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Humans and animals at Bugul'deika II, a Trans-Holocene habitation site on the shore of Lake Baikal, Russia

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ABSTRACT

This paper examines Holocene tends in subsistence practices through the examination of archaeological faunal remains from the Bugul'deika II habitation site on the west shore of Lake Baikal, Russian Federation. This data indicates that the primary focus of subsistence activities at the site in almost all periods was the hunting of Baikal seals (*Phoca sibirica*). While some deer and other fauna are represented in most cultural layers, they appear to be supplementary resources throughout the Early and Middle Holocene period of site use. By ~2900 cal. BP, domesticated ungulates appear at the site, and become increasingly more relatively abundant through time. Humans using the site during these periods also continued to use wild fauna, particularly Baikal seals. Yearlings and other juveniles were the most commonly taken seals at the site, and most were killed in the late winter or early spring when the lake was ice covered. The overall pattern of fauna use at the site is very similar to that at other sites located on the open shoreline of Lake Baikal, but contrasts sharply with fauna use at sites located along the Little Sea shoreline of the lake, which focuses of littoral fish. Finally, while Middle Holocene human cemeteries in the study area have abundant remains of deer, and stable isotope data on human remains from them indicate some dietary reliance on such herbivores, remains of deer are not found in abundance in any local habitation site.

1. Introduction

The Holocene archaeological record of the Lake Baikal region of Eastern Siberia (Russian Federation; Fig. 1) offers a diversity of data for understanding long-term trends in human subsistence patterns and diets. However, most efforts to address these trends have focused almost exclusively on stable carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotope analysis of bone collagen from human remains, all dating to the Middle Holocene (~8000–3500 cal. BP; Katzenberg and Weber, 1999; Katzenberg et al., 2009, 2010, 2011; Weber et al., 2002, 2011). While these studies have been very informative, they have limitations, and clearly can be most informative when used in combination with other sources of data, including that from zooarchaeology, which is one goal of this paper. The reasons for the need for a more diverse approach to subsistence practices and paleodiet are becoming clearer as more archaeological information emerges from the region, including from these stable isotope studies. First, it is well established that the stable isotope ecology of the Baikal region, particularly for the lake's aquatic fauna, is both complex and highly variable. As a result, it is often impossible when using solely human stable isotope values to determine which particular foodstuffs are contributing to diets. For example, some of the lake's fish and its seals (*Phoca sibirica*) have overlapping stable carbon and nitrogen isotope values, making it impossible to determine which species were eaten, or in what proportions they were consumed. Even local 'terrestrial' food items present interpretive challenges. A case in point is the contributions to past diets made by wild deer and domesticated ungulates such as cattle and sheep, the latter of which likely first entered this region ~3000 years ago during the Late Bronze Age (see Table 1 for a simplified Holocene culture history for the region). These two groups of fauna, and the subsistence strategies associated with them, appear to be difficult to differentiate using stable isotope values, as both groups of herbivores would feed upon the same

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foods, at least until agriculture enters the region. Second, stable carbon and nitrogen isotopes of bone collagen are well-known to reflect primarily the protein consumed by the organism under consideration (Ambrose and Norr, 1993), which means that other portions of the diet are likely to be under-emphasized in this data, particularly foodstuffs such as fats. This is an issue in our study area in regard to human use of Baikal seals, which by body mass are at least 30% fat (blubber), and which among modern hunters are pursued primarily for their fat (Petrov, 2009; Nomokonova et al., 2013b). The contribution of this fat-rich food source to the total diet then is likely more important than isotope data indicates, at least in those regions and seasons where and when the seals were readily available. Finally, stable isotope data can only address protein diets for periods in which human remains are available. This is a particular challenge in the region immediately west of Lake Baikal (Cis-Baikal), where Mesolithic (Early Holocene, or 12,000–8000 cal. BP) burials are rare, and for a period in the Middle Holocene (the Middle Neolithic), nearly entirely absent (Weber et al., 2002, 2010; Weber and Bettinger, 2010). Further, no attempts have been made to determine stable carbon and nitrogen values in human remains dating to the Late Holocene (the last ~3500 years). Together, these two issues result in major gaps in our knowledge of past diets and ultimately diachronic patterns in subsistence strategies.

Table 1
Simplified Holocene culture history model for the Priol'khon'e region of Eastern Siberia, Russia (Losey et al., 2013).

Culture history period	Approximate age range cal. BP	Holocene subdivisions
Mesolithic	12,000 to 8000	Early Holocene
Early Neolithic	8000 to 7000	Middle Holocene
Middle Neolithic	7000 to 6000	
Late Neolithic	6000 to 5000	
Early Bronze Age	5000 to 3400	
Late Bronze Age	3400 to 2250	Late Holocene
Early Iron Age	2250 to 1350	
Late Iron Age	1350 to 850	
Early Mongolian	850 to 550	
Ethnohistoric	550 to present	

Zooarchaeological data on habitation sites has high potential to fill some of these knowledge gaps, but faces limitations and ambiguities of its own. First, habitation site faunal assemblages are informative about human interaction with animals and their body parts at particular places, and only some of these interactions may be dietary ones. For seasonally mobile people, this means that foodstuffs consumed outside the foraging range of the site under consideration likely are not represented in its faunal assemblages. Second, the diets of identifiable individuals are impossible to assess

Fig. 1. Map of the Russian Federation, with the study area indicated. The oval on the detailed map encloses Priol'khon'e. Numbers designate the following habitation sites and cemeteries: 1. Bugul'deika II, 2. Sagan-Zaba II, 3. Tyshkine II/III, 4. Shamanskii Mys, 5–7. Khuzhir-Nuge XIV, Kurma XI, and Ityrkhei.

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