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Original Synthesis Article

Origin of Ancient Canary Islanders (Guanches): presence of Atlantic/Iberian HLA and Y chromosome genes and Ancient Iberian language

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Abstract - First Canary Islands (Spain) Inhabitants ("Guanches") origin has been much debated. Lately, it has come popular the simplistic theory that they came from North Africa. In the present paper, we conclude that not only North Africans but also Iberian/Atlantic Europeans (and possibly others) must have been first Canarians. Debate whether North Africans or Iberians were the first "Guanches" is artificial since Iberian Peninsula-North African genes flow in ancient times was abundant and Iberians share a great part of genetic profile with North Africans. New genetic (HLA) and linguistic data shown in the present paper is conjointly analyzed with early anthropological data; at least two "Guanches" anthropological types existed. In addition, a correct interpretation of R1b Y chromosome high frequency in Atlantic Europe (Ireland, British Isles, North Spain and Portugal), which is also found in Canary Islands (13.3%) supports that Atlantic/Europeans are among Canary Islands First Inhabitants. Present paper HLA genes partial data and presence of abundant old Iberian language scripts (which show an easy translation proposal by using Basque language) suggest that a present day dogma of a hypothetically North African single origin should be changed. Both Atlantic/Europeans and North Africans must have been in the origin of Canary Islands First Inhabitants.

Keywords: Canary Islands, El Hierro, Fuerteventura, genes, genetic markers, Guanche, HLA, Iberian, Language, Lanzarote, Latin Inscriptions, Naviform lines, R1b, R1b1b, Rock scripts, Y chromosome

Introduction

Human leukocyte antigen (HLA) complex comprises a group of very polymorphic loci, which have been used mostly in medical practice and research. HLA compatibility is routinely used for choosing donor/recipient couples in transplantation, for studying autoimmune genetic epidemiology and other diseases (HLA linkage to disease). These genes are also useful in anthropological and forensic studies (Riley and Olerup, 1992; Gomez-Casado *et al.*, 2003).

Nowadays, the peopling of the Canary Islands is still unclear. Several hypotheses have been put forward. North African migration to Canary Islands when the hyperarid conditions in Sahara were established is hypothesized (Arnaiz-Villena *et al.*, 2002). However, North African people (genes) also migrated to Iberia through Gibraltar Strait Arnaiz-Villena *et al.*, 2002; Botigue *et al.*, 2013).

On the other hand, it seems that First Canary Islands Inhabitants ("Guanches") showed a varied anthropological typology (González, 1992; Braem, 2010). Thus, it is possible that part of "Guanche" people may be originated from an African migration into Canaries, but also other groups coming from other places may have contributed to form First Canary Islands Inhabitants. At least, two types of anthropologically defined individuals were found by Recco de Genova expedition in 1341 and related by Bocaccio ("Il Decameron"). Some inhabitants were described as tall, blue-eyed (Sardinians-like probably coming from Atlantic Europeans) and other more gracile and similar to Mediterraneans (González, 1992; Braem, 2010).

In 1980, at least 280 inscriptions carved on the rocks were found in Lanzarote and Fuerteventura Islands, many more in the last Island (Pichler, 1995). These inscriptions were called "*Latin inscriptions*". The abundance of these inscriptions in Fuerteventura Island drives to think that they were written during a long period of time. In fact, we noted that they had been written in Iberian language (Arnaiz-Villena and Alonso-Garcia, 2000a; Arnaiz-Villena and Rey, 2012; http://basques-iberians.blogspot.com.es/2014/02/la-ruta-del-atun-explicaria-las.html; http://basques-iberians.blogspot.com.es/2013/11/las-escrituras-ibero-guanches-de.html; https://commons.wikimedia.org/wiki/File:Iberian-Guanche_inscriptions.pdf).

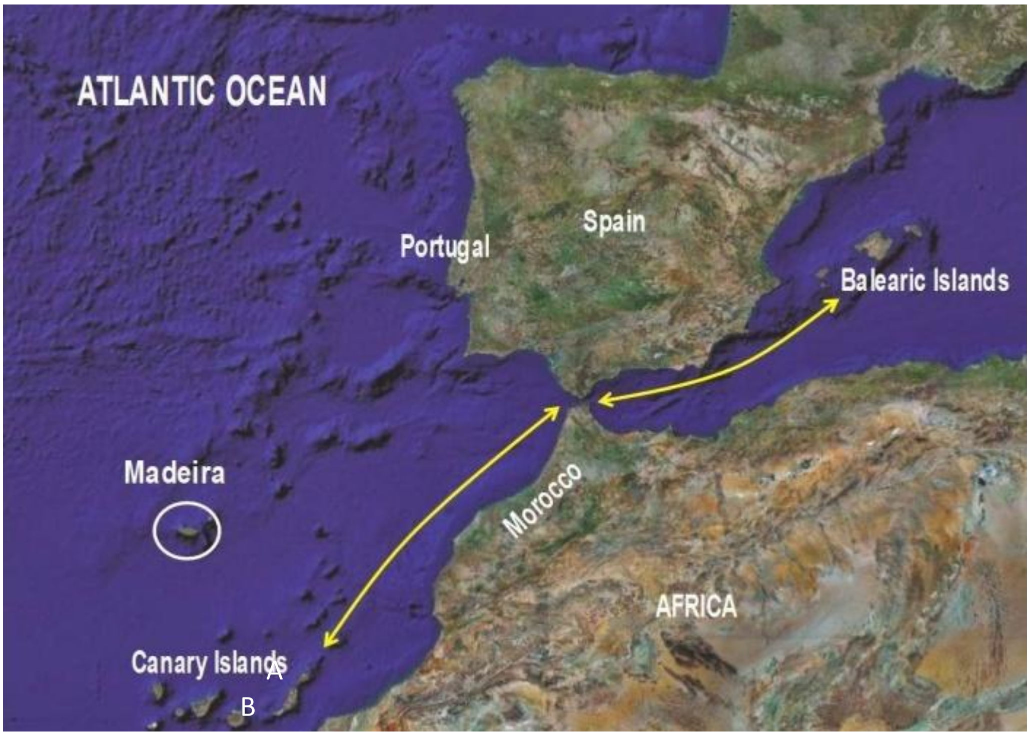


Fig. 1.
Iberian Peninsula, Balearic Islands, Madeira, Canary Islands and North Africa map.
The map shows, in yellow arrows, the route which the Iberians tuna fishers followed through the Gibraltar Strait. A- Lanzarote Island; B- Fuerteventura Island. Islands (also, in El Hierro,see Fig. 3), where most ancient Iberian writings were found.

There is no historical data that supported the existence of the inscriptions. However, it was possible they were written by Iberian tuna fishers who followed the fishes from their mating zone (Mediterranean Sea, between Balearic Islands and Iberian Peninsula) to their birth zone (near of Fuerteventura/Lanzarote). In fact, Plutarch on his book "Parallel Lives" (Arnaiz-Villena and Alonso-García, 2000a) mentioned the Roman-Iberian commander Sertorius, who was fighting against Rome about I century BC, had been informed by two fishers from Cadiz (close to Gibraltar Strait) shore about islands near to Africa where fishing was abundant. They might have been referred to Lanzarote and Fuerteventura (Fig.1). So, it was possible Iberians have been more or less permanently living because of this fishing industry in the Canary Islands before the Roman Invasion (218 BC).

In the XV century, the French-Norman Jean de Bethencourt and his fleet started the invasion and colonization of Canary Islands. He had support of Spanish Catholics Kings and invasion was difficult with strong “Guanche” resistance. The Islanders fierce opposition and distance from Europe made that invasion lasted for about one hundred years. In addition to this war, the raids to enslave “Guanches” diminished the indigenous population of the Islands (Arnaiz-Villena and Alonso-Garcia, 2000a; Arnaiz-Villena and Rey, 2012; http://basques-iberians.blogspot.com.es/2014/02/la-ruta-del-atun-explicaria-las.html). There have been contacts of Romans, Arabs and Europeans with this Archipelago in historic times. Thus, nowadays Canary Island population may represent a wide admixture of people.

In the present paper, new (HLA) and already published genetic, linguistic, cultural and anthropological data about Canary Islands are put together. It is shown that the single North African hypothesis for “Guanche” First Canary Islands Inhabitants origin does not stand anymore.

Material and Methods

Population Sample

Eighty three samples were collected by Francisco García Talavera at Museo de Ciencias Naturales in Tenerife. Samples were chosen from unrelated individuals whose at least two previous generations came from Canary Islands. “Guanche” word is now used for naming all First Canary Islands Inhabitants but after de Spanish Conquest only people coming from Tenerife were named as such. Today, some scholars use “Guanche” also for Tenerife First Inhabitants (Arnaiz-Villena and Alonso-Garcia, 2000a).

Our HLA data were composed with those of Caucasian European, Mediterranean, Atlantic European, African, Siberian and Oriental populations (these populations are detailed in Table 1), obtaining the genetic distances (comparison was done with 7,746 chromosomes), relatedness dendrograms and correspondence analyses.

HLA Genotyping

High resolution HLA class II analysis (DRB1 and DQB1) was performed by PCR-SSOP Luminex technique (Itoh *et al.,* 2005). This methodology consists of: a) PCR using specific primer pairs as provided by manufacturers (Luminex Corporation, Austin, TX, USA). All of these primers are 5'-biotine and they are specific to determinate sequences of exons 2 of HLA class II genes; b) hybridization: product of PCR biotin-labeled were denaturalized at 97ºC and then were hybridized to complementary DNA probes associated to microbeads; and c) assignation of HLA alleles: complex resulting of hybridization was introduced a Luminex platform, this system identify the fluorescent intensity of fluorophores on each oligobead that has hybridized with the biotin-labeled PCR Luminex Software assigns the HLA alleles for each DNA sample (Itoh *et al.,* 2005). HLA-DRB1 and –DQB1 allele DNA automates sequencing (ABI PRISM 3700/ ABI PRISM 3700. Applied Biosystems; California) was only when DNA typing yielded ambiguous results.

Statistical Analysis

Statistical analysis was performed with Arlequin v3.0 software provided by Excoffier and Slatkin (Schneider *et al.,* 2000). In summary, this program calculates HLA-DRB1 and –DQB1 allele frequencies, Hardy-Weinberg equilibrium and the linkage disequilibrium between *n* alleles at *n* different loci. Their level of significance (p) for 2 x 2 comparisons was determined as previously described (Imanishi *et al.,* 1991a; Imanishi *et al.,* 1991b). In addition, the most frequent complete extended haplotypes in other were deduced from: 1) the 2 HLA loci Haplotype frequencies (Imanishi *et al.,* 1991a; Imanishi *et al.,* 1991b) 2) the previously described haplotypes in other populations (Imanishi *et al.,* 1991b); and 3) haplotypes if they appeared in two or more individuals and the alternative haplotype was well defined (Imanishi *et al.,* 1991a; Imanishi *et al.,* 1991b). In order to compare phenotype and haplotype HLA frequencies with other populations, the reference tables of the 11th and 12th International HLA Workshops were used (Imanishi *et al.,* 1991c; Clayton and Lonjou, 1997). Phylogenetic trees (dendrograms) were constructed with the allelic frequencies using the Neighbor-Joining (NJ) method (Saitou and Nei, 1987) with the genetic distances between populations (DA) (Nei, 1972), using DISPAN software comprising the programs GNKDST and TREEVIEW (Nei, 1973; Nei *et al.*, 1983). Correspondence analysis in three dimensions and its bidimensional representation was carried out using the Vista v5.05 computer program (Young and Bann, 1996). Correspondence analysis consists of a geometric technique that may be used for displaying a global view of the relationships among population according to HLA (or other) allele frequencies. This methodology is based on the genetic distances (DA) variance among population (similar to the classical principal components methodology) and of a statistical visualization of the differences.

Table 1. Worldwide population included in the analysis.

Population	N	Ref.	Population	N	Ref.
Algerians	102	Arnaiz-Villena *et al.*,1995	Murcians	173	Muro *et al.*, 2001
Alpujarra	242	Longás *et al.*, 2012	Non-Ashkenazi Jews	80	Martínez-Laso *et al.*, 1996
Ashkenazi Jews	80	Martínez-Laso *et al.*, 1996	Sardinians	91	Imanishi *et al.*, 1991c
Basques-Arrati	83	Sanchez-Velasco *et al.*,2003	Souss-Berber	98	Izaabel *et al.*, 1998
Cabuérnigos	95	Sanchez-Velasco *et al.*,2003	Spaniards	176	Martínez-Laso *et al.*, 1995
Tenerife	83	*This study*	Spanish Basques	80	Martínez-Laso *et al.*, 1995
Cantabrians	83	Sanchez-Velasco *et al.*,2003	Andalusia-Spain	105	Rama *et al.*, 2001
Chuvash	82	Arnaiz-Villena *et al.*, 2003	Terceira-Azores	129	Armas *et al.*, 2004
Cretans	135	Arnaiz-Villena *et al.*, 1999	Portugal	50	Arnaiz-Villena *et al.*, *1997*
Danes	53	Imanishi *et al.*, 1991c	Galician	427	*Unpublished data*
French	179	Imanishi *et al.*, 1991c	Pas Valley	88	Sanchez-Velasco *et al.*,2003
Germans	88	Imanishi *et al.*, 1991c	French-Bretons	400	Clayton and Lonjou, 1997
Italians	284	Imanishi *et al.*, 1991c	Orkney Islands-Scotland	158	Winney *et al.*, *2012*
Japanese	493	Imanishi *et al.*, 1991c	Wales	1798	Darke *et al.*, 1998
Lebanese-KZ[1]	93	Clayton and Lonjou, 1997	North Ireland	1000	Williams *et al.*, 2002
Lebanese-NS[2]	59	Clayton and Lonjou, 1997	Northwest England	298	Alfirevic *et al.*, 2012
Macedonians	356	Arnaiz-Villena *et al.*, 2001	South African Blacks	86	Imanishi *et al.*, 1991c
Moroccan	98	Gomez-Casado *et al.*, 2000	Cape Verde	64	Spínola *et al.*, 2005
Moroccan Jews	94	Izaabel *et al.*, 1998	Guinea-Bissau	65	Spínola *et al.*, 2005

KZ[1]= Kafar Zubian, a Shia Muslim village
NS[2]= Niha el Shouff, a Druze Muslim village

Ancient Iberian writing (firstly named "Latin inscriptions") in Canary Islands (Lanzarote, Fuerteventura and El Hierro).

In 1983, two Spanish archaeologists found rare ("*Latin*") inscriptions in Lanzarote while constructing a general Archeology chart of the Island (Hernández Bautista and Perera, 1983). Later, in 1990 Hans-Joachim Ulbrich published an ancient Iberian rock ("*Latin Inscription*") in Lanzarote Island (Ulbricht, 1990). Later, Pichler published about 280 "Latin inscriptions" also from Fuerteventura in Almogaren issues (Pichler, 1995; Pichler, 1997). These two Austrian researchers named all of these inscriptions also as “*Latin inscriptions*” (Fig. 2).

Iberian scripts in Canary Islands.

In order to understand their meaning, transliteration discovered by Gomez-Moreno was used to transcribe from Iberian characters to Spanish letters and for their translation into Spanish and English, Basque language was used (Pichler, 1995; Arnaiz-Villena and Alonso-Garcia, 2000a; Arnaiz-Villena and Rey, 2012; http://basques-iberians.blogspot.com.es/2014/02/la-ruta-del-atun-explicaria-las.html; http://basques-iberians.blogspot.com.es/2013/11/las-escrituras-ibero-guanches-de.html; https://commons.wikimedia.org/wiki/File:Iberian-Guanche_inscriptions.pdf). In addition, another Iberian scripts was found in westernmost El Hierro Island (Nowak, 1994) (see Fig.3).

Naviform Lines Associated to Iberian writing.

In the Iberian Peninsula from the North Spain (in Cerdanya, Catalonia region) to the South, there are strange symbols associated to Iberian scripts (Campmajo and Crabol, 2009). They were called *Naviform scripts* because they are lines which seems the keel of ships which are seen from the depths of the sea. They are very often associated to Iberian scripts; archaeological dating of *Naviform* scripts was contemporaneous to Iberian scripts (Campmajo and Crabol, 2009). (see Fig. 2).

Fig. 2.
Iberian scripts with *Naviform* lines in Fuerteventura Island (Pichler, 2003).
A) Scripts in the rocks. **B)** Same Iberian symbols and *Naviform* lines marked for better appreciation. **C)** Script out of rock context: Iberian scripts plus *Naviform* lines

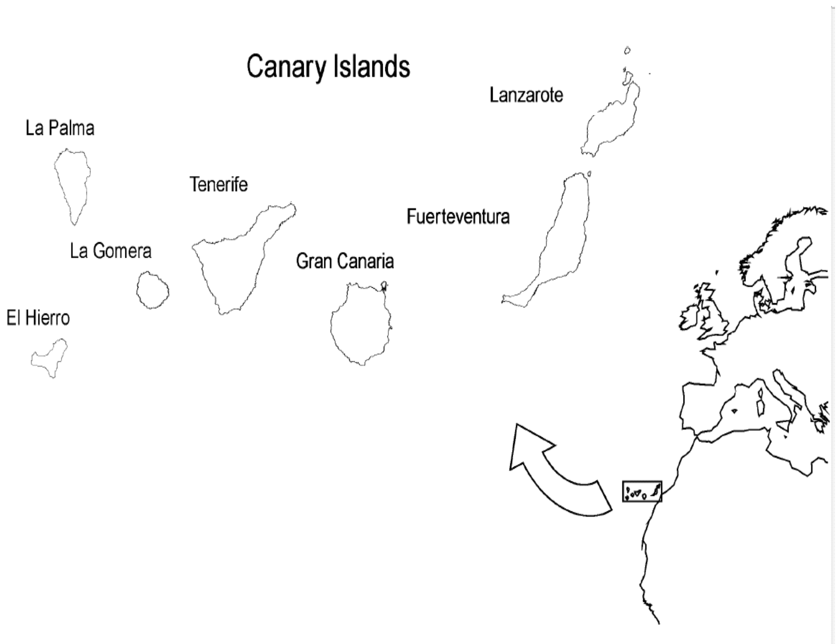


Fig. 3. Canary Islands map.
Map of Canary Islands with their names and the Atlantic shores of Europe and North West Africa.

Results

HLA Allele Frequencies Found in Tenerife Population: Comparisons with Other Populations

The expected and observed gene frequency values for HLA-DRB1 and -DQB1 loci do not differ significantly and the population is found in Hardy-Weinberg equilibrium (data not shown). Table 2 shows the HLA allele frequencies found in the sampled population. Twenty different HLA-DRB1 and eleven different HLA-DQB1 alleles were found in Tenerife Island sample (Table 2). Only nine HLA-DRB1 alleles and five HLA-DQB1 alleles had frequencies higher than 4% (DRB1*01:01, DRB1*01:02, DRB1*03:01, DRB1*07:01, DRB1*08:01, DRB1*11:01, DRB1*11:03, DRB1*13:01, DRB1*13:03, DQB1*02:01, DQB1*03:01, DQB1*04:02, DQB1*05:01 and DQB1*06:03).

Table 2. **HLA-DQB1 and –DRB1 allele frequencies in Tenerife Island population**.

Allele	Frequencies %	Allele	Frequencies %
HLA-DRB1		DRB1*13:03	10.294
DRB1*01:01	4.412	DRB1*14:01	1.471
DRB1*01:02	7.353	DRB1*14:06	1.471
DRB1*03:01	8.824	DRB1*15:01	1.471
DRB1*03:02	1.471	DRB1*16:01	1.471
DRB1*04:03	2.941	**HLA-DQB1**	
DRB1*04:07	2.941	DQB1*02:01	20.588
DRB1*07:01	13.235	DQB1*02:02	1.471
DRB1*08:01	8.824	DQB1*03:01	29.412
DRB1*10:01	1.471	DQB1*03:02	2.941
DRB1*11:01	4.412	DQB1*04:02	10.294
DRB1*11:02	1.471	DQB1*05:01	13.235
DRB1*11:03	4.412	DQB1*05:02	1.471
DRB1*11:04	2.941	DQB1*05:03	1.471
DRB1*11:06	1.471	DQB1*06:02	1.471
DRB1*12:01	1.471	DQB1*06:03	16.176
DRB1*13:01	13.235	DQB1*06:09	1.471
DRB1*13:02	2.941		

An analysis was done in order to compare Tenerife population HLA frequencies with other World population frequencies (Table 1) by using pooled DRB1 frequencies. NJ relatedness dendrogram based on HLA-DRB1 allele frequencies (Fig.4) separates populations in two well-defined clusters. One of them is, also, divided in two subclusters. The first cluster groups European and North Africa populations. One of its subclusters groups North, South, West Mediterranean and Atlantic populations (from Lebanon to Azores and Portugal and from Sardinians to Algerians). The other subcluster groups European and Atlantic European populations (German, Basques, and Orkney Islands for example). The other cluster, however, groups the rest of analyzed populations (Cape Verde, Guinea-Bissau, South African Blacks and Japan populations).Tenerife Island population is integrated in the first subcluster of the first cluster, together with Terceira-Azores and Portugal (Arnaiz-Villena *et al.*, 1997; Armas *et al.*, 2004), Souss-Berber (Izaabel *et al.*,, 1978), Moroccan (Gomez-Casado *et al.*, 2000) and Algerians (Arnaiz-Villena *et al.*, 1995).

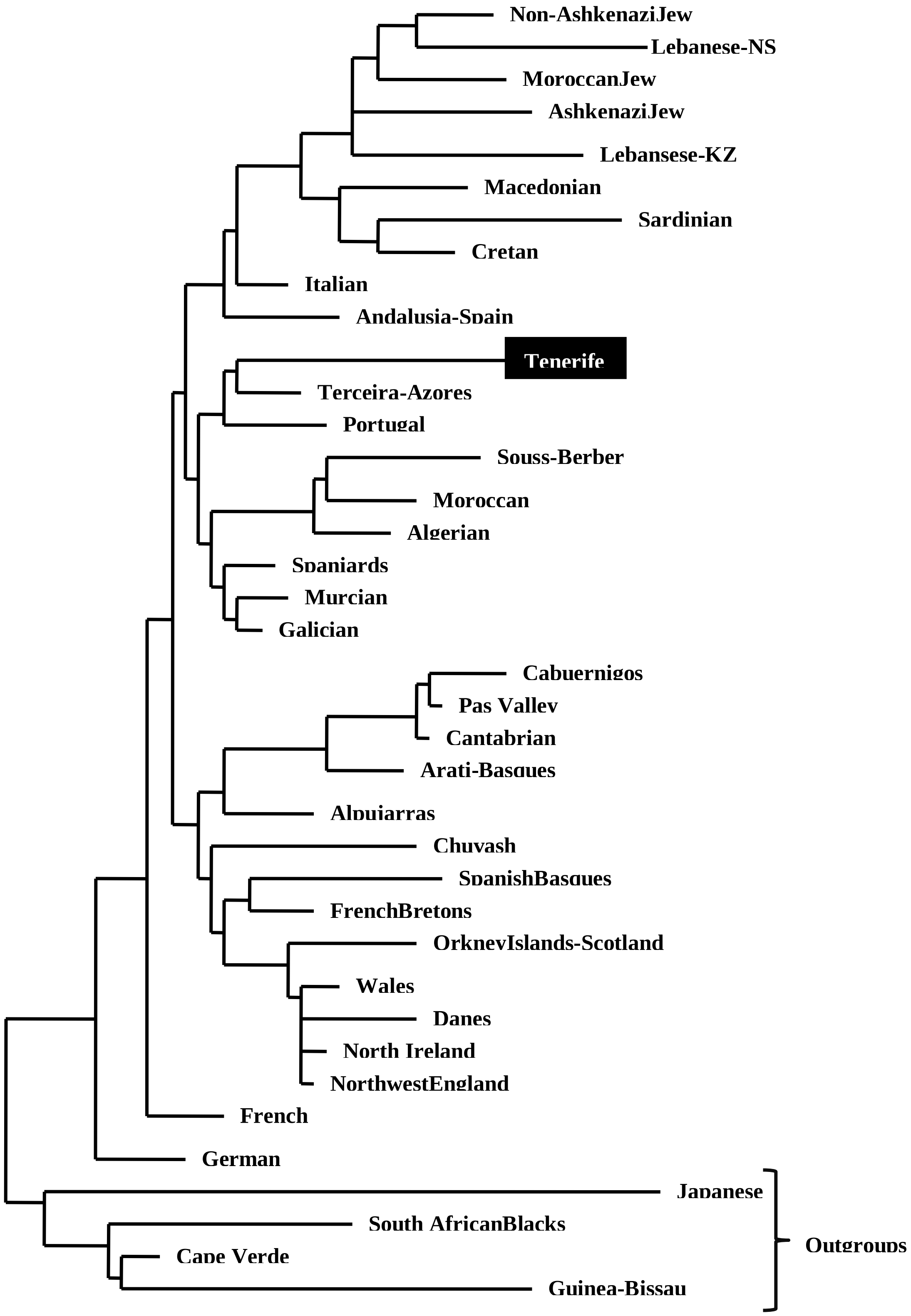


Fig. 4. **Neighbor-Joining (NJ).** Dendrogram shows relatedness between Tenerife Population and other World populations. Genetic distances between populations (DA) were calculated by using HLA-DRB1 frequencies (high resolution). Data from World populations were taken from references stated in Table 1. Bootstrap values are 100%. Outgroup long branches trend to go together, as it is usual behavior in dendrograms for long branches. Cape and Outgroups do not show properly.

Correspondence analysis based on HLA-DRB1 frequencies shows similar results (Fig.5). Also, two groups clearly defined according to first dimension that explain most of the variability among populations. First group includes Atlantic European population and Central European population. The second group includes Tenerife Island, North Africa and three Mediterranean populations: Sardinians, Cretans and Macedonians. The second dimension groups according a Mediterranean influence and there are two groups. In the first group (bigger Mediterranean influence than the second group) are grouped West European, North Africa, Tenerife Island and Mediterranean population. In the second group are included Northwest European populations such as French-Bretons, Northern Ireland (Williams *et al.*, 2002), Orkney Islands (Winney *et al.*, 2012), Dane (Imanishi *et al.*, 1991c), Wales (Darke *et al.*, 1998) and Northwest England (Alfirevic *et al.*, 2012). Then, Tenerife Island population may seem to be related to both Mediterranean and Atlantic populations.

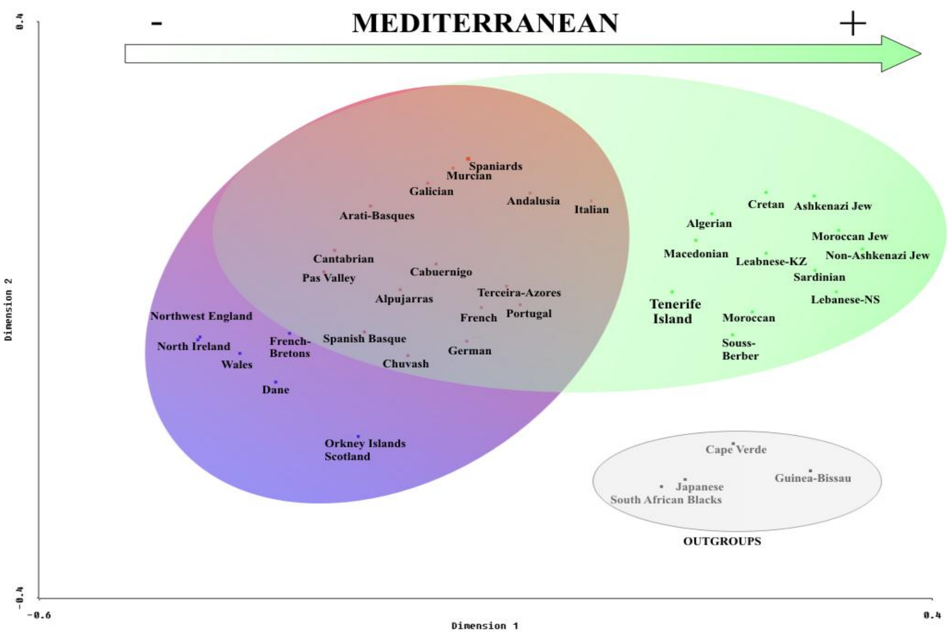


Fig. 5. Correspondence analysis. Correspondence analysis shows a global view of the relationship between Tenerife Islandpopulation and Mediterranean and other World populations according to HLA-DRB1 allele frequencies in three dimensions (bidimensional representation). Green arrow indicates the Mediterranean relationship in Tenerife population.

This effect is more evident in Table 3, which shows that Tenerife Island population's closest genetic distances are the following: Terceira-Azores and Murcians (Atlantic and Mediterranean populations).

Table 3. Genetic distances (DA) between Tenerife Island Population and other populations ($\times 10^{-2}$) obtained by using high-resolution HLA-DRB1 allele frequencies

Population	Genetic Distance (DA) (x100)
Terceira Azores	14,83
Murcians	16,1
Italians	17,32
Portuguese	18,27
Russians	18,62
Eastern Azores	18,82
French	18,83
Spaniards	19,1
Andalusia	21,14
Moroccan	22,39
Algerians	22,87
Central Azores	22,91
Ashkenazi-Jews	22,98
Germans	23,52
Lebanese-NS	23,9
French-Bretons	24,39
Souss-Berber	24,98
Chuvash	25,48
Alpujarras	25,98
Moroccan Jews	26,08
Wales	26,73
Cretans	26,93
Northern Ireland	27,65
Northwest England	28,1
Non-Ashkenazi Jews	28,79
Macedonians	29,28
Orkney Scotland	29,5
Lebanese-KZ	30,07
Spanish Basques	31,52
Danes	31,53
Sardinians	32,12
Japanese	62,13

HLA-DRB1 and -DQB1 Extended Haplotype Analysis in Tenerife Island population: Comparison with Other Populations

Associations between different HLA loci were estimated in Tenerife Island population. The fifteen most frequent two HLA loci haplotype (DRB1-DQB1) were calculated and these extended haplotypes are depicted in Table 4; they represent 80.85% of all haplotypes. The three most frequent haplotypes in Tenerife Island population are Mediterranean haplotypes (DR*13:01-DQ*06:03, DR*07:01-DQ*02:01 and DR*13:03-DQ*03:01). The following five haplotypes (DR*03:01-DQ*02:01, DR*01:02-DQ*05:01, DR*08:01-DQ*04:02, DR*01:01-DQ*05:01 and DR*11:03-DQ*03:01) are restricted to the Mediterranean Sea, however the first of them (DR*13:01-DQ*06:03) are coming from Sardinians. There is only one haplotype (DR*04:03-DQ*04:02) from North Africa. One of the extended haplotypes came from Portugal (DR*11:01-DQ*03:01). Moreover, there are two new haplotypes: DR*04:07-DQ*04:02 (HF: 2.94%) and DR*04:03-DQ*05:02 (HF: 1.47%).

Table 4. **The fifteen most frequent HLA-DRB1 and -DQB1 extended haplotypes in Tenerife Island Population.**

Haplotype	HF (%)	Possible Origin
DR*13:01-DQ*06:03	13,23	Mediterranean
DR*07:01-DQ*02:01	11,76	Mediterranean
DR*13:03-DQ*03:01	10,29	Mediterranean
DR*03:01-DQ*02:01	8,82	Sardinians
DR*01:02-DQ*05:01	7,35	Mediterranean
DR*08:01-DQ*04:02	5,88	European
DR*01:01-DQ*05:01	4,41	Euroasiatic
DR*11:03-DQ*03:01	4,41	Mediterranean
DR*04:07-DQ*04:02	2,94	New
DR*11:01-DQ*03:01	2,94	Portugal
DR*11:04-DQ*03:01	2,94	Mediterranean
DR*03:02-DQ*03:02	1,47	New
DR*04:03-DQ*04:02	1,47	North Africa
DR*04:03-DQ*05:02	1,47	Italy
DR*07:01-DQ*02:02	1,47	Mediterranean

Naviform scripts (lines) are Associated to Iberian writing in Cerdanya region, Catalonia, North-East Spain.

These peculiar scripts (Fig. 6) may appear unrelated or related with Iberian scripts usually in North and Central Iberian regions (Campmajo and Crabol, 2009). The most southern *Naviform* inscription has been found in Monreal of Ariza (South Zaragoza province) (Campmajo and Crabol, 2009).

There are many hypotheses about the meaning of these lines. A hypothesis that they might be grooves sharpening metal tools; it was refuted because these are contemporaneous to Iberian scripts in Neolithic times whenmetal tools did not yet exist (Pichler, 2010). Another theory puts forward that *Naviform* lines were used like decorative element however, the lines are disorganized and they are not decorative elements, Pichler names these *Naviform* lines as "Striated Lines" (Pichler, 2010). Other *Naviform* lines theories have been put forward. Thus, the meaning of *Naviform* scripts is still unknown.

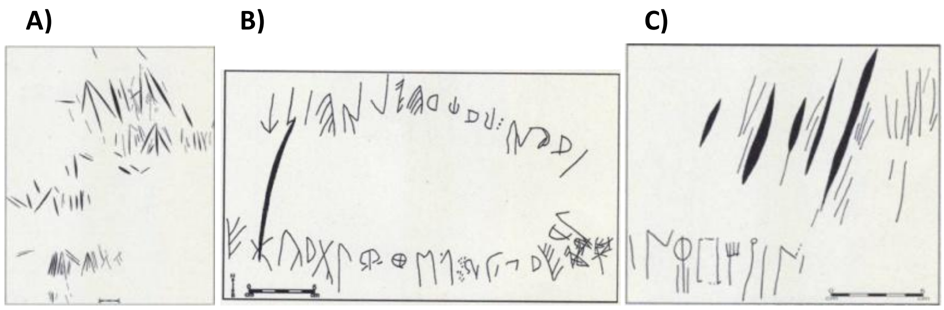


Fig.6. Group of _Naviform_ scripts located in Cerdanya
(Campmajo and Crabol, 2009). **A)** Groups of *Naviform* scripts non-related with other sort of scripts or writings. **B)** and **C)** Groups of *Naviform* scripts associated to Iberian scripts.

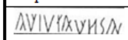
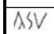
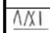
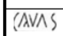
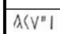
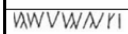
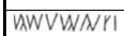
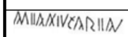
Naviform and Iberian Scripts in Fuerteventura

The "*Latin Inscriptions*" found in Fuerteventura and Lanzarote in the second half of XX century were representing, in fact, Iberian semi-silabary signs (Gómez Moreno, 1949; Gómez Moreno, 1962) but not Latin alphabet (Fig.2) (Pichler, 1995; Pichler 1997; Arnaiz-Villena and Alonso-Garcia, 2000a; Arnaiz-Villena and Rey, 2012;

http://basques-iberians.blogspot.com.es/2014/02/la-ruta-del-atun-explicaria-las.html; http://basques-iberians.blogspot.com.es/2013/11/las-escrituras-ibero-guanches-de.html; https://commons.wikimedia.org/wiki/File:Iberian-Guanche_inscriptions.pdf). It is easy to find Iberian symbols such as , that according to Gomez-Moreno's transcription (Gómez Moreno, 1949; Gómez Moreno, 1962) corresponds to "KA" in Spanish translation. Some Iberian scripts (taken from Arnaiz-Villena and Alonso-Garcia, 2000a; https://commons.wikimedia.org/wiki/File:Iberian-Guanche_inscriptions.pdf) are transcript and translated to Basque, Spanish and English languages in Table 5.

Other Iberian Scripts in Fuerteventura

Table 5. Iberian scripts in Fuerteventura. Iberian scripts found in Fuerteventura with their transcriptions to Spanish characters and their translations to Basque, Spanish and English languages (Pichler, 1995; Arnaiz-Villena and Alonso-Garcia, 2000a; Arnaiz-Villena and Rey, 2012; http://basques-iberians.blogspot.com.es/2014/02/la-ruta-del-atun-explicaria-las.html; http://basques-iberians.blogspot.com.es/2013/11/las-escrituras-ibero-guanches-de.html; https://commons.wikimedia.org/wiki/File:Iberian-Guanche_inscriptions.pdf).

Fuerteventura's Scripts	Iberian-Levantin Transcription	Translate to Basque and Spanish	Translate to English
	KAMMBAMMKAMMOSKAN	KAMU-AMA-ABA-MAMA-AKA-MAMA-OSKAN Difunto de la madrecita dormido (en) la sepultura, madrecita del más allá	Little Mother's deceased sleeping in the sepulcher, Little Mother from afterlife
	KASM	AKA-AS-AMA Difunto (en) la oscuridad de la madre	Deceased in the darkness of the Mother
	BAMSBABABABABA	ABA-AMA-SABAI-BUBA-BUBA En el interior (de) la tumba de la madre dormido dormido	Inside the Mother's tomb sleeping sleeping
	(I)LKAMBA	IL-KAMU-ABA Difunto dormido (en) la sepultura	Deceased sleeping in the sepulcher
	KEKAMLS	KAKA-AMA-LUZE Despojos de la madre (en) el abismo	Mother's remains in the Depths
	KAMBABAKAKEKAKA	KAMU-BUBA-BAKE-KAKA-AKA Despojos del difunto dormidos (en) el sueño de la paz	Deceased's remains sleep in the peace dream
	KAKEMMMBA	KAKA-MAMA-AMA-ABA Difunto de la madrecita (en)la tumba de la madre	Little Mother's deceased in Her tomb
	BABABALBA	BUBA-BALTZ-ABA Dormido (en) la tumba de la oscuridad	Sleeping in the Darkness tomb
	BASNBA	BASA-NABA (En) el barro de la llanura	In the grasslands' mud
	MKAMKMMMKAKAMMBA	MAKA-MALLO-MAMA-MAKA-KAMU-AMA-ABA Pecador (en) la colina de la madre, pecador sueño (en) la sepultura de la madre	Sinner in the Mother's Hill, sinner dream in the Mother's Sepulcher
	MKAMKMMMKAKAMMBA	MAKA-MALLO-MAMA-MAKA-KAMU-AMA-ABA Pecador (en) la colina de la madre, pecador sueño (en) la sepultura de la madre	Sinner in the Mother's Hill, sinner dream in the Mother Sepulcher
	KAMLBABAKALTABAMGEKA RBABAKAM	KAMU-IL-BUBA-KAL-ATA-ABA-AMA-GE-KAR-BUBA-AKA-AMA Cada uno (de) los difuntos durmiendo el sueño (en) la sepultura de la madre de la puerta; difunto de la madre durmiendo sin fuego	Each one of the deceased sleeping the dream in the Sepulcher of the Mother of the Door, Mother's deceased without fire
	MKAMLBARBABABABAKAM	MAKA-AMA-IL-BARA-BUBA-BUBA-AKA-AMA Difunto pecador de la madre, dormido dormido, venido a parar a la sepultura de la madre	Mother's sinner deceased, sleeping sleeping in the Mother Sepulcher
	RKARNANKA	UR-KAR-BAN-AKA Cada uno de los difuntos (en) las aguas de fuego	Each one of the deceased in the fire water

Discussion

***Origin of First Canary Islands Inhabitants according to HLA genetics*.**

Our present day Tenerife Islanders population HLA studies show that an admixture of European (mainly Atlantic) and North African population is found (Table 2, and Table 3; Fig. 4 and Fig. 5). These findings may not reflect the First Canary Islands Inhabitants genetic features. This is because only Tenerife Island is analyzed and also because different Canary Islands invasions, particularly Spanish conquest in XV century AD, may have altered the initial population genetic composition.

Other genetic studies about Canary Islands Inhabitants (today assimilated to "Guanche" in Spanish and English literature) have been performed. Studies were carried out by using autosomic DNA (Alu insertions), mtDNA and Y chromosome markers (Maca-Meyer *et al.,* 2004). According to these authors most present day population in the seven Canary Islands come from Iberia, with some North West African contribution and a minimal Sub-Saharan one, this latter probably coming from slave trading. These results are concordant with our data presented in this paper for Tenerife.

Significant genetic heterogeneity was found among Islands. Also, ancient "Guanche" samples used from all Islands (except La Palma, Fuerteventura and Lanzarote; Fig. 3.) were analyzed for mtDNA (Maca-Meyer *et al.,* 2003a). Berber characteristics drives the conclusion that the main ancestors that they are main "Guanches" ancestors. However, autosomal HLA characters common to Iberian and Berbers are formed (Arnaiz-Villena *et al.,* 1997) and conjoint autosomal, mtDNA and Y chromosome markers study revealed a gene flow across the Strait of Gibraltar; it was ongoing in high rates since pre-Neolithic times (Currat *et al.,* 2010). This makes difficult a distinction between Iberian and North West Africans on the bases of both autosomal and sex chromosomes markers. Thus, genetic discussion about whether Iberians or North African Berbers where the First Canary Inhabitants is artificial, when only genetic markers are considered. In fact, the bias towards high frequencies of European Y chromosomes and mtDNA African markers in present day Canary Islanders have been interpreted a "Guanche" male substitution by Normand and Spanish XIV-XV century conquerors (Maca-Meyer *et al.,* 2004, Maca-Meyer *et al.,* 2003b). In the context of abundant gene flow between Europeans (Iberians) and North Africa (Berbers) this interpretation is simplistic and artificial (Arnaiz-Villena *et al.*, 1995; Currat *et al.*, 2010, Maca-Meyer *et al.*, 2003b); difficult genetic distinction between Iberian and North African Berbers is the most straight forward and feasible. Genetics must be interpreted together with cultural, linguistic and anthropological traits in order to reach accurate composition between populations.

In 2009, ancient "Guanches" samples were genetically analyzed from Tenerife, La Gomera, El Hierro and Gran Canaria Islands and historical pre-Spanish Conquest remains from all Islands except from Lanzarote (Fregel *et al.*, 2009). Authors conclude that there was a higher frequency of male genetic "North African" markers and a lower frequency of male genetic "European markers". Authors again conclude that this (R1b1b2, M269) marker and frequency in ancient "Guanches" shows that a "Guanche" (mostly North African) male substitution was achieved because of Spanish conquest. However, they do not take with account that this marker is high in western Atlantic Europeans particularly in the British Isles, Portugal, French Britain and Northern Spain (for a review see [Oppenheimer, 2007]). Thus, the "North African" origin of this Y chromosome marker should be considered Atlantic (Europe and British Isles) including "North Africa" and Canary Islands.

Iberian Scripts in Lanzarote, Fuerteventura and El Hierro rocks

Two Canary Islanders discovered them when working in Lanzarote Archeological chart in 1983 (Fig.3.) (Hernández Bautista and Perera, 1983). Sometime later, two Austrians researchers (Ulbricht, 1990; Pichler, 1995; Pichler, 1997) presented a collection of this type of inscription throughout Fuerteventura and also in Lanzarote. In addition, one of these Iberian rock inscriptions was also found in El Hierro Island (Nowak, 1994). These inscriptions were named as "Latin" and identified with expression of this language, but it was impossible their translation from Latin. In year 2000, Arnaiz-Villena and Alonso-García showed that these inscriptions were Iberian and simple translations were put forward taking into account that Iberian language is now represented as Basque language (Arnaiz-Villena and Alonso-Garcia, 2000a). Iberian language has been classified as one of the Usko-Mediterranean languages, included into the Dene-caucasian range of languages (Arnaiz-Villena *et al.*, 2002; Arnaiz-Villena and Alonso-Garcia, 2000a; Arnaiz-Villena and Rey, 2012; http://basques-iberians.blogspot.com.es/2014/02/la-ruta-del-atun-explicaria-las.html; http://basques-iberians.blogspot.com.es/2013/11/las-escrituras-ibero-guanches-de.html; https://commons.wikimedia.org/wiki/File:Iberian-Guanche_inscriptions.pdf; Arnaiz-Villena and Alonso-García, 2000b).

A further confirmation that the firstly called "Latin" inscriptions are Iberian inscriptions instead is that are very frequently found together and mixed with *Naviform* lines which are usually found on rocks by themselves or associated to Iberian scripts in Iberian Peninsula, Fig.6 (Arnaiz-Villena and Alonso-Garcia, 2000a; Campmajo and Crabol, 2009; Pichler, 2010). Iberian characters were used since about 800 years BC until 300 years AD, throughout Iberia, Southern France and Sardinia (Arnaiz-Villena and Alonso-Garcia, 2000a; Arnaiz-Villena and Alonso-García, 1998; Arnaiz-Villena and Alonso-García, 2007). The possibility that is Iberian scripts were used by stable Canary Islands population in antiquity is feasible. However, it is more likely that Iberian scripters were temporarily based for fishing according to tuna fish life cycle and they came from Iberian Peninsula (Fig.1); this is widely discussed in (Arnaiz-Villena and Alonso-Garcia, 2000a; http://basques-iberians.blogspot.com.es/2014/02/la-ruta-del-atun-explicaria-las.html; http://basques-iberians.blogspot.com.es/2013/11/las-escrituras-ibero-guanches-de.html) and Plutarch may refer to facts supporting hypothesis which is detailed in Fig.1, in Sertorius, Roman-Iberian leader life. Hypothesis of African origin of Iberian scripts cannot be discarded but it is seems quite unlikely. However, Iberian inscriptions are usually mixed with Lybic-berber ones in Fuerteventura. Moreover, there is no archaeological site in Fuerteventura where Iberian inscriptions exist and Lybic ones are not also present (Pichler, 2010); it seems that sometimes both writing types have beenadmixed by the same person(s) (Pichler, 2010). Thus, Iberian scripts would seem to represent the same language than Lybic and/or "Guanche" language. Indeed, language similar to Basque was spoken by "Guanches" to Spanish conquerors in XV century, and Basque bishops were named in order to christianize "Guanches" (Arnaiz-Villena and Alonso-Garcia, 2000a). It is thought that "Guanches" spoke a language similar to Basque from Usko-Mediterranean and Dene-Caucasian branches (Arnaiz-Villena, 2000a).

Genes by themselves cannot usually solve most of different population relationships. Anthropology, Culture and Language must be taken into the particular genetic context (Arnaiz-Villena *et al.*, 2009; Arnaiz-Villena *et al.*, 2014). Also genes and languages do not correlate (Arnaiz-Villena *et al.*, 2002, Arnaiz-Villena *et al.*, 2009; Arnaiz-Villena *et al.*, 2014).

There is a consensus about Canary Island ancientanthropological data: two types of individuals may be found according to most ancients historical descriptions and two types of "Guanche" mummies study (González, 1992; Braem, 2010, Arnaiz-Villena and Alonso-Garcia, 2000a; Verneau, 1887; Hooton, 1916). One type shows thick built bones and bodies, like Cro-Magnon individuals from Atlantic/European side, Portugal, North Spain, French Britain and Britain Isles; and the second type is more Mediterranean showing a lighter body and cranial built; this last type may be from North Africa/Mediterranean/Western-Sahara. These anthropological two Canary Islanders ancient types are concordant with most genetic findings presented by us and other in this paper. R1b Y chromosome European Atlantic variant is very frequent in Atlantic Europe: Ireland, Great Britain, French Britain, Atlantic Spain and Portugal (Oppenheimer, 2007; www.eupedia.com/Europe/HAPLOGROUP_R1b_Y-DNA.shtml). This marker apparently originated in Iberia but there is a very high frequency in a semi-isolated Sub-Saharan area, particularly in North Nigeria and Cameroun (www.eupedia.com/Europe/HAPLOGROUP_R1b_Y-DNA.shtml). This may suggest that origin there R1b marker origin might have beenthe once very populated Sahara desert (Arnaiz-Villena *et al.*, 2002; Arnaiz-Villena and Alonso-Garcia, 2000a; Arnaiz-Villena and Alonso-García, 1998). However, this genetic marker went from Iberia northwards after Last Ice Age retreat (Oppenheimer, 2007; www.eupedia.com/Europe/HAPLOGROUP_R1b_Y-DNA.shtml).R1b marker could have also been established in Canary Islands in ancient times; about 13.3% of Canary aboriginal samples beared R1b2 and P(xR1a and R1b1b2) (Fregel *et al.*, 2009; www.eupedia.com/Europe/HAPLOGROUP_R1b_Y-DNA.shtml). Finally, the closest pyramids found in North Africaare in Egypt, similar to Canarian ones are far from the Islands.They were discovered in Tenerife Island by Thor Heyerdhal; it is not discarded that other pyramids may have existed in a pre-postglaciation Sahara desert (Arnaiz-Villena *et al.*, 2002; Braem, 2010).

In conclusion, cultural (pyramids), linguistic (Iberian and Lybic inscriptions), old anthropological data (both Atlantic/European and more gracile North African co-extant types), ancient genetic and modern genetic data strongly suggest that both Atlantic Europeans and Africans were Canary Islands First Inhabitants. Either aiming to pushing an exclusive African or an exclusive European "Guanche" origin lack of scientific bases. Also, continuing to hide presence of Iberian scripts in Canary Islands is also destroying Canary Islands and World culture and heritage.

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