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ABO, MNSs and Rh Blood Groups frequencies in the four Albanian Villages of Molise, Italy

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SEZIONE III

(Botanica, zoologia, fisiologia e patologia)

Antropologia. — ABO, MNSs *and* Rh *Blood Groups frequencies in the four Albanian Villages of Molise, Italy* (*). Nota di GIANFRANCO BIONDI [1], GABRIELLA SPEDINI [1], MARIA PURPURA [2], MIRELLA MARIANI [2], ALBERTO MASTROMONACO [2], ANNA MARIA GUIDI [2], ELENA SAMPIETRI [3], GIOVANNINO DE VITO [4] e LUCIANO TERRENATO [5], presentata dal Socio G. MONTALENTI.

RIASSUNTO. — Sono presentati i dati relativi alle frequenze fenotipiche e geniche dei gruppi sanguigni ABO, MNSs ed Rh in campioni di popolazione di quattro paesi di origini albanese del Molise, esaminati nell'ambito di un programma di ricerche sulla struttura demografica e genetica delle minoranze alloglotte che vivono in Italia.

Il gruppo sanguigno ABO presenta frequenze geniche più o meno simili a quelle note per le regioni dell'Italia meridionale ed abbastanza diverse da quelle conosciute per la popolazione attuale dell'Albania ed il confronto delle frequenze aplotipiche dei gruppi sanguigni MNSs ed Rh, tra i paesi esaminati e le diverse regioni italiane, non ha messo in evidenza chiare differenze.

INTRODUCTION

The Albanians settled in Molise between 1456 and 1494: they founded or repopulated some villages but, at the present time, only in four villages (Campomarino, Montecilfone, Portocannone and Ururi) has the population maintained the use of Albanian language [1]. In the other villages the Albanians mixed themselves completely with the Italian population [2].

In the 1966 54.8% of the population of Campomarino was speaking Albanian, in Montecilfone the percentage was 98.9, in Portocannone 90.1 and in Ururi 86.4 [3].

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(**) Nella seduta del 14 gennaio 1984.

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Information on the demography and genetics of the Albanian communities of Molise has recently become available [1, 4]. This report adds information on the frequencies of different blood groups (ABO, MNSs and Rh) and their analyses for comparison, whenever possible, with those of Italy and Albania.

Materials and methods

This study was carried out on a total of 370 schoolboys (Campomarino: 69 males and 77 females; Montecilfone: 29 males and 38 females; Portocannone: 27 males and 25 females; Ururi: 47 males and 58 females) aged from eleven to fifteen.

Blood was obtained by vein puncture and collected in heparin Vacutainers (Becton Dickinson and Company, Rutherford, New Jersey, U.S.A.); determinations were performed at the Centro Nazionale Trasfusione Sangue of the C.R.I., Rome, Italy. The following techniques were used: ABO system: agglutination in saline solution by anti—A, —B, —A + B, —A_1 and —H sera for anigens, and ABO erythrocytes test for antibodies; MNSs system: agglutinatiotn in saline solution by anti—M, —N and —S sera and by anti-globulins technique for s antigen; Rh system: agglutination in saline solution at 37°C by anti—C, —c, —D, —E and —e sera. The investigation of D antigen was also performed by an incomplete anti—D hemodiagnostic serum by anti-globulin tes. The anti—A, —B, —A + B, —A_1, —H, —N, —D incomplete and —D complete sera were produced by Centro Nazionale Trasfusione Sangue of the C.R.I. of Rome and the anti—M, —S, —s, —C, —c, —E, —e and —globuline sera were provided by Biotest (Milan, Italy).

As our sample comprised some pairs of brothers or cousins, to calculate phenotype and gene frequencies we only excluded a member of each pair of brothers, drawn at random. Maximum likelihood method was used to calculate gene frequencies.

Results and discussion

Phenotype and gene frequencies are shown in Tables I and II. All the observed frequencies agree with the Hardy-Weinberg expectations.

The heterogeneity analysis among the four villages has pointed out statistically significant differences ($P < .05$) between Campomarino and Montecilfone for the *MN* alleles of the MNSs system and between Campomarino and Ururi for *Cc* alleles of the Rh system. These differences agree with those found for other erythrocyte and serum markers and confirm the peculiarity of Campo-

TABLE I.

ABO, MNSs *and* Rh *Blood Groups Polymorphisms : Distribution of Phenotypic Frequencies*

Systems and Villages	N	Phenotype Frequencies (*)												$\chi^{2(**)}$	P
ABO		A_2	A_1	A_2B	A_1B	B	O								
Campomarino	146	10	41	4	4	16	71							5.096	> .05
		(12.43)	(40.82)	(1.48)	(4.20)	(18.19)	(68.88)							(2 d.f.)	
Montecilfone	67	3	17	1	1	14	31							1.421	> .30
		(3.43)	(15.62)	(0.62)	(2.51)	(12.96)	(31.86)							(2 d.f.)	
Portocannone	52	—	18	—	1	9	24							0.891	> .30
		—	(16.96)	—	(2.17)	(7.90)	(24.97)							(1 d.f.)	
Ururi	105	6	30	3	3	12	51							4.792	> .05
		(7.95)	(29.80)	(0.99)	(3.22)	(13.68)	(49.36)							(2 d.f.)	
MNSs		MMSS	MMSs	MMss	MNSS	MNSs	MNss	NNSS	NNSss	NNss					
Campomarino	145	13	20	10	13	30	25	0	15	19				5.561	> .30
		(11.59)	(20.36)	(8.94)	(9.90)	(37.25)	(25.07)	(2.11)	(12.19)	(17.59)				(5 d.f.)	
Montecilfone	67	5	12	7	7	16	14	0	3	3				3.692	> .70
		(5.78)	(13.41)	(7.77)	(4.59)	(15.13)	(11.36)	(0.91)	(3.89)	(4.16)				(5 d.f.)	
Portocannone	52	1	10	3	2	12	11	0	3	10				3.543	> .70
		(2.79)	(6.70)	(4.01)	(1.60)	(12.14)	(12.25)	(0.23)	(2.92)	(9.36)				(5 d.f.)	
Ururi	105	12	16	8	4	20	21	0	7	17				4.180	> .50
		(8.94)	(16.26)	(7.39)	(4.00)	(26.77)	(21.04)	(0.45)	(5.18)	(14.97)				(5 d.f.)	
Rh		CCDEE	CCDEe	CcDEE	CcDEe	CCDee	CcDee	CCdee	Ccdee	ccDEE	ccDEe	ccDee	ccdee		
Campomarino	146	0	1	0	12	43	63	1	1	0	11	5	9	11.051	> .05
		(0.01)	(0.83)	(0.11)	(13.21)	(46.22)	(55.86)	(0.13)	(2.44)	(0.87)	(7.98)	(6.99)	(11.35)	(6 d.f.)	
Montecilfone	67	—	—	—	7	16	25	—	—	1	5	5	8	0.529	> .90
		—	—	—	(6.69)	(15.28)	(26.75)	—	—	(0.73)	(5.85)	(4.50)	(7.20)	(3 d.f.)	
Portocannone	52	0	0	1	6	14	20	—	—	1	2	1	7	6.684	> .20
		(0.01)	(0.82)	(0.16)	(5.93)	(13.71)	(19.82)	—	—	(0.52)	(3.86)	(0.89)	(6.28)	(5 d.f.)	
Ururi	105	—	—	—	10	21	41	—	—	3	9	4	17	2.033	> .50
		—	—	—	(11.07)	(20.59)	(40.74)	—	—	(1.49)	(10.95)	(3.84)	(16.32)	(3 d.f.)	

(*) Expected frequencies in parentheses. (**) χ^2 for Hardy-Weinberg equilibrium.

TABLE II.

Gene Frequencies of ABO, MNSs *and* Rh *Blood Groups Systems*

Markers	Alleles or Aplotypes	Villages			
		Campomarino	Montecilfone	Portocannone	Ururi
ABO					
	A_1	.168 ± .023	.146 ± .032	.205 ± .042	.172 ± .027
	A_2	.060 ± .015	.036 ± .018	—	.053 ± .017
	B	.085 ± .017	.128 ± .030	.102 ± .031	.089 ± .020
	O	.687 ± .029	.690 ± .042	.693 ± .048	.686 ± .034
MNSs					
	MS	.283 ± .029	.294 ± .044	.232 ± .044	.292 ± .033
	NS	.121 ± .022	.117 ± .034	.066 ± .029	.065 ± .020
	Ms	.248 ± .028	.340 ± .045	.278 ± .047	.265 ± .032
	Ns	.348 ± .030	.249 ± .042	.424 ± .051	.378 ± .035
Rh					
	CDe	.533 ± .033	.478 ± .043	.514 ± .050	.443 ± .034
	cde	.279 ± .034	.328 ± .051	.347 ± .051	.394 ± .037
	cDE	.077 ± .016	.104 ± .026	.100 ± .031	.119 ± .022
	cDe	.076 ± .026	.090 ± .039	.024 ± .025	.044 ± .022
	CDE	.055 ± .005	—	.015 ± .015	—
	Cde	.030 ± .017	—	—	—

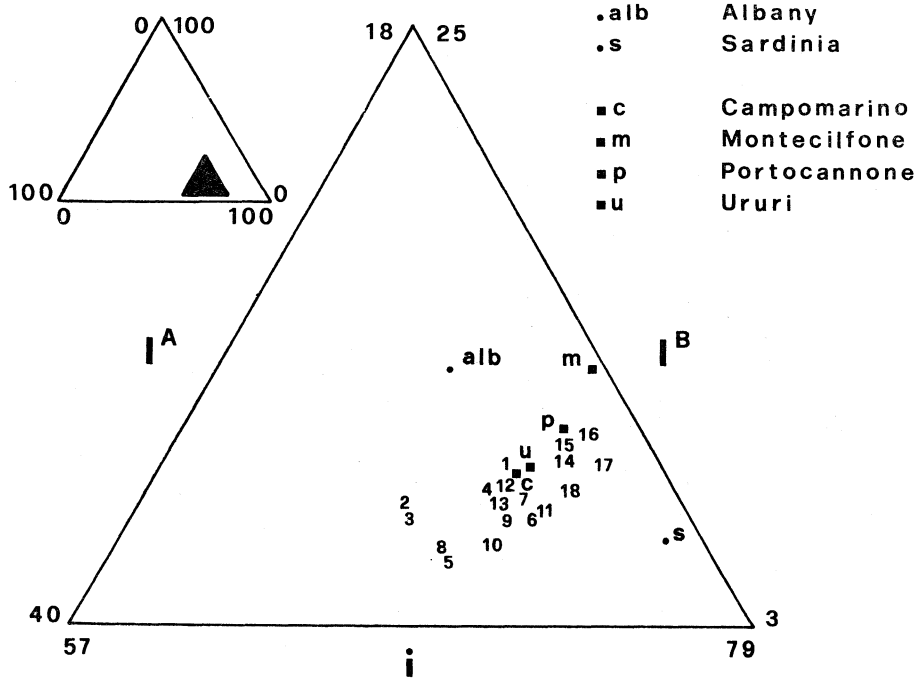

Fig. 1. - Graphic representation of Albania, Italian regions and examined Albanian villages distribution of ABO blood group gene frequencies. Keys: 1) Valle d'Aosta; 2) Piedmont; 3) Lombardy; 4) Liguria; 5) Trentino-Alto Adige; 6) Veneto; 7) Friuli-Venetia Giulia; 8) Emilia-Romagna; 9) Tuscany; 10) Umbria; 11) Marche; 12) Latium; 13) Abruzzi e Molise; 14) Campania; 15) Apulia; 16) Basilicata; 17) Calabria; 18) Sicily.

marino, which is characterized by high immigration rate and low percentages of endogamy and Albanian surnames and people speaking the Albanian language as well, in comparison with Montecilfone and Ururi which show opposite values, and Portocannone which shows intermediate values [1, 4].

Since data for present population of Albania are available only for ABO blood group [5] the comparison was possible only for this marker. Fig. 1 shows the frequencies found in the four villages examined, in the present population of Albania and in the Italian regions. For each Italian region the weighted mean value was considered [6]. The Albanian communities of Molise show gene frequencies more or less similar to those of the southern Italian populations but rather different from those known for Albania.

Figs. 2 and 3 show the comparisons of the MNSs and Rh aplotype frequencies of the four villages examined with the available data for the Italian regions [6]. No clear cut difference is apparent.

However, it is to be stressed that some of the genetic systems so far examined [4] show frequencies different from those known for the Italian population (e.g. AcP and AK).

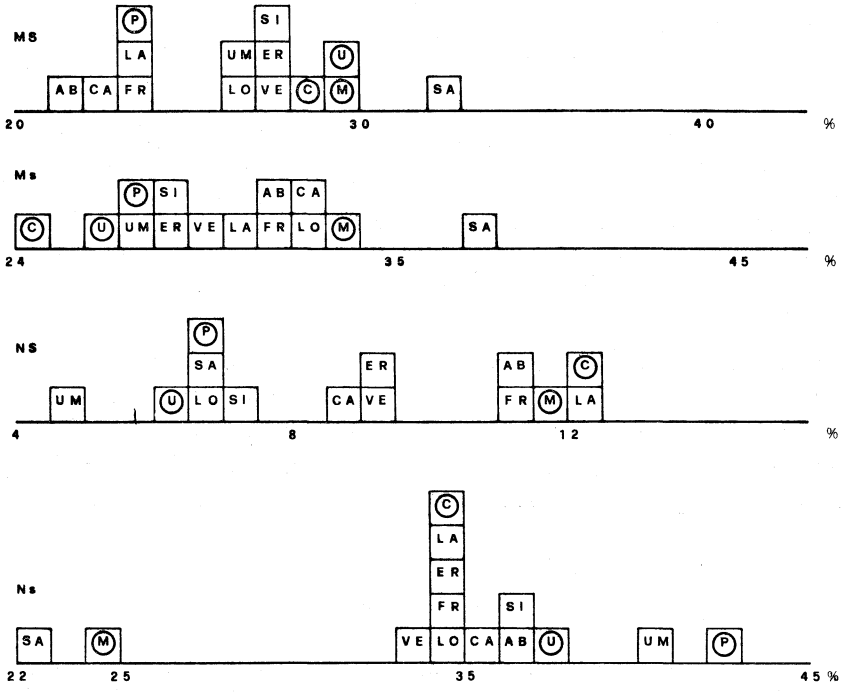

Fig. 2. – MNSs aplotypes frequencies comparisons between the examined Albanian villages and the Italian regions. Keys: AB) Abruzzi e Molise; CA) Campania; ER) Emilia-Romagna; FR) Friuli-Venetia Giulia; LA) Latium; LO) Lombardy; SA) Sardinia; SI) Sicily; UM) Umbria; VE) Veneto; **C** Campomarino; **M** Montecilfone; **P** Portocannone; **U** Ururi.

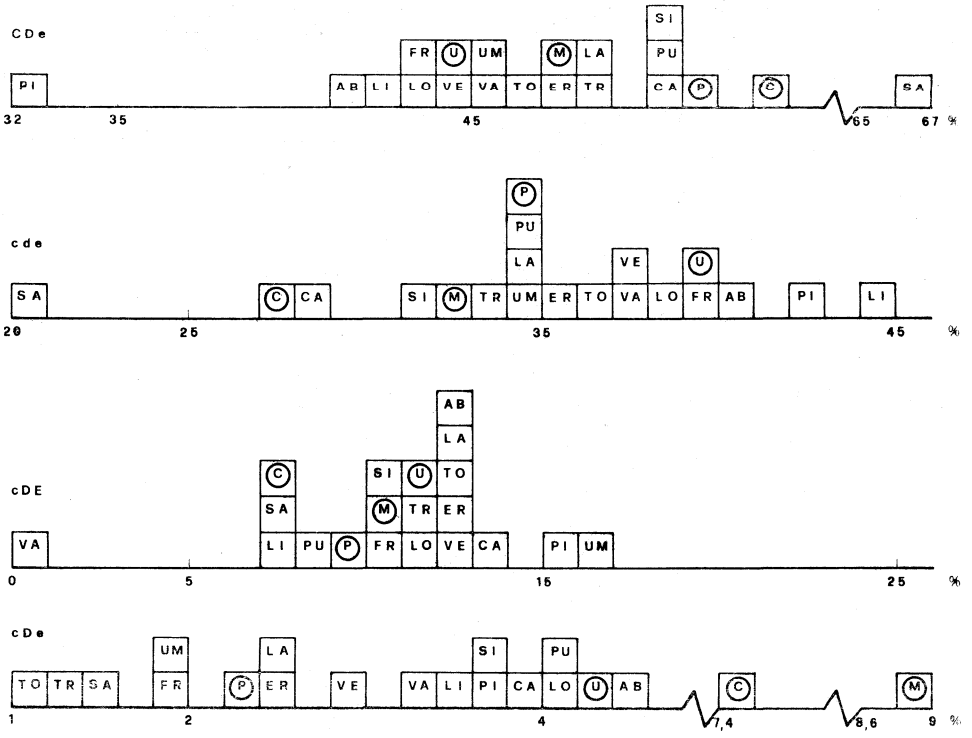

Fig. 3. – Rh aplotypes frequencies comparisons between the Albanian villages examined and the Italian regions. Keys: AB) Abruzzi e Molise; CA) Campania; ER) Emilia-Romagna; FR) Friuli-Venetia Giulia; LA) Latium; LI) Liguria; LO) Lombardy; PI) Piedmont; PU) Apulia; SA) Sardinia; SI) Sicily; TO) Tuscany; TR) Trentino-Alto Adige; UM) Umbria; VA) Valle d'Aosta; VE) Veneto; **C** Campomarino; **M** Montecilfone; **P** Portocannone; **U** Ururi.

For the present it is not possible to estimate the exactd egree of admixture between the communities examined and the Italian population. In fact a more accurate knowledge of the gene frequencies for several genetic markers is still lacking both in the area where the ethno-linguistic minorities are living and in the present population of Albania.

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