimes characterized by enormous testicles or acting as a testicle eater (Lévi-Strauss 1995: 135–145). An episode describes Coyote stealing adornment from Moon but being unable to escape. In some versions of this myth, an opposition is established between heart as an *internal* round organ and testicles as *external* round organs. In this context, Lévi-Strauss (1995: 141) also emphasizes a key contrast being drawn in Amerindian thought between the hard and soft parts of the body, the latter associated with nose, ears, and sexual organs, all of which require durable ornaments to protect them. Based on a myth coming from the Coast Salish in which Coyote while cleaning salmon found two white and round milts that were set aside and not eaten, and which were later transformed into two young women wearing pretty blankets, a further correspondence was established between milts and testicles as round organs both linked to ornaments. In yet another story coming from the Klikitat, a female character got lost among a people of cannibals who wore testicles as earrings and forced her to do the same. "Helpful young ladies freed her and got rid of her hideous adornments. Instead, they put their own ornaments, of deer hunters and trout fishers, in her ears" (Lévi-Strauss 1995: 142). In the context of this set of mythical narratives, a relationship between food and ornaments is probed with a series of transformations. We note that the round, or gland-like shape of ornaments being described as well as the dynamic of internal vs. external in relation to ornaments might have had more universal connotations beyond this particular region-

al context, with some of the materials used for ornaments been selected based on a gland-shaped geometry of chosen elements found in different species (see below).

But a reader may ask, what are we trying to achieve by evoking mythical narratives on the origin of ornaments in the Pacific Northwest Coast thousands of miles away from our discussion of Paleolithic and Mesolithic ornaments in southeastern Europe? The purpose of this evocation is three-fold. First, methodologically and epistemologically, we hypothesize that the argued universal cognitive processes of structural transformation and substitution when mythical narratives pass from one group to another while maintaining the narrative coherence of the same plot could be homologous to the way certain body ornaments in the deep prehistory of Eurasia maintained constancy over continental scales regarding desired shapes as well as in the selection of certain species and their body parts. Such species choices were occasionally substituted when crossing social, cultural, ecological, and chronological boundaries depending on local availability and changing modes of interactions with nonhuman entities, as often happened with mythical narratives too. Second, this piece of ethnography could potentially help us in disclosing universal aspects of relations and dynamics between coastal and inland groups regarding access to certain materials, i.e., animal species, used as ornaments. And, third, while specific regional meanings assigned to certain ornamental types in the deep archaeological past will for the most part remain out of our reach, one cannot rule out cross-culturally common meanings held about certain species used for ornaments between ethnographic and archaeological case studies. The latter point will inevitably remain difficult to justify methodologically, but we argue that the consistent preference for shells and other parts of certain species used for ornaments world-wide and over the long term can hardly be ignored. While old-fashioned diffusionist arguments about deeply rooted connections between transmitted cultural traditions, including ornamental preferences, of Paleolithic ancient Eurasian populations and those that crossed the Bering Strait into the Americas should not entirely be ruled out, these are very difficult to demonstrate at continental and temporal scales with which we are confronted. Hence, here we prefer to follow the structural anthropological method of analysis and examine possible regularities by which characteristics of certain species used as ornaments might have been keenly observed and further transmitted, transformed, or substituted, in a similar way to which elements in mythical narratives morphed as they crossed social and cultural boundaries. An explanation for recurrent elements in cultural forms, including the choice of ornamental materials, would be to suggest that in the functioning of the mind there are universal predispositions for certain contents (Sperber 1996; cf. Bloch 2012).

In the following, we turn to an analysis of ornamental choices and diachronic and spatial patterning in frequencies of certain types of ornaments in a regional context typical of cultural and ecological dynamics characterizing Eurasian prehistoric foragers. We will attempt to show that some of the identified structural regularities between inside and outside regarding the choice of organs chosen as ornaments and their subsequent display on the surface of the body as well as the geometry of certain recurrent types, such as gland-like shapes, share recurrent similarities between remote and unrelated regions. At the same time, the cultural uniqueness of each particular case and their historical circumstances are equally undeniable.

ORNAMENTAL TRADITIONS IN SOUTHEASTERN EUROPE

The following survey of the evidence for ornaments in Paleolithic and Mesolithic layers of various sites in southeastern Europe must inevitably remain a work in progress due to sometimes limited presentation of various sites and collections, even though significant progress in the publication of early prehistoric ornaments from this wider region has been made in recent years. Moreover, we have made every effort to identify the chronological placement of the discussed finds as accurate as possible, but this will not be the place for fine chronological tunings about ornaments' exact stratigraphic position. Instead, rather broad chronological time blocks are used as units of analysis (Table 1). The pattern of distribution of Paleolithic and Mesolithic sites with ornaments across southeastern Europe indicates a very uneven coverage. This situation is directly linked to the sporadic and sparse record of Late Pleistocene and Early Holocene/pre-Neolithic settlement.

Several zones can be identified with larger concentrations of Paleolithic and Mesolithic sites, and consequently larger numbers of ornaments. These areas also offer a diachronic perspective in examining changes in ornaments' consumption tastes. Four major zones (Figure 1) are identified: (1) the Danube Basin catchment zone with northern Bulgaria and the Romanian Carpathian Mountains; here, there are a number of sites with significant Middle to Upper Paleolithic presence, along with several other inland sites, such as Šalitrena or Velika Pećina caves; (2) the Danube Gorges area, which is separated for its specific character and ecology, although obviously belonging to the Danube Basin Catchment zone; here, one finds the Epipaleolithic sites of Cuina Turcului and Climente II, as well as several Early to Late Mesolithic sites; (3) Greece with the sites of Franchthi and Klissoura 1 caves in the Argolid, both of which exhibit deep Paleolithic and Mesolithic stratigraphies, the sites of Kastritsa, Klithi, and other Upper Paleolithic sequences in the Epirus region of western Greece, and the Cave of the Cyclopes on the island of Gioura in the northern Sporades; and, (4) the Eastern Adriatic littoral zone and its wider hinterland of the Dinaric Alps, with relatively numerous Paleolithic and Mesolithic sites found in present-day Croatia, Bosnia and Herzegovina, and Montenegro. There are only few other sites with ornaments that are found outside and in between these four broadly defined regional zones.

One of the possibly earliest examples of personal adornment, dating to ca. 130 ky BP comes, from the cave site of Krapina in Croatia, where cutmarked white-tailed

TABLE 1. ORNAMENTAL MATERIALS (perforated, unperforated, and fragments) AND THEIR FREQUENCIES IN PALEOLITHIC AND MESOLITHIC SITES IN SOUTHEASTERN EUROPE.*

Vertebrate teeth & bone

Period/Site (Region)	*Haliaëtus albicilla* talon	Bird tubular bone	*Vulpes vulpes* canine	Bone pendant / tile	*Cervus elaphus* canine	*Meles meles* canine	*Lynx lynx* canine	Large cervid incisor	Bovid incisor	*Capra ibex* incisor	*Castor fiber* incisor	*Sus* sp. incisor	*Canis lupus* incisor	*Ursus spelaeus* tooth	*Ursus spelaeus* phalanx	Bone bead
Middle Paleolithic																
Krapina (DBC)	8															
Initial Upper Paleolithic																
Klissoura 1 (G)																
Kozarnika (DBC)			3													
Upper Paleolithic – Aurignacian																
Bacho Kiro (DBC)			4	3												
Kozarnika (DBC)		3	2+		+											
Bordul Mare (DBC)													1			
Franchthi (G)																
Klissoura 1 (G)																
Šalitrena (DBC)																
Upper Paleolithic – Gravettian-like																
Kozarnika (DBC)				2	4											
Temnata Dupka (DBC)					2				1							
Šandalja II (EA)					3	1										
Cioarei (DBC)														1	1	1
Gura Cheii (DBC)			1		1											
Mitoc – Malul Galben (DBC)				1									1			

Marine gastropods, scaphopods & bivalves

Period/Site (Region)	*Tritia neritea*	*Tritia pellucida*	*Tritia* sp.	*Tritia gibbosula*	*Columbella rustica*	*Dentalium* sp.	*Glycymeris* sp.	*Arca noae*	*Cardium rusticum*	*Lamellaria* sp.	*Pecten maximus*	*Acanthocardia tuberculata*	*Haliotis lamellose*	*Gibbula adansoni*	*Gibbula albida*	*Gibbula richardi*	*Gibbula* cf. *umbilicus*	*Gibbula* sp.	*Clanculus corallinus*	*Monodonta articulata*	*Monodonta mutabilis*	*Monodonta turbinata*	*Homalopoma sanguineus*	*Cerithium* sp.	*Naticarius* sp.	*Phalium* sp.	*Pisania maculosa*	*Cancellaria cancellata*	*Hinia reticulata*
Middle Paleolithic																													
Krapina (DBC)																													
Initial Upper Paleolithic																													
Klissoura 1 (G)	7	3	1		3	11	1					1	1			1							1						1
Kozarnika (DBC)																													
Upper Paleolithic – Aurignacian																													
Bacho Kiro (DBC)																													
Kozarnika (DBC)																													
Bordul Mare (DBC)																													
Franchthi (G)			111		6	112																	16						
Klissoura 1 (G)	478	43	6		135	14	5				18	16	5	131	61	22	3	16	73	7	11	6	115	3	4	3	7	3	97
Šalitrena (DBC)						1																							
Upper Paleolithic – Gravettian-like																													
Kozarnika (DBC)																													
Temnata Dupka (DBC)																													
Šandalja II (EA)																													
Cioarei (DBC)																													
Gura Cheii (DBC)																													
Mitoc – Malul Galben (DBC)																													

TABLE 1. ORNAMENTAL MATERIALS (perforated, unperforated, and fragments) AND THEIR FREQUENCIES IN PALEOLITHIC AND MESOLITHIC SITES IN SOUTHEASTERN EUROPE (continued).*

	Marine gastropods, scaphopods & bivalves			*Freshwater & land gastropods & semi-anadromous fish*							
Period/Site (Region)	*Conus mediterraneus*	*Corymbina rhodiensis*	*Melanopsis gorceixi*	*Chlamys varia*	*Lithoglyphus naticoides*	*Lithoglyphus apertus*	*Zebrina detrita*	*Theodoxus* sp.	*Theodoxus danubialis*	*Rutilus* sp. pharyngeal tooth	Perforated stone	**Source**
Middle Paleolithic												
Krapina (DBC)												Radovčić et al. 2015
Initial Upper Paleolithic												
Klissoura 1 (G)		1						1				Stiner 2010
Kozarnika (DBC)												Guadelli 2011
Upper Paleolithic – Aurignacian												
Bacho Kiro (DBC)												Guadelli 2011
Kozarnika (DBC)					8							Ditto
Bordul Mare (DBC)												Mărgărit 2008
Franchthi (G)												Perlès 2018
Klissoura 1 (G)	5	15	12	3				109				Stiner 2010
Šalitrena (DBC)												Marín-Arroyo & Mihailović 2017
Upper Paleolithic – Gravettian-like												
Kozarnika (DBC)												Guadelli 2011
Temnata Dupka (DBC)												Ditto
Šandalja II (EA)												Cvitkušić 2017
Cioarei (DBC)											2	Mărgărit 2008
Gura Cheii (DBC)												Ditto
Mitoc – Malul Galben (DBC)											1	Ditto

TABLE 1. ORNAMENTAL MATERIALS (perforated, unperforated, and fragments) AND THEIR FREQUENCIES IN PALEOLITHIC AND MESOLITHIC SITES IN SOUTHEASTERN EUROPE (continued).*

	Vertebrate teeth & bone															
Period/Site (Region)	*Haliaëtus albicilla* talon	Bird tubular bone	*Vulpes vulpes* canine	Bone pendant / tile	*Cervus elaphus* canine	*Meles meles* canine	*Lynx lynx* canine	Large cervid incisor	Bovid incisor	*Capra ibex* incisor	*Castor fiber* incisor	*Sus* sp. incisor	*Canis lupus* incisor	*Ursus spelaeus* tooth	*Ursus spelaeus* phalanx	Bone bead
Upper Paleolithic – Gravettian-like																
Poiana – Cireşului (DBC)			1		2											
Ţibrinu (DBC)				1										1		
Franchthi (G)																2
Klissoura 1 (G)																
Kastritsa – Strata 3, 5, 7 (E)					9											
Velika Pećina (DBC)								1								
Late Upper Paleolithic																
Temnata Dupka (DBC)					1											
Franchthi (G)										1						
Klissoura 1 (G)																
Klithi (E)					8											
Kastritsa – Stratum 1 (E)					9											
Boila (E)					2											
Climente II (DG)			1		3											
Cuina Turcului (DG)					11						1	1	1			
Romualdova (EA)					1											
Šandalja II (EA)				2	4		1		1							
Vlakno (EA)					10											
Vela Spila (EA)					7											

	Marine gastropods, scaphopods & bivalves																												
Period/Site (Region)	*Tritia neritea*	*Tritia pellucida*	*Tritia* sp.	*Tritia gibbosula*	*Columbella rustica*	*Dentalium* sp.	*Glycymeris* sp.	*Arca noae*	*Cardium rusticum*	*Lamellaria* sp.	*Pecten maximus*	*Acanthocardia tuberculata*	*Haliotis lamellose*	*Gibbula adansoni*	*Gibbula albida*	*Gibbula richardi*	*Gibbula* cf. *umbilicus*	*Gibbula* sp.	*Clanculus corallinus*	*Monodonta articulata*	*Monodonta mutabilis*	*Monodonta turbinata*	*Homalopoma sanguineus*	*Cerithium* sp.	*Naticarius* sp.	*Phalium* sp.	*Pisania maculosa*	*Cancellaria cancellata*	*Hinia reticulata*
Upper Paleolithic – Gravettian-like																													
Poiana – Cireşului (DBC)			1			1																							
Ţibrinu (DBC)																													
Franchthi (G)			200		14	272												1	1				16						
Klissoura 1 (G)	39	1	7		12	1					1																		
Kastritsa – Strata 3, 5, 7 (E)			20			6																							
Velika Pećina (DBC)																													
Late Upper Paleolithic																													
Temnata Dupka (DBC)																													
Franchthi (G)		87 0			62	64	14																						
Klissoura 1 (G)	4					4					1																		
Klithi (E)			119			7																	41						1
Kastritsa – Stratum 1 (E)			2			10																							
Boila (E)			48																				5						
Climente II (DG)						1																							
Cuina Turcului (DG)			3			1																							
Romualdova (EA)																													
Šandalja II (EA)							1																						
Vlakno (EA)	9					1	3																						
Vela Spila (EA)	2			7	2		5																						

TABLE 1. ORNAMENTAL MATERIALS (perforated, unperforated, and fragments) AND THEIR FREQUENCIES IN PALEOLITHIC AND MESOLITHIC SITES IN SOUTHEASTERN EUROPE (continued).*

	Marine gastropods, scaphopods & bivalves			*Freshwater & land gastropods & semi-anadromous fish*								
Period/Site (Region)	*Conus mediterranneus*	*Corynbina rhodiensis*	*Melanopsis gorceixi*	*Chlamys varia*	*Lithoglyphus naticoides*	*Lithoglyphus apertus*	*Zebrina detrita*	*Theodoxus* sp.	*Theodoxus danubialis*	*Rutilus* sp. pharyngeal tooth	Perforated stone	**Source**
Upper Paleolithic – Gravettian-like												
Poiana – Cireşului (DBC)					12						2	Ditto
Ţibrinu (DBC)												Ditto
Franchthi (G)												Perlès 2018
Klissoura 1 (G)												Stiner 2010
Kastritsa – Strata 3, 5, 7 (E)											2	Kotjabopoulou & Adam 2004
Velika Pećina (DBC)												Dimitrijević et al. 2018
Late Upper Paleolithic												
Temnata Dupka (DBC)												Guadelli 2011
Franchthi (G)												Perlès 2018
Klissoura 1 (G)												Stiner 2010
Klithi (E)								20				Kotjabopoulou & Adam 2004
Kastritsa – Stratum 1 (E)												Ditto
Boila (E)								3			1	Ditto
Climente II (DG)												Mărgărit et al. 2017
Cuina Turcului (DG)					37	3	1		8			Ditto
Romualdova (EA)												Cvitkušić 2017
Šandalja II (EA)												
Vlakno (EA)												Ditto
Vela Spila (EA)												Ditto

TABLE 1. ORNAMENTAL MATERIALS (perforated, unperforated, and fragments) AND THEIR FREQUENCIES IN PALEOLITHIC AND MESOLITHIC SITES IN SOUTHEASTERN EUROPE (continued).*

	Vertebrate teeth & bone															
Period/Site (Region)	*Haliaëtus albicilla* talon	Bird tubular bone	*Vulpes vulpes* canine	Bone pendant / tile	*Cervus elaphus* canine	*Meles meles* canine	*Lynx lynx* canine	Large cervid incisor	Bovid incisor	*Capra ibex* incisor	*Castor fiber* incisor	*Sus* sp. incisor	*Canis lupus* incisor	*Ursus spelaeus* tooth	*Ursus spelaeus* phalanx	Bone bead
Late Upper Paleolithic																
Badanj (EA)					30				2							1
Vešanska (EA)				1												
Pupićina (EA)								1								
Zala (EA)																
Ljubićeva (EA)																
Kopačina (EA)																
Mališina Stijena Layer 2 (EA)																
Crvena Stijena (EA)																
Early Mesolithic																
Franchthi (G)																
Klissoura 1 (G)																
Cyclops (G)																
Grava (G)					1											
Theopetra (G)					2											
Vela (EA)																
Vela Spila (EA)																
Vlakno (EA)					4											
Pupićina (EA)					6											
Lim 001 (EA)																
Abri Šebrn (EA)																
Nugljanska (EA)					1											
Zala (EA)																
Icoana (DG)																

	Marine gastropods, scaphopods & bivalves																												
Period/Site (Region)	*Tritia neritea*	*Tritia pellucida*	*Tritia* sp.	*Tritia gibbosula*	*Columbella rustica*	*Dentalium* sp.	*Glycymeris* sp.	*Arca noae*	*Cardium rusticum*	*Lamellaria* sp.	*Pecten maximus*	*Acanthocardia tuberculata*	*Haliotis lamellose*	*Gibbula adansoni*	*Gibbula albida*	*Gibbula richardi*	*Gibbula* cf. *umbilicus*	*Gibbula* sp.	*Clanculus corallinus*	*Monodonta articulata*	*Monodonta mutabilis*	*Monodonta turbinata*	*Homalopoma sanguineus*	*Cerithium* sp.	*Naticarius* sp.	*Phalium* sp.	*Pisania maculosa*	*Cancellaria cancellata*	*Hinia reticulata*
Late Upper Paleolithic																													
Badanj (EA)	269			22	38	371	53																						
Vešanska (EA)	1																												
Pupićina (EA)					1																								
Zala (EA)	14																												
Ljubićeva (EA)			1																										
Kopačina (EA)					+																								
Mališina Stijena Layer 2 (EA)				2																									
Crvena Stijena (EA)							3																						
Early Mesolithic																													
Franchthi (G)			7523		148	401																							
Klissoura 1 (G)	1					1	1				2	1																	
Cyclops (G)																													
Grava (G)																													
Theopetra (G)																													
Vela (EA)					1																								
Vela Spila (EA)					338																								
Vlakno (EA)	80			2	352		2		1	2																			
Pupićina (EA)	1			1	94																			1					
Lim 001 (EA)					20		1	1																3					
Abri Šebrn (EA)					14																								
Nugljanska (EA)					5?																			1?					
Zala (EA)	1				13																								
Icoana (DG)						1																							

TABLE 1. ORNAMENTAL MATERIALS (perforated, unperforated, and fragments) AND THEIR FREQUENCIES IN PALEOLITHIC AND MESOLITHIC SITES IN SOUTHEASTERN EUROPE (continued).*

	Marine gastropods, scaphopods & bivalves			*Freshwater & land gastropods & semi-anadromous fish*								
Period/Site (Region)	*Conus mediterranneus*	*Corymbina rhodiensis*	*Melanopsis gorceixi*	*Chlamys varia*	*Lithoglyphus naticoides*	*Lithoglyphus apertus*	*Zebrina detrita*	*Theodoxus* sp.	*Theodoxus danubialis*	*Rutilus* sp. pharyngeal tooth	Perforated stone	**Source**
Late Upper Paleolithic												
Badanj (EA)					8							This paper
Vešanska (EA)												Cvitkušić 2017
Pupićina (EA)												Ditto
Zala (EA)												Ditto
Ljubićeva (EA)												Ditto
Kopačina (EA)												Ditto
Mališina Stijena Layer 2 (EA)												Bogićević & Dimitrijević 2004
Crvena Stijena (EA)												This paper
Early Mesolithic												
Franchthi (G)											10	Perlès 2018
Klissoura 1 (G)												Stiner 2010
Cyclops (G)											3	Sampson 2008
Grava (G)												Kotjabopoulou & Adam 2004
Theopetra (G)												Ditto
Vela (EA)												Cvitkušić 2017
Vela Spila (EA)												Ditto
Vlakno (EA)	1				3							Ditto
Pupićina (EA)					8				1			Ditto
Lim 001 (EA)					2							Ditto
Abri Šebrn (EA)												Ditto
Nugljanska (EA)												Ditto
Zala (EA)					34							Ditto
Icoana (DG)												Mărgărit et al. 2017

TABLE 1. ORNAMENTAL MATERIALS (perforated, unperforated, and fragments) AND THEIR FREQUENCIES IN PALEOLITHIC AND MESOLITHIC SITES IN SOUTHEASTERN EUROPE (continued).*

Period/Site (Region)	*Haliaëtus albicilla* talon	Bird tubular bone	*Vulpes vulpes* canine	Bone pendant / tile	*Cervus elaphus* canine	*Meles meles* canine	*Lynx lynx* canine	Large cervid incisor	Bovid incisor	*Capra ibex* incisor	*Castor fiber* incisor	*Sus* sp. incisor	*Canis lupus* incisor	*Ursus spelaeus* tooth	*Ursus spelaeus* phalanx	Bone bead
	Vertebrate teeth & bone															
Late Mesolithic																
Franchthi (G)																
Vrbička (EA)																
Vruća (EA)																
Crvena Stijena (EA)																
Vlasac (DG)																
Schela Cladovei (DG)																
Ostrovul Banului (DG)																
Icoana (DG)												2				
Kula (DG)																

Period/Site (Region)	*Tritia neritea*	*Tritia pellucida*	*Tritia* sp.	*Tritia gibbosula*	*Columbella rustica*	*Dentalium* sp.	*Glycymeris* sp.	*Arca noae*	*Cardium rusticum*	*Lamellaria* sp.	*Pecten maximus*	*Acanthocardia tuberculata*	*Haliotis lamellose*	*Gibbula adansoni*	*Gibbula albida*	*Gibbula richardi*	*Gibbula* cf. *umbilicus*	*Gibbula* sp.	*Clanculus corallinus*	*Monodonta articulata*	*Monodonta mutabilis*	*Monodonta turbinata*	*Homalopoma sanguineus*	*Cerithium* sp.	*Naticarius* sp.	*Phalium* sp.	*Pisania maculosa*	*Cancellaria cancellata*	*Hinia reticulata*
	Marine gastropods, scaphopods & bivalves																												
Late Mesolithic																													
Franchthi (G)			2611		165	17																							
Vrbička (EA)					2																								
Vruća (EA)					1																								
Crvena Stijena (EA)					10																								
Vlasac (DG)	140				15																								
Schela Cladovei (DG)	5																												
Ostrovul Banului (DG)			20																										
Icoana (DG)																													
Kula (DG)																													

*For many assemblages, the frequencies shown are minimal numbers only. Where the exact number is unknown, only presence (+) is indicated. Abbreviations: DG – Danube Gorges; DBC – Danube Basin Catchment; EA – Eastern Adriatic catchment; E – Epirus; G – Greece.

Note: For the following species only one or two specimens were found in Lower Aurignacian deposits (Layer IV) of the site of Klissoura 1 Cave in Greece, and hence these were not included in the table: *Calliostoma* sp. (2), *Clanculus cruciatus* ? (2), *Littorina neritoides* (2), *Turritella communis* (2), *Vermetus* sp. (2), *Cerithium vulgaris* (1), *Neverita/Naticarius* sp. (2), *Mitrella/Pyrene scripta* (1), *Hexaplex trunculus* (1), *Thais hemastoma* (1), *Sphaeronossa mutabilis* (2), and *Colus jeffreysianus* (1). The same applies to one specimen of *Cerastoderma edule* found in the Uluzzian (Earliest Upper Paleolithic) Layer V (Stiner 2010: Appendix 1). There were also only two specimens of *Mitromorpha olividea* and two specimens of *Arcularia gibbosula* in Epipaleolithic layers of Klithi rockshelter in Greece (Adam and Kotjabopoulou 2004: Table 1).

TABLE 1. ORNAMENTAL MATERIALS (perforated, unperforated, and fragments) AND THEIR FREQUENCIES IN PALEOLITHIC AND MESOLITHIC SITES IN SOUTHEASTERN EUROPE (continued).*

	Marine gastropods, scaphopods & bivalves			*Freshwater & land gastropods & semi-anadromous fish*								
Period/Site (Region)	*Conus mediterraneus*	*Corymbina rhodiensis*	*Melanopsis gorceixi*	*Chlamys varia*	*Lithoglyphus naticoides*	*Lithoglyphus apertus*	*Zebrina detrita*	*Theodoxus* sp.	*Theodoxus danubialis*	*Rutilus* sp. pharyngeal tooth	Perforated stone	**Source**
Late Mesolithic												
Franchthi (G)											1?	Perlès 2018
Vrbička (EA)											1	This paper
Vruća (EA)												This paper
Crvena Stijena (EA)												This paper
Vlasac (DG)					3				3	3123+		Cristiani & Borić 2017
Schela Cladovei (DG)					107					324+		Mărgărit et al. 2017
Ostrovul Banului (DG)												Ditto
Icoana (DG)										1		Ditto
Kula (DG)										+		Cristiani & Borić 2017

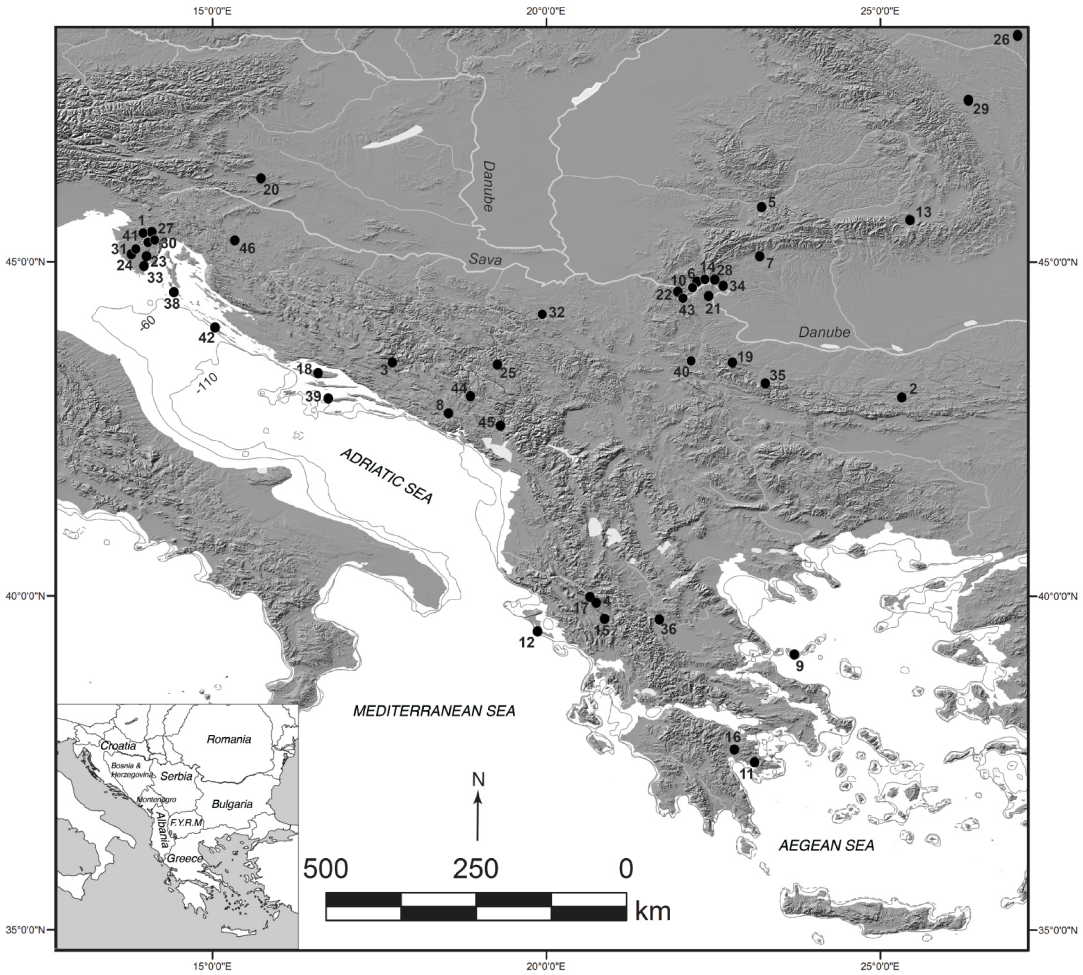

Figure 1. Map showing the distribution of Paleolithic and Mesolithic sites with ornaments in southeastern Europe. Bathymetric contours show the drop of sea levels -110m during the LGM climax and -60m by the end of the Pleistocene. 1. Abri Šebrn; 2. Bacho Kiro; 3. Badanj; 4. Boila; 5. Bordul Mare; 6. Climente II; 7. Cioarei; 8. Crvena Stijena; 9. Cyclops; 10. Cuina Turcului; 11. Franchthi; 12. Grava; 13. Gura Cheii; 14. Icoana; 15. Kastritsa; 16. Klissoura 1; 17. Klithi; 18. Kopačina; 19. Kozarnika; 20. Krapina; 21. Kula; 22. Lepenski Vir; 23. Ljubićeva; 24. Lim 001; 25. Mališina Stijena; 26. Mitoc–Malul Galben; 27. Nugljanska; 28. Ostrovul Banului; 29. Poiana Cireşului; 30. Pupićina; 31. Ramualdova; 32. Šalitrena; 33. Šandalja II; 34. Schela Cladovei; 35. Temnata; 36. Theopetra; 37. Ţibrinu; 38. Vela; 39. Vela Spila; 40. Velika pećina; 41. Vešanska; 42. Vlakno; 43. Vlasac; 44. Vrbička; 45. Vruća; 46. Zala.

(*Haliaëtus albicilla*) eagle talons have been singled out for their likely use as items of personal decoration by the Neanderthals (Radovčić et al. 2015). All other ornaments appear with the start of the Upper Paleolithic.

Items of personal adornment found across southeastern Europe in the Upper Paleolithic and Mesolithic can be classified based on the type of raw material used in their production. The main groupings (see Table 1), based on their taxonomic and ecological/environmental attributes, can be defined as follows: (1) vertebrate teeth and bone; (2) non-edible marine gastropods, scaphopods, and bivalves; (3) freshwater and land gastropods; (4) Cyprinidae/*Rutilus* sp. fish pharyngeal "teeth;" and, (5) perforated stone beads/pendants. Below we have reviewed the evidence for the presence of different ornament types across southeastern Europe as well as the chronological place of particular types of ornaments in individual stratigraphic sequences.

DANUBE BASIN CATCHMENT

Some of the possibly oldest specimens of personal adornment in Europe come from the Middle to Upper Paleolithic transitional Layer 11 at the site of Bacho Kiro in northern Bulgaria, dated to ca. 40 to 33 ky cal BP (cf. Kozłowski 1982; Teyssandier 2008; Tsanova 2008). Primarily teeth or fragments of teeth were being used for suspension with a single perforation by scraping or rotation as well as by incision (Guadelli 2011: Figure 72). There was a spindle-shaped bone pendant, oval in cross section and grooved at the narrow end. In the succeeding layers, pearl-like bone beads were created, intensively polished and perforated with a rotatory movement.

At the site of Kozarnika, found farther to the west from Bacho Kiro in the same general region of northern Bulgaria, there were perforated or grooved fox (*Vulpes vulpes*) canines associated with the Initial Upper Paleolithic levels

(Layer VIII) (Guadelli 2011: 191–192). In the succeeding Early Upper Paleolithic levels associated with the Aurignacian industry (Ancient Kozarnikian, Layer VII), there were two types of ornaments—modified bird tubular bones and perforated specimens of *Lithoglyphus naticoides* (Guadelli 2011: Figures 27–28) (Figure 2.8–13). In the succeeding Middle Kozarnikian (Layer VI), there are more diagnostic and numerous specimens, such as incisors of bovids, perforated or grooved fox canines (Figure 2.1–2), and red deer (*Cervus elaphus*) canines (Guadelli 2011: Figures 32, 35) (Figure 2.5–7, 2.14-16). The novelty in this assemblage of ornaments is the appearance of the bone imitations of red deer canines (Figure 2.4). The use of red deer canines or bone imitations of the same shape continue in association with the Gravettian industry (Recent Kozarnikian, Layer IVb) (Guadelli 2011: Figure 45). In this level there are also two perforated bone plates similarly modified, with both lateral sides decorated by making a wavy edge (Guadelli 2011: Figure 46) (Figure 2.3).

At another site, Temnata Dupka, where predominantly Gravettian levels are found, ornaments are rare, with only one specimen of perforated red deer canine, one bone imitation of the same shape, and a perforated sesamoid bone (Guadelli 2011: Figures 59, 63).

In the Carpathian Mountains of Romania, a perforated wolf canine comes from Aurignacian levels of the site of Bordul Mare (see Figure 1) (Mărgărit 2008: Figure 27). Several other Romanian sites dated to the Gravettian period yielded ornaments, such as perforated wolf (*Canis lupus*), fox, and red deer canines, bone pendants, as well as both blank and incised perforated pebbles (see Table 1, see Figure 2). One of the specificities of this region during the Gravettian period are documented perforations on an incisor, a canine, and a phalanx of cave bear (*Ursus spelaeus*), possibly used as ornaments, at the sites of Cioarei cave (Figure 2.26-27) and Țibrinu (Figure 2.31). At the site of Poiana–Cireşului, a *Dentalium* sp. and a *Tritia neritea* (formerly *Cyclope neritea*) beads were also found in association with Phase I dated to 24–20 ky cal BP (Cârciumaru et al. 2018; Mărgărit 2008).

In the catchment zone of the Lower Danube, at the inland cave site of Šalitrena in western Serbia (see Figure 1), a *Dentalium* sp. specimen was found in Aurignacian levels and has directly been AMS-dated to 34,531–33,877 cal BP (OxA-27683: 30,150±150 BP) (Marín-Arroyo and Mihailović 2017: Table 1).

DANUBE GORGES

Different from the previously discussed region, in the Danube Gorges area there are no currently known deeply stratified caves to illuminate diachronic changes in ornamental preferences at a single location over time (cf. Bonsall 2008; Borić 2011; Borić and Cristiani 2016; Mărgărit et al. 2017). However, a number of sites in the stretch of some 135km along the Danube in this region can be assigned to discrete chronological periods. Hence, it is possible to follow changes over time at the level of the region as a whole. There are several caves and rock-shelters in the region that are dated to the Upper Paleolithic, while ornaments come from only two sites with lowermost levels dating to the final Paleolithic or Epipaleolithic, corresponding to the Bølling-Allerød warming phase starting ca. 14.7 ky cal BP, followed by the duration of the Younger Dryas from ca. 12.9 ky cal BP up until the beginning of the Early Holocene warming ca. 11.7 ky cal BP. At the Epipaleolithic site of Climente II cave, where a human burial and other occupation deposits are on the basis of current dating evidence confined to the Bølling-Allerød warming phase (Bonsall et al. 2016; Bonsall and Boroneanț 2016), there were perforated vestigial teeth of red deer, a *Dentalium* sp., and a pierced fox canine (Figure 2.32) (Bonsall and Boroneanț 2016; Mărgărit 2008: Figure 54; Mărgărit et al. 2017). At the rock-shelter of Cuina Turcului, situated in close proximity of Climente II, there were pierced red deer vestigial canines (Figure 2.35–37), a perforated wolf incisor (Figure 2.34), a perforated pig (*Sus* sp.) incisor (Figure 2.33), a perforated beaver (*Castor fiber*) incisor, and pendants made of unknown mammalian bone elements, of which one was a perforated squared bone pendant with a direct analogy to a similar piece found at the Mesolithic site of Vlasac in the same region (Srejović and Letica 1979: Plate CVI). Among freshwater shells and land gastropods, there were specimens of *Lithoglyphus naticoides*, *Lithoglyphus apertus*, *Theodoxus danubialis* (Figure 2.72–74), and *Zebrina detrita*. Fish vertebrae were also perforated and possibly used as ornaments. There were also "exotic," non-locally available materials turned into beads, such as *Tritia neritea* (Figure 2.69–71) and *Dentalium* sp. (Mărgărit 2008: Figure 81; Mărgărit et al. 2017; Păunescu 1970).

Despite the existence of both burials and settlement deposits dating to the Early and Middle Mesolithic at several sites in the Danube Gorges (cf. Borić 2011, 2016), almost no ornaments can securely be assigned to this initial period from ca. 11.7 to 9.3 ky cal BP. Only in the case of the site of Icoana, it has been tentatively suggested that one specimen of *Dentalium* sp. may belong to this period (Mărgărit et al. 2017). However, potentially alternative evidence for ornamentation and decoration during the Epipaleolithic and Mesolithic in this region comes from the presence of red ochre hematite found at the sites of Climente II in the Epigravettian levels (Bonsall and Boroneanț 2016) and at the site of Lepenski Vir, where two nuggets of red ochre hematite were found beneath the floor of Building 47 (Figure 2.75–76) (Borić 2015; Borić et al. 2018). While red ochre might have been used for various utilitarian tasks (e.g., hide-working, compound adhesive, etc.), it is also likely that it played a role in body decoration, perhaps in tandem with ornaments as previously shown based on residue analysis of various ornamental beads (Cristiani and Borić 2012, 2017; Cristiani et al. 2014; cf. Mărgărit et al. 2017). We note that use-wear analysis performed on a number of groundstone tools from this regional context show traces of ochre hematite processing from nodules to powder at the sites of Padina and Vlasac (unpublished data).

The richness and uniqueness of personal body adornment assemblages in this region peak during the Mesolithic period, and in particular in the Late Mesolithic (ca. 9.3–8.2 ky cal BP). At the sites of Vlasac (Borić et al. 2014;

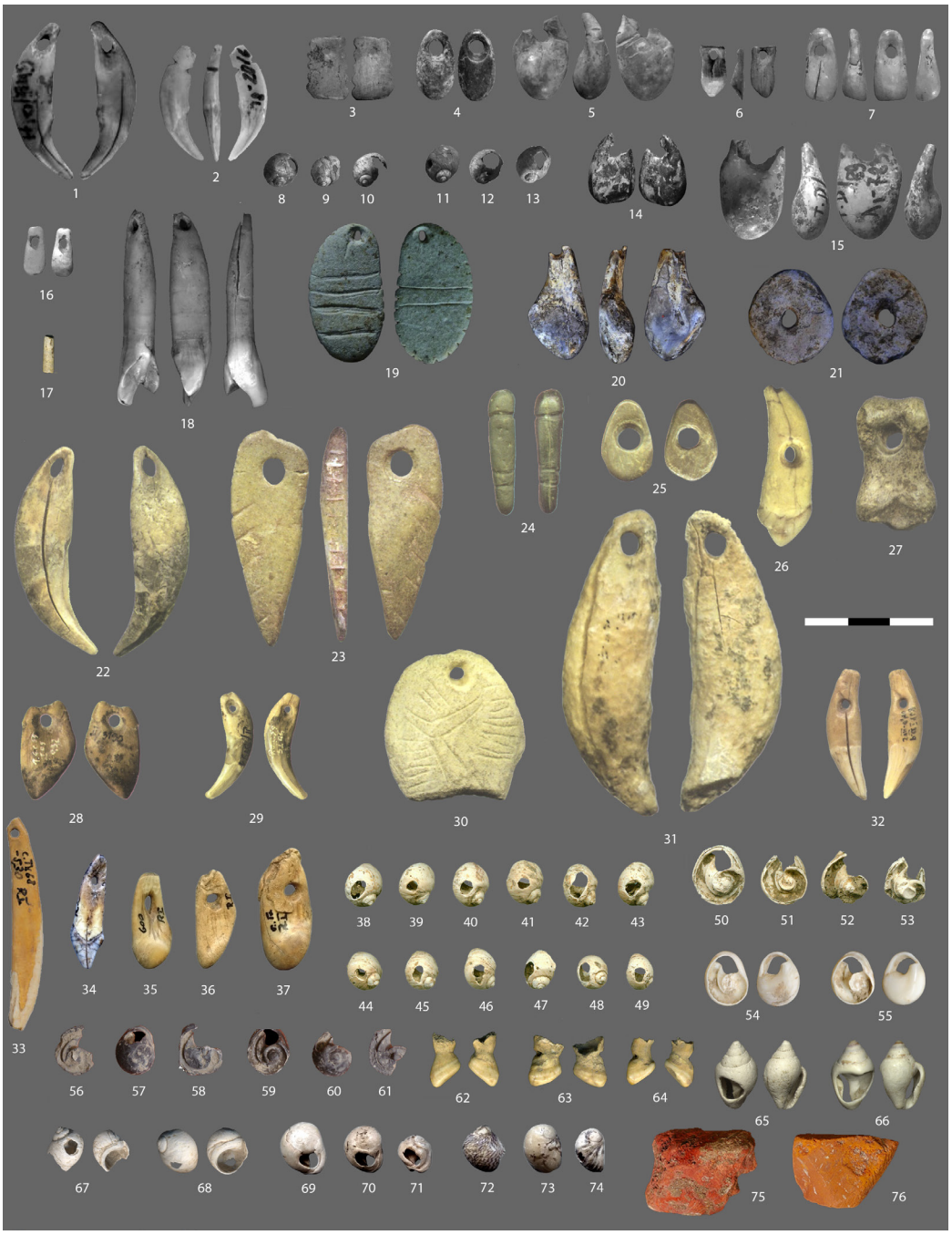

Figure 2. A selection of ornaments found in Paleolithic deposits of inland sites in northern Bulgaria , Romania, and Serbia, and Epipaleolithic and Mesolithic sites in the Danube Gorges region. 1–7. Fox canines, bone pendant, red deer canine imitation bead, red deer canines, Kozarnika cave, Gravettian levels (Layer IVb); 8–13. Lithoglyphus naticoides, *Kozarnika cave, Aurignacian levels (Layer VII); 14–16. Red deer canines, Kozarnika, late Aurignacian (Layer VI); 17.* Dentalium *sp., Šalitrena cave, Aurignacian (OxA-27683); 18. Large cervid incisor, Velika cave, Gravettian; 19–22. Engraved stone pebble, red deer canine, stone bead, and wolf canine, Poiana Cireşului, Gravettian; 23–27. Engraved stone pendants, stone bead, cave bear incisor, and cave bear phalanx, Cioarei cave, Gravettian; 28–29. Red deer and fox canines, Gura Cheii cave, Gravettian; 30. Engraved stone pendant, Malul Galben, Gravettian; 31. Cave bear canine, Ţibrinu, Gravettian; 32. Fox canine, Climente II, Epipaleolithic; 32. Fox canine, Climente II cave, Epipaleolithic; 33–37. Wild boar incisor, wolf incisor, red deer canines, Cuina Turcului rock-shelter, Epipaleolithic; 38–49.* Lithoglyphus *sp. shells, Schela Cladovei, from Late Mesolithic Burial M38; 50–53.* Tritia neritea *appliques, Schela Cladovei, Late Mesolithic; 54–55.* Tritia neritea *appliques, Vlasac, Late Mesolithic Burial H297; 56–61. Burnt* Tritia neritea *appliques, Vlasac, Late Mesolithic cremation burial (context 242); 62–64. Unmodified and pierced* Rutilus *sp. pharyngeal teeth appliques, Vlasac, Late Mesolithic Burial H297; 65–66.* Columbella rustica *beads, Vlasac, Late Mesolithic; 67–68.* Lithoglyphus naticoides, *Vlasac, Late Mesolithic (U47); 69–71.* Tritia neritea, *Cuina Turcului, Epipaleolithic/Early Mesolithic?; 72–74.* Theodoxus danubialis, *Cuina Turcului, Epipaleolithic/Mesolithic-Neolithic; 75–76. Nuggets of ochre hematite, Lepenski Vir, Early Mesolithic (?) deposits (beneath Building 47, 1314d).*

Cristiani and Borić 2012, 2017; Cristiani et al. 2014) and Schela Cladovei (Boroneanț 1990), in particular, one finds numerous beads associated with burials as part of personal adornment worn by the deceased, but possibly also hinting at everyday customs of adorning one's body. Ornaments in burials are restricted to the Late Mesolithic and later phases of occupation. The specificity of this regional context in the course of the Late Mesolithic is the appearance of ornaments made from pharyngeal "teeth" of large Cyprinidae species, most likely Black Sea roach or *perlfisch* (*Rutilus frissii* Nordmann, 1840) (Cristiani and Borić 2017; Cristiani et al. 2014; cf. Mărgărit et al. 2017; Živaljević et al. 2017). Roach (*Rutilus* sp.) teeth were suspended by either making a groove through the action of sawing on the neck of the tooth and in this way creating a little hole, or unmodified with a simple use of tendons coiled up around the tooth. These strings were sometimes colored in red ochre (Cristiani and Borić 2012), or, alternatively, by using a glue-like compound that also contained red ochre and that helped fix these ornamental beads onto the wearers' organic clothing surfaces (Cristiani et al. 2014; Mărgărit et al. 2017) (Figures 3 and 4). There were between only few and up to several hundred *Rutilus* sp. pharyngeal teeth beads found in certain burials (the highest number recorded in a child burial from Vlasac was 701 specimens). It has been suggested that on the basis of their distribution in relation to the body of the deceased, these beads might have adorned an organic surface that particularly covered the back of the body, similar to a cloak or a mantle, in which the body of the deceased might have been wrapped (Cristiani and Borić 2012). At Schela Cladovei, several burials had *Rutilus* sp. teeth ornaments, but a detailed report exists only for Burial M38 in which 324 specimens were found (Mărgărit et al. 2017).

Rutilus sp. teeth were most likely manufactured locally, and apart from burials have been found in settlement deposits of the sites of Lepenski Vir, Vlasac, Icoana, Schela Cladovei, and Kula. This abundance in the use of *Rutilus* sp. teeth as ornaments in the Danube Gorges and the fact that these are in date no later than examples of any other region (the Upper Danube in Germany, Crimea, and Montenegro) where this specific type of ornament has been found in rather smaller numbers or as single specimens only, suggested to us that this tradition might have originated in the Danube Gorges area (Borić and Cristiani 2016; Cristiani and Borić 2012, 2017). Recent criticism of our position and a suggestion that the origin of this tradition might have been further east (Mărgărit et al. 2017) remains unsubstantiated by evidence.

After a gap in the archaeological record of this region during the Early/Middle Mesolithic, specifically modified *Tritia neritea* beads reappear in the Late Mesolithic, and are found along with *Rutilus* sp. teeth in the same burial assemblages, likely attached to organic surfaces, and were similarly suspended on the back of the body of a wearer, in at least two instances as a horizontal string of beads, positioned in the same way in relation to the body of the deceased in both burials (Cristiani and Borić 2012, 2017). At Vlasac, apart from one instance (Burial H244), all burials with *Tritia neritea* beads also contained *Rutilus* sp. teeth beads, while the opposite was not the case. At the sites of Schela Cladove and Ostrovul Banului, *Tritia neritea* specimens were found in Late Mesolithic settlement deposits (Mărgărit et al. 2017). While the same species of exotic material, *Tritia neritea*, was used both in the Epipaleolithic and Late Mesolithic of the Danube Gorges area, there is a clear difference in modalities of suspension between the two periods with simple perforations made by indirect percussion or pressure characterizing the Epipaleolithic specimens and more involved modifications in order to flatten a snail shell by removing the body whorls and apex, thus creating a desirable shape to be used as appliques sewn onto clothing, characterizing the Late Mesolithic (Figure 2.50–53, 2.54–55) (Cristiani and Borić 2012, 2017; Mărgărit et al. 2017).

Columbella rustica, as another type of "exotic" marine gastropods were found in small numbers in settlement deposits at Vlasac (Figure 2.65–66) and in only one instance in Burial 49 at the same site in combination with *Rutilus* sp. teeth ornaments (Borić 2011; Cristiani et al. 2014). This particular individual from Burial 49 at Vlasac was also of nonlocal origin based on strontium isotope analysis (Borić and Price 2013), and the presence of these beads in the burial might have underlined the identity of the deceased in relation to her place of origin.

At the site of Vlasac, a small number of freshwater gastropods *Lithoglyphus naticoides* (Figure 2.67–68) and *Theodoxus danubialis* were also found as single specimens in burials (H317, H326, H321) or in settlement deposits (Cristiani and Borić 2017: Table 4.1). At Schela Cladovei, the already mentioned burial, M38, with several hundred *Rutilus* sp. teeth, also contained 107 perforated specimens of *Lithoglyphus naticoides* (Mărgărit et al. 2017).

The Mesolithic-Neolithic transition phase, documented in several burials from this region, saw a continuation of some of the Mesolithic ornamental choices, such as *Rutilus* sp. pharyngeal teeth, but there were also changes in other types of ornaments both in the materials used and forms shaped. However, the coverage of this period is beyond the remits of the current paper (cf. Borić 2011; Borić et al. 2014).

GREECE

The earliest ornaments in southern Greece come from transitional Middle to Upper Paleolithic Uluzzian Layer V at the site of Klissoura 1 in Argolid (Stiner 2010). The site was located roughly 12km inland from the nearest coast of the Aegean Sea and it yielded over 1400 ornamental beads made from marine shells (see Table 1) (Figure 5.22–30). The Uluzzian layer is radiocarbon dated to over 39 ky cal BP (Stiner et al. 2010). The most frequent types of ornaments in this layer, in approximately the same numbers, are *Tritia neritea* and *Dentalium* sp. specimens followed by a small number of *Columbella rustica* and various other marine gastropods, bivalves, and scaphopoda. The succeeding earliest Aurignacian Layer IV has the largest number of ornaments with *Tritia neritea* remaining the most frequently used gastropod species but with a significant reduction in the use of *Dentalium* (tusk) sp. shells, while several other marine shell

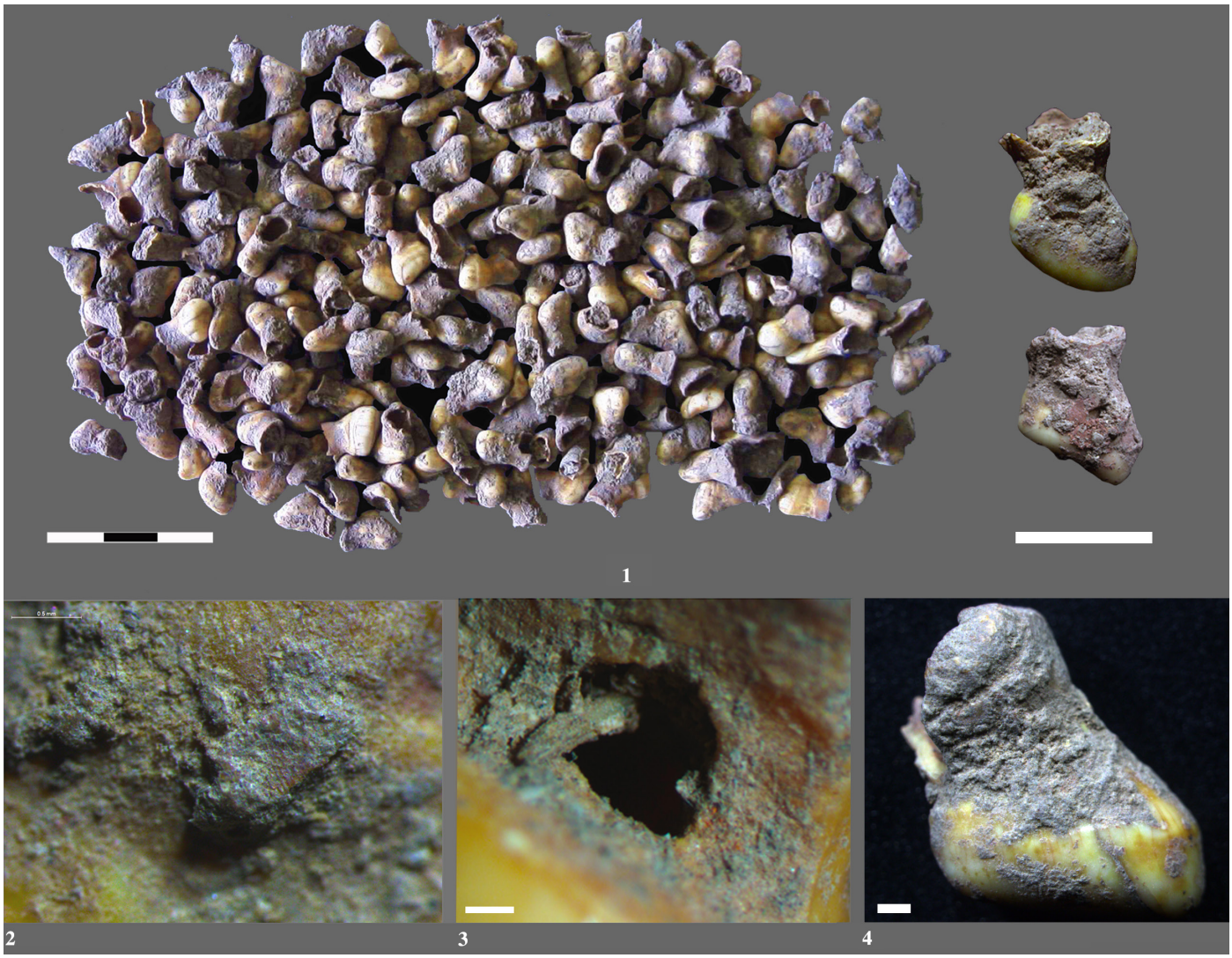

Figure 3. 1. Unmodified, i.e., unperforated, Rutilus *sp. pharyngeal teeth specimens found in infant Burial 42a at Vlasac; 2. Residue of sinew thread on the neck of one pharyngeal tooth, Burial H2, x.33; 3. Sinew thread still lodged in the tooth perforation, Burial 42a—note the residues of red paste at the side of the perforation; 4. Ornament with paste and tendon thread visible, Burial 42a.*

ornaments were found in smaller numbers. This presence of *Dentalium* sp. shells in the Uluzzian levels compares to a similar presence of this genus used for personal adornment at several contemporaneous sites belonging to the same cultural taxonomic unit in southern Italy (e.g., Grotta del Cavallo: Douka et al. 2014). Stiner (2010; cf. Stiner et al. 2010) notes that the assemblage of marine gastropods used in Klissoura 1 is dominated by finished products, suggesting that their manufacturing might not have taken place on-site. There is a high likelihood that the ornaments were introduced to the site while being attached to clothing and/or while adorning human bodies. Red ochre was applied on ornaments made of *Clanculus* spp., which in the process of wear lost their natural red color. Later Aurignacian (Layers IIIa-g and IIIc) and "Gravettoid" levels are dominated by *Tritia neritea* ornaments followed by *Columbella rustica* in smaller frequencies. The absence of *Dentalium* sp. is noticeable throughout the Upper Paleolithic levels of the site and it re-surfaces in higher frequencies only in the Epipaleolithic and Mesolithic levels. The Mesolithic levels exhibit the largest percentage of bivalve species.

A large assemblage of personal ornaments (over 14,000 specimens) comes from the deep stratigraphy of the cave of Franchthi in Argolid that spans the period from the beginnings of the Upper Paleolithic through to the Neolithic (Perlès 2013, 2018; Perlès and Vanhaeren 2010; Shackleton 1988). Some of these shells have directly been AMS-dated (Douka et al. 2011). Similar to Klissoura 1 cave, at Franchthi, *Tritia neritea*, *Dentalium* sp., and *Columbella rustica* species predominate as the choice for personal adornment with a notable constancy throughout the Upper Paleolithic (from ca. 41 to 12.5 ky cal BP) and Mesolithic, despite various changes observable in other classes of material culture recovered at the site. A peculiarity of the site is the noted heat treatment of about one third of *Tritia neritea* shell ornaments, assumed to be intentional in order to achieve black

Figure 4. Late Mesolithic extended supine inhumation Burial H267 from Vlasac, Danube Gorges area, with in situ Rutilus *sp. pharyngeal teeth beads found primarily associated with the upper torso of this individual (photo by D. Borić).*

coloration of beads that might have been placed in contrast with other items maintaining the original color (Perlès and Vanhaeren 2010). Among other marine gastropod species, *Homalopoma sanguineus* is more ubiquitous in earlier Upper Paleolithic levels, and the same taxonomic unit is abundant in Early Upper Paleolithic sites from the adjacent region of Italy (e.g., Riparo Bombrini, Riparo Fumane: Bertola et al. 2013). There were also perforated valves of *Glycymeris* sp. (Figure 5.10) with traces of ochre in the cavity of the shell in the late Upper Paleolithic levels, Phases 5 and 6, and, among other things, they might have had the role of pigment containers (Perlès 2018: 65–67; cf. Bar-Yosef Mayer et al. 2009). Among other, non-marine gastropod ornaments, which are rare, only one pierced ibex incisor worn as a pendant was found in the Upper Paleolithic deposits assigned to Phase 4, i.e. Perlès's Ornamental Phase 2 (Perlès 2018: 68) (Figure 5.11).

Mesolithic levels (Phases 7 to 9, ca. 10.6–8.7 ky cal BP) from several main reference trenches yielded 10,134 specimens of *Tritia neritea*, and 418 specimens of *Dentalium* sp. *Columbella rustica* specimens are more frequently found in later Epipaleolithic and Mesolithic levels (Figure 5.54–87). There were also several modified flat pebbles of dark color and round to elliptical shape in Lower Mesolithic levels (mostly Phase 7 and interface of Phases 7 and 8) (Figure 5.88–90), of which two larger specimens were unfinished roughouts, while others were perforated and worn as pendants possibly strung on ochred threads based on the presence of ochre specks on their surfaces (Perlès 2018: 171–175). Similar perforated stone pendants have also been found in the Early Mesolithic levels of the Cave of Cyclops in the Sporades (Sampson 2008: 164–165, Plate 7.1). Tubular bird bone beads were also found at Franchthi and might have been used as beads.

At the site of Kastritsa in the Epirus region of northwestern Greece (see Figure 1), some 115km from the Last Glacial Maximum (LGM) littoral of the Ionian Sea, a small number of beads from red deer canines (Figure 5.31–32), *Tritia* sp., and *Dentalium* sp. were found in the Upper Paleolithic levels dated to ca. 24–22 ky cal BP, as well as in the Late Upper Paleolithic (Epipaleolithic) levels dated to ca. 14–12 ky cal BP (Kotjabopoulou and Adam 2004). At the site of Klithi, located some 75km from the LGM littoral, where the main occupation phase is dated to 16.5–13.5 ky BP, the most prominent are *Tritia* sp., followed by marine *Homalopoma sanguineus*, freshwater *Theodoxus* sp. and, in smaller numbers, there were also beads from red deer canines and *Dentalium* sp. (Adam and Kotjabopoulou 1997: Figure

Figure 5. A selection of ornaments found in Paleolithic and Mesolithic deposits of coastal and inland sites in Greece. 1–9. Tritia neritea, *Franchthi cave, Upper Paleolithic; 10.* Glycymeris *sp., Franchthi, Upper Paleolithic; 11.* Capra ibex *incisor, Franchthi, Upper Paleolithic; 12–18.* Dentalium *sp., Franchthi, Upper Paleolithic; 19–21.* Columbella rustica, *Franchthi, Upper Paleolithic; 22–30.* Homalopoma sanguineus, Nucella lapillus, Tritia neritea, Dentalium *sp.*, Theodoxus *sp. (2 specimens)*, Monodonta *sp.*, Columbella rustica, *and* Clanculus corallinus, *Klissoura 1, Upper Paleolithic; 31–32. Incised red deer canines, Kastritsa, Upper Paleolithic; 33–35.* Theodoxus *sp., Klithi rock-shelter, Epigravettian; 36–39.* Dentalium *sp., Klithi rock-shelter, Epigravettian; 40–47. Perforated red deer canines, Klithi rock-shelter, Epigravettian; 48–49.* Columbella rustica, *Klithi rock-shelter, Epigravettian; 50–53.* Tritia *sp., Klithi rock-shelter, Epigravettian; 54–62.* Tritia neritea, *Franchthi cave, Lower Mesolithic; 63–72.* Columbella rustica, *Franchthi cave, Lower and Upper Mesolithic; 73–87.* Dentalium *sp. Franchthi cave, Lower Mesolithic; 88–90. Perforated pebbles, Franchthi cave, Lower Mesolithic.*

13.17; Kotjabopoulou and Adam 2004) (Figure 5.33–53). At the neighboring site of Boila, which largely overlaps the sequence of Klithi but is also slightly later, the ratio of *Tritia* sp., *Homalopoma sanguineus*, and *Dentalium* sp. mirrors that of Klithi (see Table 1).

EASTERN ADRIATIC CATCHMENT

There are more than dozen Paleolithic and Mesolithic sites found along the Eastern Adriatic coast, on its islands as well as in the hinterland areas at locations found up to 100 kilometers away from the coast. These sites in total contained

close to two thousand items of personal adornment found exclusively in settlement deposits (Borić et al. forthcoming; Cristiani et al. 2014; Cvitkušić 2017; Cvitkušić and Komšo 2015; Cvitkušić et al. 2018; Komšo and Vukosavljević 2011). Several sites (Pupićina cave in Istria, Vela Spila cave on the island of Korčula, Vlakno cave on the Dugi Otok island, and Zala cave in the hinterland zone some 100km away from the coast; all in Croatia) are also characterized by deeply stratified sequences where it is possible to follow changes in ornamental consumption over time.

The earliest ornaments come from Aurignacian to Gravettian levels (Layers G, F, E, and C/d, ca. 38.4–24 ky cal BP) of the cave site of Šandalja II in Istria with perforated red deer canines (Figure 6.25) and a perforated badger (*Meles meles*) tooth, the latter being a unique ornamental type considering the choice of species anywhere in the Upper Paleolithic of Europe.

Pierced red deer canines were also found in Late Upper Paleolithic levels at the sites of Šandalja II (Epigravettian Layers C/s and B/C, ca. 16.7–12.7 ky cal BP) (Figure 6.17–24), Romualdova cave (Figure 6.31) in Istria, Vlakno (ca. 14.9–12.87 ky cal BP) (Figure 6.51–55), and Vela Spila in Dalmatia, and in Epipaleolithic levels (ca. 13.2–10.5 ky cal BP) at the inland rock-shelter site of Badanj in Herzegovina, where some of these were decorated by incision (Figure 6.32). At Šandalja II, perforated teeth of lynx (Figure 6.16) and bison (Figure 6.15) were also found as well as pierced bone tiles (Figure 6.26). One perforated bone tile was found in Vešanska cave (ca. 13.4–13.1 ky cal BP) in the Kvarner Gulf. A perforated moose (*Alces alces*) incisor was found in Upper Paleolithic levels (ca. 13.2–10.7 kya cal BP) at Pupićina (Figure 6.30).

Late Upper Paleolithic levels at different sites in this regional context also contained a range of marine gastropods, scaphopods, and bivalves. The most frequent were *Tritia neritea* found at the cave sites of Zala (Layer 12, ca. 17.1–16.8 ky cal BP), Vlakno (Figure 6.42–43), Vela Spila (Figure 6.56–63), and Ljubićeva (Horizon D, ca. 16.7–15.4 ky cal BP), the latter site situated in Istria. *Tritia* sp. beads were also found in large numbers inland at Badanj (Figure 6.34–37). At Badanj, there were also *Tritia gibbosula*, which have been reported at Vela Spila during this period. *Dentalium* sp. specimens are very abundant in the Pleistocene deposits at Vlakno (B. Cvitkušić, personal communication, June 2017) as well as in Epipaleolithic levels at Badanj (Basler 1979: 313, T. XLVII; Borić et al. forthcoming; Whallon 2007). At Mališina Stijena rock-shelter in northern Montenegro, deep into the hinterland of the Dinaric Alps, perforated specimens of *Tritia gibbosula* were found in late Epigravettian Layer 2 (ca. 13 ky cal BP) (Bogićević and Dimitrijević 2004; Radovanović 1986). *Columbella rustica* beads were found in small numbers during this period at Pupićina (Figure 6.38), Vlakno (Figure 6.46–50), Vela spila (Figure 6.64), Kopačina cave on the island of Brač, and Badanj. Close to the Adriatic coastal zone, one finds valves of *Glycymeris* sp. shells in late Upper Paleolithic levels at Šandalja II (Figure 6.14), Vlakno, Vela, Gravettian/Epigravettian Layer VIII at Crvena Stijena rock-shelter in Montenegro (ca. 13.7–13.4 ky cal BP, cf. Mercier et al. 2017) (Figure 6.1–3) and at Badanj, where a relatively large number of perforated specimens were found (see Table 1) (Borić et al. forthcoming).

In the Mesolithic, across this regional context as well as farther afield (e.g., in Italy or other areas of southeastern and more generally Mediterranean Europe), there is a significant shift in a growing preference for *Columbella rustica* beads (e.g., Álvarez Fernández 2008; Cristiani et al. 2014b), which were found at Vlakno, Vela Spila (Figure 6.65–69), Pupićina (ca. 11.4–9.4 ky cal BP), Lim 001, Abri Šebrn (ca. 10.5–9.6 ky cal BP), and Nugljanska cave (9.3–8.7 ky cal BP), the latter three situated in Istria, Vela cave in the Kvarner Gulf, as well as at the hinterland cave sites of Zala (ca. 10.5–10.2 ky cal BP), Vruća (ca. 9 ky cal BP) (Figure 6.39), Vrbička (ca. 9 ky cal BP) (Figure 6.40), and Crvena Stijena (Figure 6.4–13), the latter three located in the Dinaric Alps of Montenegro (Borić and Cristiani 2016; Borić et al. in press). During the Mesolithic, *Tritia neritea* beads still remain relatively popular only at Vlakno, along with a single specimen found at Pupićina and Zala, respectively. A variety of other species used as personal adornment were found during this period at Vlakno—*Tritia gibbosula*, *Conus mediteranneus*, *Glycymeris* sp., *Lamellaria* sp., and *Cardium rusticum*. A small number of pierced red deer vestigial canines were found in the Mesolithic levels at Pupićina, Vlakno, and Lim 001.

An additional ornamental choice during this period are shells from freshwater gastropods. *Lithoglyphus naticoides* beads were found in the largest quantity at the hinterland site of Zala, as would be expected considering the site's geographic and ecological setting, but also at the coastal or near-coastal sites of Pupićina, Vlakno, and Lim 001. A single specimen of *Theoduxus danubialis* was found at Pupićina.

COMPARATIVE REGIONAL PATTERNS: A DISCUSSION

We have quantified frequencies of the most common bead types specific to each of the three main zones—the Danube Basin Catchment, Greece, and the Eastern Adriatic—by the main periods (Figure 7) in order to discern and compare patterns of diachronic changes and geographic distributions related to Paleolithic and Mesolithic ornamental choices across southeastern Europe. Although region-wide patterns may mask some of the previously described variability at the micro-regional or site-specific levels, they can be instructive when attempting a more general comparison between periods and regions.

At face value, throughout the Upper Paleolithic of the Danube Basin catchment zone (see Figure 7A) personal ornaments are found in very low frequencies. This could be an artifact of a lack of extensive wet sieving at older excavations. But even at the more recently excavated sites of Kozarnika or Šalitrena, frequencies remain very small. Hence we suggest that this pattern is very likely real. As expected from a deep hinterland zone, ornaments used for personal adornment are dominated by teeth of mammals (*Vulpes vulpes*, *Canis lupus*, *Ursus spelaeus*, *Bos* sp.), likely used as pendants, along the presence of freshwater *Lithoglyphus naticoides*. The first "exotic," marine species that appears in

Figure 6. A selection of ornaments found in Paleolithic and Mesolithic deposits of coastal and inland sites the Eastern Adriatic catchment zone. 1–3. Glycymeris *sp. shells, Crvena Stijena rock-shelter, Gravettian (?) (Layer VIII); 4–13.* Columbella rustica*, Crvena Stijena, Mesolithic levels; 14. Perforated* Glycymeris *sp. shell, Šandalja II cave, Epigravettian (Layer B/s); 15.* Bos *sp./Bison incisor, Šandalja II cave, Epigravettian (Complex B); 16. Lynx canine, Šandalja II, Epigravettian (Complex C); 17–24. Red deer canines, Šandalja I, Epigravettian (Layers C/d and B/s); 25. Red deer canine, Šandalja II, Aurignacian (Layer G); 26. Bone tile, Šandalja II, Epigravettian (Complex C); 27. Badger canine, Šandalja II, Late Aurignacian (Layer F); 28. Bone pendant, Šandalja II, Epigravettian (Complex B-C); 29. Grooved ruminant incisor, Šandalja II, Epigravettian (Layer C/d); 30. Perforated moose incisor, Pupićina cave, Epigravettian (Layer 372); 31. Red deer canine, Romualdova cave, Upper Paleolithic (Layer C); 32–37. Incised red deer canine and* Tritia neritea*, Badanj, Epigravettian; 38.* Columbella rustica*, Pupićina cave, Epigravettian (Layer 373); 39. Burnt* Columbella rustica*, Vruća cave, Late Mesolithic (Spit 16); 40. Columbella rustica, Vrbička cave, Late Mesolithic (Layer 73); 41. Perforated* Rutilus *pharyngeal tooth, Vrbička cave, Late Mesolithic (Layer 29); 42–43.* Tritia neritea*, Vlakno, Epigravettian; 44–45.* Lithoglyphus naticoides*, Vlakno, Epigravettian; 46–50.* Columbella rustica*, Vlakno, Epigravettian; 50. Perforated red deer canine, Vlakno, Epigravettian; 51–55. Perforated red deer canines, Vela spila, Upper Paleolithic; 56–63.* Tritia neritea*, Vela spila, Upper Paleolithic; 64.* Columbella rustica*, Vela spila, Upper Paleolithic; 65–69.* Columbella rustica*, Vela spila, Mesolithic.*

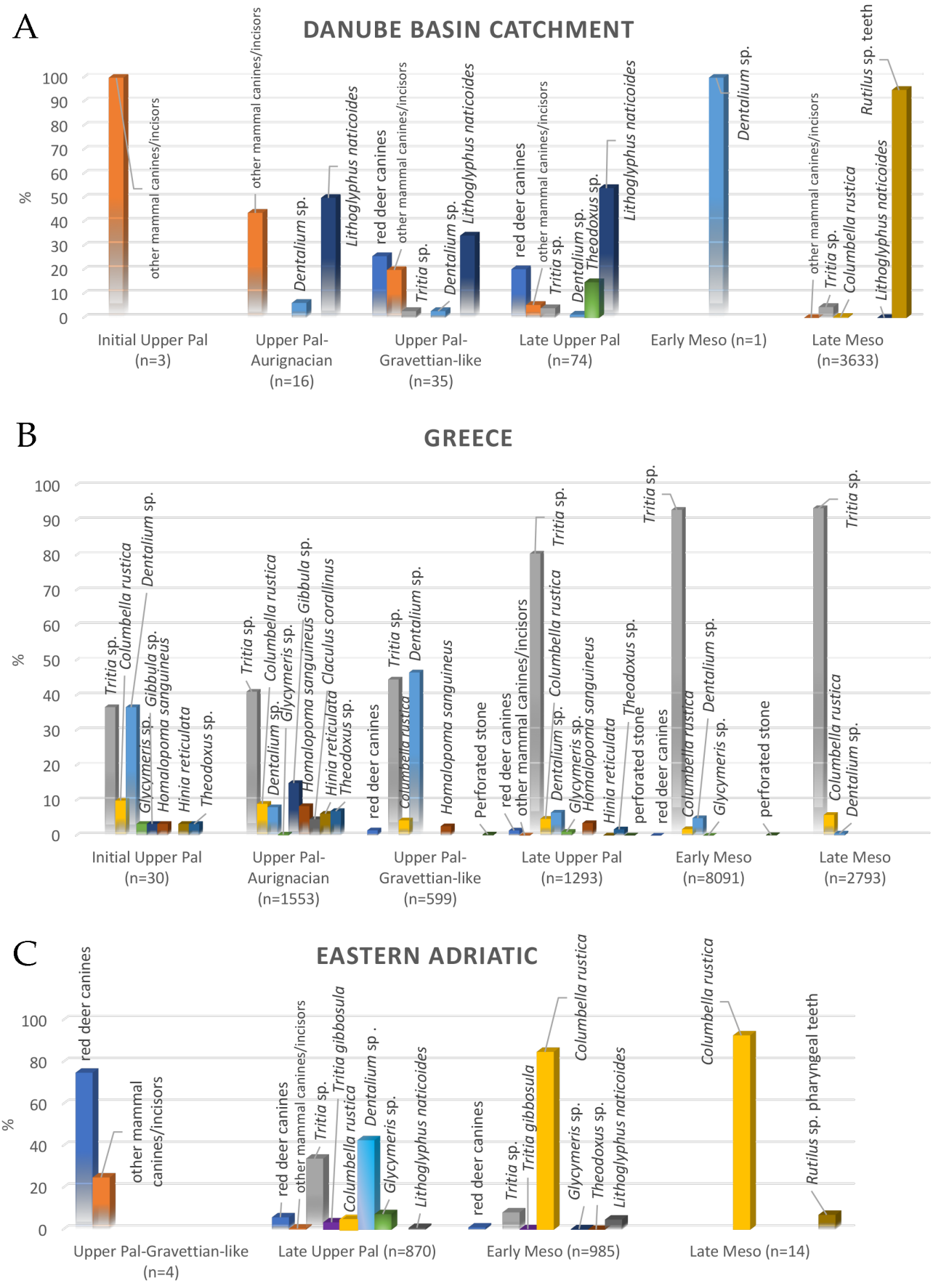

Figure 7. Diachronic changes in the frequencies of the main ornament types in three main geographical zones of southeastern Europe.

this regional context in the early Upper Paleolithic is *Dentalium* sp. In the Danube Basin catchment zone, red deer canines appear in the Aurignacian for the first time and remain in use throughout the Paleolithic. In this hinterland zone, *Tritia* sp. appears for the first time during the Gravettian period. Somewhat higher frequencies of beads are found in the Late Upper Paleolithic with the dominance of freshwater species of *Lithoglyphus naticoides* and *Theodoxus danubialis*. There were also occasional finds of *Dentalium* sp. Only one bead might have been associated with the Early Mesolithic occupation, the remains of which are found in the Danube Gorges area alone. The Late Mesolithic period is currently best known in the Danube Gorges area and at several sites during this period a sharp rise in the number of beads is seen with the use of pharyngeal teeth of freshwater *Rutilus* sp., primarily found in association with burials. Exotic marine species in the form of *Tritia* sp. and *Columbella rustica* were also found in Mesolithic deposits, including burials, albeit in smaller numbers.

In Greece (see Figure 7B), compared to the Danube Basin catchment, beads are found in significantly larger quantities and a more diverse spectrum of materials were being used; the latter applying to the Paleolithic, while a reduced variety of bead types is seen in the Mesolithic. One should note that under Greece, here we lumped together both coastal Aegean sites, such as Franchthi, Klissoura, 1, and the Cave of Cyclops, and inland sites, primarily found in the Epirus region. While there are similarities in ornamental choices between the two regions, they are also very different, with much higher frequencies and diversity of bead types found at coastal sites. From the start of the Initial Upper Paleolithic, *Tritia* sp. and *Dentalium* sp. dominate, although beads are found during this period in significantly smaller quantities than in the later phases of occupation. The initial dominance of *Tritia* sp. is maintained throughout the Paleolithic and into the Mesolithic. The stark difference between the coastal Aegean sites and inland sites in the Epirus region and Theopetra cave in Thessaly is the total absence of red deer canines at coastal sites and their steady presence at inland sites from the start of the Gravettian-like phases of occupation until the end of the Paleolithic and into the Early Mesolithic. The absence of red deer canines as ornaments in southern Greece cannot be explained by ecological reasons regarding the availability of red deer since the remains of this species were abundantly present in the Paleolithic and Mesolithic faunal assemblage at Franchthi (Stiner and Munro 2011). Similarly, ornaments made from other mammal teeth are also absent from the coastal sites. On the other hand, at Klissoura 1, despite the dominance of marine species used as beads, freshwater *Theodoxus* sp. is found in significant quantities in Aurignacian levels. Perforated stone pebbles, found at Early Mesolithic Franchthi and the Cave of Cyclops only, speak of a common ornamental tradition shared by the two sites and possibly other Aegean sites during this period.

In the Eastern Adriatic catchment zone (see Figure 7C), early Upper Paleolithic phases are not well represented and the earliest deposits with beads are dated to the interface of the Aurignacian/Gravettian occupation period, found only at the site of Šandalja II in Istria. While this sample is particularly small and thus might not be representative of the whole period, the absence of marine species used as ornaments is notable with the predominance of red deer canines and other mammalian pierced teeth. This must have been at least in part related to the site's position at the northern edge of the North Adriatic Plain, several hundred kilometers away from the LGM littoral, within a different ecological setting than in later times. Sites with ornaments increase during the Late Upper Paleolithic in this region, found at both coastal and inland locations, which show approximately similar proportions of the main marine species (*Tritia* sp., *Dentalium* sp., *Glycymeris* sp.) along with the presence of beads from red deer canines and occasionally perforated canines and incisors of other mammals. This combination of both marine and mammal species used as ornaments makes these sites in the Eastern Adriatic zone similar to those found in the Epirus region of Greece during the same period. Beads made from *Tritia gibbosula*, found at Badanj, Vela Spila, and Mališina during this period, and also later in the Early Mesolithic levels of Vlakno and Pupićina, are specific to this region only in the context of southeastern Europe. During the Late Upper Paleolithic, several sites also produced both perforated and unperforated specimens made from *Glycymeris* sp., likely used as personal adornment or as pigment containers, as suggested for Franchthi. High frequencies of a variety of beads are notable at the inland site of Badanj compared to other contemporaneous sites (see Table 1), and these are reported here for the first time. As the excavation campaigns during which these beads were unearthed were made in the 1970s by the same excavator who worked at Crvena Stijena, where much smaller frequencies of beads have been found over an area larger than the one investigated at Badanj, it is unlikely that the recovery bias can explain this situation. Badanj is unique in the presence of an engraved rock (Basler 1976, 1979), which is a rare occurrence of Upper Paleolithic "art" in this regional context, and we could speculate that higher frequencies in ornaments found here could in some way be linked to the presence of these engravings, possibly related to heightened levels of symbolic expression at this particular locale. The dominant trend is a sharp increase in the use of *Columbella rustica* beads across the region in the Mesolithic. *Columbella rustica* beads are found in the Late Upper Paleolithic assemblages too, albeit in smaller frequencies.

Throughout the Paleolithic and Mesolithic of southeastern Europe, there was a general preference for "natural" shapes, and by and large relatively little effort was being invested in the transformation of the original raw material into beads (cf. Perlès 2013). Relatively simple single or only occasionally double (e.g., *Lithoglyphus* sp. specimens from Cuina Turcului in the Danube Gorges, *Glycymeris* sp. valves from Badanj) perforations dominated as modes of bead suspension, with occasional, and apparently intentional, use of fire for achieving black coloration noticed on *Tritia neritea* at Franchthi in Greece (Perlès 2018; Vanhaeren and

Perlès 2010), Badanj (Borić et al. forthcoming), Pupićina, Vela cave, Vlakno, Lim 001, and Zala in the Eastern Adriatic region (Cvitkušić 2017). Burnt *Tritia neritea*, but also some *Rutilus* sp. teeth beads, were found at Vlasac in the Danube Gorges where the black coloration of beads stemmed from their exposure to fire in cremation pyres in the course of secondary mortuary rites (Borić et al. 2009; 2014). Modifications also included application of red ochre over surfaces of certain types of shells to enhance their already extant red natural coloration (cf. Stiner 2010), while red ochre or a pasty compound containing red ochre mixed with organic matter was in the Danube Gorges used for covering perishable organic materials (sinew threads) used for suspension and/or sewing, thus leaving visible residues on beads and appliques where the thread was in contact with a particular ornament (cf. Cristiani and Borić 2012, 2017; Cristiani et al. 2014; Mărgărit et al. 2017).

The presence of unperforated *Tritia neritea* at Franchthi in large numbers (Perlès 2018: 28) and the presence of various unperforated *Columbella rustica* shells in the Mesolithic levels of Vela Spila (Cristiani et al. 2014b) and Vlakno (Cvitkušić 2017) may suggest that these places contained on-site production zones for these ornaments. At Vlakno, a likely seasonal workshop for *Columbella rustica* beads is inferred on the basis of the presence of numerous manufacturing accidents and waste as well as pierced specimens with no wear traces developed on their perforations (E. Cristiani and B. Cvitkušić, personal communication, June 2018). It is possible that such sites were also sources for further inland distribution of finished beads. For marine gastropods, this may be expected at those sites found in coastal regions or in the vicinity of the coast at times when the sea was at lower levels than today (e.g., Franchthi, Vlakno, Vela spila). Yet, at the site of Klissoura 1, which was situated only 12km from the Aegean coast, all of the discovered *Tritia neritea* and other specimens of marine shells used as beads were finished products despite a large number of beads recovered, with no evidence of on-site production attested (Stiner 2010). *Rutilus* sp. teeth ornaments in the Danube Gorges were likely locally manufactured due to their abundance and the presence of the remains of *Rutilus* sp. pharyngeal bone. At other sites, there were very few bead roughouts.

Tritia neritea or *Columbella rustica* specimens were found in the Danube Gorges several hundred kilometers away from the closest seas (as the crow flies, the distance of the region to the Black Sea along the Danube is ~500km, the shortest route to the southern Adriatic Sea is ~400km, and to the northern Aegean Sea ~500km). More modest but still significant distances of around 100km were involved in the transfer of *Tritia neritea* and *Columbella rustica* beads from the Adriatic coast to Zala. It has also been argued that the presence of *Lithoglyphus naticoides* at the near-coastal site of Pupićina in Istria and abundant finds of beads from the same species at contemporaneous Zala, may tentatively suggest that transfers were also made from the hinterland to the coast (Komšo and Vukosavljević 2011) although some of the freshwater gastropod species used as ornaments might have been available locally at near-coastal locations, which may undermine the argument about transfers of these specimens to the coast. However, the presence of a *Rutilus* sp. pharyngeal tooth bead in the Mesolithic levels of Vrbička cave in Montenegro (Figure 6.41), in an area far removed from large rivers which are the main habitat of *Rutilus* species whose pharyngeal teeth were used for these beads, along with the uniqueness of this ornamental type and its predominance along the Danube River, suggests that long-distance movement of materials did not only involve transfers from the coast to the hinterland. Hence, the hinterland also might have supplied coastal regions with certain types of ornamental beads. This is important for an understanding of social dynamics between coastal and inland groups, suggesting relatively significant and persistent levels of mobility and transferability across regions throughout the examined periods. Conversely, periods during which such connections are not documented in the archaeological record may suggest possible breaks in the functioning of social networks for a variety of reasons (Borić and Cristiani 2016). There must have been important social dynamics that structured relations between groups inhabiting coastal versus deep inland zones as well as those groups who inhabited regions in-between and who might have acted as intermediaries in the transfer of certain ornamental items, as in the previously cited ethnographic example (cf. Lévi-Strauss 1987: 261, 1992: 106–110).

There was nothing trivial about the choice of certain raw materials for suspension (cf. Perlès 2018: 197) and some of the taxa selected or the choice of certain elements must have been imbued with significance that stemmed from both meanings assigned to a particular animal/body part and the origin place of certain "exotic" materials for ornaments in case of their long-distance transfers, or perhaps even at shorter distances regarding the significance of certain features and locales in a landscape where these were collected. This being said, it has been noted that the element of standardization across different regions might have stemmed from a desire and preference for particular shapes in the final outcome of a bead's production regardless of the exact species or type of raw material used. One such particular shape relates to the so-called category of basket-shaped beads, which we suggest should more accurately and evocatively be described as "gland-shaped" or "globular-shaped" beads. It seems that the preference for this shape started already in the African Middle Stone Age (e.g., Henshilwood et al. 2004). Gland-shaped beads came from a variety of gastropod species found across Mediterranean Europe: *Tritia, Littorina, Clanculus, Homalopoma, Theodoxus, Gibbula, Polynices* (Stiner 2014: 54). As noted by Stiner (2014: 60) "many of these beads resemble one another in spite of having been from diverse materials," hinting at the idea of the existence of a desirable bead geometry. In addition, it is likely that the idea behind the preference for these commonalities in beads' shape is also related to the use of red deer canines, the shape of which was imitated in examples that come from Upper Paleolithic sites in northern Bulgaria, starting to be made already in the Aurignacian.

Even perforated stone pebbles found in Lower Mesolithic levels at Franchthi (Perlès 2018: 171–175) were likely chosen for their oval shape (Figure 5.88–90). A similar gland-like shape also characterizes the use of *Rutilus* sp. pharyngeal teeth, specific to the Danube Gorges area. *Rutilus* sp. teeth were also found elsewhere in the Mesolithic of central Europe (Rigaud et al. 2014), Montenegro, and Crimea (Borić and Cristiani 2016; Cristiani and Borić 2017).

RED DEER CANINES VS. *RUTILUS* SP. PHARYNGEAL TEETH: A CASE OF SUBSTITUTION

In the reminder of this article, we turn to the example of what we argue is the case of a structural transformation and substitution involving red deer canines and *Rutilus* sp. teeth beads. This example illustrates why we consider it useful to revive some of the aspects of the theoretical framework proposed by Lévi-Strauss in our attempts to make sense of both recurrent similarities and differences in the consumption of different materials used for ornaments over large geographical scales and over the long-term. Our thesis is that the abundance and popularity of *Rutilus* sp. teeth beads and appliques in the Danube Gorges area in the Late Mesolithic might have directly been related to the absolute absence of perforated vestigial canines of red deer in Late Mesolithic deposits of this region. This is despite the evidence in faunal assemblages for abundant presence of red deer remains, suggesting their uninterrupted hunting during this period (e.g., Borić et al. 2014). This case could be seen as similar to the previously cited example regarding the absence of red deer canines in southern Greece throughout the Paleolithic and Mesolithic despite red deer's abundance in the faunal material from Franchthi, thus suggesting that the avoidance of red deer canines had nothing to do with its ecological availability.

In the Danube Gorges, this Late Mesolithic pattern in ornamental consumption is in a marked contrast to the presence of perforated red deer canines found in the Epipaleolithic levels at the sites of Cuina Turcului and Climente II. This shift to us suggests a substitution of the material and species with the outcome being a similar shape. Mărgărit et al. (2017) criticized our argument, pointing out that despite the presence of red deer canine beads in the Epipaleolithic, there is a gap in their use during the Early/Middle Mesolithic of the region, making the scenario about the substitution less likely. They also add that red deer canines are rare or absent as ornaments with the onset of the Holocene, excepting the Eastern Adriatic zone. We disagree with this criticism. The intermittent but recurring consumption of red deer canines as ornaments is one of the long-term constants since the beginning of the Upper Paleolithic of Eurasia. It continued throughout the Mesolithic and persisted well into the Neolithic and Copper Age of many different regions. Hence these ornaments were abundant, desirable, and widespread despite regional or chronological gaps in their use. Deer and elk canines were also found among numerous ethnographic societies of North America (e.g., Dubin 1999; Sturtevant 1978), and we would suggest that the popularity of this body element for ornaments can hardly be coincidental—there are deeply rooted reasons for the choice of this anatomical element in similar staple subsistence species, relating to certain cross-culturally held commonalities.

We suggest that the choice of particular teeth of both species used for beads, their anatomical position in each of the two species as well as the choice of the substituting species can hardly be accidental (Cristiani and Borić 2012, 2017). Let us for a moment examine the anatomic position of *Rutilus* sp. pharyngeal teeth and deer vestigial canines. Both of these gland-like parts are found "hidden" *inside* the body and yet both were chosen as a preferred type of ornamental bead to be displayed on the *outer* surface of the body by attaching such ornaments onto organic materials used as clothing. This semantic field containing a symmetry between inside::outside can be established unmistakably in both of the chosen species regardless of their belonging to very different taxa. It would be very surprising that ancient humans accidentally and independently chose *Rutilus* sp. pharyngeal teeth, which approximated the same structural properties of deer vestigial canines. While ornaments made of deer vestigial canines are of great antiquity, reaching to the beginnings of the Upper Paleolithic, we currently estimate that *Rutilus* sp. pharyngeal teeth started to be used around 9 ky cal BP along the Upper and Lower Danube and possibly also further east along the Black Sea coast, occasionally also reaching other parts of the Balkan peninsula as the single specimen from Montenegro shows. Hence the argument is that in changing circumstances where subsistence activities and livelihood of certain forager groups along the Danube started to depend heavily on fishing, there was a structural transformation that led to a focus on a new species that became imbued with relational significance that previously might have been held by deer. As stressed earlier, this transformation occurs on a long-term scale and is not challenged by current evidence for the lack of ornaments in this regional context throughout the Early and Middle Mesolithic, i.e. between the Epipaleolithic when red deer vestigial canines are present in this region and the beginning of the Late Mesolithic when *Rutilus* sp. pharyngeal teeth beads are exclusively found.

In our opinion, there is ample evidence for the existence of long-term structures in the transmission of deeply rooted modes of relating to the world regarding the role and understanding of ornaments as evidenced in periodic recurrence of a limited number of materials, species, and anatomical parts that were being chosen as desirable body adornment across Eurasia and beyond. Our argument has been that choices made regarding the selection of species/materials used for prehistoric ornaments can be seen as homologous to the functioning of mythical narratives and structures with a surprising long-term persistence. Similarly, we have also tried to demonstrate that over regional long distances there is surprisingly limited variation in ornamental choices during the examined periods. All this suggests a major role played by ornaments in the stabilization of shared representations. And, exactly here is the

benefit of the structural mode of analysis in attempting to identify framing structures of coherence and regularity in collective practices that are cognitively rooted (cf. Descola 2013b: 74–76). Hence, whether red deer canines were used as ornaments in the Early/Middle Mesolithic of the region is irrelevant for the structural properties that were fulfilled by both red deer canines and *Rutilus* sp. pharyngeal teeth as ornaments over the long term. Moreover, the argued substitution most certainly did not happen in a reflexive, conscious manner but as a part of more deeply ingrained schemes of practice. Thus, on the one hand, our argument is supported by the long-term continuous persistence of the same cultural tradition and presumably population in this region from the Epipaleolithic to the Late Mesolithic that in earlier times used red deer canines and later exclusively *Rutilus* sp. pharyngeal teeth as ornaments, and, on the other hand, by the very properties of the animals/body parts chosen as ornaments, i.e., their anatomical positioning and shape geometry.

We maintain that the role and significance held by red deer canines in earlier times among the Danube Gorges foragers was in the Late Mesolithic taken over by *Rutilus* sp. teeth beads as part of a structural transformation by substitution. This happened at the time when these groups intensified their relations with different species of fish, which obviously included their important subsistence role. Previously, sturgeon species were singled out as being imbued with relational significance in totemic or animic terms among Mesolithic foragers in the Danube Gorges based on the orientation of burials and a proliferation of sculpted boulders, among which some depict human-fish hybrids (cf. Borić 2005, 2007, 2016 and references therein). Emphasis on certain species or their mythical derivatives being depicted in these objects of "art" could perhaps be seen as related to choices of species selected for ornaments, which are by some also seen as artistic expression (e.g., Stiner 2014). Thus, it should be of little surprise that the *Rutilus* sp. species was being chosen for ornaments due to their similar semi-anadromous behavior to that of sturgeon, and the fact that during the breeding period male individuals have pearl-like tubercles on the head and back (hence the German name *perlfisch*) (cf. Schmall and Ratschan 2010 cited by Mărgărit et al. 2017). We may be allowed to speculate that this deliberate mimetic link between the natural appearance of *Rutilus* sp. and a cloak containing embroidered *Rutilus* sp. teeth adorning the body of the deceased, stemmed from the existence of beliefs in metamorphosis into this species of fish after death.

CONCLUSIONS

In this paper, by reviewing regional assemblages of beads throughout the Paleolithic and Mesolithic of southeastern Europe, we have attempted to indicate an underexplored aspect of the significance of ornaments, moving away from the dominant paradigm in the study of early systems of ornamentation, where the significance of personal adornment is either seen as a way of signaling human behavioral modernity or being the function of an effective information technology for transmission of social messages for the purpose of alliance building and "social insurance systems" (cf. Stiner 2014: 62). Following solely our research preoccupations within an evolutionary paradigm brings us to an impasse of understanding *how* and *why* certain choices were being made with regard to long-term preferences for certain shapes, species, or body elements used as beads and what past distributions of ornamental types in time and space may suggest. And, this is even before we start evoking ethnographic examples that time and again suggest complex ways in which ornaments partake in personhood construction and constitution of relational assemblages of humans and nonhumans.

It could be suggested that across southeastern Europe and beyond, two related principles acted simultaneously regarding the selection of materials to be used for ornamental beads—while certain species were certainly preferred, perhaps on the basis of the essential properties assigned to a certain organism, the choice was also dictated by a preference for specific shapes that in turn biased the selection of raw materials but also enabled substitutions of various species of shell or other raw materials that resembled a desired shape. Examining in detail the reality of ethnolinguistic groupings proposed by Vanhaeren and d'Errico (2006) when studying Aurignacian ornamental traditions, Stiner (2014) suggests that the biogeographic availability of certain species played an important part in the selection/substitution decision-making. Hence, ecological patterns in raw materials availability across the Mediterranean, particularly in coastal zones, greatly influenced local choices when collecting certain gastropods or other marine taxa. Yet, rather than just a pure question of ecological availability, which certainly is a part of the equation of why certain species are preferred for ornaments, it seems that in each particular case there were uniquely developed relations with nonhuman entities that preferred certain species and body parts for ornaments over other available alternatives.

Despite extended periods of stability of ornamental traditions with preferences for certain types of ornamental materials and shapes, or what Perlès (2018) calls "a monotonous sequence" referring to the constancy of ornamental choices in Franchthi, the offered long-term diachronic view allows us to follow variations and transformations that we are inclined to interpret as logically structured adjustments to a large and underlying set of commonly held preoccupations and conversations, rather than as idiosyncratic and random changes. Factors that influenced these alterations might have depended on the ecological availability of certain species and materials, establishment of subsistence and relational links to various nonhuman entities as well as geographical positioning of groups using ornaments along the assumed coastal-inland dynamics. In order to suggest a possible way of understanding how these processes of both stability and variation might have operated in relation to some or all of these different factors throughout early prehistory of Eurasia, we argue that reviving a structural anthropological framework could help us in trying to make sense of the seemingly random ornamental choices and

their transformations over time.

We have suggested that there might be observable structural regularities in ornamental choices that are most recognizable when evidencing transformations in certain ornamental traditions due to changes in ecological, subsistence, social, or cultural circumstances. Arguably, the Danube Gorges area stands out in this respect, both regarding the clearest example of a structural transformation in the use of ornamental beads that we were able to demonstrate and in the exclusive and abundant presence of burials in the context of southeastern Europe, with beads found in their original positions on wearers thus allowing a more involved discussion. But particularities of this case study also make more sense when compared to wider regional and long-term patterns of evidence, such as long-term regional patterns in the use of red deer canines as beads. Even the "monotonous" sequences of persistent and unchanging ornamental traditions speak volumes about non-trivial and non-random nature of choices made by "prehistoric beachcombers […] as keen malacologists" (Perlès 2018: 198).

In her discussion of beads' cognitive affordances, Stiner (2014: 59) suggests that beads can be compared to particles of language, as minimal units in systems of visual signaling. This could be seen as compatible with the view held by Lévi-Strauss regarding the argued existence of elementary units of myths, or "mythemes," clearly evoking a linguistic analogy of deeper rules governing combinations of different elementary properties. Language, myth, and ornaments can yet be seen as part and parcel of the same metaphoric and metonymic play of difference, feeding a "dynamic disequilibrium" (Lévi-Strauss 1995: 63) in the generation of meaning through the mind's game of organizing the world.

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