

Gnarly Tree Can Cure Ill, Purify Water and Feed the Hungry

A Common Tree with Rare Power

By Mark Fritz, TIMES STAFF WRITER

Scientifically speaking, Moringa sounds like magic. It can rebuild weak bones, enrich anemic blood and enable a malnourished mother to nurse her starving baby. Ounce for ounce, it has the calcium of four glasses of milk, the Vitamin C of seven oranges and the potassium of three bananas.

Sounds like your Power Bar, you say? Well, consider this: A dash of Moringa can make dirty water drinkable. Doctors use it to treat diabetes in West Africa and high blood pressure in India. Not only can it staunch a skin infection, Moringa makes an efficient fuel, fertilizer and livestock feed.

Memo to Popeye: Moringa has triple the iron of spinach and more impressive attributes than olive oil. And it's not only good for you, it's delicious. You can cook Moringa in Moringa oil and top it with Moringa sauce and still taste a spectrum of flavors.

And it's cheap enough to grow on trees. Which is what Moringa oleifera is: A tree, with a gnarly trunk and tousled head of foliage that make it look like a cypress that just rolled out of bed. It is a common tree that thrives in both the desert and the living room and produces leaves, pods, seeds and flowers that each do uncommon things.

"It's a remarkable tree," said Lowell Fuglie, West Africa director for Church World Service, the relief arm of the National Council of Churches. "Among academics, the properties have been known for years. We decided to put it to the test."

The organization recently convinced the nation of Senegal to promote Moringa as part of the national diet. This came after a two-year pilot project in the hardscrabble villages in the Senegalese southwest, where Moringa grows wild.

Plant's Following Begins to Build

Fuglie found ground Moringa leaves to be more readily embraced by rural villagers than other dietary aids, plus four times as effective. "I couldn't believe what was happening," he said.

Malnutrition causes high infant mortality and a staggering array of health problems among an estimated 1 billion people. Though experts doubt a single food source can be a silver bullet in the war on hunger, Moringa has built an increasingly larger following in the last two years. More people are noticing that the plant is a proven water purifier with remarkable nutritional and medicinal properties that just happens to thrive in places where bad water, poor diets and the diseases they promote are leading killers.

Scientists who study this gifted bit of flora also consider it an outstanding example of what has been lost in many other plants and animals: a genetic versatility bred away by huge agri-businesses.

Many argue that a lack of genetic variation in the food we eat makes specific strains more susceptible to getting wiped out by a single pest, pathogen or climatological change. In 1970, 15% of the U.S. corn crop was destroyed when blight swept the grain belt. In the mid-19th century, the Irish potato crop crashed, causing

famine that killed a million people. The reason? Dominant plant varieties were too genetically alike and therefore vulnerable to the same enemy.

"There are probably a lot of plants [other than Moringa] that have the same benefits," said Barbara Schaal, an expert on evolutionary plant genetics at Washington University in St. Louis. "That's why it's so important to preserve natural biodiversity. Corn and soybean, all of these things have incredible potential. But we've lost a lot of their wild relatives." At the same time, herb-happy consumers are gobbling up candy-coated nutrient bars crammed with everything from pine bark to bioflavonoids. Yet Moringa is a reminder of what nature can do.

Here are some examples of how the plant is picking up a devoted following:

The National Science Foundation, National Geographic Society and the Andrew Mellon Foundation are financing a scientist's hair-raising attempts to collect the world's 13 Moringa species.

Both Moringa and the common carrot are diamonds in the roughage department, but Moringa has quadruple the beta carotene, which is good for the eyes and effective against cancer. The Bethesda, Md.-based International Eye Foundation is using Moringa in Malawi because it's loaded with Vitamin A, the lack of which causes 70% of childhood blindness.

Wichita, Kan.-based Trees for Life, which has been planting food-bearing trees in impoverished places since 1984, is running Moringa cultivation programs in India after convincing a town of 40,000 to make the tree a structured part of the local diet.

Britain's University of Leicester is studying the coagulating properties of the seeds in those tasty Moringa pods, which researchers believe work better than the common water purifier aluminum sulfate, which can be toxic. The school weaned a Malawi village off imported alum by building a simpler Moringa-based system.

Hospitalized for prostate surgery in December, former United Nations ambassador and ex-Atlanta mayor Andrew Young told people not to send flowers, but buy Moringa seedlings for the malnourished. Young is the new president of the National Council of Churches.

The interest in Moringa is growing in a field filled with conflicting theories about fighting hunger. Several relief organizations asked to comment on the tree had never heard of it. Some were leery of anything that sounded like an easy fix to a complex problem. "You'd think Monsanto or somebody would have patented it by now," joked Ian Bray, spokesman for the relief group Oxfam of Great Britain, when asked about Moringa. "We've been looking for silver bullets for so long I think they don't exist."

Steve Hansch, research coordinator for the Congressional Hunger Center in Washington, said he was annoyed that a

November article in Monday Developments, a newsletter of the U.S. humanitarian community, touted the plant and Senegal effort without explaining hunger's complexities. "A tree is not going to be a single intervention," he said. "There are thousands of ways to treat malnutrition. If we can convince people in developing countries to eat any leafy green vegetable, if we can convince women to take iron supplements, we've accomplished a lot. It's not like we lack food for people to consume."

The fact that Moringa is a known quantity in much of the developing world is the key to its potential, Fuglie insisted. Moringa leaves already are used in Senegal to make a sauce. Some Nile River villages discovered its effectiveness as a water purifier. Nigerians use crushed leaves to clean cooking utensils and the wood yields a common blue dye in Jamaica. The seed oil is used for cooking and, because it won't spoil, as a preservative and even machinery lubricant. The plant crops up elsewhere as an animal feed, plant fertilizer, fence post, stationery and oil paint.

American stores specializing in Indian cuisine sell pickled Moringa pods as "drumsticks." In some places, Moringa lives a sort of Clark Kent existence as a mere ornamental.

Jim Johnson, head of a Mississippi seed company, Seedman.com, began selling Moringa seeds several years ago after a Brazilian grower sent him samples. "It conforms its size and shape to whatever container it's in. We've sold thousands," he said, expressing surprise at Moringa's other attributes.

Ubiquitous though it is, Moringa advocates say the tree is only an occasional food source in the places where it grows, and that much of its nutritional value is boiled away.

In a 65-page book on the National Council of Church's pilot project in Senegal, Fuglie described the willingness of a hospital administrator to substitute Moringa for the classical, and costly, methods of using whole milk powder, vegetable oil and sugar to treat malnutrition. The official, a diabetic, had been drinking Moringa tea to control his glucose for years, but had been unaware of its nutritional properties.

A star of the project was Awa Diedhou, an infant born weighing 3 pounds, 5 ounces. Her mother couldn't produce sufficient milk and the child was given little chance to survive. On a Moringa-supplemented diet, the child quickly grew "quite fat," Fuglie said, and the mother began producing milk.

Beri beri, rickets and scurvy are among the diseases caused by the lack of nutrients that are abundant in Moringa. Three spoonfuls of Moringa leaf powder contain 272% of a typical toddler's daily Vitamin A requirement, along with 42% of the protein, 125% of the calcium,, 71% of the iron and 22% of the Vitamin C. It contains a full complement of minerals and all the amino acids of meat.

Some people find its water-purifying powers most compelling. Lack of drinkable water is, arguably, the world's biggest health threat. Pressed Moringa seeds can turn a tumbler of bacteria-laced river muck into clean water more economically than imported chemicals, researchers say.

"With all these advantages, what are we waiting for?" University of Leicester scientist Ben Bazeley wrote last year in The Rotarian magazine. Rotary Clubs are sponsoring Moringa projects in Brazil and Zimbabwe.

Its medicinal qualities also are tantalizing. The seeds and roots contain an antibiotic that Guatemala's University of San Carlos found to be as effective against skin infections as neomycin. In recent years, studies published in the journal *Phytotherapy Research* and *Hort Science* have found different Moringa parts to be effective in lowering blood sugar, reducing swelling, healing gastric ulcers, lowering blood pressure and even calming the nervous system.

Moringa is also very rugged for something that sprouts flowers. A seed or cut branch can grow into a 15-foot tree in a year. A giant tap root lets the plant soldier through Saharan-scale droughts and withstand overly acidic, alkaline or salty soil.

Though Moringa oleifera is most common, there are a dozen other known species within the genus, which means they share the same underlying biochemical structure. Moringa plays a blue fungus in Madagascar, green cactuses in Mexico and a bulbous bottle tree in Oman.

It has hundreds of names: the Benzolive tree of Haiti, the Malnuggay of the Philippines, even the horseradish tree of Florida because the roots taste like the condiment. But the root bark is toxic and the root meat contains a nerve paralyzer. Moringa bark is sometimes used to induce abortions in India, sometimes killing women in the process.

Mark Olson, a Washington University doctoral candidate in evolutionary botany, has spent the last five years scouring some of the world's deadliest shrubbery in a hunt for every species.

Trip to Unstable Somalia Pays Off

He's found 12, and he suspects the 13th may be extinct. Each are found in dry, remote tropical areas that often feature a war of some kind. "Practically nothing is known about them, and I quickly found out why," said Olson.

Particularly hairy was a 1998 hunt for a species that hadn't been recorded in 30 years. Olson and a band of armed bodyguards had to forage through the plant's likeliest habitat: perennially unstable Somalia. The risk was worth it. Out in the scrub of the arid landscape, Olson found his missing Moringa. It was laden with pods that looked like 3-foot-long string beans. "The local people used them for everything," said Olson. "It's one of the most useful trees in the world."

Time will tell if Moringa makes its way to American supermarkets, where everything from ginkgo biloba to green algae can be found crammed into artificially flavored chocolate bars.

Olson, whose field work was recently featured in *National Geographic* magazine, has become a human clearinghouse of all things Moringa. He said he's seen a big jump in entrepreneurial inquiries in the last year. "I get e-mails from businessmen in China who are growing huge crops of this to make money," he said. "There's a huge amount of interest."

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