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Introduction

Hello, and welcome to the February 2010 issue of DNA Tribes® Digest. This month’s feature article focuses on the Sahelian genetic region along the borderlands between the Sahara Desert and tropical forest zone of Africa. It was here that many diverse and influential African cultures have emerged, such as the Mali Empire of Mansa Musa, who awed Egypt and Arabia with the wealth of his caravan and established the famous University of Timbuktu.

Best regards and I hope to speak with you soon,
Lucas Martin
DNA Tribes

Shores of the Sahara: Genetic Contributions to the Sahelian Genetic Region

Background: The Sahelian genetic region encompasses the western portion of a long horizontal strip of territories between the Sahara Desert to the north and the more humid forested zone to the south (see **Figure 1**). These lands are traditionally divided into two horizontal zones: to the north, the drier **Sahel** (from an Arabic word for “shore,” evoking the Sahara Desert as a vast “sea” of sand); and to the south, the grassier **Sudanian savannah** (from the Arabic *Bilad as-Sudan*, meaning “Land of the Black Peoples”).

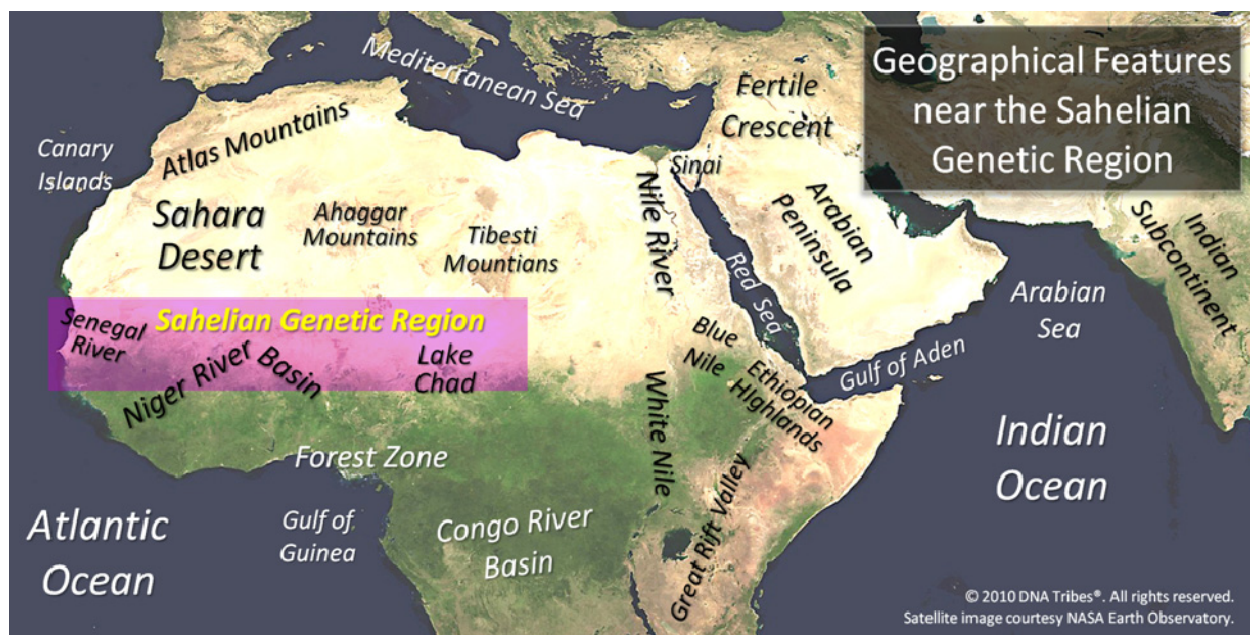


Figure 1: Map of geographical features near the Sahelian genetic region (highlighted in purple).

In past epochs, these African grasslands were much larger and covered areas of the Sahara that are now a formidable desert. For instance, one wetter and more fertile “Green Sahara” period was the Neolithic Subpluvial between 7,000 and 3,000 BC, when cultures living in a lush and more abundant Sahara decorated places such as the Ahaggar and Tibesti Mountains (see **Figure 1**) with artistic scenes of elephants and giraffe. Today, these lands have become much drier, and their inhabitants are supported by the **Senegal River** and **Niger River Basin** to the west and **Lake Chad** to the east. For instance, Lake Chad was once an inland sea known as Mega Chad, but today is reduced to a substantially smaller lake a fraction of its previous size.

Cultures living here have traditionally facilitated trade between the African forest zones to the south (an important source of gold) and the desert to the north (an important source of salt). Similarly, the Sahelian genetic region has functioned as a meeting point for a variety of African cultures from the north, south, east, and west (see **Figure 2**). These cultures can be described in terms of three large language families: **Niger-Congo** speaking cultures to the west and south; **Afro-Asiatic** speaking cultures

to the north and east; and **Nilo-Saharan** speaking cultures to the east. The interactions of these peoples, sometimes peaceful and sometimes warlike, have fueled the development of uniquely Sahelian cultures that have become famous in the course of several influential civilizations.

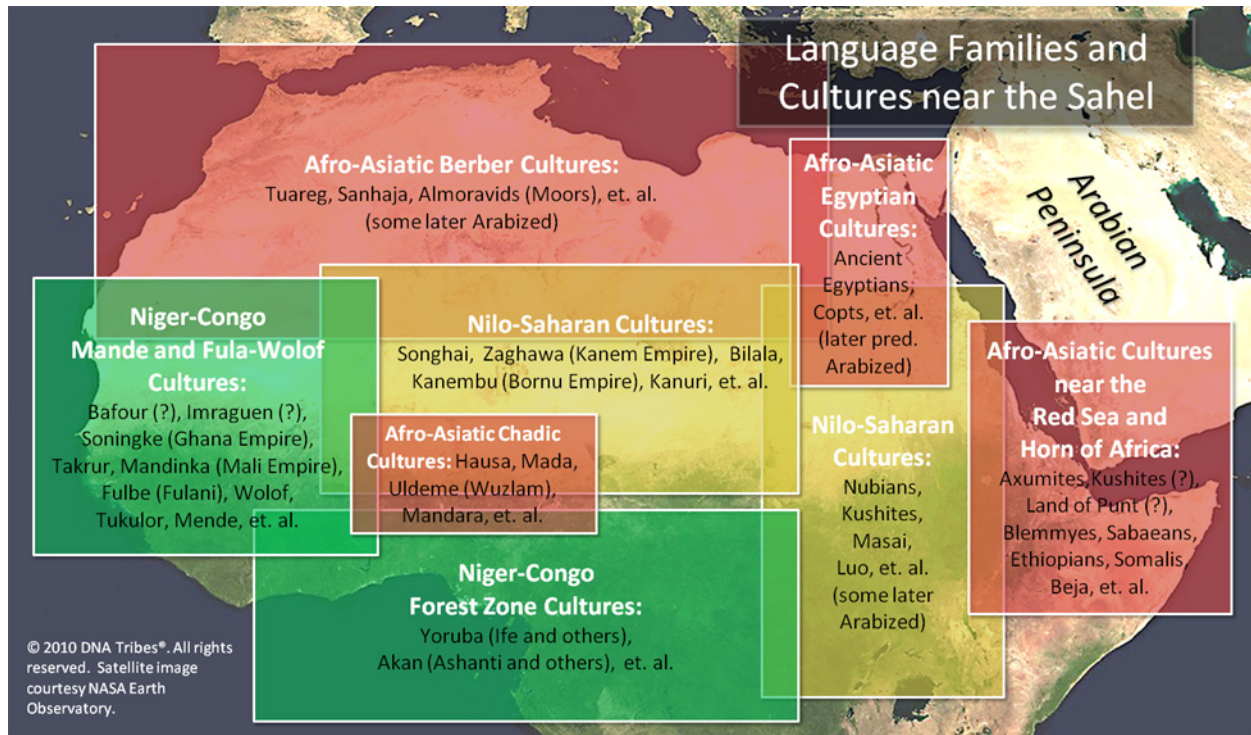


Figure 2: Map of language families and cultures near the Sahel.

Perhaps the oldest layer of indigenous cultures near the Sahelian genetic region is comprised of speakers of the **Niger-Congo** family of languages (highlighted in green in **Figure 2**), which is the largest group of languages spoken in Africa, and also includes the Bantu family of languages spoken in southern parts of Africa¹.

Mande and **Fula-Wolof** speaking cultures have lived in western lands near the Atlantic Ocean and Senegal River since time immemorial. These have included local agricultural and fishing peoples (such as the Bafours and Imraguen of Mauritania and Senegal), as well as cultures that expanded eastward into the Sahelian zones to build empires (such as the **Ghana Empire** and **Mali Empire**). Mande and Fula-Wolof cultures today are represented by peoples such as the Mende², Fulani, and Wolof. Other Niger-Congo speaking cultures have lived in the forest zone to the south, including **Yoruba** (famous for the expert craftsmanship of the lifelike Ife bronzes) and **Akan** peoples (such as the Ashanti).

Another family of languages spoken by many cultures near the Sahelian region is **Afro-Asiatic** (highlighted in red in **Figure 2**), a group that includes languages associated with early Fertile Crescent

¹ See “Genetic Relationships in Africa,” <http://dnatribes.com/dnatribes-digest-2009-02-28.pdf>.

² One famous Mende leader in recent history was Joseph Cinque, one of a group of Mende who won their freedom before the Supreme Court of the United States, after successfully taking control of the *Amistad* slave ship.

civilizations such as ancient Egyptian, Phoenician, Hebrew, and Aramaic³, as well as **Berber** (Tamazight) languages spoken in North Africa and **Ethiopian** and **Somali** languages spoken near the Horn of Africa. Berber cultures in particular have periodically interacted with Sahelian peoples, including the Tuareg (historically involved with Trans-Saharan trade) and the Almoravids (known in Europe as the Moors who ruled parts of Spain in the medieval period).

At times, other Afro-Asiatic cultures have penetrated deeper into the interior of Africa, including the enigmatic **Sao (So) Civilization** near Lake Chad. The pre-Islamic Sao people are thought to have come from a distant land (possibly in the Levant), and oral histories associated with the Sao distantly echo Biblical traditions from the Fertile Crescent, such as tales of Noah's Ark and Nimrod. Other Afro-Asiatic cultures that have taken root near the Sahelian region include **Chadic** speaking peoples such as the **Hausa**, whose language has become a *lingua franca* in West and Central Africa, as well as smaller peoples including the Mada, Uldeme (Wuzlam), and Mandara.

A third group of cultures present in the Sahelian region has been the **Nilo-Saharan** speaking peoples (highlighted in gold in **Figure 2**), related to easterly cultures near the African Great Lakes such as the ancient **Nubians** and **Kushites** as well as the **Masai** and **Luo** peoples of today. Nilo-Saharan peoples have established empires such as the **Songhai Empire** (the largest empire in Africa for a period) and the **Kanem-Bornu** states near Lake Chad.

Genetic analysis: Genetic contributions to the Sahelian genetic region were identified. Results are illustrated in **Figure 3** and summarized in **Table 1**.

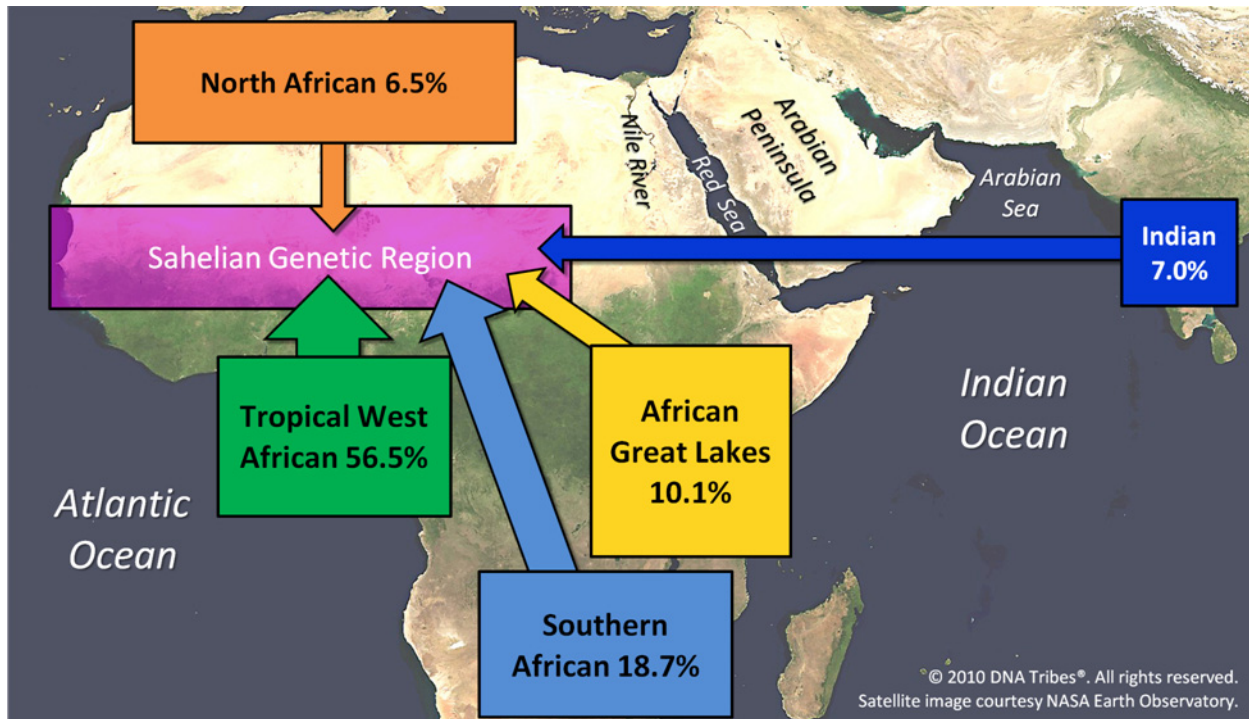


Figure 3: Map of genetic contributions to the Sahelian genetic region.

³ See "Basic Genetic Contributions in Southwest Asia," <http://dnatribes.com/dnatribes-digest-2010-01-29.pdf>.

Genetic Region	Contribution
Tropical West African	56.5%
Southern African	18.7%
African Great Lakes	10.1%
India	7.0%
North African	6.5%
Other	1.0%

Table 1: Genetic contributions to the Sahelian genetic region.

Discussion: Results in **Table 1** indicate genetic contributions to the Sahelian genetic region from several sources. The largest contributions were identified from the Tropical West African (56.5%) and Southern African (18.7%) regions, for a total of 75.2%. This might reflect contacts with westerly Mande and Fula-Wolof cultures as well as with southerly forest zone cultures such as Yoruba and Akan peoples. Similarly, genetic contributions from the African Great Lakes region (10.1%) might reflect contacts with Nilo-Saharan cultures such as the Songhai, Zaghawa, and Kanuri. These first three contributions indicate substantial continuity between the Sahelian genetic region and adjacent parts of Sub-Saharan Africa.

In addition, some smaller contributions from outside of Sub-Saharan Africa were also identified: first, a 7.0% contribution from India was identified. Although cultural contact between Sahelian populations and South Asian cultures is not attested in the historical record⁴, genetic data suggest the possibility of some (perhaps earlier) contact with South Asian populations. Less enigmatically, the North African (6.5%) contribution appears to reflect the ongoing contacts with Saharan Berber cultures (such as the Tuareg and Almoravids) that are abundantly attested in the historical record.

⁴ Some speculative linguists have in the past suggested possible similarities between Wolof and Dravidian vocabulary associated with early agricultural and pastoral practices. The suggestion of a cultural connection that is not attested in the historical record over this great a distance would be tenuous at best. However, small but substantial genetic contributions from India are observed in Fertile Crescent populations along a band that stretches between Anatolia and the Indus River Valley. These relationships might reflect early contacts among early Near Eastern and South Asian civilizations (discussed in “Basic Genetic Contributions in Southwest Asia” at <http://dnatribes.com/dnatribes-digest-2010-01-29.pdf>). This could suggest a speculative connection with India via early Neolithic cultures that spread from Fertile Crescent, perhaps reaching as far as the African Sahelian region.



Announcements for February 2010

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

New African Populations:

- Berber (Azrou, Morocco) (201)
- Khoisan (Republic of South Africa) (108)

New European and European Diaspora Populations:

- Hungary (4,213)
- Pomeranian (Espirito Santo, Brazil) (82)
- South Portugal (2,723)

Enhanced Scoring: Our scoring algorithms have been updated to reflect our expanded global population database, now representing over 1,000 reference samples from around the world. This scoring update will allow for higher MLI scores, particularly for populations and regions in more geographically isolated parts of the Americas and northern and eastern Eurasia. In some cases, this will provide greater informativeness of personal DNA matches due to enhanced stratification of individual MLI scores and greater power of exclusion of TribeScore percentile information.

For more information, our Global Survey⁵ and Sample Result documents⁶ have been updated to incorporate our enhanced scoring system.

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>.

⁵ Available at <http://dnatribes.com/sample-results/dnatribes-global-survey-regional-affinities.pdf>

⁶ Available at <http://dnatribes.com/sampleresults.html>