

The Best Fruit You've Never Eaten

by Cynthia Graber

The cherimoya, sometimes called a custard apple, has a rather unassuming appearance. Some fruits grow in the shape of a bulbous heart, with a pale green skin. They're often covered in large scales like the back of an armadillo. When ripe, the fruit has a slight give without being mushy, like a ripe avocado.



Have you tasted the ice-cream fruit?

But opening a cherimoya can send lovers of this fruit into a rapturous state. The cherimoya is filled with a creamy white or yellow flesh—sometimes even pink—surrounding shiny black seeds, like small beans. The fruit has a faint, sweet perfume, and a flavor that reminds you of a day at the beach: a tropical mix of banana, pineapple, and vanilla. In Peru, Chile, and other countries in South and Central America, the fruit is often chilled and eaten with a spoon for dessert. It's so sweet and refreshing that it's sometimes called the "ice-cream fruit."

Most Americans, though, have never heard of a cherimoya, nor seen one among the abundance of tropical fruits in the grocery store. So what's keeping the cherimoya from joining the bananas, mangos, and pineapples we gobble up with abandon?

A Finicky Fruit

Cherimoyas were one of the delicacies—along with pineapples, potatoes, and chili peppers—that Spanish explorers encountered when they reached Central and South America. The Incas, who ruled the highlands in what is now Peru and parts of nearby countries, prized the fruit, as had civilizations before them for thousands of years. Cherimoyas were sent to Spain soon after their discovery, and they eventually spread to other countries around the world. People grew cherimoya trees in backyards to snack on the fruit at home. Around the late 1800s, people in Spain and Southern California began to cultivate and sell the fruit.

Part of the reason the cherimoya hasn't taken off in the supermarket is that the fruit is incredibly finicky. The trees flourish in the coastal mountains of the Andes in northern

Peru and southern Ecuador. They like cool air, but not too cold, because a frost will kill the fruit. They like to be in the mountains—but not too far from the coast, no more than maybe 20 miles (30 kilometers) inland. And the fruits need to be shaded by the tree's branches.

The cherimoya tree is also quite choosy about its pollinators. The tree's flowers are both male and female, but the flowers first appear as females, with petals that have a narrow opening. A few hours later, the petals fully unfurl, and the flowers become male, producing pollen. This way, a flower can't pollinate itself—a precaution that keeps the species genetically healthy.

In the cherimoya's native home, tiny beetles collect the pollen from male flowers and then squeeze into the narrow opening of a nearby, almost-closed female flower to deposit that pollen. In other countries, there is no pollinator tiny enough to do the job. So cherimoya growers in California or Spain, for instance, must carefully pollinate the fruit trees by hand, using a small brush to pick up pollen from one flower and transfer it to another. This allows the flowers to turn into fruit.

The third challenge of growing the cherimoya lies in picking and handling. It has to be picked at just the right time, when the fruit has barely begun to progress from hard and unripe to soft and mature. Because of its large, uneven shape, it has to be packed by hand. Once picked, it ripens quickly, in only about five days, so it won't last long in transit or on a shelf. It must be stored at a constant temperature of about 50 degrees Fahrenheit (10 degrees Celsius). Most grocery-store fruits and vegetables are shipped at colder temperatures, which





A tower of cherimoyas awaits shoppers at a market in Barcelona, Spain.

would damage the cherimoya. Finally, the fruit's skin is thin and bruises very easily, turning a dark brownish-black.

Tropical bananas and mangos, on the other hand, can grow in a much wider variety of climates and don't need to be pollinated by hand. They're mostly the same size and shape, which makes for easy packing. They can be picked when they're harder and less mature, and will last for weeks during shipping at cold temperatures before they can then be ripened.

For all these reasons, the cherimoya has not reached many eaters beyond those in its native countries. There are a handful of growers in Southern California who cultivate cherimoyas in the narrow region of the state where the fruit can flourish. Farmers in southern Spain grow the crop mostly for local consumption. There are also some cherimoya trees and growers in southern Asia, central Africa, and Australia and New Zealand.

But today there are many people trying to solve the cherimoya's challenges and bring the ice-cream fruit to more tables around the world.

Have Fruit. Won't Travel

Klaus Bederski, a Peruvian farmer born to German immigrants, strides through his plant nursery at the Topara Organic Farm. He runs the farm, which is about three hours outside Peru's capital city of Lima, with his son, Stefan. The lush green of the family's nearly 200 acres appears almost like magic in the dry desert land, fed by water that flows from rainfall and glacier melt high up in the Andes Mountains to the east.

Klaus and Stefan mainly grow organic pecans for export to the United States and Europe, along with bright orange and red Peruvian chili peppers. But while Stefan manages the day-to-day needs of the crops, Klaus prefers to carefully tend to the small plants that make up the nursery. These are young trees such as citrus, avocado, and

olive that he sells to other Peruvian farmers. Most of all, Klaus loves to breed new varieties of crops. And for the past decade, he's worked on developing a new kind of cherimoya.

WHO'S RESPONSIBLE FOR THIS HIDEOUS INJUSTICE?

UM... THAT WOULD BE MOTHER NATURE...



Traveling Fruits

Like the cherimoya, these tropical fruits come from warm regions outside of the United States. Unlike the cherimoya, they've had some success in this country and might be familiar to you. Can you match each fruit picture to its name—and its original home? Answers are on the bottom of the next page.



Guava

Watermelon

Kumquat

Mango

Fig

India

Mediterranean

China

Southern Africa

Mexico

Klaus thought that more people, perhaps in the United States, would be able to enjoy the cherimoya if he could grow a small, regularly shaped fruit that was round like a grapefruit and didn't have many seeds. Most of all, he dreamed of breeding a cherimoya with a tough, avocado-like skin that would make it less sensitive to shipping and handling.

Then one day, about a decade ago, he heard an intriguing bit of information from a college student who was working on the farm as part of his agriculture degree. The student said that his uncle, who lived in a village in the Andes, had a cherimoya tree with tough-skinned fruit. So the two of them hopped into Klaus's car and drove for 10 hours over dirt roads. They reached a town of only about 50 families that was 9,000 feet (3 kilometers) high in the mountains. The uncle took Klaus for a walk up and down a hill to reach the bottom of the nearby valley, where they grew the town's cherimoyas.

And there it was, the cherimoya that Klaus had been searching for: a tree that bore fruit with a tough, yellowy, avocado-like skin.

Klaus says, quite calmly, that he was excited when he first saw the tree. His blue eyes twinkle

as he tells the story. "There was no hotel, we ate at a local's house, we slept there with the goats and the sheep," he says. While there, he cut off a bit of what's called "bud wood" from some of the trees, which can be used to grow a clone of the original tree.

But these trees had one major drawback: All the fruit was full of seeds, with only the tiniest bit of fruit flesh. That would never sell at the market.

So back at his farm, he grew the bud wood from those trees to maturity, which took about five years. He then selected one tree that produced better-looking fruit than the others. The cherimoyas



Peruvian farmer Klaus Bederski shows off his organically grown cherimoya trees.

on its branches were the size of grapefruits, round with almost no bumpy scales and a tough skin. This fruit would be perfect, Klaus thought, because it wouldn't bruise or blemish during shipping.

Here's where the work of the breeder begins. He needed to cross that tree with one that had fewer seeds. So Klaus selected cherimoya trees at his farm that produced fruit with lots of flesh and few seeds. He mixed the pollen of one into the female flower of the other. He hoped to develop a hybrid plant from two tree parents that would produce round fruit with a tough skin, containing delicious, creamy flesh with few seeds.

Now, a few years after that step, he finally has hybrid trees growing to maturity. Among those hybrids, he says, he's found at least one that has the type of fruit he hoped to breed. He hefts a piece of fruit in his palm, admiring the size and color.

Thirty more hybrids will produce fruit next year, and maybe one of those will also produce his dream cherimoya. Then he'll patent the new breeds and sell the trees to local farmers. He hopes those farmers will be able to sell the cheri-

moya overseas, perhaps in the United States—and by patenting the breed, he hopes to earn some money himself.

The whole process may have taken 10 to 15 years by the time he sees any results. Despite that, Klaus grins when he looks at the fruit growing in his orchard. "It's a thrill," he says. "I don't think of it as work—it's an adventure."

Getting the Seeds Out

Farmers in California and Spain aren't as concerned with long-distance shipping as Klaus Bederski is. Instead, they'd like to find a seed-free cherimoya that might attract more customers within the five-day radius that the fruit can travel without spoiling—up the coast to Northern California, or in northern Spain and other countries in Europe.

In many varieties, the seeds are quite sticky and adhere tightly to the fruit's flesh. It's not easy to remove them without, say, sucking them out. Growers think consumers might be more willing to try a cherimoya if it had no seeds. A new discovery by scientists in Spain and California might help solve just this problem.

A group of scientists in southern Spain work in a research institute devoted to growing and

studying subtropical and Mediterranean fruit. The microclimate there is perfect for growing cherimoya trees, and the center has collected 300 different varieties from around the world.

In their plant collection, the team also has a cousin to the cherimoya called *Annona squamosa*, or the sugar apple. One sugar apple variety from Thailand has no seeds. The scientists wondered whether a genetic mutation was making these plants seedless. If so, would there be any way to transfer that mutation to the sugar apple's relative, the cherimoya?

So they got in touch with a researcher named Charles Gasser at the University of California at Davis. He had previously found a mutation in an unrelated plant, a missing gene, that caused seedlessness—and the way the plant looked without seeds was similar to the seedless sugar apple.

Maybe the Thai sugar apple was seedless because it had the same mutation. To find out, the Spanish researchers sent samples of the sugar apple to Gasser's lab. He told them that the Thai sugar apple was in fact missing the same gene.

The results were great news, explains Iñaki Hormaza, one of the Spanish researchers.

This discovery might allow them to grow a seedless cherimoya. Charles Gasser has another tool that could help in that quest: a test to find that seed-free mutation. So the researchers could cross the seedless sugar apples with seeded cherimoyas, then check the baby trees' DNA for the seedlessness mutation, instead of waiting for them to grow up and produce fruit.

Hormaza says his lab's goal is to help out local farmers so they can sell more of the fruit farther north in Spain, and even in France or Germany. But, he admits, this won't be enough to overcome the fruit's other challenges—such as the need for hand-pollination, or the short time it remains fresh before it starts to spoil.

The cherimoya, so picky about how and where it grows and so sensitive to travel, may never become as popular as fruit better suited for widespread cultivation and distant shipping, such as the banana. Still, perhaps these new cherimoya developments will help boost the popularity of a fruit that's considered a divine dessert in South America. It might even turn up in a market near you. 🦋



On an organic farm in warm and coastal Southern California, cherimoya trees are right at home.



Cynthia Graber is a journalist living in Massachusetts. She has previously written for Muse about artistic mathematicians, space mirrors, and unemployed elephants.

Does anyone have a spoon?

