

# Surnames in Bolivia: A Study of the Population of Bolivia Through Isonymy

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**KEY WORDS:** inbreeding levels by isonymy; isolation by distance; human low-density diffusion

## ABSTRACT

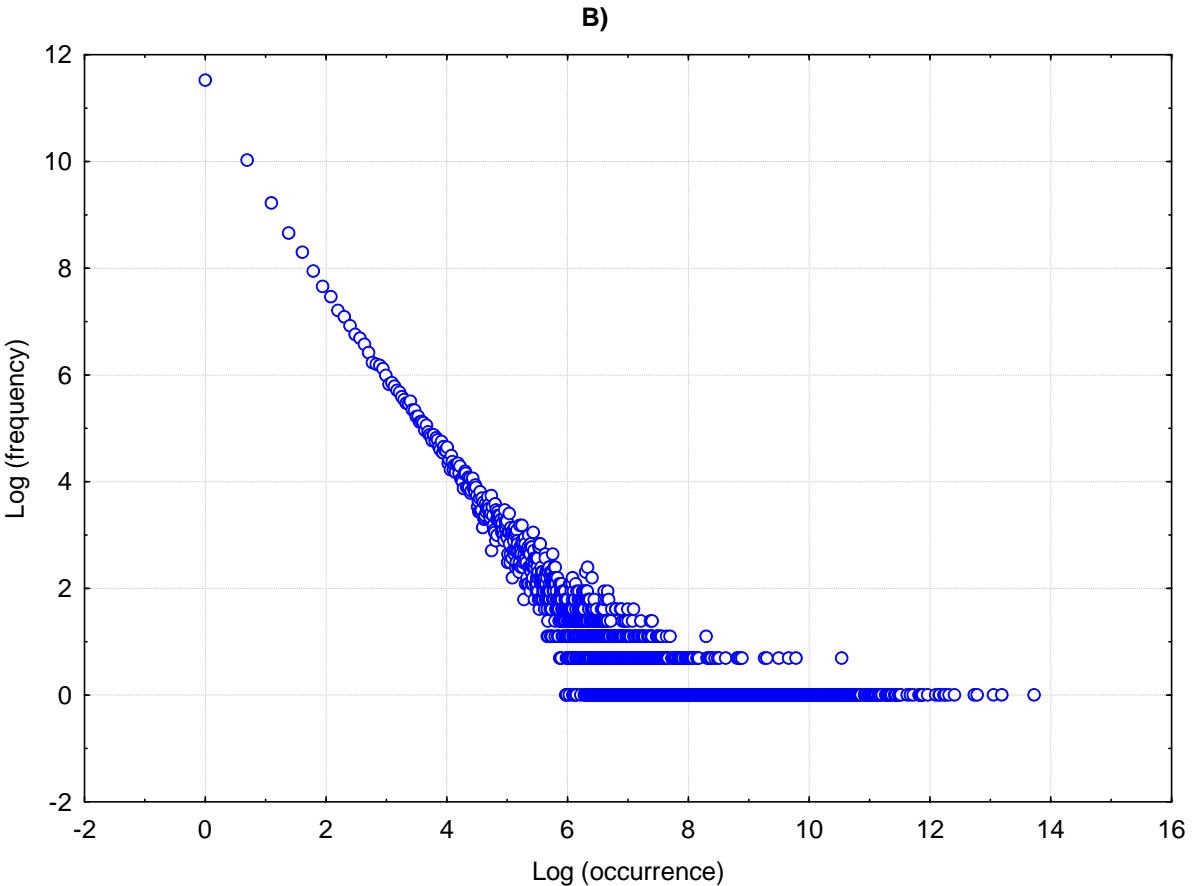
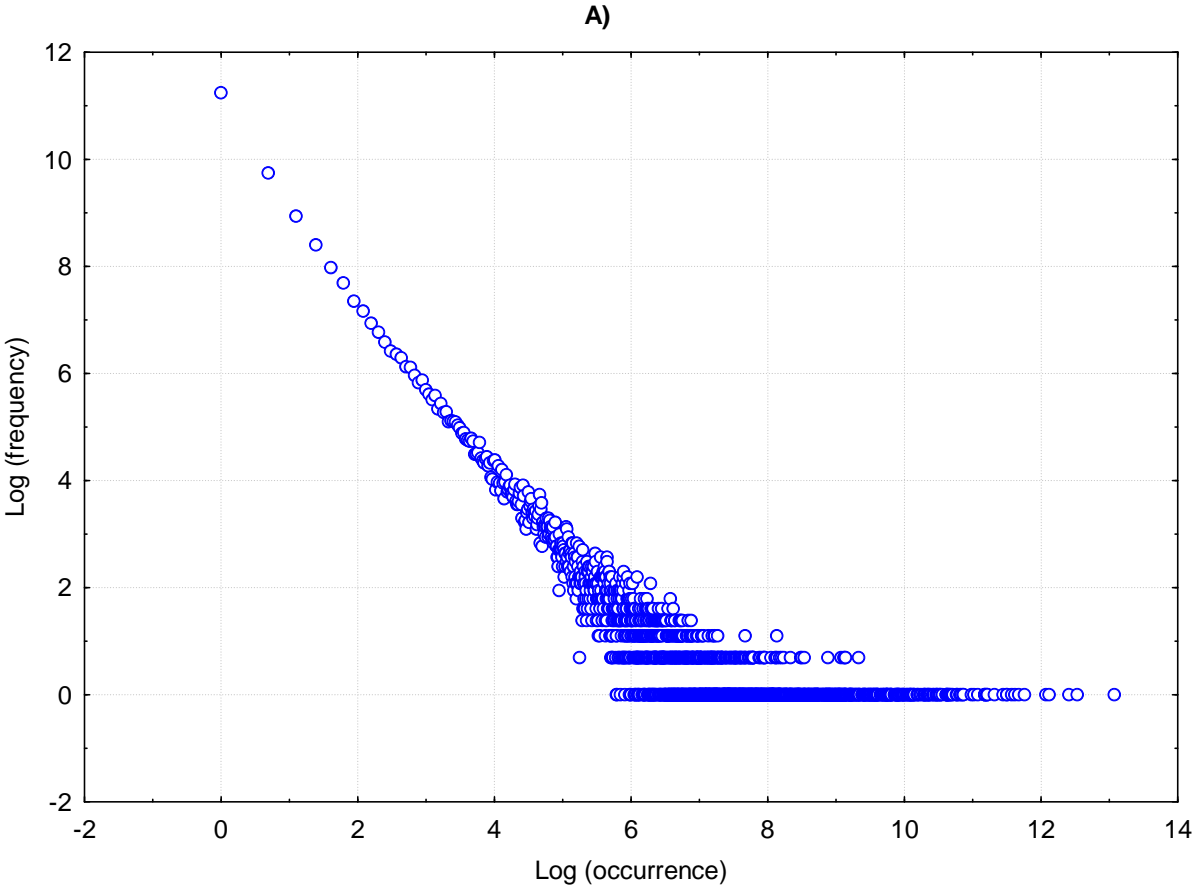
In Bolivia, the Hispanic dual surname system is used. To describe the isonymic structure of Bolivia, the surname distribution of 12,139,448 persons registered in the 2006 census data was studied in 9 districts and 112 provinces of the nation, for a total of 23,244,064 surnames. The number of different surnames found was 174,922. Matrices of isonymic distances between the administrative units (districts and provinces) were constructed and tested for correlation with geographic distance. In the 112 provinces, isonymic distances were correlated with geographic distance ( $r = 0.545 \pm 0.011$  for Euclidean,  $0.501 \pm 0.012$  for Nei's, and  $0.556 \pm 0.010$  for Lasker's distance). The multiple regression of the surname effective number ( $a$ ), equivalent to the allele effective number in a genetic system, was nonsignificant on latitude and longitude; however, it was highly significant and negative on altitude ( $r = -0.72$ ). Because the Andes extend from north to south in west-central Bolivia, random inbreeding was lowest in the eastern districts, and highest in mountainous western Bolivia. Average  $a$  for the provinces was  $122 \pm 2$ ; for the districts, it was  $216 \pm 29$ , and for the whole of Bolivia it was 213. The geographical distribution of  $a$  in the provinces is compatible with the settlement of subsequent groups of migrants moving from east and north toward the center and south of Bolivia. The relative frequency of indigenous surnames is correlated positively with altitude. This suggests that the country was populated by recent low-density demic diffusion over a low-density indigenous population. This may have been a common phenomenon in the immigration to tropical South America.

**Am J Phys Anthropol 144:177–184, 2011. VVC 2010 Wiley-Liss, Inc.**

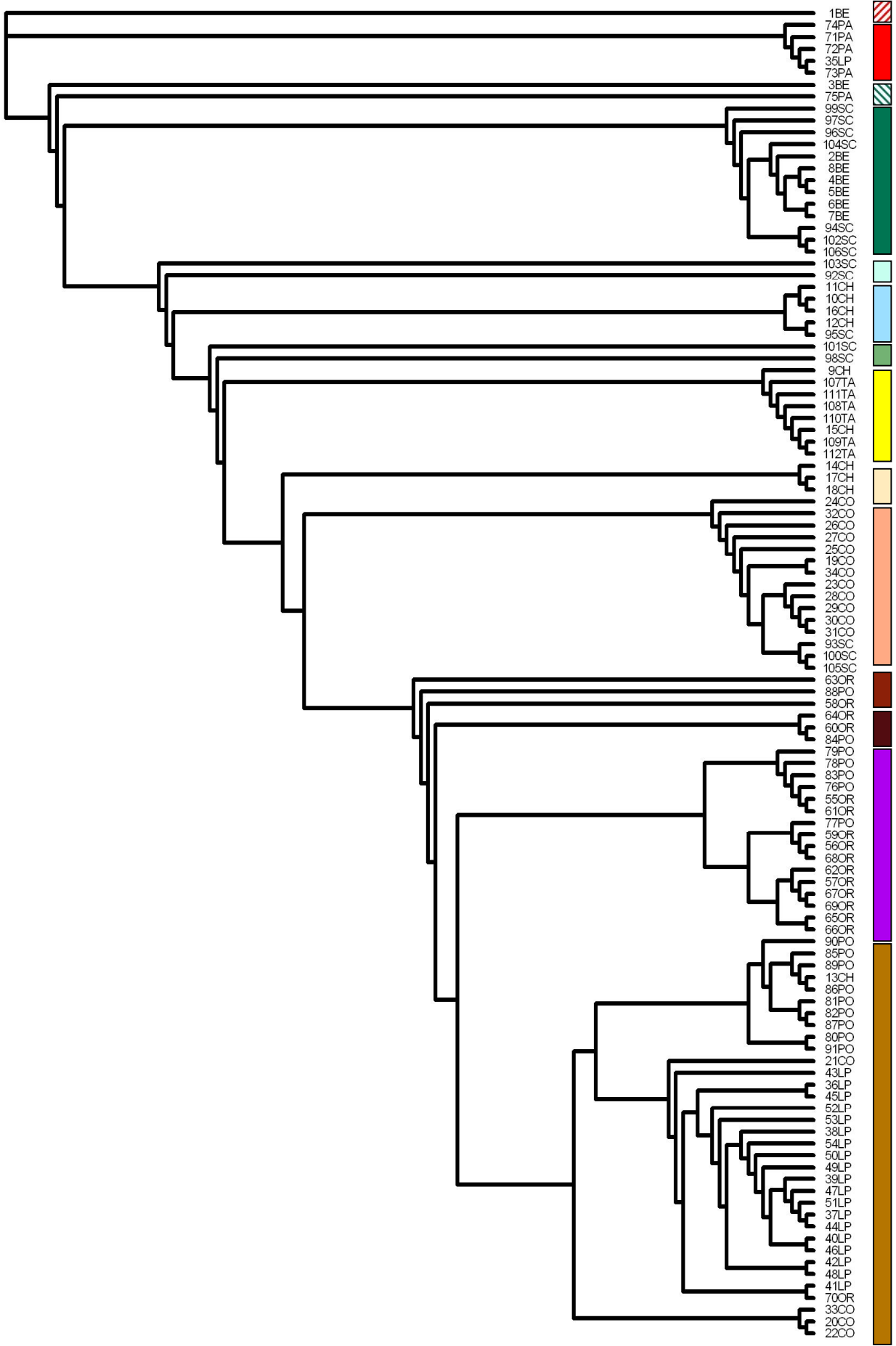
s1. The most frequent surnames of paternal and maternal origin in Bolivia

<b>Paternal</b>		<b>Maternal</b>	
DURAN	31600	JIMENEZ	35135
LIMACHI	31694	ROCHA	35320
JIMENEZ	32184	DURAN	35439
JUSTINIANO	32680	POMA	35731
SOLIZ	33584	SOLIZ	36303
POMA	34201	JUSTINIANO	37185
MONTAÑO	34463	SUAREZ	37262
SUAREZ	35017	MONTAÑO	37400
ALVAREZ	35668	ALVAREZ	38384
ORTIZ	37224	CALLE	40580
ESPINOZA	37526	ESPINOZA	40845
MIRANDA	37800	MORALES	40915
CASTRO	38180	NINA	41275
MORALES	38589	MIRANDA	41474
CALLE	38590	CASTRO	41666
VASQUEZ	39023	CHAMBI	42058
NINA	39258	TICONA	42551
CUELLAR	39408	ORTIZ	42796
CHAMBI	40749	VASQUEZ	43400
VACA	41469	CUELLAR	44234
TICONA	41936	RAMIREZ	44859
RAMIREZ	42139	GUZMAN	47238
GUZMAN	43588	TORREZ	47749
TORREZ	45384	CHAVEZ	47900
CHAVEZ	45418	AGUILAR	49887
ROMERO	45604	VACA	50656
AGUILAR	47346	ROMERO	52264
VILLCA	48429	VILLCA	52438
SANCHEZ	52475	SANCHEZ	59002
MARTINEZ	56571	MARTINEZ	61190
MENDOZA	59076	MENDOZA	64704
GONZALES	64320	COLQUE	71630
COLQUE	66229	PEREZ	71824
PEREZ	66936	GONZALES	71855
APAZA	68991	RAMOS	73747
RAMOS	69557	APAZA	73866
HUANCA	70574	HUANCA	74205
GARCIA	74287	GARCIA	82346
FERNANDEZ	85303	FERNANDEZ	93666
CRUZ	90825	LOPEZ	99044
LOPEZ	92421	CRUZ	99060
GUTIERREZ	99445	GUTIERREZ	106073
ROJAS	100162	ROJAS	111240
RODRIGUEZ	105968	RODRIGUEZ	117373
VARGAS	116556	VARGAS	128037
CHOQUE	164970	CHOQUE	175506
CONDORI	172884	CONDORI	183769
FLORES	221769	FLORES	245290
QUISPE	258458	QUISPE	276630
MAMANI	436838	MAMANI	476867

**S2.** The log-log distribution of the frequency of occurrence of surnames in Bolivia. A, maternal and B, paternal.



s3. Dendrogram obtained from the matrix of Nei's distances for the 112 provinces in Bolivia.



**S4.** Map of the main clusters identified with the matrix of surname distances in Bolivia. Provinces in the same color belong to the same cluster. Note the correlation of the clusters with the administrative districts.

