Comparison between Mitochondrial DNA haplogroup frequencies of Prehistoric and Modern Siberian Populations

Nour Moussa*[1], Hugh Mckenzie[2], Vladimir Bazaliiskii[3], Olga Goriunova[4], Fiona Bamforth[5], and Andrzej Weber[6]

[1]Moussa NM – Department of Biological Sciences, MacEwan University, Edmonton, Alberta, Canada, Canada

[2]McKenzie HG – Department of Anthropology, Economics and Political Science, MacEwan University, Edmonton, Alberta, Canada, Canada

[3]Bazaliiskii VI – Department of Archaeology and Ethnography, Irkutsk State University, Karl Marx, Street 1, Irkutsk 664003, Russia, Russia

[4]Goriunova OI – Department of Archaeology and Ethnography, Irkutsk State University, Karl Marx, Street 1, Irkutsk 664003, Russia Institute of Archaeology and Ethnography, Siberian Branch of the Russian Academy of Sciences, Academician Lavrentiev Ave. 17, Novosibirsk 630090, Russia, Russia

[5]Bamforth F, – Canada

[6]Weber AW – Department of Anthropology, 13-15 H.M. Tory Building, University of Alberta, Edmonton, Alberta T6G 2H4, Canada Laboratoire Méditerranéen de Préhistoire Europe Afrique (LAMPEA) – UMR 7269, Aix-Marseille Université, 5 rue du Château de l'Horloge, B.P. 647, 13094 Aix-en-Provence Cedex 2, France, Canada

Abstract

This Cis-Baikal prehistoric hunter-gatherer populations inhabited Siberia, Russia several hundred years ago. The Lake Baikal of Siberia was home to two temporally distinct populations from Early Neolithic (EN: _˜7560–6690 cal BP) to the Late Neolithic-Early Bronze Age (LN-EBA, _˜6060–3470 cal BP). No cemeteries were identified during the Middle Neolithic, and the EN group was separated from the LN-EBA group by a 700-year hiatus. Several cemeteries have been excavated as a part of the international Baikal Archaeology Project (BAP) including EN cemeteries (Lokomotiv and Shamanka II), LN-EBA Ust'-Ida and EBA Kurma XI. Maternally inherited mitochondrial DNA (mtDNA) has been examined previously for individuals from all the excavated cemeteries using PCR amplifications for the HV1 region (bp 16191 to 16367) and assigning a mtDNA haplogroup to each of the examined prehistoric individuals. Biological distances were predicted from mtDNA haplogroup frequencies between modern and prehistoric (EN, LN and EBA) Siberian populations using Nei's pairwise GST estimate. The modern populations' mtDNA haplogroup distributions were recruited from literature. Pairwise GST estimate was calculated using the SAS/STAT® software, and results from pairwise GST estimate were plotted on a two-dimensional PC plot using SAS PROC PRINCOMP software. From the PC plot we can deduce several useful points. First, the PC plot shows that Tuvinians are an outlier, while the remaining groups cluster together.

*Speaker

Second, the EBA Kurma XI_EBA Ust'-Ida group is in close affinity with the Itel'men population. Third, the novel appearance of haplogroup Z, more frequent in northeastern Siberian populations, gives the EBA Kurma XI_ EBA Ust'-Ida group a closer affinity with some northeast Siberian populations such as the Koryaks and Itel'men. Finally, EN Shamanka II associate closely to the Egyin Gol ancient Mongolian population due to the fact that both of EN Shamanka II and the Egyin Gol have a high frequency of haplogroup D. Despite the small sample size from the Cis-Baikal prehistoric populations the mtDNA signature is of importance in understanding the maternal background of the area when comparing the frequencies of mtDNA haplogroups with the modern populations. This research shows closer genetic affinities with modern populations and heterogeneous background of the prehistoric population with respect to maternal origin.

Keywords: Hunter, Gatherers, Early Neolithic, Late Neolithic, Bronze Age, mitochondrial DNA haplogroups, Modern Siberian populations.