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File'Wiik Haplogroup R1a'
Originally 'Y-haploryhmä R1a kuvat engl'

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Haplogroup R1a
Maps and Tables

Main question:
What is the origin of Finnish R1a-men? Have they come from the west or east?

Contents

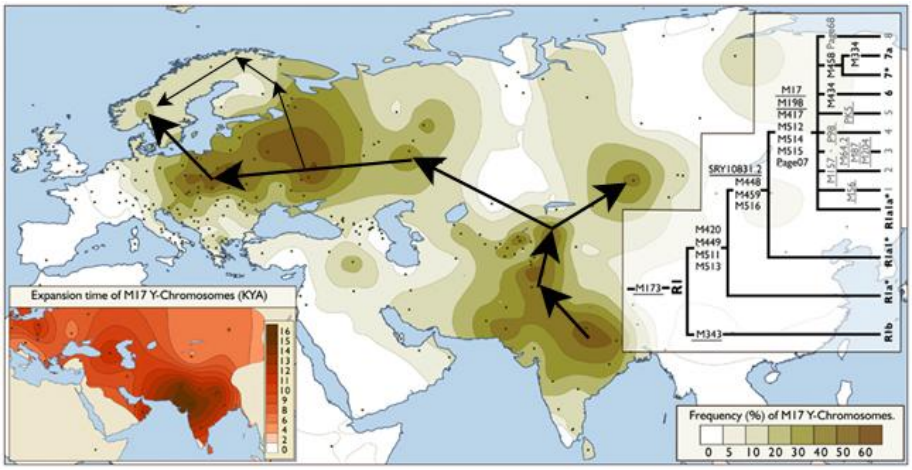
(b) One effective distinctive marker: DYS 594 65

(1) Areas and arrivals of Western Finnish and Eastern Finnish R1a-men if based on alleles 10 and 11 of DYS594 65

(c) Two large R1a-populations: Poles and Russians 70

1. Geographic distribution and frequences of R1a-men in various parts of the world and their potential migration routes.

Source: Underhill et al. 2009.

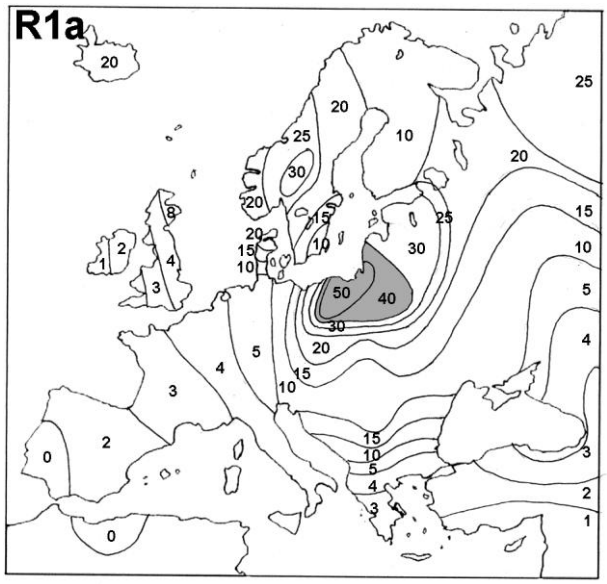


Conclusions:

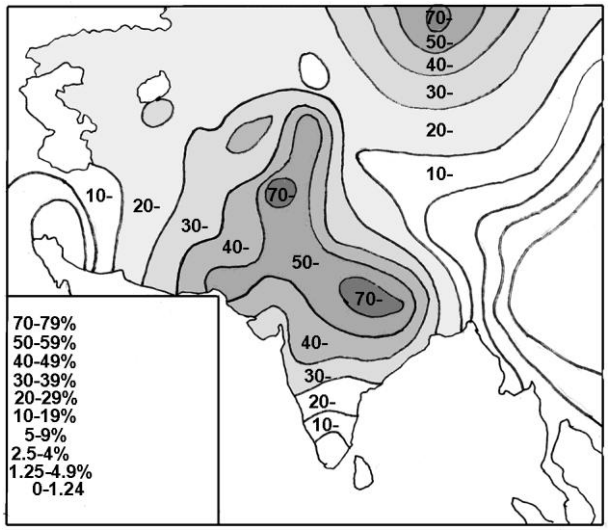
(1) Haplogroup R1a emerged in Northern India: cf. the map in the left lower corner.

(2) From India these men migrated to Mongolia and Eastern Europe. From Eastern Europe they continued to Russia and the Ukraine and further to Poland. From Russia and Poland they migrated also to Scandinavia.

2a. Frequencies of R1a-men in Europe.
Source: Pericic 2005 ja Wiik 2009.



2b. Frequencies of R1a-men in Asia.
Source: Sahoo et al. (2006).



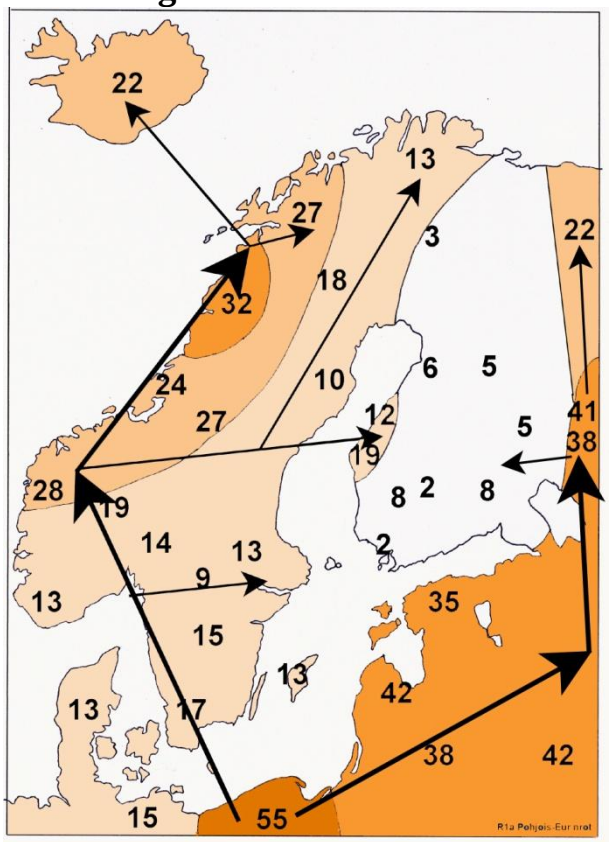
Conclusions:
Haplotype R1a is common in certain areas of Europe and Asia. The European concentration is situated in Poland and Belarus. Asia has two concentrations: one in Northern India and the other on Mongolia.

3. Frequencies of R1a-men in various areas/populations.
Source: Eupedia (*Distribution of European Y-chromosome DNA (Y-DNA) haplogroups by country in percentage*).

Area/ Population	R1a-%	Area/ Population	R1a-%	Area/ Population	R1a-%	Area/ Population	R1a-%
Poland	55	Sweden	19	Cantabria	8.5	Castile- Le	3
Belarus	49	Bulgaria	18	Scotland	8.5	Valencia	3
Russia	46	N-Greece	18	Alsace	8	France	2.5
Ukraine	43	Romania	18	Switzerland	7.5	Fland-Art	2.5
Slovakia	42	Germany	16	Turkey	7.5	Italia	2.5
Latvia	40	Serbia	15	Finland	7.5	D-Italia	2.5
Lithuania	38	Bosnia-He	13.5	Holland	5.5	Asturias	2.5
Slovenia	34.5	Denmark	12	Auvergne	5	Spain	2
Czech	34	Makedonia	13.5	Provence	5	Aragon	2
Hungary	32.5	Greece	11.5	Rhône-Alpes	4.5	Castile-L-M	1.5
Estonia	32	C-Greece	11	England	4.5	Portugal	1.5
Croatia	29	S-Greece	10.5	Sicilia	4	Wales	1
Norway	27	Aigeian isl	10	Belgium	3.5	Brittany	0.5
Austria	26	S-Germany	9.5	C-Italia	3.5	Catalonia	0.5
Bashkiria	26	Ile-de-Fra	9.5	N-Italia	3.5	Baski	0
Iceland	23	Albania	9	Andalusia	3	Galicia	0
E-Germany	24	W-Germany	9	Irland	3	Sardinia	0
N-Germany	22	Crete	9	Cypros	3	Extremadura	0

Conclusions:
(1) Haplogroup R1a is common in populations speaking certain Balto-Slavic languages (grey in the Table):
(a) West Slavic languages (Polish, Slovakian, and Czech),
(b) East Slavic languages (Belarusian, Russian, and Ukrainian), and
(c) Baltic languages (Lavian and Lithuanian).
R1a is less frequent, for example, in South Slavic languages (Serbo-Croatian, Bulgarian) and Germanic languages.

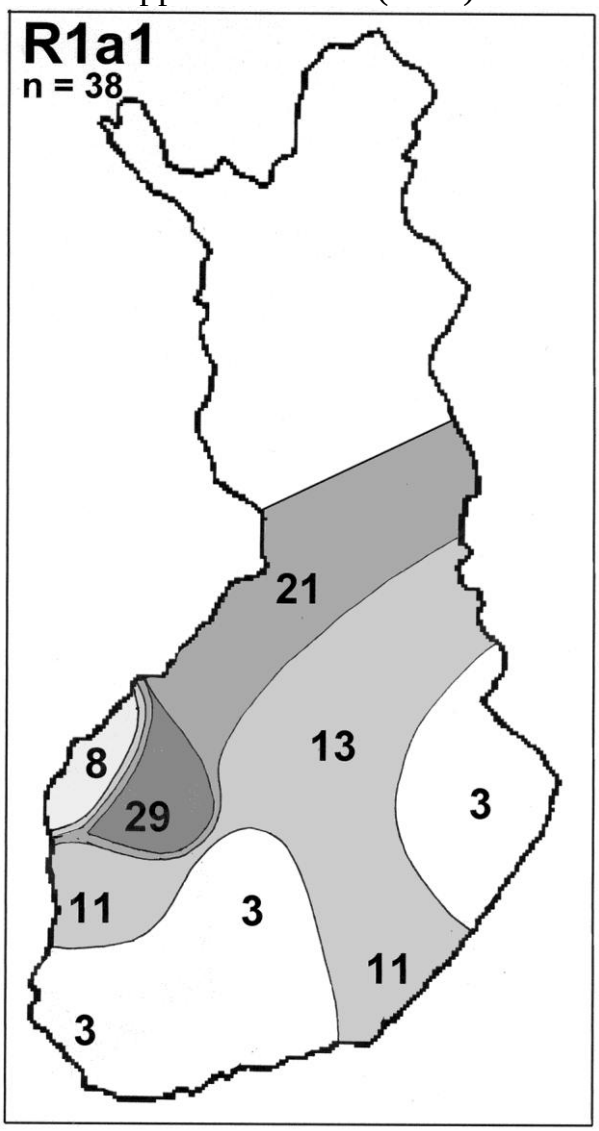
4. Frequencies and assumed migration routes of R1a-men in Northern Europe.



Conclusions:

In Northenmost Europe, R1a is relatively common (maximun about 30 – 40 %) in Scandinavia and North-Western Russia, but in Finland and Lapland R1a is relatively low, mostly below ten percent. A question arises: Was the Finnish and Sami ”R1a-gap” been filled by newcomers from the west or east?

5. Frequencies of R1a-men in various parts of present Finland.
Map based on the material in Lappalainen et al. (2006).



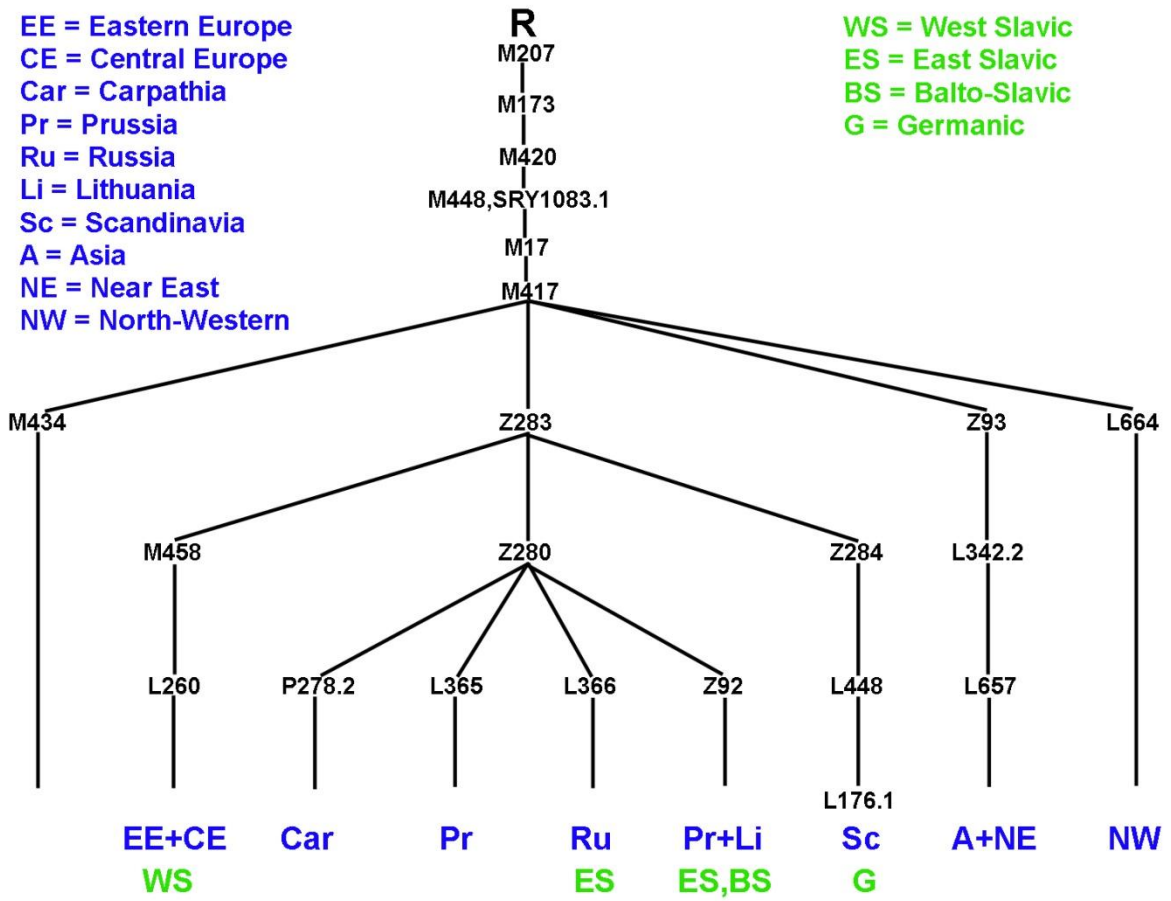
Conclusions:
The centre of gravity of haplogroup R1a in Finland is situated in Finnish-speaking Ostrobothnia (29 %) and to a lesser extent in Central and Norhtern Bothnia (21 %). Surprisngly, the percentage if lower (8 %) in Swedish-speaking Ostrobothnia.This may mean that the R1a-men of Ostrobothnia represent two layers of newcomers: those representing the older layer of newcomers from Scandinavia hava already shifted their language from a Scandinavian language to Finnish. The Swedish-speaking Ostrobothnians have not yet shifted their language.

6a. Subclades and SNP-mutations of haplgroup R1a.

Red: Mutations included in the tree below.

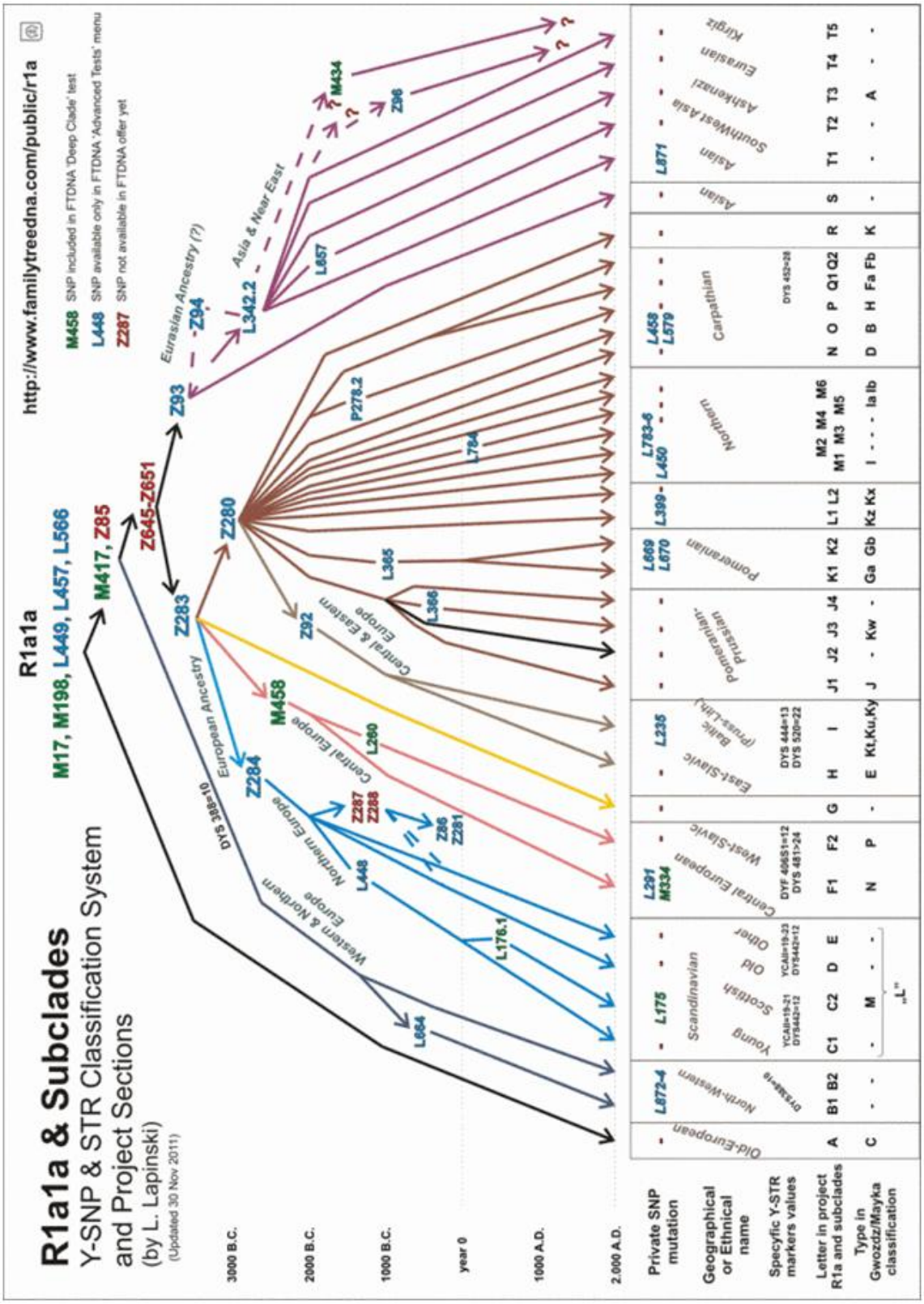
R M207/Page37/UTY2, P224, P227, P229, P232, P280, P285, S4, S9
• R* -
• R1 M173/P241/Page29, M306/S1, P225, P231, P233, P234, P236, P238, P242, P245, P286, P294
• • R1* -
• • R1a L62/M513, L63/M511, L145/M449, L146/M420
• • • R1a* -
• • • R1a1 *L120/M516*, L122/M448, M459, Page65.2/SRY1532.2/SRY10831.2
• • • • R1a1* -
• • • • R1a1a L168, *L449*, M17, M198, M512, M514, M515
• • • • • R1a1a* -
• • • • • R1a1a1 *L457*, M417, Page7
• • • • • • R1a1a1* -
• • • • • • R1a1a1a *M56*
• • • • • • R1a1a1b *M157.1*
• • • • • • R1a1a1c M64.2/Page44.2, M87, M204
• • • • • • R1a1a1d P98
• • • • • • R1a1a1e *PK5*
• • • • • • R1a1a1f M434
• • • • • • R1a1a1g Z283
• • • • • • • R1a1a1g* -
• • • • • • • R1a1a1g1 M458
• • • • • • • • R1a1a1g1* -
• • • • • • • • R1a1a1g1a *M334* (position relative to L260 uncertain)
• • • • • • • • R1a1a1g1b L260
• • • • • • • R1a1a1g2 Z280
• • • • • • • • R1a1a1g2* -
• • • • • • • • R1a1a1g2a P278.2
• • • • • • • • R1a1a1g2b L365
• • • • • • • • R1a1a1g2c L366
• • • • • • • • R1a1a1g2d Z92
• • • • • • • R1a1a1g3 Z284
• • • • • • • • R1a1a1g3* -
• • • • • • • • R1a1a1g3a L448
• • • • • • • • • R1a1a1g3a* -
• • • • • • • • • R1a1a1g3a1 L176.1/S179.1
• • • • • • • • • • R1a1a1g3a1* -
• &• • • • • • • • • R1a1a1g3a1a *L175*
• • • • • • R1a1a1h Z93
• • • • • • • R1a1a1h* -
• • • • • • • R1a1a1h1 L342.2
• • • • • • • • R1a1a1h1* -
• • • • • • • • R1a1a1h1a L657
• • • • • • R1a1a1i L664

6b. Relevant SNP-mutations in haplogroup R1a.
Haplogroups below M207 in the tree are: R1 (M173), Ra1 (M420), R1a1 (M448, SRY1081.2), R1a1a (M17), and R1a1a1 (M417).
The subhaplogroups below R1a1a1 (417) are in four layers:
(1) R1a1a1f (M434), R1a1a1g (Z283), R1a1a1h (Z83), and R1a1a1i (L664);
(2) R1a1a1g1 (M458), R1a1a1g2 (Z280), R1a1a1g3 (Z284), and R1a1a1h1 (L342.2);
(3) R1a1a1g1b (L260), R1a1a1g2a (P278.2), R1a1a1g2b (L365), R1a1a1g2c (L366), R1a1a1g2d (Z92), R1a1a1g3a (L448), and R1a1a1h1a (L657); and
(4) R1a1a1g3a1 (L176.1).
Blue: geographic areas
Green: linguistic groups



Conclusions:
About ten relevant SNP-suclades of R1a show positive correlation with geographic areas and languages. Roughly, there are five more or less distinct areas:
(1) Central Europe (M458), (2) Eastern Europe (Z280), (3) Scandinavia (Z284), (4) North-Western Europe (L664), (5) and Asia and Near East (Z93).
In Central Europe (M458) the main languages are West Slavic, those of Eastern Europe (Z280) are Balto-Slavic and East Slavic, those of Scandinavia (Z284) are North Germanic, those of North-Western Europe are Continental-Germanic, and those of Asia and Near East (Z93) are other languages.

7. Details of SNP-subclades of haplogroup R1a and its main STR-haplotypes.
Source: L. Lapinski

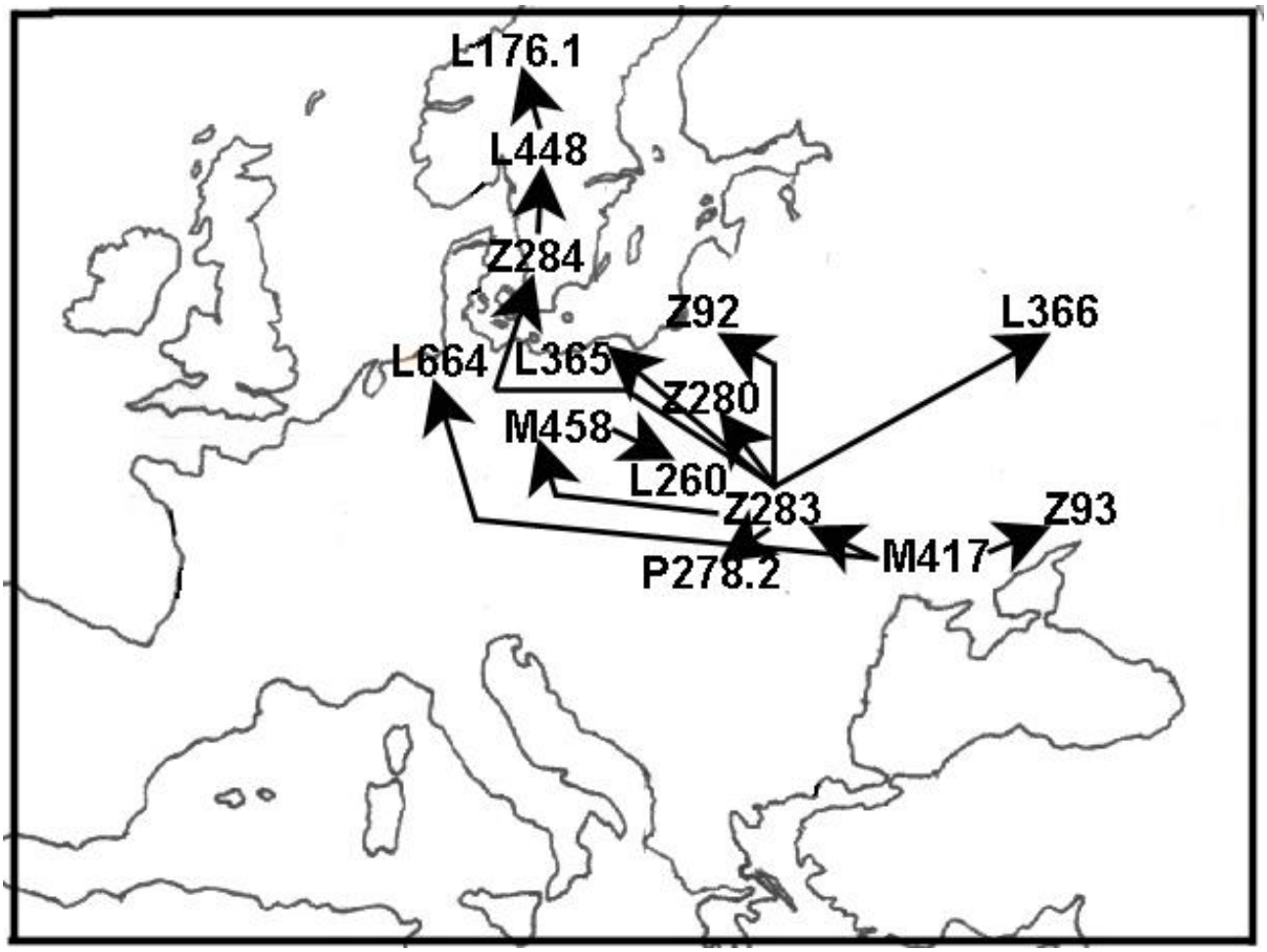


8. Main subclades and defining SNP-mutations of the subclades of haplogroup R1a. STS-types with some relevant DYS-values.

G-M types = types of Gwozdz-Mayka.

Group	Name of group	Symbol	SNP-mutations	G-M:n type	DYS-values
A	Old European	OE	M198+ ,M417-	Tyyppi C	DYS392=13
B1	North-Western	NW	L664+	Tyyppi -	DYS388=10
B2	North-Western	NW	L664-	Tyyppi -	DYS399=10
C1	Young Scandinavian	YS	Z284+,L448+	Tyyppi M	
C2-A	Scottish	YS	Z284+,L448+,L176+		
C2-B	Scottish	YS	Z284+,L448+,L176-		
D	Old Scandinavian		Z284+		
E	Other Scandinavian		Z284+		
F1	Central European	CE	M417+,M458+,L260-	Tyyppi N	
F1-B	Central European B		M417+,M458+,L260-		
F1-C	Central European C	Ns	M417+,M458+,L260-		
F2	West Slavic	WS	M417+,M458+,L260+	Tyyppi P	
F-2A	West Slavic A		M417+,M458+,L260-		
F2-B	West Slavic B (SE)		M417+,M458+,L260-		
G	?		Z283+,M458+,Z280-,Z284-		
H	East Slavic		Z280+,Z92	Tyyppi E	DYS447=25 DYS531=12&c
I1	Baltic	WEA	Z280+,Z92+	Tyyppi Ky	DYS444=13, DYS520=22&c
I2	Baltic	WEA	Z280+,Z92+	Tyypit Kt, Ku	DYS444=13 DYS520=22&c
J1	Pomer.-Prussian A	BC	Z280+	Tyyppi J	
J2	Pomer.-Prussian B	BC	Z280+(?)	Tyyppi J	
J3	Prussian	CEA	Z280+,L366+	Tyyppi Kw	
J4	Austro-Hungarian	BC	Z280+	Tyyppi -	
K1	Pomeranian	NE	Z280+,L365+	Type Ga	
K2	Pomeranian	NE	Z280+,L365+	Tyyppi Gb	
L1	?		Z280+	Tyyppi Kz	
L2	?		Z280+	Tyyppi Kx	
M1	Northern	NC	Z280+	Tyyppi I	
M2	Northern; NE-I	NC	Z280+,L784+	Tyyppi -	
M3	Northern NE-II	NC	Z280+	Tyyppi -	
M4	Northern; Eastern	NC	Z280+	Tyyppi -	
M5	Northern A	WEA	Z280+	Tyyppi Ia	
M6	Northern B	WEA	Z280+	Tyyppi Ib	
N	Carpathian I	BC	Z280+	Tyyppi D	
O	Carpathian II	WEA-2	Z280+	Tyyppi B	
P	Carpathian III		Z280+,P278.2+	Tyyppi H	
Q1	Carpathian IV		Z280+	Tyyppi Fa	
Q2	Carpathian IV		Z280+	Tyyppi Fb	
R	?		Z280+		
S	C&SW Asian		Z93+		
T	C&SW Asian		L342+		
T1	C&SW Asian		Z93+, L342+, L657-		
T2	C&SW Asian		Z93+, L342+, L657+		
T3	Ashkenazi-Levite	AJ	Z93+, L342+, L657-	Tyyppi A	
T4	Eurasian		Z93+, L342+, L657-		
T5	Central Asian		Z93+,Z94+,L342+, L871, L657-		

9. Essential SNP-subclades of R1a and their assumed migration routes.



M417 = R1a1a1 = Old European.
L176.1= R1a1a1j/k = Scandinavian or Scandinavian-Scottish.
L260 = R1a1a1g2 = Central-European and West-Slavic; type P,
L448 = R1a (Private SNPs) Young Scandinavian.
L342.2 = R1a1a1h1 = Cetral and Sout-Western Asian, Ashkenazi-Levitian, Eurasian perhaps Jewish-Hebrew.
L357 = ??
L365 = R1a1a1i2 = Pommerian, type Ga.
L366 = R1a1a1i3 = Prussian; type Kw.
L384 = R2 (Private SNPs)
L657 = R1a1a1h1a = Central and Soth-Western Asian.
L664 (DYS388 = 10) = North West European (DYS388 = 10).
L669 L670 = subclade of Pommerian
L784 = North European, I and II of North Western group, Eastern group.

L871 = Cantral Asian.
M458 = R1a1a1g = Central European and Wets Slavic.
P276.2 = group III of Carpathia, type B.
Z92 = East Slavic (DYS447=25, DYS531=12&c) and Baltic (DYS444=13, DYS522=22&c).
Z93 = R1a1a1h = Asian or Central and Southwest Asian; ancestral mutation for M458, Z280 and Z284 clades.
Z280 = R1a1a1i = Central European; Pommerian-Prussian, Austrian-Hungarian, North European (= Northern), Carpathian.
Z283 = ??,
Z284 = Old Scandinavian, Other Scandinavian) and Scottish.
P278.2 = R1a1a1a = Carpathian.

10. Central regions and times of emergence of some subclades of R1a.
Source: International Y-DNA Project (internet).

No.	Name	BP	Central area	DNA
1	**Northern European**	2700	North- Polabnd	
2	**Central European 1**	2700	Czech+Danube	M458
3	**Central European 1a**	2400	Poland+Germany	DYS464=12-12-15-15-15-16
4	**Central European 1b**	2200	Poland+Germany	DYS454=12-15-15-16
5	**Ashkenazi Jewish**	1100	Soth-Germany	
6	**Central Eurasian**	4700	Indostan, Andronovo culture	
7	**Northern Eurasian**	2100	Russia+Belarus	
8	**Western Carpathian**	1975	South-Poland+Czech	
9	**Young Scandinavian**	2225	South-Norway	
10	**Northern Carpathian**	2550	Poland	
11	**Baltic-Carpathian**	3225	Latvia	
12	**Eastern Eurasian 1**	4500	Eastern Eurasia?	
13	**Eastern Eurasian 1a**	1000	Kirgisia	
14	**North-Western 1**	4100	North-Germany	DYS388=10
15	**North-Western 1a**	1125	South-Norway	DYS388=10
16	**North-Western 1b**	2975	Dewnmark+Britain	DYS388=10
17	**North-Western 1c**	1975	Britain	DYS388=10
18	**Western Eurasian 1**	3800	Poland+Britain	
19	**Western Eurasian 1a**	2600	Poland+Britain	
20	**Western Eurasian 1b**	1700	Poland	
21	**Old European 1**	7000	Germany+Britain	
22	**Old European 1a**	2150	South-Germany	DYS392=13
23	**Old European 1b**	?	Britain	R1a*: SRY10831.2 + ,M17-
24	**Scandinavian Q**	2150	West Sweden, Asia+America	Haplogroup Q

Conclusions:

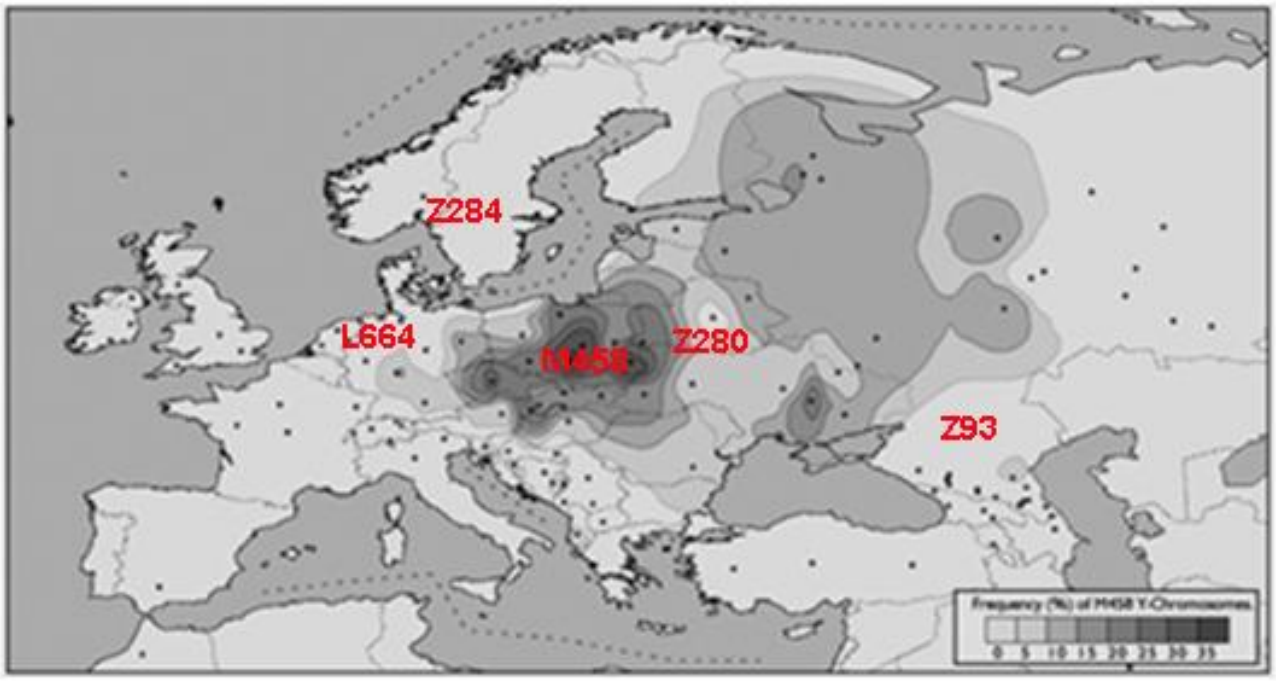
According to the International Y-DNA Project, times of emergence of the oldest subgroups and their areas are as follows:

Old European 1	7000 BP	Germany-Britain
Central Eurasian	4700 BP	Indostan, Andronovo culture
Eastern Eurasian 1	4500 BP	Eastern Eurasia?
North-Western 1	4100 BP	North-Germany
Western Eurasian 1	3800 BP	Poland-Britain
Baltic-Carpathian	3225 BP	Latvia

11. Geographic distribution of subclade M458, and central areas of the four other subcldaes of R1a.

Main source: Underhill et al. 2009.

Dark areas: Haplotype M458. Four other haplotypes are seen as light areas.



Conclusions:

The subclades of haplogroup R1a form five centers. The main subclade is M458 in Poland and Belarus. The other subclades are Z284 in Scandinavia, L664 in South-West Europe, Z280 in Eastern Russia, and Z93 in Asia and South-East Europe.

12a. Most frequent alleles in the twelve marker pannel of FTDNA Project.

Light grey: one step from R1a-modal in the more common direction; dark grey: two steps from modal in the more common direction; brown: one step from modal in the less common direction.

	Area/Population	393	390	19	391	385 a	385 b	426	388	439	389-1	392	389-2	n
	R1a-modal	13	25	16	11	11	14	12	12	10	13	11	30	
1	India etc.	13	25	15,16	10	11	14	12	12	10	13	11	31	118
2	Poland	13	25	16	10	11	14	12	12	10	13	11	30	846
2-1	Po1 (P)	13	25	17	10	10	14	12	12	10	13	11	30	132
2-2	Pol2 (K)	13	25	16	11	11	14	12	12	10	13	11	30	107
2-3	Pol3(E)	13	25	16	11	11	15	12	12	10	13	11	30	34
2-4	Pol4 (N)	13	25	16	10	11	14	12	12	11	13	11	30	79
2-5	Pol5 (A)	13	25	16	10	11	14	12	12	10	13	11	30	27
2-6	Pol6 (I)	13	25	17	11	11	14	12	12	10	13	11	30	20
2-7	Pol7 (G)	13	25	15	11	11	14	12	12	10	13	11	30	20
2-8	Pol8 (B)	13	25	16	11	11	14	12	12	10	14	11	31	13
3	Czech	13	25	16	10	11	14	12	12	11	13	11	30	89
4	Slovakia	13	25	16	10	11	14	12	12	10	13	11	30	52
5	Hungary	13	25	16	11	11	14	12	12	10	13	11	30,31	58
6	Romania	13	25	16	10	11	14	12	12	10	13	11	30	14
7	Latvia	13	25	16	10	11	14	12	12	10	13	11	30	79
8	Lithuania	13	25	16	10	11	14	12	12	10	13	11	30	132
9	Belarus	13	25	16	11	11	14	12	12	10	13	11	30	6
10	Russia	13	25	16	11	11	14	12	12	10	13	11	30	210
10-1	Rus1 (Veneds)	13	25	16	11	11	15	12	12	11	13	11	30	24
10-2	Rus2 (Ants)	13	25	16	10	11	14	12	12	11	13	11	29	35
10-3	Rus3 (Sclav)	13	25	17	10	10	14	12	12	10	13	11	30	16
10-4	Rus4 (Sarm)	13	25	16	11	11	14	12	12	10	13	11	30	13
11	Ukraine	13	25	16	10	11	14	12	12	10	13	11	30	22
12	Finland	13	25	15	11	11	14	12	12	10	13	11	30	44
12-1	West-Fi	13	25	15	11	11	14	12	12	11	13	11	30	20
12-2	Eas-Fi	13	25	16	11	11	14	12	12	10	13	11	30	24
13	Norway	13	25	15	11	11	14	12	12	10	13	11	31	75
13-1	Nor1 (YSc)	13	25	16	11	11	14	12	12	11	13	11	29	33
13-2	Nor2 (OSc)	13	25	15	11	11	14	12	12	10	14	11	30,31	37
14	Scotland	13	24	15	11	11	14	12	12	10	13	11	31	193
15	Irland	13	25	15	11	11	14	12	12	10	13	11	30	115
16	Devon	13	25	15	10	11	14	12	12	11	13	11	29	8
17	Sweden	13	25	16	11	11	14	12	12	10	13	11	30	34
18	Denmark	13	25	15	11	11	14	12	12	10	13	11	30	30
19	Germany	13	25	16	10	11	14	12	12	10	13	11	30	165
20	Fla-Fle	13	24	15,16	10	11	14	12	12	10	13	11	30	8

Conclusions: Many populations geographically far from each other are identical in relation to their twelve marker alleles. So for example, five population (Poland2, Belarus, Russia4, East-Finland and Sweden) are identical with the R1a-modal. This tends to show that the twelve marker panel is not sufficient to differentiate populations efficiently.

12b. Most frequent alleles in the thirteen ”critical” markers of the FTDNA Project.

Light grey: one step from R1a-modal in common direction; dark grey: two steps from modal in common direction; brown: one step from modal in exceptional direction.

Nro	Area/Population	19	391	439	389-1	389-2	447	YCAIIb	442	537	406	594	481	565
0	R1a-modal	16	11	10	13	30	23	23	14	12	11	10	23	13
1	India etc.	15,16	10	10	13	31	24	23	14	12	11	10	23	13
2	Poland	16	10	10	13	30	x	23	x	x	x	10	x	13
2-1	Po1 (P)	17	10	10	13	30	23	23	13	12	12	10	25	13
2-2	Pol2 (K)	16	11	10	13	30	24	23	12	12	12	10	23	13
2-3	Pol3(E)	16	11	10	13	30	25	23	14	12	11	10	23	13
2-4	Pol4 (N)	16	10	11	13	30	23	23	14	11	12	10	25	13
2-5	Pol5 (A)	16	10	10	13	30	24	23	14	12	11	10	23	13
2-6	Pol6 (I)	17	11	10	13	30	24	23	14	12	11	10	23	13
2-7	Pol7 (G)	15	11	10	13	30	23	23	14	12	11	10	24	13
2-8	Pol8 (B)	16	11	10	14	31	24	23	12	12	10	10	23	13
3	Czech	16	10	11	13	30	23	23	14	12	12	10	23	13
4	Slovakia	16	10	10	13	30	24	23	14	12	12	10	23	13
5	Hungary	16	11	10	13	30,31	24	23	13	12	11	10	23	13
6	Romania	16	10	10	13	30	24	23	13	12	11	10	23	13
7	Latvia	16	10	10	13	30	24	23	14	12	11	10	23	13
8	Lithuania	16	10	10	13	30	24	23	14	12	11	10	23	13
9	Belarus	16	11	10	13	30	24	23	13	12	11	10	23	13
10	Russia	16	11	10	13	30	x	23	x	12	x	10	23	13
10-1	Rus1 (Veneds)	16	11	11	13	30	25	23	13	12	11	10	23	13
10-2	Rus2 (Ants)	16	10	11	13	29	23	23	14	11	12	10	25	13
10-3	Rus3 (Sclav)	17	10	10	13	30	23	23	14	11	12	10	25	12
10-4	Rus4 (Sarm)	16	11	10	13	30	24	23	12	12	10	10	22	13
11	Ukraine	16	10	10	13	30	23	23	12	11	11	10	23	13
12	Finland	15	11	10	13	30	23	23	12	12	11	10	23	13
12-1	West-Fi	15	11	11	13	30	23	23	12	12	11	10	23	13
12-2	Eas-Fi	16	11	10	13	30	23	23	14	12	11	10	23	13
13	Norway	15	11	10	13	31	23	21	12	12	11	11	23	12
13-1	Nor1 (YSc)	16	11	11	13	29	24	23	12	12	11	11	25	12
13-2	Nor2 (OSc)	15	11	10	14	30,31	23	21	12	12	11	11	23	12
14	Scotland	15	11	10	13	31	23	21	12	12	11	11	23	12
15	Irland	15	11	10	13	30	23	21	12	12	11	11	23	12
16	Devon	15	10	11	13	29	23	23	12	12	11	10	23	13
17	Sweden	16	11	10	13	30	23,24	23	12	12	11	11	23	13
18	Denmark	15	11	10	13	30	23,24	23	13	12	11	10	23	12
19	Germany	16	10	10	13	30	23	23	14	12	11	10	23	13
20	Fla-Fle	15,16	10	10	13	30	24	23,24	12	11	11	10	23	13

Conclusions:

The thirteen ”critical” markers are efficient in differentiating populations from each other. The only population with identical alleles with R1a modal is East-Finland.

13. Genetic distances between the R1a-men of various populations.

Numbering of populations (top line and rightmost column) same as in the Tables.

Grey: Western and Eastern Finns.

Green: ”genetically close to each other”: distance = 4 or less.

Pink: ”genetically far from each other”: distance = 5 or more.

	1	**2**	**2-1**	**2-2**	**2-3**	**2-4**	**2-5**	**2-6**	**2-7**	**2-8**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**10-1**	**10-2**	**10-3**	**10-4**	**11**	**12**	**12-1**	**12-2**	**13**	**13-1**	**13-2**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	
0	3.5	x	6	4	2	6	2	2	2	6	3	3	2.5	3	2	2	2	x	4	7	6	5	4	3	4	0	7	9	8.5	8	7	6	3.5	3.5	1	6	**0**
0		x	7.5	5.5	3.5	5.5	1.5	3.5	4.5	5.5	4.5	2.5	3	2.5	1.5	1.5	3.5	x	5.5	8.5	8.5	6.5	5.5	5.5	6.5	3.5	8.5	10.5	10	8.5	8.5	5.5	6	5	2.5	5	**1**
		0	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	**2**
			0	6	8	4	6	6	6	10	5	5	6.5	5	6	6	6	x	8	5	3	9	6	7	8	6	12	9	11.5	12	11	8	7.5	7.5	5	8	**2-1**
				0	4	8	4	4	6	6	5	3	2.5	3	4	4	2	x	3	9	9	3	4	3	4	4	8	7	8.5	8	7	5	4.5	4.5	5	4	**2-2**
					0	8	2	2	4	6	5	3	2.5	3	2	2	2	x	2	9	9	5	6	5	6	2	10	9	10.5	10	9	8	4.5	4.5	3	6	**2-3**
						0	6	8	6	11	11	5	8.5	7	6	6	8	x	8	1	3	11	6	9	8	6	14	9	14.5	14	13	8	9.5	9.5	5	8	**2-4**
							0	6	8	6	3	1	2.5	1	0	0	2	x	4	7	7	6	4	5	6	2	10	9	10.5	10	9	6	4.5	4.5	1	4	**2-5**
								0	4	6	5	3	2.5	3	2	2	2	x	4	8	7	5	6	5	6	2	10	9	9.5	10	9	8	4.5	3.5	3	6	**2-6**
									0	8	5	5	4.5	5	4	4	4	x	6	7	7	7	6	3	4	2	8	9	8.5	8	7	6	5.5	3.5	3	7	**2-7**
										0	9	7	3.5	5	6	6	4	x	6	13	12	3	6	5	6	6	8	9	7.5	8	9	7	4.5	6.5	7	6	**2-8**
											0	2	5.5	4	3	3	5	x	5	4	6	8	5	6	5	3	11	10	11.5	11	10	5	7.5	6.5	2	7	**3**
												0	3.5	2	1	1	3	x	5	6	6	6	5	6	7	3	11	10	11.5	11	10	7	5.5	5.5	2	4	**4**
													0	1.5	2.5	2.5	0.5	x	2.5	9.5	9.5	3.5	4.5	3.5	4.5	2.5	7.5	7.5	8	7.5	7.5	5.5	3	3	3.5	4.5	**5**
														0	1	1	1	x	3	8	8	4	3	4	5	3	9	8	9.5	9	8	5	3.5	3.5	2	3	**6**
															0	0	2	x	4	7	7	5	4	5	6	2	10	8	10.5	10	9	6	4.5	4.5	1	4	**7**
																0	2	x	4	7	7	5	4	5	6	2	10	9	10.5	10	9	6	4.5	4.5	1	4	**8**
																	0	x	2	9	9	3	4	3	4	2	6	7	8.5	8	7	5	2.5	2.5	3	4	**9**

0	1	2	2-1	2-2	2-3	2-4	2-5	2-6	2-7	2-8	3	4	5	6	7	8	9	10	10-1	10-2	10-3	10-4	11	12	12-1	12-2	13	13-1	13-2	14	15	16	17	18	19	20	
																		0	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	**10**
																			0	9	11	5	6	5	4	4	10	7	10.5	10	9	6	4.5	3.5	4	6	**10-1**
																				0	4	12	7	10	9	7	15	8	15.5	15	14	8	10.5	10.5	6	9	**10-2**
																					0	12	7	10	11	7	13	10	13.5	12.5	12	11	10.5	8.5	6	9	**10-3**
																						0	5	4	5	5	9	8	9.5	9	8	7	3.5	5.5	6	5	**10-4**
																							0	3	4	4	8	9	8.5	8	7	4	3.5	5.5	3	3	**11**
																								0	1	3	5	8	5.5	5	4	3	2.5	2.5	4	6	**12**
																									0	4	6	5	6.5	6	5	2	3.5	3.5	5	5	**12-1**
																										0	8	9	8.5	8	7	6	3.5	3.5	1	6	**12-2**
																											0	9	1.5	0	1	7	5.5	5.5	9	8	**13**
																												0	9.5	9	8	8	5.5	7.5	10	9	**13-1**
																													0	1.5	1.5	8	6.5	6	9.5	8.5	**13-2**
																														0	1	7	5.5	5.5	9	7	**14**
																															0	7	4.5	4.5	8	6	**15**
																																0	5.5	5.5	5	5	**16**
																																	0	4.5	4.5	5.5	**17**
																																		0	4.5	5.5	**18**
																																			0	5	**19**
																																				0	**20**

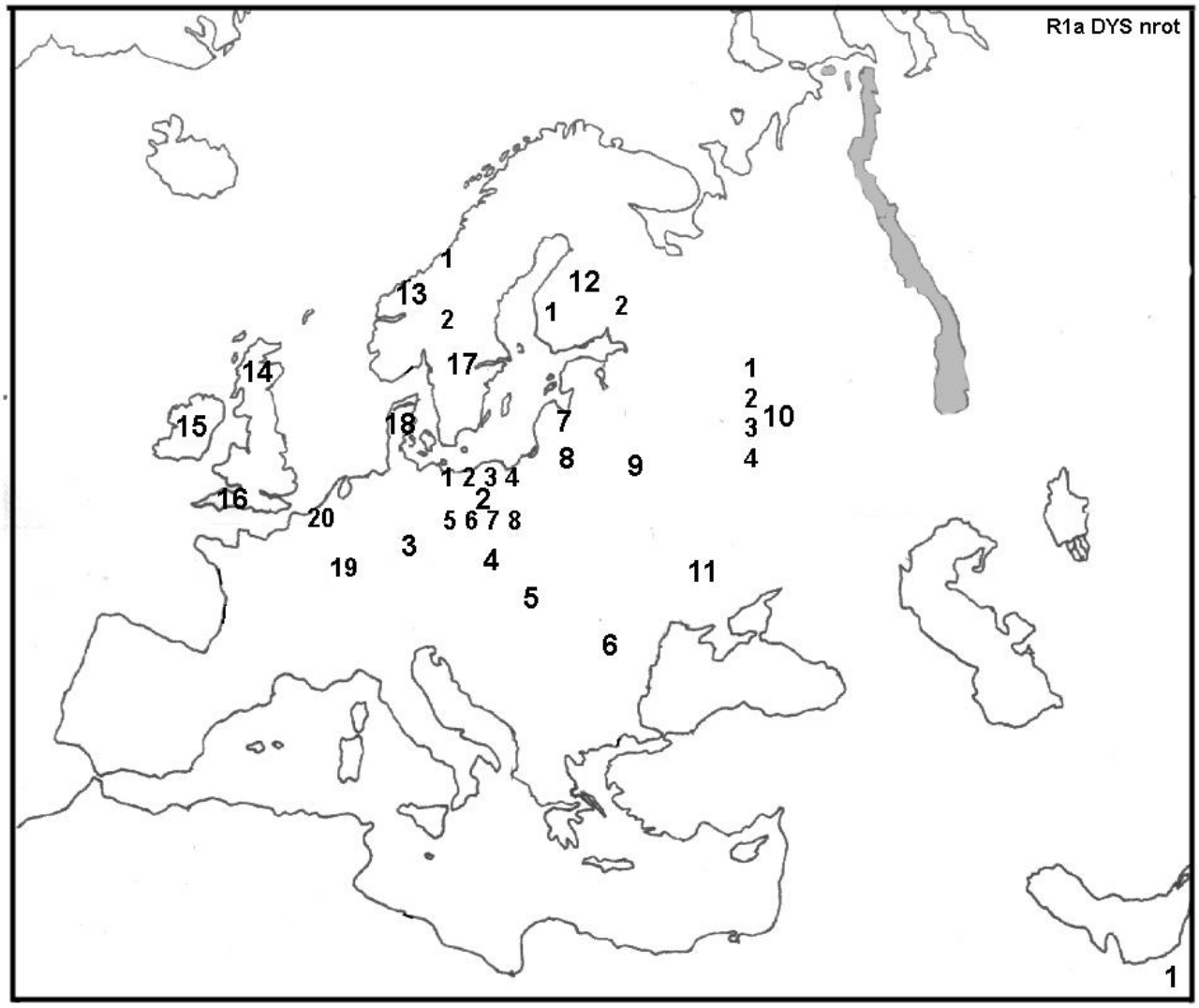
Conclusions:

(1) **Eastern Finns** are ”genetically close” to the following groups of populations:

(a) four Polish subclades: Poland3 (E), Poland5 (A), Poland6 (I), and Poland7 (G):
(b) Czechs and Slovakians;
(c) Latvians and Lithuanians;
(d) Belarussians.
These form a uniform area in Eastern Central Europe.
In addition, Eastern Finns are close to the Devonians of South-Western England, but the number of informants in this area is so low that the observation is not convincing. These observations tend to show that the Eastern Finnish R1a-men have come to Finland from Central Eastern Europe (Czech, Slovenia and parts of Poland) and they have used the Eastern route through Belarussia and Balticum to arrive in Finland.
(2) **Western Finns** are genetically close to two Polish subclades (Poland2 K and Poland7 G), the Belarussians, the Veneds of Russia, Ukranians and the Swedes and Danes (when the Finns total and the Davonians are nor considered). This tends to show that the Western Finns have come to Finland from Central and Eastern Europe (cf. the two Polish subclades, Belarusians, Veneds, and Ukrainians) and they have used (partly at least) the western route via Denmark and Sweden.

14. Map of the localities of the populations included in this study.

Four populations (Poland, Russia, Norway, and Finland) are devided in subgroups. These are marked with smaller numbers. Their localities in relation to the respective main population are abritrary (not geographically realistic).



Four populations (Poland, Russia, Norway, and Finland) are devided in subgroups. These are marked with smaller numbers. Their localities in relation to the respective main population are abritrary (not geographically realistic).

The eight Polish subclades 1-8 are in the following order in the Map:

E B G K

I N P A

The order of the Russian subclades 1-4 from the top to the bottom is Sarmathians, Veneds, Sclavs, Ants.

In Finland, Western Finns are No. 1 and Estern Finns No. 2.

In Norway, Young Scandinavian are No. 1 and Old Scandinavians No. 2.

15. Names, home places and alleles of the twelve marker panel of the R1a-men of FTDNA Finland Project.

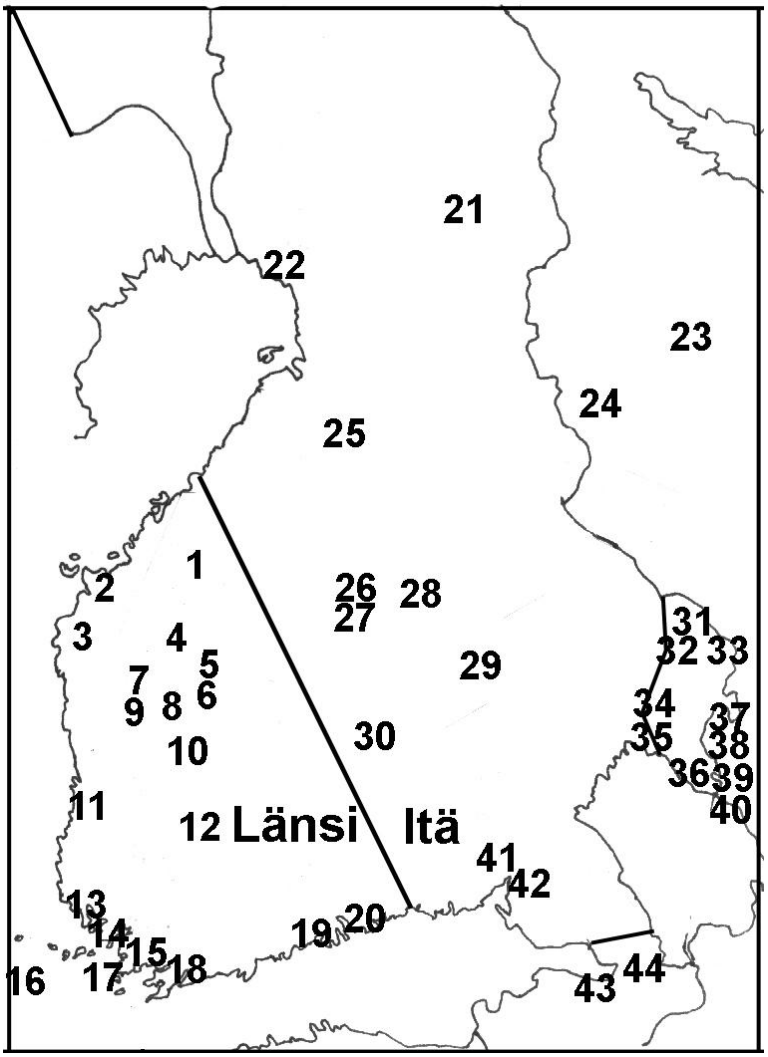
Länsi-Suomi

Nro	Kit	Kotipaikka	HR	393	390	19	391	385a	385b	425	388	439	389i	392	389ii
1	146498	Gustaf Forsman, b. 1841,Evijärvi, Finland	R1a1	13	25	16	11	11	14	12	12	11	13	11	29
2	200354	Abraham ähman,1734,Koivulahti,Mustasaari,Finland	R1a1a	13	25	15	10	10	15	12	12	10	13	11	30
3	N71085	Johannes Holm/Holmblad, b. 1890, Korsnäs, Finland	R1a1	13	25	15	11	11	14	12	12	11	13	11	29
4	146958	Matti Kalliokoski, b. 1774, Lapua Finland	R1a1a	13	24	15	11	11	14	12	12	11	13	11	31
5	177614	Heikki Juhonpoika Rasula 1746 Kuortane -1807 Kuort	R1a1a	13	24	15	11	11	14	12	12	11	13	11	30
6	211899	Erkki Yrjönpoika Mikkilä, n. 1690-1753, Kuortane	R1a1a	13	24	15	11	11	14	12	12	11	13	11	30
7	149642	Juho Hautamäki, 1844 - 1926,Ilmajoki,Finland	R1a1a	13	25	15	11	11	14	12	12	10	14	11	31
8	105382	Lauri Laurinpoika Saari, Alavus, Finland	R1a1a	13	24	15	11	11	14	12	12	11	13	11	31
9	197855	Isak Esanpoika Laturi, 22.7.1788,Kauhajoki,Finland	R1a1a	13	25	15	10	11	14	12	12	11	13	11	30
10	N31136	Johan Roth,1657-1714, Kihniö, Finland	R1a1a	13	25	14	11	11	14	12	12	11	14	11	31
11	N21908	Johan Andersson 1850(?) Nystad, Finland	R1a1a	13	24	15	11	11	15	12	12	10	13	11	30
12	N35124	Loimaa	R1a1a	13	25	15	11	11	14	12	12	10	14	11	31
13	66411	Kustavi, Finland	R1a1a	13	25	17	10	9	15	12	12	10	13	11	30
14	111750	Oskar Wilhelm, b 1884, Naantali, Finland	R1a1a	13	25	15	11	11	14	12	12	10	14	13	31
15	130729	Kustaa Antinpoika Kivikaski,1737-1812,Perniö,Finla	R1a1a	13	24	17	10	11	15	12	10	10	14	11	31
16	86160	Karlby,Kökar, Åland	R1a1a	13	24	15	10	11	14	12	12	11	14	11	31
17	N21632	Johan Eriksson 10.2.1758 Västerkalax,Korppoo,Suomi	**R1a1a1g**	13	25	16	10	11	14	12	12	11	13	11	31
18	N53880	Gustaf Hagström,1790,Snappertuna,TammisaariFinland	R1a1a	13	24	16	11	11	14	12	12	10	13	11	30
19	N37402	Helsinki	R1a1a	13	25	15	11	11	14	12	12	11	13	11	30
20	75319	Jacob Wahrmann, b.c. 1727, Porvoo	R1a1a	13	25	15	10	11	14	12	12	10	13	11	30
		Modaali		**13**	**25**	**15**	**11**	**11**	**14**	**12**	**12**	**11**	**13**	**11**	**30.31**

Itä-Suomi

Nro	Kit	Kotipaikka	HR	393	390	19	391	385a	385b	425	388	439	389i	392	389ii
21	184333	Pekka Heikinpoika Karjalainen 1662-1743,Posio,Finl	R1a1a1	13	25	16	11	11	14	12	12	10	13	11	30
22	N80214	Anders Luckarila,1772-1841,Kemi,Finland	R1a1a1	13	24	16	10	11	14	12	12	10	13	11	29
23	105959	Vasiljeff Jefim ba. 1838 Alajärvi Uhtua	R1a1a	13	25	16	11	11	15	12	12	10	13	11	30
24	196353	Lesonen Tero ba. 1820 Venehjärvi, Sudnozero	R1a1a	13	25	16	11	11	15	12	12	10	13	11	30
25	131978	Topi Saisa,1848, Launola, Pulkkila, Finland	R1a1	13	25	16	10	11	14	12	12	11	13	11	29
26	N21851	Carl Liimatainen,1810,Hannula,Liimattala,Kongink.	R1a1a	13	24	16	11	11	15	12	12	10	12	11	29
27	131259	Carl Liimatainen,1810,Hannula,Liimattala,Kongink	R1a1a	13	24	16	11	11	15	12	12	10	12	11	29
28	N18360	Kalle Liimatainen 19/11/1884 Mäntylä, Vesanto	R1a1a	13	24	16	11	11	15	12	12	10	12	11	29
29	N29496	Keman,b.1689,Leppävirta,Finland	R1a1a1	13	25	15	11	11	14	12	12	10	14	11	31
30	N25040	Suurola,Kangasniemi,Finland	R1a1a	13	25	15	11	11	15	12	12	10	14	13	31
31	N40501	Vasil son of Jeremei, b.c 1735, Suistamo, Finland	R1a1a	13	23	15	11	11	14	12	12	10	13	11	30
32	164489	Vasili, son of Jeremei,b.c 1735, Suistamo, Finland	R1a1a1	13	23	15	11	11	14	12	12	10	13	11	30
33	185863	Mitrofan Vasilievich,1736-1810,Suistamo,Finland -1	R1a1a	13	25	16	11	11	15	12	12	10	13	11	30
34	N29577	Olli Parviainen, b. 1877, Harlu, Finland-1939	R1a1a	13	23	15	11	11	15	12	12	10	13	11	29
35	184035	Ivan Jefiminpoika,Paussunselkä,Harlu,Finland - 1765	R1a1a	13	24	15	11	11	14	12	12	10	13	11	29
36	N26055	Nikolai Mylläri (ex Kordejeff),Salmi,Finland - 1939	R1a1a	13	24	15	11	11	14	12	12	11	13	11	30
37	163907	Ondrei Jacobsson Röppöin, born ca. 1670 lived Lunk	R1a1a	13	24	16	11	11	14	12	12	10	13	11	30
38	189857	Ondrei Jacobsson Röppöin died ca.1670 Lunkulansaar	R1a1a	13	25	16	11	11	14	12	12	10	13	11	30
39	114382	Konon Jevsejev, 1741-1811,Impilahti,Finland - 1939	R1a1a	13	25	16	11	11	16	12	12	10	13	11	30
40	205594	Filip Semenov, b. c. 1738, Pitkärannan piiri, Russ	R1a1a	13	25	15	10	12	14	12	12	10	14	11	30
41	107347	Semen Mordvintzev ,Viipuri, Finland circa 1850	R1a1a	13	24	16	11	11	13	12	12	11	13	11	30
42	114951	Olof Häkli, b.c.1497, Viipuri, Finland	R1a1a	13	25	16	11	11	15	12	12	10	13	11	30
43	185581	Gottfried Bock *1688 Inkeri, RUS, † 1764 Karleby	R1a1a	13	24	17	11	11	14	12	12	10	13	11	31
44	153126	Gottfried Bock,1688,Inkeri,Russia	R1a1a	13	25	17	11	11	14	12	12	10	13	11	31
		Modaali		**13**	**25**	**16**	**11**	**11**	**14**	**12**	**12**	**10**	**13**	**11**	**30**

16. Home places of the R1a-men of FTDNA Finland Project.



West-Finland (Länsi): 1 Evijärvi, 2 Mustasaari, 3 Korsnäs, 4 Lapua, 5 Kuortane a, 6 Kuortane b, 7 Ilmajoki, 8 Alavus, 9 Kauhajoki, 10 Kihniö, 11 Uusikaupunki, 12 Loimaa, 13 Kustavi, 14 Naantali, 15 Perniö, 16 Kökar, 17 Korppoo, 18 Tammisaari, 19 Helsinki, 20 Porvoo;
East-Finland (Itä): 21 Posio, 22 Kemi, 23 Uhtua, 24 Venehjärvi, 25 Pulkkila, 26 Konginkangas a, 27 Konginkangas b, 28 Vesanto, 29 Leppävirta, 30 Kangasniemi, 31 Suistamo a, 32 Suistamo b, 33 Suistamo c, 34 Harlu a, 35 Harlu b, 36 Salmi, 37 Lunkulansaari a, 38 Lunkulansaari b, 39 Impilahti, 40 Pitkäranta, 41 Viipuri a, 42 Viipuri b, 43 Inkari a, ja 44 Inkeri b.

17. Allelic differences between the two Finnish tribes in terms of the twelve marker pannel.

	393	390	19	391	385a	385b	426	388	439	389-1	392	289-2
West-Fi	13	25	15	11	11	14	12	12	11	13	11	30.31
East-Fi	13	25	16	11	11	14	12	12	10	13	11	30

18a. Genetic distances of two Finnish tribes from other populations in terms of the FTDNA twelve marker pannel.

Blue: two steps or less from Western Finns.
Red: one step or less from Eastern Finns.

Area/Population	West-Fin	Area/Population	East-Fin
R1a-modal	2	R1a-modal	0
India etc.	3	India etc.	2.5
Poland	3	Poland	1
Po1 (P)	5	Po1 (P)	3
Pol2 (K)	2	Pol2 (K)	0
Pol3(E)	3	Pol3(E)	1
Pol4 (N)	2	Pol4 (N)	2
Pol5 (A)	3	Pol5 (A)	1
Pol6 (I)	3	Pol6 (I)	1
Pol7 (G)	1	Pol7 (G)	1
Pol8 (B)	4	Pol8 (B)	2
Czech	2	Czech	2
Slovakia	3	Slovakia	1
Hungary	2.5	Hungary	0.5
Romania	3	Romania	1
Latvia	3	Latvia	2
Lithuania	3	Lithuania	1
Belarus	2	Belarus	0
Russia	3	Russia	1
Rus1 (Veneds)	2	Rus1 (Veneds)	2
Rus2 (Ants)	3	Rus2 (Ants)	3
Rus3 (Sclav)	5	Rus3 (Sclav)	3
Rus4 (Sarm)	2	Rus4 (Sarm)	0
Ukraine	3	Ukraine	1
Finland	1	Finland	1
West-Fi	0	West-Fi	2
Eas-Fi	2	Eas-Fi	0
Norway	2	Norway	2
Nor1 (YSc)	2	Nor1 (YSc)	2
Nor2 (OSc)	2.5	Nor2 (OSc)	2.5
Scotland	3	Scotland	3
Irland	1	Irland	1
Devon	2	Devon	4
Sweden	2	Sweden	0
Denmark	1	Denmark	1
Germany	3	Germany	1
Fla-Fle	3.5	Fla-Fle	1.5

Conclusion:

The twelve markers used do not seem to allow a reliable solution to the question ”Have the Finnish R1a-men come from the West or East?”

18b. Genetic distances of two Finnish tribes from other populations in terms of the thirteen ”critical” markers of FTDNA Project.

Blue: distance closer to Western Finns.

Red: distance closer to Eastern Finns.

	West-Fin		East-Fin
R1a-modal	4	**R1a-modal**	0
India etc.	6.5	**India etc.**	3.5
Poland	x	**Poland**	x
Po1 (P)	8	**Po1 (P)**	6
Pol2 (K)	4	**Pol2 (K)**	4
Pol3(E)	6	**Pol3(E)**	2
Pol4 (N)	8	**Pol4 (N)**	6
Pol5 (A)	6	**Pol5 (A)**	2
Pol6 (I)	6	**Pol6 (I)**	2
Pol7 (G)	4	**Pol7 (G)**	2
Pol8 (B)	6	**Pol8 (B)**	6
Czech	5	**Czech**	3
Slovakia	7	**Slovakia**	3
Hungary	4.5	**Hungary**	2.5
Romania	5	**Romania**	3
Latvia	6	**Latvia**	2
Lithuania	6	**Lithuania**	2
Belarus	4	**Belarus**	2
Russia	x	**Russia**	x
Rus1 (Veneds)	4	**Rus1 (Veneds)**	4
Rus2 (Ants)	9	**Rus2 (Ants)**	7
Rus3 (Sclav)	11	**Rus3 (Sclav)**	7
Rus4 (Sarm)	5	**Rus4 (Sarm)**	5
Ukraine	4	**Ukraine**	4
Finland	1	**Finland**	3
West-Fi	0	**West-Fi**	4
Eas-Fi	4	**Eas-Fi**	0
Norway	6	**Norway**	8
Nor1 (YSc)	5	**Nor1 (YSc)**	9
Nor2 (OSc)	6.5	**Nor2 (OSc)**	8.5
Scotland	6	**Scotland**	8
Ireland	5	**Irland**	7
Devon	2	**Devon**	6
Sweden	3.5	**Sweden**	3.5
Denmark	3.5	**Denmark**	3.5
Germany	5	**Germany**	1
Fla-Fle	5	**Fla-Fle**	6

Conclusions:

The thirteen ”critical” markers used for the Table seem to give a reliable answer to the question ”Have the Finnish R1a-men come from the West or East?”

(1) **Western Finns** are genetically close to the Norwegian populations (Young Scandinavians and Old Scandinavians) and also to the areas of strong Viking influence in the British Isles and North-Western Continent (Scotland, Ireland, and Fanders-Flemish). This may mean that the Western Finnish R1a-men have arrived in Finland mainly from Scandinavia.

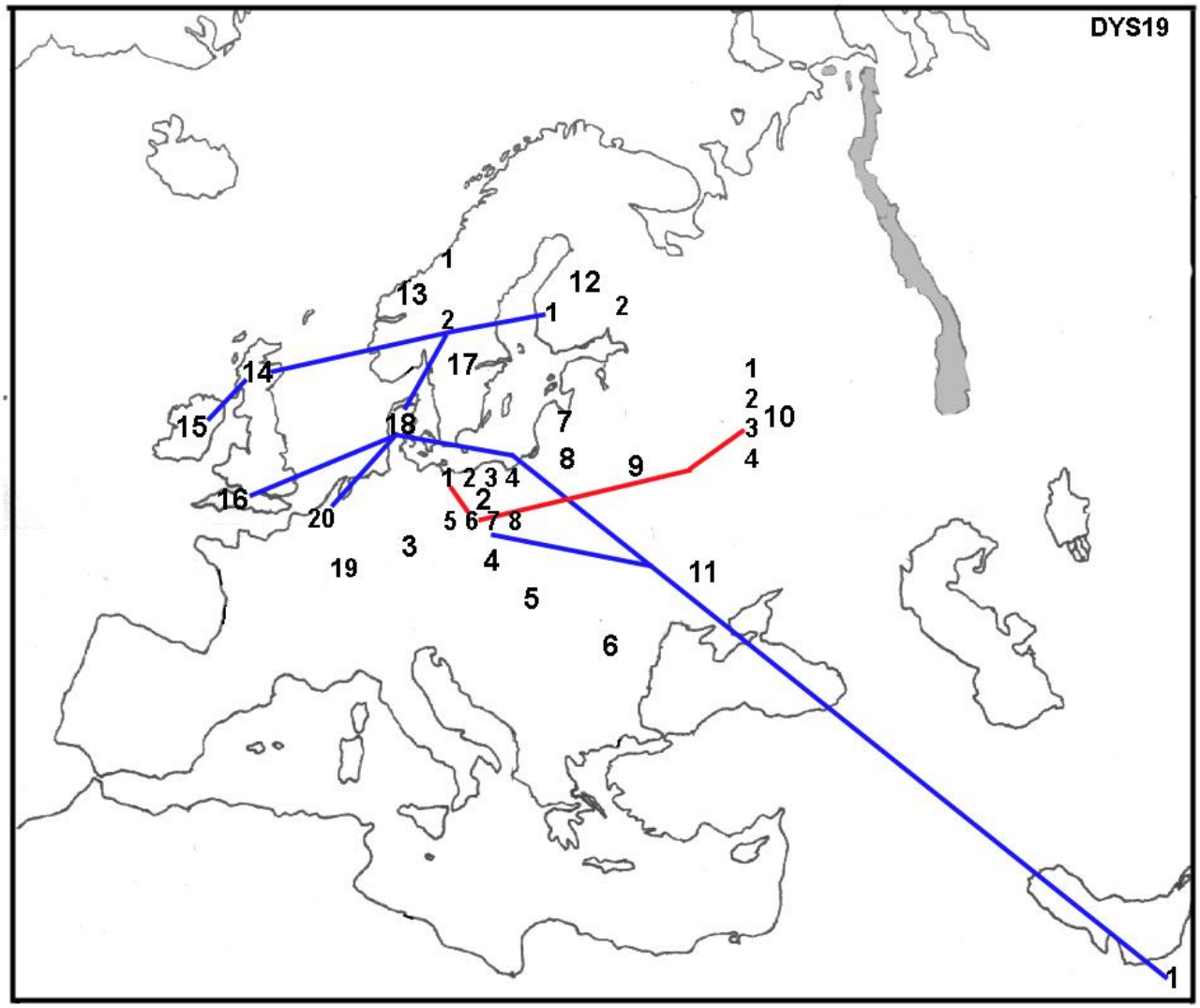
(2) **Eastern Finns** are genetically close to many East-European populations in Poland, Czech, Slovakia, Latvia, Lithuania, Belarus and Russia, and also to the Western Central European speaking the Germanic languge. This may mean that the Eastern Finns have arrived in Finland from Central Europe via the Eastern route.

19a. Frequencies of the alleles of DYS19 in R1a-men.

Grey: most frequent allele.

DYS19	Area/Population	13	14	15	16	17	18	n
1	**India etc.**	0.4	1.7	**45.8**	**45.8**	5.9	-	118
2	**Poland**	-	0.1	22.5	**51.9**	25.2	0.4	846
2-1	**Po1 (P)**	-	-	1.5	24.2	**73.0**	1.5	137
2-2	**Pol2 (K)**	-	-	18.9	**58.9**	20.0	2.7	75
2-3	**Pol3(E)**	-	-	29.4	**70.6**	-	-	34
2-4	**Pol4 (N)**	-	-	24.7	**72.8**	2.7	-	81
2-5	**Pol5 (A)**	-	-	7.4	**81.5**	11.1	-	27
2-6	**Pol6 (I)**	-	-	-	5.0	**90.0**	5.0	20
2-7	**Pol7 (G)**	-	15.0	**60.0**	25.0	-	-	20
2-8	**Pol8 (B)**	-	-	-	**92.3**	8.0	-	13
3	**Czech**	-	-	35.2	**36.4**	28.4	-	88
4	**Slovakia**	-	-	19.6	**46.7**	33.6	-	107
5	**Hungary**	-	-	26.8	**57.1**	16.1	-	56
6	**Romania**	-	-	21.4	**64.3**	14.3	-	14
7	**Latvia**	-	-	40.0	**50.0**	10.0	-	20
8	**Lithuania**	-	-	40.6	**50.0**	9.4	-	32
9	**Belarus**	-	-	18.2	**72.7**	9.1	-	11
10	**Russia**	-	0.6	25.3	**58.4**	15.7	-	166
10-1	**Rus1 (Veneds)**	-	-	29.2	**70.8**	-	-	24
10-2	**Rus2 (Ants)**	-	-	44.0	**52.0**	4.9	-	25
10-3	**Rus3 (Sclav)**	-	-	12.5	31.3	**56.3**	-	16
10-4	**Rus4 (Sarm)**	-	-	-	**92.9**	7.1	-	14
11	**Ukraine**	-	-	36.4	**50.0**	13.6	-	22
12	**Finland**	-	2.4	**45.9**	41.2	10.6	-	85
12-1	**West-Fi**	-	5.0	**65.0**	20.0	10.0	-	20
12-2	**Eas-Fi**	-	-	33.3	**58.3**	8.3	-	24
13	**Norway**	-	-	**71.8**	25.4	2.8	-	71
13-1	**Nor1 (YSc)**	-	-	33.3	**53.3**	13.3	-	15
13-2	**Nor2 (OSc)**	-	-	**94.6**	5.4	-	-	37
14	**Scotland**	-	2.0	**66.8**	29.1	2.0	-	196
15	**Irland**	-	3.6	**65.2**	27.7	3.6	-	112
16	**Devon**	-	-	**62.5**	25.0	12.5	-	8
17	**Sweden**	-	9.1	30.3	**51.5**	6.1	3.0	33
18	**Denmark**	-	6.9	**48.3**	37.9	6.9	-	29
19	**Germany**	-	4.1	23.7	**48.5**	23.1	0.6	169
20	**Fla-Fle**	-	-	**37.5**	**37.5**	25.0	-	8

19b. Map of the distribution of the haplotypes of DYS19.
Red lines: DYS19 = 17; blue lines: DYS19 = 15. Unconnected: DYS19 = 16.

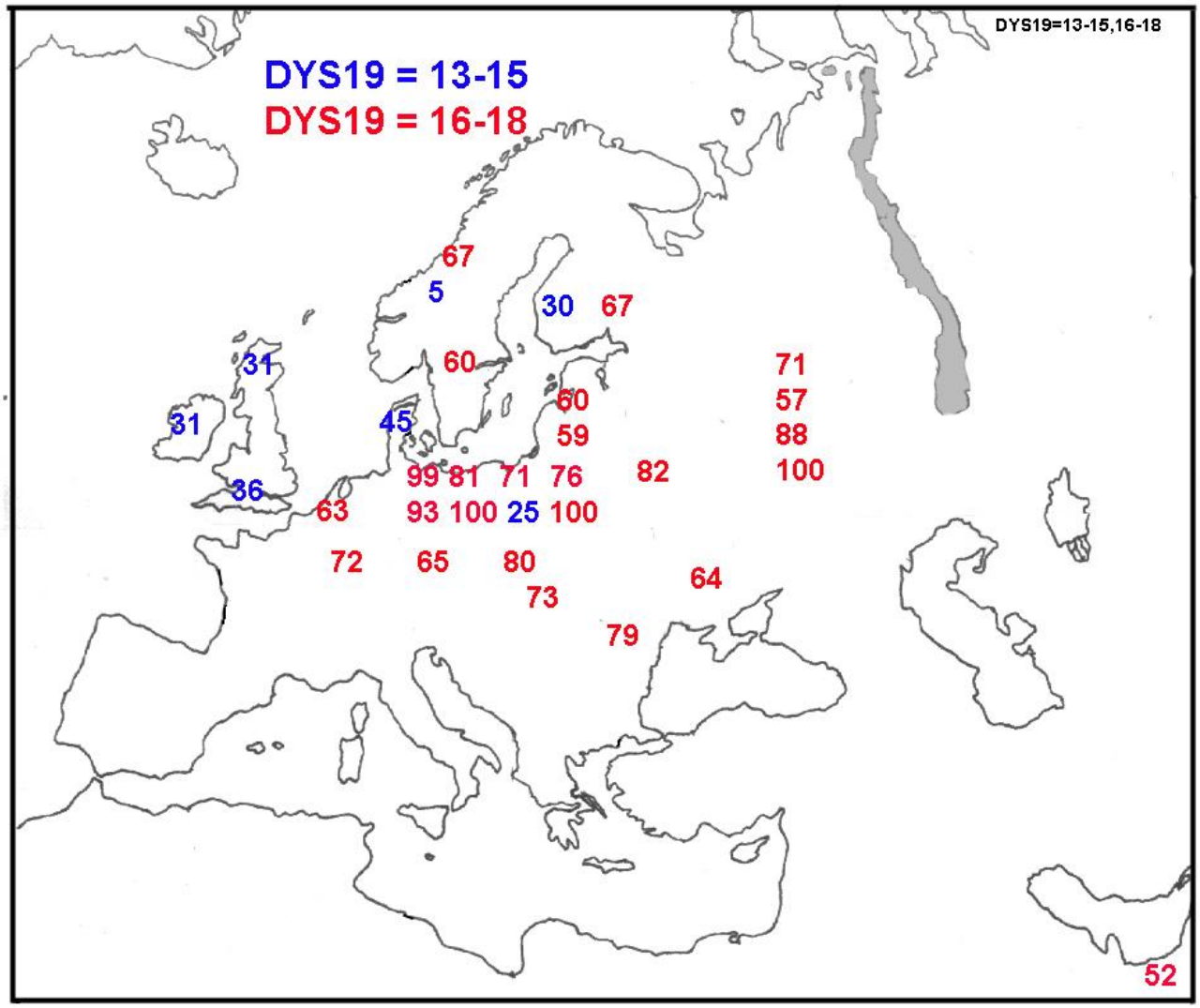


Conclusions:
On the basis of DYS19, R1a-men can be classified in three types:
(1) **DYS19 = 17** (red lines in the Map) in some areas of Russia and Poland (Sclavs and Poland 1 (P) and Poland 6 (I)).
(2) **DYS19 = 15** (blue lines) in some North-Western areas of Europe (Old Scandinavians, Scotland, Ireland, Devon, Denmark, Flanders-Flemish, and West-Finland), in one Polish area (Poland 7 = G) and in India.
(3**) DYS19 = 16** (unconnected in the Map) everywhere else, including, for example, most popualations in Central and Eastern Europe, Young-Scadinavians, Swedes, and Eastern Finns.
Wihin Finland, **DYS19 = 15** is typical in **Western Finland**, while **DYS19 = 16** is typical in **Eastern Finland**.

19c. Frequencies of alleles 13-15 versus 16-18 of DYS19 in R1a-men.
Grey: more frequent alleles.

DYS19	Area/Population	13-15	16-18
1	**India etc.**	47.9	**51.7**
2	**Poland**	22.6	**77.5**
2-1	**Po1 (P)**	1.5	**98.7**
2-2	**Pol2 (K)**	18.9	**80.6**
2-3	**Pol3(E)**	29.4	**70.6**
2-4	**Pol4 (N)**	24.7	**75.5**
2-5	**Pol5 (A)**	7.4	**92.6**
2-6	**Pol6 (I)**	-	**100.0**
2-7	**Pol7 (G)**	**75.0**	25.0
2-8	**Pol8 (B)**	-	**100.0**
3	**Czech**	35.2	**64.8**
4	**Slovakia**	19.6	**80.3**
5	**Hungary**	26.8	**73.2**
6	**Romania**	21.4	**78.6**
7	**Latvia**	40.0	**60.0**
8	**Lithuania**	40.6	**59.4**
9	**Belarus**	18.2	**81.8**
10	**Russia**	25.9	**74.1**
10-1	**Rus1 (Veneds)**	29.2	**70.8**
10-2	**Rus2 (Ants)**	44.0	**56.9**
10-3	**Rus3 (Sclav)**	12.5	**87.6**
10-4	**Rus4 (Sarm)**	-	**100.0**
11	**Ukraine**	36.4	**63.6**
12	**Finland**	48.3	**51.8**
12-1	**West-Fi**	**70.0**	30.0
12-2	**Eas-Fi**	33.3	**66.6**
13	**Norway**	**71.8**	28.2
13-1	**Nor1 (YSc)**	33.3	**66.6**
13-2	**Nor2 (OSc)**	**94.6**	5.4
14	**Scotland**	**68.8**	31.1
15	**Irland**	**68.8**	31.3
16	**Devon**	**62.5**	35.5
17	**Sweden**	39.4	**60.2**
18	**Denmark**	**55.2**	44.8
19	**Germany**	27.8	**72.2**
20	**Fla-Fle**	37.5	**62.5**

19d. Map of the distribution of alleles 13-15 and 16-18 of DYS19 in R1a-men.



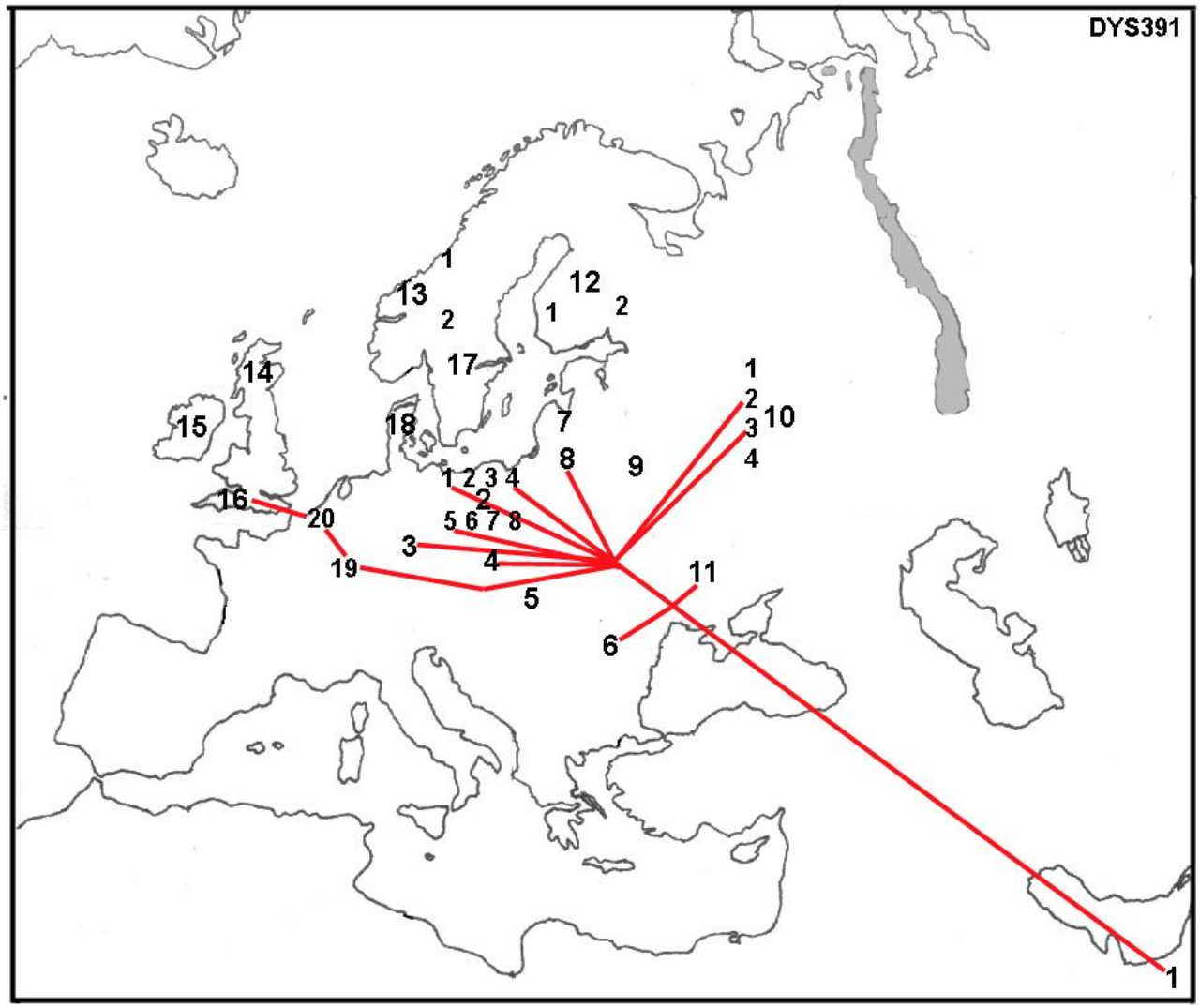
Coclusions:

In respect to DYS19, R1a-men form two categories, one with lower DYS values (13-15) and the other with higher DYS values (15-18). The figures of the Map show the percentages of DYS19=16-18. Red: allelesd 16-18 form the majority; blue: these allales form the minority. Lower alleles 15-18 are in majority in (a) the Old-Scandinavians, (b) the Viking influenced populations of Britain, (c) Danes, and (d) Western Finns. Higher alleles 16-18 are typical in the R1a-populations living in Continantal Europe. Easternn Finns belong to the latter type.

20a. Frequencies of the alleles of DYS391 in R1a-men.

DYS391	Area/Population	9	10	11	12	n
1	**India etc.**	16.7	**57.5**	40.0	0.8	120
2	**Poland**	0.5	**62.0**	36.6	0.9	855
2-1	**Po1 (P)**	0.7	**97.1**	2.2	-	136
2-2	**Pol2 (K)**	-	30.7	**61.3**	8.0	75
2-3	**Pol3(E)**	-	2.9	**97.1**	-	34
2-4	**Pol4 (N)**	1.2	**90.1**	8.6	-	81
2-5	**Pol5 (A)**	-	**100.0**	-	-	27
2-6	**Pol6 (I)**	-	15.0	**85**	-	20
2-7	**Pol7 (G)**	-	23.8	**76.2**	-	21
2-8	**Pol8 (B)**	-	15.4	**84.6**	-	13
3	**Czech**	-	**75.0**	25.0	-	76
4	**Slovakia**	-	**67.2**	32.8	-	64
5	**Hungary**	1.8	48.2	**50.0**	-	56
6	**Romania**	-	**100.0**	-	-	14
7	**Latvia**	-	**89.5**	10.5	-	19
8	**Lithuania**	-	**61.3**	38.7	-	31
9	**Belarus**	-	16.7	**83.3**	-	6
10	**Russia**	1.2	48.2	**49.4**	1.2	166
10-1	**Rus1 (Veneds)**	-	8.3	**91.7**	-	24
10-2	**Rus2 (Ants)**	-	**100.0**	-	-	25
10-3	**Rus3 (Sclav)**	-	**93.8**	6.3	-	16
10-4	**Rus4 (Sarm)**	-	14.9	**85.1**	-	14
11	**Ukraine**	-	**59.1**	40.9	-	22
12	**Finland**	-	34.9	**64.0**	1.2	86
12-1	**West-Fi**	-	26.7	**73.3**	-	15
12-2	**Eas-Fi**	-	22.2	**77.8**	-	18
13	**Norway**	-	14.3	**84.3**	1.4	70
13-1	**Nor1 (YSc)**	-	-	**100.0**	-	10
13-2	**Nor2 (OSc)**	-	11.1	**86.1**	2.8	36
14	**Scotland**	-	30.3	**68.6**	1.1	188
15	**Irland**	0.9	40.9	**53.0**	5.2	115
16	**Devon**	-	**75.0**	25.0	-	8
17	**Sweden**	-	37.1	**60.0**	2.9	35
18	**Denmark**	2.4	38.1	**57.1**	2.4	42
19	**Germany**	-	**68.3**	28.7	3.0	167
20	**Fla-Fle**	12.5	**87.5**	-	-	8

20b. Map of the distribution of the haplotypes of DYS391.
Red lines: DYS391 = 10; unconnected: DYS391 = 11.

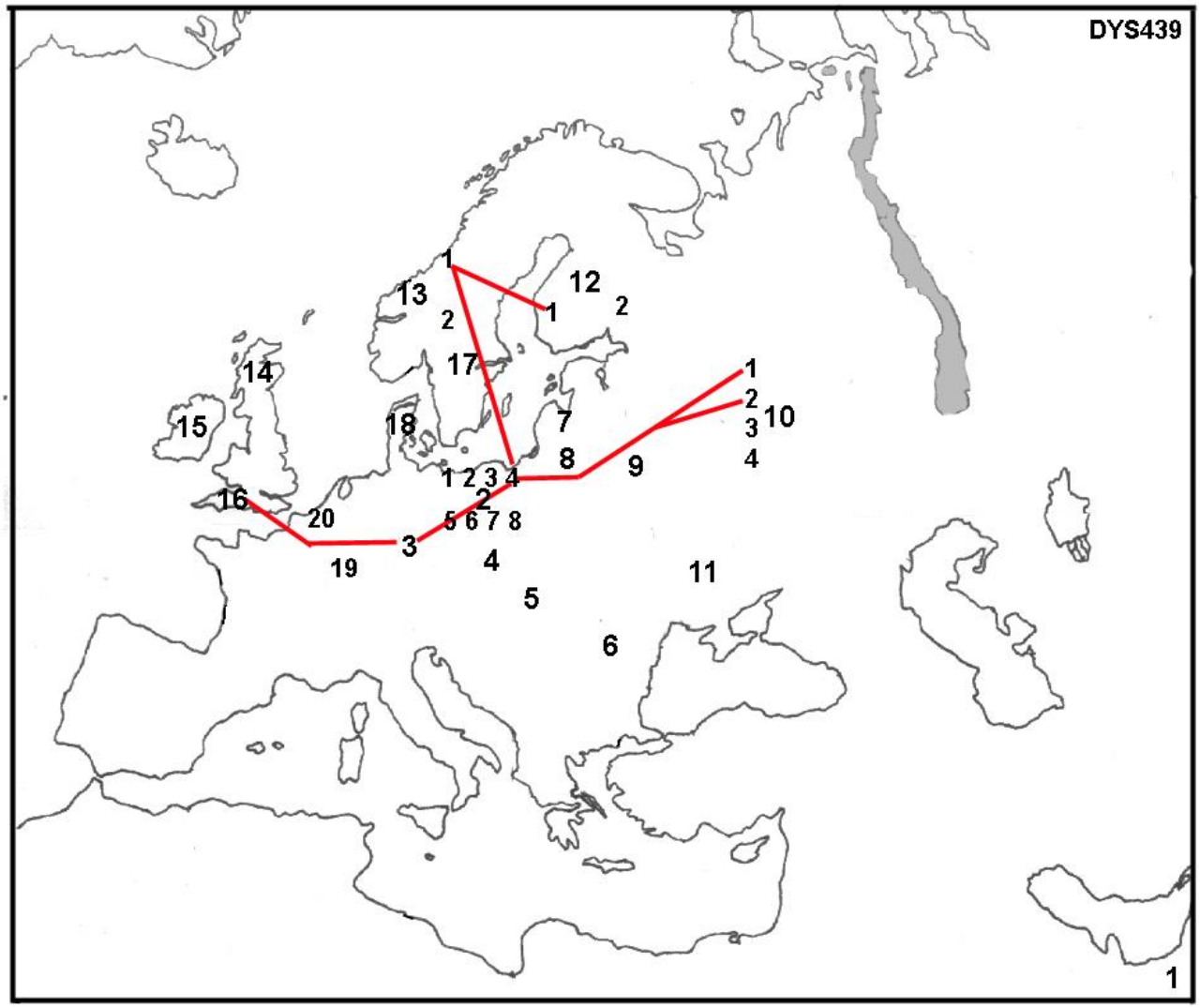


Conclusions:
(1) DYS391 = 10, which is the original allele of DYS391, is typical of more southerly situated areas (India. Romania, Ukraine, Slovakia, Czech, Germany, Fladers-Flemish, Lithuania, and certain Polish and Russian areas).
(2) DYS391 = 11, which is a result of SNP-mutation DYS391 10 > 11, is typical of more norhterly situated areas (for example, Latvia, Finland, Scandinavia, Denmark, Scotland, Ireland and certain areas of Poland and Russia).
(3) As the dividing line is horizontal separating the South from the North, it cannot be used as a criterion separating the West from the East within Finland.

21a. Frequencies of the alleles of DYS439 in R1a-men.

DYS439	Area/Population	8	9	10	11	12	13	14	n
1	India etc.	-	0.8	82.2	13.6	3.4	-	-	118
2	Poland	0.1	0.2	61.3	32.8	5.5	1.1	-	869
2-1	Po1 (P)	-	-	80.1	18.4	1.5	-	-	136
2-2	Pol2 (K)	-	-	92.0	8.9		-	-	75
2-3	Pol3(E)	-	-	88.2	8.8	2.9	-	-	34
2-4	Pol4 (N)	-	-		90.1	8.6	1.2	-	81
2-5	Pol5 (A)	-	-	100.0	-	-	-	-	23
2-6	Pol6 (I)	-	-	90.0	10.0	-	-	-	20
2-7	Pol7 (G)	-	-	85.7	14.3	-	-	-	21
2-8	Pol8 (B)	-	-	92.3	76.9	-	-	-	13
3	Czech	-	-	37.1	38.2	10.1	12.4	2.2	89
4	Slovakia	-	-	55.8	36.5	17.3	1.9	-	52
5	Hungary	-	1.7	65.5	27.6	5.2	-	-	58
6	Romania	-	-	78.6	7.1	7.1	7.1	-	14
7	Latvia	-	-	57.9	42.1	-	-	-	19
8	Lithuania	-	-	71.0	25.9	3.2	-	-	31
9	Belarus	-	-	83.3	16.7	-	-	-	6
10	Russia	-	-	52.4	41.0	21.0	0.5	-	210
10-1	Rus1 (Veneds)	-	-	8.3	91.7	-	-	-	24
10-2	Rus2 (Ants)	-	-	2.2	62.3	31.4	2.2	-	35
10-3	Rus3 (Sclav)	-	-	62.5	37.5	-	-	-	16
10-4	Rus4 (Sarm)	-	-	91.7	8.3	-	-	-	12
11	Ukraine	-	-	63.6	22.7	9.0	4.5	-	22
12	Finland	-	-	65.9	34.1	-	-	-	44
12-1	West-Fi	-	-	45.0	55.0	-	-	-	20
12-2	Eas-Fi	-	-	83.3	16.7	-	-	-	24
13	Norway	-	-	61.3	37.3	1.3	-	-	75
13-1	Nor1 (YSc)	-	-	33.3	67.7	-	-	-	15
13-2	Nor2 (OSc)	-	-	81.1	18.9	-	-	-	37
14	Scotland	-	-	92.7	6.0	1.6	-	-	193
15	Irland	-	-	86.1	10.4	3.5	-	-	115
16	Devon	-	-	50.0	50.0	-	-	-	8
17	Sweden	-	-	67.6	29.0	2.9	-	-	34
18	Denmark	-	-	50.0	40.0	10.0	-	-	30
19	Germany	-	0.6	48.8	42.3	7.3	-	-	164
20	Fla-Fle	-	-	63.5	37.5	-	-	-	8

21b. Map of the distribution of the haplotypes of DYS439.
Red lines: DYS439 = 11; unconnected: DYS439 = 10.

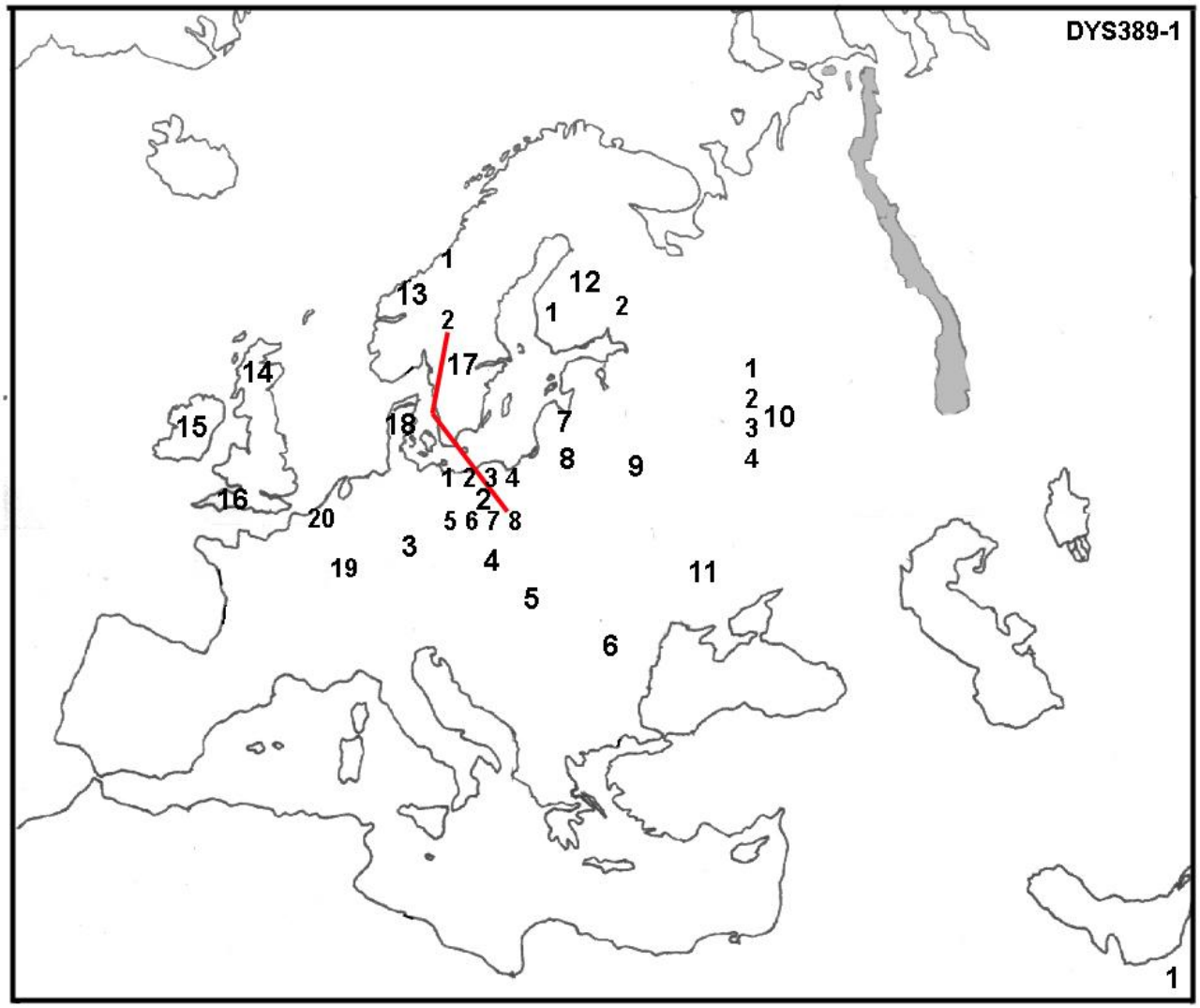


Conclusions:
DYS439 value is 10 in most populations. The material contains , however, seven exceptional populatations. These are scattered all over Europe icluding, one Polish, one Czeck, two Russian, one Devonish, one Scandinavian, and one Finnish subclade. The Scandinavian subclade is Young-Scandinavian, and the Finnish one is Estern Finnish. The results are not relevant from a general point of view.

22a. Frequencies of the alleles of DYS389-1 in R1a-men.

DYS389-1	Area/Population	10	11	12	13	14	15	
1	**India etc.**	-	-	0.8	**66.9**	28.8	3.4	118
2	**Poland**							
2-1	**Po1 (P)**	-	-	2.2	**89.0**	8.8	-	136
2-2	**Pol2 (K)**	-	-	1.3	**92.0**	4.0	2.7	75
2-3	**Pol3(E)**	-	-	-	**97.1**	2.9	-	34
2-4	**Pol4 (N)**	-	-	1.3	**90.0**	8.8	-	81
2-5	**Pol5 (A)**	-	-	3.7	**96.3**	-	-	27
2-6	**Pol6 (I)**	-	-	-	**100.0**	-	-	20
2-7	**Pol7 (G)**	-	-	4.8	**81.0**	14.3	-	21
2-8	**Pol8 (B)**	-	-	-	23.1	**76.9**	-	13
3	**Czech**	-	-	1.1	**89.4**	9.6	-	94
4	**Slovakia**	-	-	1.9	**92.6**	3.7	1.9	54
5	**Hungary**	-	1.8	-	**63.6**	34.5	-	55
6	**Romania**	-	-	-	**85.7**	14.3	-	14
7	**Latvia**	-	-	-	**94.1**	-	5.9	17
8	**Lithuania**	-	-	-	**96.9**	0.3	-	32
9	**Belarus**	-	-	-	**92.9**	7.1	-	14
10	**Russia**	-	-	1.2	**83.6**	13.9	1.2	165
10-1	**Rus1 (Veneds)**	-	-	-	**95.8**	4.2	-	24
10-2	**Rus2 (Ants)**	-	-	-	**92.0**	4.0	4.0	25
10-3	**Rus3 (Sclav)**	-	-	-	**75.0**	25.0	-	16
10-4	**Rus4 (Sarm)**	-	-	-	**75.0**	25.0	-	12
11	**Ukraine**	-	-	-	**76.5**	17.6	5.9	17
12	**Finland**	-	-	6.0	**75.9**	18.1	-	83
12-1	**West-Fi**	-	-	-	**68.4**	31.6	-	19
12-2	**Eas-Fi**	-	-	12.0	**80.0**	8.0	-	25
13	**Norway**	-	-	-	**60.9**	39.2	-	74
13-1	**Nor1 (YSc)**	-	-	-	**86.7**	13.3	-	15
13-2	**Nor2 (OSc)**	-	-	-	40.5	**59.5**	-	37
14	**Scotland**	-	-	4.7	**49.7**	45.5	-	191
15	**Irland**	-	-	-	**73.1**	26.0	1.0	104
16	**Devon**	-	-	-	**87.5**	12.5	-	8
17	**Sweden**	-	-	3.3	**73.3**	23.3	-	30
18	**Denmark**	-	-	10.3	**65.5**	24.1	-	29
19	**Germany**	-	0.6	43.5	**81.4**	13.0	0.6	161
20	**Fla-Fle**	-	-	-	**100.0**	-	-	8

22b. Map of the distribution of the haplotypes of DYS389-1.
Red line: DYS389-1 = 14; unconnected: DYS389-1 = 13.

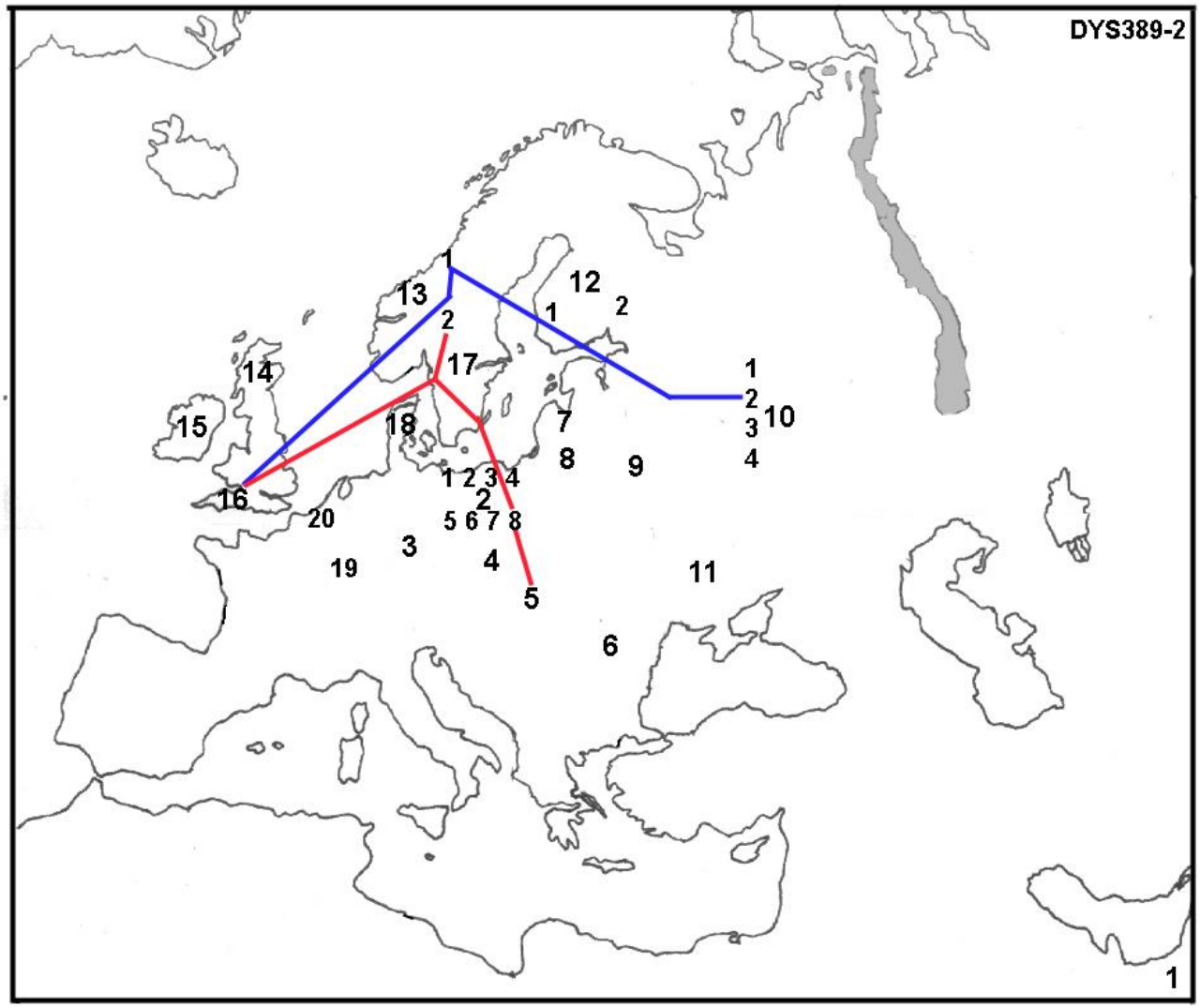


Conclusion:
DYS389-1 is **13** in almost all populations ; the only exceptions are Poland 8 (B) and Old Scandinavian that have undergone mutation DYS389-1 **13>14**.

23a. Frequencies of the alleles of DYS389-2 in R1a-men.

DYS389-2	Area/Population	26	28	29	30	31	32	33	n
1	India etc.	-	0.9	7.9	26.3	36.8	24.6	3.5	114
2	Poland	-							
2-1	Po1 (P)	-	-	4.4	71.3	24.3	-	-	136
2-2	Pol2 (K)	-	-	9.5	64.9	25.7	1.4	-	74
2-3	Pol3(E)	-	-	12.1	75.8	12.1	-	-	33
2-4	Pol4 (N)	-	-	-	88.2	11.8	-	-	17
2-5	Pol5 (A)	-	2.8	22.2	77.8		-	-	27
2-6	Pol6 (I)	-	-	-	55.0	45.0	-	-	20
2-7	Pol7 (G)	-	-	11.3	69.2	19.2	-	-	26
2-8	Pol8 (B)	-	-	-	30.8	69.2	-	-	13
3	Czech	-	-	31.0	51.2	17.9	-	-	84
4	Slovakia	-	-	17.6	68.6	11.8	-	2.0	51
5	Hungary	1.8	-	22.8	35.1	35.1	5.3	-	57
6	Romania	-	-	28.6	50.0	14.3	7.1	-	14
7	Latvia	-	-	17.6	76.5	-	-	5.9	17
8	Lithuania	-	-	21.9	62.5	15.6	-	-	32
9	Belarus	-	-	16.7	66.7	16.7	-	-	6
10	Russia	-	-	23.2	59.4	16.1	0.6	0.6	155
10-1	Rus1 (Veneds)	-	-	16.0	72.0	8.0	14.0	-	25
10-2	Rus2 (Ants)	-	-	84.0	8.0	8.0	-	-	25
10-3	Rus3 (Sclav)	-	-	6.3	68.8	25.0	-	-	16
10-4	Rus4 (Sarm)	-	-	8.3	75.0	16.	-	-	12
11	Ukraine	-	-	23.8	47.6	23.8	4,8	-	21
12	Finland	-	1.1	21.8	51.7	25.3	-	-	87
12-1	West-Fi	-	-	10.0	45.0	45.0	-	-	20
12-2	Eas-Fi	-	-	33.3	54.2	12.5	-	-	24
13	Norway	-	-	15.4	26.4	57.1	1.1	-	91
13-1	Nor1 (YSc)	-	-	73.3	13.3	13.3	-	-	15
13-2	Nor2 (OSc)	-	-	-	48.7	48.7	2.7	-	37
14	Scotland	-	-	12.0	40.3	45.0	2.6	-	191
15	Irland	-	1.8	9.1	58.2	26.4	3.6	0.9	110
16	Devon	-	-	37.5	12.5	12.5	37.5	-	8
17	Sweden	-	2.9	20.6	44.1	26.5	5.9	-	34
18	Denmark	-	-	26.7	40.0	26.7	6.7	-	30
19	Germany	-	1.9	30.0	44.4	21.9	1.9	-	160
20	Fla-Fle	-	-	12.5	87.5	-	-	-	8

23b. Map of the distribution of the haplotypes of DYS389-2.
Blue lines: DYS389-2 = 29; red lines: DYS389-2 = 31; unconnected: DYS389-2 = 30.

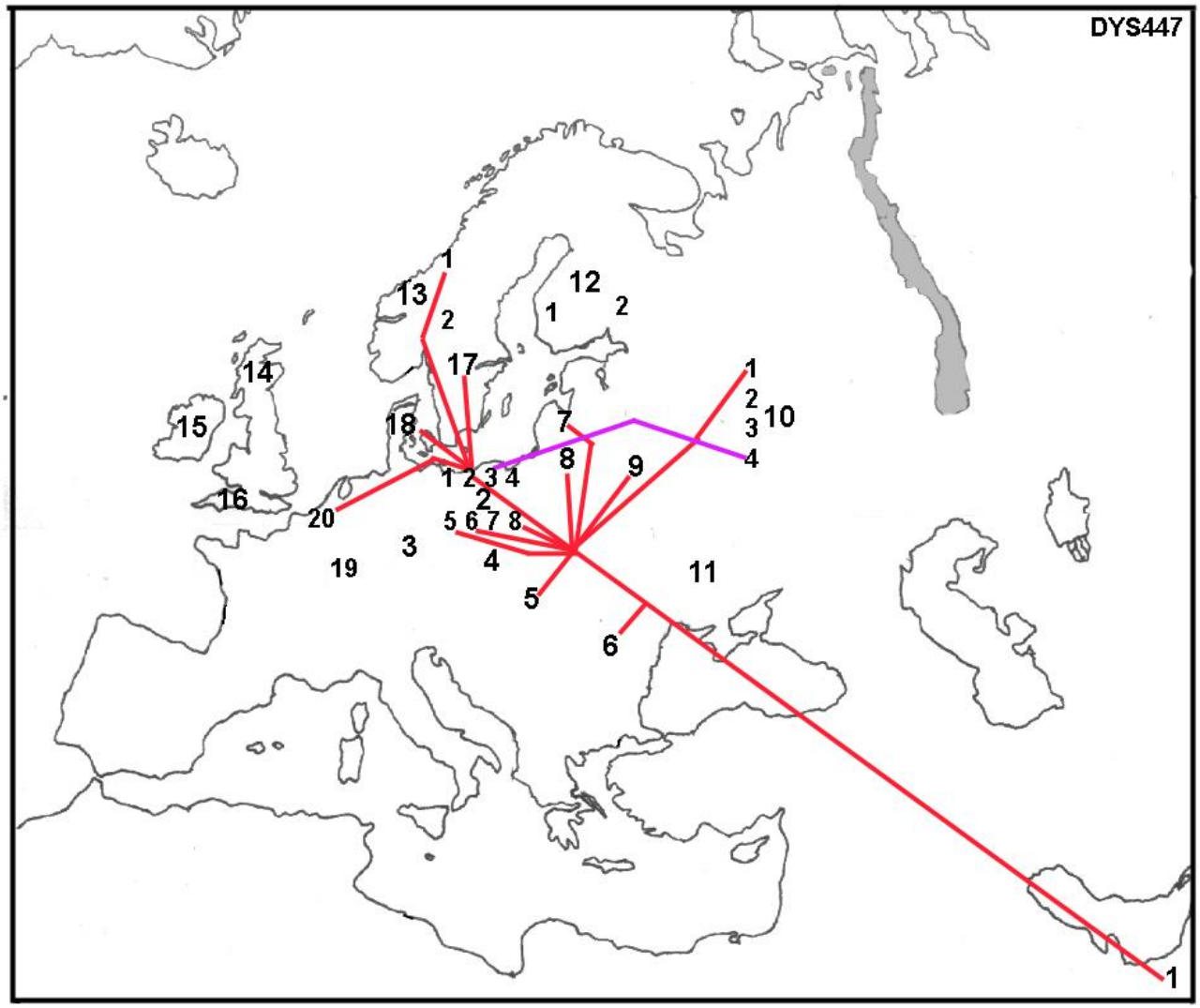


Conclusions: DYS389-2 value is generally 30, but there are two small groups of exceptions: value is 29 and 32. Both seem to be scattered over various parts of Europea with no clear concentration area.

24a. Frequencies of the alleles of DYS447 in R1a-men.

DYS447	Area/Population	21	22	23	24	25	26	27?	n
1	**India etc.**	-	1.6	13.1	**63.9**	18.0	3.3	-	61
2	**Poland**								
2-1	**Po1 (P)**	-	0.8	**95.1**	4.1	-	-	-	123
2-2	**Pol2 (K)**	-	-	21.3	**76.0**	2.7	-	-	75
2-3	**Pol3(E)**	-	-		11.4	**82.9**	5.7	-	35
2-4	**Pol4 (N)**	-	1.2	**86.4**	12.3	-	-	-	81
2-5	**Pol5 (A)**	-	-		**96.3**	3.7	-	-	27
2-6	**Pol6 (I)**	-	-	5.0	**95.0**	-	-	-	20
2-7	**Pol7 (G)**	-	4.8	**95.2**	4,8	9.5	-	-	21
2-8	**Pol8 (B)**	-	-		**92.3**	7.7	-	-	13
3	**Czech**	-	-	**66.7**	31.0	2.4	-	-	42
4	**Slovakia**	-	43.9	**56.1**	**-**	-	-	-	41
5	**Hungary**	-	-	33.3	**64.9**	-	-	1.8	57
6	**Romania**	-	-	27.3	**63.6**	9.1	-	-	11
7	**Latvia**	-	-	38.9	**55.6**	5.6	-	-	18
8	**Lithuania**	-	-	30.8	**50.0**	19.2	-	-	26
9	**Belarus**	-		33.3	**50.0**	16.7	-	-	6
10	**Russia**								
10-1	**Rus1 (Veneds)**	-	-	-	**100.0**	-	-	-	14
10-2	**Rus2 (Ants)**	-	-	**93.8**	6.3	-	-	-	16
10-3	**Rus3 (Sclav)**	-	-	**92.0**	8.0	-	-	-	25
10-4	**Rus4 (Sarm)**	-	-	-	13.0	**87.0**	-	-	23
11	**Ukraine**	-		**66.7**	33.3	-	-	-	15
12	**Finland**	1.5	1.5	**52.9**	32.4	11.8	-	-	68
12-1	**West-Fi**	-	-	**81.3**	18.8	-	-	-	16
12-2	**Eas-Fi**	-	-	**40.0**	35.0	25.0	-	-	20
13	**Norway**	-	-	**60.3**	27.0	7.9	4.8	-	63
13-1	**Nor1 (YSc)**	-	-	-	**66.7**	20.0	13.3	-	15
13-2	**Nor2 (OSc)**	-	-	**89.5**	8.0	-	-	-	38
14	**Scotland**	-	1.6	**59.7**	30.1	2.8	6.8	-	176
15	**Irland**	-	1.2	**51.2**	33.3	11.9	2.4	-	84
16	**Devon**	-	-	**50.0**	**12.5**	37.5	-	-	8
17	**Sweden**	-	3.4	**44.8**	**44.8**	6.9	-	-	29
18	**Denmark**	-	-	**42.1**	**42.1**	10.5	5.3	-	19
19	**Germany**	-	1.5	**51.1**	37.8	8.9	0.7	-	135
20	**Fla-Fle**			25.0	**75.0**		-	-	4

24b. Map of the distribution of the haplotypes of DYS447.
Purple lines: DYS447 = 25; red lines: DYS447 = 24; unconnected: DYS447 = 23.

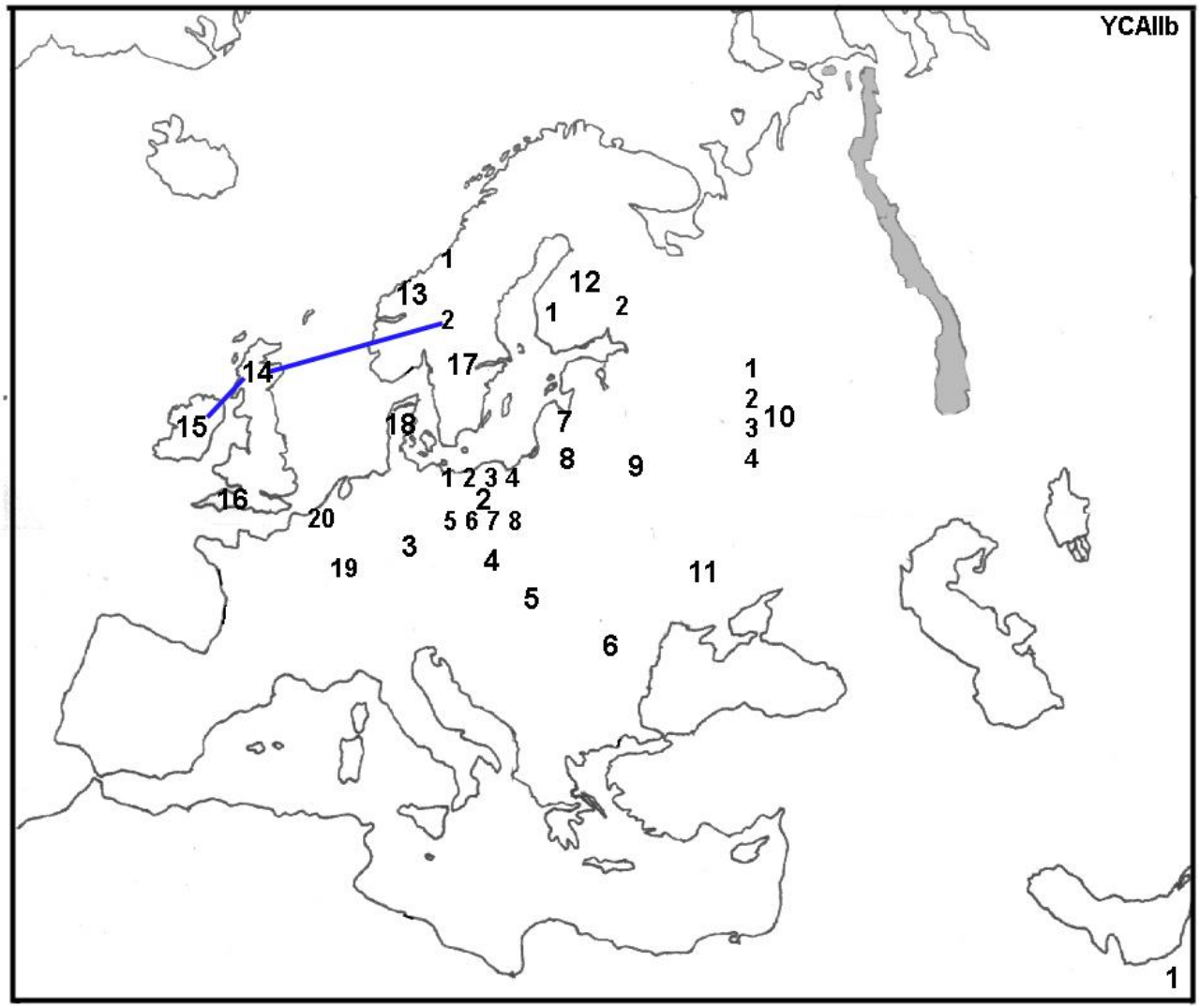


Conclusions: DYS447 is slightly more often 23 than 24; value 23 is more frequent in norhtern populations and value 24 in southern one. The difference is not, however, very regular. The more exceptional value 25 occurs in one polish and and one Russian subclade.

25a. Frequencies of the alleles of YCAIIb in R1a-men.

YCAIIb	Area/Population	19	20	21	22	23	24	25	n
1	India etc.	-	-	4.4	6.7	88.9	-	-	45
2	Poland								
2-1	Po1 (P)	-	-	-	0.8	96.6	2.5	-	119
2-2	Pol2 (K)	-	-	-	25.3	60.8	1.3	-	79
2-3	Pol3(E)	-	-	2.9	8.8	88.2	-	-	34
2-4	Pol4 (N)	37.0	-	1.2	1.2	92.3	1.2	-	81
2-5	Pol5 (A)	-	-	-	-	100.0	-	-	26
2-6	Pol6 (I)	-	-	-	10.0	85.0	-	5.0	20
2-7	Pol7 (G)	-	-	-	4.8	85.7	9.5	-	21
2-8	Pol8 (B)	-	-	-	-	100.0	-	-	13
3	Czech	-	-	2.7	2.7	94.6	-	-	37
4	Slovakia	-	-	2.6	-	94.7	-	2.6	38
5	Hungary	3.8	-	-	3.8	92.3	-	-	52
6	Romania	-	-	-	9.1	81.8	9.1	-	11
7	Latvia	-	-	11.1	-	88.9	-	-	18
8	Lithuania	-	3.6	-	17.9	75.0	3.6	-	28
9	Belarus	-	-	-	33.3	67.7	-	-	6
10	Russia	2.0	0.7	0.7	5.3	91.4	-	-	151
10-1	Rus1 (Veneds)	-	-	-	4.2	95.8	-	-	24
10-2	Rus2 (Ants)	8.3	-	-	-	91.7	-	-	24
10-3	Rus3 (Sclav)	-	-	-	-	100.0	-	-	14
10-4	Rus4 (Sarm)	-	-	-	-	100.0	-	-	12
11	Ukraine	-	-	14.3	7.1	78.6	-	-	14
12	Finland	1.5	1.5	14.7	1.5	76.5	4.4	-	68
12-1	West-Fi	-	-	28.6	-	64.3	7.1	-	14
12-2	Eas-Fi	-	-	11.8	-	88.2	-	-	17
13	Norway	-	14.6	52.8	1.4	23.6	18.1	-	72
13-1	Nor1 (YSc)	-	-	-	-	60.0	40.0	-	10
13-2	Nor2 (OSc)	-	6.3	93.9	-	-	-	-	32
14	Scotland	-	1.9	50.3	0.6	47.1	-	-	155
15	Irland	1.3	3.9	43.4	1.3	42.1	7.9	-	76
16	Devon	-	-	37.5	-	62.5	-	-	8
17	Sweden	-	-	17.9	3.6	71.4	7.1	-	28
18	Denmark	-	-	11.8	-	76.5	11.8	-	17
19	Germany	-	-	4.8	4.8	88.7	0.8	0.8	124
20	Fla-Fle	-	-	-	-	50.0	50.0		4

25b. Map of the distribution of the haplotypes of YCAIIb.
Blue lines: YCAIIb = 21; unconnected: YCAIIb = 23.

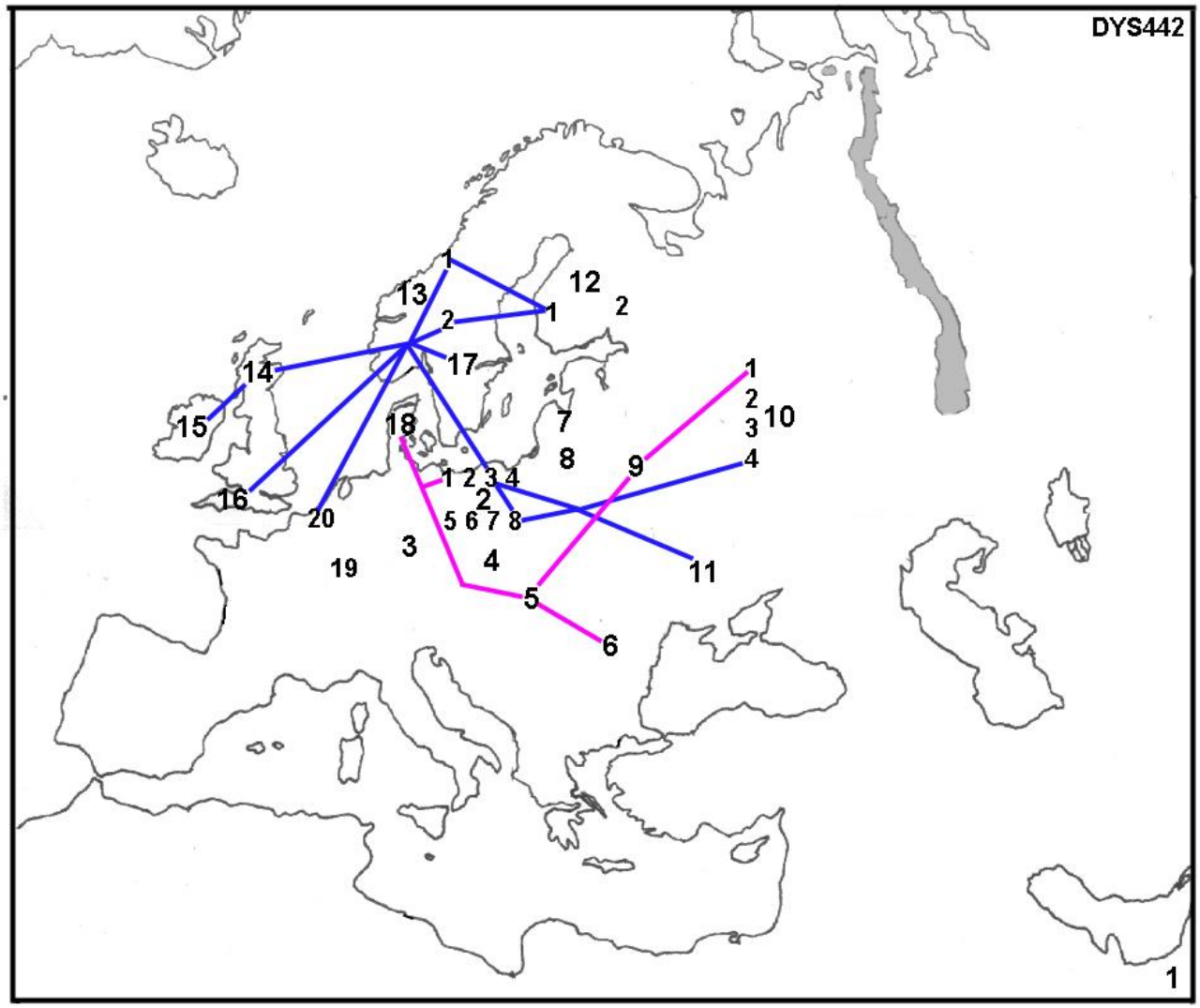


Conclusions: YCAIIb has allele 23 in almost all R1a-populations. It is 21, however, in two subclades: Old Scandinavians, Scottish, and Irish. This shows that value 21 is more or less typical of the men of Viking origin. Their highest frequency (about 94 %) is in the Old Scandinavians; it is lower (about 50-43 %) in Scots and Irishmen.

26a. Frequencies of the alleles of DYS442 in R1a-men.

DYS442	Area/Population	11	12	13	14	15	n
1	**India etc.**	-	27.3	22.7	**45.5**	4.6	44
2	**Poland**						
2-1	**Po1 (P)**	1.7	23.1	**56.4**	18.8	-	117
2-2	**Pol2 (K)**	-	27.9	32.4	**36.8**	2.9	68
2-3	**Pol3(E)**	-	**47.1**	41.2	8.8	2.9	34
2-4	**Pol4 (N)**	-	2.6	18.2	**76.6**	2.6	77
2-5	**Pol5 (A)**	-	-	7.4	**88.9**	3.7	27
2-6	**Pol6 (I)**	-	5.3	15.9	**78.9**	-	19
2-7	**Pol7 (G)**	-	5.6	22.2	**72.2**	-	18
2-8	**Pol8 (B)**	7.7	**92.3**	-	-	-	13
3	**Czech**	-	21.1	13.2	**65.8**	-	38
4	**Slovakia**	-	25.7	31.4	**40.0**	**2.9**	35
5	**Hungary**	2.0	38.8	**40.8**	18.4	-	49
6	**Romania**	-	9.1	**45.5**	**45.5**	-	11
7	**Latvia**		5.9	17.6	**76.5**		17
8	**Lithuania**		32.0	24.0	**44.0**		25
9	**Belarus**	-	33.3	**66.7**	-	-	6
10	**Russia**						
10-1	**Rus1 (Veneds)**	-	41.7	**50.0**	4.2	4.2	24
10-2	**Rus2 (Ants)**	-	14.3	9.5	**66.7**	-	21
10-3	**Rus3 (Sclav)**	-	23.1	30.8	**46.2**	-	13
10-4	**Rus4 (Sarm)**	8.3	**75.0**	16.7	-	-	12
11	**Ukraine**	-	**44.4**	-	33.3	22.2	9
12	**Finland**	3.0	37.3	20.9	**38.8**	-	67
12-1	**West-Fi**	-	**37.5**	31.3	31.3	-	16
12-2	**Eas-Fi**	5.6	33.3	11.1	**50.0**	-	18
13	**Norway**	7.7	**86.2**	6.2	-	-	65
13-1	**Nor1 (YSc)**		**93.8**	6.3	-	-	16
13-2	**Nor2 (OSc)**	11.4	**85.7**	12.9	-	-	35
14	**Scotland**	1.2	**79.6**	11.7	6.8	0.6	162
15	**Irland**	2.7	**57.5**	27.4	11.0	1.4	73
16	**Devon**	-	**50.0**	25.0	25.5	-	8
17	**Sweden**	-	**58.6**	34.5	**6.9**	-	29
18	**Denmark**	5.6	27.8	**38.9**	27.8	-	18
19	**Germany**	0.9	22.2	21.4	**53.8**	**1.7**	117
20	**Fla-Fle**	25.0	**50.0**	-	25.0		4

26b. Map of the distribution of the haplotypes of DYS442.
Blue lines: DYS442 = 12; purple lines: DYS442 = 13; unconnected: DYS442 = 14.



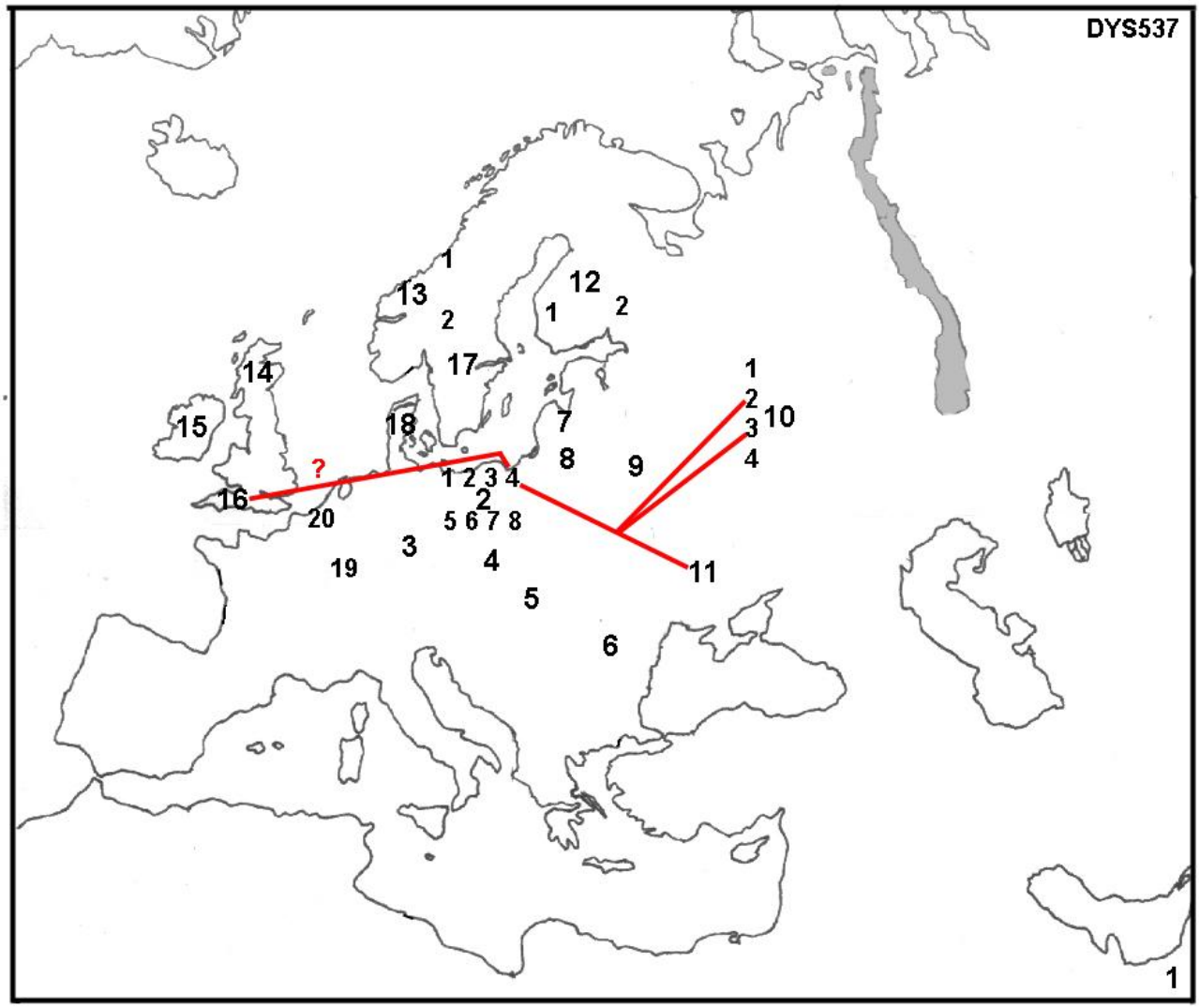
Conclusions:

(1) The frequencies of **DYS442 = 12** form two categories:
(a) **75-94 %** in Norway and in one Polish and one Russian (Sarmatian) subclade.
(b) **37.6-50 %** in Sweden and Finland, in some areas outside Scandinavia with strong Viking influence (Scotland and Ireland and perhaps also Devon and Flandres-Flemish), in one Polish subclade (Pol3 = E) and surprisingly also in the Ukraine.
The central area of DYS442 = 12 is **Scandinavia**.
(2) The frequency of **DYS442 = 13** is relatively high or 39-67 % in Hungary and Romania, one Polish subclade (Pol1 = P), one Russian subclade (Rus1 = Veneds), Belarus, and surprisingly also in Denamark. The center of DYS442 = 13 is in **Eastern and Southern Europe**.
(3) The frequency of **DYS442 = 14** is higher than those of the other two alleles (12 and 13) in **Eastern and Central Europe**: Russia, Balticum. Poland, Slovakia, Czech, Germany, and Eastern Finland. The center is in Poland with frequencies from about 70 per cent to about 90.

27a. Frequencies of the alleles of DYS537 in R1a-men.

DYS537	Area/Population	10	11	12	13	n
1	India etc.	-	40.9	59.1	-	22
2	Poland					
2-1	Po1 (P)	1.1	11.8	96.8	-	93
2-2	Pol2 (K)	-	10.5	89.5	-	19
2-3	Pol3(E)	3.0	9.1	87.9	-	33
2-4	Pol4 (N)	3.3	90.1	6.6	-	61
2-5	Pol5 (A)	-	31.6	68.4	-	19
2-6	Pol6 (I)	-	25.0	75.0	-	20
2-7	Pol7 (G)	-	28.6	71.4	-	21
2-8	Pol8 (B)	-	25.0	75.0	-	12
3	Czech	3.8	46.4	50.0	-	28
4	Slovakia	4.8	14.3	81.0	-	21
5	Hungary	-	46.2	53.8	-	13
6	Romania	-	16.7	83.3	-	6
7	Latvia		27.3	72.7		11
8	Lithuania		47.4	52.6		19
9	Belarus	-	-	100.0	-	4
10	Russia					
10-1	Rus1 (Veneds)	-	-	100.0	-	24
10-2	Rus2 (Ants)	-	100.0	-	-	24
10-3	Rus3 (Sclav)	-	100.0	-	-	14
10-4	Rus4 (Sarm)	-	25.0	75.0	-	12
11	Ukraine	-	71.4	28.6	-	14
12	Finland	-	33.3	66.7	-	54
12-1	West-Fi	-	33.3	66.7	-	12
12-2	Eas-Fi	-	22.2	77.8	-	18
13	Norway	-	25.0	72.7	2.3	44
13-1	Nor1 (YSc)	-	21.4	78.6	-	14
13-2	Nor2 (OSc)	-	20.0	76.0	4.0	25
14	Scotland	-	30.0	69.0	1.0	100
15	Irland	-	29.6	70.4	-	54
16	Devon	-	40.0	60.0	-	5
17	Sweden	-	37.5	62.5	-	16
18	Denmark	-	28.6	71.4	-	7
19	Germany	-	44.4	54.2	1.4	72
20	Fla-Fle	-	66.7	33.3	-	3

27b. Map of the distribution of the haplotypes of DYS537.
Red lines: DYS537 = 11; unconnected: DYS537 = 12.

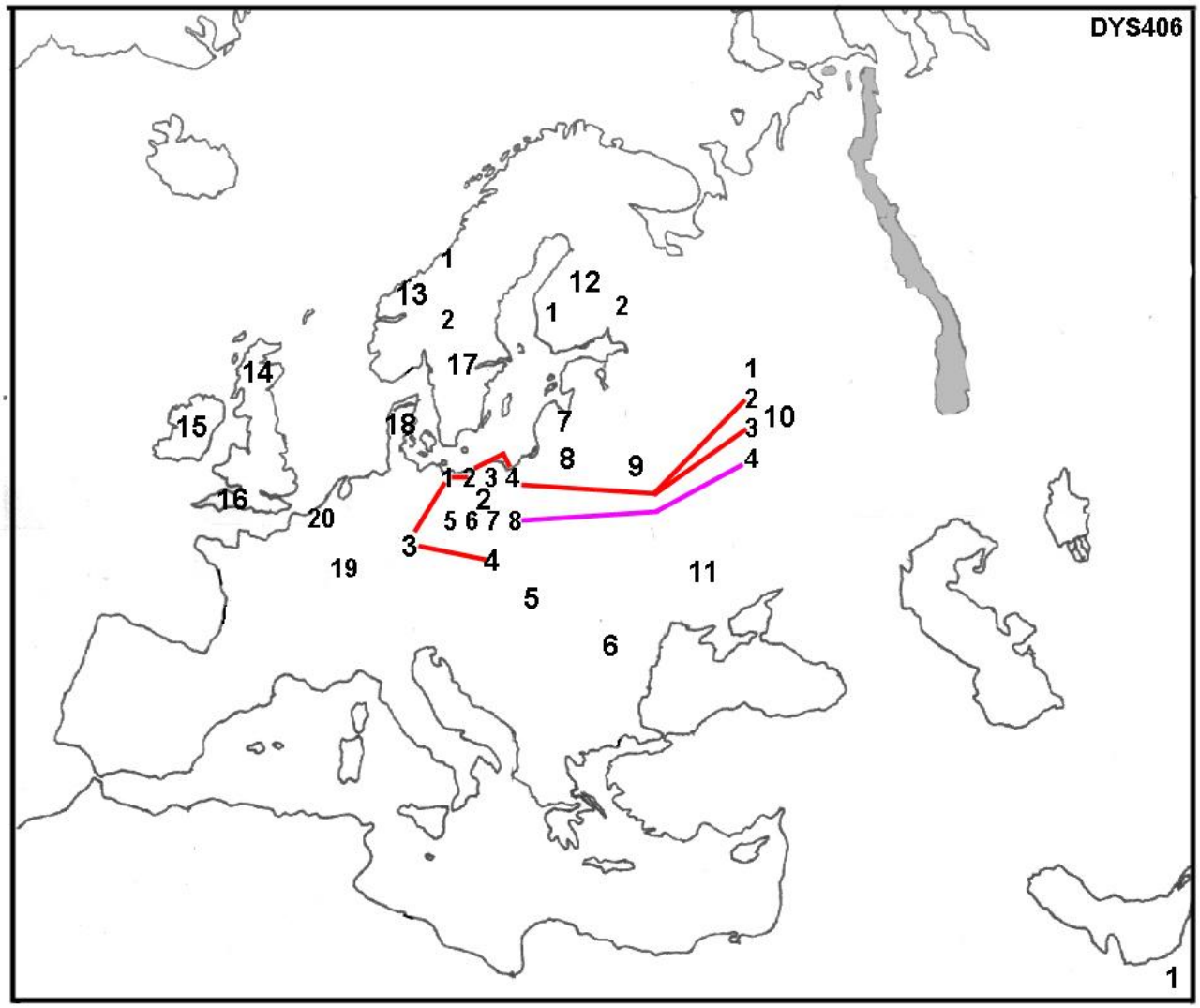


Conclusions:
DYS537 is almost invariably **12**. The only exceptions are two Russian subclades (Rus2 = Ants and Rus3 = Sclavs), Ukranians, and one Polish subgrade (Pol4 = N) (when Devonians are not considered) with allele **11**. The four exceptions are typically East-European.

28a. Frequencies of the alleles of DYS406 in R1a-men.

DYS406	Area/Population	10	11	12	13	14	15	n
1	India etc.	4.5	81.8	13.6	-	-	-	22
2	Poland							
2-1	Po1 (P)	-	4.1	90.7	4.1	1.0	-	97
2-2	Pol2 (K)	-	33.3	67.7	-	-	-	18
2-3	Pol3(E)	3.0	81.8	15.1	-	-	-	33
2-4	Pol4 (N)	-	8.2	86.9	4.9	-	-	61
2-5	Pol5 (A)	-	94.7	5.3	-	-	-	19
2-6	Pol6 (I)	10.0	75.0	15.0	-	-	-	20
2-7	Pol7 (G)	4.8	81.0	14.3	-	-	-	21
2-8	Pol8 (B)	100.0	-	-	-	-	-	12
3	Czech	3.8	30.8	53.8	7.7	-	3.8	26
4	Slovakia	9.1	45.5	45.5		-	-	22
5	Hungary	30.8	46.2	23.1		-	-	13
6	Romania	-	83.3	16.7	-	-	-	6
7	Latvia	9.1	72.7	18.2				11
8	Lithuania	5.3	68.4	21.1	5.3			19
9	Belarus	25.0	75.0	-	-	-	-	4
10	Russia							
10-1	Rus1 (Veneds)	4.2	91.7	4.2	-	-	-	24
10-2	Rus2 (Ants)	-	-	94.1	5.9	-	-	17
10-3	Rus3 (Sclav)	-	7.7	92.3	-	-	-	13
10-4	Rus4 (Sarm)	100.0	-	-	-	-	-	12
11	Ukraine	-	61.5	30.8	-	7.7	-	13
12	Finland	20.0	61.8	14.5	3.6	-	-	55
12-1	West-Fi	16.7	58.3	16.7	18.3	-	-	12
12-2	Eas-Fi	29.4	58.8	11.8	-	-	-	17
13	Norway	-	89.1	10.9	-	-	-	55
13-1	Nor1 (YSc)	-	100.0	-	-	-	-	14
13-2	Nor2 (OSc)	-	80.8	9.2	-	-	-	26
14	Scotland	-	93.4	5.5	1.1	-	-	91
15	Irland	7.8	82.4	9.8	-	-	-	51
16	Devon	-	80.0	20.0	-	-	-	5
17	Sweden	6.3	87.5	6.3	-	-	-	16
18	Denmark	-	57.1	42.9		-	-	7
19	Germany	7.0	52.1	39.4	-	1.4	-	71
20	Fla-Fle	-	100.0			-	-	3

28b. Map of the distribution of the haplotypes of DYS406.
Purple lines: DYS406 = 10; red lines: DYS406 = 12; unconnected: DYS406 = 11.

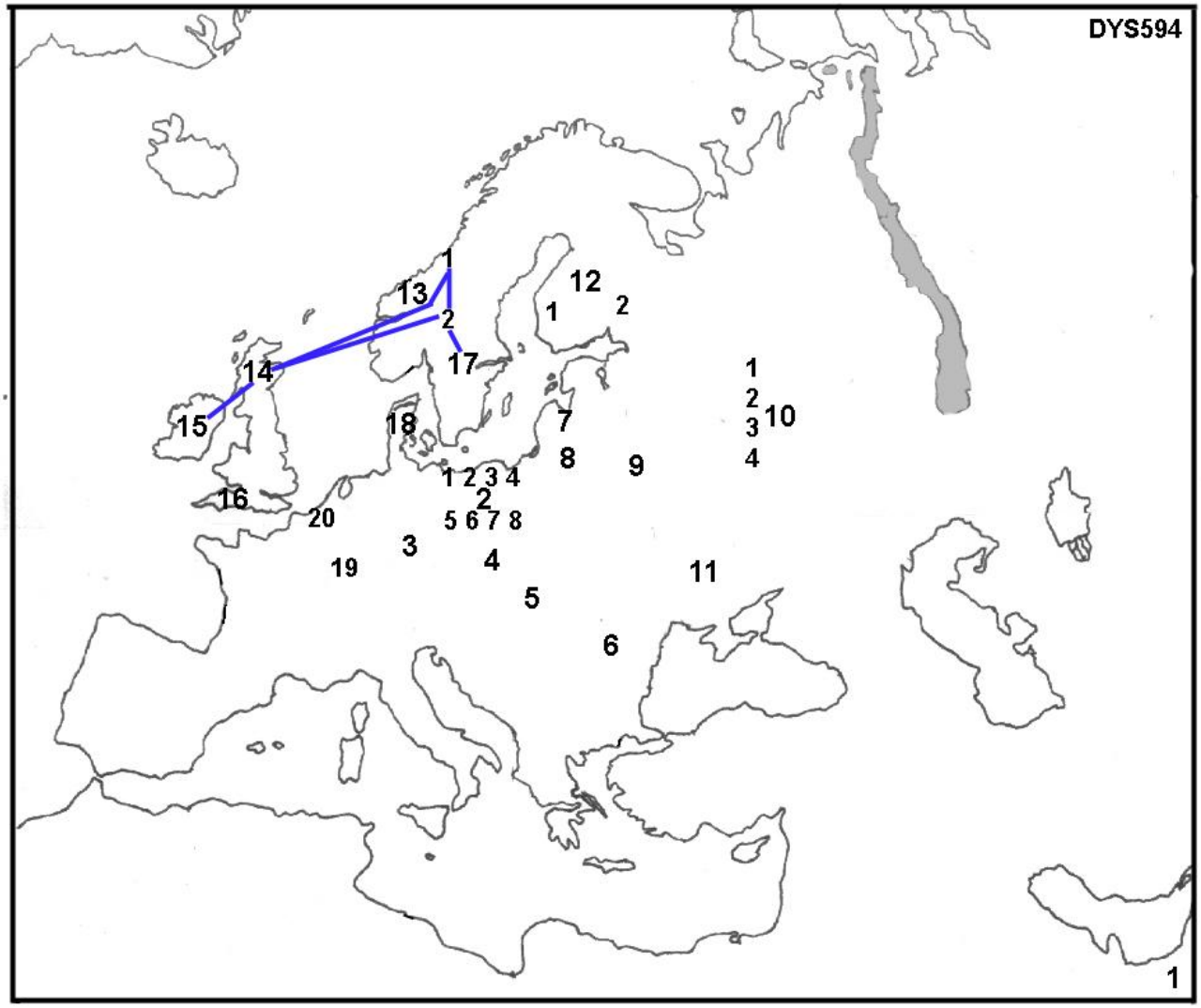


Conclusions:
(1) The most frequent allele and geographically **General European** allele for DYS406 is **11**.
(2) Allele **12** is common (over 50 %) in three Polish subclades (Pol1 = P, Pol2 = K, and Pol4 = N), in two Russian subclades (Rus2 = Ants and Rus3 = Sclavs), and in Chech. The group is typically **Central and Eastern European** and linguistically **Slavic**.
(3) Surprisingly, DYS406 = **10** is the only allele in two subgroups, one Polish (Pol8 = B) and the other Russian (Rus4 = Sarmatians). Georgafically these, too, are **Central and Eastern European** and linguistically **Slavic**.

29a. Frequencies of the alleles of DYS594 in R1a-men.

DYS594	Area/Population	8	9	10	11	12	n
1	India etc.	-	-	95.0	5.0		20
2	Poland		-	95.1	4.0	-	634
2-1	Po1 (P)	-	-	99.1	0.9	-	110
2-2	Pol2 (K)	5.3	5.3	89.5	-	-	19
2-3	Pol3(E)	3.0	-	97.0	-	-	33
2-4	Pol4 (N)	-	-	100.0	-	-	61
2-5	Pol5 (A)	-	-	100.0	-	-	19
2-6	Pol6 (I)	-	-	100.0	-	-	20
2-7	Pol7 (G)	-	-	100.0	-	-	20
2-8	Pol8 (B)	-	-	100.0	-	-	12
3	Czech	-	-	100,0	-	-	24
4	Slovakia	-	-	100.0	-	-	21
5	Hungary	-	-	100.0	-		13
6	Romania	-	-	100.0	-		6
7	Latvia	-	-	90.9	9.1	-	11
8	Lithuania	-	-	88.9	11.1	-	18
9	Belarus	-	-	100.0		-	4
10	Russia	-	1.1	97.7	0.6	0.6	174
10-1	Rus1 (Veneds)	-	4.8	95.2	-	-	21
10-2	Rus2 (Ants)	-	-	100.0	-	-	17
10-3	Rus3 (Sclav)	-	-	100.0	-	-	12
10-4	Rus4 (Sarm)	-	8.3	91.7	-	-	12
11	Ukraine	-	-	86.2	13.8		29
12	Finland	-	-	76.4	23.6		55
12-1	West-Fi	-	-	66.7	33.3		15
12-2	Eas-Fi	-	-	83.3	16.7		18
13	Norway	2	4.8	-	95.2	-	42
13-1	Nor1 (YSc)	-	-	-	100.0	-	9
13-2	Nor2 (OSc)	-	-	-	100.0	-	29
14	Scotland	-	-	12.9	86.1	1.1	91
15	Irland	-	-	40.0	60.0	-	50
16	Devon	-	-	60.0	40,0		5
17	Sweden	-	-	31.3	68.9	-	16
18	Denmark	-	-	71.4	28.6	-	9
19	Germany	-	-	94.4	5.6	-	71
20	Fla-Fle	-	-	66.7	33.3	-	3

29b. Map of the distribution of the haplotypes of DYS594.
Blue lines: DYS594 = 11: unconnected: DYS594 = 10.

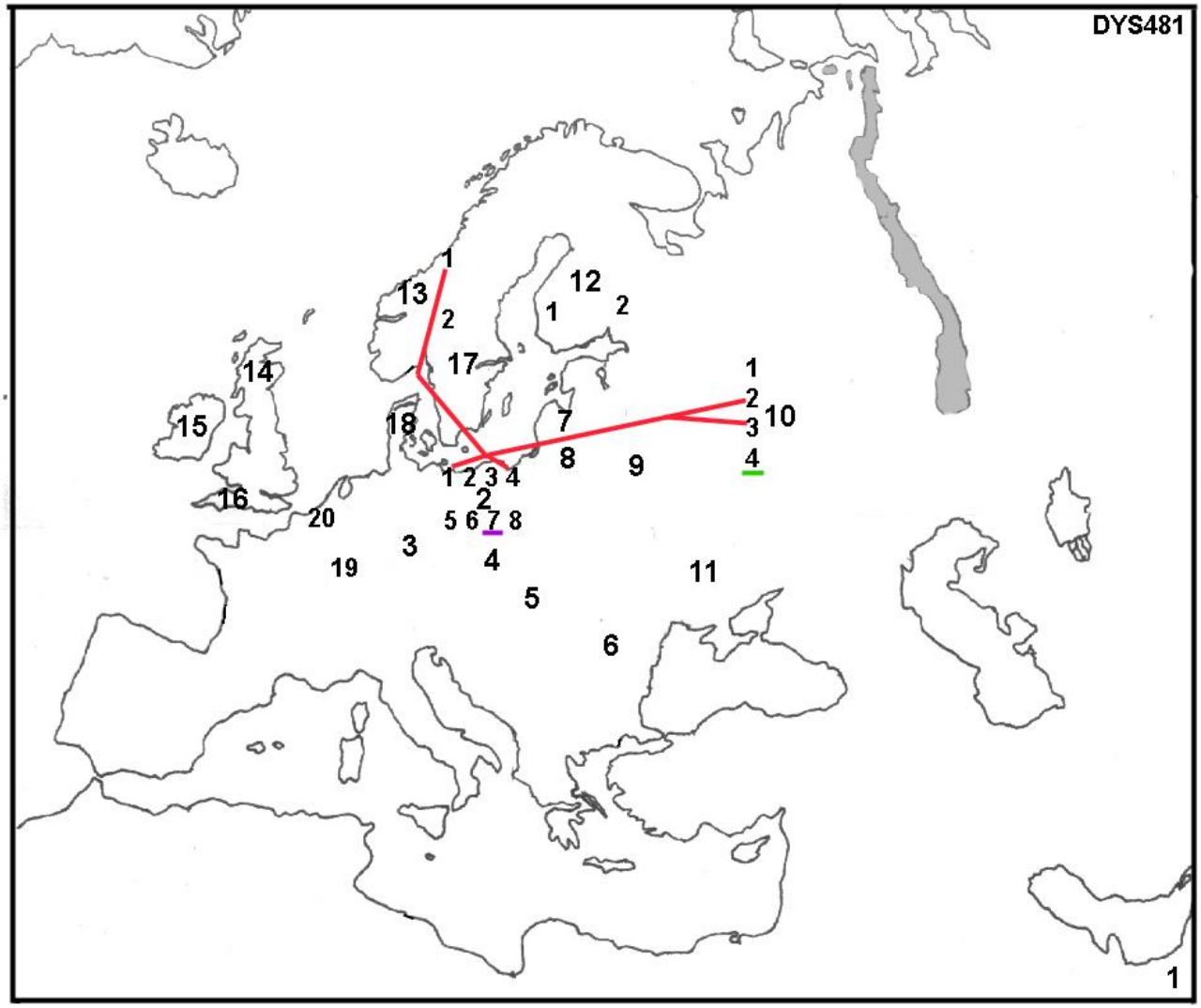


Conclusions:
On the basis of the alleles of DYS594 R1a-men form two distinct categories: Allele **10** is in majority in almost all populations. The only exceptions are Norwegians, Swedes, Scots and Irish. which have allele **11**. This group is typically Scandinavian with the Nort-British subgroups that have experiences a strong Viking influence. The group is clearly a result of relatively recent STR-mutation **DYS594 10>11**.
More detailed maps of the distribution of allele 10 and 11 are seen in Chapter ”One effective distinctive marker: DYS 594”.

30a. Frequencies of the alleles of DYS481 in R1a-men.

DYS481	Area/Population	19	20	21	22	23	24	25	26	27	n
1	**India etc.**	-	-	-	13.6	**63.6**	18.2	4.5	-	-	22
2	**Poland**										
2-1	**Po1 (P)**	-	-	-	-	1.0	12.1	**69.7**	17.2	-	99
2-2	**Pol2 (K)**	-	-	-	5.3	**73.7**	21.1	-	-	-	19
2-3	**Pol3(E)**	-	-	-	-	**90.9**	9.1	-	-	-	33
2-4	**Pol4 (N)**	-	-	-	1.8	-	10.7	**67.9**	19.6	-	56
2-5	**Pol5 (A)**	-	-	-	-	**89.5**	10.5	-	-	-	19
2-6	**Pol6 (I)**	-	-	-	-	**95.0**	5.0	-	-	-	20
2-7	**Pol7 (G)**	-	-	-	-	5.0	**90.0**	5.0	-	-	20
2-8	**Pol8 (B)**	-	-	-	-	**83.3**	16.7	-	-	-	12
3	**Czech**	4.0	-	-	-	20.0	12.0	**56.0**	4.0	1	**25**
4	**Slovakia**	-	-	14.3	-	**42.9**	-	28.6	9.5	4.8	**21**
5	**Hungary**	-	-	15.4	7.7	**53.8**	7.7	7.7	7.7	-	**13**
6	**Romania**	-	-	-	16.7	**50.0**	-	3.3	-	-	**6**
7	**Latvia**					**63.6**	18.2	18.2			11
8	**Lithuania**				5.3	**52.6**	15.8	26.3			19
9	**Belarus**	-	-	-	-	**100.0**	-	-	-	-	**4**
10	**Russia**										
10-1	**Rus1 (Veneds)**	-	-	-	-	**81.0**	19.0	-	-	-	21
10-2	**Rus2 (Ants)**	-	-	-	-	-	12.5	**81.3**	-	6.3	16
10-3	**Rus3 (Sclav)**	-	-	-	-	-	25.0	**58.3**	16.7	-	12
10-4	**Rus4 (Sarm)**	-	-	-	**58.3**	41.7	-	-	-	-	12
11	**Ukraine**	-	-	6.7	13.3	**40.0**	6.7	33.3	-	-	**15**
12	**Finland**	-	-	-	8.9	**55.4**	21.4	12.5	1.8	-	56
12-1	**West-Fi**	-	-	-	9.1	**63.6**	18.2	9.1	-	-	11
12-2	**Eas-Fi**	-	-	-	11.8	**64.7**	17.6	5.9	-	-	17
13	**Norway**	-	-	-	8.9	**60.0**	6.7	24.4	-	-	**45**
13-1	**Nor1 (YSc)**	-	-	-	-	42.3	-	**57.1**	-	-	**14**
13-2	**Nor2 (OSc)**	-	-	-	12.0	**72.0**	8.0	8.0	-	-	**25**
14	**Scotland**	-	-	1.0	1.0	**87.9**	8.1	2.0	-	-	**99**
15	**Irland**	-	-	1.9	1.9	**76.9**	5.8	11.5	1.9	-	**52**
16	**Devon**	-	-	-	-	**80.0**	20.0	-	-	-	5
17	**Sweden**	-	-	-	12.5	**50.5**	18.8	18.8	-	-	**16**
18	**Denmark**	-	-	-	14.9	**71.4**	-	14.9	-	-	**7**
19	**Germany**	-	-	6.1	-	**43.9**	13.6	28.8	7.6	-	**66**
20	**Fla-Fle**	-	-	-	-	**100.0**	-	-	-	-	**3**

30b. Map of the distribution of the haplotypes of DYS481.
Red lines: DYS481 = 25; purple underlining: DYS481 = 24; green underlining: DYS481 = 22; others: DYS481 = 23.

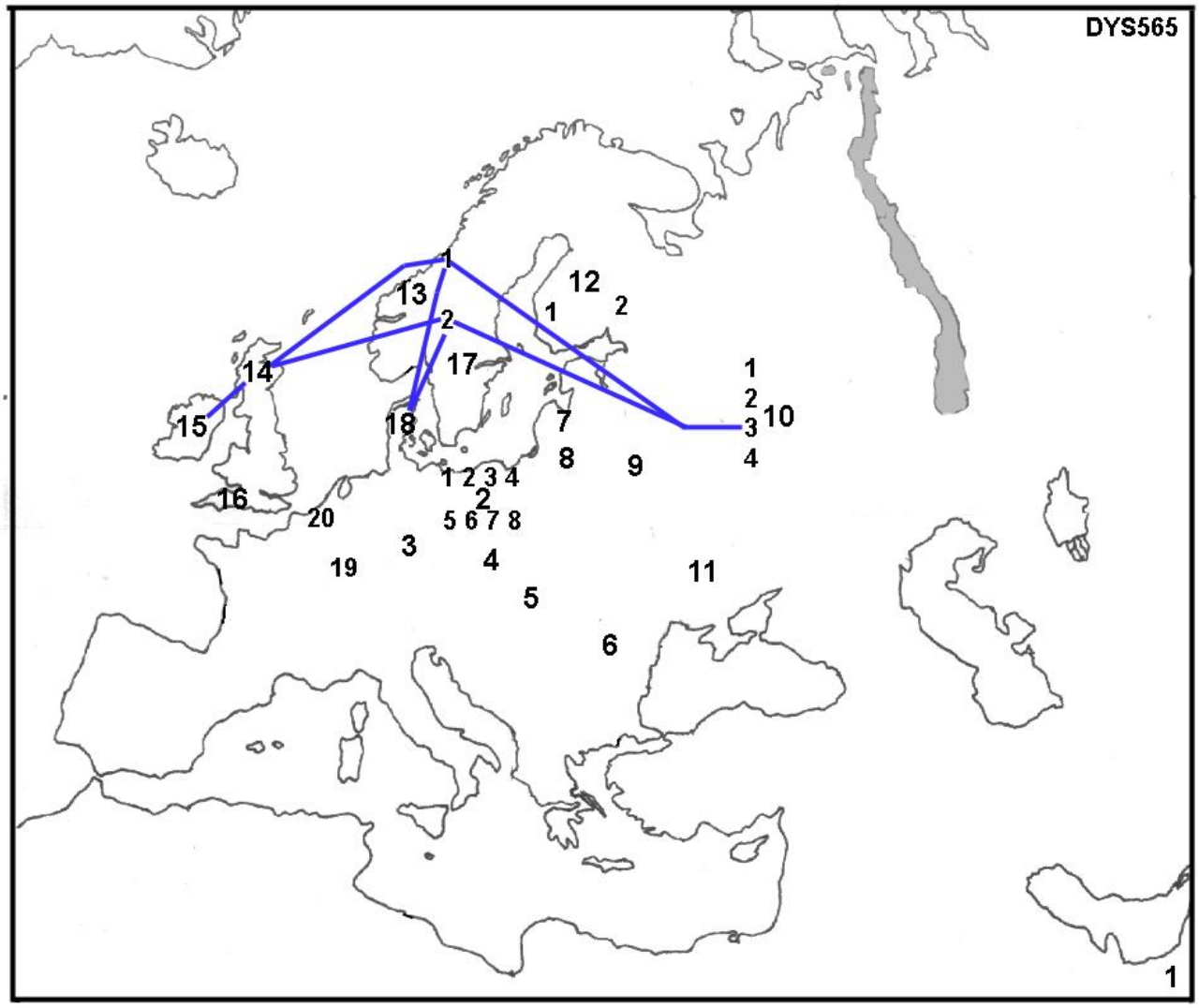


Conclusions:
(1) The main allele of DYS481 is **23**. The group can be called **General European**.
(2) Next in frequency is **25**, which is the commonest allele in five populations; two of these are Russian (Rus2 = Ants and Rus 3 = Sclavs), two Polish (Pol1 = P and Pol4 = N), and one, surprosingly, Scandinavian (Young Scandinavian).
(3) Poland has one unic subgroup with DYS481 = **24**: Pol7 = G.
(3) Also Russia has one exceptional subgroup: DYS481 is **22** Rus4 = Sarmathians.

31a. Frequencies of the alleles of DYS565 in R1a-men.

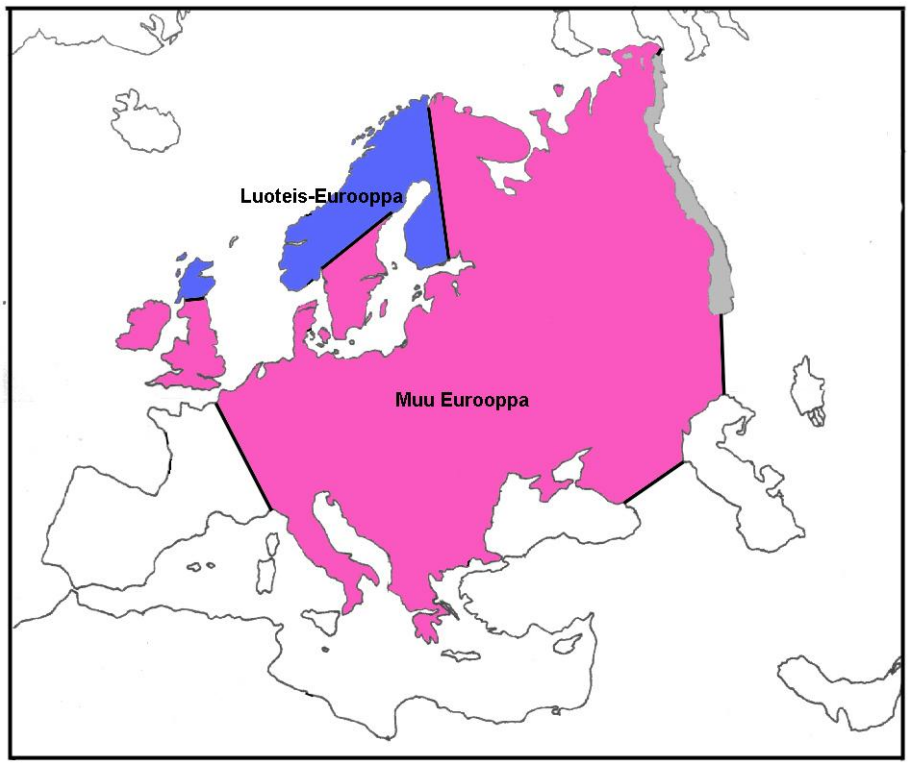
DYS565	Area/Population	11	12	13	14	n
1	India etc.	-	18.2	81.8	-	22
2	Poland					
2-1	Po1 (P)	-	21.0	74.0	5.0	100
2-2	Pol2 (K)	-	38.9	61.1	-	18
2-3	Pol3(E)	-	9.1	90.9		33
2-4	Pol4 (N)	1.7	16.9	81.4	-	59
2-5	Pol5 (A)	-	15.8	84.2	-	19
2-6	Pol6 (I)	-	15.0	85.0	-	20
2-7	Pol7 (G)	-	40.0	60.0	-	20
2-8	Pol8 (B)	-	8.3	91.7	-	12
3	Czech	4.0	40.0	56.0	-	25
4	Slovakia	-	23.8	76.2	-	21
5	Hungary	-	21.4	78.6	-	14
6	Romania	-	-	100.0	-	6
7	Latvia	-	9.1	90.9	-	11
8	Lithuania	-	16.7	83.3	-	18
9	Belarus	-	25.0	75.0	-	4
10	Russia	1.9	20.4	75.7	1.9	103
10-1	Rus1 (Veneds)	-	5.0	90.0	5.0	20
10-2	Rus2 (Ants)	-	-	100.0		17
10-3	Rus3 (Sclav)	8.3	50.0	33.3	8.3	12
10-4	Rus4 (Sarm)		8.3	91.7	-	12
11	Ukraine	-	42.9	57.1	-	14
12	Finland	-	24.1	75.9	-	54
12-1	West-Fi	-	40.0	60.0	-	15
12-2	Eas-Fi	-	16.7	83.3	-	18
13	Norway	-	68.9	31.1	-	45
13-1	Nor1 (YSc)	-	66.7	33.3	-	6
13-2	Nor2 (OSc)	-	100.0	-	-	25
14	Scotland	-	77.8	22.2	-	81
15	Irland	-	56.9	39.2	3.9	51
16	Devon	-	40.0	60.0	-	5
17	Sweden	2.7	40.0	53.3	-	15
18	Denmark	-	57.1	42.9	-	7
19	Germany	-	18.3	81.7	-	71
20	Fla-Fle	-	33.3	66.7	-	3

31b. Map of the distribution of the haplotypes of DYS565.
Blue lines: DYS565 = 12; unconnected: DYS565 = 13.



Conclusions:
(1) DYS565 value of the General European group is **13**.
(2) Norway (both Young Scandinavians and Old Scandinavians) is a center for DYS565 = **12**. This allele is common, in addition to Norway, also in Denmark, Scotland , and Ireland, and in one Russian subglade (Rus 3 = Sclavs). The Norwegian and Danish subclades represent Vikings and the other three can be interpreted as areas with strong Viking influence. There may have been a STR-mutation **DYS565 13>12** in Scandinavia.

32. Map of the two main areas based on the alleles of the thirteen ”critical” loci. Blue: internal genetic distances 2 – 3 steps; red: internal genetic distances 4 – 14 steps.



Luoteis-Eurooppa = North-Western Europe. *Muu Eurooppa* = the rest of Europe.

Summary of haplotypes: Two main types

R1a-men consist genetically and geographically of **two main STR-types**. One can be called **General**, the other **Scandinavian**. The General type is original; the Scandinavian type was developed later by a number of STR-mutations.

(a) Six essential STR-mutations

The mutations developed at the time of the arrival of R1a men in Scandinavia or just before they arrived there. The most essential mutations concern following six markers and their alleles:

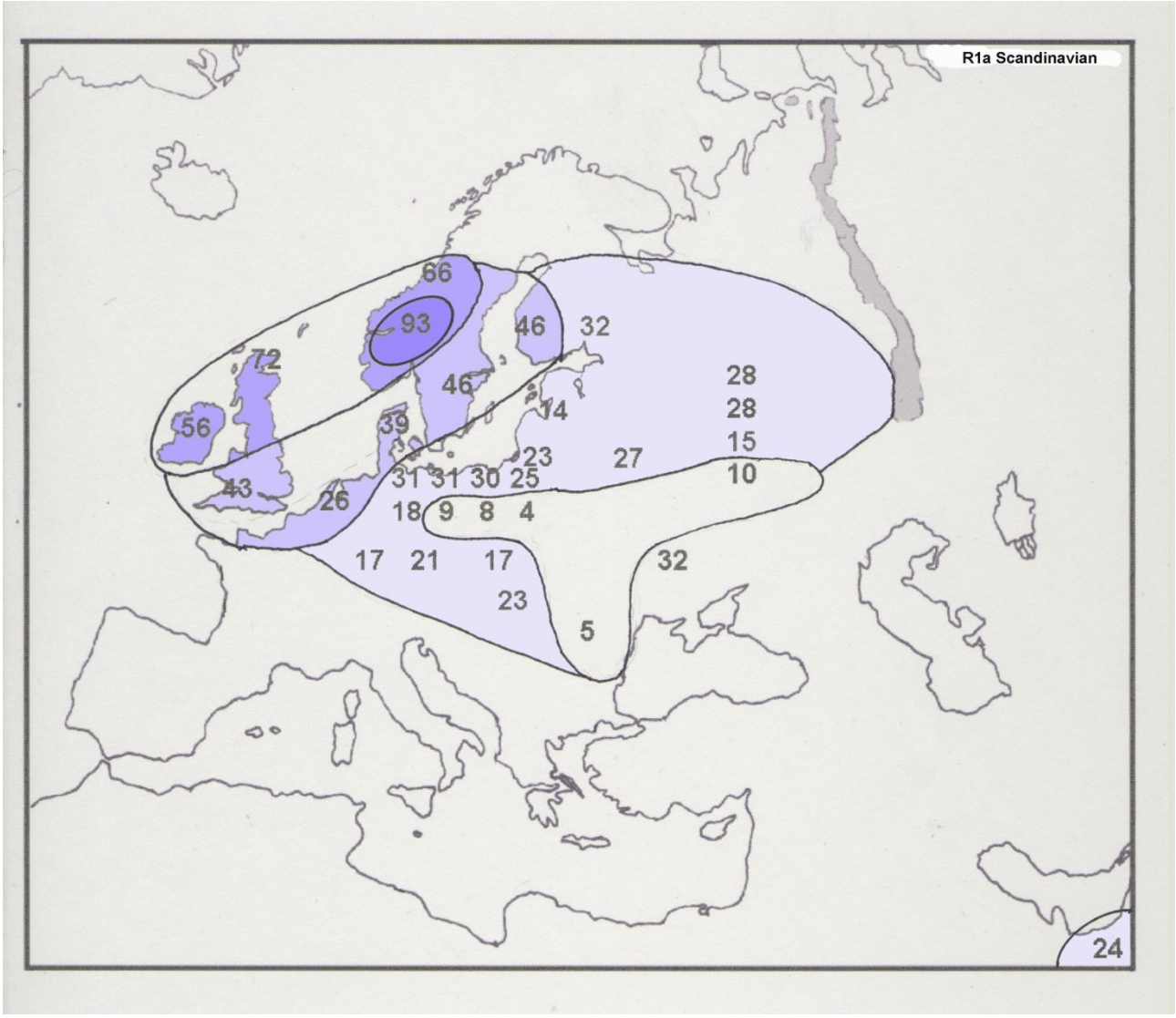
	General type	**Scandinavian type**	**Mutations**
DYS19	16-17	15	DYS19: 17>16>15
DYS391	10	11	DYS391: 10>11
YCAIIb	23	21	DYS: 23(>22)>21
DYS 442	13-14	12	DYS442: 14>13>12
DYS594	10	11	DYS394: 10>11
DYS565	13	12	DYS13>12

The mutation are presented as one step mutations; it is, of course, possible that some of the mutationes have involved as two simultaneous steps. Of the six markers, DYS594 is more reliable than others to differentiate the Scandinavian type from the General one.

Distinctive features of the Scandinavian type

The next Table shows the percentages of the Scandia-type alleles of the six markers in question. The frequencies are seen also in the following Map.

		DYS19 15	DYS391 11	YCAIIb 21	DYS442 12	DYS594 11	DYS565 12	Average
1	**India etc.**	**45.8**	40.0	4.4	27.3	5.0	18.2	23.5
2	**Poland**							
2-1	**Po1 (P)**	1.5	2.2	-	23.1	0.9	21.0	8.1
2-2	**Pol2 (K)**	18.9	**61.3**	-	27.9	-	38.9	24.5
2-3	**Pol3(E)**	29.4	**97.1**	2.9	**47.1**	-	9.1	30.9
2-4	**Pol4 (N)**	24.7	8.6	1.2	2.6	-	16.9	9.0
2-5	**Pol5 (A)**	7.4	-	-	-	-	15.8	3.9
2-6	**Pol6 (I)**	-	**85**	-	5.3	-	15.0	17.6
2-7	**Pol7 (G)**	**60.0**	**76.2**	-	5.6	-	40.0	30.3
2-8	**Pol8 (B)**	-	**84.6**	-	**92.3**	-	8.3	30.9
3	**Czech**	35.2	25.0	2.7	21.1	-	40.0	20.7
4	**Slovakia**	19.6	32.8	2.6	25.7	-	23.8	17.4
5	**Hungary**	26.8	**50.0**	-	38.8	-	21.4	22.8
6	**Romania**	21.4	-	-	9.1	-	-	5.1
7	**Latvia**	40.0	10.5	11.1	5.9	9.1	9.1	14.3
8	**Lithuania**	40.6	38.7	-	32.0	11.1	16.7	23.2
9	**Belarus**	18.2	**83.3**	-	33.3	-	25.0	26.6
10	**Russia**							
10-1	**Rus1 (Veneds)**	29.2	**91.7**	-	41.7	-	5.0	27.9
10-2	**Rus2 (Ants)**	44.0	-	-	14.3	-	-	9.7
10-3	**Rus3 (Sclav)**	12.5	6.3	-	23.1	-	**50.0**	15.3
10-4	**Rus4 (Sarm)**	-	**85.1**	-	**75.0**	-	8.3	28.1
11	**Ukraine**	36.4	40.9	14.3	**44.4**	13.8	42.9	32.1
12	**Finland**	**45.9**	**64.0**	14.7	37.3	23.6	24.1	34.9
12-1	**West-Fi**	**65.0**	**73.3**	28.6	**37.5**	33.3	40.0	46.3
12-2	**Eas-Fi**	33.3	**77.8**	11.8	33.3	16.7	16.7	31.6
13	**Norway**	**71.8**	**84.3**	**52.8**	**86.2**	**95.2**	**68.9**	76.5
13-1	**Nor1 (YSc)**	33.3	**100.0**	-	**93.8**	**100.0**	**66.7**	65.6
13-2	**Nor2 (OSc)**	**94.6**	**86.1**	**93.9**	**85.7**	**100.0**	**100.0**	93.4
14	**Scotland**	**66.8**	**68.6**	**50.3**	**79.6**	**86.1**	**77.8**	71.5
15	**Irland**	**65.2**	**53.0**	**43.4**	**57.5**	**60.0**	**56.9**	56.0
16	**Devon**	**62.5**	25.0	37.5	**50.0**	40,0	40.0	42.5
17	**Sweden**	30.3	**60.0**	17.9	**58.6**	**68.9**	40.0	46.0
18	**Denmark**	**48.3**	**57.1**	11.8	27.8	28.6	**57.1**	38.5
19	**Germany**	23.7	28.7	4.8	22.2	**5.6**	18.3	17.2
20	**Fla-Fle**	**37.5**	-	-	**50.0**	33.3	33.3	25.7



’R1a Scandinavian sin’. Average frequencies of in column *Average* of the preceding Table. The figures show the procentage of the six alleles typical of Scandinavian R1a-men.

The eight Polish subclades are arranged in the following order in the Map:

Pol3 (E) Pol8 (B) Pol7 (G) Pol2 (K)

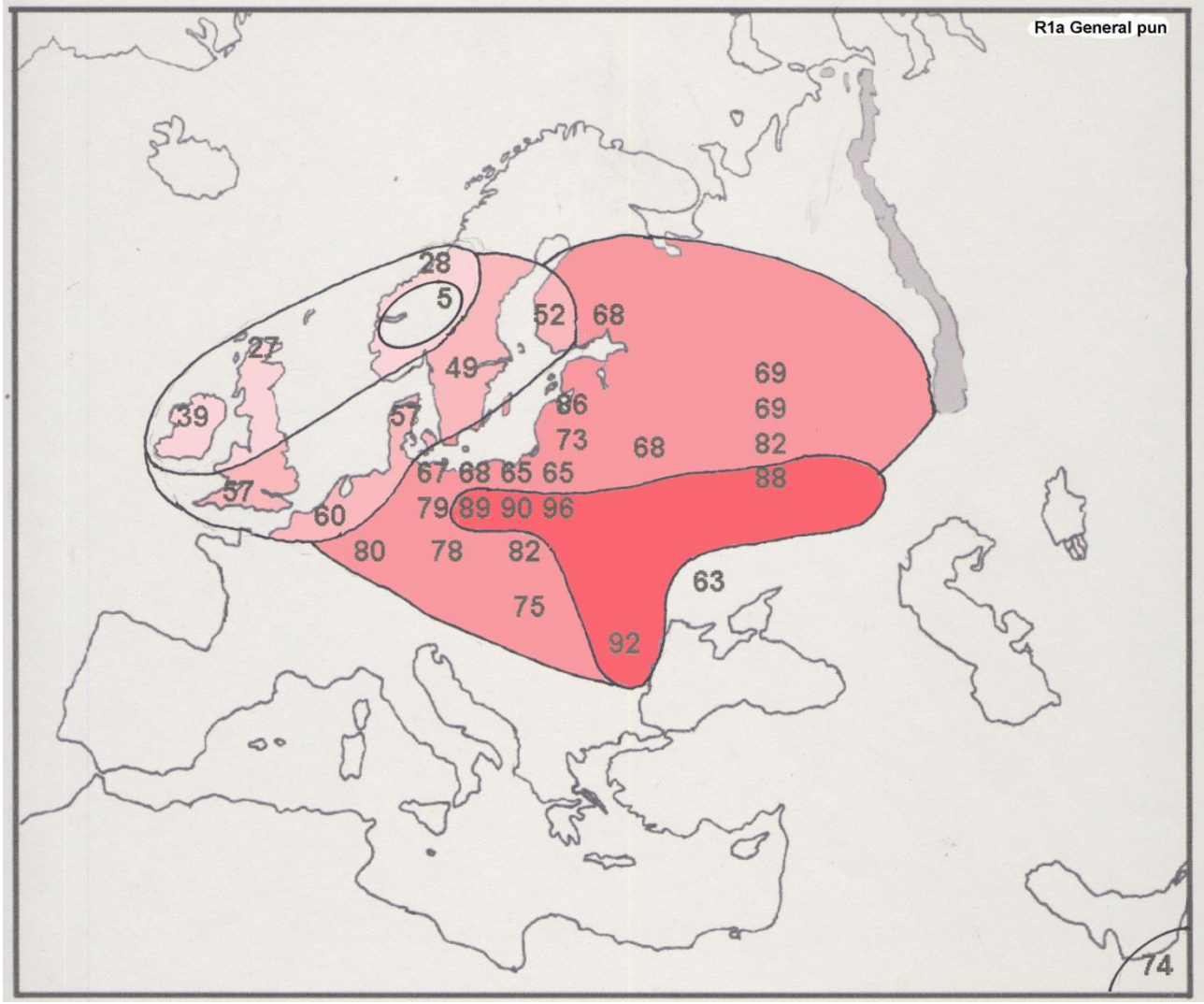
Pol6 (I) Pol4 (N) Pol1 (P) Pol5 (A)

The four Russian subclades are from the top to the bottom: Rus4 (Sarm), Rus1 (Veneds), Rus3 (Sclav), Rus2 (Ants).

Distinctive features of the General type

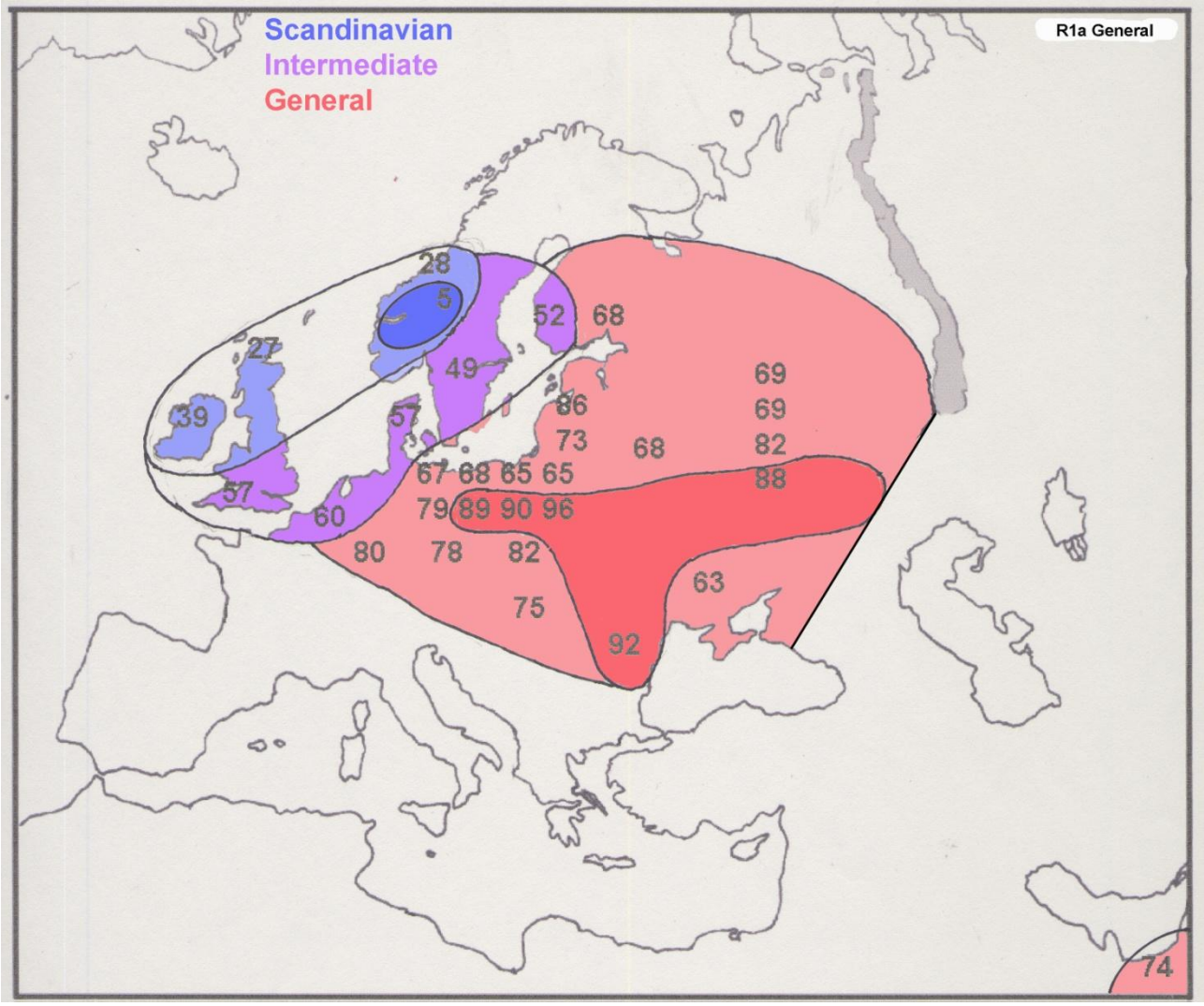
	Area/Population	DYS19 16-17	DYS391 10	YCAIIb 23	DYS442 13-14	DYS594 10	DYS565 13	Average
1	India etc.	51.7	57.5	88.9	68.2	95.0	81.8	73.9
2	Poland							
2-1	Po1 (P)	97.2	97.1	96.6	75.2	99.1	74.0	89.9
2-2	Pol2 (K)	78.9	30.7	60.8	69.2	89.5	61.1	65.0
2-3	Pol3(E)	70.6	2.9	88.2	50.0	97.0	90.9	66.6
2-4	Pol4 (N)	75.5	90.1	92.3	94.8	100.0	81.4	89.0
2-5	Pol5 (A)	92.6	100.0	100.0	96.3	100.0	84.2	95.5
2-6	Pol6 (I)	95.0	15.0	85.0	94.8	100.0	85.0	79.1
2-7	Pol7 (G)	25.0	23.8	85.7	94.4	100.0	60.0	64.8
2-8	Pol8 (B)	100.0	15.4	100.0	0	100.0	91.7	67.9
3	Czech	64.8	75.0	94.6	79.0	100,0	56.0	78.2
4	Slovakia	80.3	67.2	94.7	71.4	100.0	76.2	81.6
5	Hungary	73.2	48.2	92.3	59.2	100.0	78.6	75.3
6	Romania	78.6	100.0	81.8	91.0	100.0	100.0	91.9
7	Latvia	60.0	89.5	88.9	94.1	90.9	90.9	85.7
8	Lithuania	59.4	61.3	75.0	68.0	88.9	83.3	72.7
9	Belarus	81.8	16.7	67.7	66.7	100.0	75.0	68.0
10	Russia							
10-1	Rus1 (Veneds)	70.8	8.3	95.8	54.2	95.2	90.0	69.1
10-2	Rus2 (Ants)	56.9	100.0	91.7	76.2	100.0	100.0	87.5
10-3	Rus3 (Sclav)	87.6	93.8	100.0	77.0	100.0	33.3	82.0
10-4	Rus4 (Sarm)	100.0	14.9	100.0	16.7	91.7	91.7	69.2
11	Ukraine	63.6	59.1	78.6	33.3	86.2	57.1	63.0
12	Finland	51.8	34.9	76.5	59.7	76.4	75.9	62.5
12-1	West-Fi	30.0	26.7	64.3	62.6	66.7	60.0	51.7
12-2	Eas-Fi	66.6	22.2	88.2	61.1	83.3	83.3	67.5
13	Norway	28.2	14.3	23.6	6.2	0	31.1	29.3
13-1	Nor1 (YSc)	66.6	0	60.0	6.3	0	33.3	27.7
13-2	Nor2 (OSc)	5.4	11.1	0	12.9	0	0	4.9
14	Scotland	31.1	30.3	47.1	18.5	12.9	22.2	27.0
15	Irland	31.3	40.9	42.1	38.4	40.0	39.2	38.6
16	Devon	32.5	75.0	62.5	50.5	60.0	60.0	56.8
17	Sweden	57.6	37.1	71.4	41.4	31.3	53.3	48.7
18	Denmark	44,8	38.1	76.5	66.7	71.4	42.9	56.7
19	Germany	71.6	68.3	88.7	75.2	94.4	81.7	80.0
20	Fla-Fle	62.5	87.5	50.0	25.0	66.7	66.7	59.7

Blue: Old Scandinavian and close to Old Scandinavian. Red: Center of the General type.



Average frequencies of in column *Average* of the preceding Table. The figures show the procentage of the six alleles typical of the General type of R1a-men.
The eight Polish and four Russian subclades are arranged in the wat as in the preceding map.

Geographic areas of the Scandinavian, General and Intermediate types



Geographic distribution of the Scandinavian and General types and that of the intermediate type. The extreme types of the Scandinavian and General types are Old Scandinavian (figure 5 in the Map) and Poland A (figure 96 in the Map).

The **Western Finns** belong to the Immediate type, which covers also certain areas of Britain, the Flandres-Flemish area, Denmark and Sweden. This zone represents a typical zone of about equal percentages of the Scandinavian and General types. The **Easterns Finns** are closer to the General type and form a moderate variety of the General type. The percentages of this type vary between 60-85, while the center has procentages 86-100.

The most typical representatives of the two extreme types of R1a-men are **Poland 5 (type A)** and **Old Scandinavian**. The typical fingerprints of the two types are as follows:

	DYS19	**DYS391**	**YCAIIb**	**DYS442**	**DYS594**	**DYS565**
Old Scandinavian	15	11	21	12	11	12
Poland 5, type A	17	10	23	14	10	13

Western Finns are closer to Old Scandinavians, and Eastern Finn to Poles, type A:

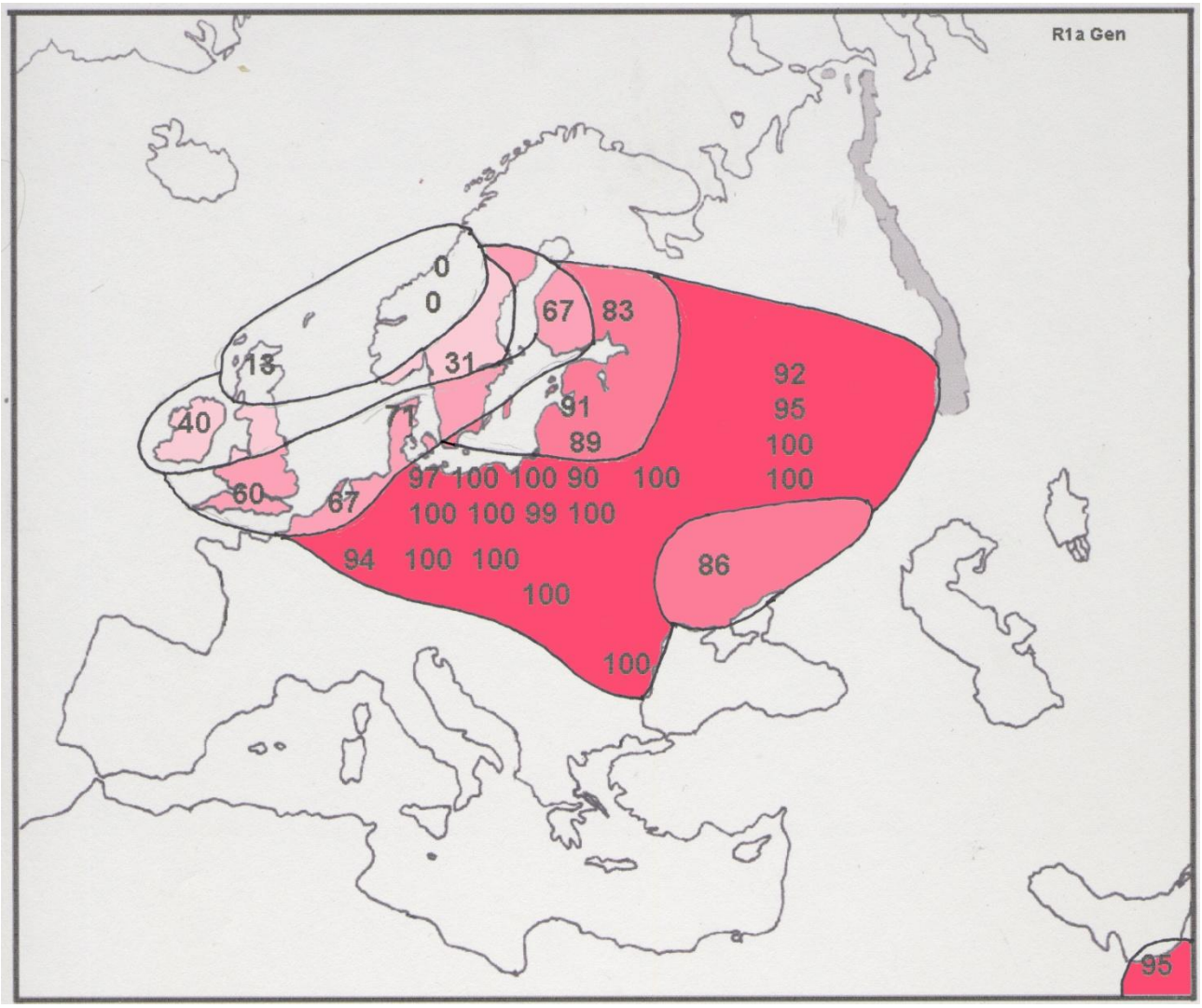
	DYS19	**DYS391**	**YCAIIb**	**DYS442**	**DYS594**	**DYS565**
Old Scandinavian	15	11	21	12	11	12
Western Finns	15	11	23	12	10	13
Eastern Finns	16	11	23	14	10	13
Poland 5, type A	17	10	23	14	10	13

(b) One effective distinctive marker: DYS 594

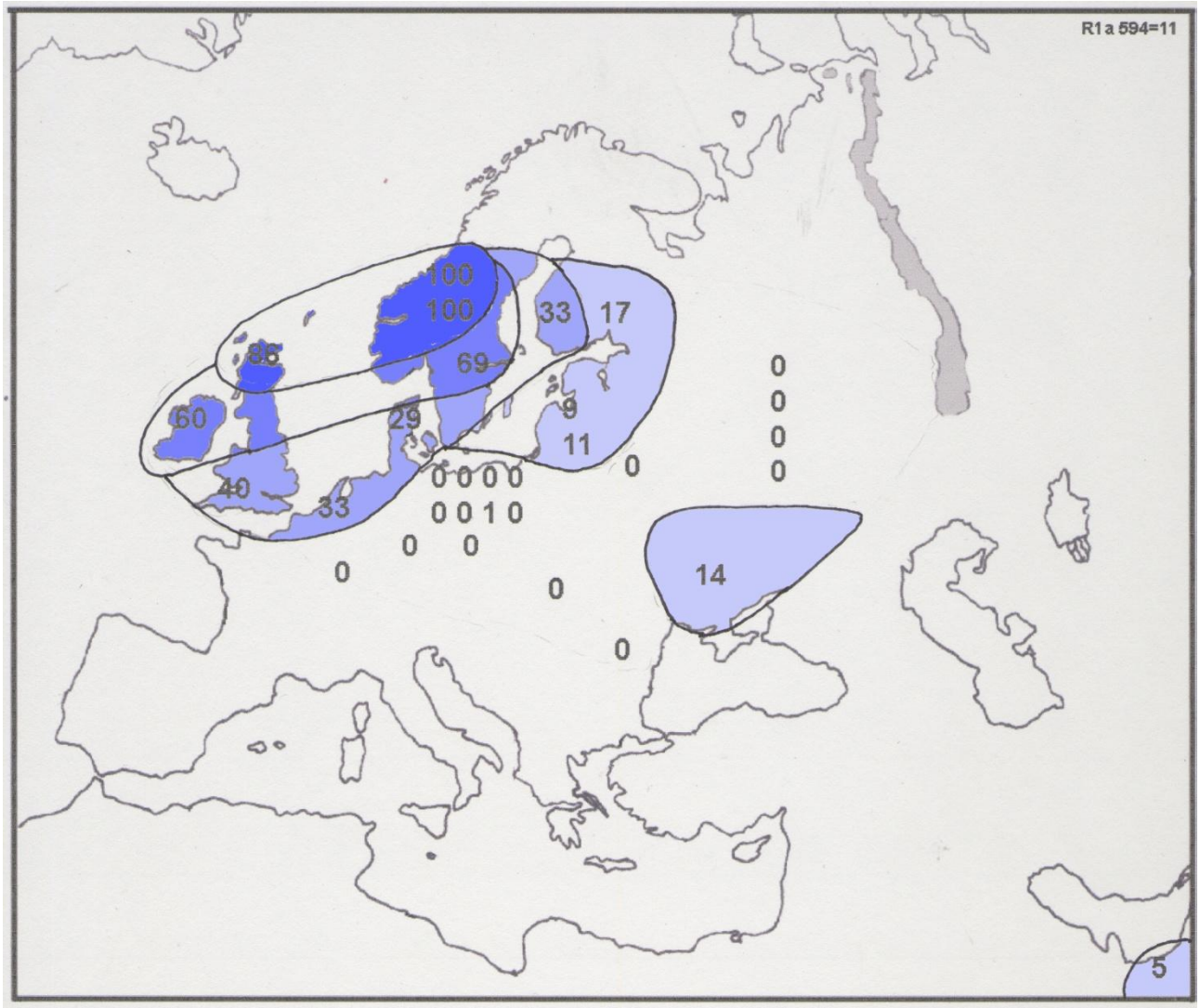
A simple but reliable means of differentiating the Scandinavian R1a-men from the General R1a-men is **marker 594**. Its value is typically 11 in the Scandinavian subtype and 10 in the General one.

DYS594	Area/Population	8	9	10	11	12	n
1	India etc.	-	-	95.0	5.0		20
2	Poland	-	-	95.1	4.0	-	634
2-1	Po1 (P)	-	-	99.1	0.9	-	110
2-2	Pol2 (K)	5.3	5.3	89.5	-	-	19
2-3	Pol3(E)	3.0	-	97.0	-	-	33
2-4	Pol4 (N)	-	-	100.0	-	-	61
2-5	Pol5 (A)	-	-	100.0	-	-	19
2-6	Pol6 (I)	-	-	100.0	-	-	20
2-7	Pol7 (G)	-	-	100.0	-	-	20
2-8	Pol8 (B)	-	-	100.0	-	-	12
3	Czech	-	-	100,0	-	-	24
4	Slovakia	-	-	100.0	-	-	21
5	Hungary	-	-	100.0	-		13
6	Romania	-	-	100.0	-	-	6
7	Latvia	-	-	90.9	9.1	-	11
8	Lithuania	-	-	88.9	11.1	-	18
9	Belarus	-	-	100.0	-	-	4
10	Russia	-	1.1	97.7	0.6	0.6	174
10-1	Rus1 (Veneds)	-	4.8	95.2	-	-	21
10-2	Rus2 (Ants)	-	-	100.0	-	-	17
10-3	Rus3 (Sclav)	-	-	100.0	-	-	12
10-4	Rus4 (Sarm)	-	8.3	91.7	-	-	12
11	Ukraine	-	-	86.2	13.8		29
12	Finland	-	-	76.4	23.6	-	55
12-1	West-Fi	-	-	66.7	33.3	-	15
12-2	Eas-Fi	-	-	83.3	16.7	-	18
13	Norway	-	4.8	-	95.2	-	42
13-1	Nor1 (YSc)	-	-	-	100.0	-	9
13-2	Nor2 (OSc)	-	-	-	100.0	-	29
14	Scotland	-	-	12.9	86.1	1.1	91
15	Irland	-	-	40.0	60.0	-	50
16	Devon	-	-	60.0	40,0		5
17	Sweden	-	-	31.3	68.9	-	16
18	Denmark	-	-	71.4	28.6	-	9
19	Germany	-	-	94.4	5.6	-	71
20	Fla-Fle	-	-	66.7	33.3	-	3

Red: allele 10 has majority; blue: allele 11 has majority; grey: significant minority alleles. The geographic distribution of the frequencies of alleles 10 and 11 are seen in the following two maps.



Frequencies of DYS594=10 in various areas.



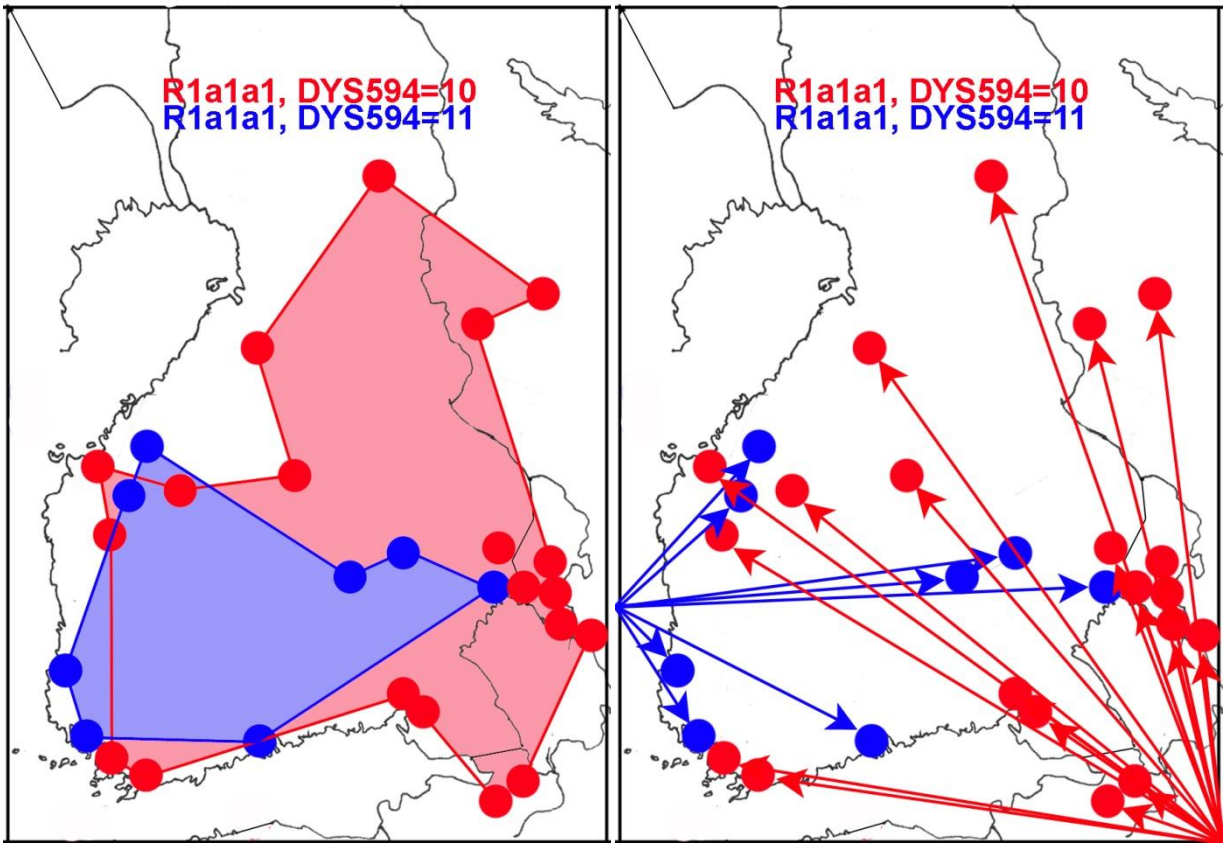
Frequencies of DYS594=11 in various areas.

The two types of Finns belong to the outskirtes of the area of DYS594=11. The center of DYS594=11 is in Western Scandinavia with the frequency of one hundred per cent, and its fruqency decreases with distance from the center. **Western Finland** belongs to the same zone with certain parts of Britain, the Flanders-Flemish area, and Denmark with frequencies of 30-40 per cent. **Eastern Finland** belongs to the next zone further from the center with frequencies of 9-29. This zone covers also the Baltic countries and the Ukraine.

The frequencies of the Scandinavian type DYS594=11of R1a-men in the two Finnish ”tribes” show that more Scandinavian R1a-men have come to Western Finland (frequency 33) and less to Eastern Finland (frequency 17). On the other hand, the frequency of the General type with DYS594=10 is higher in Eastern Finland (frequency 83) than Western Finland (frequency 67). These figures show two things:

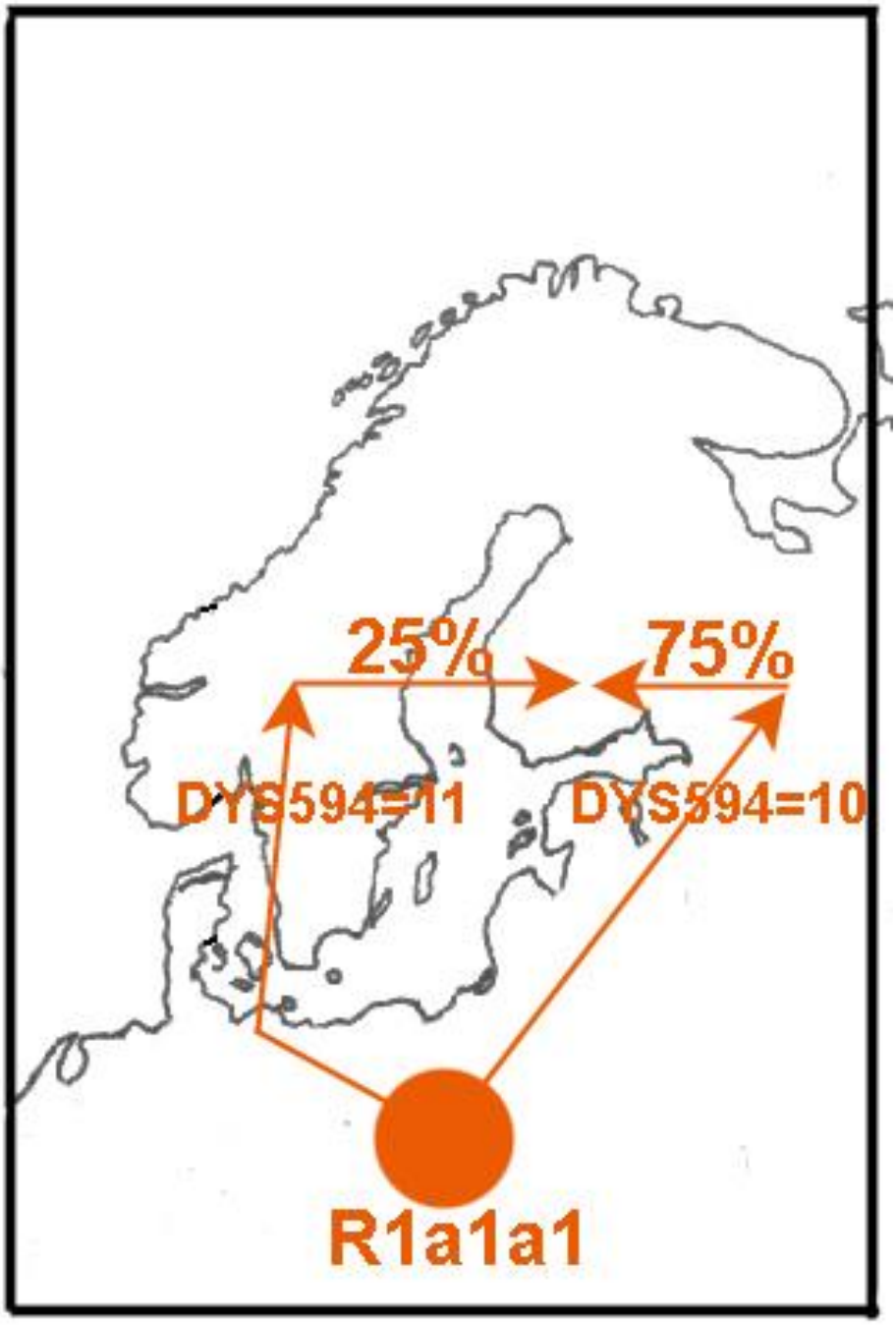
(a) In Finland, the Scandinavian type is, as expected, more typical in Western Finland (33 %) than Eastern Finland (17 %). Conversely, the General type is more frequent in Eastern Finland (83 %) and less frequent in Eastern Finland (67 %); cf. Table ’DYS594=10’.

(b) On the whole, Finnish R1a-men have come more frequently from the east than from the west. The percentages of the Scandinavian origin is 33+17 (average 50) while that of Eastern (General) origin is 67+83 (average 75). Accordingly, if based on the frequencies of the alleles of DYS594, about three quarters of Finnish R1a-men have come from the East and about one quarter from the West.



The arrows of the Map are based on the assumption that the forefathers of Finnish R1a-men with allele 11 have come to Finland from Scandinavia and those with allele from North-Western Russia.

The following table shows the relevant alleles of Western and Eastern Finns compared to those of Old Scandinavians and Poland type A . In the table, Eastern Finns are closer to the Polish A type, while Western Finns are closer to the Old Scandinavian type.



Conclusion: About 25 per cent of these Finnish men have come from the west and about 75 per cent from the east and south.

Two large R1a-populations: Poles and RussiansPoles and Russians

The **Polish** subclades fall into two opposing groups: one with more similarities with the Scandinavians, and the other with fewer similarities with them. The subclades closer to the Scandinavians are Pol3 (E), Pol8 (B), Pol7 (G), and Pol2 (K). The one clade represent the intermediate group is Pol6(I), and the subclades further from the Scandinavians are Pol4 (N), Pol1 (P), and Pol5 (A).
The **Russian** subgroups, likewise, form two main groups and with one intermediate one. Sarmathians and Veneds are closer to the Scandinavians and are therefore perhaps situated further north, while Ants are furthest from the Scandinavians. The intermediate group consists of the Sclavs.

DYS391 is effective in differentiting certain Polish and Russian subclades from each other:
(a) **Poles** have five subgroups that have a ”Scandinavian-like” allele 11 (Pol2 K, Pol3 E, Pol6 I, Pol 7 G, and Pol8 G) and three with a ”non-Scandinavian” allele 10 (Pol1 P, Pol4 N, and Pol5 A).
(b) **Russians** have two subclades with ”Scandinavian-like” allele 11 (Rus1 Veneds and Rus4 Sarmathians) and two with ”non-Scandinavian” allele 10 (Rus2 Ants and Rus3 Sclavs).