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Contribution to The Anthropogenetic Study by The Blood Systems of The Arabophone Population of Beni Mellal Area

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Introduction

In aim to anthropogenetic characterization of populations, the blood groups, considered like classic genetic groups, present a big degree of polymorphism what gives them a particular interest in the studies of micro differentiation and the migratory history of the populations.

This study, on the arabophone population of Beni Mellal plane, that separates the Berber middle Atlas populations and the Arabic populations of Tadla plane and Chaouia, try to retrace the history of the genetic exchanges in this region. A second objective try to achieve a comparative survey, with the Arabic and Berber populations of North Africa, as well as with the Middle Orient populations in order to value the genetic diversity and to estimate the genetic distances between these different populations.

Material and methods

The present survey has been achieved on a sample of 131 voluntary individuals selected in the Beni Mellal area in according to the recommendations of HUGO program (Human Genom Diversity Program). These individuals are Arabophone, apparently healthy, unrelated and their paternal and maternal grand parents are originating from the Beni Mellal area. A card of consent is signed by all participants.

10 ml of blood by individual are taked; some appropriate antibodies are used in the forty eight hours to determine the blood groups. The allelic frequency is estimated by the method of the maximum similarity and the gaps in relation to the Hardy Weinberg equilibrium are tested by Khi2. The genetic diversity and genetic distances has been analysed by Biosys program 1981 and the development of the phylogenetic tree (dendrogramme) has been accomplish by Phylip program 3.5 1989.

Results and discussion

Table 1 present the distribution of allelic frequencies of the ABO, Rhesus, Ss and Dafy systems and the comparison results (Khi2) with some population of North Africa and Middle Orient, the most frequent alleles at the Beni Mellal population are ABO*O (0,698), CDe (0,382) and Fy (0,860).

The comparison of the allelic frequencies distributions showed some meaningful differences, for the four systems, in relation to the populations mentioned in the table 1 in exception of the ABO system at the Beni Hlal, Middle Orient and Turkey populations and of the Ss system at the Turkey population.

Table 1: *distribution of allelic frequencies of the ABO, Rhesus, Ss and Dafy systems at Beni mellal population.*

		X^2 des comparaisons				
	frequence Beni Mellal	Doukkala (14)	Beni Hlal (4)	Moyen Atlas (13)	Tizi Ouzo (2)	Arabie Saoudite (1)
ABO*A	0.225	**7.824 ***	**0.980 NS**	**2.820 NS**	**11.270 ****	**7.914 ***
ABO*B	0.073					
ABO*O	0.698					
CDE	0.000	**21.549 ****	**22.760*****	**33.881 *****	**76.881 *****	**59.034 *****
CDe	0.382					
cDE	0.076					
cDe	0.225					
CdE	0.000					
Cde	0.065					
cdE	0.073					
cde	0.179					

The evaluation of genetic diversity coefficients (table 2) showed that the Dafy system is most informative (0,214), in more the intra-population diversity is raised more than the inter-populations diversity for the four biomarkers. What explains the importance of genetics variations within the Berber and Arabian population [2]; [13]; [14]).

Table2: *Comparison of the genetic diversity coefficients according to the studied system*

System	Coefficients			
	F Intra région	F Inter région	F Total	
ABO	0.044	0.001	0.045	
Ss	0.040	0.002	0.042	
Duffy	0.122	0.092	0.214	
Rhesus	0.016	0.005	0.021	

The genetic distances evaluation (Table 3) show that the Beni Mellal population presents the weakest distances in relation to Saudi Arabia and Yemen, 89 10^{-4} and 185 10^{-4} respectively.

Populations	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII
I.Beni-Mellal	**0.0944**	**0.0251**	**0.1227**	**0.18566**	**0.1605**	**0.0908**	**0.0432**	**0.1269**	**0.1307**	**0.1236**	**0.1116**	**0.0185**	**0.0345**	**0.0571**	**0.0089**	**0.0432**
II.Ouarzazate (11)		0.0677	0.0732	0.0993	0.0774	0.0223	0.0524	0.0563	0.0689	0.0612	0.0616	0.0714	0.0441	0.0428	0.0689	0.0491
I.Berbère du Sous (6)			0.0754	0.11433	0.0874	0.0509	0.0136	0.0673	0.0757	0.0692	0.0740	0.0232	0.0226	0.0559	0.0144	0.0651
IV.Berbère du Rif				0.00157	0.0257	0.0321	0.0448	0.0078	0.0023	0.0196	0.0121	0.0898	0.0740	0.0658	0.0886	0.0644
V.Ttizi Ouzo					0.0120	0.0461	0.0737	0.0109	0.0081	0.0214	0.0301	0.1408	0.1135	0.1077	0.1413	0.1053
VI.Moyen Atlas (13)						0.0313	0.0530	0.0084	0.0148	0.0133	0.0334	0.1191	0.0907	0.0988	0.1199	0.0971
VII.Doukkala (14)							0.0264	0.0204	0.0262	0.0137	0.0259	0.0516	0.0318	0.0289	0.0577	0.0301
VIII.Beni Hlal (4)								0.0381	0.0423	0.0326	0.0409	0.0295	0.0214	0.0358	0.0236	0.0383
IX.Oran									0.0030	0.0102	0.0166	0.0908	0.0657	0.0700	0.0892	0.0687
X.Alger *(2;3)*										0.0116	0.0119	0.0942	0.0730	0.0686	0.0935	0.0656
*XI.*Lybie											0.0213	0.0783	0.0552	0.0563	0.0854	0.0481
XII.Egypte												0.0842	0.0636	0.0606	0.0803	0.0493
XIII.Yemen (20)													0.0125	0.0242	0.0062	0.0349
XIV.Jordanie														0.0266	0.0145	0.0246
XV.Koweit															0.0330	0.0124
Arabie Saoudite (18)																0.0446
XVI.Turkyee																

Besides, the most elevated distances have been observed in report, to the Algerian populations Oran's Arabs 1856 10^{-4}, Tizi-Ouzous's Berber 1269 10^{-4} and Algiers's Arabs 1227 10^{-4}.

The development of the dendrogramme (figure 1), show that the Beni Mellal population is located in one coins group with the Middle Orient populations and the Berber population of Sous. It can be explained by a common origin of the relative gene pool to these blood scorers at these populations.

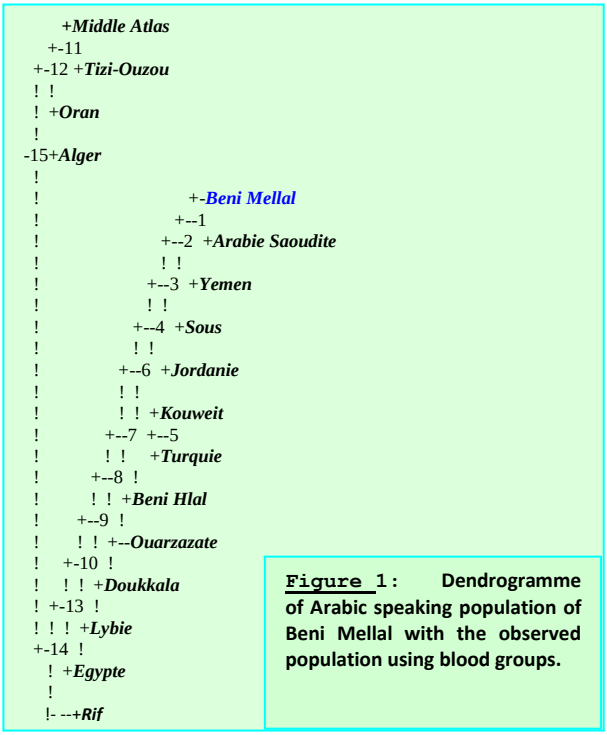

Figure 1: Dendrogramme of Arabic speaking population of Beni Mellal with the observed population using blood groups.

Conclusion

The results of this analysis permit to conclude that the population Arab phone of Beni Mellal presents the weakest genetic distances of populations of the Middle orient and in particular Saudi Arabia and Yemen, what would explain their origin likely of this region. It is essentially due to the frequencies relatively raised of the Fyo allèles and s that characterizes the populations oriental Arabic as presented by Cavali-sphorza in 1994. The analysis of the genetic diversity coefficients shows that the populations Berber Moroccans and Algerians present a big genetic heterogeneity, expressed intra by one elevated degree of diversity region, what lets suppose an effect of the genetic drift and the one of the founding effects was at the origin of an amplification of the micro differentiation phenomena on a regional scale.

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