How natural poison drove evolution of South American community

The Atacama Desert straddles the Andes Mountains, reaching into parts of Chile, Peru, Bolivia and Argentina. Little rain falls on the desert — some spots haven't received a single drop in recorded history.

But the people who arrived at the Atacama managed to turn it into a home. Some Atacameños, as they are known today, fished the Pacific. Others hunted game and herded livestock in the highlands. They mummified their dead, decorating them with ceremonial wigs before leaving them in the mountains.

Those mummies reveal a hidden threat in the Atacama. When scientists analyzed the hair in 7,000-year-old mummy wigs, they discovered high levels of arsenic. Through their lives, the Atacameños were gradually poisoned.

Arsenic can poison people today through exposure to pesticides and pollution. But arsenic is also naturally present in the water and soil in some parts of the world. The Atacama Desert, sitting on top of arsenic-rich volcanic rock, is one of them. The concentration of arsenic in Atacama drinking water can be 20 times higher than the level considered safe for human consumption.

Now a team of scientists has discovered that the arsenic of the Atacama Desert didn't just make people sick. It also spurred their evolution.

In a new study in the journal Molecular Biology and Evolution, researchers report that over the years the Atacameños became more resistant to arsenic, thanks to natural selection. It is the first documented case of natural selection in humans for a defense against an environmental poison.

The liver defends the body against arsenic by tacking on extra carbon and hydrogen atoms to the element. Those extra atoms make arsenic less toxic and easier to draw out of the bloodstream in the kidneys, so that it can be flushed out of the body with urine.

In the late 1990s, researchers discovered that most Atacameños detoxify arsenic at an unusually high rate. Recently a group of researchers in Sweden went searching for the genes that make the Atacameños so unusual.

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