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# Scientists date the origin of the cacao tree to 10 million years ago

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**IMAGE:** THIS IS A PICTURE OF THE CO-AUTHOR SANTIAGO MADRIÑÁN ON FIELD WORK IN COLOMBIA. [view more >](#)

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Chocolate, produced from seeds of the cacao tree *Theobroma cacao*, is one of the most popular flavors in the world, with sales around 100\$ billion dollars per year. Yet, as worldwide demand increases, there are fears the industry will fail to cope with growing public hunger for the product. The main problem, common

to many crops, is the lack of genetic variation in cultivated cacao, which makes it vulnerable to pests and blights. Lack of genetic variation also puts cacao trees at risk from climate change, jeopardizing the long-term sustainability of the industry.

Now, however, new research suggests the cacao tree is much older than previously realised -- and may have close relations capable of sustaining our sweet-toothed appetites.

"Studies of the evolutionary history of economically important groups are vital to develop agricultural industries, and demonstrate the importance of conserving biodiversity to contribute towards sustainable development. Here we show for the first time that the source of chocolate, *Theobroma cacao*, is remarkably old for an Amazonian plant species," says Dr James Richardson, a tropical botanist at the Royal Botanic Garden Edinburgh, UK, and lead author of the study.

Together with researchers from the University of Rosario and the University of the Andes in Colombia, the University of Miami, USA, and the United States Department of Agriculture (USDA), Richardson found that *Theobroma cacao* is one of the oldest species in the genus *Theobroma*, having evolved around 10 million years ago. At the time, the Andes were not yet fully elevated, which explains why cacao trees today occur on both sides of the Andes.

The species' early evolutionary origin is good news: it suggests that cacao has had enough time to diversify genetically, with each wild population adapting to its local habitat. Wild populations of cacao across the Americas may therefore be treasure troves of genetic variation, which could be bred into cultivated strains to make the latter more resistant to disease and climate change, and perhaps even create new flavors of chocolate.

"After ten million years of evolution we should not be surprised to see a large amount of variation within the species, some of which might exhibit novel flavours or forms that are resistant to diseases. These varieties may contribute towards improving a developing chocolate industry," says James Richardson.

The researchers already plan to return to South America to sample all species related to cacao and investigate the characteristics of their native populations.

"We hope to highlight the importance of conserving biodiversity so that it can be used to augment and safeguard the agricultural sector. By understanding the diversification processes of chocolate and its relatives we can contribute to the development of the industry and demonstrate that this truly is the Age of Chocolate," says coauthor Dr Santiago Madriñán of the University of the Andes in Bogotá, Colombia.

The study is published in the open-access journal *Frontiers in Ecology and Evolution*.

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