

PALEO-ETHNOBIOLOGY OF NEANDERTHALS: A BIOCULTURAL APPROACH

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Abstract

The hominini lineage which includes modern humans and our extinct relatives had considerable knowledge regarding the use of environmental resources to better adapt to the major ecological shifts that occurred during their evolutionary history which are reflected in dietary shifts related to plants and animals used for survival. Neanderthal fossils and tools are found in Europe and Western Asia, dating from 450,000 to 40,000 years ago. Recently, subsistence strategies and associated cultural adaptations have been intensively studied. In this article, we provide an overview of the recent findings of plants and animals used by Neanderthals from several geographic areas and periods. Additionally, we will consider Neanderthal settlement and dispersal, including Albania in the Balkan region, which offers a glimpse of their environmental adaptations and cognitive abilities. This short review is mostly focused on the interaction between biological and cultural factors concerning one of the many facets of survival problems, diet composition and breadth.

Keywords: Paleo-ethnobiology, Neanderthals, plants, animals, Balkans, Albania

Përmbledhje

Njeriu i sotëm si dhe paraardhësit e tij të zhdukur, kanë pasur dije të konsiderueshme mbi mënyrat e përdorimit të resurseve natyrore, për tu përshtatur me ndryshimet e mëdha mjedisore, që shënjuan etapat e historisë së tyre evolucionare dhe që pasqyrohen në ndryshimet e dietës, përdorimin e bimëve dhe kafshëve për të zgjidhur një ndër aspektet e mbijetesës. Fosilet dhe artefaktet e Neandertalëve datojnë nga 450 mijë vite më parë e deri 40 mijë vite më parë. Modelet e tyre të jetesës ose përshtatjet kulturore kanë qenë në qendër të studimeve në këto vitet e fundit. Në këtë artikull, do të paraqitet një panoramë përmbledhëse e bimëve dhe kafshëve që janë përdorur kryesisht prej Neandertalëve për qëllime të ndryshme, në rajone dhe kohë të ndryshme. Në vijim, do të marrim në konsideratë sitet, artefaktet dhe fosilet e gjetura në Ballkan, përfshirë dhe Shqipërinë, shprehje e aftësive konjitive dhe kulturore të Neandertalëve. Ky artikull, ka në qendër të tij qasjen biokulturore, ose bashkëveprimin mes faktorëve biologjikë e kulturore, të lidhura kryesisht me një ndër aspektet kryesore të mbijetesës, përbërjen dhe llojin e dietës që kanë përdorur kushërinjtë tanë më të afërt evolutivë, Neandertalët.

Fjalë kyçe: Paleo-etnobiologji, Neandertalë, bimë, kafshë, Ballkan, Shqipëri

Introduction

Paleo-ethnobiology can be considered an essential part of ethnobiology and could help us expand our understanding of the knowledge and uses of plants and animals by our ancestors. Relevant data for understanding plant-animals-hominin interrelationship and entanglement could be considered valuable, a glimpse into past environments and subsistence knowledge strategies, to adapt and survive. Most importantly, centering the human species in cultural and evolutionary processes or using anthropocentric analysis misses the important entanglement and interlacing between hominins and the “others”.

Human evolution which led to the emergence of *Homo sapiens* has a long history, dating back at least 7 million years ago, with *Sahelanthropus tchadensis* (7.2 Ma) and *Orrorin tugenensis* (6.0-5.7 Ma) considered the oldest known species in the human family (Brunet *et al.*, 2002; Senut *et al.*, 2001; Pickford *et al.*, 2002). Additionally, *Ardipithecus ramidus* (4.4 Ma) and *Ardipithecus kadabba* (5.8-5.2 Ma) fossils at the Middle Awash dig site and Afar region in Ethiopia preserved fundamental arboreal adaptations and exclusively share several independent character complexes with all later hominids (Haile-Selassie, 2001; White *et al.*, 1994). The three genera

mentioned above are considered hominins based on reduced canine size and an increased capacity for bipedal locomotion (Harcourt-Smith, 2010). As expected, major dietary shifts that occurred during hominin evolution based on the reconstruction of the environment, *Orrorin tugenensis* and *Ardipithecus ramidus* lived in a woodland to patchy forest and their diet was general and mixed (Luca *et al.*, 2014).

Australopithecines are a group of early hominins (humans and their close extinct relatives) that are considered adaptive radiation of early hominins; they had similar adaptations, lived from 4.1 to 1.4 million years ago, and have been recovered from the Plio-Pleistocene of southern, eastern, and central Africa (Strait, 2010). They were probably ecological generalists, capable of living in different habitats and consuming various types of food, and this flexibility ought to have made them resistant to extinction (Wood & Strait, 2004). With terrestrial bipedalism considered the hallmark of the hominin “tribe”, numerous adaptive explanations for its origins focused on the fact that hominin bipedalism is either the result of an initial evolutionary shift towards terrestriality from an arboreal ancestor or a secondary shift from a semi-terrestrial quadrupedal ancestor (Prang, 2019).

The hands of these early hominins could combine the functional requirements of both arboreal locomotion and enhanced manipulation: toolmaking could be considered a complex interplay of complex cognitive skills and physical traits with a combination of learning and practice by hominins during their evolutionary history (Kivell, 2015; Muller *et al.*, 2022). In this context, the evolution of tools is related to better adaptive biocultural subsistence strategies to enhance survival and is expressed in our closest relatives, Neanderthals.

How did Neanderthals live?

The origin of Neanderthals and modern human lineages is a matter of intense debate with some scientists accepting the view that the last common ancestor (LCA) of *Homo neanderthalensis* and *Homo sapiens* lived from 400 ka to 800 ka (Hublin, 2009; Prüfer K., *et al.*, 2014; Roksandic *et al.*, 2018). They were once widespread across Europe and Western Asia and their period of existence, geographical range, dispersal and extinction are considered key issues in the study of human evolution and migration (Kolobova *et al.*, 2019). Additionally, it is believed that their social group was composed of both sexes and various age classes, with an estimated number of 10 to 30 individuals along with their children (Hayden, 2012; Duveau *et al.*, 2019; Skov *et al.*

2022). Another widely held view is that Neanderthals contributed DNA to Denisovan and modern humans (Hajdinjak *et al.*, 2018; Slon *et al.*, 2018).

Neanderthals used a variety of stone, bone, and wood to make tools. Their tool technology was far more complex or sophisticated than their predecessors in the degree of preparation and planning which manifests in their superior cognitive abilities (Bajrami and Rexhepi, 2018). Mousterian and Châtelperronian industries were of Neanderthal authorship and widely produced throughout Europe and are found in various archeological sites in Western Asia and Europe.

Neanderthals' capacity for abstract thought, sophisticated communication, labor division for obtaining food, fiber, and toolmaking technology are clear indications of higher cognitive and physical abilities compared to their predecessors and possibly, expose a closer resemblance to humans. Their capacities included large terrestrial mammals hunting using sharp, wooden spears, probably sewing clothes, preying on choughs, birds, fishing techniques, and shellfish consuming (Zilhao *et al.*, 2020; Rios-Garaizar, 2020; Blanco *et al.*, 2021).

Additionally, they intentionally buried their dead, used body ornaments, went deep inside caves to build large ritual features, indulged in wall painting, and possibly practiced cannibalism (Rendu *et al.*, 2013; Rougier *et al.*, 2016; Zilhão *et al.*, 2010). Neanderthals' relationship with plants was complex: they used them as food, raw material, medicinal and ceremonial purposes; plants played an important role in their subsistence strategies related to diet and food (Shipley & Kindscher, 2016; Hardy, 2022; Bajrami *et al.*, 2023).

The timing and circumstances for the final demise of the Neanderthal population are considered one of the key questions in paleoanthropology and possibly occurred at different times in different regions (Currie & Meneganzin, 2022). The disappearance of Neanderthal groups was contemporaneous with a significant decrease in the available biomass for secondary consumers, therefore newly hostile environmental conditions which coincided with the arrival and spread of anatomically modern humans (AMH) (Staubwasser *et al.*, 2018; Vidal-Cordasco, 2022). Additionally, besides environmental pressures or modern humans' cultural superiority, the smallness of their population reinforced Allee effects and the effects of inbreeding and stochasticity (Vaesen *et al.*, 2019; Rios *et al.*, 2019).

Neanderthals' settlement in the Balkan region

The Balkans is one of the areas in Europe where a variety of hominins may have enjoyed their ecological niches over an extensive period bridging the Near East and Western Europe during the Palaeolithic. Middle and Upper Palaeolithic sites are common, and human remains of both Neanderthals and anatomically modern humans appear throughout the record (Tillier *et al.*, 2017). The systematic excavations of Velika and Mala Balanica and Pešturina Cave (southern Serbia) have led to the discovery of well-stratified Middle Paleolithic assemblages associated with hominini fossils and abundant animal bones, allowing us to consider the end of the Middle Palaeolithic in the central Balkans (ca. 60 Ma) from a new perspective.

The presence of significant ungulate prey remains combined with predominantly Quina-type artifacts fashioned on quartz has been taken as a characteristic feature of a quite homogenous Balkan Mousterian in which the latest Levallois methods were not employed, as the assemblages from Pešturina Cave demonstrate (Mihailović *et al.*, 2022). Additionally, Vindija Cave in Croatia has yielded Neanderthal remains, including bones and teeth which contributed to our understanding of Neanderthal behaviors and evolution.

Evidence of hearths and burned bone fragments attest to the mastery of fire by these inhabitants, skills essential for cooking, warmth, and tool production (Radovčić *et al.*, 2015). Furthermore, analysis of faunal remains provides glimpses into Neanderthal subsistence strategies. On the other hand, Krapina's fossilized remains in northern Croatia, indicates that the Krapina Neanderthals had ritual and symbolic capacities (Frayser *et al.*, 2020).

Regarding information obtained from Middle Paleolithic sites in Albania associated with Neanderthal occupation there has been an increase in data availability. Previously limited data hindered efforts to place Albanian's records within models of early land use patterns (Korkuti, 1995; Korkuti & Petruso, 1993). In the past, during the Pleistocene and early Holocene, the terrain looked quite different from what we see today.

The Adriatic Seas shoreline used to be positioned inland than it is now leading to vast coastal wetlands and estuaries filled with diverse ecosystems and valuable resources (Runnels *et al.*, 2004). The state of knowledge about the Palaeolithic and Mesolithic periods in Albania was based on investigations at only a handful of sites, some known since the 1930s (Mustilli, 1942), Dajti

(Von Richtofen, 1939), the open-air sites of Xarë (Korkuti, 1983), Gajtan Cave (Fistani, 1989), Vlushë (Ylli, 1990) and Konispol Cave (Korkuti, 1992-1994).

Within this changing setting ancient foragers from the Palaeolithic and Mesolithic periods flourished by adapting their way of life to make use of the offerings provided by these coastal areas. They skilfully navigated through a network of water bodies and marshes making use of marine creatures' migratory birds and plant life. Findings from the Mallakstra Regional Archaeological Project (MRAP) suggest that ancient human settlements were scattered throughout the Myzeqe Plain and Mallakstra hills demonstrating how extensively these coastal environments were utilized (Runnels, 2004).

Archaeological survey conducted by MRAP allows us to catch a glimpse of the rich cultural heritage of early human societies who made their home (or home away from home) in this realm (Kozlowski, 1992). It is important to understand that the landscape analyzed by MRAP represents but a fraction of the broader territory that would have been settled and exploited by early foragers in the Balkans.

The broad territorial range of these ancient foragers could likely have spanned the greater part of southwest Albania, and parts of northwest Greece – a telling illustration of the interconnectivity of prehistoric human populations across the continent (Runnels, 2001).

Conclusions

For Neanderthals, environmental knowledge and the adequate use of resources were keen on solving adaptive problems, mostly related to survival. Diet changes in Neanderthals reveal novel and creative environmental knowledge, related to their high cognitive ability to learn and transform their niche.

Although regional and temporal variation must be considered for Neanderthal disappearance, coupled with climatically driven changes and most probably, the arrival and spread of modern humans and inbreeding, the repertoire of their subsistence behaviors was various and diverse, expressed in their diet composition and diet breadth.

The Balkan region has long intrigued researchers delving into the presence and behavioral patterns of Neanderthals. Several archaeological sites in the Balkans have provided evidence of Neanderthal presence and biocultural subsistence strategies. In Albania, there is a growing need for further excavations to better understand Neanderthal relationship with biota from multispecies approach.

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