International Journal of Osteoarchaeology, Vol. 7: 172–180 (1997)

Vertebrate Animal Remains from Prehistoric and Medieval Settlements in Primorye (Russian Far East)

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ABSTRACT A review of zooarchaeological research is presented for one of the best-studied areas of the Russian Far East, Primorye (Maritime) Province. The faunal remains, including mammals, birds and fish, were derived from archaeological contexts ranging from the Upper Palaeolithic, ca. 33 000 years ago, to the Middle Ages, twelfth to thirteenth centuries AD. Among the wild species, hoofed animals, wild boar, and bears are the most common. Domesticated animals are represented mostly by pig and dog. At the Pleistocene–Holocene boundary, ca. 10 000–12 000 years ago, some species, such as mammoth, woolly rhinoceros and bison, became extinct. Since the Middle Holocene, ca. 7000 years ago, the faunal complexes became of modern composition. The finding of bones of domesticated animals in the Bronze Age, dated ca. 2800–3200 years ago, allows the correlation of the emergence of livestock in Primorye with cultural influences from northern China. © 1997 by John Wiley & Sons, Ltd.

Int. J. Osteoarchaeol., **7**: 172–180 (1997)
No. of Figures: 2. No. of Tables: 3. No. of References: 37.

Key words: vertebrate animals; prehistory; Middle Ages; Russian Far East.

Introduction

The study of vertebrate animal remains from ancient sites in Primorye, the southernmost part of the Russian Far East (Figure 1), has been carried out since the 1860s, most intensively in the 1950s–1980s in the wake of large-scale excavations.[1,2] It should be stressed that Primorye is the best-studied area in the Russian Far East in terms of zooarchaeological records. During more than 35 years the remains of mammals, birds, and fish have been identified from ancient sites ranging from the Upper Palaeolithic period to the Middle Ages. The location of sites from Primorye with zooarchaeological records is shown in Figure 1.

The identification of terrestrial mammals and birds was made at different times by E. V. Alekseeva, N. I. Burchak-Abramovich, V. P. Danilchenko, N. M. Ermolova, V. A. Nechaev, N. D. Ovodov, V. I. Tsalkin, N. K. Vereschagin and M. A. Voinstvensky; the fish bones were analysed by L. N. Besednov, A. Y. Taranets and E. I. Tsepkin. Because of the relatively small amount of vertebrate faunal remains known from the Late Quaternary outcrops in Primorye, the study of the bones derived from archaeological contexts is very important, not only for palaeoeconomic investigations but also for palaeoenvironmental reconstruction.

The aim of this paper is to present a summary of zooarchaeological data from Primorye previously published only in Russian, together with a short review of the archaeology, chronology, and palaeoenvironment of the ancient cultures. Because the author's field is geoarchaeology,[3–6] I try to correlate the changes in faunal composition with environmental fluctuations.

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CCC 1047–482X/97/020172–09$17.50

Received 6 December 1996
Accepted 19 January 1997

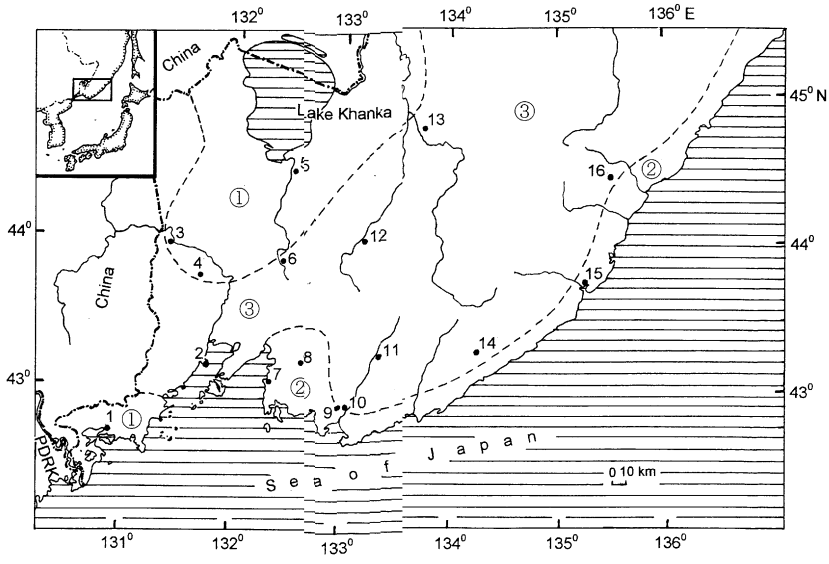

Figure 1. The position of sites with zooarchaeological records and landscape areas in Primorye. 1, Zaisanovka 1; 2, Peschany 3; Konstantinovskoye 1; 4, Krounovka; 5, Sinii Gai; 6, Nikolaevskoye 2; 7, Yuzhny; 8, Malaya Podushechka; 9, Bliznets cave; 10, Geographic Society Cave; 11, Shaiginskoye; 12, Novogordeevka; 13, Marianovskoye; 14, Sokolchi; 15, Sinie Skaly; 16, Chertovy Vorota Cave. Circled Numbers (landscape areas): 1, forest-steppe of the Khanka and Khasan Plains; 2, coastal broadleaf (oak) forests; 3, mixed coniferous–broad-leaved forests of the Sikhote–Alin Ridge.

Archaeology and palaeoenvironment of Primorye

The prehistoric cultures of Primorye are subdivided into Upper Palaeolithic, Neolithic, Bronze Age, and early Iron Age cultures.[2] Upper Palaeolithic (including Final Palaeolithic or Mesolithic) sites correspond to the Last Glacial Maximum, the Late-glacial, and the Early Holocene, ca. 32 000–8000 radiocarbon years ago (BP).[3] About 8000 years BP, the early Neolithic Rudnaya culture appeared; one of the key sites Chertovy Vorota dates to ca. 6800–5900 years BP[7] and corresponds to the Atlantic period (i.e. Holocene climatic optimum).[4] The late Neolithic Zaisanovskaya culture (key sites Zaisanovka 1 and Sinii Gai, lower layer) dates to ca. 5400–3000 years BP,[7] and existed during the Atlantic–Sub boreal transition (cooling and drying) as well as Sub boreal time.[4]

Bronze Age sites (Grotto site near Sinie Skaly and Sinii Gai, upper layer) date to ca. 2800–2300 years BP.[7] They coexisted with the early Iron Age cultures, named Yankovskaya (key sites Peschany, Yuzhny, and the lower layer of Malaya Podushechka), dated to 3000–2000 years BP, and Krounovskaya (key sites Krounovka and Sokolchi), dated to 2500–1800 years BP. All the Bronze and early Iron Age cultures correspond to the Sub boreal–Subatlantic transition and early Subatlantic time. The Olginskaya Culture (upper layer of Malaya Podushechka, and the Sinie Skaly site) was of transitional character from the early Iron Age to the Middle Ages, and dates to 1800–1500 years BP.

The Medieval cultures in Primorye existed in mid-Subatlantic time and may be subdivided into Pohai (Bohai), eighth to tenth centuries AD (Nikolaevskoye 2 and Marianovskoye fortresses; Novogordeevka and Konstantinovskoye 1 rural settlements), and Jurchen, twelfth to thirteenth centuries AD (Shaiginskoye and Novogordeevka fortresses).[2]

Zooarchaeological records

Wild mammals

The available data on prehistoric fauna from Primorye are presented in Tables 1 and 2. The list of species for the single Upper Palaeolithic

Table 1. The wild animal remains from prehistoric sites in Primorye[10–21] (number of bones/individuals; +presence, no more data).

Species	Chertovy Vorota	Zaisanovka 1	Sinii Gai, Neolithic	Sinii Gai, Bronze	Grotto near Sinie Skaly	Yankovskaya culture	Krounovskaya culture
Carnivores							
Wolf (*Canis lupus* L.)	+					+	
Racoon-like dog (*Nyctereutes procyonoides* Gray)	28/9		+				
Fox (*Vulpes vulpes* L.)			+		1/1	+	
Bears (*Ursus arctos* L., *U. tibetanus* Cuv.)	579/54		+		7/2	+	
Otter (*Lutra lutra* L.)	+				+		
Siberian weasel (*Mustella sibirica* Pall.)	+					+	
Badger (*Meles meles* L.)	182/30		+			+	
Tiger (*Panthera tigris* L.)	+		+				
Pinnipeds							
Steiler sea lion (*Eumetopias jubatus* Schr.)						+	
Larga seal (*Phoca vitulina* L.)				+		+	
Artiodactyles							
Elk (*Alces alces* L.)	+		+	+		+	
Wild boar (*Sus scrofa* L.)	413/16	+	+		+	+	+
Roe deer (*Capreolus capreolus* L.)	+	+	+		39/3	+	+
Red deer (*Cervus elaphus* L.)	190/5	+	+	+		+	+
Sika deer (*Cervus nippon* Temm.)	+		+				+
Musc deer (*Moschus moschiferus* L.)	+					+	
Caribou (*Rangifer tarandus* L.)			+	+			
Goral (*Nemorhaedus goral* Har.)	+						
Rodents							
Hares and rabbits (*Lepus* sp.)	+		+			+	
Amount of wild animals in total assemblage	100	100	100	100	84.4		

faunal locality in the region, Geographic Society Cave (radiocarbon dated to 32 500 years BP), was compiled by Ovodov[8] and republished by the present author.[5,9] The most abundant faunal remains in this cave belong to red, sika, and roe deer, respectively.

Red deer (wapiti), roe deer, elk (moose), and wild boar were the most commonly hunted animals during the Neolithic, Bronze and early Iron Age (Table 1).[10–21] Among the other mammals, bears (both brown bear and Asiatic black bear), sika deer, and badger also played an important role. The same animals were mainly hunted in medieval times (Table 2),[22–25] along with racoon-like dogs and foxes. The bones of pinnipeds such as the larga seal and Steller sea lion, from coastal sites on the Sea of Japan and Lake Khanka,[10,13,15] present evidence of restricted marine hunting beginning in the Bronze and early Iron Ages.

The amount of wild animals in faunal assemblages decreases from Neolithic (100 per cent) to the Bronze Age (85 per cent) and the Middle Ages (15–45 per cent).

Wild birds

Data about the composition of wild bird faunas from ancient sites in Primorye are still scanty. The most common non-passerine species in the Neolithic and Bronze Ages were white-fronted goose (*Anser albifrons* Scop.), pheasant (*Phasianus colchicus* L.), swan goose (*Cygnopsis cygnoides* L.), Bewick's swan (*Cygnus bewiekii* Yarr.), pintail (*Anas acuta* L.), heath cock (*Lyrurus tetrix* L.), and some birds of prey such as white-tailed eagle (*Haliaeotus albicilla* L.) and the Ural owl (*Strix uralensis* Pall.).[26] In coastal sites of the early Iron Age, Yankovskaya culture, several kinds of marine birds such as divers, goldeneyes, and different cormorants and sea gulls were identified.[13]

Domesticated animals and birds

The composition of faunal assemblages is presented in Table 3.[13–16,18–25,27] The earliest

Table 2. The wild animal remains from medieval sites in Primorye[22–25] (number of bones/individuals; +presence, no more data).

Species	Nikolaevskoye 2		Shaiginskoye	Novogordevka site	Novogordeevka fortress, Pohai	Novogordeevka fortress, Jurchen	Konstantinovskoye 1
	Layer 1	Layer 2					
Carnivores							
Wolf (*Canis lupus* L.)	33/13	2/1	51/37				
Racoon-like dog (*Nyctereutes procyonoides* Gray)	17/10	6/4	18/2	+		+	
Fox (*Vulpes vulpes* L.)	6/6	9/5	18/2	+	+		+
Bears (*Ursus arctos* L., *U. tibetanus* Cuv.)	37/20	13/3		+	+		+
Marten (*Martes flavigula* Bod.)	1/1			+	+		+
Badger (*Meles meles* L.)	72/30	22/9		+	+		+
Tiger (*Panthera tigris* L.)	5/5				+		
Artiodactyles							
Elk (*Alces alces* L.)	3/3			+	+		
Wild boar (*Sus scrofa* L.)	175/59	57/19	175/74	+	+		+
Roe deer (*Capreolus capreolus* L.)	214/84	126/38	60/40	+	+	+	+
Red deer (*Cervus elaphus* L.)	9/6	5/3		+			+
Sika deer (*Cervus nippon* Temm.)	32/14	14/6	8/4	+	+	+	+
Musc deer (*Moschus moschiferus* L.)			+				+
Caribou (*Rangifer tarandus* L.)			1/1				
Goral (*Nemorhaedus goral* Har.)	2/2	3/3					
Rodents							
Beaver (*Castor fiber* L.)	10/2	1/1					
Hares and rabbits (*Lepus* sp.)	39/7	4/4					
Amount of wild animals in total assemblage	23.2	23.2	13.8	30.2	26.0	13.1	44.7

Table 3. The domesticated animal remains from the ancient sites in Primorye[13–16,18–25,27] (in per cent; +presence, no more data).

Sites	Pig	Dog	Horse	Cow	Cattle (cow, bull)	Sheep	Percentage of domestic species in total assemblage
Bronze Age							
Grotto near Sinie Skaly	80.1	19.9					15.6
Early Iron Age							
Yankovskaya culture (general)	+	+					
Peschany	59.0	40.5		0.5			87.4
Yuzhny	+	+	+				
Malaya Podushechka (lower layer)	+	+	+				
Krounovka	+	+	+				
Sokolchi	+			+			
Malaya Podushenchka (upper layer)	44.8		29.8		25.4		67.0
Sinie Skaly	5.0		54.0		38.0		99.0
Middle Ages							
Novogordeevka site	62.5	16.5	7.0	14.0			66.7
Nikolaevskoye 2, layer 1	42.8	27.4	13.7	16.0		0.01	76.8
Nikolaevskoye 2, layer 2	41.9	22.9	15.6	19.6			76.8
Marianovskoye	27.5	12.5	22.5	37.5			
Shaiginskoye	6.3	1.9	10.8	80.8		0.2	86.2

domesticated animal remains are known from the Grotto site near Sinie Skaly, Sinegaiskaya culture (Bronze Age),[21] and may be archaeologically cross-dated to ca. 2800–3200 years BP.[7] During all the prehistoric and medieval periods, pig and dog were the most significant species although during the medieval period, cow and horse also became important. In the Olginskaya culture, dated to ca. 1500 years BP, bones of cattle (cow and bull) were identified, which may indicate their use in ploughing.[15] Sheep and chickens were not common in Primorye as ancient livestock and the camel seems to be an exotic feature in the Middle Ages.

Since the early Iron Age, the amount of domesticated animal bones in faunal composition is much greater than that of wild ones (67–99 per cent versus 1–33 per cent; see Table 3).

Fish

Marine fish remains have been studied mostly from the Yankovskaya culture, early Iron Age, and from some Neolithic (Zaisanovka 1) and Bronze Age (Grotto site near Sinie Skaly) sites. The most abundant remains belong to the Japanese mackerel (*Pneumatophorus japonicus* Houtt.), yellow-fin sole (*Limanda aspera* Pall.), and far eastern krasnoperka (*Leuciscus brandti* Dyb.).[28,29] Among the freshwater fish at the Sinii Gai site (late Neolithic layer), the snakehead (*Ophiocephalus argus warpachowskii*), Amur catfish (*Parasilurus asotus* L.), and different species of carp (*Cyprinus carpio haematopterus* Temm. et Schlegel; *Carassius carassius* L.) were the most common.[17]

Discussion

The changes in the vertebrate faunal composition from Primorye sites correlate with environmental fluctuations during the last 30 000 years. The general warming after the Last Glacial Maximum, beginning in the area ca. 15 000 years BP, led to the extinction of the typical representatives of the Late Pleistocene fauna, such as mammoth (*Mammuthus primigenius* Blum.), woolly rhinocerus (*Coelodonta antiquitatis* Blum.), and bison (*Bison priscus* Boj.) by ca. 12 000 years BP. The latest radiocarbon date for this faunal assemblage was obtained from Bliznets cave, $11\,965 \pm 65$ years BP (SOAN-1530).[30]

Beginning in the early mid-Holocene, ca. 7000 years BP, the modern faunal complex arose in Primorye. Nevertheless, some species represented in the archaeological record, such as elk (moose) and caribou, do not inhabit the

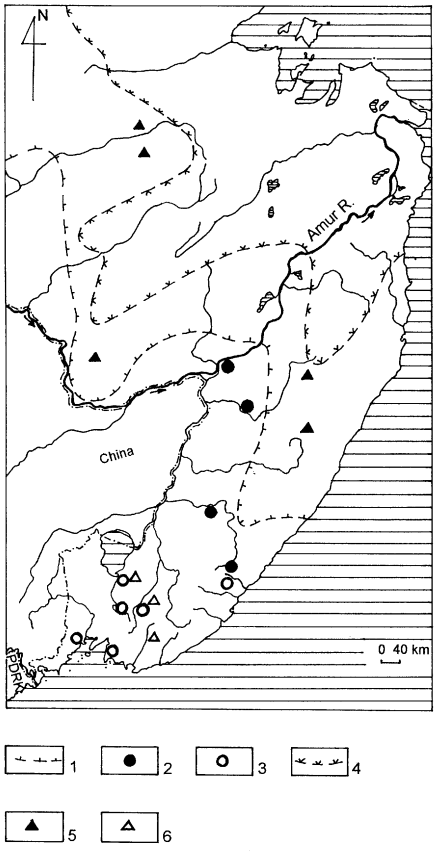

Figure 2. The natural habitat changes of some animals since prehistoric and medieval time in Primorye. 1, the southern limit of elk natural habitat (after Bromlei[31]); 2, rare modern migrations of elk; 3, zooarchaeological findings of elk bones; 4, the southern limit of caribou natural habitat (after Bromlei[31]); 5, rare modern migrations of caribou; 6, zooarchaeological findings of caribou bones.

southern part of Primorye at the present time.[31,32] The presence of elk and caribou bones on some sites may be explained either by their extended natural habitat in the late Neolithic–Middle Ages or by occasional migrations that were wider in ancient times than today (Figure 2).

The modern landscapes of Primorye may be generalized into three types: (i) the mixed coniferous–broad-leaved forests of the Sikhote–Alin Ridge; (ii) coastal broadleaf (oak) forests; and (iii) forest-steppe of the Khanka and Khasan Plains (Figure 1). Palaeogeographical data show that the area of forest-steppe expanded during cooling in the Late Holocene.[33–35] However, there are no significant differences in faunal composition between prehistoric sites located in forest zones (Chertovy Vorota and Grotto site near Sinie Skaly) and those located in forest-steppe (Sinii Gai and Zaisanovka 1) (see Table 1). Thus, it may be that the forest-steppe landscape for the last 3000–5000 years was a mosaic with 'islands' of forest where typical faunal representatives (e.g. various species of deer, wild boar and bear) survived.

The wild/domestic animal ratio from the medieval settlements probably reflects the economic specializations of the period. The amount of wild animal bones from medieval fortresses (13–26 per cent) is lower than from rural settlements (30–45 per cent). This may indicate different kinds of site functions. Fortresses served as administrative centres for agriculture and animal breeding in nearby areas, whereas for unfortified sites hunting continued to be most important to the economy.

One important problem is the origin of the Primorye domestic livestock. One of the famous centres of animal husbandry in northeast Asia close to Primorye is northern China. The earliest evidence of dog, pig, sheep, chicken, and ox domestication is known from the Cishan, Beixin, Yangshao, and Hongshan cultures of north China, dated to ca. 5000–7000 years BP.[36] The increased amount of bones of the dog-like wolf (*Canis* sp.) in the upper part of the Chertovy Vorota cultural layer allowed Alekseeva[11] to suggest that the domestication of dog in Primorye may have begun during the early Neolithic, ca. 6000–6800 years BP. There is some equivocal palynological evidence of animal grazing from another early Neolithic site, Rudnaya, dated to ca. 7400–7700 years BP.[37] The first direct(!) evidence of animal domestication (i.e. bones of pig and dog) are known from the Bronze Age and cross-dated to ca. 3000 years BP.

Based on the data observed, it is possible to suggest that the development of animal husbandry in Primorye was influenced by northern China. The diffusion of domesticated species such as pig, cow, and bull was the mechanism for introducing animal breeding to Primorye since the Neolithic period. In the Middle Ages, when the territory of southern Primorye was annexed by the Pohai and Jurchen medieval empires,

which covered most of northeastern China and adjacent areas, some additional domesticated animals, such as sheep, camel, and chicken, were introduced on a limited scale.

Conclusion

Throughout prehistoric and medieval times, the hoofed animals, wild boar, and bears were the most important hunting objects in Primorye (Russian Far East). Evidence of marine hunting is rare. The largest changes in wild animal composition in Primorye took place at the Pleistocene–Holocene boundary, ca. 10 000–12 000 years BP. After ca. 7000 years BP, regional fossil faunal assemblages became close to the modern ones.

The most common livestock species in Primorye in the Bronze and early Iron Ages and the Middle Ages, were pig and dog. The process of domestication most probably was not independent from adjacent northeastern China, and cultural influences and exchanges since the late Neolithic–Bronzes Age periods, ca. 3000–4000 years BP, caused the appearance of animal husbandry in Primorye.

Acknowledgements

I am deeply grateful to Professor David R. Yesner, University of Alaska-Anchorage, for the correction of English and some useful comments. My thanks also going to Drs Vladimir N. Bocharnikov, Pacific Institute of Geography, Vladivostok, and Vladimir A. Rakov, Far Eastern State University, Vladivostok, for translation of bird and fish names. This study was supported partly by the Grant from the Russian Foundation for Fundamental Investigations (RFFI), number 96-06-80688.

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