

Article

Paleo-Asian Cultural Phenomena of Ancient Beringia: Population Convergence and Solution of Ethnic Self-Identification

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ABSTRACT: Authors offer for a discussion the materials from studies of archaic culture elements that include body modifications in ethnic groups in the context of population genetic data from native peoples of the Far North. The authors consider materials from the territory of ancient Beringia which include a part of Chukotka and Kamchatka in Russia, Alaska in the USA and several island groups in between. The working hypothesis of the study involves the identification of common and specific features of body modifications in ethnic groups having similar population genesis. This allows to clarify the specifics of the regional contacts. Body modifications (tattoos, piercings, etc.) are considered as a way of a person's self-identification and a form of his group membership (in this case—ethnic group). The study used ethnographic, archaeological, paleo-history, folklore materials and up-to-date data that include genetic research of contemporary ethnic groups inhabiting the territory of ancient Beringia and maintaining their traditional way of life. The methodology base of the research is based on formalized approach and cross-cultural analysis evidence of the similarity/difference of the population in combination with the method of comparative analysis of DNA data and information about their genetic structure.

Keywords: Pacific North; Aleuts; Eskimos; Chukchi; Genetic data; Ethnic people; Tattoos; Cross-cultural analysis

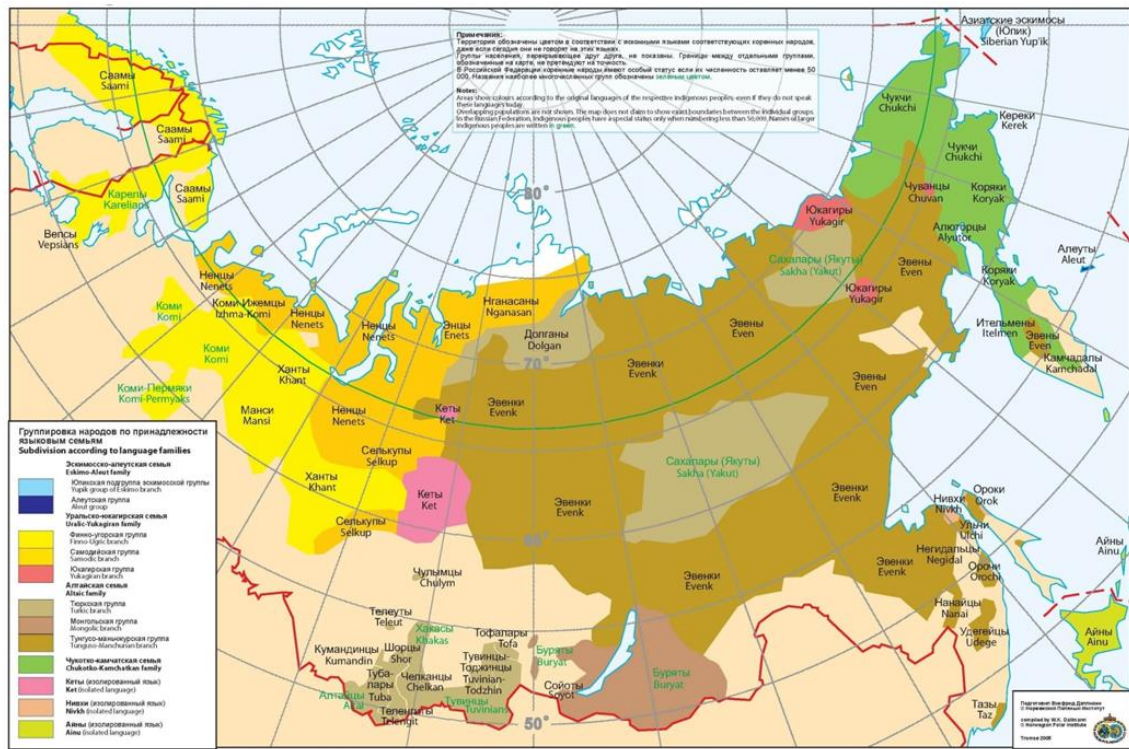


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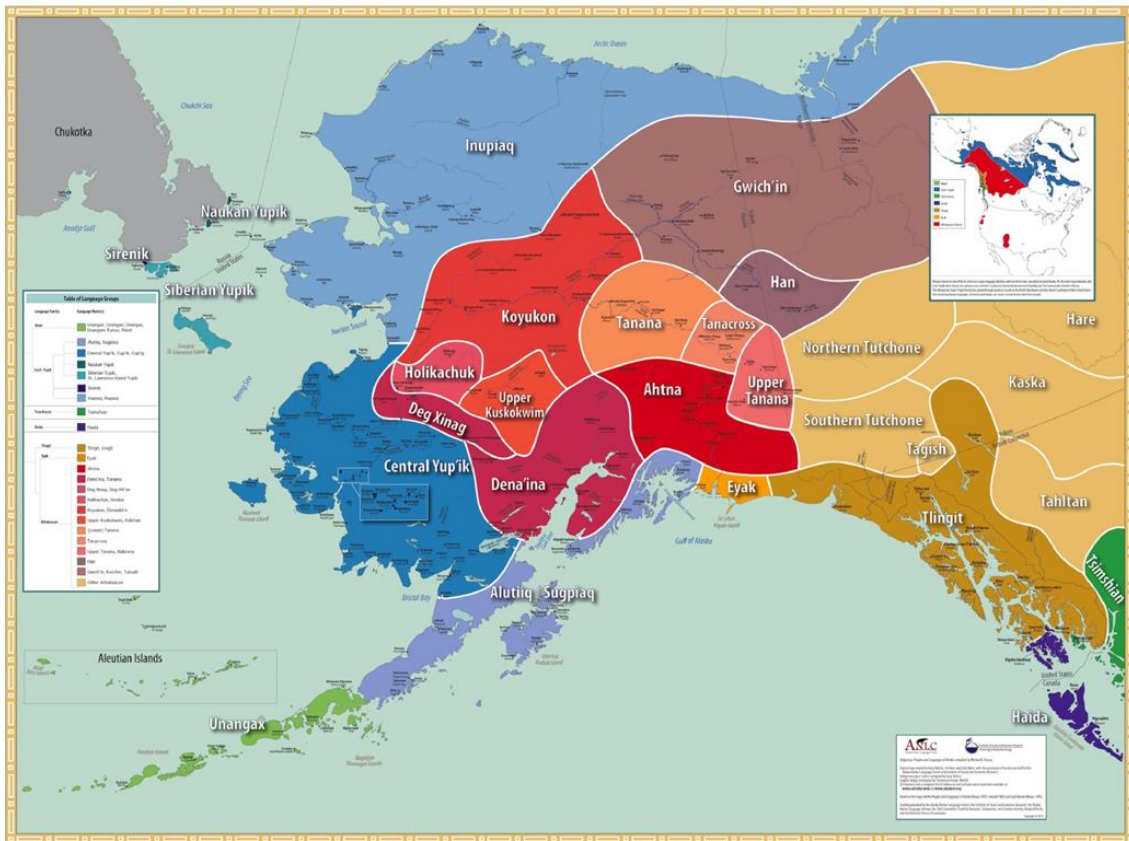
1. Introduction

The North's contemporary peoples represent numerous groups of autochthonous populations, a total of about 260 thousand people, living in traditional territories and preserving the cultural traditions, crafts and economic life of their ancestors. The specific feature is low population density but at the same time their ethnic diversity is clearly expressed (Figure 1). It should be noted that today about 45 ethnic groups are speaking mainly languages of the Tungus-Manchu, Paleo-Asian, Turkic and Samoyedic language families [1]. For this study the particular interest includes groups of Paleo-Asian origin (Chukchi, Eskimos, Koryaks, Yukaghirs, Eskimos, Aleuts), who retained archaic features in their cultures. The Paleo-Asian peoples of the Far North and North-East of Eurasia, the Arctic coast of Kamchatka, the Kuril and Aleutian Islands are ethnically represented by the Chukchi, Koryaks, Aleuts, Itel'mens, etc. The main activities are sea hunting, fishing, reindeer herding, and gathering continues. From the point of view of physical anthropology, the so-called Arctic race has been identified for the Paleo-Asian peoples [2] but its homogeneity is very doubtful.

From the perspective of population genetics, modern peoples are the heirs of ancient Beringia—the Chukchi, Asian Eskimos and Commander Aleuts—primary anthropological isolates in the stage of decay and accelerated assimilation. Nevertheless, it is a rich source of genetic information for the reconstruction of evolutionary and historical events in the territory of Northeastern Eurasia and North America, since they are linked by genetic and cultural continuity with the ancient Beringia population. In search of the American Indians genetic roots, individual genomes of autochthons from Siberia and the North are being studied [3]. More recently, it is asserted that data from archaeology, ethnography, linguistics should be used to verify the results of genetic research [4–7].



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Figure 1. 1—Map of indigenous peoples of Siberia and the Russian Far East Federation, the western part of ancient Beringia is marked by a conditionally red line [8]; 2—Indigenous Peoples and Languages of Alaska [9].

Limited forms of adaptation (for example, clothing, dwellings, forms of management, ritual practices, etc.) have been formed in the specific natural conditions of the study area. Based on a comparative analysis of genetic data and cultural traditions (such as tattoos) among the peoples of the North Pacific region, the authors propose materials that will help confirm or disprove the similarities or differences of population groups having general forms of body modification, i.e., a similar culture of corporeality. Body modifying (tattoos, piercing, scarification, etc.) are considered as the main concepts of self-identification of a person and related community [10–12]. The authors previously identified the features of tattoo genesis, tattoo functions and their meanings, forms of symbolic behavior in the peoples of the Northern Pacific [10,13–18].

Tattoos, as markers of bodily and social relations, have been used in the region since at least 13,000 years ago performing various ritual, decorative and identification functions. Man had to wear clothes made of animal hides constantly, and for his identification certain ways were needed. And tattoos became this method of identification as a form of expression of visible differences between people [15].

The proposed article focuses on cultural forms of body's modification in the context of genetic picture of the Northern Aboriginal population (Chukchi, Inuit, Aleut), distinctive qualitative characteristic of which is the preservation of traditional way of life, cultural phenomena, ways of manifestation of ideas about man and his natural surroundings. The study of the ornamental tradition of tattooing in the context of the general meaning and probable picture of the world of the designated ethnic groups in traditional culture against the background of genetic research makes up relevance and scientific novelty.

2. Materials and Methods

The main sources of the research are materials on tattoo traditions in the Pacific North:

- Funds and collections of the Peter Great Museum of Anthropology and Ethnography (Kunstkamera);
- ethnographic descriptions left by travelers and scientists who visited the region in the 17th—early 20th centuries. (materials of Bogoraz-Tan V.G. [19], Georgi I.G. [20], Gurvich I.S. [21], Jochelson V.I. [22], Krasheninnikov S.P. [23], Lindenau Y.I. [24], Merk K.G. [25], Miller G.F. [26], Orlova C.E. [27] and others);
- tales and myths of the peoples of the Pacific region (Asian Eskimos, Chukchi, Kereks, Koryaks and Itelmen) [28–30].

On the basis of the materials involved, universal tables on certain principles of classification were made. They are based on the formalized approach and cross-cultural analysis and were tested earlier in scientific publications on the culture of tattooing of the peoples of the Northern Pacific [10,13–18].

As evidence of the similarity/difference of the population, the method of comparative analysis of DNA data and information about the genetic structure of the population was used for description and relevance of using sources on paleogenetics [3,30–35].

2.1. Ethnographic Materials (tattoos)

The tradition of body tattooing is a vibrant artistic form and an expressive means of cultural, social, ethnic identity among the peoples of the North. The classification of the Northern Pacific people's tattoos has not been sufficiently developed, but preliminary data demonstrate that the main type of ornament among the peoples of the North is represented by simple geometric forms (lines, dotted lines, geometric figures, grids, etc.), however, unique stylized anthropomorphic and zoomorphic elements were also preserved [8]. In the process of studying and classifying ornamental compositions of tattoos from the peoples of the North, we highlighted:

- ornamental field—the surface of the human body within which the ornament (head, torso, extremities) was made;
- ornamental zones—horizontal belt patterns located on different parts of the body—face, shoulders, arms, legs, trunk;
- ornamental motif—the simplest compound, repetitive part of the ornament;
- ornamental complex—a set of uniform features of ornament, characteristic for certain cultures and archaeological sites.

A.A. Ivanov believed that the predominance of the geometric ornament [36] was characteristic both for the ornamentation of the body and for the decoration of other objects in the North (boats, utensils, weapons, clothing, etc.). Among the features of the tattooing traditions of the northern peoples are the elementary ornamental geometric images, which were complicated by repetition and rhythm, the combination of geometric motifs, but the most complex they were in the Chukchi and Eskimo.

2.1.1. Aleuts

Reconstruction of the Aleuts tattoo tradition, one of the most ancient peoples of the Northern Pacific, based on the analysis of tattoo tools showed a special attitude towards these objects, their special status and the significance of the procedure (Figure 2-1). Based on the analysis of tools, coloring pigments, and ornaments, the peculiarities of tattooing among the Aleuts were revealed. Coal, white lime, copper ore, and blood were used as paint after pretreatment. Analysis of ethnographic materials showed that the Aleuts used the head, torso, lower and upper limbs for tattooing. Particular attention is paid to ornamental zones—the face (cheeks, chin), the front of the forearm, the back, arms and legs. The main types are geometric, object, zoomorphic and floral ornaments. The authors proposed a hypothesis for understanding the process of tattooing as one of the main traditional elements of culture among the indigenous population of the Pacific coast of Asia and America [16].

2.1.2. Eskimos

The tradition of tattooing is also known among the Asian Eskimos on the coast of the Bering Sea and the Chukotka Peninsula. Location of tattoos—face, arms, legs; noted as a simple ornamental motif—several vertical broken lines cover the chin, the pattern consists of two lines of ornament from the forehead along the nose, which cover both cheeks, chin, hands with wrists and forearms, and complex ornamental compositions [37,38]. Men were rarely tattooed (circles or semicircles at the corners of the mouth, short lines on the temples, and occasionally human figures (yukhak) on the forehead above the eyebrows). Women's tattoos are more varied: usually on the chin, from the lower lip downwards there are three, five, seven double, less often triple lines. Often two parallel lines are drawn on the forehead between the eyebrows, going down either side of the nose. Cheek tattoos are much more difficult. As a rule, the right cheek was covered with a more complex tattoo, and the left cheek was covered with a simpler one. In some cases, only one cheek was tattooed. There are various combinations of a relatively small number of traditional elements: “whale tails” mounted on straight lines, arcs or circles, which often turn into horns, concentric circles and ellipses, “scapulas”, “scrapers”, “tridents” or “blades” [37]. An image of fighting people with shields was recorded, perhaps this is an image of shamans with tambourines [19] (Figure 2-2).



Figure 2. Ethnographic drawings from the 18th to 19th centuries depicting tattoos on the body of the indigenous peoples of Northern Pacific (1—the Aleutian tattooed woman [39]; 2—the Eskimo tattooed woman [40]; 3—the Chukchi tattooed woman [25]).

2.1.3 Chukchi

In the 18th century, the Chukchi tattooed not only their faces, but also other parts of their bodies (arms, shoulders, shoulder blades and even pubis). Astral signs, anthropomorphic figures, horizontal and vertical lines, dots, circles, etc. were depicted [25]. The Chukchi painted figures of people on the face (forehead), shoulders or diseased organs—“protectors” for nervous diseases or “helpers” to turn a possible enemy into a friend. Such figures were also applied to the shoulders of people who committed murder, trying to depict the soul of the murdered person and thus make him a part of themselves [19]. Circles were applied to the cheeks supposedly to protect against the attack of the evil spirit “kelet,” although it is possible that this was a kind of replacement for bone or stone cheek bushings (labrets), popular among the Eskimos and Aleuts [19]. For example, a tattooed Chukchi woman is depicted in an 18th-century engraving (Figure 2-3). By the middle of the 20th century, the tradition of tattooing, like other archaic customs, had passed. According to ethnographer informants I.S. Gurvich, the custom of tattooing girls aged 7–12 years in families of coast Chukchi disappeared. Moreover, it has come to be regarded by the population as a violation of social norms. Some young Chukchi women performed appropriate cosmetic operations to remove the tattoo [21].

2.2. Genetic Research Materials

Currently, autochthonous peoples living in the northeastern tip of Siberia demonstrate a very small set of mitochondrial haplogroups specific to this region: A2a, A2b, D2a, D4b1a2a1, as well as C4b2, C5a2. The closest maternal relatives are the Eskimos of Canada and Greenland, as well as the Aleuts of Alaska and the Aleutian Islands [41–43]. Other populations living relatively nearby (Koryaks, Itel'mens, Yukaghirs, Na-Dene Indians, Ojibwe, Cree, Algonquins) have a related, but clearly distinct pool of mitochondrial haplogroups [34,44–49]. The main factor determining the distribution of genes throughout the archipelago is geography. The strongest relationship exists between genetics (based on mtDNA sequences and distances between matches) and geographic distances (measured in kilometers). The results of a nuclear DNA study showed the absence of a significant flow of genes from outside into the gene pool of the coastal Chukchi and Eskimos for at least 200 generations, in contrast to their immediate neighbors—the Koryaks, Itel'mens and Yukaghirs; a clear genetic difference between the Naukan Eskimos and other Siberian Eskimos has been demonstrated [3].

2.2.1. Genetic Data on Aleut's People

It has been established that the Aleuts demonstrate the closest genetic relationship with modern Siberian Eskimos, the Chukchi of Chukotka and differ significantly from the populations of Kamchatka (the tip of the archipelago) and the Eskimos of Alaska. The hypothesis was confirmed that the ancestors of the Aleuts crossed Beringia and spread west of the islands about 9000 years ago. Monmonier's algorithm indicates a genetic gap between modern Kamchatka populations and western Aleut populations, suggesting that movement from Kamchatka to the western Aleutian Islands was highly unlikely [31,32].

2.2.2. Genetic Data on Chukchi's People

The Y-chromosomal gene pool of the Chukchi of Kamchatka is strikingly different from neighboring populations (Koryaks, Evens) and variety of Far Eastern groups in the high frequency of variants of haplogroup N3 (N3a5b-B202, N3*-M178*, a total of 76%). At the same time, phylogenetic analysis of the dominant lines reveals the similarity of the gene pools of the Chukchi of Kamchatka and Chukotka (the distribution of common clusters and close haplotypes). This similarity indicates an inextricable connection between the Chukchi of Kamchatka and Chukotka and may be due, according to the obtained genealogical data, to the constant influx of genes from the main ethnic area of settlement of the Chukchi to the northern regions of Kamchatka. Despite the intensity of interethnic marriages, the Chukchi of Kamchatka retain the greatest similarity with the Chukchi and Eskimos of Chukotka. Dating of the three branches of haplogroup N3, characteristic of the Chukchi, indicates an increase in their numbers over the last 500–1500 years ago [50].

2.2.3. Genetic Data on Eskimo People

The Paleo-Eskimos probably represent a single migratory impulse into the Americas from Siberia, separate from those that gave rise to the Inuit and other Native Americans, including Athabaskan speakers. The Paleo-Eskimos, despite cultural differences across time and space, constituted a unified population demonstrating genetic continuity for over 4000 years. The long-term genetic continuity of this gene pool and the lack of evidence of Native American admixture suggest that the Saqqaq and Dorset peoples lived largely in genetic isolation after arriving in the New World. Thus, Paleo-Eskimo technological innovations and changes over time, as seen in the archaeological record, appear to have occurred solely as a result of the movement of ideas within a single resident population. This suggests that cultural similarities and differences are not a reliable indicator of population movements and migrations into new and radically different environments, as is often assumed [51].

The lineal ancestors of the Paleo-Eskimos mostly originate from Chukotka, while the Neo-Eskimos are found to originate mainly from northern Alaska, but also to be of Altai-Sayan origin. Phylogeographic and BSP analysis of these haplogroups indicate a common origin of the Paleo-Eskimos, Aleut and Tlingit, whose direct ancestors lived along the southern coast of the former Bering Bridge in the early Holocene, about 6000–8000 years ago [34].

3. Theory/Calculation

Genomic analysis shows that the Arctic was colonized from 9000 to 6000 years ago as a result of migration of populations unrelated to the American Indian populations. Moreover, the original Arctic paleohabitats appear to have been completely replaced approximately 700 years ago [51]. Archaeological cultures originating from a common ancient center provoked common features of the material culture of hunters and fishermen. Features were manifested in the use of forms of body modification (tattoos, piercings) as elements of ancestral, tribal, family identification. These elements played an important role in the everyday and ritual life of the peoples inhabiting the Northern Pacific in ancient times, which makes it possible to clarify the specifics of cultural contacts in the region. The tattoo designs of the northern peoples represent simple monochrome solutions through basic means of expression (symmetry, rhythm), but can have different meanings. In our opinion, the universal meanings of identifying a person and his belonging to a certain community (in this case, to an ethnic group or its components) prevail.

4. Results

1. Siberian Eskimos, Coastal Chukchi and Commander Aleuts—the last inhabitants of the territory of the Northern Pacific—are genetically related to the population of ancient Beringia, carry information about the events that happened to their ancestors not only after, but also before the beginning of the last glacial maximum. The mitochondrial gene pool of the Chukchi, Naukan, Sirenikov and Chaplin Eskimos, and Komandorsky Aleuts is represented by haplogroups A2a, A2b, C4b2, C5a2, D4b1a2a1, D4b1c/D3, D2a1, D2a1a, D2a1b, which is not typical for other northern peoples who have admixtures with other peoples of Siberia [3].

2. Among the features of tattooing traditions among the northern peoples are elementary ornamental geometric images, which became more complex due to repetition and rhythm; the combinations of geometric motifs among the peoples in question are the most complex. The Aleuts have lines and dotted lines, figures in the form of “scapulas” and “scrapers”. There is a similarity between the ornamental motifs of Aleut tattoos and designs on other items (for example, on hats and dishes) [16] (Figure 3-1–22). The Chukchi have short and long single, double, triple lines, circles with dots, arcs, figures of people [52] (Figure 3-23–44). The Eskimos have circles, concentric circles and ellipses, short single, double, triple lines, human figures, “mesh”, squares, “teeth”, “whale tails”, arcs, “scapulas”, “tridents”, “scrapers” [37,53] (Figure 3-42–57). Thus, a pattern has been established: geometric elementary forms of tattooing are noted among almost all peoples of the North, while stylized anthropomorphic, zoomorphic, astral, object figures are common in the cultures of only the Chukchi, Eskimos, and Aleuts. The latter have a more expanded understanding of the types of ornamentation, understanding of the meaning and functions.

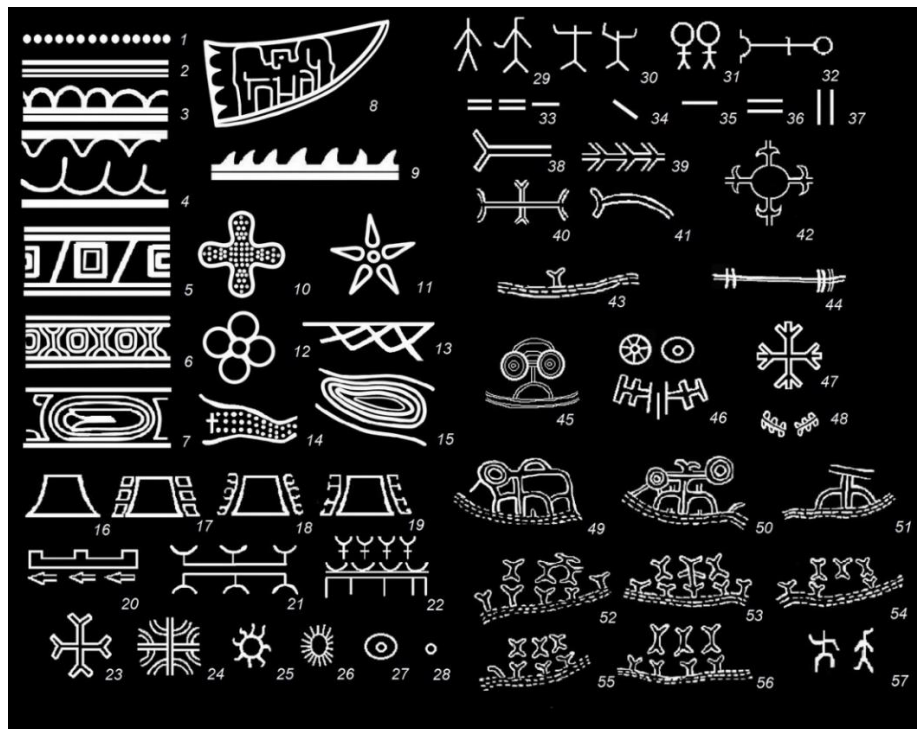


Figure 3. Ornamental compositions of tattoos of Aleut (1–22), Chukchi (23–44), Eskimos (45–57). Compiled according to historical and ethnographic data [19,24,25,29,30,36,38,53–55].

5. Discussion

Among the Northernmost archaeological cultures associated with sea hunting, researchers include the ancient Eskimo culture, which in Chukotka went through several stages in its development: Okvik, Old Bering Sea, Birnirk and Punuk. These were not general stages for the entire ancient Eskimo culture, but local, may be multi-temporal derivatives of cultures. On the Chukotka Peninsula, archaeologists find traces of the North Chukotka culture of sedentary hunters and fishermen of the late Neolithic era of the 3000–4000 years ago sites of which were found in the tundra of Northern Chukotka adjacent to the Arctic Ocean. The Ust-Belskaya culture formed and spread in the forest-tundra of Chukotka (the same time). The sites of its bearers were located along the middle reaches of the Anadyr River, at the seasonal crossings of reindeer across it. The basis of existence of these tribes was deer hunting, fishing, and gathering plant foods. The complex of stone products of the cultures is extensive and consists of stone cores, flakes and knife-like blades, throwing points, knives, scrapers, burins, piercings, axes and adzes [56].

Historical and archaeological evidence shows that tattooing was practiced in ancient times on almost every continent. Tattoos are a marker of bodily and social relationships, and there is great interest in them. Dozens of works have been devoted to the history of tattooing, but despite growing scientific and public interest in ancient tattooing over the past decade, there is confusion regarding the identity of surviving tattoos and their functions, and the problem of the genesis of this art form remains open. Almost all peoples of the world mastered the art of tattooing [57–60], including the peoples of the Northern Pacific [19,20,22,25,37,61–66]. The identified similar tattoo complexes of the Chukchi, Aleut and Eskimo distinguish these groups from the rest of the peoples of the North (Koryaks, Itel'mens, Nenets, Evens, etc.) (Figure 4).

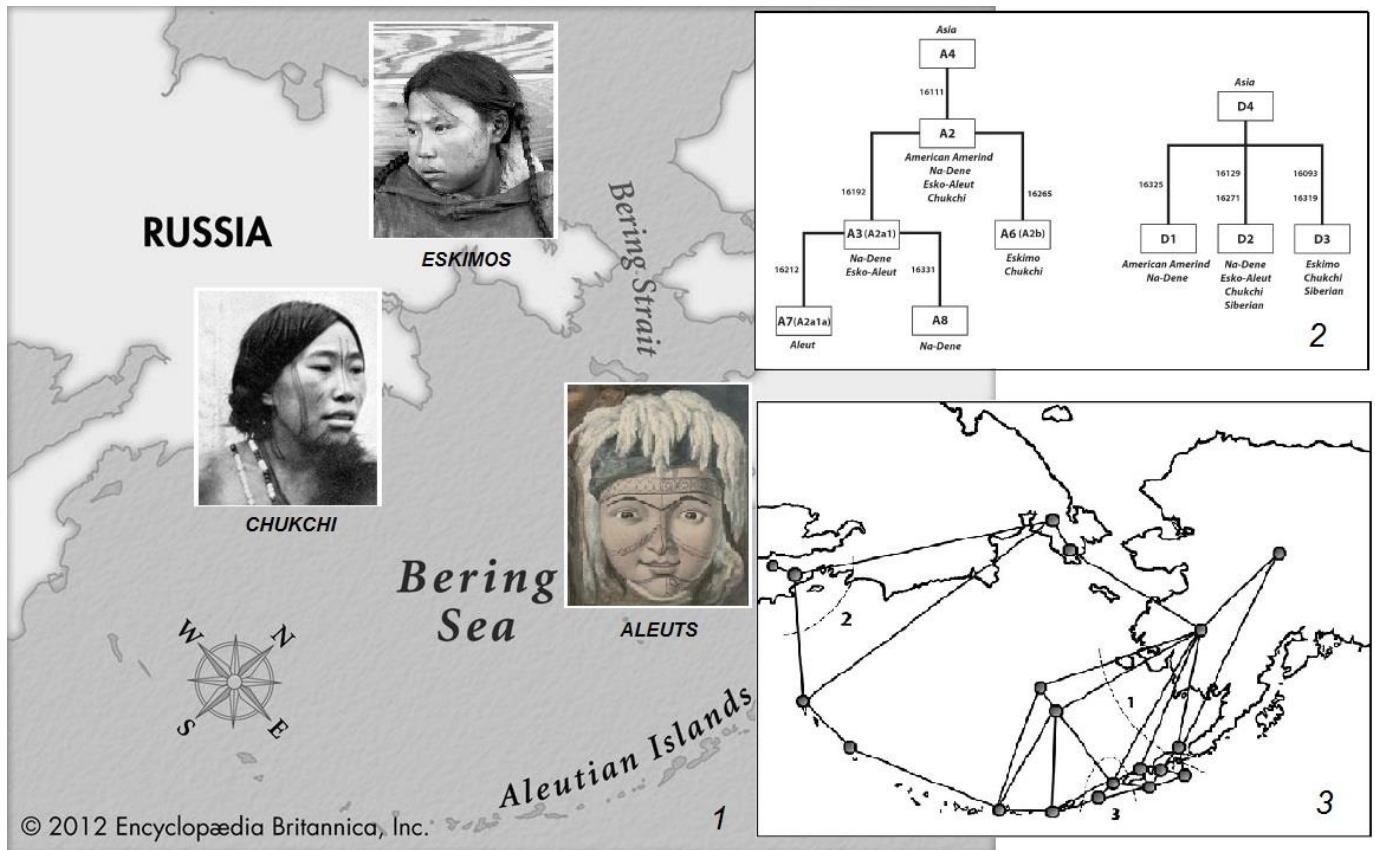


Figure 4. The scheme of distribution of similar body modifications (tattoos) and close genetically aboriginal ancient Beringia. 1. Settlement map of the Paleohabitat study groups. 2. Schematic phylogenetic reconstruction of the relationship among haplotypes of mtDNA haplogroups A and D. For some sub haplogroups of haplogroup A (in parentheses), the commonly used designation is provided (e.g., A2a1a for the A7 lineage (Figure 3 in [31])). 3. Triangulation plot using the Monmonier algorithm for identifying genetic discontinuity. Numbers in the plot denote the location of regions of discontinuity, based on the proportion of the total genetic variance resulting from differences between groups (Figure 8 in [32]).

Currently, autochthonous peoples living in the northeastern tip of Siberia and the Far East demonstrate a very small set of mitochondrial haplogroups specific to this region: A2a, A2b, D2a, D4b1a2a1, as well as C4b2, C5a2 [34] (Figure 4-2). The closest maternal relatives are the Eskimos of Canada and Greenland, as well as the Aleuts of Alaska and the Aleutian Islands [41–43]. Other populations living relatively nearby (Koryaks, Itel'mens, Yukaghirs, Na-Dene Indians, Ojibwe, Cree, Algonquins) have a related, but clearly distinct pool of mitochondrial haplogroups [34–39]. Based on the discovery of sister haplotypes D4b1a2a1 among the Tubalars of the northern Altai, the Naukan Eskimos and the Canadian and Greenlandic Inuit, their genetic connection was demonstrated, confirming the hypothesis that part of the gene pool of the immediate ancestors of the Indians of North America arose in the refugium of Southern Siberia—the Altai-Sayan Highlands [3]. The mtDNA variations of more than 400 individuals from 10 indigenous Siberian populations were analyzed to determine the relationships between Siberian and Native American populations. All mtDNAs were characterized using PCR amplification and restriction analysis, and some of them were characterized by sequencing the control region. The resulting data were then combined with previous Native American and Asian mtDNA data and used for phylogenetic analysis and assessment of sequence divergence (Figure 4-3).

The initial split between the eastern and western Beringian haplogroups likely occurred in southern Siberia and the Russian Far East, the site of the presumed origin of the foundational haplotypes for the major Native American mtDNA haplogroups at or near the Last Glacial Maximum. The current analysis, based on the largest and most diverse set of complete mtDNA sequences obtained to date from both sides of the Bering Strait, reveals a palimpsest of distinct migrations. For example, the mtDNA of three (A, C and D) of the four haplogroups observed in Native Americans was found in the natives of Siberia. However, in none of the Siberian populations did the mtDNA belong to the fourth haplogroup, group B. The presence of group B deletion haplotypes in East Asian and Native American populations, but their absence in Siberians, raises the possibility that haplogroup B may represent a migratory event that brought mtDNA groups A, C and D to America. The results support the hypothesis that the first people to migrate from Siberia to the Americas carried with them a limited amount of foundational mtDNA and that the initial migration occurred between 17,000–34,000 years ago [33].

6. Conclusions

Our study has demonstrated that ethnographic identification of types and variants of tattoos of a group of similar cultures (Chukchi, Aleut, Eskimo) is confirmed by genetic research. The coincidence of these data is not accidental and is confirmed by both linguistic (Chukchi-Kamchatka and Eskimo-Aleutian families) and archaeological materials (ancient Eskimo, North Chukchi cultures, materials of sites from the Aleutian and Commander Islands, dated from 6000 years ago to 700 years ago). It is most probably that these specified peoples had common roots, but in the process of development of ethnic groups, independent groups were formed that retained both archaic elements of ethnic identification and developed new design solutions. In the prospect of further research, the authors see several important guidelines for themselves, which include expanding the scope of ethnographic research on the material and spiritual culture of the aboriginal population of the Subarctic region, additional information about genetic studies of the modern population and their paleogenetic connections with the ancient population.

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Author Contributions

Conceptualization, L.L. and I.P.; Methodology, L.L. and I.P.; Formal Analysis, L.L. and I.P.; Investigation, L.L. and I.P.; Resources, I.P.; Data Curation, L.L.; Writing—Original Draft Preparation, L.L. and I.P.; Writing—Review & Editing, L.L. and I.P.; Visualization, I.P.; Supervision, L.L. and I.P.; Project Administration, L.L.; Funding Acquisition, L.L.

Ethics Statement

Not applicable.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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