



DNA Tribes® Digest May 30, 2009
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Introduction

Hello, and welcome to the May 2009 issue of DNA Tribes® Digest. In this issue, we will explore genetic relationships among South American Indians. This is a part of the world whose history is only beginning to be understood, yet has furnished some of the most important food crops (such as the potato) in use around the world today. Two recent books that discuss new research about this part of the world, including information presented in this article, are “1491: New Revelations of the Americas before Columbus” by Charles C. Mann and “Indian Givers: How the Indians of the Americas Transformed the World” by Jack Weatherford.

As research about the Americas progresses, it is likely that new information will become available, perhaps laying foundations for a fuller understanding of the pre-history and history of South American Indians and their pre-European relations with neighboring peoples of Central and North America as well as the more fundamental relationships between American Indians and other parts of the world.

Best regards and I hope to speak with you soon,

Lucas Martin
DNA Tribes

Genetic Relationships among South American Indians

In this article, we will explore relationships among South American Indian genetic regions, including the Patagonian, Amazonian, and Andean regions.

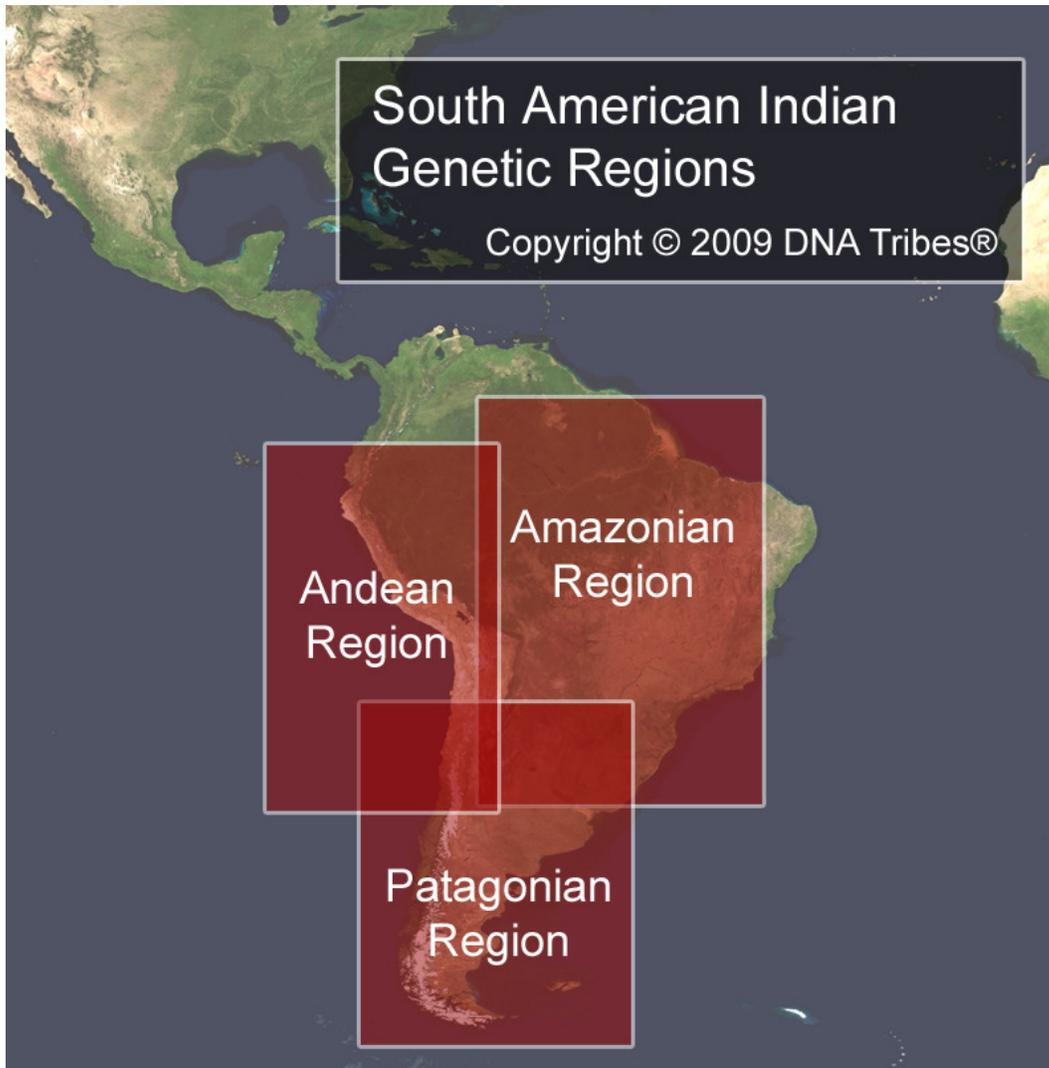


Figure 1: South American Indian regions surveyed in this article.

At the Ends of the Earth: the Patagonian Region

Background: The Patagonian genetic region characterizes populations in the southernmost part of South America known as Patagonia, including parts of present day Chile and Argentina. The first Europeans to visit these lands were Ferdinand Magellan’s crew, who named the inhabitants of these lands *Patagones*¹ and described them as tall and well proportioned. Today, Patagonia is home to the indigenous Tehuelche peoples, who are thought to be descended from the earliest settlers of the Patagonian plains. Patagonia is also home to Mapuche people descended from nomadic cattle raising cultures that expanded east from Araucanía (their homeland in Chile) after European contact in a process known as Araucanization.

Further, Patagonia is home to the archeological site known as Monte Verde, which has been dated to 14,500 years before present and constitutes some of the oldest accepted evidence for human habitation anywhere in the Americas. The Monte Verde site lies more than 10,000 miles south (by sea) of the Bering Sea that connects Siberia to Alaska, and has been dated to a period older than the Clovis site in New Mexico² (previously considered the earliest evidence of human settlement in the Americas).

Evidence from Monte Verde and elsewhere (including other more controversial evidence of even older human presence) has called into question the older prevailing theory that American Indians are solely descended from an inland wave of hunting cultures that rapidly colonized the Americas at the end of the last ice age.

Genetic analysis: Genetic contributions to the Patagonian region from the 35 other world regions presently identified by DNA Tribes® analysis³ were estimated. Results are illustrated in **Figure 2** and summarized in **Table 1** below.

Discussion: Results in **Table 1** indicate the largest genetic contribution from the Amazonian region (46.0%). The smaller Andean contribution (13.0%) might reflect to some degree the recent process of Araucanization, in which Mapuche cultures expanded into Patagonia. A substantial contribution was also observed from the Central American region (29.7%), perhaps mediated through the Amazonian region.

Also identified was a North Amerindian contribution (4.6%). This smaller contribution corresponds to separate patterns of north-south genetic continuity observed along both the Atlantic and Pacific coasts of the Americas⁴.

¹ The name “Patagones” is of unknown etymology, but has been (doubtfully) said to refer to the Patagones’ large *patas*, meaning feet or legs.

² Clovis, New Mexico itself is more than 3,000 miles from the Bering Sea. Navajo and Apache peoples living in the Southwestern U.S. today share genetic characteristics with northern peoples of Alaska. However, these shared Athabaskan genetic patterns are primarily affiliated with the southerly grouping of American Indian regions. These connections are discussed in greater detail in the October 2008 issue of DNA Tribes® Digest at: <http://www.dnatribes.com/dnatribes-digest-2008-10-25.pdf>.

³ A map illustrating the genetic world regions presently identified by DNA Tribes® analysis can be viewed at: <http://dnatribes.com/populations.html>.

⁴ For more information, see: <http://www.dnatribes.com/dnatribes-digest-2008-10-25.pdf>.

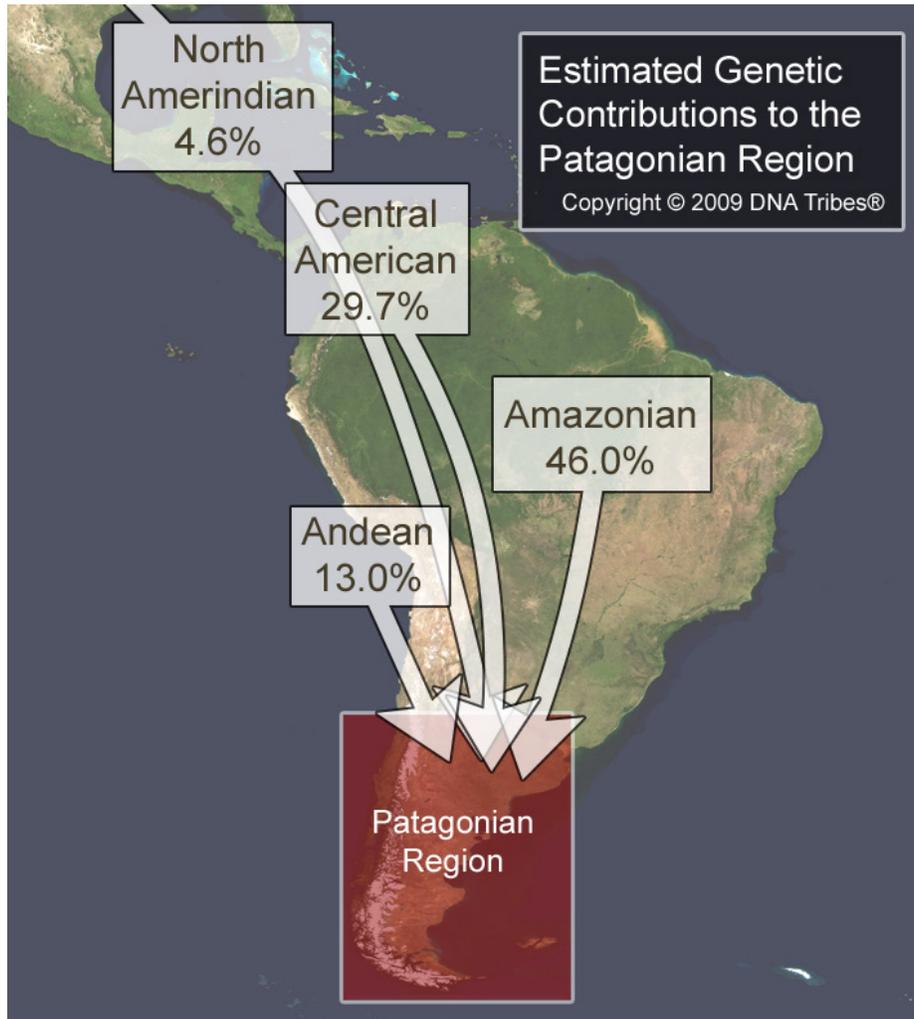


Figure 2: Estimated genetic contributions to the Patagonian region.

Genetic Region	Estimated Contribution
Amazonian	46.0%
Central American	29.7%
Andean	13.0%
North Amerindian	4.6%
Other	6.7%

Table 1: Estimated genetic contributions to the Patagonian region.

Eden of the Americas: the Amazonian Region

Background: The Amazonian genetic region characterizes indigenous populations in a large eastern zone of South America that extends from the Amazon River Basin to the Gran Chaco (from a Quechua word meaning “hunting grounds”) flatlands of northern Argentina. These lands support a variety of ecological systems including the Amazon Rainforest, where one in ten of Earth’s known species is thought to live. Similarly, this region is home to a variety of indigenous cultures (to name only a few: Ayoreo, Caingang, Pilaga, Surui, Toba, Wichí, and Xavante peoples), speaking a great variety of languages and adapted to life in this biologically rich environment.

Although the biological richness of Amazonia is well known, this apparently wild environment has also been shaped by longstanding human occupation and cultivation. Large parts of the Amazon are covered by a type of soil known in Portuguese as *Terra preta do índio* (“Indian black earth”). This highly fertile soil is rich in charcoal and animal remains as well as pottery shards deposited by indigenous settlements.

It is now thought that some Amazonian hunting and gathering peoples living today are descended from former agricultural communities who adopted a more mobile lifestyle after European contact began. It has also been suggested that many useful plants of the Amazon have been spread by planned cultivation, and that apparently wild forest lands of today include the remnants of American Indian orchards⁵. Some of the many useful plants from the Amazon include the rubber tree, manioc (also known as tapioca), and peach palm.

Archaeological evidence of early human occupation in this region include Lagoa Santa in southeastern Brazil (dated to approximately 11,000 years before present), where the skeletal remains known as Luzia Woman have been excavated along with tool remains that do not include Clovis point technology. Another more recent site in this region is on Marajó Island in northern Brazil (dated to between 800 and 1400 AD), where abundant artifacts including elaborate pottery and evidence of mound building have been found. In the Beni savanna of Bolivia (also part of the Amazon River Basin), evidence of complex agricultural engineering dating to two thousand years before present has also been discovered.

Genetic analysis: Genetic contributions to the Amazonian region from the 35 other world regions presently identified by DNA Tribes® analysis were estimated. Results are illustrated in **Figure 3** and summarized in **Table 2** below.

Discussion: Results in **Table 2** indicate the largest contributions from the neighboring Andean (36.8%) and Patagonian (43.5%) regions, for a combined contribution of 80.3% from other South American Indian regions. However, substantial contributions from more distant northerly regions were also identified: Ojibwa (12.4%), Athabaskan (3.7%), North Amerindian (2.4%), and Arctic (1.3%), for a combined contribution of 19.8% from North American Indian regions. This

⁵ These new findings are discussed in greater detail in the books “1491” and “Indian Givers” referenced in the Introduction to this article.

corresponds to other north-south connections observed in the Americas, suggesting the possibility of reciprocal pre-European contacts along the Atlantic coasts of North and South America⁶.

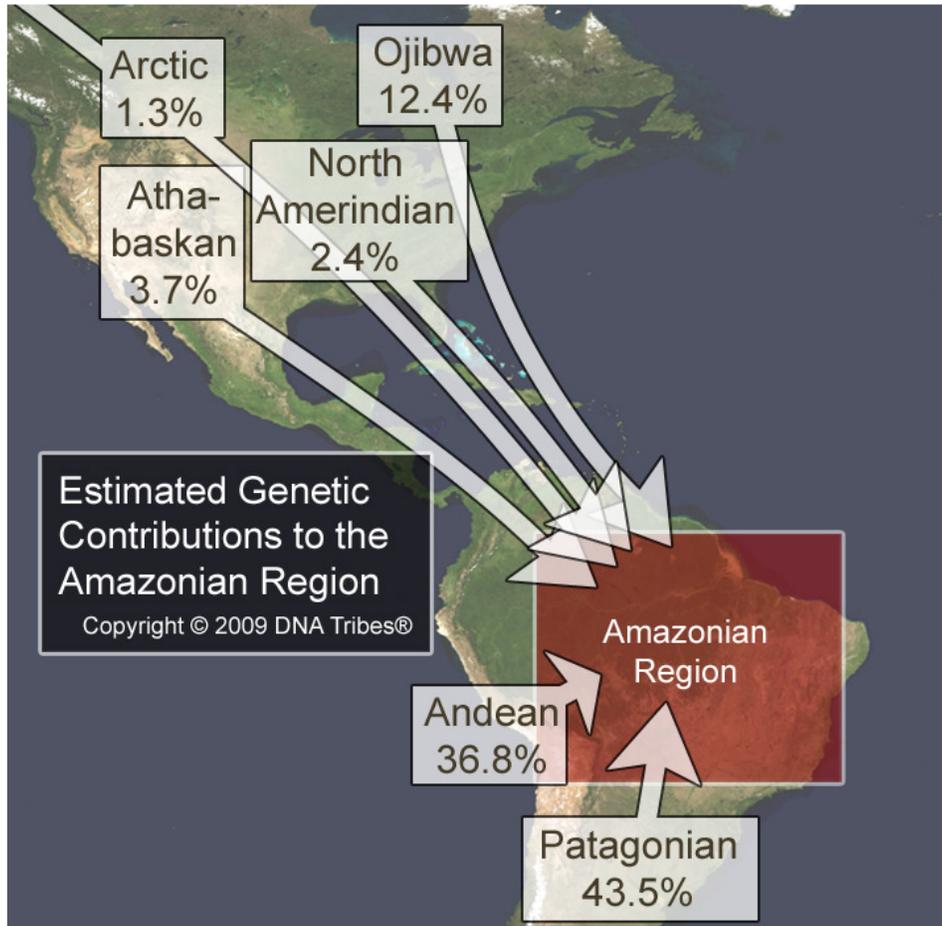


Figure 3: Estimated genetic contributions to the Amazonian region.

Genetic Region	Estimated Contribution
Patagonian	43.5%
Andean	36.8%
Ojibwa	12.4%
Athabaskan	3.7%
North Amerindian	2.4%
Arctic	1.3%
Other	0.0%

Table 2: Estimated genetic contributions to the Amazonian region.

⁶ For more information, see: <http://www.dnatribes.com/dnatribes-digest-2008-10-25.pdf>.

Mountain Backbone of South America: the Andean Region

Background: The Andean genetic region characterizes populations along the Andes Mountains, which are part of a long chain of mountain systems that runs more than ten thousand miles from Alaska through North America and continues to the southern part of South America. These mountain systems are part of the seismically active Pacific Ring of Fire along the western coasts of the Americas known for mineral wealth as well as periodic volcanic and earthquake activity.

It was here that the potato was first domesticated perhaps as early as ten thousand years ago, later spreading after European contact to become one of the world's most important food crops⁷. Another crop cultivated in the Andes since ancient times is coca, which was traditionally chewed for its pharmacological effects as a stimulant and pain reducer, but is now widely used in production of the more powerful narcotic cocaine. A third influential product of the Andes is guano (from the Quechua word *wanu*), nitrogen rich seabird droppings used to enrich soils, which was widely exported after Europeans learned of its use in reviving depleted farmlands.

At the time of European contact, the Andean region was home to the largest contemporary land empire on earth, the Inca Empire, whose territories extended over thirty two degrees of latitude from Ecuador to central Chile. The Inca Empire was known to its Quechua rulers as *Tawantinsuyu*, meaning "Four Regions" or "Four Quarters" in reference to its four part division⁸. This sprawling empire was centrally administered from its capitol in Cusco and connected by a network of well built roads. The Inca Empire is known for its excellent engineering, including the city Machu Picchu, which was constructed near 1430 AD but abandoned at the time of the Spanish conquest. Today, indigenous cultures of the Andean region include Quechua and Aymara speaking peoples.

Genetic analysis: Genetic contributions to the Andean region from the 35 other world regions presently identified by DNA Tribes® analysis were estimated. Results are illustrated in **Figure 4** and summarized in **Table 3** below.

Discussion: Results in **Table 3** indicate contributions from the neighboring Amazonian (33.8%) and Central American (9.3%) regions. However, results also indicate contributions from the Mexican (43.4%) and Salishan (7.7%) regions, suggesting the possibility of substantial north-south contacts with North American Indians, perhaps by way of maritime contacts along the Pacific Coast.

⁷ "Potato" is one of the comparatively few English words derived from American Indian languages. However, the word "potato" derives from the Taino word *batata*, which originally described the sweet potato. *Papa*, the actual Andean term for the potato, has retained its original meaning in Spanish. Another indigenous Andean term is *charqui*, which has entered the English language as "jerky."

⁸ The "Four Quarters" or "Four Directions" is a ubiquitous symbol found throughout the Americas, and is sometimes ascribed with cosmological meanings in indigenous cultures.

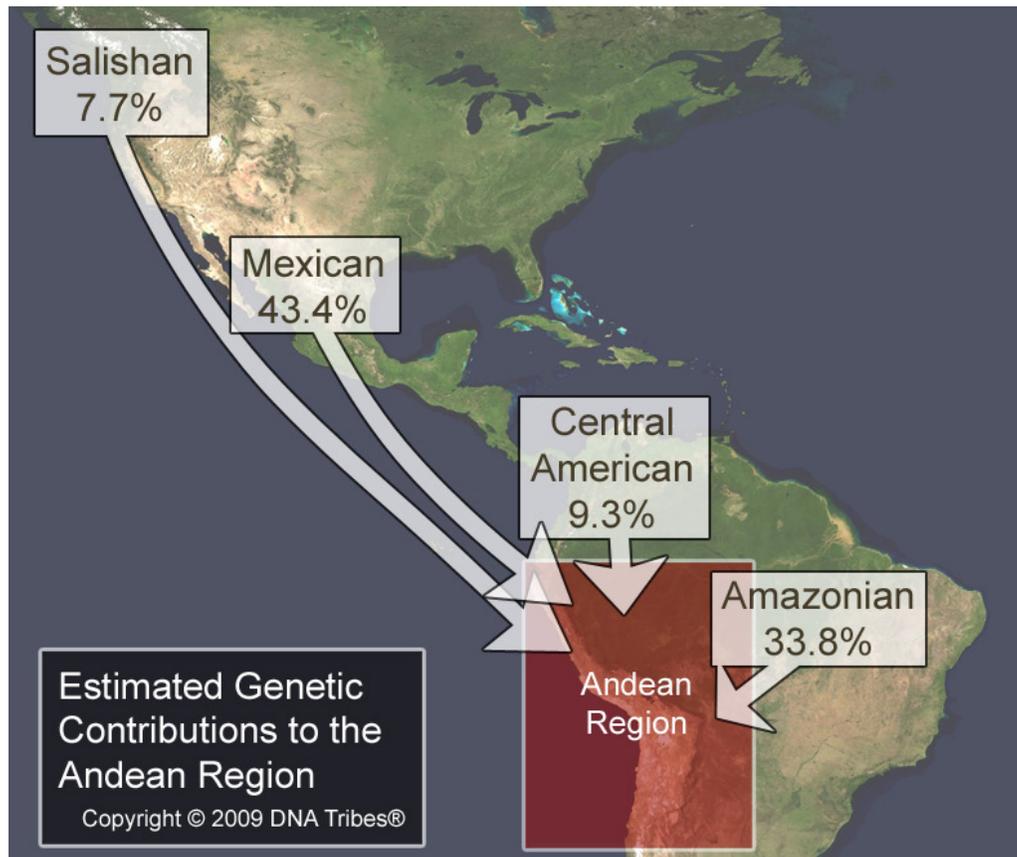


Figure 4: Estimated genetic contributions to the Andean genetic region.

Genetic Region	Estimated Contribution
Mexican	43.4%
Amazonian	33.8%
Central American	9.3%
Salishan	7.7%
Other	5.8%

Table 3: Estimated genetic contributions to the Andean genetic region.

Conclusion

Results for all three South American Indian regions indicate substantial contacts over long distances, notably along the Atlantic Coast (particularly for the Amazonian region) and Pacific Coast (particularly for the Andean region). This corresponds to the reciprocal north-south contacts previously observed among North American Indians⁹.

⁹ See: <http://www.dnatribes.com/dnatribes-digest-2008-10-25.pdf>.



New Populations for May 15, 2009

We are pleased to announce the addition of several new populations to our database:

New East Asian Populations:

- Central Thailand (212)
- Indonesia (402)
- Northeastern Thailand (304)
- Northern Thailand (202)
- Philippines (181)
- Southern Thailand (211)

New European Populations:

- Moldavia, Romania (1,321)
- Republic of Montenegro (101)

New Latin American Populations:

- Mestizo (Bolivia) (148)

New Near Eastern Populations:

- Palestinian (Gaza Strip) (125)
- Southern Morocco (Arabic speakers) (204)

New South Asian Populations:

- Bengali (Bangladesh) (148)

Updates:

Previous DNA Tribes customers who would like to update their results to include these new populations and our most up to date algorithms can order using the "Update Your Analysis" option through our secure online checkout at: <http://dnatribes.com/order.html>.