



DNA Tribes® Digest December 1, 2011
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Introduction

Hello, and welcome to the December 2011 issue of DNA Tribes® Digest. This month's feature article explores genetic relationships of Armenian populations of the Transcaucasus. This will include two separate analyses (autosomal STR and autosomal SNP), each providing an independent source of information about genetic links in this part of the world.

The historical background section of the article will highlight patterns of contact between the Armenian Highland and early civilizations of the Fertile Crescent, including Hurrian migrations that helped shape the cultural landscape of the ancient Near East.

We are also pleased to offer special Holiday Sale pricing for STR and SNP tests:

Group Discount for STR Tests: Orders including three (3) or more 15, 21 or 27 Marker Kit STR tests are eligible for special Holiday pricing at <http://dnatribes.com/order.html>.

SNP Analysis Discount: DNA Tribes® SNP analysis is available for the reduced price of \$39.99 with submitted grandparent information (genome file required) at <http://dnatribes.com/snp.html>.

Have a safe and happy Holiday Season,
Lucas Martin
DNA Tribes

Armenian Populations of the Transcaucasus

Historical Background

The Armenian Highland is a dry, high altitude plateau at the crossroads of the Near East, Europe and Central Asia (see **Figure 1**). This is highest of three neighboring plateaus in Southwest Asia: the Anatolian Plateau, Armenian Highland and Iranian Plateau.



Figure 1: Map of the Armenian Highland (highlighted) and surrounding landmarks.

The local climate is relatively harsh, with hot summers and cold winters. Due to scanty rainfall, agriculture here has depended on irrigation. These factors are sometimes said to have given a hardy quality to the farming cultures that have persisted in the Armenian Highland over several millennia despite periodic invasions and hardship.

Today, this area (also known as the Transcaucasus) is home to several cultures, including the Armenians as well as several other ethnic groups. This linguistic diversity is the product of millennia of contacts (see **Figure 2**); nevertheless, the highland Armenian culture retains distinctive characteristics that can be traced to the early indigenous societies of the Transcaucasus.

During the late 4th millennium BCE, a uniform Copper and Early Bronze Age material culture emerged here, known as the Kura-Araxes culture. Stimulated by nearby sources of metal and trade links with Mesopotamia¹ and cultures near the Black Sea, the Kura-Araxes culture developed high levels of craftsmanship that left traces in a large zone extending into the Levantine (East Mediterranean) coast, Eurasian Steppe, and Anatolia. Although the language(s) spoken during this period are unknown, some

¹ Sumerian literature from the 21st century BCE refers to a land of “Aratta” that has sometimes been identified with the Transcaucasus (in part due to resemblance to the name *Urartu*). However, Sumerian descriptions of Aratta as an exporter of lapis lazuli suggest instead a location closer to Badakhshan, where the Harappan civilization (whose name is lost to history) established the trading colony of Shortugai around 2000 BCE.

authors have suggested the possibility of an ancestral Hurrian related language for this early Trans-Caucasian culture.²

However, this large area of cultural uniformity was broken up after 2000 BCE, as several more localized cultures emerged. Partly on theoretical grounds, linguists have proposed migrations of Indo-European speaking cultures during this period.³ Nevertheless and despite any such invasions, Trans-Caucasian cultures continued local metallurgy traditions and trade links with the Fertile Crescent and Pontic-Caspian Steppe.

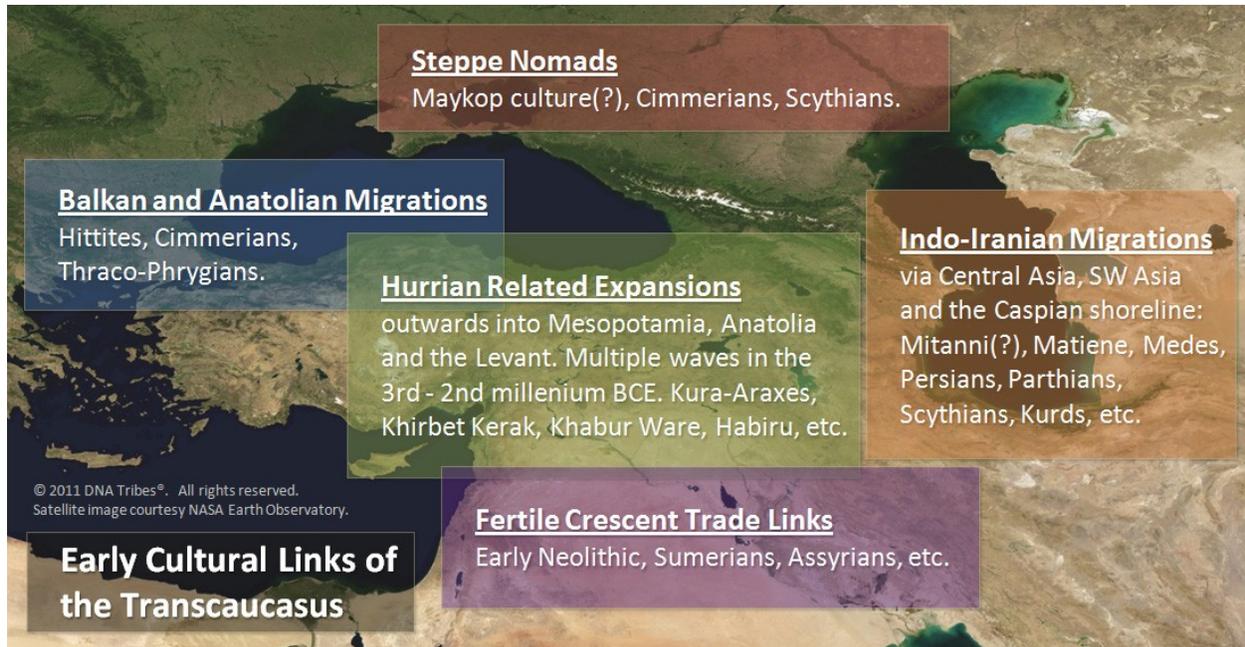


Figure 2: Early cultural links of the Transcaucasus.

During the Bronze Age, multiple waves of Hurrian migrants (probably from the Transcaucasus) appeared throughout the Fertile Crescent. Some of these newcomers integrated into the older city-states of Southwest Asia; others founded new Hurrian speaking states (such as Mitanni⁴).

For instance, the city of Ugarit maintained trade links with Egypt, Cyprus and the Mycenaean Aegean. Cuneiform tablets found here include writings in Hurrian, as well as Sumerian, Akkadian and local Ugaritic (an early relative of the Phoenician, Hebrew and Aramaic languages). One Hurrian tablet found in Ugarit contains one of the world's oldest pieces of written music, a hymn composed for voice and a lyre or harp like instrument dated to c. 1400 BCE.

² See *The Peoples of the Hills: Ancient Ararat and Caucasus* by C. Burney and D. M. Lang, p. 44.

³ *Ibid.*, p. 47. Sometime between 2500-1900 BCE, the Ghaggar-Hakra river system (possibly the Vedic Sarasvati) of South Asia was disrupted. Towards the end of this period (referred to as the “Middle Bronze Age migrations”), new Indo-European speaking cultures appeared in Southwest Asia. These included speakers of Nešili, just one of several languages of Hittite Anatolia. Similarly, Egyptian records list a few Indic or Sanskrit-like “Mitannian” names (Šuwardata, etc.) among the Semitic and Hurrian names of local client rulers in Bronze Age Canaan.

⁴ For a Mitannian style seal found in the ancient city of Akko (Acre) including a seven branched “Tree of Life” or sacred tree symbol, see Amihai Mazar, *Archaeology of the Land of the Bible* (vol. 1), p. 268.

Hurrian names are also associated with the wandering groups of Bronze Age *Habiru* (nomads) that had kinship links with ruling families of the nearby Fertile Crescent cities (such as Idrimi of Alalakh). In addition, Hurrians have been suggested as one of several elements involved in the Hyksos cultures of Bronze Age Canaan and Egypt.⁵

In the subsequent Iron Age, a new Kingdom of Urartu emerged in the Armenian Highland. Urartu's origins are obscure due to a gap in the archaeological record lasting several centuries.⁶ However, the Urartian (Chaldean) language was related to Hurrian languages of the Bronze Age.

Joining with Urartu were Nairi confederations from nearby Lake Van. Although Nairi origins (possibly Hurrian) are also obscure, their name recalls old place names of the Bronze Age Levant, such as *Naharin* (an Egyptian name for Mitanni) and *Aram-Naharaim* (where traditionally the Hebrew patriarch Abraham stayed during the journey from *Ur Kasdim*).⁷

However, the formerly Hurrian and Urartian linguistic landscape of the Transcaucasus was transformed by waves of migrations during the Iron Age: the first of these involved Cimmerian and Scythian nomads from the Pontic-Caspian Steppe. According to Greek accounts, the Cimmerians had been displaced from their former territories by incoming Scythians (*Skolotoi* or *Saka*) from Central Asia, led by the "Royal Scythians" (Paralatai). These steppe migrations helped spread Urartian influenced "animal style" art throughout Iron Age Europe.

Later in the Iron Age, another wave of migrations came to the Armenian Highland: Phrygian invaders linked to Thracian Treres that had entered Anatolia from the Balkan Peninsula. These "Thraco-Phrygian" cultures are traditionally attributed as the ancestors of the modern Armenians.

However, archaeological evidence does not support such a simple model of cultural replacement in this late period: for instance, Armenian cultures did not construct tumuli ("kurgans"), unlike Phrygians or contemporary steppe populations. One possibility is that early Armenian cultures had local roots in highland cultures linked to ancient Hurrian, Hattian and Urartian peoples of the Transcaucasus, but were linguistically influenced by Thraco-Phrygian invaders.⁸

The Armenian languages (Eastern and Western Armenian) spoken today are part of the larger family of Indo-European languages spoken in many parts of Europe and Asia. Within this family, Armenian shares characteristics with Greek and the ancient Anatolian languages. In addition, Armenian also retains linguistic traces of Hurro-Urartian, Iranian (Arsacid Pahlavi or Parthian) and Turkic contacts from the Armenian Highland's long history of trade and migrations.

⁵ [The Peoples of the Hills: Ancient Ararat and Caucasus](#) by C. Burney and D. M. Lang, p. 51. Perhaps coming full circle after Bronze Age migrations in the Near East, the Yusufzai ("Sons of Joseph") tribe of Afghanistan maintains a tradition of descent from ancient Hebrews who had been living in Egypt. Another Pashtun tradition recorded in the *Mutla-ul-Anwar* describes descent from groups that were in conflict with Moses during the Exodus and fled to the Sulaiman Mountains. Although these highland tribal areas are largely unexcavated by archaeologists, early Vedic literature described them as non-Brahmanical "Mleccha" cultures.

In later antiquity, this area was reached by Alexander the Great. Sometimes overlooked is that the armies of Alexander's eastern campaigns included large numbers of recruits from the defeated Persian Empire: that is, from populations of Highland Southwest Asia and the Fertile Crescent. Today, the Pashtun speak a language related to Sogdian, Ossetian, and the ancient Scytho-Sarmatian languages of Central Asia.

⁶ *Ibid.*, p. 127.

⁷ During the Iron Age, the term *Eber-Nari* or *Abar-Nahara* ("Beyond the River") was used to describe the northern Levant, similar to usage of the Bronze Age geographical term *Mar.tu*.

⁸ *Ibid.* pp. 178-179. For instance, the Armenian ethnonym *Hayer* has been linked to the ancient Hittite term Hayasa.

Similarly, early Armenian folklore traces origins from the figure of Togarmah, the common ancestor of the Phrygians, Georgians and other peoples of the South Caucasus.⁹ Togarmah was said to be a son of Gomer (representing the Cimmerians) who lived for a time in Mesopotamia (Babylon) and traded horses in the Levant (Tyre). His son Hayk emigrated from Babylon to Armenia and fought for independence from the king Belus (representing Assyria).

Taken generally, these Armenian legends are consistent with archaeological evidence of ancient links with the Pontic-Caspian Steppe (Maykop), early Trans-Caucasian links with neighboring cultures (Kura-Araxes), expansions into the Fertile Crescent (Hurrians and Nairi), and finally the establishment of an independent Armenian culture in the Transcaucasus.¹⁰

Summary of Cultures and Languages in the Transcaucasus:

- 6000 – 4000 BCE: Neolithic Shulaveri-Shomu culture, probably related to Fertile Crescent farmers. Language(s) unknown.
- 4000 – 2500 BCE: *Maykop Culture in North Caucasus. Language(s) unknown; possibly included an intrusive Indo-European language along with indigenous language(s).*
- 3700 – 2000 BCE: Kura-Araxes Culture. Language(s) unknown; possibly Hurrian.
- 2250 or earlier – 1300 BCE: Hurrian expansions into the Fertile Crescent.
- 1300 – 1100 BCE: Nairi confederation. Possibly Hurrian speaking.
- 860 – 590 BCE: Kingdom of Urartu. Urartian (Hurro-Urartian) speaking.
- 700 – 585 BCE: *Phrygian kingdoms in Anatolia. Indo-European speaking.*
- 331 BCE – 428 CE: Kingdom of Armenia. Armenian (Indo-European) speaking.

⁹ Togarmah was also claimed as an ancestor of Turkic cultures during the medieval period.

¹⁰ These legends suggest the possibility that Iron Age Thraco-Phrygians were back-migrants returning from the Balkans to their ancestral territories in highland Southwest Asia. These legends also suggest ancient interactions between the Transcaucasus and Europe via the East Mediterranean. For instance, the Armenian Hayk is described as the grandfather of Kadmos (the Phoenician founder of the Greek city of Thebes). Greek legends further described Phoenician origins of some Thracian kings, such as Phineas son of Agenor, who established a kingdom on the shores of the Black Sea.

Genetic Analysis of Armenians (STR)

Genetic contributions to the Armenian populations were identified based on autosomal STR data. Results are summarized in **Table 1** and illustrated in **Figure 3**.

World Region	Estimated Contribution
Mesopotamian	74.8%
Aegean	20.1%
Other	5.1%

Table 1: Genetic contributions to Armenians (STR).

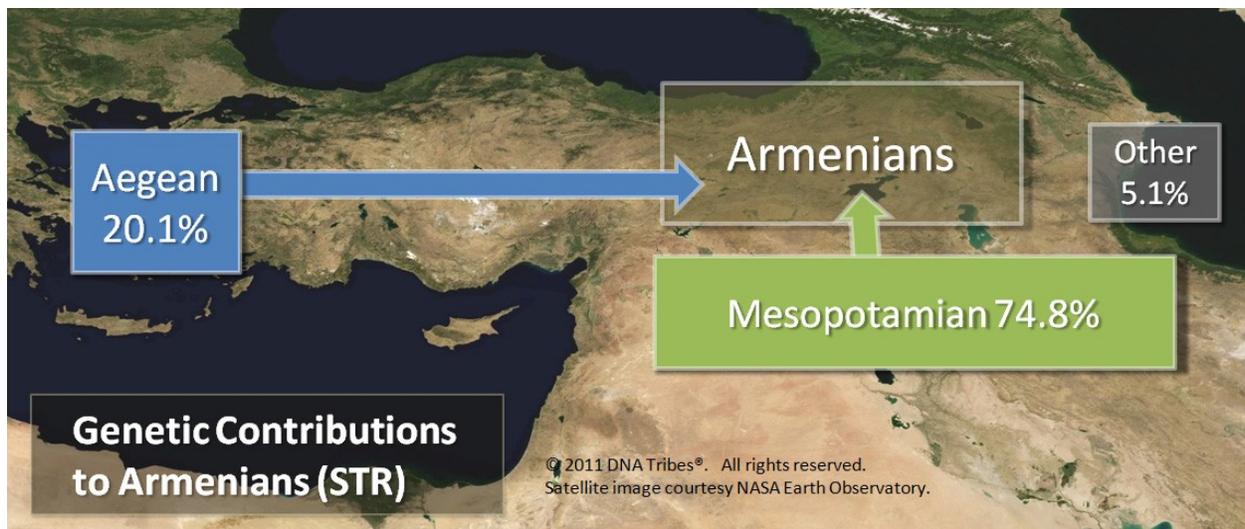


Figure 3: Genetic contributions to Armenian populations based on autosomal STR data. For more about the world regions in DNA Tribes® STR based 15, 21 and 27 Marker Kit tests, see <http://dnatribes.com/populations.html>.

Discussion: Results in **Table 1** indicate genetic links with two world regions: the Mesopotamian region (74.8%); and Aegean (20.1%). The Mesopotamian contribution (74.8%) suggests predominantly autochthonous (local) origins for Armenian populations. This might reflect local roots in Southwest Asia dating (at least) to the period of the Hurrian and Urartian speaking cultures of the Bronze Age and Iron Age. This might also express ongoing links with neighboring cultures, including historically attested Sumerian, Assyrian and Persian contacts.

The Aegean contribution (20.1%) suggests links with populations of Western Anatolia and the Aegean Sea, perhaps dating at least to the Hittite period. Anatolian contacts have included both westward and eastward migrations: westward of Hurrians and other Transcaucasus populations into Anatolia; and eastward of Hittites and other Anatolian populations into the Transcaucasus. Genetic links with Anatolia might have included (to some degree) migrations from the Phrygian kingdoms, thought to have played a role in shaping the Armenian language.

Genetic Analysis of Armenians (SNP)

Regional admixture components in Armenians and neighboring populations were identified based on autosomal SNP data. Results are summarized in **Table 2** and illustrated in **Figure 4**.

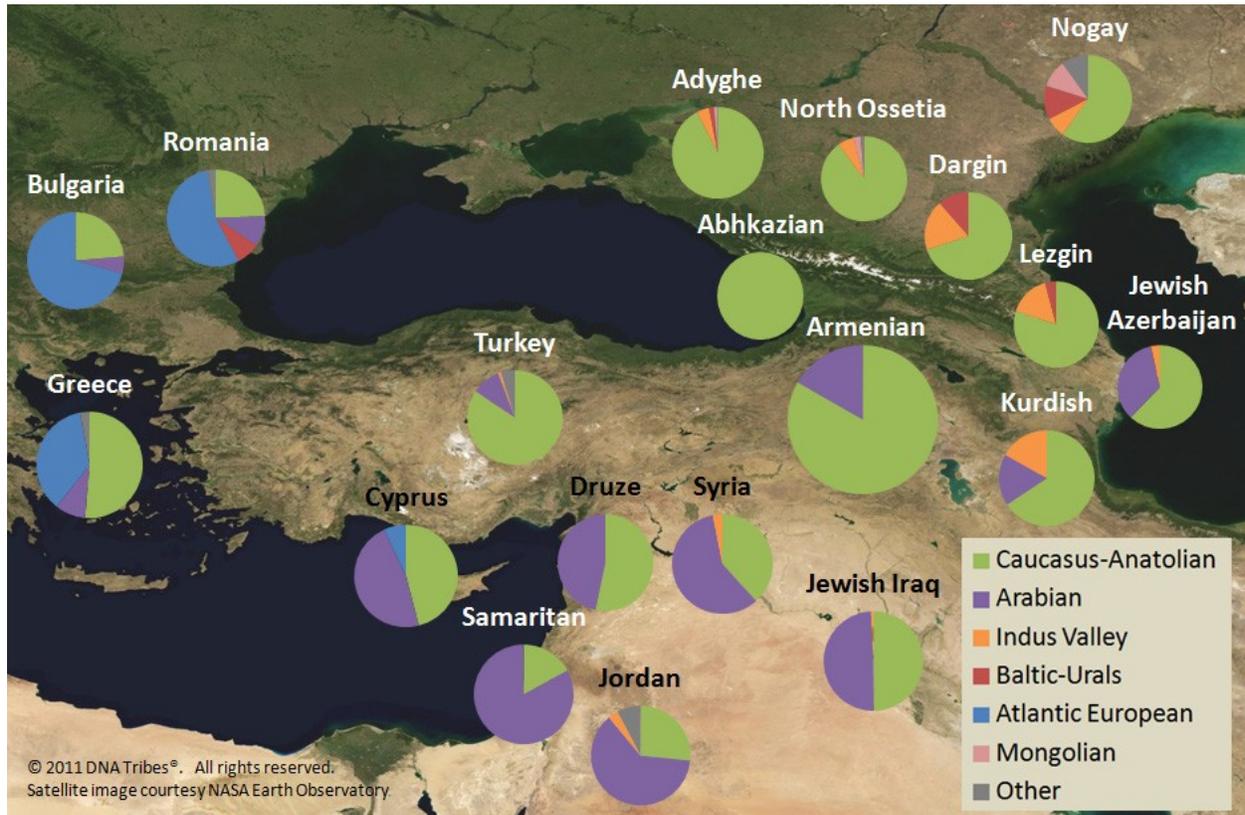


Figure 4: Regional admixture in Armenians and neighboring populations based on autosomal SNP data. For more information about *DNA Tribes*® SNP analysis, see <http://www.dnatribes.com/snp.html>.

Discussion: Results in **Table 2** indicate two sources of regional admixture in Armenian populations based on SNP data: Caucasus-Anatolian (83.3%) and Arabian (16.7%).

The first, Caucasus-Anatolian regional component of Armenian populations (83.3%) is similar to the predominant local Mesopotamian regional link identified based on STR data (see previous section of article) and is consistent with autochthonous Armenian origins in Highland Southwest Asia.

The Caucasus-Anatolian component is shared with surrounding populations of the Caucasus Mountains (such as Abkhazians), Anatolia (such as Turkey) and near the Iranian Plateau (such as Kurds). In addition, Caucasus-Anatolian admixture is found in populations of the Levantine coast (such as Druze, Samaritans and Jordanians) and as distant as Cyprus, Greece and Romania.

The second, Arabian regional component of Armenian populations (16.7%) is consistent with the long history of contacts between the Armenian Highland and Fertile Crescent, including Bronze Age Hurrian migrations between the Levant and Transcaucasus.

However, Armenians are distinguished from Dargins and Lezgins (whose Northeast Caucasian languages are possibly related to ancient Hurro-Urartian) by the absence of Indus Valley and Baltic-Urals components. This suggests genetic differences between these Northeast Caucasians and the ancestors of Armenians (including any ancestral Hurro-Urartian speaking populations).

In addition, the absence of substantial Atlantic European admixture distinguishes Armenians from Greek, Romanian and Bulgarian populations of the Balkan Peninsula. This suggests that direct gene flow from Europe is not greater in Armenians than in neighboring populations. However, this is not necessarily inconsistent with possible Armenian ancestry from Phrygian kingdoms (whose Phrygian language might have been adopted by indigenous Anatolian populations that later moved into the Transcaucasus).

Population	Caucasus-Anatolian	Arabian	Indus Valley	Baltic-Urals	Atlantic European	Mongolian	Other
Abkhazian	100.0%	-	-	-	-	-	-
Adyghe North Caucasus	92.5%	-	4.4%	1.7%	-	1.1%	0.3%
Armenian	83.3%	16.7%	-	-	-	-	-
Bulgaria	23.6%	5.7%	-	-	70.7%	-	-
Dargin Urkarah Dagestan	70.0%	-	18.6%	11.4%	-	-	0.1%
Druze Israel-Carmel	53.3%	46.7%	-	-	-	-	-
Greece	51.4%	9.2%	-	-	36.5%	-	2.9%
Jewish Azerbaijan	62.2%	34.3%	3.5%	-	-	-	-
Jordan	26.6%	62.4%	3.3%	-	-	-	7.7%
Kurdish	65.7%	17.5%	16.9%	-	-	-	-
Lezgin	80.2%	-	15.6%	4.2%	-	-	-
Nogay	59.9%	-	7.6%	12.3%	0.1%	10.1%	9.9%
North Ossetia	89.8%	-	6.1%	-	-	2.7%	1.4%
Romania	24.3%	10.1%	-	7.8%	54.9%	0.1%	2.7%
Samaritan	17.1%	82.9%	-	-	-	-	-
Turkey	84.4%	9.8%	0.7%	-	-	0.5%	4.7%
Jewish Iraq	49.8%	49.4%	0.8%	-	-	-	-
Cyprus	46.0%	47.0%	-	-	7.1%	-	-
Syria	38.2%	58.7%	3.1%	-	-	-	-

Table 2: Regional admixture in Armenians and neighboring populations based on autosomal SNP data.

Conclusion

Results from both autosomal STR and autosomal SNP analysis indicated genetic continuity between Armenians and neighboring populations. This is consistent with ancient Armenian origins in Highland Southwest Asia.

In addition, SNP analysis indicated that Armenian populations share a Caucasus-Anatolian genetic component with populations of the Levantine (East Mediterranean) coast. This might reflect links between the Transcaucasus and Fertile Crescent including Bronze Age Hurrian expansions.



New STR Populations for December 2011

DNA Tribes is pleased to announce the addition of several new populations to our STR analysis:

East Asian:

- Bai (China) (125)

European:

- Haban (Western Slovakia) (110)
- Northern Portugal (213)
- Slovakia (201)
- Spain (284)

Native American:

- Terena (Mato Grosso do Sul, Brazil) (117)

Near Eastern:

- Armenian (Ararat Valley, Armenia) (105)
- Armenian (Gardman, Azerbaijan) (95)
- Armenian (Lake Van, Armenia) (101)
- Armenian (Sason, Eastern Turkey) (103)
- Libya (99)

Latin American:

- Brazil (137,161)
- Macapa, Brazil (307)
- Mestizo (Calchaqui, Argentina) (110)
- Mestizo (Chile) (732)
- Mestizo (Nayarit, Mexico) (231)

Updates: STR Updates to incorporate these new populations are available for order through our secure checkout system at http://dnatribes.com/order_addons.html.

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