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Dental Data on the Origin of the Early Iron Age Bolshaya Rechka Population in the Upper Ob Area, and the Differentiation Between the Kamen and Bolshaya Rechka Cultures

This dental study addresses the origin of the Bolshaya Rechka people in the Novosibirsk region of the Ob, with reference to the migration of Saka and Sarmatian tribes from the southwest. I compare dental features of southern Kamen and northern Bolshaya Rechka populations inhabiting the entire Upper Ob area. Dental samples from eleven Bolshaya Rechka cemeteries were studied. Findings indicate heterogeneity. Nearly all samples evidence admixture between eastern and western groups. That from Bystrovka-3 takes a separate position, revealing more eastern traits along with those marking the Southern Siberian Upper Paleolithic complex. The results enable us to evaluate the role of Saka and Sarmatian migrants from Kazakhstan, Cis-Urals, and Tian Shan. This role appears to have been relatively minor and likely indirect, upholding the ideas advanced by archaeologists. Bolshaya Rechka and Kamen populations (the latter culture was thought to include the former) are biologically distinct. Bolshaya Rechka displays continuity with local Early Bronze Age groups. The main component of the Kamen population of forest-steppe Altai, on the other hand, was introduced by Saka and Sarmatian immigrants, who, evidently, had not reached the Novosibirsk region of the Ob. Rather than moving on northwards along the Ob from the forest-steppe Altai, they turned west, toward the Tobol-Irtysh watershed.

Keywords: *Upper Ob area, Bolshaya Rechka culture, Kamen culture, Early Iron Age, Saka migration, dental anthropology.*

Introduction

The tribes inhabiting the Upper Ob basin in the Early Iron Age are typically considered as representatives of two archaeological cultures: either Bolshaya Rechka or Kamen. The former was initially described by M.P. Gryaznov based on the materials from the burial sites of the forest-steppe Ob region. According to the scholar, that culture had developed from the cultural traditions of the preceding population of the area (Gryaznov, 1956: 44).

However, following research has demonstrated substantial cultural heterogeneity of the Upper Ob ancient tribes. Expanding on this idea, V.A. Mogilnikov and A.P. Umansky in the early 1980s suggested singling out the Kamen culture (Mogilnikov, 1997: 4). The main argument for this was the prevalence, in the grave goods of the Altaian tribes, of the cultural traits associated with the Saka and Sarmatians of present-day Kazakhstan (Ibid.: 4–8). The researchers did not limit area of that newly described culture to the forest-steppe part of Altai, but

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extended it to the whole Upper Ob area, which provoked a discussion regarding the relationship between Kamen and Bolshaya Rechka complexes. T.N. Troitskaya, A.P. Borodovsky, and N.V. Polosmak opposed the extension of the area of the Kamen culture. According to them, the influence of the Saka and Sarmatians on the formation of the Bolshaya Rechka populations was indirect and rather weak. The origin of the traditions of the Bolshaya Rechka culture, as it was pointed out by Gryaznov, was related to the local Late Bronze Age groups (Troitskaya, Borodovsky, 1994: 104; Polosmak, 1987: 101–102). An attempt of solving this issue was made by Troitskaya, who suggested to consider all the Upper Ob tribes of the Early Iron Age as parts of the same Bolshaya Rechka cultural and historical community, but also to separate this into several local variants: Kamen (Novosibirsk and Barnaul regions of the Ob), Staroaleiskoye (along the Ob River, from the mouth of Anui to the mouth of Chumysh), and Kizhirovo (Tomsk region of the Ob and the north of the Novosibirsk region of the Ob) (Troitskaya, Novikov, 2007: 96–97).

The employment of anthropological data could have facilitated solving the question regarding the relationship between Bolshaya Rechka and Kamen populations via the study of biological distances between those groups. However, there is a notable disproportion between the numbers of studied and published samples, most of which come from Kamen culture sites. Previous research on cranial metrics and dental traits has shown that the population of the Kamen culture from the forest-steppe Altai has actually formed under a substantial influence from the Saka of the Southeastern Aral Sea region and Central Kazakhstan (Rykun, 2013: 165; Leibova, Tur, 2020). But the Novosibirsk region of the Ob remains *terra incognita* from the anthropological point of view. Previous studies were based on scarce samples from single burial sites (Alekseev, 1958; Dremov, 1970; Rykun, 2013: 19–21; Kishkurno, Zubova, 2015; Kishkurno, 2018a, b). All those authors pointed to the typological pattern of admixture in the samples of the Bolshaya Rechka culture. But owing to the paucity of data, it has not been possible to describe the anthropological composition of the Bolshaya Rechka community of the Novosibirsk region of the Ob in full. The aim of this study was a reconstruction of the history of this population, employing all available dental samples.

Material and methods

Dental specimens from 11 burial sites were sampled (Table 1). These were studied using the standard dental non-metric protocol by A.A. Zubov (1968, 2006) and employing the markers of generalized archaic (Zubova, 2013a). Only the permanent dentition was studied, the sexes were pooled. The individual method disregarding the side of observation was employed for scoring the traits. Seven small samples from some burial sites were pooled together.

The Pearson's χ^2 criterion was used to assess the significance of the difference between local populations. The intergroup comparisons was carried out in Statistica for Windows, version 10.0, via the principal component analysis based on trigonometrically transformed frequencies of eight dental traits: shoveling (I^1), hypocone reduction (M^2), Carabelli cusp (M^1), six-cusped and four-cusped forms of M_1, four-cusped forms of M_2, distal trigonid crest (M_1), deflecting wrinkle of the metaconid (M_1). Neolithic, Bronze, and Early Iron Ages samples from Siberia, Volga-Ural region, Kazakhstan, and Aral Sea were employed as reference.

Table 1. **Dental samples of the Bolshaya Rechka culture**

Site	Sample size, individuals	Date
Verkh-Suzun-5	29	4th–2nd centuries BC
Bystrovka-1	19	Second half of the 1st millennium BC
Bystrovka-2	135	5th – early 2nd centuries BC
Bystrovka-3	117	3rd–1st centuries BC
"26 iyunya"	1	5th–3rd centuries BC
Milovanovo-2	2	4th–3rd centuries BC
Milovanovo-3	2	2nd–1st centuries BC
Milovanovo-8	6	2nd–1st centuries BC
Noviy Sharap-1	4	5th–4th centuries BC
Noviy Sharap-2	8	4th–3rd centuries BC
Krokhalevka-5	2	Second half of the 1st millennium BC

Characteristics of the Bolshaya Rechka sample

The sample displays moderate frequencies of I^1 and I^2 shoveling (Table 2). A few cases of double shoveling and vestibular convexity of I^1 were observed. The frequency of the distal crest of the upper canines is increased. The prevalence of the Carabelli cusp of M^1 and accessory distal cusps of M^1 is moderate. The reduction of the hypocone of M^2 is rare. A case of anterior and a case of posterior fovea of M^1 were detected. The cingulum of M^1 is rare.

The lower canines exhibit a moderate frequency of the distal accessory ridges. A few cases of the styloid cusps in the distal parts of P_1 and P_2 were observed. While the prevalence of six-cusped M_1 is increased, the frequency of $M_2$4 is lower, and the four-cusped form is extremely rare. The following traits are found seldom: tami M_1, distal and middle trigonid crests of M_1. The prevalence of the deflecting wrinkle of the metaconid of M_1 is greatly

Table 2. **Frequencies of the main dental phenes**

Trait	Verkh-Suzun-5		Bystrovka-1		Bystrovka-2		Bystrovka-3		Composite sample		Total	
	n (*N*)	%	*n* (*N*)	%	*n* (*N*)	%	*n* (*N*)	%	*n* (*N*)	%	*n* (*N*)	%
Maxillary dentition												
Shoveling I^1	2 (7)	28.57	0 (3)	0	7 (32)	21.87	5 (8)	62.5	3 (9)	33.33	17 (57)	29.82
Shoveling I^2	4 (8)	50	1 (9)	11.11	24 (43)	55.81	7 (12)	58.33	4 (9)	44.44	40 (81)	49.38
Vestibular shoveling I^1	0 (7)	0	0 (3)	0	3 (46)	6.52	2 (12)	16.66	0 (7)	0	5 (75)	6.66
Vestibular convexity I^1	1 (6)	17	0 (3)	0	3 (43)	6.97	0 (14)	0	0 (8)	0	4 (74)	5.4
Distal ridge C	6 (7)	85.71	4 (6)	66.66	38 (41)	92.68	15 (16)	93.75	7 (9)	77.77	70 (79)	88.6
Carabelli cusp M^1	8 (17)	47	1 (14)	7.14	16 (77)	20.77	17 (53)	32.07	8 (23)	34.78	50 (182)	27.47
Hypocone reduction (3, 3+) M^2	7 (20)	35	2 (13)	15.38	19 (79)	24.05	4 (52)	7.69	3 (23)	13.04	34 (185)	18.37
Accessory cusp (c5) M^1	8 (19)	42.1	2 (3)	66.66	13 (37)	35.13	12 (36)	33.33	3 (12)	25	38 (107)	35.51
Anterior fovea M^1	0 (8)	0	0 (2)	0	0 (20)	0	1 (15)	6.66	0 (6)	0	1 (51)	1.96
Posterior fovea M^1	0 (8)	0	0 (4)	0	0 (33)	0	1 (25)	4	0 (8)	0	1 (68)	1.47
Cingulum M^1	3 (21)	14	0 (15)	0	2 (100)	2	0 (62)	0	0 (26)	0	5 (229)	2.18
Mandibular dentition												
Distal ridge C	3 (12)	25	1 (3)	33.33	25 (42)	59.52	8 (18)	44.44	7 (13)	53.84	44 (88)	50
Distostylid P_1	0 (11)	0	0 (10)	0	1 (65)	1.53	4 (36)	11.11	2 (17)	11.76	7 (109)	6.42
Distostylid P_2	1 (10)	10	0 (10)	0	1 (48)	2.08	0 (23)	0	1 (17)	5.88	5 (119)	4.2
$M_1$6	2 (11)	18	2 (6)	33.33	9 (43)	20.93	3 (32)	9.37	1 (10)	10	17 (99)	17.17
$M_1$4	0 (11)	0	0 (6)	0	1 (43)	2.32	1 (32)	3.12	0 (10)	0	2 (99)	2.02
$M_2$4	6 (8)	75	1 (2)	50	25 (37)	67.56	15 (26)	57.69	9 (17)	52.94	53 (86)	61.62
Tami M_1	3 (19)	15.78	0 (11)	0	3 (67)	4.47	4 (45)	8.88	2 (18)	11.11	11 (156)	7.05
Distal ridge of the trigonid M_1	0 (14)	0	0 (8)	0	1 (40)	2.5	4 (29)	13.79	0 (7)	0	5 (96)	5.21
Middle ridge of the trigonid M_1	1 (14)	7.14	0 (7)	0	1 (39)	2.56	2 (30)	6.66	0 (6)	0	4 (96)	4.16
Deflecting wrinkle of the metaconid M_1	3 (13)	23	1 (2)	50	9 (21)	42.85	5 (20)	25	0 (4)	0	36 (59)	61.01
Anterior fovea M_1	0 (9)	0	1 (2)	50	0 (22)	0	2 (18)	11.11	0 (2)	0	3 (53)	5.66
Posterior fovea M_1	0 (11)	0	0 (2)	0	0 (29)	0	1 (18)	5.55	0 (3)	0	1 (63)	1.58
Cingulum M_1	2 (21)	9.5	0 (15)	0	7 (91)	7.69	6 (61)	9.83	2 (23)	8.69	17 (211)	8.05

increased, while the cingulum and anterior and posterior fovei of M_1 are observed very rarely.

Turning to the local groups, some morphological heterogeneity of the Bolshaya Rechka population of the Novosibirsk region of the Ob should be pointed out (Table 2). All the local samples, except for Bystrovka-3, display an intermediate western-eastern morphology. The lower prevalence of the traits of the Eastern dental stock at Bystrovka-1 can be explained by the low sample size. The feature sharply contrasting Bystrovka-3 to other Bolshaya Rechka groups is an increased frequency of shoveling (I^1) and the distal trigonid crest (M_1). The differences between the samples from Bystrovka-3 and Bystrovka-2 are statistically significant: $p = 0.02$ for shoveling (I^1) and $p = 0.04$ for the distal trigonid crest.

The Verkh-Suzun-5 and Bystrovka-2 samples display a southern dental complex (Zubov, 2006: 59–62), namely a combination of the vestibular convexity of I^1, middle trigonid crest of M_1 and tami at M_1 (Table 2). The same complex is present at Bystrovka-3 as well, but as a combination of tami M_1 and the epicristid of M_1. The presence of such dental patterns in the Bolshaya Rechka groups could be a result of contacts with contemporaneous migrant tribes from the south and south-west. Alternatively, the complexes might be inherited from preceding autochthonous population, e.g. from the descendants of the groups of the Early Bronze Age Odino culture displaying similar dental patterns (Zubov, Chikisheva, Molodin, 2016).

One more component was specific only for the sample from Bystrovka-3, where increased frequencies of six-cusped M_1 are found in combination with some archaic morphological features: anterior and posterior fovei of M_1 and an enlarged cingulum of M_1 (Table 2). Such a complex goes back to the Upper Paleolithic populations of Southern Siberia (Afontova Gora II, Listvenka) (Zubova, Chikiseva, 2015b), but is also found in the Neolithic groups from the Baraba forest-steppe (Zubova, Chikiseva, 2015a) and some Odino samples (Zubov, Chikisheva, Molodin, 2016). The presence of this complex likely points to an increased proportion of the autochthonous component in the sample from Bystrovka-3.

Discussion

An intergroup comparison of the Early Iron Age dental samples revealed the following results (Fig. 1). The first two principal components (PC) account for approximately 52 % of the total variance. The first PC (33.77 % of total variance) distinguishes groups (Table 3) displaying high frequencies of the Carabelli cusp (M^1), six-cusped M_1, deflecting wrinkle of metaconid (negative values of PC1) from the samples exhibiting an enhanced gracile complex (positive values of PC1). The second PC (19.01 %) arranges the populations according to the west-east gradient (Table 4).

The samples of the Bolshaya Rechka culture occupy the area of negative values of PC1. Most of these also display negative values of PC2, while the sample from Bystrovka-3 exhibits a positive value along this axis (Fig. 1). Such a pattern of differentiation seems logical, as the latter sample displays the highest proportion of the traits associated with the Eastern dental stock.

The Bolshaya Rechka populations plotted quite separately from the reference samples. The closest groups among them are Verkh-Suzun-5 and Bystrovka-2. These are also similar to the sample from Stantsiya Kazanovskaya-1 belonging to the Tagar culture (Fig. 1). The latter was previously shown to possibly have tight connections with the Early Iron Age populations of the Upper Ob area (Kishkurno, 2021). All the local samples mentioned above are also similar to an extent to the groups of the Sargatka culture from the basins of Tobol, Irtysh, and Ishim rivers. The sample from the Bystrovka-1 cemetery is found in the margin of the plot (Fig. 1), while Bystrovka-3 displays some similarity to the groups of the Kulai culture from the Novosibirsk region of the Ob and to the samples from the burial sites of the Korgantas type (Fig. 1). This latter observation can be explained, first, by increased frequencies of the traits of the Eastern dental stock in this particular sample, which is untypical for the Saka in general (Beisenov et al., 2015: 111); and second, by the low size of this sample, which makes it a rather poor representative of the respective population. The populations of the Kamen culture from the forest-steppe Altai plot compactly in the center of the graph (Fig. 1), being part of a large cluster that includes samples of the Early Sarmatians, Sauromatians, and Saka from various areas. These groups do not exhibit similarity to the Bolshaya Rechka populations.

The first two PCs of the analysis comparing the samples of the Kamen and Bolshaya Rechka cultures with the Neolithic and Bronze Age populations (Fig. 2) account for approximately 45 % of the total variance. The first PC (29 %) differentiates groups with higher frequencies of "eastern" traits (positive values of PC) from those displaying accentuation of the reduction complex (negative values). The second PC (16.52 %) separates populations showing a high frequency of the distal trigonid crest of M_1 (positive values) from samples exhibiting high prevalence of the deflecting wrinkle of the metaconid of M_1 (negative values).

In this analysis, the groups of the Bolshaya Rechka culture are dispersed more compactly (Fig. 2) as compared to the previous plot with the samples of the Early Iron Age (see Fig. 1) occupying the area of positive values of PC1 and negative values of PC2. All the autochthonous Neolithic and Bronze Age Siberian populations occupy the same area of the graph.

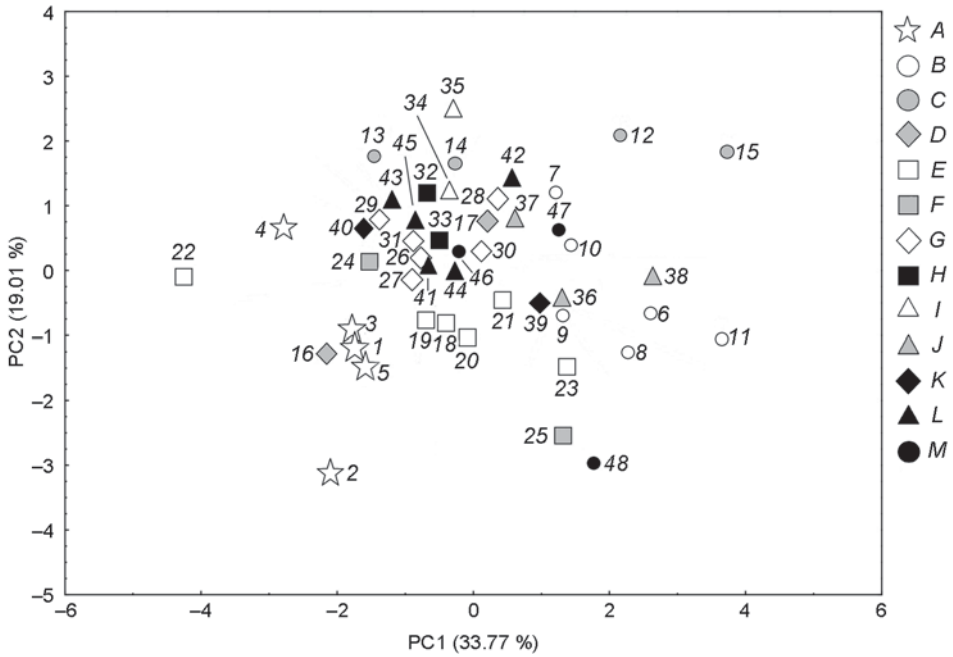

Fig. 1. Results of the principal component analysis of the Early Iron Age dental samples.
A – Novosibirsk region of the Ob: *1* –Verkh-Suzun-5, *2* –Bystrovka-1, *3* – Bystrovka-2, *4* – Bystrovka-3, *5* – composite sample (author's data); *B* – the Altai Mountains: *6–10* – Pazyryk culture of valleys of the rivers of Ulandryk (*6*), Yustyd (*7*), Barburgazy and Buguzun (*8*), Ukok plateau (*9*), valleys of the middle reaches of the rivers of Chuya, Ursul, and Katun (*10*), *11* – Kara-Koba group of sites; *C* – Tuva: *12*, *13* – Aldy-Bel culture (*12* – Arzhan-2, *13* – Kopto), *14* – Uyuk-Sagly culture, Dogee-Baary II, *15* – Dogee-Baary II (2nd century BC to 1st century AD) (Chikisheva, 2012); *D* – Khakass-Minusinsk Basin: *16* – Tagar culture, Stantsiya Kazanovskaya-1 (Kishkurno, 2021), *17* – Tagar culture (Rykushina, 1977; Postnikova, 1974); *E* – Tobol-Irtysh watershed: *18–21* – Sargatka culture of the Tobol basin (*18*), Irtysh basin (*19*), Ishim basin (*20*), Baraba forest-steppe (*21*) (Sleptsova, 2021), *22* – Kashino culture (Sleptsova, Yudakova, 2021), *23* – Gorokhovo culture (Sleptsova, 2021); *F* –Novosibirsk and Tomsk regions of the Ob, Kulai culture: *24* – Kamenny Mys (Kishkurno, Sleptsova, 2019), *25* – Aldygan (Aksyanova, Bobrova, Yakovlev, 2004); *G* – forest-steppe Altai, Kamen culture: *26* – Maslyakha-1, *27* – Novotroitskoye-1, -2, *28* – Kamen-2, *29* – Rogozikha-1, *30* – Obyezdnoye-1, *31* – Kirillovka-3; *H* – Barnaul region of the Ob, Staroaleiskoye culture: *32* – Firsovo-14, *33* – Obskiye Plesy-2, Tuzovskiye Bugry (Leibova, Tur, 2020); *I* – lower Syr-Darya River, Dzhetyasar culture: *34* – Kosasar-2 (Rykushina, 1993a), *35* – Kosasar-3, Tompakasar, Bedaikasar (Rykushina, 1993b); *J* – Western Kazakhstan, early nomads: *36* – 6th–4th centuries BC, *37* – 4th–3rd centuries BC, *38* – 3rd–1st centuries BC (Kitov, Mamedov, 2014); *K* – Central Kazakhstan: *39* – Tasmola culture, *40* – sites of the Korgantas type (Beisenov et al., 2015); *L* – Cis-Urals: *41* – Sarmatians of the 4th–2nd centuries BC (Pokrovka X), *42* – Sarmatians of the 2nd–4th centuries AD (Pokrovka X) (Suvorova, 2008), *43* – Sauromatians of the Southern Urals (Novy Kumak) (Segeda, 2006), *44* – Sauromatians of the Southwestern Urals (Kazy-Baba) (Bagdasarova, 2000), *45* – early Sarmatians of the Southern Urals (Lebedevka) (Segeda, 2006); *M* – Tian Shan area: *46* – the Saka people of Semirechye, *47* – of Tian Shan, *48* – of Alai (Kitov, Tur, Ivanov, 2019).

Table 3. **Factor loadings on the first two principal components of the analysis of the Early Iron Age dental samples**

Trait	PC1	PC2
Shov I[1]	–0.37	0.61
Cara M[1]	–0.68	0.28
Hypocone 3, 3+M[2]	0.67	–0.12
$M_1$6	–0.78	–0.27
$M_1$4	0.56	0.47
$M_2$4	0.53	0.45
Dtc M_1	–0.30	0.75
Dw M_1	–0.60	–0.02

Table 4. **Factor loadings on the first two principal components of the analysis of the Neolithic and Bronze Age dental samples**

Trait	PC1	PC2
Shov I[1]	0.50	0.48
Cara M[1]	0.24	–0.29
Hypocone 3, 3+ M[2]	0.13	0.21
$M_1$6	0.67	–0.26
$M_1$4	–0.86	0.06
$M_2$4	–0.75	0.04
Dtc M_1	0.44	0.51
Dw M_1	0.21	–0.80

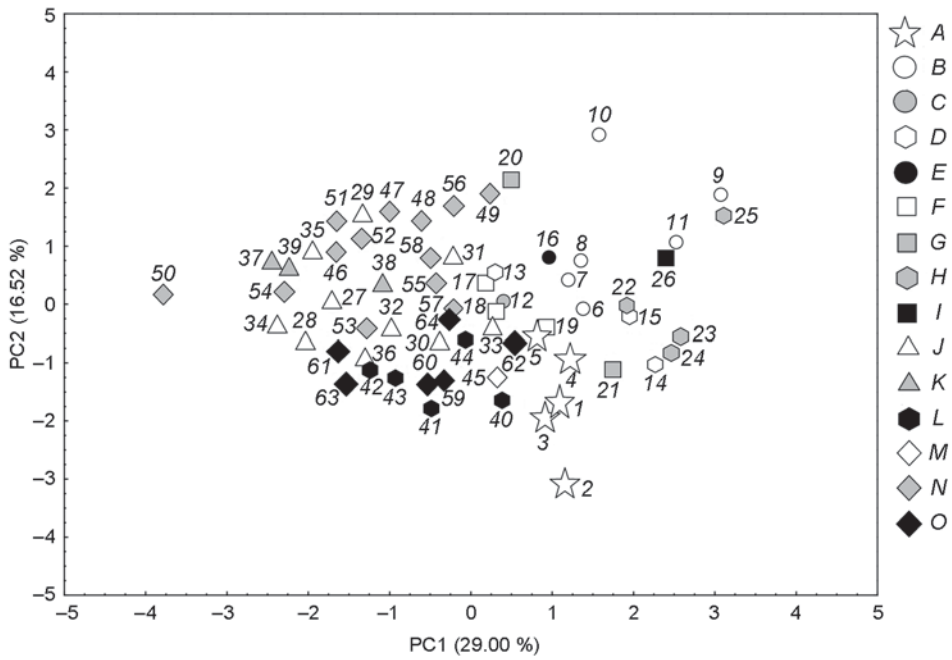

Fig. 2. Results of the principal component analysis of the dental samples of the Bolshaya Rechka culture of the Novosibirsk region of the Ob, Kamen culture of the forest-steppe Altai, and Neolithic and Bronze Age groups of Eurasia.

A – Novosibirsk region of the Ob: *1* –Verkh-Suzun-5, *2* –Bystrovka-1, *3* – Bystrovka-2, *4* – Bystrovka-3, *5* – composite sample (author's data); *B* – the Neolithic of the south of Western Siberia: *6–8* – Middle Irtysh culture (*6* – Vengerovo-2a, *7* – Protoka-1, *8* – Sopka-2/1), *9*, *10* – Kuznetsk-Altai culture (*9* – Solontsy-5, *10* – Ust-Isha, Lebedi-2, Vaskovo-4), *11* – Bolshoy Mys culture (Itkul) (Zubova, Chikisheva, 2015a); *C* – Early Iron Age of the Baraba forest-steppe: *12* – Ust-Tartas culture; *D* – Early Bronze Age of the Ob-Irtysh watershed, Odino culture: *13* – Sopka-2 (Chikisheva, 2012), *14* – Preobrazhenka-6, *15* – Tartas-1 (Zubova, Chikisheva, Molodin, 2016); *E* – Early Bronze Age of the Baraba forest-steppe: *16* – Krotovo culture (Sopka-2); *F* – Middle Bronze Age of the Baraba forest-steppe, Late Krotovo culture: *17* – Sopka-2 (Chikisheva, 2012), *18* – Cherno-Ozerye I, *19* – Borovyanka-17; *G* – Middle Bronze Age of the Omsk region of the Irtysh: *20* – Rostovka, *21* – Okunevo-7 (Zubova, 2014); *H* – Bronze Age of the Khakass-Minusinsk Basin, Okunev culture: *22* – Verkh-Askiz, *23* – Uibat-5 (Zubova, 2013b), *24* – Chernovaya VIII (Zubov, 1980), *25* – Itkol (Zubova, 2013b); *I* – Bronze Age of the Altai Mountains: 26 – Karakol culture (Chikisheva, 2012); *J* – Middle Bronze Age of the south of Western Siberia: *27–35* – Fedorovka culture of the Kuznetsk Basin (*27* – Titovo-2, *28* – Chudinovka-1, *29* – Tanai-12), of the Tomsk (*30*) and Novosibirsk regions (*31*) of the Ob, forest-steppe Altai (*32*, *33*), Baraba forest-steppe (*34* – Preobrazhenka-3, *35* – Abramovo-4, Sopka-2, Vengerovo-1, Grishkina Zaimka, Vakhrushevo-5 (Zubova, 2014)), *36* – Andronovo culture of the Altai Mountains (Tur, 2009); *K* – Middle Bronze Age of the Omsk region of the Irtysh and Kazakhstan, Alakul culture: *37* – Ermak-4 (Zubova, 2014), *38* – Tasty-Butak, *39* – Maitan, Nurtai, Lisakovsky (Zubova, 2011); *L* – Bronze Age of the Southern Urals: *40* – Sintashta culture, *41* – its Ural variant, *42* – Petrovka culture, *43* – sites of the Alakul timber-grave cultural type, *44* – Alakul culture (Kitov, 2011); *M* – Middle Bronze Age of the Khakass-Minusinsk Basin: *45* – Karasuk culture (Rykushina, 2007); *N* – Late Bronze Age of the south of Western Siberia: *46–53* – Irmen culture of the Kuznetsk Basin (*46* – Zhuravlevo-1–4, *47* – Zarechnoye-1, *48* – Tanai-2, -7, *49* – Vaganovo-2), of the Tomsk (*50*) and Novosibirsk regions (*51*) of the Ob, forest-steppe Altai (*52*), Baraba forest-steppe (*53*), *54–56* – Pakhomovo culture of the Tumen region of the Tobol (*54*), Baraba forest-steppe (*55* – Stary Sad, *56* – Preobrazhenka-3, Grishkina Zaimka, Sopka-2, Protoka), *57* – Elovka culture of the Tomsk region of the Ob, *58* – Korchazhka culture of the Kuznetsk Basin (Zubova, 2014); *O* – Early Iron Age of the forest-steppe Altai, Kamen culture: *59* – Maslyakha-1, *60* – Novotroitskoye-1, -2, *61* – Kamen-2, *62* – Rogozikha-1, *63* – Obyezdnoye-1, *64* – Kirillovka-3 (Leibova, Tur, 2020).

The samples from Verkh-Suzun-5 and Bystrovka-2 plot between the clusters of populations of the Okunev and Odino cultures from Western Siberia, on one hand, and the groups of the Southern Uralian Sintashta culture, on the other hand. The similarity with the Odino samples may suggest that the Bolshaya Rechka people inherited some "southern" features from that population (Zubova, Chikisheva, Molodin, 2016). Bystrovka-1 is separated from other samples, and only tends to have some affinity with Verkh-Suzun-5 and Bystrovka-2. The sample from Bystrovka-3 plots between two small clusters, one of which includes Okunev and two Western Siberian groups (Preobrazhenka-6 and Okunev-7), while the second comprises the composite sample of the Bolshaya Rechka culture and a group of the Late Krotovo culture from Borovyanka-17. The latter two plot close to the zero of both coordinates, where populations of the Kamen culture from Rogozikha-1 and of the Andronovo (Fedorovka) culture from Rubleovo-8 are found together, with some Ust-Tartas and Late Krotovo (Cherno-Ozerye I) groups (Fig. 2).

Almost all the Kamen samples from the forest-steppe Altai plot together with the Caucasoid populations of the Southern Urals and Kazakhstan and those of the Andronovo (Fedorovka) culture from the south of Western Siberia (Fig. 2). This supports the conclusion arrived at by N.A. Leibova, who suggested that the Caucasoid groups from the south-west had played the major role in the formation of the Kamen population. But here, two samples (from the Rogozikha-1 and Kirillovka-3 cemeteries) stand alone. These show more similarity to the Western Siberian groups, in which the prevalence of Mongoloid features was previously noted (Leibova, Tur, 2020: 182). Thus, one can suggest that a part of the Kamen groups from the forest-steppe Altai and the Bolshaya Rechka populations from the Novosibirsk region of the Ob had different origins.

Conclusions

A synthesis of the results of archaeological and anthropological research permits a thorough consideration of the processes that were taking place at the Upper Ob during the Early Iron Age. According to the first discipline, the material culture of the Saka and Sarmatians was widespread across the region. But for the forest-steppe Altai this trend was stronger (Mogilnikov, 1997: 4–8) than for the Novosibirsk region of the Ob (Troitskaya, Borodovsky, 1994: 104). Such a situation raised the question of if the Saka and Sarmatian populations were influencing the local groups directly, and if a new archaeological culture—Kamen—must be singled out. The study of anthropological data has shown that the tribes of the forest-steppe Altai were related with the migrants from the south-west. It seems likely that the local population had direct contacts with the Saka and Sarmatians, and those contacts led to a transformation of the both cultural traditions and the anthropological composition of the autochthons. The Bolshaya Rechka tribes from the north (Upper Ob area) have adopted much less southern cultural traits, which can be explained, according to T.N. Troitskaya, by either indirect contacts between the northern and southern groups or by a low frequency of such contacts (Ibid.). The archaeological data show that the Bolshaya Rechka groups had trade connections with the neighbors, which stimulated the introduction of some foreign traits into their material culture (Ibid.; Polosmak, 1987: 101–102).

The results of the study of dental data from the Early Iron Age cemeteries of the Novosibirsk region of the Ob confirm and expand this concept. The principal component analysis has shown that the formation of the Bolshaya Rechka tribes was not connected with the migration of the Saka and Sarmatians that bypassed this area. Their anthropological composition emerged on the basis of the local Siberian population of preceding periods. The influence of migrant groups apparent in the material culture of the Bolshaya Rechka groups could be indirect only (Troitskaya, Borodovsky, 1994: 104). Such contacts were probably mediated by the Western Siberian populations, namely those of the Sargatka traditions in the west and the Kamen culture in the south. Thus, the concept of the formation of the Bolshaya Rechka tribes first put forward by M.P. Gryaznov (1956: 44) and later supported by T.N. Troitskaya, A.P. Borodovsky, and N.V. Polosmak has been confirmed by the results of the present analysis of dental traits.

The anthropological composition of the Bolshaya Rechka groups was not entirely homogenous: they exhibit a dental pattern intermediate between the Western and Eastern dental stocks. The prevalence of markers of the latter is greatly increased in the sample from Bystrovka-3, which displays markers of the Southern Siberian Upper Paleolithic dental complex (Zubova, Chikisheva, 2015b). This complex was inherited from the most ancient Siberian populations and was widespread in the Neolithic and Bronze Age populations of the Baraba forest-steppe (Zubova, Chikisheva, 2015a; Zubova, Chikisheva, Molodin, 2016). Furthermore, the samples from Verkh-Suzun-5 and Bystrovka-2 display some “southern” features that were likely received from the Early Bronze Age Odino groups.

The population of the Kamen culture of the forest-steppe Altai differed substantially from that of the Bolshaya Rechka culture. While the formation of the latter was not related to migrant tribes, the Saka component was predominant in the population of the Kamen culture according to both craniometric and dental data. Thus, results of the present study support the view that the Bolshaya Rechka and Kamen sites do not belong to the same population, and should not be combined in a single archaeological culture.

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References

Aksyanova G.A., Bobrova A.I., Yakovlev Y.A. 2004
Mogilnik Aldygan – nekropol rannego zheleznogo veka kulaiskoy kultury. *Vestnik antropologii*, iss. 11: 54–75.

Alekseev V.P. 1958
Paleoantropologiya Altaya epokhi zheleza. *Sovetskaya arkheologiya*, No. 1: 45–49.

Bagdasarova N.A. 2000
Savromaty Yugo-Zapadnogo Priaralya po materialam mogilnika Kazybaba. In *Antropologicheskiye i etnograficheskiye svedeniya o naselenii Sredney Azii*. Moscow: Stariy sad, pp. 78–112.

Beisenov A.Z., Ismagulova A.O., Kitov E.P., Kitova A.O. 2015
Naseleniye Tsentralnogo Kazakhstana v I tysyacheletii do n.e. Almaty: Inst. arkheologii im. A.K. Margulana.

Chikisheva T.A. 2012
Dinamika antropologicheskoy differentsiatsii naseleniya yuga Zapadnoy Sibiri v epokhi neolita – rannego zheleza. Novosibirsk: Izd. IAET SO RAN.

Dremov V.A. 1970
Materialy k antropologii bolsherechenskoy kultury. *Izvestiya laboratorii arkheologicheskikh issledovaniy*, iss. 2. Kemerovo: pp. 99–108.

Gryaznov M.P. 1956
Istoriya drevnikh plemen verkhney Obi po raskopkam bliz s. Bolshaya Rechka. Moscow: Izd. AN SSSR. (MIA; No. 48).

Kishkurno M.S. 2018a
Odontologicheskaya kharakteristika antropologicheskoy serii iz mogilnika Verkh-Suzun-5 rannego zheleznogo veka s territorii Novosibirskogo Priobya. *Vestnik Novosibirskogo gosudarstvennogo universiteta*. Ser.: Istoriya, filologiya, vol. 17. Iss. 5: Arkheologiya i etnografiya: 137–149.

Kishkurno M.S. 2018b
Proiskhozhdeniye nositeley kamenskoy kultury Novosibirskogo Priobya po odontologicheskim dannym iz mogilnika Bystrovka-3 (III–I vv. do n.e.). *Camera praehistorica*, No. 1: 134–147.

Kishkurno M.S. 2021
Odontoskopicheskaya kharakteristika serii tagarskoy kultury iz kurgannogo mogilnika Stantsiya Kazanovskaya-1. In *Problemy arkheologii, etnografii i antropologii Sibiri i sopredelnykh territoriy*, vol. XXVII. Novosibirsk: Izd. IAET SO RAN, pp. 459–467.

Kishkurno M.S., Sleptsova A.V. 2019
Noviye danniye po odontologii naseleniya kulaiskoy kultury Novosibirskogo Priobya. *Vestnik arkheologii, antropologii i etnografii*, No. 4: 140–151.

Kishkurno M.S., Zubova A.V. 2015
Kraniologiya nositeley verkhneobskogo varianta kamenskoy kultury po materialam mogilnika Verkh-Suzun-5. *Vestnik arkheologii, antropologii i etnografii*, No. 3: 92–103.

Kitov E.P. 2011
Paleoantropologiya naseleniya Yuzhnogo Urala epokhi bronzy: Cand. Sc. (History) Dissertation. Moscow.

Kitov E.P., Mamedov A.M. 2014
Kochevoye naseleniye Zapadnogo Kazakhstana v rannem zheleznom veke. Astana: Izdat. gruppa fil. Inst. arkheologii im. A.K. Margulana.

Kitov E.P., Tur S.S., Ivanov S.S. 2019
Paleoantropologiya sakskikh kultur Prityanshanya (VIII – pervaya polovina II v. do n.e.). Almaty: Khikari.

Leibova N.A., Tur S.S. 2020
Odontologicheskiye osobennosti naseleniya lesostepnogo Altaia skifskogo vremeni. *Vestnik arkheologii, antropologii i etnografii*, No. 4: 171–186.

Mogilnikov V.A. 1997
Naseleniye Verkhnego Priobya v seredine – vtoroy polovine I tysyacheletiya do n.e. Moscow: IA RAN.

Polosmak N.V. 1987
Baraba v epokhu rannego zheleza. Novosibirsk: Nauka.

Postnikova N.M. 1974
Odontologicheskaya kharakteristika kraniologicheskikh seriy Minusinskoy kotloviny. In *Rasogeneticheskiye protsessy v etnicheskoy istorii*. Moscow: Nauka, pp. 243–250.

Rykun M.P. 2013
Paleoantropologiya Verkhnego Priobya epokhi rannego zheleza (po materialam kamenskoy kultury). Barnaul: Izd. Alt. Gos. Univ.

Rykushina G.V. 1977
Odontologicheskaya kharakteristika naseleniya karasukskoy kultury. *Voprosy antropologii*, iss. 57: 143–154.

Rykushina G.V. 1993a
Materialy po odontologii dzhetyasarskoy kultury: Gruntoviye pogrebeniya mogilnikov Kosasar 2, Kosasar 3, Tompakasar i Bedaikasar. In *Nizovya Syrdaryi v drevnosti*. Iss. III: Dzhetyasarskaya kultura. Pt. 2: Mogilniki Tompakasar i Kosasar. Moscow: IEA RAN, pp. 194–205.

Rykushina G.V. 1993b
Odontologicheskaya kharakteristika cherepov iz sklepov dzhetyasarskoy kultury (Altynasar 4, Tompakasar, Kosasar 3). In *Nizovya Syrdaryi v drevnosti*. Iss. II: Dzhetyasarskaya kultira. Pt. 1: Sklepy. Moscow: IEA RAN, pp. 243–252.

Rykushina G.V. 2007
Paleoantropologiya karasukskoy kultury. Moscow: Stariy sad.

Segeda S.P. 2006
Ranniye sarmary Yuzhnogo Priuralya po dannym odontologii (na materialakh mogilnika Lebedevka). In *Drevnosti Lebedevki (VI–II vv. do n.e.)*. Moscow: Vost. lit., pp. 155–159.

Sleptsova A.V. 2021
Proiskhozhdeniye naseleniya Zapadnoy Sibiri rannego zheleznogo veka po dannym odontologii. *Vestnik arkheologii, antropologii i etnografii*, No. 4: 163–175.

Sleptsova A.V., Yudakova V.S. 2021
K voprosu o proiskhozhdenii nositeley kashinskoy kultury Zapadnoy Sibiri rannego zheleznogo veka (danniye arkheologii i odontologii). *Camera praehistorica*, No. 2: 106–123.

Suvorova N.A. 2008
Odontologicheskaya kharakteristika rannikh kochevnikov Yuzhnogo Priuralya po materialam mogilnika Pokrovka 10 (predvaritelnoye soobshcheniye). In *Stepnoye naseleniye Yuzhnogo Priuralya v pozdnesarmatskoye vremya: Po materialam mogilnika Pokrovka 10*. Moscow: Vost. lit., pp. 87–95.

Troitskaya T.N., Borodovsky A.P. 1994
Bolsherechenskaya kultura lesostepnogo Priobya. Novosibirsk: Nauka.

Troitskaya T.N., Novikov A.V. 2007
Skifo-sibirskiy mir. Novosibirsk: Geo.

Tur S.S. 2009
Odontologicheskaya kharakteristika naseleniya andronovskoy kultury Altaya. *Izvestiya Altaiskogo gosudarstvennogo universiteta*, No. 4: 228–236.

Zubov A.A. 1968
Odontologiya: Metodika antropologicheskikh issledovaniy. Moscow: Nauka.

Zubov A.A. 1980

Kharakteristika zubnoy sistemy v cherepnoy serii iz Okunevskogo mogilnika. *Paleoantropologiya Sibiri*. Moscow: Nauka, pp. 9–18.

Zubov A.A. 2006

Metodicheskoye posobiye po antropologicheskomu analizu odontologicheskikh materialov. Moscow: Etno-Onlain.

Zubova A.V. 2011

The dentition of the Alakul people, with reference to their origin. *Archaeology, Ethnology and Anthropology of Eurasia*, No. 3: 143–153.

Zubova A.V. 2013a

Predvaritelniye rezultaty izucheniya arkhaichnoy sostavlyayushchey odontologicheskikh kompleksov naseleniya Yevrazii epokhi neolita. *Vestnik antropologii*, No. 4: 107–127.

Zubova A.V. 2013b

Dental affinities of the Irmen people, Western Siberia. *Archaeology, Ethnology and Anthropology of Eurasia*, No. 3: 132–139.

Zubova A.V. 2014

Naseleniye Zapadnoy Sibiri vo II tysyacheletii do nashey ery (po antropologicheskim dannym). Novosibirsk: Izd. IAET SO RAN.

Zubova A.V., Chikisheva T.A. 2015a

Nonmetric dental trait distribution in the Neolithic populations of Southwestern Siberia. *Archaeology, Ethnology and Anthropology of Eurasia*, vol. 43 (3): 135–143.

Zubova A.V., Chikisheva T.A. 2015b

The morphology of human teeth from Afontova Gora II, Southern Siberia, and their status relative to the dentition of other Upper Paleolithic Northern Eurasians. *Archaeology, Ethnology and Anthropology of Eurasia*, vol. 43 (4): 135–143.

Zubova A.V., Chikisheva T.A., Molodin V.I. 2016

Perviye rezultaty sravnitelnogo analiza odontologicheskikh kharakteristik populyatskiy odinovskoy kultury: K voprosu o yuzhnykh migratsiyakh. In *Problemy arkheologii, etnografii i antropologii Sibiri i sopredelnykh territoriy*, vol. XXII. Novosibirsk: Izd. IAET SO RAN, pp. 292–298.

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