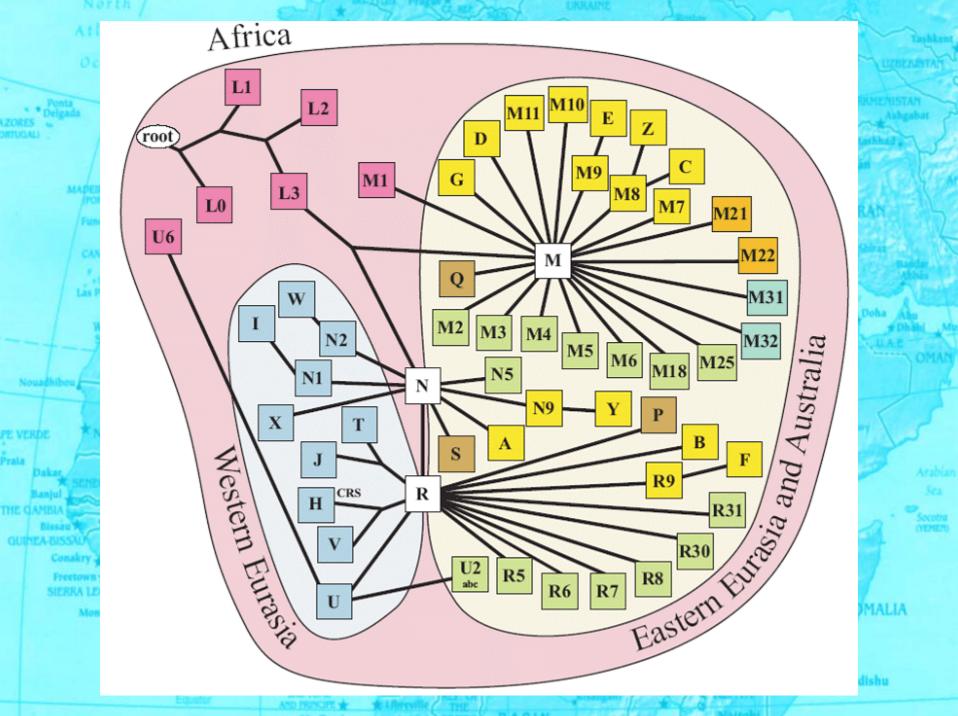
North West and North East Africa: a different perspective from mtDNA haplogroups distribution

Erwan Pennarun

Estonian Biocentre & University of Tartu, Estonia Laboratoire d'Étude des Polymorphismes de L'ADN, Nantes Aussois, 23/09/2005

Mitochondrial DNA

- Maternally Inherited
- No recombination
- · Higher mutation rate than autosomes
- HVS I (and II) sequencing + RFLP/SNP typing allows unambiguous classification into haplogroups



Most of the extant mtDNA boundaries in South and Southwest Asia were likely shaped during the initial settlement of Eurasia by anatomically modern humans

Mait Metspalu*1, Toomas Kivisild1, Ene Metspalu1, Jüri Parik1, Georgi Hudjashov¹, Katrin Kaldma¹, Piia Serk¹, Monika Karmin¹, Doron M Behar², M Thomas P Gilbert⁶, Phillip Endicott⁷, Sarabjit Mastana⁴, Surinder S Papiha⁵, Karl Skorecki², Antonio Torroni³ and Richard Villems¹ N1, N2, M7,8,9,10 U1,2e,3, N+A, N9 4,5,7,8 M2,3,4,6, R+B, R9 M → 18,25

North Africa

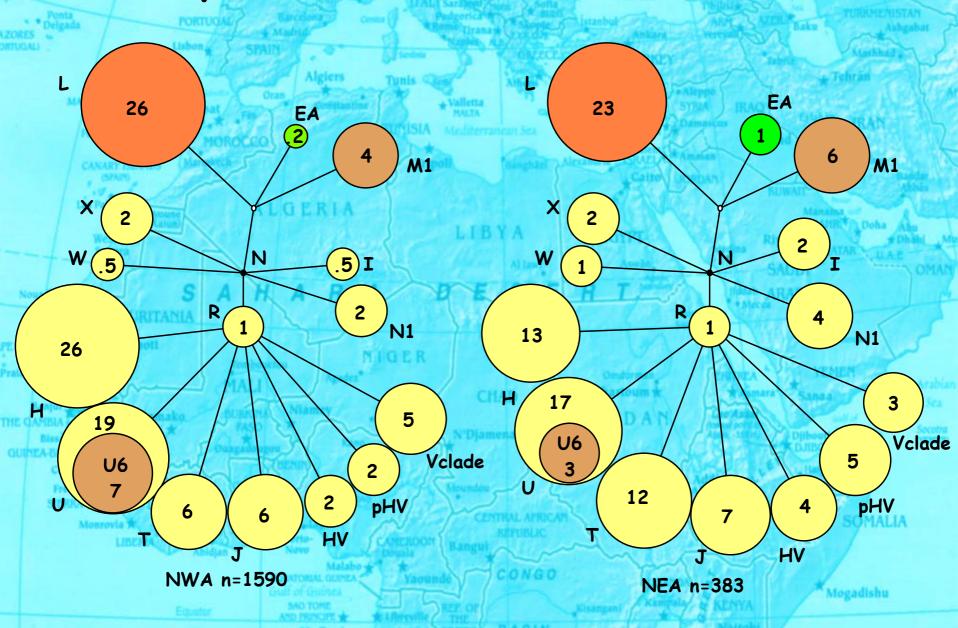
- · Inhabited as far as 40 kya
- · Ibero-maurusian industry 22-9 kya
- Berbers are thought to be the aboriginal North African
- Neolithic time: spread of farming alongside the Northern and Southern shore of Mediterranean sea
- · Muslim ruling

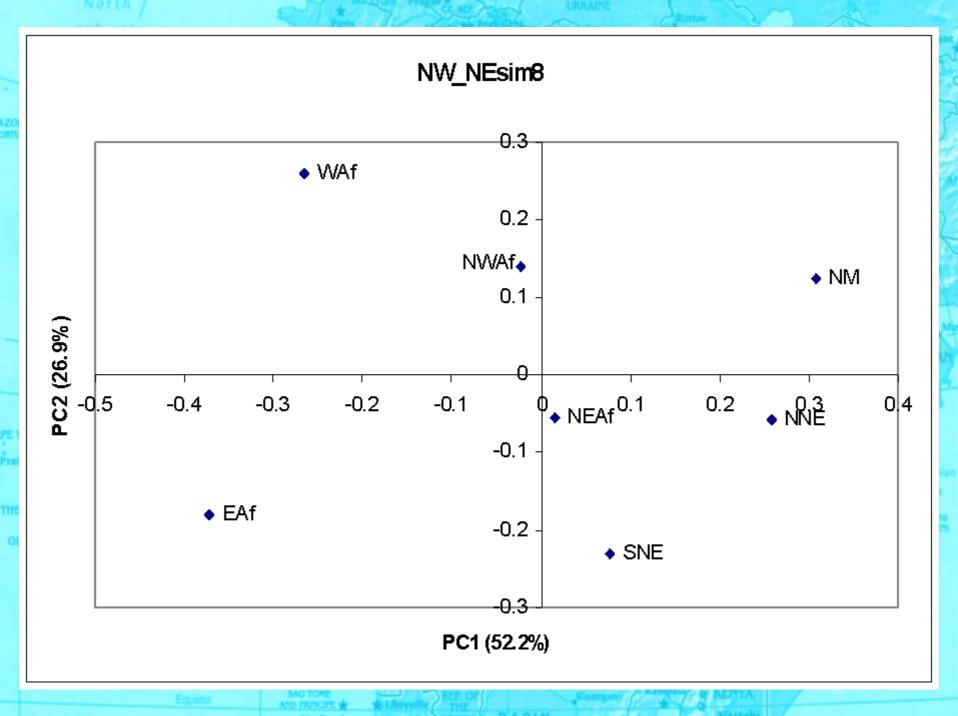
Populations studied

- · 24 different populations
- · Total number: 5107 DNAs
- · Coverage of the different regions of interest
 - West Africa (WAf)
 - NW Africa (NWAf)
 - NE Africa (NEAf)
 - E Africa (EAf)
 - Near East (NE/ME)
 - "North Mediterranean" (NM)

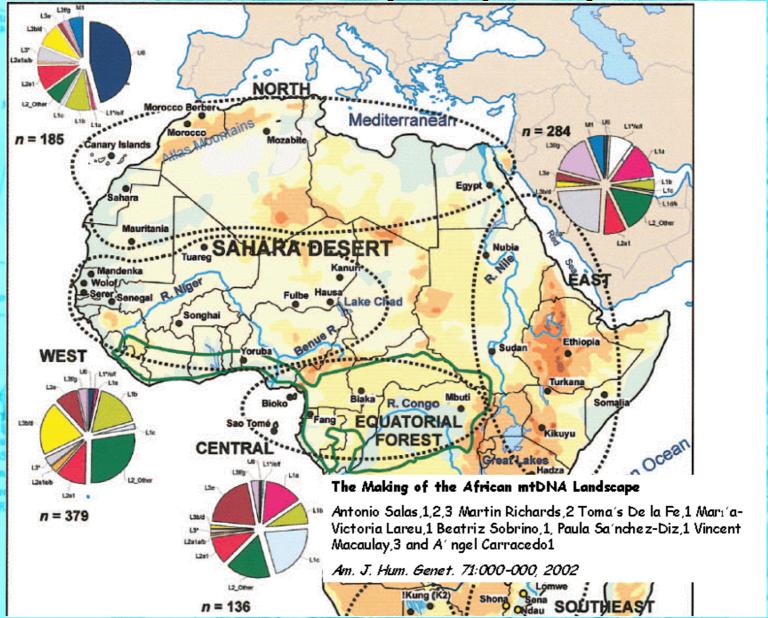
Populations studied North Rostov Menna A Bratislava Paris Atlantic * Budapest Tashkent Ljubliana * CRO Belgrade Bucharest Ocean UZBEKISTA Marsellles deo. Barcelona. AZER. Baku · Delgada PORTUGAL Istanbul ARM Ashgabat * Madrid Ankara AZORES ORTUGAL) Lisbon SPAIN Mashhad . TURKEY * Tehran Adana Algiers Tunis Sien Nicosia CYPRUS LEB Damascus Beirut Damascus · Aleppo Oran *Valletta MADEIRA ISLANDS Constantine IRAQ Rabat (PORTUGAL) Casablanca Fes Esfahan, IRAN TUNISIA Mediterranean Sea Funchal Baghdad MOROCCO Alexandria ISRAEL Amman Marrakech Tripoli CANARY ISLANDS (SPAIN) * Kuwait Las Palmas KUWAII' Al lizah ALGERIA Manama. Laayoune (El Aaiún) BAHR Doha LIBYA EGYPT Western * Dhabi Sahara Aswan. Al Jawf SAUDI Ilddah ARABIA Nouadhibou • Mecea Port MAURITANIA Sudan no defined boundary PE VERDE Nouakchott NIGER Tombouctou YEMEN Praia Agadez* Omdurman MALI Arabian Dakar. Khartoum * * Asmara CHAD Sanaa Banjul BURKINA Zinder Niamey Lac'Assal Bamako SUDAN THE GAMBIA FASO Socotra Djibouti Aden N'Djamena Bissau * (YEMEN) Ouagadougou Kano, DJIBOUT **GUINEA-BISSAU** NIGERIA Addis * * Abuja Moundou COTE SIERRA LEONE DIVOIRE **ETHIOPIA** CENTRAL AFRICAN SOMALIA REPUBLIC Yamoussoukro CAMEROON Juba_ Bangui Abidjan Novo CONGO EQUATORIAL GUINEA Yaounde UGANDA Mogadishu KENYA Kisangani

Frequencies in NWA & NEA





Macrohaplogroup L

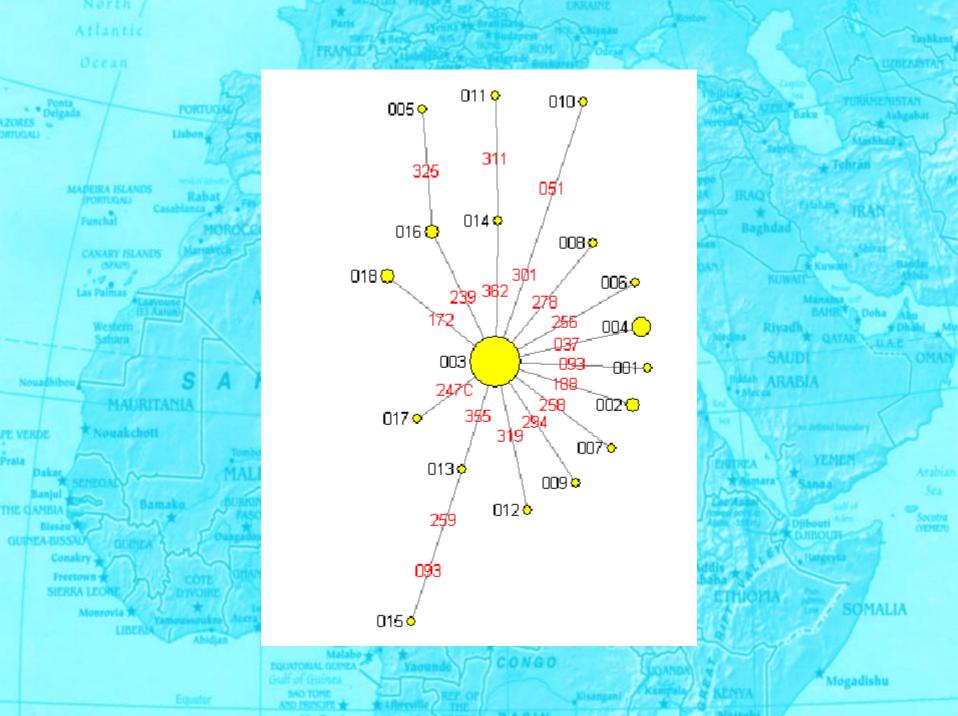


MALIA

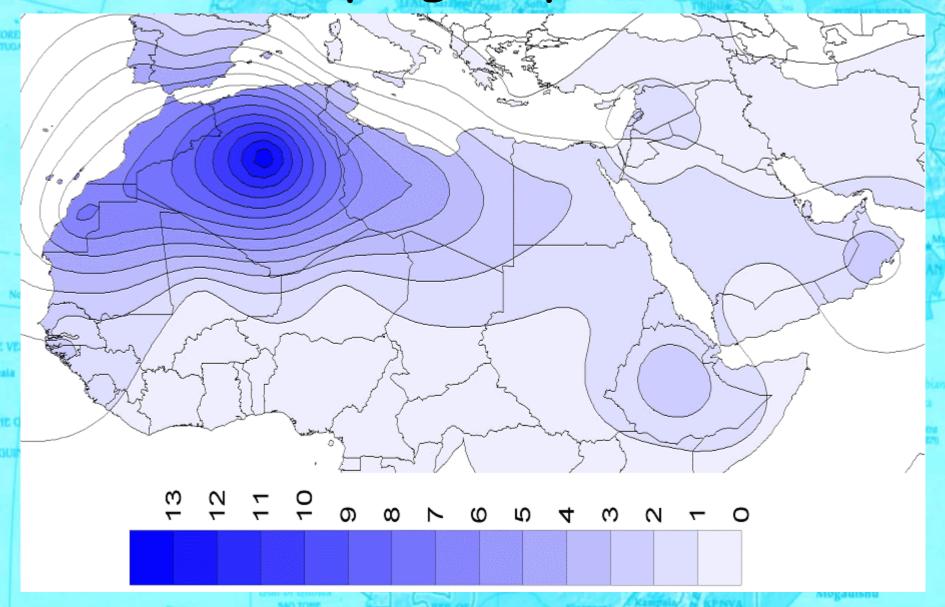
ogadishu

Macrohaplogroup L

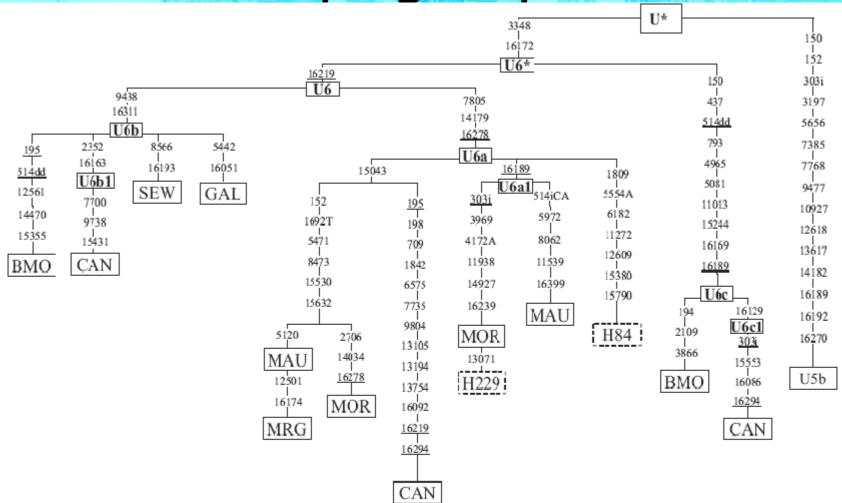
- East African lineages (LO, L3f/x, L4, L5)
 - 30% of NE Africa L, ~1-2% for NW Africa
- West African lineages (L1b, L2 Hp, L3b/d)
- · L3e5 041-223



Haplogroup U6

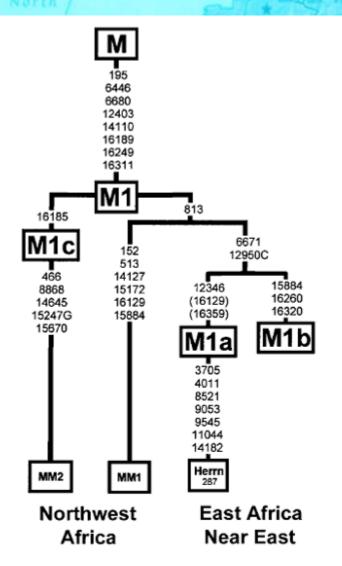


Haplogroup U6



Mitochondrial DNA transit between West Asia and North Africa inferred from U6 phylogeography

Nicole Maca-Meyer 1, Ana M González 1, José Pestano 2, Carlos Flores 1, José M Larruga 1 and Vicente M Cabrera*1 BMC Genetics 2003, 4:15



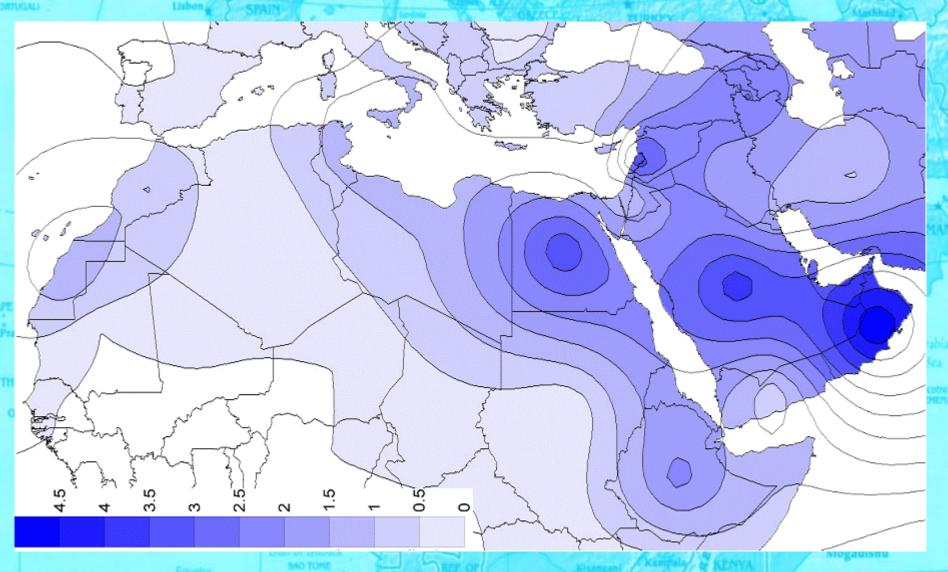
Haplogroup M1

Ethiopian Mitochondrial DNA Heritage: Tracking Gene Flow Across and Around the Gate of Tears

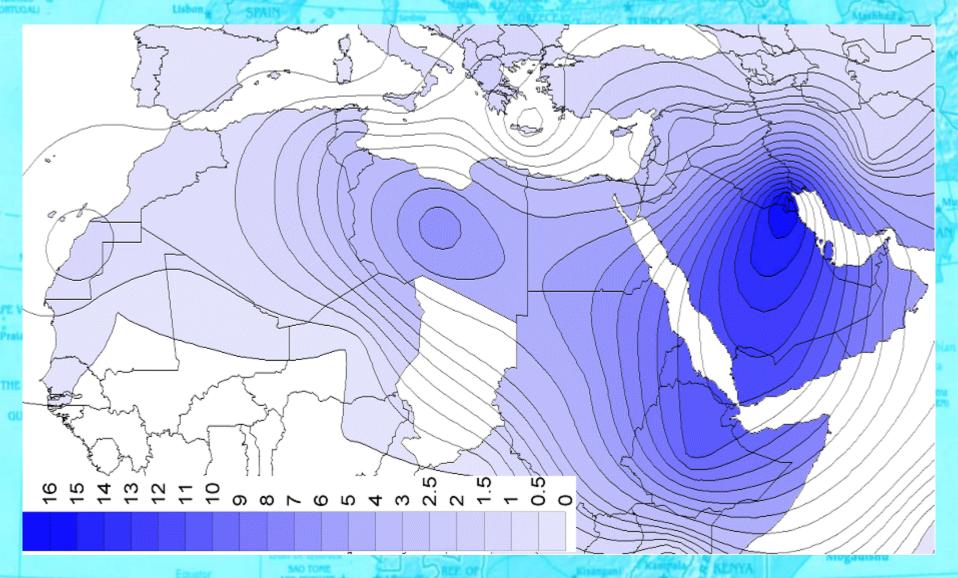
Toomas Kivisild,1 Maere Reidla,1 Ene Metspalu,1 Alexandra Rosa,1 Antonio Brehm,2 Erwan Pennarun,1 Ju"ri Parik,1 Tarekegn Geberhiwot,3 Esien Usanga,4 and Richard Villems1

Am. J. Hum. Genet. 75:752-770, 2004

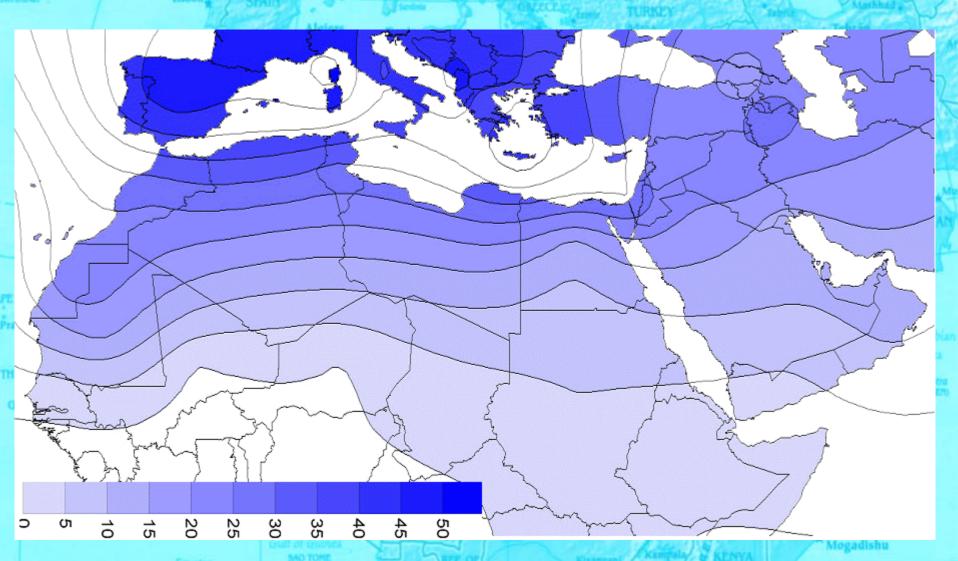
Middle East haplogroups • (pre-HV)1



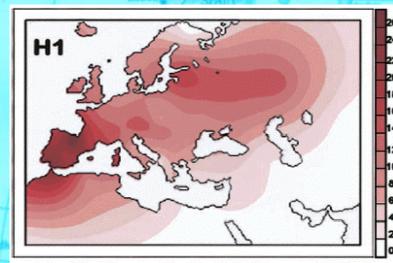
Middle East haplogroups N1b

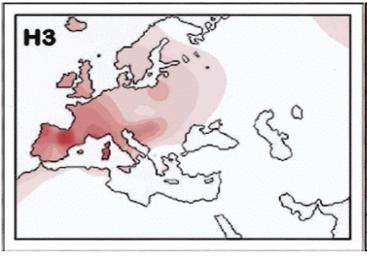


· Haplogroup H



· Haplogroup H



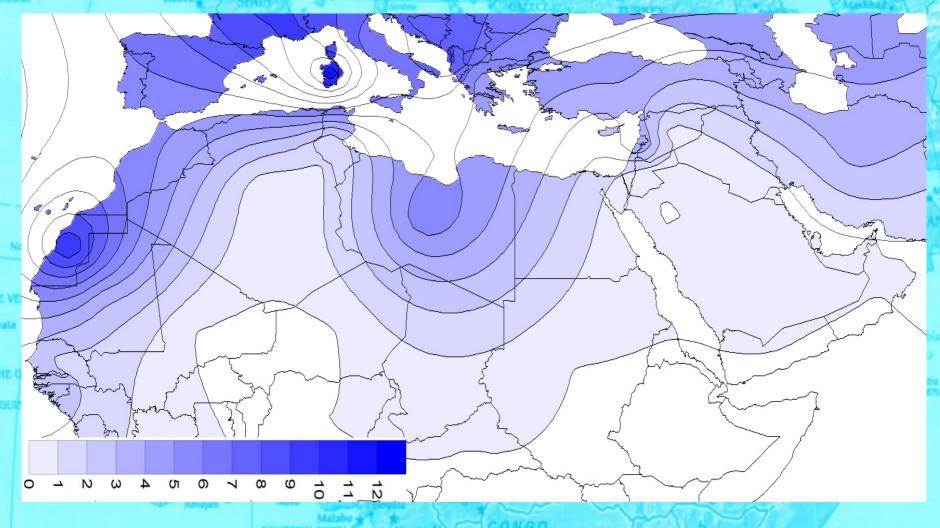


The Molecular Dissection of mtDNA Haplogroup H Confirms That the Franco-Cantabrian Glacial Refuge Was a Major Source for the European Gene Pool

Achilli et al.

Am. J. Hum. Genet. 75:910-918, 2004

· Haplogroup U5



· V clade

