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Possible North-Eastern Connections of the R1a1-populations of Corded Ware Culture According to the Archaeologic and Paleogenetic Data

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Abstract

Our new work considers the problems of paleogenetics, archeology and antropology connected with origins of Corded Ware culture and early migration of Y-DNA R1 carriers. This work considers the Second Corded Ware Center on the Far East and Yakutia and its connection with the Eastern European one. Authors examine the hypothesis that the two Corded Ware cultures have the common source.

Keywords: R1a1, Mesolithic, Yuzni Oleni Ostrov, paleogenetics, paleolinguistics, subclades, Yakutia, Na-Dene.

Introduction

The emergence of Corded Ware culture is concerned with «the setting of agricultural and cattle breeding tribes among the local late Neolithic ones». They had similar features in forms and ornamentations of pottery, types of stone tools, funeral rites. It makes it possible to bring them together into cultural and historic area of the corded ware tribes, which occupied the huge territory in Europe» [1, p. 35].

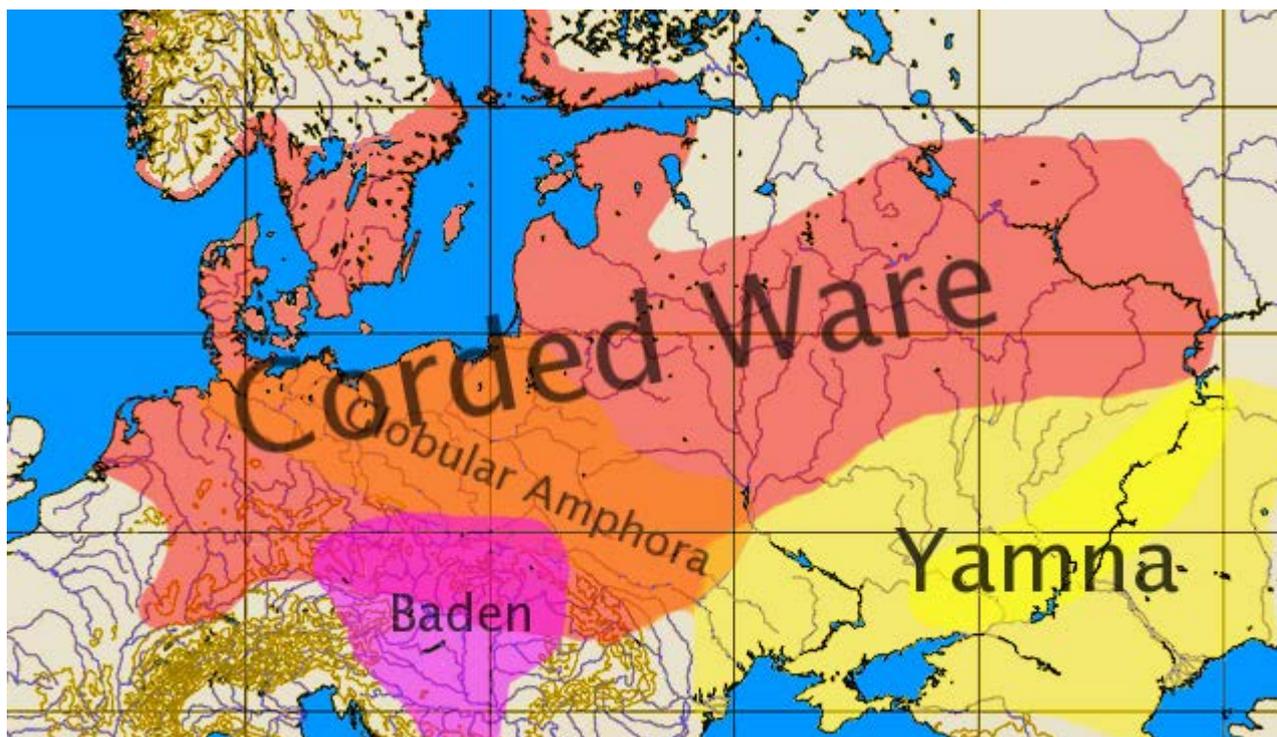


Image 1. Map of the main archaeological cultures of the Early Bronze Age in Central and Eastern Europe.

Initially these cultures dated back to the second half of the III–early II millennia BC (ibid), but nowadays the lower edge of their emergence shifted to the last centuries of the V millennium BC [2, p 127], although this shift can be explained by the calibration of radiocarbon dates, thus, it can have polemic character [3, p 107-111]. Initially the corded tribes were considered nomadic-pastoral, but today they are referred to as settled pastoralists and farmers [1, p 35], moreover, it is prerequisite by the forest area. «Anthropologic composition of Corded Ware population is diverse. But the evident archeologic similarity indicates the common ancestor of these cultures. Different researchers sought this ancestor in Northern Black Sea Region (Gimbutas, Danilenko), in the Right-Bank Ukraine (Artemenko, Sveshnikov), in Polesia (Denisova, Krainov) and in the interfluvium of the Vistula and the Rhine (Fisher, Hoysler)» [ibid]. Special attention is attached to the fact that over 20 ethnically related cultures have emerged within the distribution area of the Corded Ware tribes as a result of their inclusion in the local substrate [ibid]. So the problem of the genesis of the Corded Ware culture is complicated and a hypotheses concerning the Eastern impact on its formation is discussed.

Materials and Methods

The main research method of this paper is the interpretation of recently obtained genetic data which is compared with archaeological and, in lesser degree, linguistic data. The most used methodological approach is the use of the maps of ancient or modern spread of mtDNA haplogroups C and Z and Y-DNA Q, N, and R with the spreads of Corded Ware culture and its Eastern analogues. The serious methodological support is obtained by the use of the theory of A.A. Romanchuk of the migration path of Sino-Caucasian tribes and their origins in the Eastern part of Eurasia*. The proven areas of the ancient archaeological cultures and technologies compared with haplogroup areals are the main scientific materials for this work.

* Another eastern migration idea was independently proposed in <http://pereformat.ru/2014/04/arbins/> in context of R1b Y-haplogroup migration

Discussion and Results

1. Corded Ware Substrate Problem

Substrate issue in the archeological cultures of Corded Ware and their possible descendants (Soviet monography of 1987 diplomatically points at the role of corded tribes as a basis of the Slavs, the Balts and the Germans ethnogenesis within the framework of the concept of autochtony of the major population [1, p 37]) deserve special attention. Linguists in cooperation with archeologists noted that the Balts and the Slavs historically have more similar features with pro-Germans, than with other Indo-European groups [4, p 11]. However, ethnogenesis of the ancient Germans (Jastorf culture [5, 309-311] is considered their habitat both today and in the XIX century [4, p 19]) appears to be complicated. Gradual transition of the preceding Neolithic cultures into the corded community [1, p 35] points at the special role of the so-called substrates. It is evident from the abundance of mito-haplogroups, inherent to this culture.

To 2015, different genotyped representatives of the Corded Ware Culture showed such diverse mtDNA haplogroups as H5a1, J1c1b, J1b1a1, K1a2a, K1b1a1, T2e, U4, U5b1c2 x [7], H6a1a, U2e1, U5a, U5a1, W6, X2, J1c, J2b1a, T2b и X2 (<http://suyun.info/index.php?p=ancientdna>). But the most of the Corded Ware cultures are characterized by the steady dominance of Y-DNA R1a1 haplogroup*.

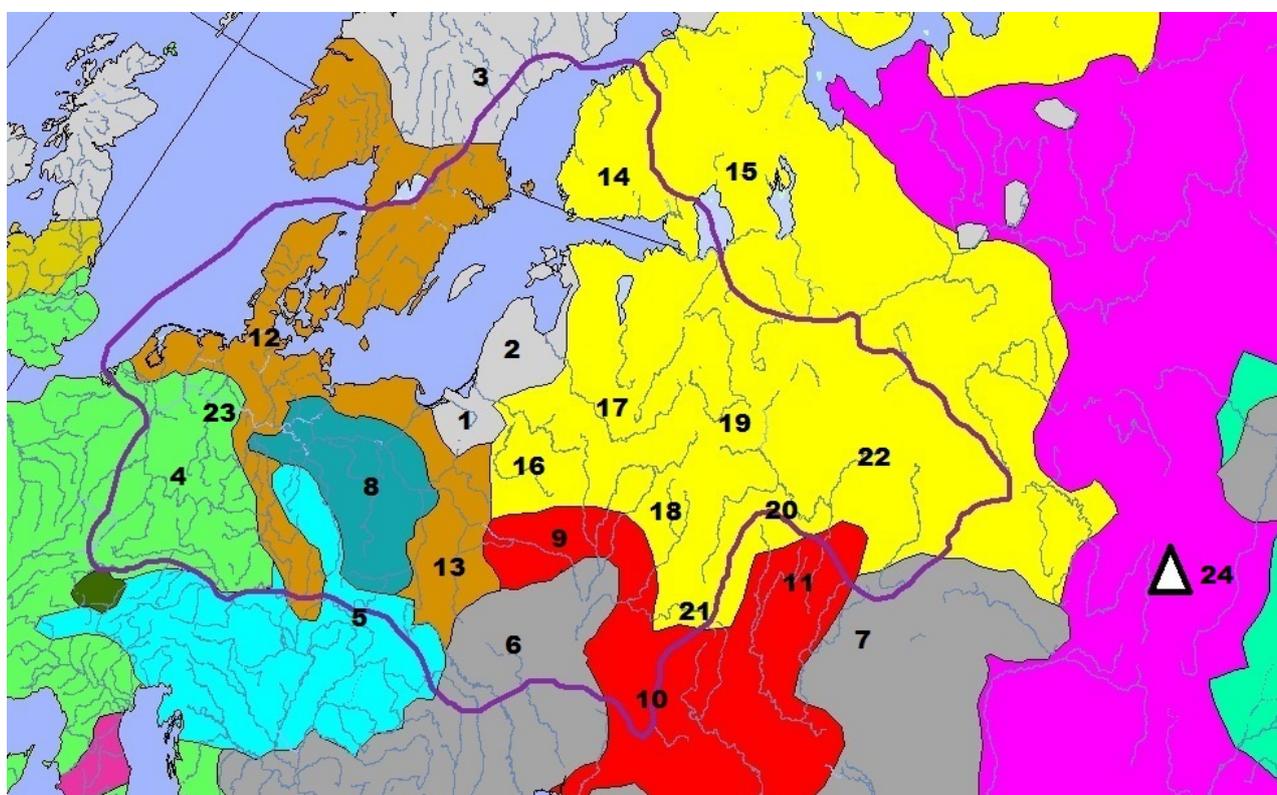


Image 2. The area of the Corded Ware culture and the absorption of the archaeological culture of the period around 3000 BC (violet line) according to 1, p 35-77 6, p 1231-1232.

- 1 – Zedmar culture
- 2 – Narva Culture
- 3 – mezolit of Scandinavia
- 4 – Michelsberg culture
- 5 – Lengyel culture
- 6 – Trypolie culture
- 7 – Khvalynsk culture
- 8 – Komornicze and Choiniki-Penkovo culture
- 9 – the late Dnieper-Donets culture
- 10 – Sredni Stog culture

* <http://polishgenes.blogspot.ru/2015/06/bad-asses-of-bronze-age-analysis-of.html> (see Supplement 1)

- 11 – Middle Don culture
- 12 – Funnelbeaker culture
- 13 – Globular Amphoras culture
- 14 – Sperrings culture
- 15 – Karelia culture
- 16– Neman culture
- 17 – Usvyaty culture
- 18 – Desna culture
- 19 – Balakhna culture
- 20 – Ryazan culture
- 21 – Ryboozerskaya culture
- 22 – Volga-Kama culture
- 23 – Walterninburg – Bernburg culture
- 24 – Sintashta complex

The same source points out that «*R1a1* appears to be an Eastern Hunter-Gatherer (EHG) marker that in all likelihood failed to penetrate west of present-day Ukraine until the Late Neolithic, because it's missing in all the relevant samples before this period. So it probably first arrived in Central Europe with the Corded Ware people. We know that the Corded Ware people were foreign to Central Europe because their genome-wide genetic structure is starkly different from that of the Middle Neolithic farmers who lived there before them.... On the other hand, the Corded Ware sample, also from east-central Germany, is sitting at the other end of the plot, among groups from the Volga-Ural region» The very important work [7] using wide range of paleogenetic data showed the crucial role of the Corded Ware in the forming of different indoeuropean groups, and especially those of Sintashta (Image 2).

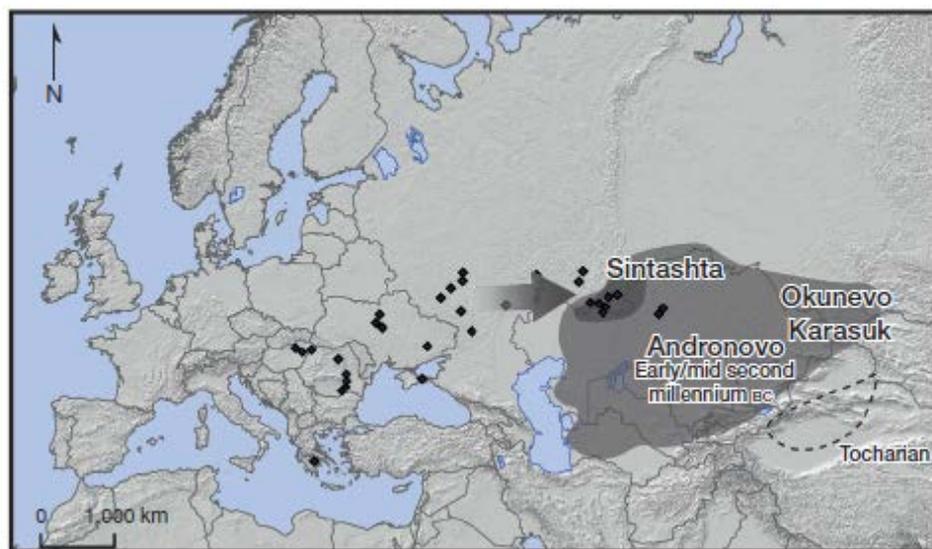


Image 2. The possible way of influence or migration between the Corded Ware and Sintashta [7].

The second important result is that Corded Ware cultures had at the beginning strong impulses from Yamna (although, up to day almost all Yamna genotyped males were R1b1). The possible migration is outlined on Image 3.

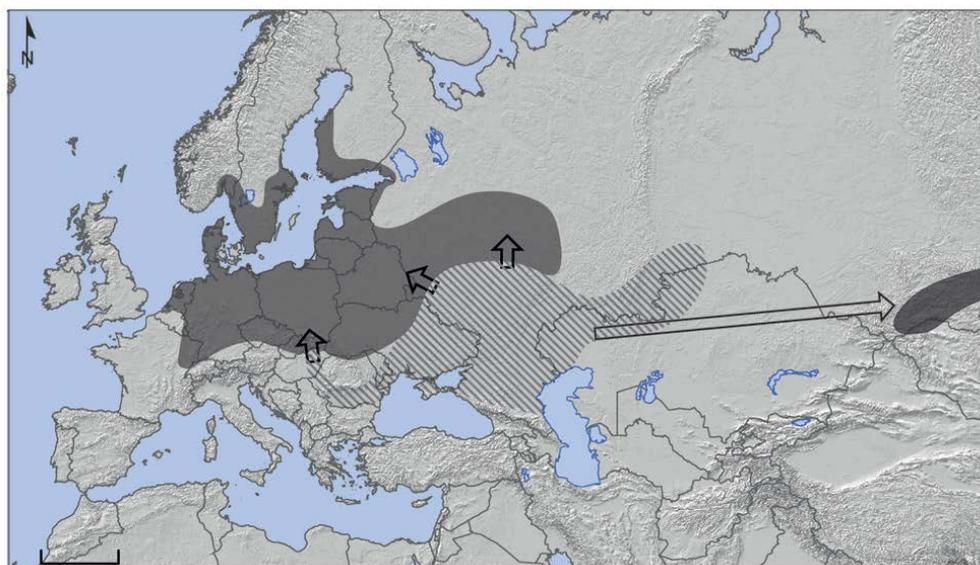
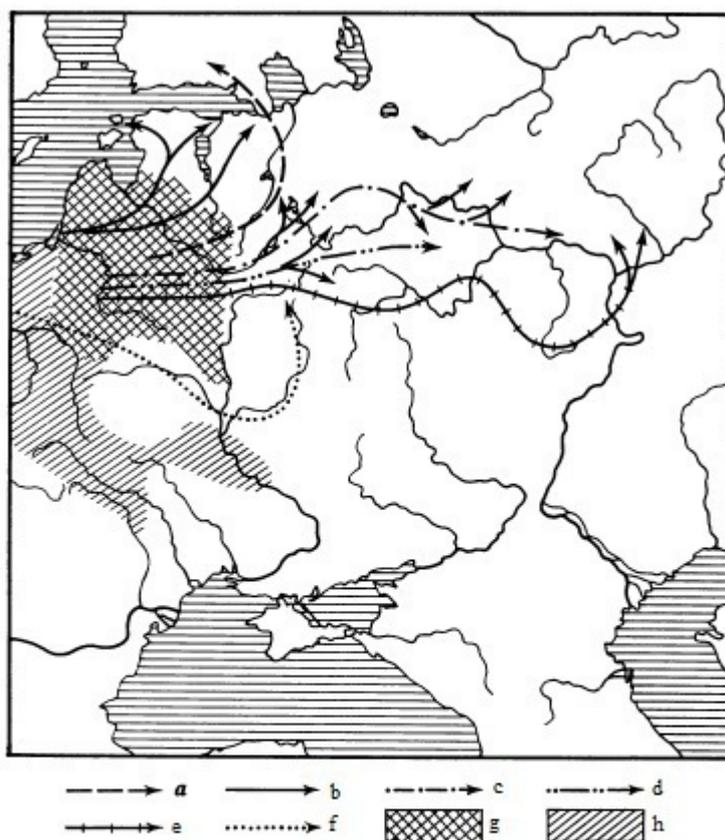


Image 3. The possible way of influence or migration between Yamna and Corded Ware [7].

Comparing this paleogenetic data with the localization of the initial center of the Corded Ware (or Battle Axe) culture, the Soviet monograph «The Bronze Age of the Forest Zone of the USSR» states: «The only initial territory possible is the one in the middle of the area of Battle Axe culture distribution, in other words, the territory between the Dnepr and the Vistula-Oder (Belarus, Ukraine behind the Middle Dnepr, the Carpathian Region, Poland, Lithuania, Kaliningrad Region and a part of Latvia), where all ancient components of these cultures are located. Their resettlement to the west and to the east – to Denmark and Cisurals area started from here» [1, p 74]. Also, we come across the migration of Yamna in the north-western direction (Image 4).



Map 11. The migration of Eastern branches of Corded Ware (Battle Axe) culture
 a - Baltic group: b - Ilmen group: c - Upper Volga group: d - Volga-Klyazma Group: e-f - Middle Volga Group: g - proto Fatyanovo territory: h - Corded and Globular Amphora Carpathian and Baltic Group.

Image 4. Map of the tribal migration of the Corded Ware culture [1, p. 72].

The mentioned above habitat has, primarily, determinate relation to the territories, considered the time of Indo-European tribes' formation (firstly, the ancestors of Indo-Iranian peoples, including the Pit Grave culture) in the Neolithic epoch by L.S. Kleyn, expecting the population of the Funnel-beaker culture (or its part) to be the earliest Indo-Europeans [8, p 93, p 96]. Secondly, Sertey Neolithic complex is very interesting and significant for the neolitization of the vicinity of the east of the Middle Europe and it is located in the region, directly adjacent to the area, detected as the primary area of the further spread of the Corded Ware cultures, namely, the region of the north-west of the Smolensk Region (Dvina-Lovatsky interflue). Here we can observe the sequence of the Neolithic cultures, although having different origin, but stratifying and interacting between VI and II millennia BC. These are the alien Early Neolithic Sertey culture [9, p 99-106], dated back to the Atlantic period 1-2, namely VI-V millennia BC [10, p 11-12], Dubokray type, connected with the cultures of the stroke-ornamented ware of the Middle Europe [11, p 108-110], dated back to V-IV millennia BC, Rudnyanskaya culture of the local Mesolithic basis [12, p 258], Zhizhitskaya culture, determined by A.M. Miklyaev, and North-Belarus one (II millennium BC) were deeply influenced by the Corded Ware culture [13, p 23]. We should note that the transition period from the middle to the late Neolithic Age (namely to the North-Belarus culture) in Sertey is occupied by the so-called Usvyatskaya culture, having much in common with the Funnel-beaker cultures, or being their eastern edge [14, p 9]. The research (a tooth was found in the grave) detected that the population of Sertey culture could have the male haplogroup R1a1 [15, p 294]. Is it the target source of subclade R1a1, spread in the habitat of the Corded Ware tribes? Of course, the multiple migrations in the region, especially the possible migration of the carriers of the same

haplogroup from the south-east, from the region of ancient Yamnaya-like tribes in the initial period of their history should be also considered. It is closely related to the above mentioned tooth, the carrier of the male haplogroup R1a1, referred to the layer of Sertey VIII (ibid), which is much younger than the epoch of the Sertey culture (Sertey XIV-X) and related to the Usvyatskaya culture, determined by Mazurkevich, connected with the stroke-ornamented ware culture from the Middle Europe, neither than the northern Caspian Sea Region and the Middle Asia [14, p 9-10].

This article attempts to study the archeological issue, concerning the origin of the Corded ornament of the ware (all the abovementioned cultures were defined in accordance with it) in Neolithic/Eneolithic cultures.

The Sperrings culture is perhaps one of the most ancient candidate for the role of such ornament source in the Western Europe Region [16, p 79], which existed in the second half of V–IV millennia BC and partially the habitat of the pit-comb ware [16, p 123]. The corded ornament was found in Sperrings. If we consider the theory of the origin of the corded ornament in the pit-comb ware technique more thoroughly, we can suppose some (though, very indirect) roots of the ornament in the Dnieper-Donetsk culture, which is regarded as the source of the pit-comb technique (which is, appearingly, was not accompanied with migrations of any kind).

The Sperrings culture has local background [17, p 212], which, of course, includes the alien influence. The cultural body of pit-comb ware spread along the north of the Western Europe from the Dnieper-Donetsk cultural community, though the ware of the latter does not contain the corded ornament. Thus, precisely the Karelian-Finnish late Neolithic Sperrings culture can be considered one of the main candidates for the role of the technological source of the Corded Ware in the Western Europe. The other candidate is the Eneolithic ware of the Sredny Stog culture (primarily – the location of Lipetsk Lake, for which the corded ornaments, besides the rudiments of pit-comb technique, vaguely resembling the classic variant, were typical). This type of ornament recedes to the past of the region – to the early Neolithic Age of the Upper Don [18]. Thus, the tradition of ware decoration with the Corded ornament existed in steppes and forest steppes of the South of Russia in the VI millennium BC and could spread to the North within the frameworks of either pit-comb ware, or directly to the region of the Battle Axe/Corded Ware cultures formation, namely, to Belarus-Poland-Western Russia. The remained theories take us outside of the region, primarily, to the Southern Trans-Urals.

We can get more accurate picture if we analyze the second, Eastern center of the corded ware development.

2. Eastern Asian Center of Corded Ware

Links with the East and the Eastern Eurasian influence on the Corded Ware culture (both proved and hypothetic) touch upon one of the most interesting problems of the Siberian Neolithic, namely the problem of Corded Ware ornament of Bel'kachinskaya culture in Yakutia [17, p 298]. According to Everstov: «*Bel'kachinskaya culture people made their pottery by knocking it out. While forming the vessel, they used the wooden stick with the twisted cord tied around the working tip. Sharp prints of the latter stamped at the surface of a vessel. The scientific literature calls the pottery, made by the cord tied around the wooden stick the corded ware. The remains of the corded ware are found within Yakutia, as well, as at the Far East and even in North America. The researchers therefore suggest that Bel'kachinskaya culture people could be the ancestors of some Indian tribes of North America*» [19, p 40-64; 20, p 66]. One of candidates for these tribes could be Na-Dene, as they are considered to be one of the latest wave of the New World migration form Asia.

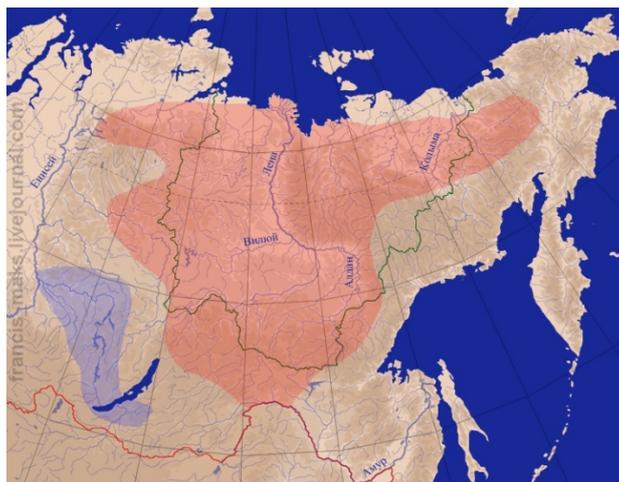


Image 5. The map of the Bel'kachinskaya culture habitat (pink)

Let us clarify the dynamics of the overview of the Yakut Neolithic. Bel'kachinskaya Neolithic culture dates back to the IV-III millennia BC. (3200-2100 BC) [20, p 49]. It occupied almost the whole territory of the modern Yakutia. Syalakhskaya culture is considered its predecessor and the closest in its characteristic features [17, p 298] in the same Yakutia territory (formed in the Middle Lena basin in V-IV millennia BC as a result of migration of the tribes from Transbaikal, which assimilated the preceding local Sumnaginskaya culture; more correct it is dated back to 4500-3200 BC [20, p 49]). The newer datae of the discoveries, belonging to Syalakhskaya, Bel'kachinskaya and Ymyyakhtanskaya cultures have significantly complicated the clear scheme mentioned above. Now these cultures seem to co-exist during the long period, rather than interchange (which is, taking into account the vast expanse of Yakutia is not surprising). Consequently, the dates have also changed: «Syalakhskaya culture (early Neolithic) – 4870 ± 170–3490 ± 150 BC (duration about 1380 years); Bel'kachinskaya (Middle Neolithic) – 4100 ± 300–2160 ± 150 BC (about 1940 years); Ymyyakhtanskaya (Late Neolithic) – 2900 ± 450–1025 ± 235 BC (about 1880 years)» [21, p 27, p 34].

According to Yu.A. Mochanov «*the carriers of Syalakhskaya were the ancestors of Nganasans, residing Taimyr*» [22, p 174]. It seems possible of the mutual influence of Syalakhskaya and Isakovskaya cultures [22, p 164]; Isakovskaya culture of the Developed Neolithic, showing the genetic similarity with the preceding Kitoy Early Neolithic culture [23, p 1418–1425], dating back to the late V– IV millennia BC. Nganasans as the descendants of the Neolithic hunters on the reindeer are really connected in their origin with the basins of the Middle and Lower Lena, where from they penetrated into Taimyr 4000 BC [24, p 242]. But the origin of Nganasans is mixed, as different tribal groups integrated into their contingent until very recently (Pyasinskaya Samoyad', Kuraks, Tidiris, Tavgs) (*ibid*). It isn't proved that Nganasansky language, belonging to the Samodiyskaya group of the Uralic family was definitely the language of Syalakhskaya culture of the Yakut Neolithic. With regard to paleogenetics no links of Bel'kachints-Syalakhs are found now. Studying mitochondrial DNA of the modern Yukaghirs, which inevitably had to perceive the gene pool of the preceding Syalakhskaya and Bel'kachinskaya cultures, N.V. Volodko came to the conclusion that «*1. Mitochondrial gene pool of the Yukaghirs consists of East-Eurasian haplogroups – A, C, D, Z, and G. Haplogroups C and D are the most frequent and diverse. The new haplogroup D2*, undescribed before, was found. It witnesses the genetic imprint, left by the migrations of early Eurasians in the interfluve of the Lower Kolyma and the Indifirka. 2. The ancestor haplotype of he haplogroup C2a was identified in the Yukaghirs of the Lower Kolyma. Its age (8150 thousand years) coincides with the beginning of the re-colonization process of the Siberian Arctic and Subarctic Regions ... Age-related estimation of the haplogroups C and D, dominating in the mitochondrial landscape of Siberia coincides with the existence of the Late Paleolithic Selemdzhinskaya culture of fishermen and hunter gatherers, formed in the basin of the middle reaches of the Amur approximately 25 thousand years ago*» [25, p 15-16].

Migrations of Samoyedic peoples to the west add a personalized touch to the hypotheses, concerning Sami origin (despite their linguistic affinity to the Finns, they seem to have a significant substrate). «According to one hypothesis, Sami have not initially belonged to Finno-Ugric peoples. In ancient times this Arctic nation came in contact with Sami tribes, further it interacted with Baltic-Finnish tribes and adopted their language (well-known Russian Finno-Ugric researcher D. Bubrikh, while considering this issue, highlighted that Proto-Sami tribes had contacts with Samodiets, but did not have genetic relationship» [27, p 43]. It is not only the matter of paleogenetics, but paleolinguistics, as well. We probably face the problem of the so-called pre-Finno-Ugric substrate, which was searched for in different language families— for example, Tungusic subfamily [28, p 20-24], though the hypothesis, concerning the fact that Y-DNA subclade N1b (including the ones of Tungusic peoples, where it is present) could be the marker of pre-Finno-Ugric substrate, would be too courageous.

Comparative genetic analysis of the ancient cultures and the modern ethnic groups of Siberia does not help to identify them completely. Male Y-DNA haplogroup N is widespread in the North of Eurasia and concentrates in various ethnic groups: Balts, Finns, Yakuts [29 – 31]. Certain subclades of this haplogroup are the most frequent among the peoples of the Extreme North of Russia: nomadic Nganasans belong to the Y-haplogroup N1b (so-called Samoyedic) by 92 % and to the Y-haplogroup C by 5 %. This is the highest rate of the haplogroup N1b among all the peoples [30; 32]. It is supposed that N1b emerged in 2500-8000 BC within Sayans or nearby. «But we should also admit that the resemblance between Samoyedic and Turkic-speaking N1b-carriers is rather remote and goes back to the Neolithic Age (3000 – 3500 years ago). Turkic languages are rather young, if compared to Indo-European, Finno-Ugric and Samoyedic ones. The possible homeland of the Turkic languages coincides with the homeland of the haplogroup N1b could be Mongolia. Thus, Turkic-speaking N1b carriers should be considered as the initial speakers of the pre-Turkic language, genetically close to pre-Samoyedic peoples, who have preserved the common ethnonyms with Samoyedic peoples from the ancient times, rather than Turkified Samoyedic peoples» [33, p 405]. If the authors of the quoted article are right in the chronology of the divergence of Samoyedic and Turkic-speaking N1b carriers, we can suppose that this split (the second half of the II millennium BC) is younger than Bel'kachinskaya and Syalakhskaya cultures and the theory by Mochanov that Bel'kachinskaya peoples are predecessors of Nganasans doesn't concern with the genetic affinity.

A.A. Romanchuk has touched upon another grand challenge of the paleogenetics of Yakut cultures (including Dene-speaking) as he noticed that all Indian tribes had migrated before Y-DNA N1 carriers came to the North-East Asia. Dene-speaking groups within the American continent do not belong to the N1b Y-subclade dominant group or have any presence of it. Y-chromosome Q (respectively 78.1%, 70.4%, 92.3% and 64%) [34; 35] dominate in Apaches, Athapascans, Navahos and Tinklits, R1 (62.5%) [36] in Chepivyans. Y-haplogroup N on its own occurs only in Eskimos, but their emergence in the New World dates back to latter time. If the tribes of the mentioned archeological cultures of Yakutia (who according to Everstov penetrated to the North America) were Dene-speaking and brought some wave of Na-Dene languages to the New World, they did not bear any share of N1b Y-DNA subclade. That means that their migration to America occurred earlier than this N1b subclade expanded across Yakutia, or that the subclade completely disappeared in the conditions of America (what is less probable). It is interesting that the explanation of the existence of R1 subclade in North America is considered unclear: the theory has it that the white colonists contributed R1 to North America [37], but the hypothesis on the links between American R1 carriers and Mal'ta-Buret' culture seems more likely to be the truth. This culture features subclade [38], suggesting that subclade R1 together with Q, has been a characteristic for the Amerindians, which is the major part of American Indians with no micro family-scale language relatives in Eurasia.

Samoyedic peoples appeared in the Arctic Circle rather late, after the beginning of our era, in the V century BC their ancestors inhabited the Middle Ob (Kulay culture) [24, p 250], and consequently had no concern with neither Taimyr, nor Yakutia. Thus, we can speak of the language change and assimilation of the resettles from the Lena to Taimyr. We consider the opinion of Mochanov, concerning Bel'kachinskaya Dene-speaking (or other connection with the New World) and possibly of the Syalakhskaya culture, preceding it, much more promising.

Nowadays peoples of the Na-Dene language family inhabit the greater part of Alaska, north-west of Canada and occur in a number of American states at the Mexican border. During the XX century different linguists (E.Sepir [39], S.Starostin, E.Vayda [40, p 177-178], J.Grinberg, M.Rulen and others) independently of each other came to the conclusion that Na-Dene is close and related with Sino-Tibetan and Yeniseian languages (according to Starostin and Grinberg, the two latter families are related to each other). The general protolanguage for the Yeniseian and Na-De languages existed in the epoch of the late Mesolithic Age (ibid.). The fact that nowadays (excluding Eskimo-Aleut family) no language taxon of a family scale lives both in the Siberia and in the North America is one of the most interesting issues in the matter of Siberia-American ethno-linguistic migrations, which demands explanation. For example, if we find peoples in Siberia, relatives of the American Indians in terms of language, or, vice versa, Nganasans (if they constituted the essence of Syalakhskaya culture and later migrated to America) occurred in Canada or Alaska, we could easily trace the chronology and geography of such migrations. As it is not observed, we can make the conclusion that the migration of the Siberian peoples (except Eskimos) to America ceased no later than 5000 years ago and the remnants of Amerinds and Na-Dene in Siberia assimilated long ago.

The problem of the whole Dene-Caucasian macro-family migration and the matter of these migrations chronology are concerned with the problem of Dene-Yeniseian language community. There's a traditional point of view, according to it the ancestors of the Chinese men, Tibetans and Na-Dene migrated from the Middle East and South Asia in the early Mesolithic Age. But there is a new theory by A.A. Romanchuk, according to it the direction was opposite and belonged to the earlier epoch -Upper Paleolithic [41]. But, no matter which of the theories is proper, Yeniseian languages (as a part of Dene-Caucasian unity) inevitably occur in the central zone of the hypothetic migrations, specifically in the Middle Siberia and probably had contacts with Na-Dene tribes in this region. These contacts dated back to the Mesolithic Age (taking into account the chronological anachronism of the Siberian Mesolithic Age). Perhaps, Western Siberia, South Asia and Urals (at least partially) were the zone of Yeniseian tribes in the Mesolithic and Early Neolithic Ages and Na-Dene tribes neighbored to the east, inhabiting the greater part of the Yenisei and the Lena basins. And the vicinity of Baikal is considered the traditional zone of the Altai tribes' formation.

As the formation of the Syalakhskaya culture, preceding the Bel'kachinskaya one is connected with Trans-Baikal, we should turn in our searches of the initial migration zones of hypothetic Na-Dene (or another Indian) tribes related to Bel'kachinskaya to archeological periodization of Trans-Baikal history of the V millennium BC. The Neolithic Age of Trans-Baikal significantly deviates from the Neolithic Age of that of the Baikal Region [17, p 306], and the first Neolithic period (the so-called Mukhinsky stage) started not until IV millennium BC. Thus, searching for the homeland of the Syalakhskaya Neolithic Age we can speak of the late Mesolithic Age of the region, rather than of the Neolithic Age. Although, the first traces of Neolithization of the south of the Western Trans-Baikal, in the region of Studenovskaya Upper Paleolithic and Mesolithic culture date back to the middle of the V millennium BC. It may happen under the influence of the surrounding, more ancient Neolithic cultures (primarily, the Amur ones) [17, p 307]. It is striking that the ceramics of two types: "*textile and knock-out corded ware, which is stated in a number of Early Neolithic sites of Baikal and Angara Region*" are typical for the Mukhinsky stage (ibid). Within Vitim Region the corded ware has remained in the Late Neolithic period (i.e. III-II millennium BC): the utensils were handled by the knocking-out with the wooden stick, the same way as in the Bel'kachinskaya culture [17, p 309]. Thus, the corded ware has already existed within the territory of Trans-Baikal (possibly, Kitoy, because Kitoy people have come to the Baikal Region from Trans-Baikal [17, p 271]) and Tungusic (17, p 310) Neolithic tribes not until V millennium BC (uncalibrated). The corded ware spreads from Transbaikal Region to Yakutia and Baikal Region. The origin of the creators of Trans-Baikal Neolithic should be searched for in Mesolithic culture of a kind of the Upper Lena Mountain [10, p 197]. Perhaps, they were the Early Mesolithic Na-Dene ancestors, although Kitoy people are more commonly referred to the ancestors of Altainian people (in any case, we can state very close contacts of Na-Dene and Altainian people in Mesolithic and Neolithic Ages).

Systematic study of Bel'kachinskaya culture has been conducted since 1960s. Ya.A. Molchanov is considered the acknowledged expert in this field of study. He competently examines Bel'kachinskaya culture and its setting in his rather old monograph [21]. The corded ware in the Neolithic Age is typical for Japan, Sakhalin, Trans-Baikal, Angara, Amur, Ussuri, the Kurile

Islands, but only Japanese, Sakhalin and Transbaikalian types are similar to Bel'kachinsky one [22, p 180]. The corded ware in Japanese Jomon emerged in the III millennium BC [22, p 181]. Thus, the phenomenon we are interested in, namely the corded ware is typical for a rather vast range of Neolithic cultures in the area of approximately ancient center of primeval 'Boreal' ceramics (in modern estimations— XI-X millennia BC)

Minimum two centers of the so-called 'pseudo-string' ceramics existed in Eurasia. It can be considered as the preceding form of the classic string one. It is the Altai location Boynikha, dated back to VI-V millennia BC and the one, synchronous to the Neolithic settlement Tytkesten'-VI [43, p 114-116 and the whole South-Ural and North-Kazakhstan Eneolithic community of comb ceramics, singled out by V.S. Mosin, including Surtadinskaya, Kysykul'skaya, Tersekskaya, Botayskaya, Ayatskaya cultures. They (Tersekskaya and Ayatskaya) are characterized by pseudo-string ceramic ornaments [43, p 183, p 227, p 237, p 283]. Referring to the origin of the pseudo-corded ware in the South-Trans-Ural Region, the authors of the monograph wrote: '*The Chronology of Eneolithic and the Early Bronze Age in the Urals Region*' state: «*At the turn of Neolithic and Eneolithic Ages, in the second half of the V millennium BC, retreating-stroke-ornamented component of Poludensky complexes has evolved in pseudo-string one, comb has evolved in comb Eneolithic one with simple and geometric ornaments*» [44, p 41-53]. We can also make an assumption, concerning the influence of the Far East center of the Early Neolithic within the Baikal Region, but, referring to the 'pseudo-string' ceramics within the Altai Region, remains the possible variant of western influence (from Trans-Urals), neither than eastern.

Mochanov expands Bel'kachinskaya culture to Chukotka and the Sea of Okhotsk [22, p 167, map]. Bel'kachinskaya culture affected the region of Anadyr basin (Ust'-Belaya) [22, p 182], but its influence goes beyond. In an old dispute of Mochanov and Diky, concerning the major source of North-American cultures and, consequently, the initial position of migrants to the New World via Beringiya or across the Bering Strait (although, we think that the dispute is pointless at least because, despite Eskimos, America is the homeland of the Indians of the four large linguistic taxons; that's why America was settled by the representatives of minimum four Eurasian groups), Mochanov defended the 'Yakut homeland'. The corded ware of Bel'kachinskaya culture has analogs in the culture of Woodland (east of the USA), but this influence is insignificant (ibid). The Bel'kachinskaya culture is much similar to the complex of the Firth River to the north-west of Canada on the banks of the Firth River – 30 km from the Beaufort Sea (III-II millennia BC) [22, p 183]. The Natwacruac cultural complex in the northern Alaska, dated back to IV-II millennia BC [22, p 178] is also similar to the Bel'kachinskaya culture. The modern American studies refers the first entries of paleo-Indians into the New World to the period of XX-X millennia BC (in other words, to the Upper Paleolithic) and even earlier. But in case of the Bel'kachinskaya culture and its corded ware, we deal with some kind of migration (ethnic or technologic), dated back to the latter time (not until late IV millennium BC). Such migrations must have occurred repeatedly (not only from the west to the east, but theoretically, in the opposite direction, from America to the Siberia). But, appearingly, this migration (excluding Eskimos), which occurred in late IV millennium BC, was the last significant Indian migration. No migrations of such scale are observed in the following five millennia (from our point of view, it explains the lack of Indian languages in the modern Siberia and the lack of Altai, Urals and the so-called paleo-Asian languages in North America, - 5000-year period was enough and the connection was lost

The problem of comparison of the above-mentioned American archeological cultures in the monograph by Mochanov with the modern ethnic groups of the American Indians directs us to the modern ethnic map of North America. Peoples of Na-Dene language family inhabit Alaska and the greater part of north-western Canada, in other words, the same territories, where Mochanov finds analogues to the Bel'kachinskaya ceramics (geographical position of Dene-speaking tribes points at the fact that they seem to be the last migration wave of the Indian population from Siberia. This is another argument in favor of the Dene-speaking of Bel'kachinskaya culture). The proximity of the Firth River complex to the Arctic Ocean coast suggests that Na-Dene people inhabited this region prior to the Eskimos.

Another language group of North American Indians attempted to compare with Dene-Caucasian people. After Nostratic and a number of different comparative theories have been introduced for the scientific use (and the emergence of larger taxons if compared to the traditional language family), the modern Indian peoples of America are divided into four large groups: first of

all, Amerinds, who have no relatives of macro-family scale outside America and are macro-family on their own, secondly, Hoka-Siouans, thirdly, Penutians, and, at last, Na-Dene, a part of large Dene-Caucasian macro-family. But reality is always more complicated. The whole macro-families are singled out among the families of Amerind macro-family (called 'philia' and the linguistic view resembles the 'division' of a large Altai family into the few smaller ones), including the ones, similar to the Eurasian macro-families. First of all, it is the so-called Mosan language macro-family, offered by E. Sepir in 1929 in the article, written for the British Encyclopedia. According to Sepir, Salish, Wakash and Chimakuan languages of the north-western coast of the Pacific Ocean are included into this macro-family (45). Although most linguists haven't supported the theory, it found a response in paleogenetics: «Similarly, a fourth non-local component found in most parts of Europe is from the Salishan region that includes indigenous populations of the Pacific Northwest of North America. Low levels of this component are found throughout Europe, with the largest percentages in the Urals (6.5%), Celtic (5.5%), Russian (4.5%), and Finnic (4.3%) sub-regions. These Salishan percentages do not necessarily suggest any direct links with Native Americans; instead, these might express genetic traces of early links between archaic European populations and the early Eurasian ancestors of indigenous Siberians and Native Americans (possibly dating to the Mesolithic period). Both Altaian and Salishan genetic components in Europe might reflect genetic traces of the Eurasian hunting-fishing cultures that were absorbed and pushed outwards by expanding Indo-European populations since the Neolithic period» (46). Thus, Indian, Salishan component is present in Europeans. It is especially strong in Slavic and Celtic environment, where subclade R1a and R1b_b are most frequent (Celts have peak values of R1b), as well as in the Urals and in Finland. V. Shevoroshkin has compared Mosan languages (namely, Salishan language) and East-Caucasian ones (Naho-Dagestan language family) and determined the approximate time of their separation – 4000-5000 years ago (47, p 88). But, appearingly, such migration (if it really occurred) referred to the category of micro-migrations and should have remained almost inconspicuous in Siberia.

The attempts to compare the modern linguistic groups with the archeological cultures of the recent past were always hard, but the Bel'kachinskaya culture, followed by the Ymyyakhtakhskaya one (2100-1300 years BC – [20, p 50]; 2900-1000 years BC – [21, p 27, p 34]), within Yakutia and the adjoining areas is a mess: «As of the ethnic background of the Ymyyakhtakhskaya culture carriers, it is still unclear. The existing working-level opinions are absolutely different. According to A. Yu. Mochanov, Ymyyakhtakhskaya people are the ancestors of the Chukchi and the Koryaks. This theory was later supported by I.V. Konstantinov, S.A. Fedoseyeva and V.I. Ertyukov. N.N. Dikov associates Ymyyakhtakhskie memorials with the ancestors of the Chukchi and R.S. Vasilevsky – with the ancient Koryaks culture. A.P. Okladnikov, archeologists L.P. Khlobystin, M.A. Kiryak, Everestov, ethnographers I.S. Gurvich, Yu.B. Simchenko and anthropologist M.G. Levin (1958) consider that the carriers of the Ymyyakhtakhskaya culture are the ancestors of the Yukaghirs. According to S.A. Arutyunov, the carriers of the Ymyyakhtakhskaya culture constituted the polyethnic historical and cultural integrity, including the Chukchi, the Koryaks, the Eskimos, as well as the Nganasans and the Yukaghirs. A.N. Alekseyev shares this opinion» (<http://m.sakha.gov.ru/node/16435>). The reason for this disagreement is the territorial expansion of the Ymyyakhtakhskaya tribes, settling on the territories from Chukotka to the Lower Yenisei and the Middle Amur by the middle of the II millennium BC. But it doesn't mean that the population of the Ymyyakhtakhskaya culture is Chukotko-Koryak or Nganasan. The prevailing element in this culture, were, probably, Yukaghirs, related to the Urals language family, who somehow showed up in the Baikal Region in late III millennium BC (this issue demands further research), wherefrom they came to the Lena basin [24, p 416]. Yukaghirs prevailed in the Eastern Siberia to the beginning of AD, followed by the Evenks (ibid), who came from the Baikal and Trans-Baikal Regions, as well. This is the amazing kaleidoscope of the ethnic map of the Eastern Siberia. The most possible way is that Dene-speaking Bel'kachinskaya people were assimilated by the alien Yukaghirs, having remained within Taimyr (Maymechinskaya culture) for some time. It should be emphasized that Na-Dene is the only community, whose the folklore has some undoubtful analogies in South Siberia and Central Asia and no analogies in the South America [48].

3. Possible Connection Between two Centers of the Corded Ware

Of course, the above mentioned facts of the corded ornament emergence and development in the ware of a number of Neolithic, Eneolithic cultures of the east and west of Eurasia demand plausible explanation. Could we in the similar vein suppose that the corded ware within Eurasia in the Neolithic Age could have two (at the minimum) advent centers or should we search for the links between the Far East Corded Ware center and the Western cultures (for instance, Sperrings), keeping in mind the so-called 'pseudo-corded' ware of the Southern Trans-Urals?

If the corded ware of the Far East (and the ware of this region in general) dated back to the earlier period, than the Eastern European one, we have the reasons to consider the possibility of one or another (at least specifically-technologic) migrations and vice versa. To solve this issue we need to compare the emergence of the corded (and pseudo-corded) ware in different regions of Eurasia more or less clearly.

'Pseudo-corded' ware of Altai – VI millennium BC

Sperrings culture – late V-IV millennium BC

Corded ware of the Eastern Europe – III millennium BC

Corded ware of the Baikal Region – V millennium BC

Corded ware of Trans-Baikal – VII millennium BC (minimally, because Trans-Baikal in this regard is older than Gromatukhinskaya culture)

Corded ware of the Middle Amur (Gromatukhinskaya culture) – VI millennium BC (minimally, because today Gromatukhinskaya culture dates back to the XIV-V millennia BC)

Corded ware of Yakutia (Syalakhskaya and Bel'kachinskaya cultures) – V-III millennia BC

Corded ware of the Eneolithic Dnepr Region – IV millennium BC

'Pseudo-corded' ware of the Southern Trans-Urals – second half of the IV millennium BC

Corded ware of Jomon culture – III millennium BC (though, ancientifying, similar to the one of the Gromatukhinskaya culture is also possible)

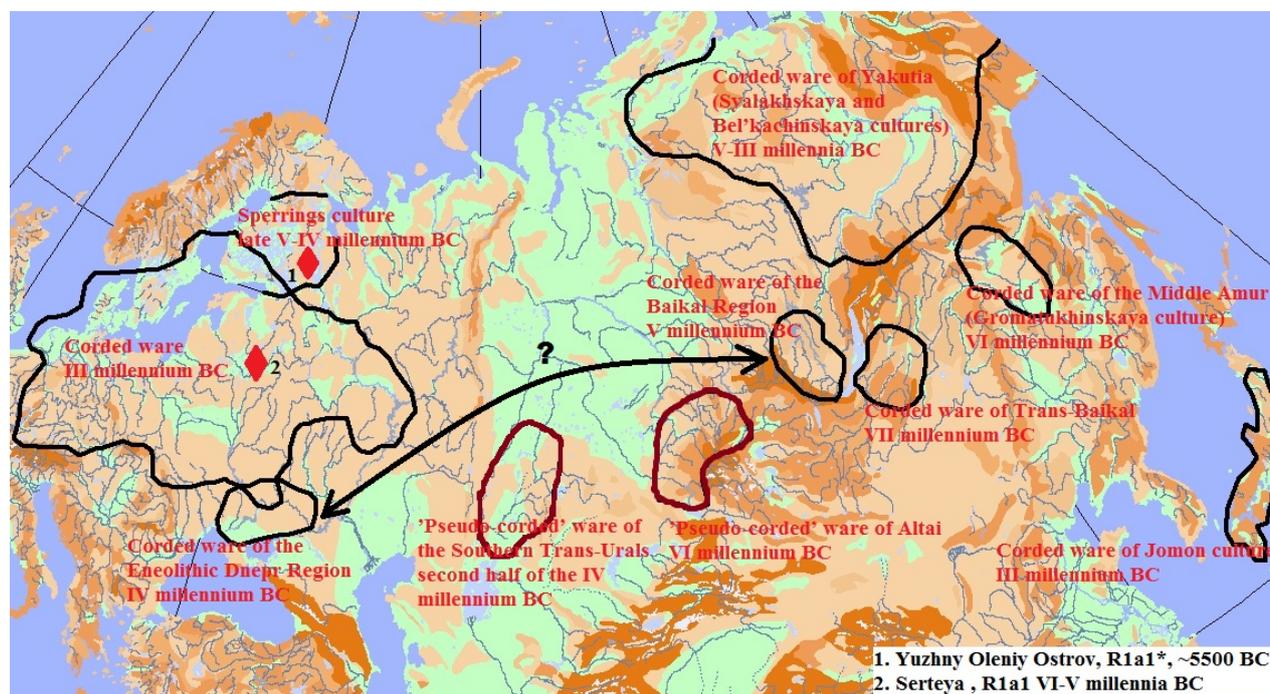


Image 6. Corded Ware cultures in the Neolithic and Chalcolithic Eurasia. The arrows indicate the possible migration. The distribution area of the real corded ware is colored in black, the 'pseudo-corded' one – in brown.

On the basis of the map, two explanations are possible:

1) Two centers of the corded ware – East-European, including the Sperrings culture and Middle Don and the Neolithic center in Trans-Baikal, which did not contact with each other, being

separated by great distances and the lack of the transition forms (if we don't consider 'pseudo-corded ware as one) existed within Eurasia.

2) The Far East Neolithic center in general and the corded ware in particular is older than the West Eurasian one and it affected the latter. These influences can be of two types: a) highly technological migration, which didn't affect the paleogenetics, paleoanthropology, paleolinguistics and the general archeology, б) notable migration, having affected paleogenetic, paleoanthropologic, paleolinguistic maps of Neolithic Eurasia.

Our goal was to find these traces and their possible paleogenetic trace.

First of all, we have detected the interesting anthropologic correspondence between the population of Dnepro-Donetsk cultural community (V-IV millennia BC) and the Altai Neolithic population [50, p 19]. If compared to other Neolithic anthropologic types, they are rather close to each other.

Secondly, the traces of the possible migrations from the Eastern part of Eurasia can be seen on the example of Karelia-Finland (and the Sperrings culture*). The Ice Age, in general opinion, ended about 10000 BC (plus-or-minus 500 years, but Finland completely cleared from ice only in the VIII millennium BC [10, p 27], and was occupied by the Mesolithic tribes [51] at that time. There are two main theories, concerning the settling: firstly, The Mesolithic population came from the east (from Ural or even from Trans-Ural) and, secondly, the region was settled from the south and from the west [10, p 27]. The distinguishing feature of Finland settlement is the presence of the large periglacial Ancylus lake [52], which could be either the hindrance or the way for the settlement (in terms of navigation development in the coastal Mesolithic tribes). Archeologists note the small number of evidence in favor of both the first and the second theory [10, p 27] and the popular theory, according to which the so-called 'pre-Finnish substrate' was followed by the modern Finns obscure the general understanding. It is commonly thought that only the cultures of the textile ware (1500-500 BC) were main predecessors the real Finns of the Volga and the Baltic regions [53]. Thus, all the preceding segment of the people, namely Volosovo-Garino-Borsky Eneolithic (III-II millennia BC), pit-comb ware (IV-III millennia BC), forest cultures with comb ware traditions (V millennium BC) [54, p 73, 77, 83; 55] and the earlier Mesolithic tribes (in fact from the moment of Finland and Karelia settlement in the VIII millennium BC) are exactly this 'pre-Finnish substrate' (more likely several substrates)

Paleogenetics has suggested another facts in favor of the eastern wave of the settlers. The Yuzhniy Oleniy Ostrov burial ground in Karelia proposed the researchers more riddles, than answers and sprang many surprises. For instance, three people from the Oleniy Yuzhniy Oleniy Ostrov, who lived 7500 years ago (UZOO-7, UZOO-8 and UZOO-74), were the carriers of mitochondrial haplogroup C1, very rare in Europe. Haplotype of the three inhabitants of the Yuzhniy Oleniy Ostrov refers to the special new subclade C1f. No concordances with this subclade were found in the current database of the ancient and modern mitochondrial genomes [56, 65]. Female mitochondrial haplogroup C is general in the North-Eastern Asia (including Siberia) and is one of the 5 mitochondrial haplogroups, found in the aborigines of America, along with A, B, D and X. It suggests that the Mesolithic migrations from Siberia to the north and north-east of Europe were real. This genetic migration can be compared with the migration of the carriers of the male subclade R1, typical for both the Eastern Europe and the center of Asia (57), and according to the primary data (hereunder), R1 can be found in North America. The spread of this subclade from the center of Asia is the widely-accepted opinion. Y haplogroup R1a1* - M198- along with mitochondrial haplogroup C1f (one person) were found in the burial ground of the Yuzhniy Oleniy Ostrov. This is the first argument in favor of their collective spread from Asia to the North of Europe. The articles by V.I. Khartanovich and A.A. Romanchuk [58, 59] contain arguments in favor of the north anthropologic type and in favor of the belonging of the population of the Yuzhniy Oleniy Ostrov to the North-European relict odontologic type.

* In [68, p. 24] is given a conjecture with some arguments that the people of Yuzhniy Oleni Ostrov could know ceramics and some of them could be essentially the early representatives of Sperrings culture. The dating of Yuzhniy Oleni Ostrov corresponds to the beginning of the ceramic neolite in North Eastern Europe.

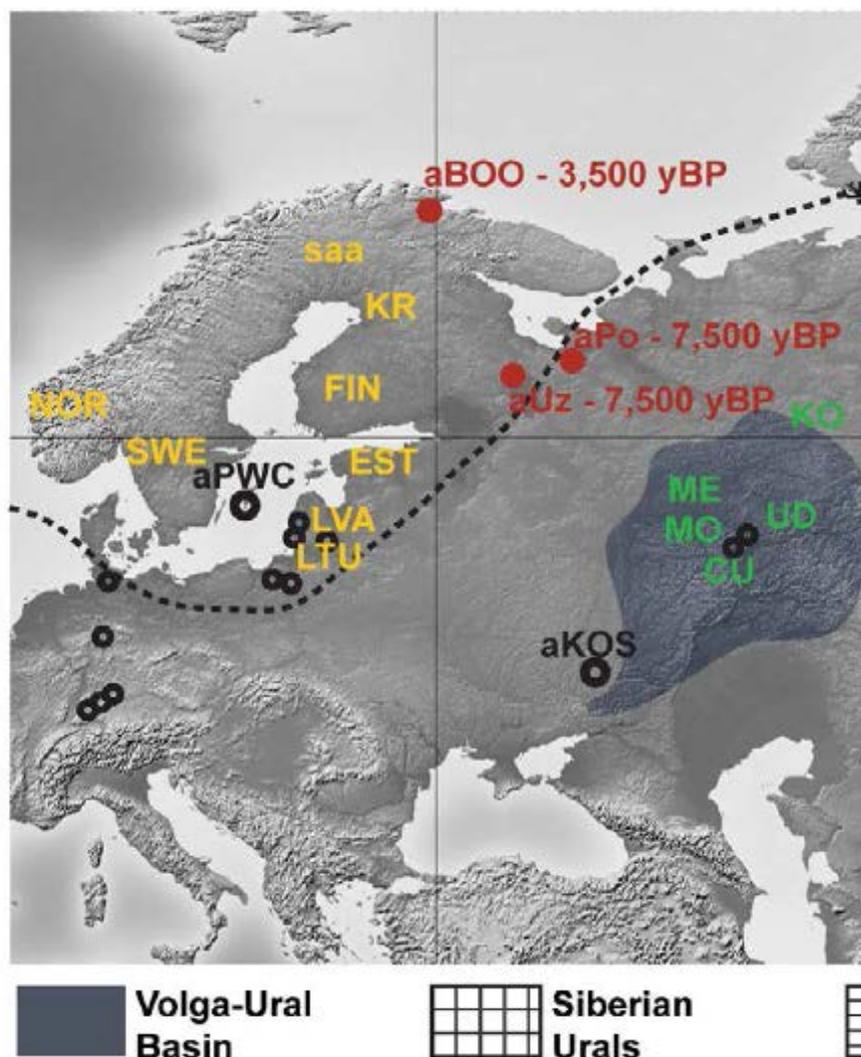


Image 6. Map of Eurasia showing the approximate location of ancient (uncalibrated dates) and present-day Eurasian samples. Red dots represent the archaeological sites sampled for ancient mitochondrial DNA in this study: aUz, Yuzhnyy Oleni Ostrov; aPo, Popovo; aBOO, Bol'shoy Oleni Ostrov [65].

In [65] there is given a genetic argument for the relativeness of 'red' population (in sense of image 6) and the population of Siberia: «*The high frequency of hg U4 is a feature shared between Mesolithic aUzPo, present-day Volga-Ural Basin (VUB) (Komi, Chuvashes, Mari), and West Siberian populations (Kets, Selkups, Mansi, Khants, Nenets), with the latter group also being characterized, like aUzPo, by the presence of hg C*». And here we should remember that «***On the other hand, the Corded Ware sample, also from east-central Germany, is sitting at the other end of the plot, among groups from the Volga-Ural region***»

Mitochondrial haplogroup C, besides the Mesolithic Age of Karelia has been recently discovered in the population of Dnieper-Donets cultural community and even in the Bronze Age of the same region [60, p 77]. The presence of the haplogroup C in these districts, essential for the history of the corded ornament in the East Europe in the relevant period of time indicates the earlier migrations to this territory from the East (Mesolithic Age of Finland and Karelia is simultaneous with the Early Neolithic Age of the Ukraine).

One more possible marker of the migration from the regions, where the corded ornament has formed much earlier, than in the East Europe, is certainly Y-DNA haplogroup N and though, as it was mentioned above, it possibly has no concern with the bearers of the corded ware in Yakutia, its

presence is possible in the other center of this technique in the Baikal Region. Despite the Mesolithic migration of the C1f carriers, this migration could refer to the Neolithic Age, or Mezolithic latter than that of C. To trace and date these migration we can use data on mtDNAs. The migration of mt-haplogroup Z is notable among the mitochondrial haplogroups: «*On the basis of modern-day genetic data, hg Z1 was proposed to have been introduced into populations of the VUB and Saami by migrations from Siberia via the southern Urals to the Pechora and Vychegda basins (northwest Urals), associated with the appearance of the **Kama culture** ~8,000 yBP. The presence of hg Z1 in aBOO establishes a direct genetic link between aBOO and modern-day populations of the VUB and Saami, and possibly indicates the trajectory of the migration that brought 'Central/East Siberian' lineages into NEE. The fact that aBOO did not contain any other Saami-specific haplotypes, suggests an independent origin and contribution of Z1 to the Saami gene pool*» [65].

We can notice that Z is present in the Eastern Siberia and completely absent in Americas: «*Thus, these six transitions are characteristic of the ancestral haplogroup Z haplotype. Based on the distribution of haplogroups C, S, Z and the number of variants encompasses, we postulate that southcentral Siberia was the place of origin for the ancestral haplotype, and the populations bearing haplogroup Z must have spread into northern Eurasia after the ancestors of the Amerindians left the region.*

Early studies of Native American mtDNA variation have shown that all Native American mtDNAs belong to haplogroups A, B, C, D and X, and that some of these haplogroups are also common along the northern Pacific Rim (Torroni et al. 1993a, b; Ward et al. 1993; Forster et al. 1996; Starikovskaya et al. 1998; Brown et al. 1998; Schurr et al. 1999). Specifically, the analysis of mtDNA diversity in the Chukchi and Siberian Eskimos of extreme northeastern Siberia revealed haplogroups A, C, and D. In contrast, the Koriak and Itelmen of the adjacent Kamchatka Peninsula, who speak a language from the same language phylum (Chukchi-Kamchatkan), harbour the east Eurasian haplogroups G, Z and Y, which are completely absent in Native Americans» [63, p 10].

The Kama culture could be the Early Neolithic bridge for the spread of mtDNA Z from the Far East (where it is common for the peoples of Korea and North China nowadays) to the west. May be this migration occurred together with the one, marked by Y-haplogroup N. **The simultaneous character of their occurrence and the absence in America point at it.** But neither classic corded, nor pseudo-corded wares haven't been discovered in the Kama culture yet [17, p 243], though the Kama culture has definite technological links with the South Trans-Ural in the Early Neolithic Age – primarily, with the Poludenovskaya culture [ibid, p 247].

Now it is too early to give a clear answer whether the Corded Ware ceramics was brought to the Eastern Europe from the East or not, and if it was so, which mtDNA's and Y-DNA's reflected the migrations. But the argument of absence of (pseudo) corded Ware in Kamskaya culture allows to give some credit to the version of mtDNA C bearers as the people who could have brought the Corded Ware style to Europe. Maybe that migration was even accompanied with migration of a certain subclade of Y-DNA R1. The data on paleo mt-haplogroup C in the Eastern Europe is presented in table 1.

Table 1: Paleo mtDNA haplogroup C in the Eastern Europe

Time	Region	Subclade
6000 B. C.	Hungary	C5
5500 B. C.	Karelia	C1f
5400 B. C.	Ukraine	C
4000 B. C.	Ukraine	C4a2, C4a3, C4a4
3740 B. C..	Ukraine	C4a6
2000 B. C.	Ukraine	C4a3, C4a6

Sources: [60, 61, 62]. (The initial tables are given in supplement 2 and 3)

In [62] is clearly stated that «*East Eurasian lineages were represented by the C clade (Ya34 and Ya45), which is uncommon in ancient or present-day European populations, but is found in Neolithic populations, as well as contemporary populations from South Siberia, where this lineage is most likely originated (Starikovskaya et al., 2005; Mooder et al., 2006). Of interest in this context is the fact that the analysis of Neolithic cemeteries of the Baikal region has suggested that a depopulation event occurred in that region during the 6th millennium BP (Mooder et al., 2006). As such, the dating of Yasinovatka (at ca. 6440–6080 [Hedges et al., 1995]) suggests that there is a possible link between the Baikal depopulation event and the appearance of the C lineage of mtDNA in the North Pontic region. Whilst the analysis is limited in terms of the numbers of individuals analysed to date, it is of some interest that individual Yas19 (female 20–25) has been identified by Potekhina as being of local origin, and the U3 clade is linked to the founder haplotypes that probably entered Europe from the Near East or Caucasus, possibly linked to the LUP population expansion. A detailed report of the results of the genetic analysis of these specimens is in preparation at the time of writing*».

The mentioned association of the Baikal Region with the Dnieper Region, which is very important because of its possible influence on the Corded Ware origin in the East Europe, can be the searched paleogenetic link between the east and the west of Eurasia via the subclade C. The dating of the abovementioned migration is the other challenge. We can speak of the IV, maximum late V millennia BC.

If we return to the Dnieper Region, where subclades C were discovered from the Neolithic to the Bronze Ages, the Corded Ware could be found there in the Eneolithic Age. According to Merpert: «*Nevertheless, the definite role of the influence of the steppe tribes, who demonstrate the very early spread of the corded ornament, proved as the result of the researches of the recent years is highly possible*” and further: «*I don't mean the excavations of the wonderful Eneolithic settlement near Selo Derievki in the mouth of the Omel'nik River (the right confluent of the Dnepr) in Kirovograd Oblast by D.Ya.Telegin (D.Ya. Telegin. From the Work of Dnepro-Dzerzhinsk Expedition of 1960 — Brief Reports of the Institute of Archaeology, Academy of Sciences of the Ukrainian Soviet Socialist Republic, issue 12. Kiev, 1962, p. 13-17)*». The rich collection of the ware of this settlement, belonging to the pre-ancient-Yamnaya culture time of the forest-steppe Ukraine contains abundant and diverse examples of the corded ornament. This complex can be justly considered the oldest of the known «corded ware» complexes of Europe [64, p 18]. As subclades C were found near Derievka, it can be interpreted as another argument in favor of the Baikal-Dnepr migration.

There is one more hint of that the mito-haplogroup C got into the Derievka Region together with the carriers of some subclade Y-DNA R1. The case is that if we accept the theory that the carriers of Y-haplogroup R1 and the mt DNA haplogroup C one went from the Siberia epicenter of migration both to the West and to the East, the presence/absence of other haplogroups could provide more arguments. In other words, those haplogroups, which spread is correlated by some subclades of the analyzed one. And there are such results for one of the C subclade: «*An abstract in a 2012 issue of the "American Journal of Physical Anthropology" states that "The similarities in ages and geographical distributions for C4c and the previously analyzed X2a lineage provide support to the scenario of a dual origin for Paleo-Indians. Taking into account that C4c is deeply rooted in the Asian portion of the mtDNA phylogeny and is indubitably of Asian origin, the finding that C4c and X2a are characterized by parallel genetic histories definitively dismisses the controversial hypothesis of an Atlantic glacial entry route into North America."* [66].

Concerning mtDNA X the sub-group X2 appears to have undergone extensive population expansion and dispersal around or soon after the last glacial maximum, about 21,000 years ago. It is more strongly present in the Near East, the Caucasus, and Mediterranean Europe; and somewhat less strongly present in the rest of Europe. Particular concentrations appear in Georgia (8%), the Orkney Islands (in Scotland) (7%), and amongst the Israeli Druze community (27%). Subclades X2a and X2g are found in North America, but are not present in native South Americans. The New World haplogroup X2a is as different from any of the Old World X2b, X2c, X2d, X2e, and X2f lineages as they are from each other, indicating an early origin «*likely at the very beginning of their expansion and spread from the Near East*». ³ Although it occurs only at a frequency of about 3% for the total current indigenous population of the Americas, **it is a bigger haplogroup in the North America, where among the Algonquian peoples it comprises**

up to 25% of mtDNA types. It is also present in lesser percentages to the west and south of this area—among the Sioux (15%), the Nuu-Chah-Nulth (11%–13%), the Navajo (7%), and the Yakama (5%). Algonquian people (esp Ojibwe) became famous for the presence of a big share of R1 subclade. **R1 (M173)** is found predominantly in North American groups like the Ojibwe (79%), Chipewyan (62%), Seminole (50%), Cherokee (47%), Dogrib (40%), and Tohono O'odham (Papago) (38%) [67]. This data gives the background for the hypothesis that as some Algonquin people has big percentages of mtDNA X and Y DNA R1, and mt DNA X is accompanied by mtDNA C, the mutual migration (or the start of migration or micromigration) of bearers of some subclades of mtDNA X, mtDNA C, Y-DNA R1. Some of them could have connections with Belkachinskaya and Syalakhskaya cultures.

So, the facts outlined in the paper give a certain basis to the hypothesis of the Far Eastern origins of the Corded Ware technology, and if that is true, Corded Ware could be brought to the Eastern Europe by a population which possessed mtDNA C and Y-DNA R1. And of course more paleogenetic and archaeological research of Eastern Europe, Ural, West and East Siberia should be carried out. The ultimate conclusion may be drawn only after the obtaining and carefully analysis of the statistics of the paleo-DNA data.

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SUPPLEMENT 1

<http://polishgenes.blogspot.com.au/2015/06/badasses-of-bronze-age-analysis-of.html>

...But we already have a reasonable collection of ancient DNA from the relevant archeological cultures. Does it back the general consensus? Let's take a look, starting with the Y-chromosome data sorted by culture. The bracketed numbers are the sample sources, which are listed at the bottom of the post.

Corded Ware, Germany, Individuals 2,3,4 [1], **R1a**

Corded Ware, Germany, I0104 [3], **R1a**

Corded Ware, Germany, RISE434 [4], **R1a**

Corded Ware, Germany, RISE436 [4], **R1a**

Corded Ware, Poland, RISE1 [4], **R1b?**

Corded Ware, Germany, RISE446 [4], **R1a**

Corded Ware, Poland, RISE431 [4], **R1a**

Single Grave?, Denmark, RISE61 [4], **R1a**

Battle-Axe, Sweden, RISE94 [4], **R1a**

Battle-Axe?, Sweden, RISE98 [4], **R1b**

Sintashta, Trans-Urals, Russia, RISE386 [4], **R1a**

Sintashta, Trans-Urals, Russia, RISE392 [4], **R1a**

Andronovo, South Siberia, Russia, S07 [2], **C**

Andronovo, South Siberia, Russia, S10 [2], **R1a**

Andronovo, South Siberia, Russia, S16 [2], **R1a**

Andronovo, Altai region, Russia, RISE512 [4], **R1a**

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SUPPLEMENT 2

Table 2 | Individual life history data for selected individuals from Yasinovatka as based on the mtDNA analysis

Cemetery	Individual	Sex/Age	Chronological Age (calBC)	Clade/haplogroup	Likely origin of the haplogroup
Yasinovatka	Yas54	♂ 30–40	5616–5482	T	Near East/West Eurasia
"	Yas19	♀ 20–25	5434–5221	U ₃	Near East/Caucasus
"	Yas17	adultus	5437–5090	Likely U ₁	West Eurasia
"	Yas45	♂ 20–25	5432–5148	C	East Eurasia
"	Yas34	infantilis	ND (not-dated)	C	East Eurasia
"	Yas32	♂ 30–40	ND (not-dated)	T	Near East/West Eurasia

Source: [62], p 88.

SUPPLEMENT 3

Table 3. MtDNA HVSI sequences of Neolithic and Bronze Age individuals from the North Pontic Region.

Sample	Age (BP)	Time Period	HVSI Sequence (+16000) ^{c, d}	RFLPs (where available)	Haplogroup
Ni58	2,305±45 ^b	Neolithic	061, 223, 298, 327		C
Ya34	6,195±80	Neolithic	223, 298, 327, 357		C4a2'3'4'
Ya45	6,360±60	Neolithic	223, 298, 327		C
D1.8	3,940±70	Bronze Age	223, 278, 298, 327, 357		C4a3
L8	3,990±70	Bronze Age	218, 223, 288, 298, 305A-T, 327, 357		C4a6
L15	3,740±70	Bronze Age	218, 223, 298, 327, 357		C4a6
DD33	6,175±60	Neolithic	311	-7025AluI	H
DD38	N/A	Neolithic	080	-7025AluI	H
Ya17	6,360±75	Neolithic	241		H? ^e
Ya36	6,260±180	Neolithic	320		H? ^e
Ya57	N/A	Neolithic	241	-7025AluI	H
Ya64	6,330±90	Neolithic	064, 240	-7025AluI	H
Ya32	4,500±120	Neolithic	294, 296		T
Ya54	6,593±35	Neolithic	294, 296		T
Ni79	5,200±30	Neolithic	294, 296		T
Ya19	6,370±60	Neolithic	343		U ₃
Ni94	6,225±75	Neolithic	256, 270, 356		U5a

^aYa – Yasinkovatka; DD – Dereivka; Ni – Nikolskoye;

^bThe radiocarbon date for this sample is likely inaccurate (see text for explanation)

^cAll mutations listed are transitions compared to the rCRS, unless noted explicitly.

^dItalics denote incomplete HVSI sequences.

^eRFLP status could not be determined for these samples.

Source: [60].