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THE MORPHOLOGY OF HUMAN TEETH FROM AFONTOVA GORA II, SOUTHERN SIBERIA, AND THEIR STATUS RELATIVE TO THE DENTITION OF OTHER UPPER PALEOLITHIC NORTHERN EURASIANS*

The article describes five teeth from a mandible found in 2014 at Afontova Gora II, dated to 16–12 ka BP. The crown morphology is rather archaic, the odontoglyphic pattern is complex, and no eastern or western markers were detected. The crowns are large whereas the roots are short. The closest parallels are found in the dentition of the Upper Paleolithic child from Listvenka, southern Siberia. The peculiar trait combination shown by those two individuals and denoted as southern Siberian, had probably originated in the Altai and Sayan piedmont. This dental pattern is neutral with regard to the east to west differentiation vector and may be independent of the eastern and western dental meta-races.

Keywords: *Dentition, Upper Paleolithic, southern Siberia, Afontova Gora II.*

Introduction

Afontova Gora II is an Upper Paleolithic site in Krasnoyarsk, Siberia, associated with the Afontova Culture and occupied between 15–11 ka BP (Derevianko et al., 2014: 431). The first human fossils from that site were found by G.P. Sosnovsky, N.K. Auerbach, and V.I. Gromov in 1924. They include a hand phalanx, fragments of the left radius, ulna, and humerus of an adult, and a second upper premolar of an 11 to 15-year-old adolescent (Gryaznov, 1932). During a geological excursion at the site in 1937, J. Fromaget discovered a fragment of a human frontal bone with upper parts of nasalia. Small dimensions and thinness suggest that the fragment belonged to an infantile cranium (Gerasimova, Astakhov, Velichko, 2007: 23). Because the subtense over a chord connecting the fronto-maxillary-nasal junctions is very small, G.F. Debets (1946: 75) concluded that the child's physical type was Mongoloid.

In 2014, new human fossils were discovered at the site: an atlas of a woman elder than 20, a mandible, and five lower teeth of a 14–15-year-old individual, apparently a female. Sex and age characteristics and morphology of the mandible will be dealt with in a forthcoming publication. The objective of the present study is to assess the morphology of the teeth and the individual's dental affinities with other Upper Paleolithic people of Northern Eurasia.

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Materials and methods

The mandibular dentition includes right first and second molars *in situ*, a left second premolar, and first and second molars. Although the latter three were found separate from the mandible, they doubtless belonged to it. The tooth found in 1924 was diagnosed as a lower left molar (Shpakova, 2001) and therefore belonged to a different individual. The crowns and roots of all the teeth are completely formed. The occlusal surfaces of the first molars display a slight abrasion of the axial crests connecting the main cusps, but the pattern is well discernible.

Molar crowns and roots were measured according to the R. Selmer-Olsen method, based on morphological contact points rather than on maximal distances. In the case of the mesio-distal crown diameter (MDcor), the anterior reference point is situated approximately 1 mm in the vestibular direction from a line continuing the mesial fissure, whereas the distal point is on the most projecting part of the hypoconulid. The vestibulo-lingual crown diameter (VLcor) was measured separately for trigonid and talonid, between the most projecting points of protoconid and metaconid in the former case and those of entoconid and hypoconid in the latter (Zubov, 1968b: 119–120). The premolar dimensions (MDcor and VLcor) were measured as maximal distances. Crown height (Hcor) was measured according to R. Martin with Selmer-Olsen's correction allowing for the enamel extension (Zubov, 2006: 70). Root length (HR) was measured as a midline distance between the apex and the cement-enamel junction in the vestibular norm. For each dimension, size categories were assessed using Zubov's scale (1968a: Table 26). For comparative purposes, we used metric characteristics of teeth of Sungir 2, Sungir 3 (Zubov, 2000: Tables 19.4 and 19.5), Kostenki 14 (Khaldeyeva, 2010), Kostenki 18 (Khaldeyeva, 2006), Malta 2, and Listvenka (Shpakova, 2001).

Nonmetric traits of crowns and roots were assessed according to methods introduced by Russian dental anthropologists (Zubov, 1968a, 1974, 2006; Zubov, Khaldeyeva, 1993) and to the Arizona State University dental anthropology standards (ASUDAS) (Turner, Nichol, Scott, 1991; Scott, Turner, 1997). Taxonomic assessment was based on the west to east differentiation in *Homo sapiens* and on markers of generalized archaism, which Russian dental anthropologists view as a separate category.

Eastern markers include distal trigonid crest, sixth cusp, protostylid fossa, 2med(III) pattern, and variant III of confluence of the first fissures of metaconid and protoconid with the intertubercular fissure. Because the variation of the deflecting wrinkle and the *tami* pattern in southwestern Siberia is virtually unrelated to the Mongoloid dental complex (Zubova, unpublished), these traits are considered of secondary importance in this study. According to the view predominant in Russian anthropology, markers of archaism on the lower teeth include greater complexity of the occlusal surface pattern, anterior and posterior fossae, medial trigonid crest, derivates of cingulum such as protostylid, central cusps, and main cusps sloping toward the center of the crown (Khaldeyeva, Kharlamova, Zubov, 2010; Zubova, 2013). Markers of the Neanderthal dental complex were also included in this group (Bailey, 2002, 2005). For comparative analysis and taxonomic assessment of the series we used nonmetric dental characteristics of Malta 2, Listvenka, Kostenki 14 and 15 (Zubova, 2014, and unpublished), Kostenki 18 (Khaldeyeva, 2006), and Sungir 2 and 3 (Zubov, 2000).

Results and discussion

Metric characteristics

The left second premolar was compared with that found at Afontova Gora II in 1924 (Shpakova, 2001: Table 2). The mesio-distal diameter of the new specimen is markedly larger whereas the vestibulo-lingual diameter is somewhat smaller than in the previously found specimen. The mesio-distal diameter of both the first and the second premolars is very large and the vestibulo-lingual diameter is large (Table 1). The crowns are very high, falling outside the modern range. The roots, on the contrary, are short, matching the small size of the mandible (Chikisheva et al., in press). Root indexes (maximal length to crown height ratio, and maximal length to vestibulo-lingual crown diameter ratio) are very low.

Compared to human molars from other Upper Paleolithic sites in Northern Eurasia (Table 1), those from Afontova Gora II have higher mesio-distal dimensions and average vestibulo-lingual dimensions. Regrettably, in two of the three individuals used for comparison, only the first permanent mandibular molars are available. Therefore, we had to refrain from statistical analysis and provide only the scatter-plot based on mesio-distal and vestibulo-lingual diameters of the right first molars (Fig. 1).

The sharpest differences from Afontova Gora II are seen in the Kostenki individuals, whereas the most similar dentition is that of the Listvenka child from the Krasnoyarsk Territory. The two individuals are dentally quite close on the scatter plot—even closer than the two Sungir children. The elder child from Malta, Irkutsk Region, is rather remote from them—both dimensions of molars teeth are considerably smaller. In terms of mesio-distal diameter, this fossil is rather close to Sungir 2 and Kostenki 18.

The comparison of mesio-distal and vestibulo-lingual diameters of the first and second lower molars (third