

Genome-wide diversity analysis to infer population structure and linkage disequilibrium among Colombian coconut germplasm

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Supplementary

Figure S1. Histogram of frequencies showing the depth of 40,614 SNPs aligned to the coconut genome and filtered to meet quality parameters required by the software Structure (Hubisz et al. 2009).

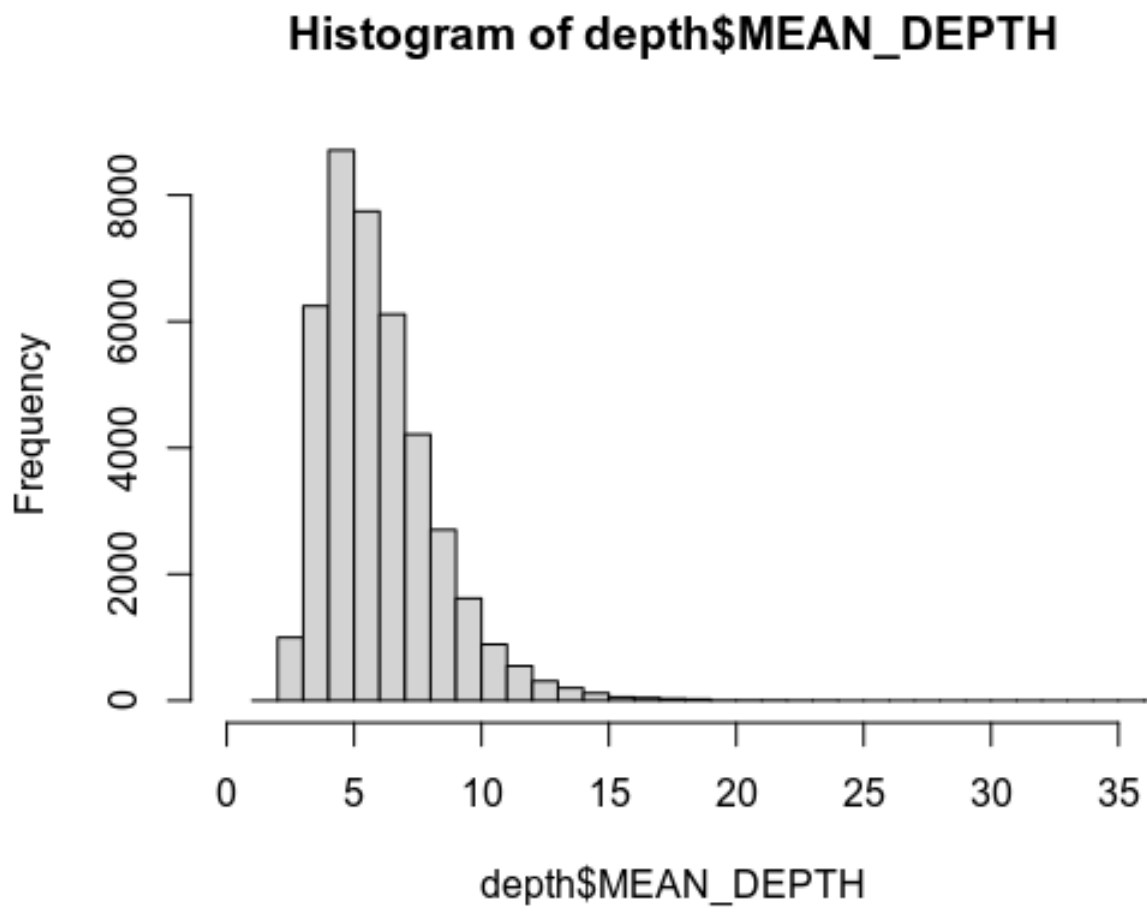


Figure S2. Results showed when the method of Evanno et al. 2005 was used to calculate delta K as a measure that best describes the number of clusters in the data. Here an analysis of K=2 to K=6 showed the highest delta K was K=4.

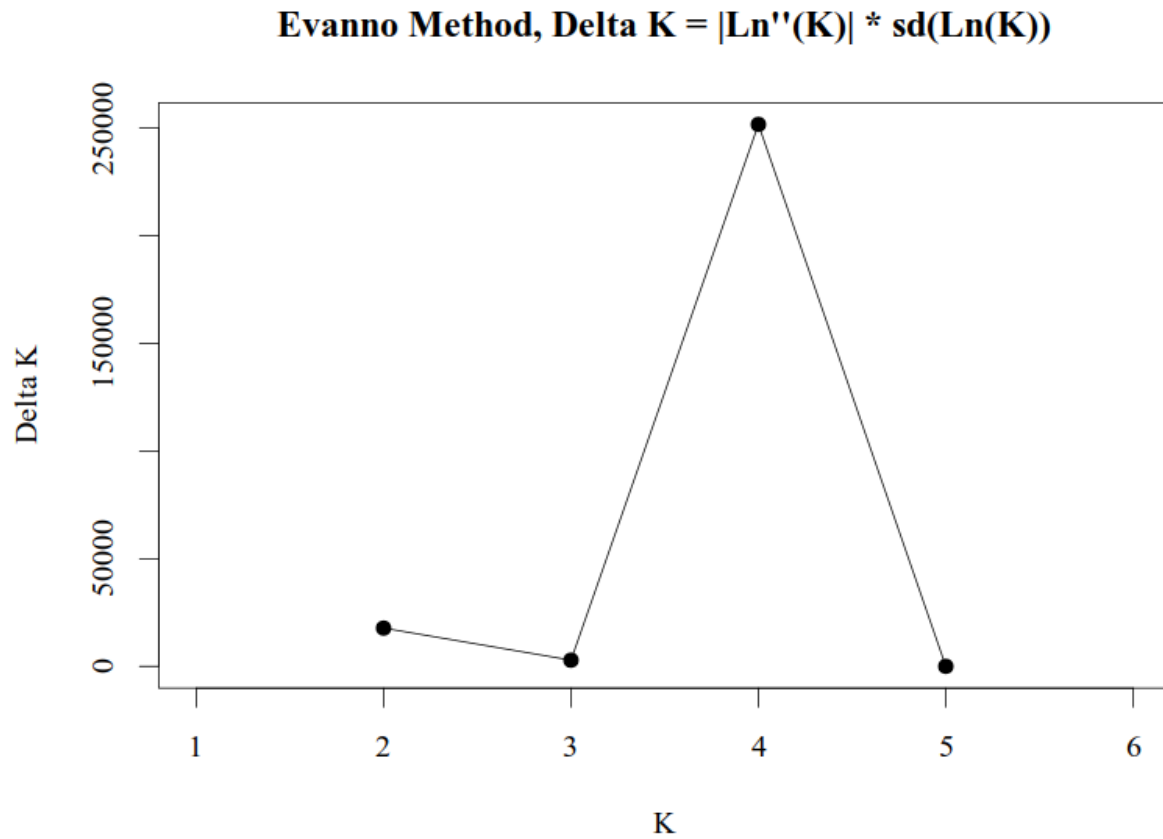


Figure S3. Analysis of the population structure using 112 accessions belonging to the Colombian coconut diversity panel with $K = 2$, $K = 3$, $K = 5$, $K = 6$.

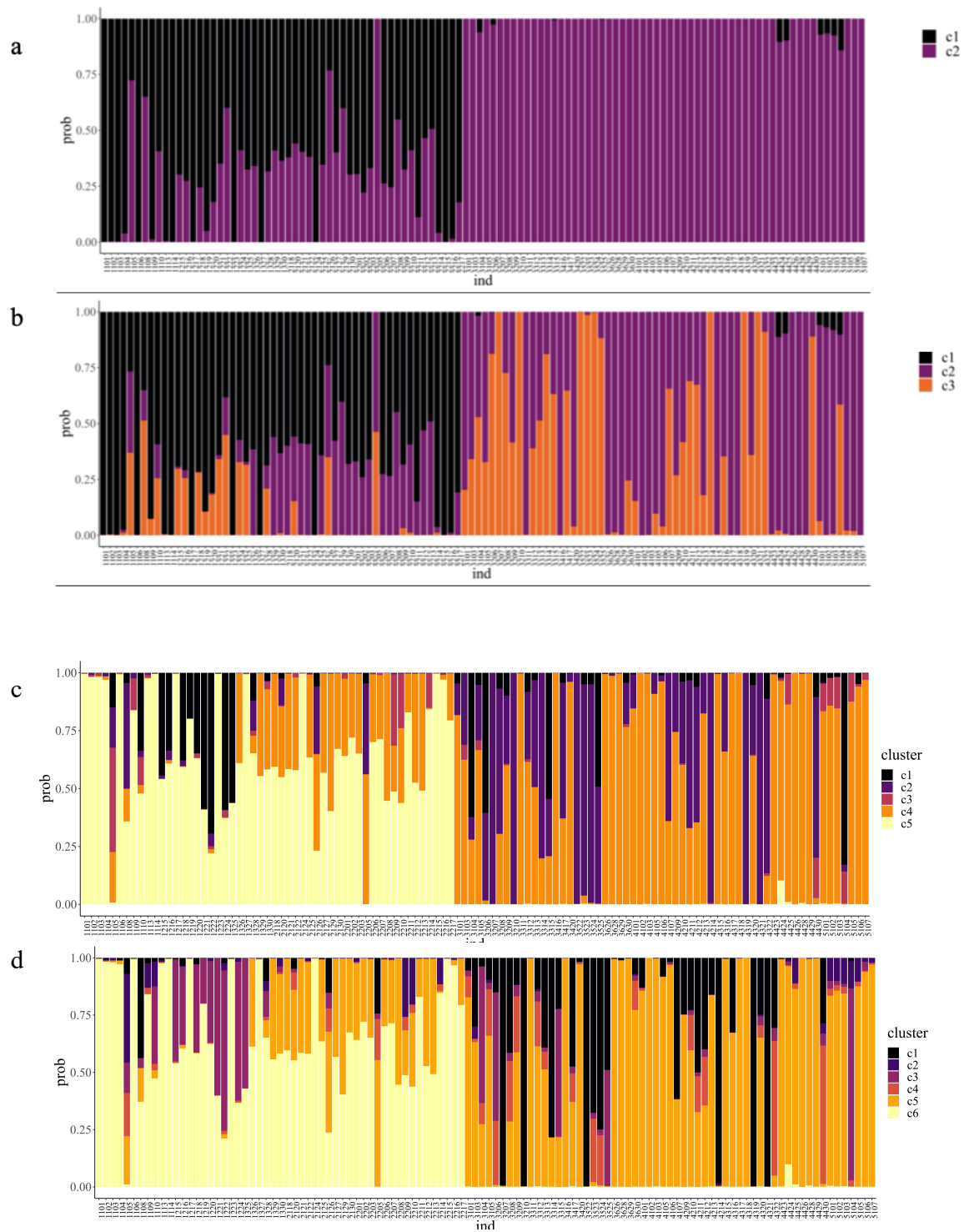


Figure S4. Recent hybrids were detected using Snapclust from the Adegnet R package V2.1.3. (Jombart 2008).

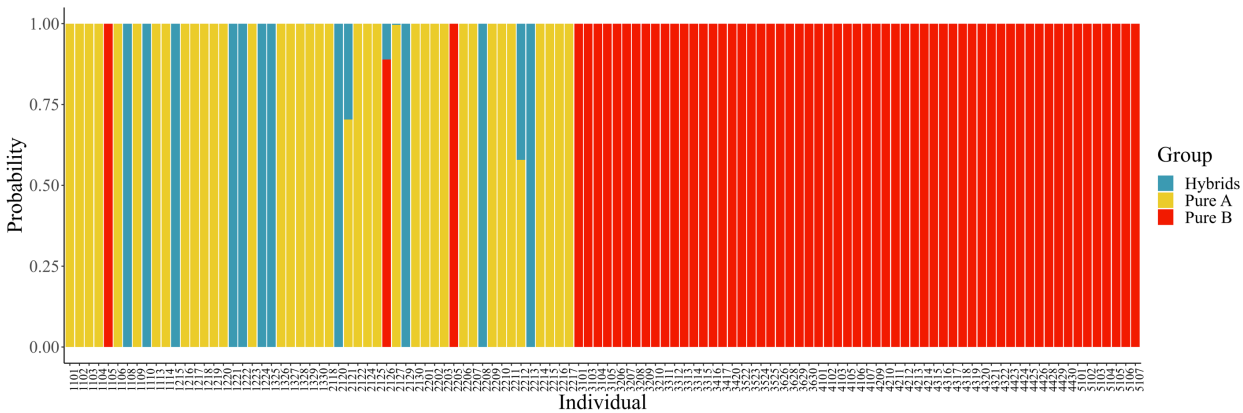


Figure S5. The kinship coefficient for Identity By Descent (IBD) was calculated done using the PLINK v1.90b5.2, Method of Moment (MoM) ([Purcell et al. 2007](#)).

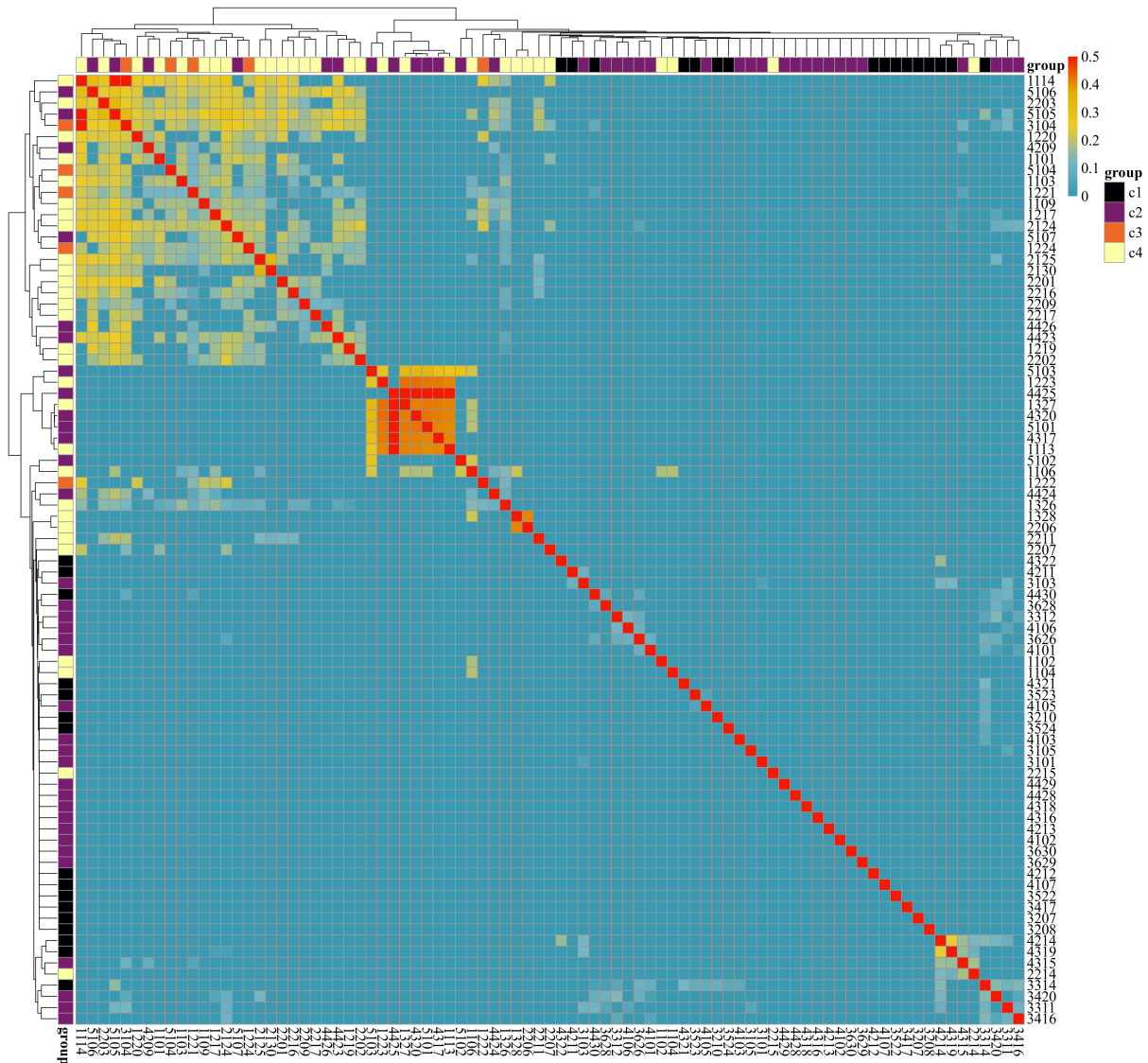


Table S1. Voucher, geographic coordinates for northern South America coconut accessions, when available.

ind	Department	Municipality	Locality	Latitud	Logitud	Coast
1101	Antioquia	San Juan de Urabá	Uveros	8.4975	76.705	Atlantic
1102	Antioquia	San Juan de Urabá	Uveros	8.46694	76.60417	Atlantic
1103	Antioquia	San Juan de Urabá	Uveros	8.49639	76.80389	Atlantic
1104	Antioquia	San Juan de Urabá	Uveros	8.475	76.79778	Atlantic
1105	Antioquia	San Juan de Urabá	Uveros	8.45583	76.59028	Atlantic
1106	Antioquia	San Juan de Urabá	Uveros	8.42111	76.62889	Atlantic
1107	Antioquia	San Juan de Urabá	Uveros	8.37306	76.62944	Atlantic
1108	Antioquia	San Juan de Urabá	Uveros	8.46444	76.74806	Atlantic
1109	Antioquia	San Juan de Urabá	Uveros	8.26861	76.74861	Atlantic
1110	Antioquia	San Juan de Urabá	Uveros	8.35333	76.69806	Atlantic
1111	Antioquia	San Juan de Urabá	Uveros	8.43056	76.84056	Atlantic
1112	Antioquia	San Juan de Urabá	Uveros	8.28917	76.57222	Atlantic
1113	Antioquia	San Juan de Urabá	Uveros	8.51361	76.82083	Atlantic
1114	Antioquia	San Juan de Urabá	Uveros	8.45083	76.82389	Atlantic
1215	Antioquia	San Juan de Urabá	La Balsilla	8.43222	76.76528	Atlantic
1216	Antioquia	San Juan de Urabá	La Balsilla	8.40806	76.82722	Atlantic
1217	Antioquia	San Juan de Urabá	La Balsilla	8.35389	76.82667	Atlantic
1218	Antioquia	San Juan de Urabá	La Balsilla	8.31639	76.82361	Atlantic
1219	Antioquia	San Juan de Urabá	La Balsilla	8.29583	76.76167	Atlantic
1220	Antioquia	San Juan de Urabá	La Balsilla	8.31778	76.72833	Atlantic
1221	Antioquia	San Juan de Urabá	La Balsilla	8.34222	76.735	Atlantic
1222	Antioquia	San Juan de Urabá	La Balsilla	8.26972	76.72861	Atlantic
1223	Antioquia	San Juan de Urabá	La Balsilla	8.4725	76.75722	Atlantic
1224	Antioquia	San Juan de Urabá	La Balsilla	8.43472	76.67972	Atlantic
1326	Antioquia	Arboletes	El Destino	8.41167	76.52861	Atlantic
1327	Antioquia	Arboletes	El Destino	8.44778	76.47972	Atlantic
1328	Antioquia	Arboletes	El Destino	8.47306	76.51361	Atlantic
1329	Antioquia	Arboletes	El Destino	8.53583	76.48694	Atlantic
2117	Córdoba	Moñitos	Behiacoita	8.47472	76.73389	Atlantic
2118	Córdoba	Moñitos	Pueblito	8.62194	75.93167	Atlantic
2119	Córdoba	Moñitos	Pueblito	8.5375	75.89944	Atlantic
2120	Córdoba	Moñitos	Pueblito	8.53028	76.03111	Atlantic
2121	Córdoba	Moñitos	Pueblito	8.44083	75.96722	Atlantic
2122	Córdoba	Moñitos	Pueblito	8.67833	75.95472	Atlantic
2123	Córdoba	Moñitos	Pueblito	8.59806	75.80333	Atlantic
2124	Córdoba	Moñitos	Pueblito	8.67556	75.76806	Atlantic

2125	Córdoba	Moñitos	La Rada	8.53028	76.89194	Atlantic
2126	Córdoba	Moñitos	La Rada	8.73333	76.69278	Atlantic
2128	Córdoba	Moñitos	Behiacoita	8.7	76.73417	Atlantic
2129	Córdoba	Moñitos	El Destino	8.60639	76.83417	Atlantic
2130	Córdoba	Moñitos	El Destino	8.55611	76.74389	Atlantic
2201	Córdoba	Puerto Escondido	Mucuna	8.17417	76.04556	Atlantic
2202	Córdoba	Puerto Escondido	Mucuna	8.17417	76.04556	Atlantic
2203	Córdoba	Puerto Escondido	Marimar	8.33472	76.27806	Atlantic
2204	Córdoba	Puerto Escondido	Marimar	8.86861	76.29417	Atlantic
2205	Córdoba	Puerto Escondido	Marimar	8.28944	76.26694	Atlantic
2206	Córdoba	Puerto Escondido	El Paraíso	8.34639	76.11667	Atlantic
2207	Córdoba	Puerto Escondido	El Paraíso	8.26694	76.23083	Atlantic
2209	Córdoba	Puerto Escondido	La Unión	8.34528	76.13	Atlantic
2210	Córdoba	Puerto Escondido	La Unión	8.13861	76.20028	Atlantic
2211	Córdoba	Puerto Escondido	Monserate	8.76944	76.19389	Atlantic
2212	Córdoba	Puerto Escondido	Monserate	8.68222	76.16972	Atlantic
2213	Córdoba	Puerto Escondido	La Maravilla	8.8225	76.16972	Atlantic
2214	Córdoba	Puerto Escondido	La Maravilla	8.81778	76.14194	Atlantic
2215	Córdoba	Puerto Escondido	La Maravilla	8.66639	76.1375	Atlantic
2216	Córdoba	Puerto Escondido	Porto alegre	8.68583	76.22417	Atlantic
2217	Córdoba	Puerto Escondido	Porto alegre	8.695	76.215	Atlantic
3101	Nariño	Tumaco	San José del Guayabo	2.2375	77.99083	Pacific
3102	Nariño	Tumaco	San José del Guayabo	2.2525	77.98944	Pacific
3103	Nariño	Tumaco	San José del Guayabo	2.21889	77.99444	Pacific
3104	Nariño	Tumaco	San José del Guayabo	2.20417	77.99972	Pacific
3105	Nariño	Tumaco	San José del Guayabo	2.18861	78.04972	Pacific
3206	Nariño	Tumaco	Tablón dulce	2.39333	77.99028	Pacific
3207	Nariño	Tumaco	Tablón dulce	2.41222	78.00083	Pacific
3209	Nariño	Tumaco	Tablón dulce	2.33194	78.04861	Pacific

3210	Nariño	Tumaco	Tablón dulce	2.30583	77.925	Pacific
3311	Nariño	Tumaco	Chagui	2.34528	78.08111	Pacific
3312	Nariño	Tumaco	Chagui	2.46972	78.12944	Pacific
3313	Nariño	Tumaco	Chagui	2.52694	77.935	Pacific
3314	Nariño	Tumaco	Chagui	2.38667	78.05361	Pacific
3315	Nariño	Tumaco	Chagui Buenos	2.32389	78.06528	Pacific
3416	Nariño	Tumaco	Aires Buenos	2.37139	78.13278	Pacific
3417	Nariño	Tumaco	Aires Buenos	2.4775	77.91361	Pacific
3418	Nariño	Tumaco	Aires Buenos	2.50528	78.11333	Pacific
3419	Nariño	Tumaco	Aires Buenos	2.37583	77.9525	Pacific
3420	Nariño	Tumaco	Aires	2.36472	77.9525	Pacific
3521	Nariño	Tumaco	Rosario	2.23861	78.05056	Pacific
3522	Nariño	Tumaco	Rosario	2.2825	78.15056	Pacific
3523	Nariño	Tumaco	Rosario	2.30611	78.21472	Pacific
3524	Nariño	Tumaco	Rosario	2.245	78.295	Pacific
3525	Nariño	Tumaco	Rosario	2.25028	78.305	Pacific
3617	Nariño	Tumaco	Gualayo	2.3025	78.23972	Pacific
3626	Nariño	Tumaco	Gualayo	2.30417	78.25194	Pacific
3628	Nariño	Tumaco	Gualayo	2.30917	77.99583	Pacific
3629	Nariño	Tumaco	Gualayo	2.37139	78.24472	Pacific
3630	Nariño	Tumaco	Gualayo Playa	2.35722	78.25361	Pacific
4101	Cauca	Guapi	Blanca Playa	3.11583	77.19389	Pacific
4102	Cauca	Guapi	Blanca Playa	3.10583	77.20361	Pacific
4103	Cauca	Guapi	Blanca Playa	3.17778	77.22639	Pacific
4104	Cauca	Guapi	Blanca Playa	3.18417	77.26	Pacific
4105	Cauca	Guapi	Blanca Playa	3.25917	77.25556	Pacific
4106	Cauca	Guapi	Blanca Playa	3.13944	77.25222	Pacific
4107	Cauca	Guapi	Blanca	3.23556	77.27056	Pacific
4209	Cauca	Guapi	Quiroga	3.16028	77.30056	Pacific
4210	Cauca	Guapi	Quiroga	3.11722	77.26222	Pacific
4211	Cauca	Guapi	Quiroga	3.33917	77.34806	Pacific
4212	Cauca	Guapi	Quiroga	3.27778	77.17306	Pacific
4213	Cauca	Guapi	Quiroga	3.29222	77.17639	Pacific

4214	Cauca	Guapi	Quiroga	3.09028	77.23972	Pacific
4316	Cauca	Guapi	Preba	3.2825	77.49667	Pacific
4317	Cauca	Guapi	Preba	3.27167	77.49167	Pacific
4318	Cauca	Guapi	Preba	3.265	77.29361	Pacific
4319	Cauca	Guapi	Preba	3.06694	77.40639	Pacific
4320	Cauca	Guapi	Preba	3.05389	77.38	Pacific
4321	Cauca	Guapi	Preba	3.06722	77.44222	Pacific
4322	Cauca	Guapi	Preba	3.28611	77.48639	Pacific
4417	Cauca	Guapi	Obregón	3.28167	77.23111	Pacific
4423	Cauca	Guapi	Obregón	3.2575	77.40194	Pacific
4424	Cauca	Guapi	Obregón	3.32528	77.42556	Pacific
4425	Cauca	Guapi	Obregón	3.35056	77.395	Pacific
4428	Cauca	Guapi	Obregón	3.28972	77.45528	Pacific
4429	Cauca	Guapi	Obregón	3.30139	77.35611	Pacific
4430	Cauca	Guapi	Obregón	3.19167	77.25417	Pacific
5101	Choco	Nuqui	Coqui	5.67139	77.46639	Pacific
5102	Choco	Nuqui	Coqui	5.68	77.47056	Pacific
5103	Choco	Nuqui	Coqui	5.68222	77.47333	Pacific
5104	Choco	Nuqui	Coqui	5.67861	77.4625	Pacific
5105	Choco	Nuqui	Coqui	5.68667	77.44639	Pacific
5106	Choco	Nuqui	Coqui	5.7	77.41	Pacific
5107	Choco	Nuqui	Coqui	5.70361	77.40361	Pacific

Table S2. Enzymes used in a pilot GBS analysis.

SNPs per enzyme test		
Enzyme	# SNPs	
PstI-MstI	1420	SNPs discovery using Freebayes v1.0.2-16
		SNP filtering according to GBS rules: (depth 8 reads min, SNPs found min in 8 individuals out of 12 , MAF > 0.1
MslI	44655	
Reads per enzyme test		
Enzyme	Restriction site	No. reads
MslI	5'...CAYNN NNRTG...3'	127,899,980
	3'...GTRNN NNYAC...5'	127899980
PstI-MspI	5'...C CGG...3'	122,593,202
	3'...GGC C...5'	122593202