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Where did the first people in the Caribbean come from?

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Abstract

The first modern humans (*Homo sapiens*) evolved in Africa around 200,000 years ago and then migrated (moved) to almost every corner of the globe! Archaeological artifacts tell us that around 6,000 years ago, people moved into the Caribbean for the first time. We wanted to use ancient DNA to find out where these people had come from. To find this answer, we needed both archaeology and DNA.

We learned that the first settlers of the Caribbean came from Central or South America. They used stone tools and probably gathered wild plants and hunted animals. Another group of people moved into the Caribbean thousands of years later from South America and brought clay pots and farming. Ancient DNA can help us tell the story of people who lived thousands of years ago. And it can help us understand how they are connected to people living today!

Introduction

Have you ever thought about where you came from? Not where you were born, but where your great-grandmother and her great-grandmother came from. This is your *ancestry*. You have a record of your ancestry with you at all times – in your DNA!

Over tens of thousands of years, humans migrated across the globe. As time went on, groups of people became more different from one another. This is because our DNA (the unique code of instructions that makes each of us our own person) naturally *mutates*. (Figure 1).

Scientists can look at the mutations across our *genome* (all our DNA together) and use it to find out about our ancestors. We can then group people together in "populations" based on their shared ancestry. People tend to marry within their communities, so they share more similar DNA with the people who live closer than those who live far away. This means "populations" are often related to geography! This information allows scientists to create maps showing how and when different groups of people migrated across the globe. This is a field of study called *population genetics*.

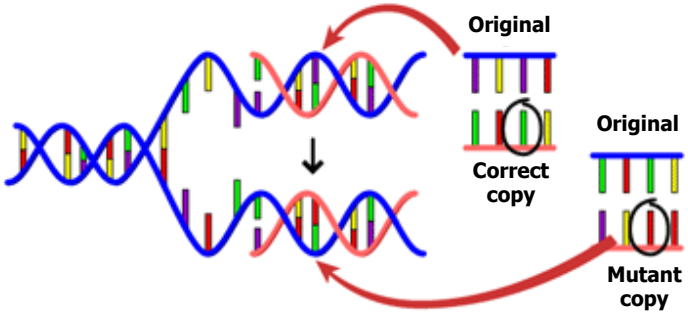

Figure 1: DNA is the material that carries all the information about how a living thing will look and function.

Source: evolution.berkley.edu

Population geneticists aren't the only ones who study human migration. *Archaeologists* use clues buried in the soil to do the same. Different groups of people had different technologies (like stone tools and clay pots) and different styles (like designs on pots).

We decided to use archaeology and ancient DNA to learn about the people who lived in the Caribbean. Where did they migrate from? How were they related to each other?

Methods

1. We looked at DNA from the skeletons of 263 ancient people from across the Caribbean. We took powder from the tiny ear bones and the teeth. Using advanced techniques in the lab, we extracted (removed) pieces of DNA in the powder. These were still there after thousands of years!
2. We then sequenced the DNA. Sequencing is like reading: it's how we know what the code in the DNA says. Using this information, we grouped people together based on their similarities.
3. We used another technique called *radiocarbon dating* to see exactly how old the skeletons were. This works by measuring the amount of *carbon* in the skeleton – the less there is, the further back in time the person lived! This is because one type of carbon disappears over time.

The locations of the skeletons also mattered. Some were from ***Ceramic Age*** archaeological sites where archeologists found lots of pottery (Figure 2a). Others were from ***Archaic Age*** sites where archaeologists found mostly stone tools (Figure 2b), like spear points and grinding stones.

Figure 2a:
Clay was formed and fired into shapes to make pottery. Here you can see pottery bottles, cooking, serving and storage bowls. Most Caribbean pots have carved designs along with animal and human faces as decorations.

Figure 2b:
During the Archaic Age, flint was flaked to make sharp cutting blades. Coarse stone was used to grind and pound seeds, chop wood, and as fishing net weights. These tools were used for woodworking (making canoes and houses).

Photo: William F. Keegan, Caribbean collections, Florida Museum of Natural History.

Results

Using ancient DNA and archaeological remains, we learned more about the story of ancient Caribbean people.

- Around 6,000 years ago, the first people to inhabit the Caribbean arrived in Cuba, Haiti, and the Dominican Republic by boat. They used stone tools and gathered or hunted for their food. We call them **Archaic Age** people.

Based on archaeology, we thought these people **probably** came from Central America. When we studied their DNA, we realized they were **definitely** from Central or South America, but we didn't have enough data to tell us which!

- About 2,500 to 3,000 years ago, a second group of people migrated to the Caribbean. This group was potters and farmers. We call them **Ceramic Age** people. They were related to the *Arawak*-speaking people from northeast South America.
- There weren't many people living in the Caribbean before colonization. Christopher Columbus thought the population was 1 million – but it was actually less than 100,000 people.
- Nowadays, many Caribbean communities have some ancestry that is directly from Ceramic Age people, showing a connection lasting thousands of years.

Where did the first Caribbean inhabitants land?

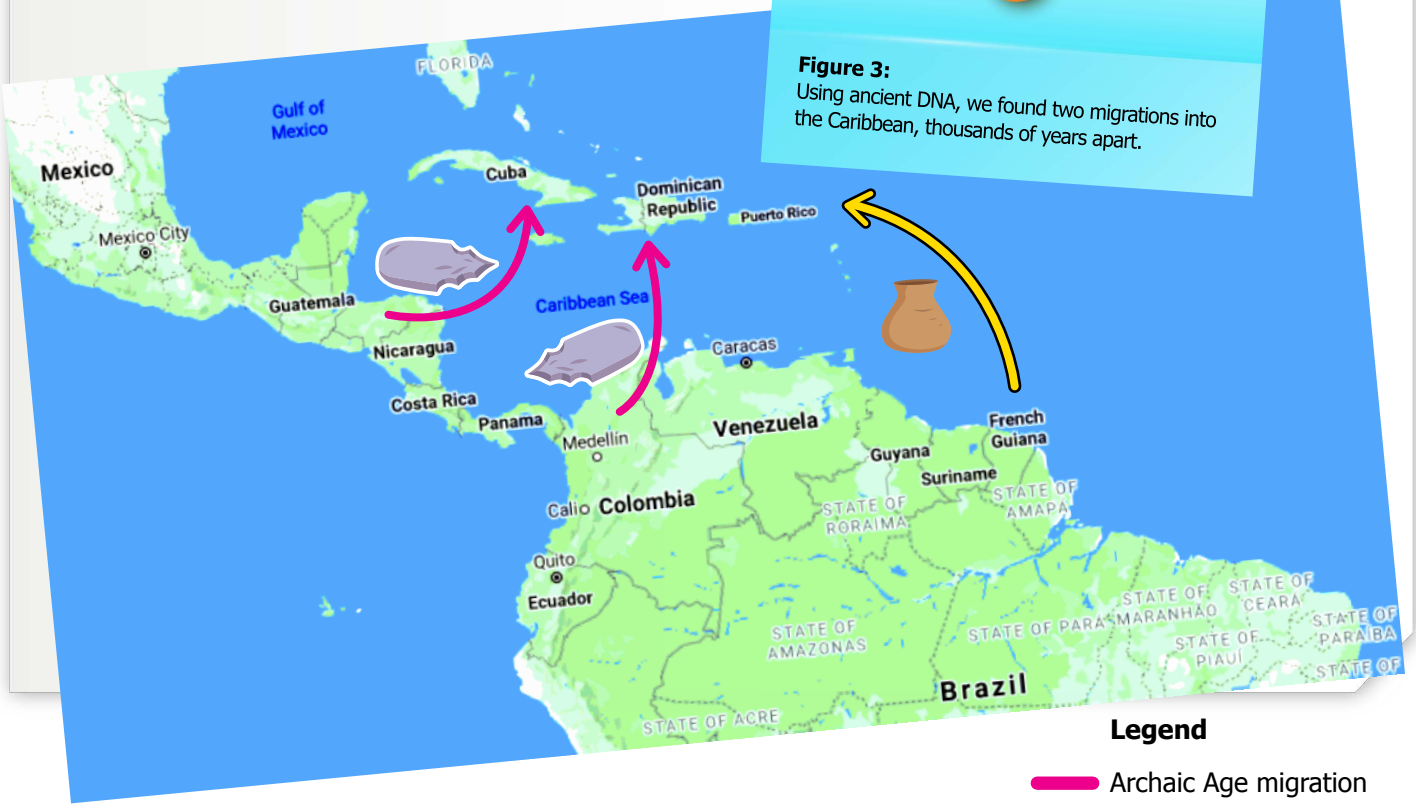

Figure 3:
Using ancient DNA, we found two migrations into the Caribbean, thousands of years apart.

Legend

Archaic Age migration

Ceramic Age migration

Discussion

Our study was the largest study of ancient human DNA in the Americas – ever! We looked at ancient DNA to better understand where people came from and how they related to each other, used radiocarbon dating to determine when they arrived, and relied on archaeology to figure out what tools different people used. We also developed a new technique using DNA to answer age-old questions about the size of the population in the Caribbean hundreds or thousands of years ago.

What about archaeological remains? We found out that people who used stone tools had very different DNA than people who used pottery. But we also knew that Caribbean pottery styles changed over time. Archaeologists used to think this was because new groups of people migrated into the Caribbean, each with their own unique style. But DNA told us all the styles were from the original Ceramic Age people and their relatives. Pottery styles changed, but the genomes of the people stayed the same!

Conclusion

We used ancient DNA, radiocarbon dating, and archaeological remains to tell the story of the original Caribbean people. You probably don't have access to these fancy technologies, but you can still trace your own ancestry!

Why not build a family tree? Start by taking a piece of paper and lay it horizontally. Write your name in the middle, along the bottom. Next, write your mother and father's names on "branches" above yours. Then do the same for their parents (your grandparents), and so on. How far can you climb up the tree?

Glossary of Key Terms

Ancestry – Your (or someone else's) family background. If you're tracing your ancestry, you're looking back on relatives from long ago.

Arawak – A group of Indigenous people from South America who migrated into the Caribbean. Arawak is also their language.

Archaeologist – A person who studies human history by exploring sites looking for remains. They study human skeletons and objects like pottery or stone tools to give them clues about the past.

Archaic Age – The time when most tools in the Caribbean were made from stone (it began about 6,000 years ago). Archaic just means they are the most ancient.

Carbon – A very important chemical element. Carbon is the framework for all tissues of plants and animals on the planet.

Ceramic Age – The time when agriculture and pottery making was common in the Caribbean (it began about 2,300 - 2,500 years ago).

Genome – All the DNA of an organism, like the DNA you get from your mother and father.

Indigenous– The first people who lived in a region.

Mutation – A change in DNA. Mutations are completely normal. In fact, without them, we'd all be the same!

Population Genetics – The study of groups of people and how they are related.

Radiocarbon dating – A method used to find the age of an object that contains organic material (like a skeleton).

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Check your understanding

1. Based on ancient DNA, how many people do we now think lived in the Caribbean before colonization?

2. Where did the first and second groups of people migrating to the Caribbean come from?

3. Radiocarbon dating can tell us how old a skeleton is. But why would this technique not work for pottery?

4. The fact that our DNA mutates over generations is really important. Why do you think mutations are so important?

5. When did ancient DNA and archaeology show the same findings, and when did they find something slightly different?

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