



Cinnamon

The Bark Heard 'Round the World

Question: What did a 16th century pirate love more than gold?

Answer: Dried tree bark. That's right—long, telescoping quills of cinnamon, stolen off merchant ships, were more valuable than gold, and a whole lot lighter to carry.



By Gail Kay Haines

In the *Pirates of the Caribbean* video game, players trade sticks of cinnamon for gold. But the pricey bark is not native to the Caribbean. Pirates who plundered the Indian Ocean or the Barbary Coast of Africa actually sailed closer to the source of cinnamon, which grew in places like China, Burma (Myanmar), Indonesia, and Ceylon (Sri Lanka).

That pungent aroma of hot cinnamon rolls you smell as you enter the mall is similar to what ancient Egyptians smelled as they gathered up their embalming supplies, or what early Romans smelled near cremation pyres. Cinnamon has been popular for at least five thousand years, but at first, it was not used in cooking.

Ancient cultures used cinnamon to cover up not-so-nice odors. The Roman Emperor Nero burned a year's worth of cinnamon at his wife's funeral—only fair, since he murdered her.

The Bible, the Torah, and the Koran mention cinnamon. Witchcraft featured it, too. Chinese and Indian medicine valued cinnamon as a cure for stomachaches and depression. Apothecary shops needed a steady supply to treat sore throats and other ills, especially flatulence. Cooks used it to preserve meat and to kill the stench of meat already spoiled.

Wars fought over the spice fueled trouble in the Near East for hundreds of years. First, Arabs kept poachers away with tales of snake-filled lakes of cinnamon, harvested by a giant phoenix—similar to Fawkes in *Harry Potter* (but just as mythical). Romans and then Venetians dominated the trade, only to have their monopolies shaken by the Portuguese, the Dutch, and the British. Traders hanged, drowned, and shot each other (while enslaving the workers) as demand for the wild-growing shrub grew. The winners got rich. In Europe, cinnamon was worth a fortune.



A cinnamon plant.

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Columbus didn't come looking for America—he was hunting cinnamon, among other things. (He didn't find it.) The 15th and 16th century world explorers were searching for spice as well as gold, and for faster, cheaper ways to get it all back to Europe. Many historians give credit to spices like cinnamon, cloves, ginger, cardamom, nutmeg, and mace for turning European countries into major sea powers and leading to many of the scientific and technological developments that resulted. Not bad for a few tropical plants.

Eventually, planters figured out that cinnamon bushes will grow anywhere they can find sandy soil, heat, and a lot of rain. Once large-scale plantations sprang up, cinnamon became cheap enough for almost anyone to afford.

On plantations, growers prune each tree back at two years old to produce "tillering"—bushy growth instead of height. A bush never gets to be more than 10 feet tall. After three years, the growers begin to harvest the bushes, twice a year, at the end of each wet season.

The peelers' technique is barely changed from ancient times. They cut the shoots, ferment them overnight, and remove leaves and outer bark, all of which they save to make oil. They pound the inner bark smooth with a brass tool and slice it free in one piece. The bark is layered and rolled, telescope-style, into long quills. Finally, the quills are cured, air- and sun-dried, trimmed to exactly 42 inches, and packed in bales. "True cinnamon" quills look like tight rolls of brown paper, and bits that don't measure up are ground or pressed into oil. Not a scrap of the bush is wasted except the roots, whose chemical composition is different.

What is cinnamon?

Think that warm, exotic aroma on your cinnamon toast is "true" cinnamon? It probably isn't. Nor is the flavoring in your grandmother's pumpkin pie, fancy cinnamon rolls, or even Atomic Fireballs. None of those treats likely contains "true cinnamon", unless, of course, your grandmother shops in Europe or Mexico, or finds a suitable source on the Internet.



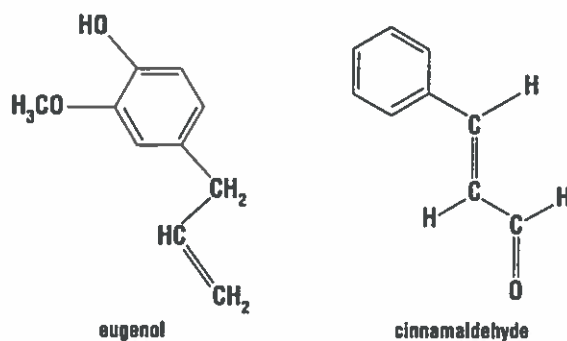
"True cinnamon" is the inner bark of a bushy evergreen tree, *Cinnamomum zeylanicum*, (or *C. verum*). Native to Ceylon—now called Sri Lanka—it has oval-shaped, shiny, and leathery leaves which, when bruised, taste hot to the tongue. It grows purple berries and yellow, bad-smelling flowers.

So-called "True" Ceylon cinnamon has a "lively", delicate flavor considered best for desserts, but several other plants in the *Cinnamomum* genus are just as popular. Chinese cinnamon, from the *Cinnamomum cassia* bush, has a strong, pungent aroma great for Indian curries, Mexican mole, Jamaican jerk, and Chinese five-spice powder. It comes from Myanmar and other East Indies lands. *Cinnamomum cassia*, *C. burmanii* (Indonesia) and *C. loureirii* (Saigon) are separate species, considered types of cassia. They are sometimes called "fake" cinnamon, although nothing about them is fake.

All of the cooking cinnamon you buy really did grow on a *Cinnamomum* tree, but almost none sold in the United States comes from *Cinnamomum zeylanicum*. After the American Revolution, American traders began seeking out spices. But rather than buy from the British, who had a monopoly on *C. zeylanicum*, they brought cassia home, called it cinnamon, and that was that.

There are some obvious differences, physical and chemical. If you have stick cinnamon, examine it. "True cinnamon" (try a Mexican grocery) is thin. You can chew the quill straight, for a sweet-hot taste. Cassia bark, thick and woody, rolls in from both sides like a scroll. Biting it could crack your teeth.

If you have powder, check its color. True cinnamon is tan. Cassia is reddish-brown. Indonesian falls in between, and the darkest, Saigon cinnamon, smells like hot candy right from the bottle.



Most of cinnamon's heat and charm come from one chemical—cinnamaldehyde, C_9H_8O , a yellow oil which makes up 1–4% of the dried bark of all cinnamon species. "True" cinnamon has some extra flavors, mainly eugenol, $C_{10}H_{12}O_2$ (the main scent in cloves). Eugenol is missing from cassia. Gas chromatographic/mass spectrometric testing for eugenol content is one way chemists identify "true" cinnamon.

But the cassia types have more cinnamaldehyde, which makes them spicier. Today, food companies believe Americans prefer the pungent flavors of Indonesian and Saigon cassia to the subtle Ceylon.

Cinnamon's distinctive smell is found in its essential oil. Essential oils are so called because they contain the



Cinnamon oil and sticks.

essence of the plant, not because they are indispensable. Ground cinnamon contains up to 2% essential oil. But the potent ingredient, cinnamaldehyde, (3-phenyl-2-propenal) is easy to synthesize in a laboratory, and it is potent, indeed.

What's new about cinnamon?

Recently, researchers have begun to take a serious look at the medicinal uses of cinnamon. Now, cinnamon is "hot" in more ways than one. It's possible it might help treat type II diabetes, a serious disease that kills millions of people a year and often strikes in middle age. When the disease strikes, the body loses the ability to use insulin, causing blood sugar levels to go seriously out of balance.

Researchers at the Department of Agriculture tested some high-calorie foods on volunteers, to see how they affected blood sugar. Most had the expected bad effect. But to researchers' amazement, apple pie lowered the subjects' blood sugar. The team didn't recommend eating more pie. Instead, they uncovered a hidden champion: the cinnamon in the pie.

A chemical known as MHCP, found in powdered cinnamon (not in the oil or in cinnamon candy) can actually mimic and enhance the effects of insulin in the body, and boost glycogen levels in the muscles. More research is needed, but some doctors are already recommending $\frac{1}{4}$ to 1 teaspoon a day of cinnamon for patients with or at risk for type II diabetes.

You think cinnamon gum sweetens your breath? It does more! Cinnamon oil in Big Red gum can kill about half the bacteria in a subject's mouth, more than any other essential oil researchers tried, and far more than plain gum alone. So grab a stick, the next time you need fresh breath.



What makes cinnamon candy hot?

Red Hots, Atomic Fireballs, and other cinnamon candies taste so hot you might take a break in midconsumption. That's extra, added cinnamaldehyde burning your tongue. Cinnamaldehyde affects the taste buds in a way similar to capsaicin in chill peppers, though the "mouth burn" is briefer. Both molecules activate nerve cells (receptors) that register pain from heat. Some candies contain oil of cinnamon and then bump up the burn with synthetic. Others use just the synthetic oil. It's all in the concentration of cinnamaldehyde.

The more, the hotter.



The bad news is that cinnamaldehyde causes a contact dermatitis in some people when rubbed on the skin. Cinnamon toothpaste or mouthwash can cause swelling of the tongue and even mouth ulcers. When working directly with the chemical, workers wear hazardous material protection. Interestingly, adding equal parts of eugenol to cinnamaldehyde can prevent sensitization.

But even the milder, powdered form of cinnamon is a powerful bactericide. It can reduce the bacteria count in apple juice and lower the *E. coli* level in uncooked ground beef. It is a fungicide used to treat an oral fungus called thrush.

Cinnamon really does aid in digestion, by stimulating enzyme activity in the stomach and intestines. It is an antispasmodic, calming the muscles in the digestive tract, and it really does ease flatulence. If you sprinkle it on frying fish, cinnamon helps eliminate odor. The Romans knew much of that, 2000 years ago. Sometimes, it takes us modern people a while to catch up. ▲



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