

# Peppers — Hot and Not

by Betty N. Shor and Don Shor

## History

The plants that we call peppers were used by natives of what is now Central and South America for centuries before Europeans arrived. Archeologists have found pepper seeds among human remains in a valley of Tehuacán in Mexico dating to 7,000 B.C. By some time between 5,200 and 3,400 B.C, the natives of Mexico were cultivating peppers. In Peru the remains of peppers, apparently domesticated, have been dated to 2,500 B.C. Wild species of peppers are still found in South America but not elsewhere. (Some introduced peppers have gone wild but they are identifiable with domesticated ones.)

In the Caribbean region where Columbus landed, the pods of the plant were called "ají," sometimes spelled "axí" or "agí" or "ajé" by early Spaniards. That name is still used by some natives in the Caribbean and South America. In Mexico the Nahuatl people (a dominant group of Aztecs) called the plants "chilli" — chil in Nahuatl means "red."

The plant came to the attention of Europe as soon as Columbus returned in 1493 from his first epic voyage to "the Indies" — i.e., the Caribbean coast of North America. The hot flavor reminded the Spanish of the valuable seeds of the tropical vine native to India, called pepper, that were laboriously hauled to Europe before the 1500s. The new plant was called pimiento, because it stung like the India plant that they called pimienta. Translated into English, both of these words became "pepper" — and it's too late to change the confusion.

Peppers spread throughout the world astonishingly fast, and soon became "the most used condiment in the entire world" (Andrews, 1984, p. 10). The reasons were simple: not only was the spiciness welcomed everywhere, but also the seeds could be carried readily and they stayed viable for some years. Unlike black pepper, the plants were annuals and easy to grow. Sailors carried peppers around the world. The expert on peppers, Jean Andrews (1984, p. 5) notes that peppers were in use in various places by these dates: Spain in 1493, Italy by 1526, Germany by 1543, Moravia by 1585. Beyond Europe, they were in Africa and then India in 1498, and by 1542 three races of peppers were in use in India. Before long, peppers were even thought to be native to India and Africa.

Some of the routes of peppers were circuitous. The Ottoman Turks may have learned of peppers when they attacked Portuguese colonies in India (1538) and Persia (1573). However they knew of this plant, the Turks introduced it into the Balkan region when they occupied that in the 15th century (very soon after Columbus) — and the result was paprika. Ornamental peppers were used by Europeans before they started eating them.

## Taxonomy

As a distinct plant, peppers originated in the family *Solanaceae*, commonly called the nightshade family, which includes some plants that are very desirable to eat, some that are poisonous, and some that are harmless. The edible ones include tomatoes, pota-

toes, eggplant, and peppers. Tobacco is also in the Solanaceae, and so are petunias. Poisonous members of the family include several (not all) nightshades — including belladonna — and the sometimes ornamentally grown Jerusalem cherry (*Solanum pseudocapsicum*).

Wild members of this family are found mostly in Central and South America, which were apparently the places of origin. There the elevation ranges from sealevel to very high mountains, so the demands of the native plants differ widely.

Mild and hot peppers are in the genus *Capsicum*. It was first named by the French physician and botanist Joseph Pitton de Tournefort (1656-1708) in *Institutiones rei Herbariae* in 1700. The meaning of his selected name is uncertain. Like many physicians of his day, he was interested in plants especially for their curative powers. He practiced medicine in London, collected plants, and visited the West Indies; his collections were given to the British Museum of Natural History. When Carolus Linnaeus presented his first classification method in *Systema Naturae* in 1737, he accepted Tournefort's description and name for the genus.

Some 20 to 30 species of *Capsicum* are native to the New World. Of these, five are domesticated: *C. annuum*, *C. frutescens*, *C. pubescens*, *C. chinense*, *C. baccatum* var. *pendulum*. The most widely used is *C. annuum*. Within these species are many varieties — and new ones show up every year in seed catalogs. The minor taxonomy is constantly being revised.

## Cultivation

The seeds of peppers are slow to germinate, generally taking from 12 to 21 days, or longer. Soaking them before planting does not seem to speed them up, and bright light is not a factor in germination. Warmth is helpful, however; the seeds do best at about 80°F; they will not germinate in soil below 50°F.

It is best to start the seeds in good soil in a warm room, not in the ground; they progress faster that way. The seeds should be covered very lightly and kept damp. They can be started about six weeks before setting out and, when they have grown to a couple of inches, should be transplanted into individual pots in a warm place for further growth.

The seedlings can be planted into the ground when the soil there is warm, at least 56°F. The preferred temperature range for peppers is 64° to 81°F, and they will not set fruit when the soil is above 86°F. Some South American peppers, from the high mountains, endure cold, but most peppers are sensitive to freezing.

The seedlings should be planted deeply in the soil. They can be planted 12 inches apart with rows at 15-inch spacing; the close planting seems to encourage more large fruit. They prefer full sunlight. Actually, because they are tropical in origin, peppers are adapted to short days; the longer days of the temperate zone delay the start of flowering.

Pepper plants like a moist but not soggy soil, preferably sandy or sandy loam that drains well and has some humus. The soil pH should be from 7.1 to 8.3. The plants require constant watering throughout their life, about an inch a week.

A fertilizer of 5-10-5 is recommended about a week before transplanting, and when the first flowers appear, high-nitrogen fertilizer is advised every three weeks. [I'm not sure that this is necessary. BNS]

Weeding should be done with care because the plants are brittle and break readily.

The flowers have no scent, but bees and butterflies are attracted to them. Aphids and ants also transfer the pollen. Peppers are mostly self-pollinating but sometimes receive pollen from other pepper plants — and can cross with related varieties. The flowers open soon after sunrise and close in late afternoon each day.

Pepper plants may produce usable fruit about 65-75 days after transplanting; fully mature red fruit may take 130 days. The shape of peppers is either globose or elongated; the globose can be somewhat flattened, and the elongated ones are sometimes fairly broad. The plants continue to flower and ripen fruit for a long time — until the nights turn cold.

Pests of peppers include aphids, European corn borer, weevils, spider mites, wire-worms, flea beetles, leafminers, and pepper maggots (these destroy the inside flesh of the pepper). Diseases of peppers include leaf spot (fungus), damping off (fungus), Phytophthora blight and Southern blight (fungi), ripe rot (fungus), and Mosaic virus. Varieties of peppers have been developed that are tolerant of some of these. The plants are also susceptible to blossom-end rot, which is a result of uneven watering, and nematodes.

Many birds are attracted to peppers — hot or mild — and especially the very small fruits of some kinds, which are often called bird peppers. The birds spread the seeds far and wide. Mammals, however, avoid peppers entirely. A prize example of this was in H. H. Bancroft's book, *Native races of the Pacific states of North America* (Vol. 2, 1882, p. 175):

..."I am seriously informed by a Spanish gentleman who resided for many years in Mexico and was an officer in Maximilian's army, that while the wolves would feed upon the dead bodies of the French that lay all night upon the battlefield, they never touched the bodies of the Mexicans, because the flesh was completely impregnated with chile. Which, if true, may be thought to show that wolves do not object to a diet seasoned with garlic."

## Harvesting and Using Peppers

Peppers may be picked green but should be left on the plant to reach full size, when the flesh is thickest. Bell peppers have good flavor when green but more when ripe. Leaving the pod on the plant to the mature color — usually red — brings maximum flavor. But that reduces the number of fruits that the plant will produce.

Most mature peppers can be dried for later use in the sun, by laying them out on sand or concrete or wood floors or woven straw mats. They should be turned daily until dry. The pods should have reached full color before drying or they will develop white patches. In New Mexico it is customary to tie the peppers together in long strings to air-dry them. Dried peppers are about one-fifth the weight of fresh ones. Commercially, peppers are dried with artificial heat.

Some peppers have flesh too thick to dry in the sun, so they are dried with smoke. Any peppers dried by smoking in Mexico are called *chipotles* — a Nahuatl word; Jalapeños are often dried this way. When peppers are smoked with the seeds removed, they are called "*capones*" (i.e., castrated) and they are much more expensive than those smoked with the seeds in.

Drying peppers by smoking was a custom in Mexico long before Cortéz got there. It is traditionally done in a pit, with a tunnel to an upper compartment where the pods are laid on a network, often of bamboo. (Early Chinese smoking methods were very similar.)



To use dried peppers, rinse them, cut off the stems, and shake out the seeds. Tear the pods into small pieces and soak them in warm water — about 6 to one cup of water — for half an hour or longer. Run the peppers and water in a blender to a puree, which can be used in recipes (Andrews, 1984, p. 129).

The flavor of peppers, separate from the pungency, is in the flesh of the outer wall. The seeds have no flavor.

The pungency of peppers comes from the chemical substance capsaicin, which is produced in the placental partitions: the pithy wall between internal sections. It is not in the seeds. In hot peppers the pungency varies in any variety as a result of the climate and the plant's age. It is greater when the night temperatures are high or when there is a heat wave, and the mature pods are hotter than the green ones — as much as 50% hotter. So the pungency can vary among the pods on a single plant.

The pungency is sort of measured by the Scoville Organoleptic Test, devised by American chemist Wilbur Scoville in 1912. For this test, an alcohol extract of a measured amount of capsaicin from a dried pepper is given to a panel, usually of five people, in a sugar/water mixture and increased slowly until the hotness is recognized. The testers should be people unaccustomed to hot peppers. Sweet peppers have 0 Scoville units; the highest numbers in the Scoville Test are greater than one million. At this time a pepper called Infinity, developed in the United Kingdom, and a pepper called Bhoot Jholakia in India are competing for the hottest, both slightly above one million. [I could not find a number for every variety below.]

The red color of peppers comes from the chemical agent called capsanthin, which is not found in green peppers. It is used for coloring in some food products. Orange and yellow peppers have a carotenoid chemical agent, which is — guess what? — also found in carrots.

Andrews (1984, p. 70-71) says that chili powder was created by Willie Gebhardt, a Texas German, in New Braunfels, Texas, in 1892. His consisted of cayenne, paprika,

garlic powder, oregano, and cumin. She also says that chile con carne was mentioned in San Antonio newspapers in the 1880s; it is an American creation.

Peppers are rich in vitamins A and C but are not usually eaten in large enough quantity to provide the daily requirement. From them came a scientific breakthrough. The distinguished Hungarian medical researcher, Albert Szent-Gyorgyi (1893-1986), found an entity in the adrenal glands of cattle, but in minute quantity, while doing research in the United States. He called it ignose (didn't know what it was) and then Godknows (didn't know what it was good for). Soon after returning to Hungary, his wife served him a dish of sweet peppers, which he did not like, so he said he would take some of it to the laboratory. There he found a great quantity of this distinctive entity, which by this time he was calling "ascorbic acid." It is best known now as Vitamin C. And Szent-Gyorgyi received a Nobel prize for his research in 1937.

## Peppers In Garden Centers

Sweet peppers common in garden centers may be hybrids, modern seed strains, or heirloom seed strains.

Most popular are the familiar Bell types. We often get the question as to which are the varieties of colored peppers you see in the grocery store. Those are hybrids which have been selected for desirable production and market characteristics. But all of garden-center varieties will ripen to red if you leave them on the plant long enough! There are also purple, yellow, orange, violet, and even white types: Chocolate Beauty, Purple Beauty, Ivory Hybrid, Lilac Hybrid are examples. These start green, turn quickly to their unique colors, and then (mostly) ripen red.

Thick-walled varieties tend to be sweeter but ripen more slowly, while thin-walled varieties color more quickly. Bell peppers are the familiar squarish, lobed peppers, with



Yolo Wonder and Bell Boy the best-known varieties. Yolo Wonder, a selected form of California Wonder, has a compact growth habit with foliage that shields the fruit from sunburn, but Bell Boy is more productive.

Other sweet peppers include thick-walled, very sweet Pimientos and other, thinner-walled sweet peppers. Heirloom types such as





Corno di Toro, Giant Aconcagua, and Tennessee Cheese are all thick-walled, extra-sweet varieties that have been saved for generations. They are open-pollinated. Gypsy is an outstanding modern F1 hybrid: incredibly productive, ripening to red quickly and producing sweet peppers past Thanksgiving.

Italian peppers, usually used for frying, are also long tapered peppers. These are usually labeled Italian Long Green, though one grower labels them Tamale.

Banana and Hungarian wax peppers are long tapered peppers that are very unpredictable in their heat content from

one plant to the next—ranging from mildly spicy to quite hot. Pepperoncini peppers are similarly tapered peppers but much shorter, and, like the little round, sweet Red Cherry peppers, are almost always grown for pickling.



## A Glossary of Peppers

Let's separate the "cool" from the hot by putting the sweet peppers ahead of the piquant ones.

**Bell Pepper (*Capsicum annuum* var. *annuum*)** — to 3 inches or more in width

Bell peppers are not hot; their Scoville heat unit is 0. (There is a hot bell-shaped pepper in Guatemala and the Oaxaca region of Mexico, there called "chile de agua.") The bell pepper was known to native people long before Columbus arrived on this continent. A fairly early reference to it was by an English buccaneer, Lionel Wafer, who in 1861 mentioned the Bell as one kind of pepper in Panama.

This pepper is widely used in the United States as a fresh vegetable and in many casserole recipes and cooked dishes — including being stuffed and baked — for its pleasant distinctive flavor. It is not commonly used south of the border, but in Mexico it is called chile dulce. The popularity in the United States has led to much variation: "New cultivars are being developed continuously," said Andrews (1984, p. 92), who continued: "The considerable variation is primarily a result of environmental response, with someone applying a new name to each new form." One of these, California Wonder, was introduced in 1928. Andrews found that in 53 commercial seed lists were 111 cultivars of Bell peppers. Ones that are fairly well known include Cubanella, Romanian, Sweet Hungarian, Gypsy, Shepherd, Szegedi; they all have large fruits.

Bell peppers can be frozen without blanching. One just cuts the pepper in half the long way, strips out the seeds, and drops the fruit into a sturdy plastic bag. The fruit softens when thawed, but it provides the good flavor to cooked recipes.

### Paprika

Paprika is not a variety of peppers. It is a prepared recipe of ground powder made from long, slender, mild, red dried peppers. Any of several varieties may be used; Anahims are often chosen. The Tomato pepper (q.v.), sometimes called Squash pepper, is especially red and yields color to foods, so it is sometimes used to make paprika, especially in Spain.

The name paprika is Hungarian. Greek sailors in the early 1500s called peppers "peperi" or "piperi." The Slavic people in the Balkan region called them "peperke" or "piperke" or "paparke." The peppers were introduced into Hungary by invading Turks and by 1569 the Hungarians settled on the name "paprika."

California is now a major supplier of paprika. Although generally mild, there are variations in hotness from one version to another of this seasoning. Generally, Hungarian paprika is made from long peppers and is more pungent than Spanish paprika, which is made from squat tomato-shaped peppers.

*Pimento (Capsicum annuum var. annuum)* — to 2 inches deep and wide

Pimento is, in the broad sense, any thick-fleshed, sweet, red capsicum — a name adopted by the Georgia Pimento Growers Association. Several cultivars are used for canning, and the result is a distinctive flavor. The pimento has 0 Scoville heat units.

Spain was the primary source of canned pimentos for a long time until, in 1911, someone introduced a Spanish pepper into the United States state of Georgia. Pimentos are now grown widely in the southern United States.

The pods are large, heart-shaped, and aromatic. In canning the color is like that of a tomato, not the crimson color of other Bell-type peppers. Pimentos are used fresh, in salads and vegetable dishes, but most of them are canned and used in casseroles, or with cheeses, as a garnish, or to stuff olives.

Pimentos and some pimento waste from canning are fed to chickens. They provide a yellowish color to the flesh and skin. Also, chickens that receive some pimento in their diet have a higher hatching rate from their eggs. When fed to cows, pimentos give an undesirable pink color to the butter.

Squash Pepper — see Tomato Pepper

*Tomato Pepper or Squash Pepper (Capsicum annuum var. annuum)* — to 1.5 inches wide

This sweet pepper has a flattened spherical shape, which resembles a tomato or round squash. It has been in cultivation for a long time, but, although it has to have originated in the New World, it is not grown commonly there now. In Spain and Morocco it has long been used for paprika, for its red color. Seeds of it from the Old World were brought into North America before 1828. It is used fresh or pickled or for canning. A coloring agent can be derived from it.

## Now for the hot ones.

The following list is nowhere nearly complete, just a sample.

Anaheim (*Capsicum annuum* var. *annuum*)  
— to 4 inches long

This pepper was apparently established in New Mexico. It may have been introduced there by Don Juan de Oñate, who in 1597 led a group of 130 men and their families from Mexico to what is now New Mexico, to establish a colony. He carried many supplies with the group. In 1889 a California rancher, Emilio Ortega, went to New Mexico to raise cattle. That effort lasted only until 1895, and when he returned to California, he carried seeds of the New Mexico peppers with him. From plants that he established with those seeds, he set up a canner in Anaheim in 1900 — hence the name. At the same time, horticulturist Fabian Garcia at the New Mexico State University was developing from local peppers a strain that was larger, smoother and thicker in flesh than the local varieties that were used for canning. His "Improved Variety no. 9" was the result. Andrews says that the preferred designation of this pepper is "Long green/red chile."

Anaheims are grown primarily in New Mexico, Arizona, and California — not in Mexico. This variety of pepper is used for canning and for making chili powder and paprika. It is used fresh in "chile relleno" and other recipes.

The Scoville heat range for Anaheims is 500 to 2500 units.

Ancho (*Capsicum annuum* var. *annuum*) — to 4.5 inches long

This pepper is the one used most commonly throughout Mexico, especially when dried. It is elongated but rather broad. There are a variety of names for the same pepper in that country. "At any given time the Ancho can be found growing somewhere in the country, thus keeping the markets supplied on a year-round basis," said Andrews (1984, p. 89). In central Mexico this pepper is called poblano when it is green.

Ancho grows most readily in the semiarid valleys of central Mexico. In the United States, it is commonly grown in southern California but is not suitable for other hot regions of the country.

Ancho peppers are a shiny blackish green when growing, turn red when ripe and reddish brown when dried; they are usually sun-dried. They become brick red when soaked.

The flavor ranges from almost mild to quite hot.



Anchos are used for chiles rellenos and in vegetable and casserole dishes. Some are used to make chili powder.

Banana Pepper or Sweet Banana or Hungarian Wax (*Capsicum annuum* var. *annuum*) — to 5.5 inches long

Banana pepper is mild: 0 Scoville heat units. Its ripe stage, which is called Hungarian wax, is hot [I couldn't find a number] — "almost inedible," says Andrews (1984, p. 91). It is commonly used before it reaches that red stage.

This variety may have originated in Hungary. It is shiny yellow before it turns red. The pods are elongated, somewhat large, and the pepper vaguely resembles a small banana. Both the sweet and the hot stages are used for pickling.

This pepper is easy to grow in a home garden.

Bird peppers

Many of the peppers with very small seed capsules are called bird peppers, because the birds are attracted to them. The birds also disperse them widely.

The primary one by the name bird pepper is Chiltecpin (q.v.)

Cascabel (*Capsicum annuum* var. *annuum*) — to 1.5 inches wide

Nearly spherical peppers, cascabels are sold mostly when dried, when they have a glossy reddish-brown color. At that stage the skin is translucent and the seeds loosen and rattle when shaken — cascabel means "sleigh bell."

There can be confusion in the name, because the cherry pepper (q.v.) is similarly shaped, but it does not rattle.

Cascabels are grown especially in the Mexican states of Coahuila, Durango, and San Luís Potosí.

Cayenne (*Capsicum annuum* var. *annuum*) — to 12 inches long

"Cayenne is an enigma," says Andrews (1984, p. 96). There is a variety, of which the origin is uncertain, and there is a commercial powder, sometimes made from other slender, hot varieties of pepper. This one may have come from what is now French Guiana in South America, where there is a Cayenne River. It has been in use since long before Columbus's day.

The plant is easy to grow and has become widely cultivated — i.e., in Mexico, Africa, Japan, India, and Louisiana commercially. But it is not a major crop in Latin America in general.

The pods are slender, slightly curved, and elongated, to as much as 12 inches. They are hot: 30,000 to 50,000 Scoville units. One can reduce this some by removing the veins. Cay-



enne peppers are used fresh or dry, or powdered, chiefly in hot sauces, as in the Creole and Cajun cooking of Louisiana.

Several varieties of pepper are similar to Cayenne, such as De Arbol and Guajillo. Cayenne itself has many cultivars.

Chiltecpin (*Capsicum annum var. aviculare*) — to less than 0.5 inch wide

Note: avis is the Latin word for "bird."

This pepper, commonly called bird pepper, is a wild shrub, a short-lived deciduous perennial that can grow to about 6 feet. The fruits are nearly spherical or partly elongated. The plant may have originated in southern Mexico or farther south, and is now widely scattered along roadways and fences and in pastures. from southeastern and southwestern United States, especially Texas, to the Caribbean and on to South America in lower altitudes. Some experts consider it the ancestor of the true species *C. annum*.

The plants are somewhat difficult to get started, but when established they continue in that spot for many years. Birds eat the fruits and spread the seeds.

The pods of Chiltecpin are very small. They are green with dark markings when immature and red when mature; they are used in all stages and when dried. In Mexico the pods are often harvested from the wild and sometimes sold to spice companies. Although these peppers are not generally grown in large acreage, farmers often have one or two of them in their yard for ready use.

These chilis are included in any recipe that calls for pepper heat. They have a distinct flavor — and are hot. The Mexicans use the word "arreatado," which means "although it is extremely hot the sensation disappears easily and rapidly" (Andrews, 1984, p. 113). For example, when a child uses an inappropriate word, he/she may be punished with bird peppers in the mouth.

### Chipotle

When peppers have been dried by smoke, they are called chipotles.

### De Arbol (*Capsicum annum var. annum*)

Chili de Arbol is thought to be a Cayenne type of pepper, which group is not well defined taxonomically. De Arbol has slender elongated pods. It is very pungent, and is often used dried, and then the pods are translucent.

De Arbol is grown in the Mexican states of Jalisco, Nayarit, Sinaloa, Zacatecas, and Aguascalientes.

Arbol means "tree" in Spanish, but sources do not explain the origin of the common name of this plant. Mexican names for it are pico de pajarito (bird's beak) and cola de rata (rat tail).

### Fresno (*Capsicum annum var. annum*) — 2



inches long, slightly wide

Fresno was named for the city of that name in the Central Valley of California, by Clarence Brown Seed Company in 1952. The medium-sized waxy pods stand erect and turn from green to bright red, but this pepper is most commonly used in the green stage. A pendent form has been developed for easier harvesting. Fresno is used in sauces, for seasoning, and for pickling. It also is an attractive ornamental, but hot.

Guajillo (*Capsicum annuum* var. *annuum*) — to 2.5 inches long, rather wide

A very pungent little elongated pepper, in parts of Mexico Guajillo is known as siete caldos (seven bowls of soup), because one of its small pods will flavor that many bowls. This pepper has been cultivated in Mexico for centuries, and is a favorite there. It gives a yellow color to the foods that are cooked with it.

The pods turn upward usually, so this plant is known in some regions of Mexico as Mirasol ("see the sun") when green and Guajillo when dried.

The name comes from a Nahuatl word, written down by Spaniards as Quauchilli.

Guajillo is grown in the Mexican states of Aguascalientes, Durango, and San Luis Potosí.

Habañero (*Capsicum chinense* var. *habañero*) — to 1.5 inches long and wide

This was long considered the hottest pepper in North America, which it may be, but the introduced high-elevation South American *Capsicum pubescens* is hotter.

The pods are yellow-orange when ripe, and this very aromatic pepper has a distinct flavor. "A few go a long way," but the burning sensation is short-lived. Habañeros are often used fresh.

This pepper is grown extensively in the West Indies, Belize, the Caribbean region, and Yucatan in Mexico. It does not do well elsewhere in Mexico. In Jamaica it is called "Scotch Bonnet."

The seeds are slow to germinate, and the plants do best in a warm, moist climate.

Hungarian Wax — see Banana Pepper

Jalapeño (*Capsicum annuum* var. *annuum*) — to 2.5 inches long, rather wide

Jalapeño — named for the Mexican town of Jalapa in Veracruz state, where it may have originated — is probably the best-known hot pepper. It is often used in pepper-eating contests. Its shape is a little elongated and somewhat broad. It is piquant — hot — usually about 2,500 to 4,000 Scoville units, but it can range from 2,500 to 25,000.





This chili is often used fresh and green and cannot be dried by the usual methods, only by smoking. It is also sold pickled.

Jalapeños are grown commercially in Veracruz and Oaxaca states in Mexico, in Costa Rica, and — in the United States — in Texas and the general Southwest. This type of pepper is considered a high-value crop.

The fresh pods are used in sauces (salsas) and in meat and vegetable dishes.

Mirasol — see Guajillo

Pasilla (*Capsicum annuum* var. *annuum*) — to 6 inches long

Pasilla is distinctive because it is dark brown when ripe, a color referred to in Mexico as "achocolatado." Ancho and Mulato varieties are somewhat brownish when dry and so are sometimes called Pasilla. This pepper is used commonly in Mexico, and

along the west coast of that country may be called "chile negro."

The pods of Pasilla are long, narrow, and curved. They are used mostly when dried and can be ground and turned into a paste for market sale. The Scoville heat unit is 1,000 to 2,000.

Poblano — see Ancho

Santa Fe Grande (*Capsicum annuum* var. *annuum*) — to 3 inches long

This pepper is grown throughout the southwestern United States and is imported from growers in Mexico. It is closely related to Caloro and Caribe — and all are quite hot. Santa Fe Grande is distinguished by its yellow color when mature but before it turns red. It is commonly used when yellow.

The pods are erect, shiny, and conical in shape. They are used in sauces, for seasoning, and as pickles.

Scotch Bonnet — see Habañero

Serrano (*Capsicum annuum* var. *annuum*) — to 2 inches long

This is probably the most widely used fresh pepper in Mexico and the United States. It is an elongated variety — and very hot. It is commonly used in fresh salsa.

Serrano may have originated in the mountain region of Mexico — hence the name. It is grown in Veracruz, Tamaulipas, Sinaloa, and Nayarit states. In the United States it is grown in southern Texas.



Three forms of Serrano are recognized: "chico," which is short and fat and used mostly for canning; "típico," the preferred form, which is elongated; and "largo," which is longer and not popular.

Sweet Banana — see Banana Pepper

Tabasco (*Capsicum frutescens* var. Tabasco) — to 1 inch long

This distinctive pepper is just plain hot — 60,000 to 80,000 Scoville heat units. Andrews (1984, p. 115), calls it "incendiary." It is a small, elongated pepper, used in a sauce, not fresh or dried.

While there is some variation in tales of its origin, it was perhaps first named in the United States in the newspaper New Orleans Daily Delta on 26 January 1850, which said that Maunsell White, banker and legislator, had introduced "Tobasco red pepper." A few years later he gave pods to his friend Edmund

McIlhenny, who married the daughter of Judge D. D. Avery and moved in 1859 to that family's plantation — on Avery Island, Louisiana, 150 miles southwest of New Orleans. (It is a salt dome, not a true island, and its primary business is mining salt.) The plantation was destroyed during the Civil War, but legend says that "a few defiant plants" survived in the kitchen garden, including this pepper. McIlhenny developed a sauce from it and began selling it in 1869. Its immediate use was on Louisiana oysters, raw or cooked. The sauce is still produced on Avery Island and the plant is grown in several other places where the McIlhenny Company provides the seeds or plants. The recipe is protected by law, and others may not produce a sauce from this pepper.

The McIlhenny family says that a friend who had been to Tabasco, Mexico gave Edmund the pepper. No one has found a plant like this in the Mexican state of Tabasco — or elsewhere. Taxonomists have placed this pepper in the species *frutescens*, distinct from the widely used species *annuum*.

The Tabasco plant is susceptible to "etch" wilt disease, but a resistant form was found in 1970.



## Ornamental Peppers

Soon after Columbus's return from the New World, some of the peppers that he had carried home became popular in Europe as ornamental plants. Their bright red and yellow colors were much appreciated there, and the ornamentals are still enjoyed. The ones chosen for this mostly have small pods. They appear at winter holiday time, especially the red ones, in florist shops, and some seed catalogs advertise the seeds. Many of the ornamental peppers are very hot, so children and strangers should be warned; most of them have no distinct flavor.

Cherry Peppers (*Capsicum annuum* var. *annuum*) — to 1.5 inches long and wide

These little peppers are rather variable — small or sort of large, sweet or sometimes pungent, orange in color or deep red. They were in use before Columbus reached the New World. Their chief characteristic is the globose — or cherry — shape. The pods generally extend above the foliage.

Fips (*Capsicum annuum* var. *annuum*) — to 2.5 inches long

This is an especially attractive little pepper because it gives a bright display as it ripens from green on to yellow, then orange, then red — and all the colors can be showing at the same time. The elongated pods point upward. Fips is easy to grow.

Peter Pepper (*Capsicum annuum* var. *annuum*) — to 1.5 inches long

This blistering pepper is too hot to eat and perhaps is best considered "a conversation piece for the gardener who has everything," as Andrews says (1984, p. 107). It is not found in seed catalogs (but there is botanical voucher material for it at the University of Texas at Austin). The plant's origin is unknown.

The small pods of Peter Pepper are elongated and contorted, and simply resemble the male organ in miniature. When ripe, most of them are red while some are yellow.

Texan (*Capsicum annuum* var. *annuum*) — to 1 inch long and wide

The plant of Texas pepper is taller than that of the other ornamentals; it can go to two feet in height. It is also attractive in the garden and, like other peppers, attracts birds. Its small pods are spherical and upright.

### A Few Others

Not included in the above list are some interesting South American peppers, not generally found north of there. Peppers are known to the Quechua natives of Peru as uchu. Briefly:

Ají Amarillo (*Capsicum baccatum* var. *pendulum*), also known as kellu-uchu, is about 6 inches long and elongated. It is yellow when mature, and it is very hot — more than a jalapeño.

Puca-uchu (*Capsicum baccatum* var. *pendulum*), from Peru, is distinctive in having spotted flowers. Its pods are elongated and about 5 inches long. It is hot.

Chinchi-uchu (*Capsicum chinense* var. *chinchi-uchu*) has cherry-like hanging pods, each less than an inch long and wide. It is also from Peru, where it is used especially for a hot sauce (salsa).

Rocotillo (*Capsicum chinense* var. *rocotillo*), from Peru, is not very hot and can be comfortably eaten raw. Its pods are like flattened patty-pan squash, about an inch across. Its mature color is deep carmine-red.

Rocoto (*Capsicum pubescens* var. *rocoto*), also grown chiefly in Peru, is unusual in having purple or purple-streaked flowers. Its pods are about an inch wide and deep. The seeds are blackish brown. It grows as a large shrub. When mature, the fruit is usually yellow-orange, occasionally red. This variety has been introduced into Central America and Mexico. It is very hot.

#### Reference

Andrews, Jean. Peppers: The Domesticated Capsicums, 1984, University of Texas Press, 170 pp.

#### Pepper, black and white (*Piper nigrum*)

Long ago, black pepper (*Piper nigrum*) was the most valuable spice in the world. It was laboriously hauled by traders from India to Africa, the Mediterranean countries and Europe, and was so costly that each peppercorn was counted in the trading. Marco Polo, visiting China in the 13th century, found it in use there. The demand for it was one of the purposes of Columbus's jaunt intended for the Orient that turned into opening a new land to the western world.

Black pepper comes from a tropical climbing vine in the family Piperaceae. It is native to northwestern India and is now grown in many other tropical countries. India and Indonesia are both major suppliers of pepper.

It is a universal seasoning for just about everything except confections. The flavor is definitely better when made fresh with a pepper grinder, but ground pepper is satisfactory in many prepared dishes.

The plants are started from stem cuttings and grown in tropical countries in a loam of leaf mold and sand, with plenty of moisture. The vines can start bearing in two to five years, may climb by way of aerial roots to 30 feet or more, and will continue bearing as long as 40 years. The flowers are small, in catkins, and the green seeds turn to red, then black when ripe.

For black pepper the seeds — called peppercorns — are picked (by hand) before reaching full ripeness and are dried in the sun (or sometimes over fires) to the black color. White pepper, considered milder than black, is made from fully ripe black seeds that have had the hull removed.

The genus *Piper* includes about a thousand species in the tropics. In addition to some commercial ones, a few are grown as ornamental plants.



Photo description from Wikimedia Commons: Pepper yet to be ripened, taken by me at our farm in Kerala. This is one of the closeup shots of this cash crop. Date: 2007-10-30 (original upload date) Source: Transferred from [en.wikipedia](#) Author: Original uploader was [Devadaskrishnan](#) at [en.wikipedia](#) Permission: [\(Reusing this file\)](#) CC-BY-3.0; Released under the [GNU Free Documentation License](#).

The name Piper is the Latin word for this seasoning (and nigrum, of course, means black).

Red and pink peppercorns are the fruit of *Schinus molle*, an evergreen tree native to northern South America, Mexico, and the Andean deserts of Peru.

It has been widely planted and naturalized in South Africa, Australia, Florida, Puerto Rico, southern and coastal California, and the American southwest. In fact, it is so common in California that one of its many common names is California pepper.

The dried fruit of *Schinus molle* is often mixed with black peppercorns for color, although they don't have the same flavor and eaten in quantity may cause an upset stomach.

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## The Surprising Spread of Peppers

My father, George G. Shor Jr., was a professor of geophysics at Scripps Institution of Oceanography. During the course of his oceanographic career he traveled the world, particularly around the Pacific and Indian oceans. With a fondness for eating locally, rather than in western-style hotels, he often encountered very peppery foods. He was also an enthusiastic gardener, with special passions for bamboo and peppers. He passed away in July 2009 after a long illness. This article was originally published in *California Garden*, July-August 1987, a publication of the San Diego Floral Association. We recently found it in his files. Also published in the *Davis Enterprise*, September 24, 2009



The history of the spread and use of the plants of the genus *Cap-sicum* is a curious one. These plants, native to the Americas, are now grown throughout the world, and appear in recipes that come back to America in ethnic restaurants. The genus is represented in American cuisine by all of the varieties of green peppers, chili peppers, Oriental hot peppers, pimentos, and paprika. The amazing part of this is the speed with which the plants spread and were adopted into local cultures along the routes of the Spanish and Portuguese explorers of the 15th and 16th centuries.

**These peppers are in varying stages of ripeness. Sweet and hot peppers turn red when fully ripe. North Americans often use peppers unripe; in many growing areas the fruit doesn't have time to fully ripen before frost kills the plants.**

The "pepper" that was so highly prized in medieval Europe was not from the same plant as the "green peppers" or "chili peppers," which are all of the genus *Capsicum*, and mostly of the species *Capsicum annuum*. (In older garden books, many of these same varieties were assigned to *Capsicum frutescens*) Both white pepper and black pepper (which the Spanish call pimenta) are the fruit of the tree *Piper nigrum*, which along with cloves and cinnamon is a native of the area formerly called "the Spice Islands," or "the Indies," now known as southeast Asia, including India and Indonesia.

Peppercorns, the whole dried fruits of *Piper nigrum*, were brought to Europe centuries ago. Egyptians, Greeks, Romans, and Arabs were acquainted with pepper and other spices, which came to them across the Asian trade routes in small quantities at very high prices - so high that peppercorns were counted out one by one. Marco Polo's trip to China and back by way of the Indies in the 13th Century solved the mystery of the source of pepper. This did not increase the supply, but provided an incentive to find a way to the source.



**The hottest pepper? Heat in peppers is measured in Scoville units, a sliding scale based on the heat perceptions of a panel of pepper-tasters. Sweet peppers such as bell and pimento contain little or none of the capsaicinoids, the chemicals in hot peppers that burn your mouth and skin, so they measure at 0 Scoville units. Jalapeño ranges from 2500 - 10,000. Habañero, shown here, is 10 - 50 times as hot as Jalapeño!**

Vasco de Gama and other Portuguese explorers set out to find the Spice Islands by going south and east by sea around Africa. Columbus and others tried to do the same by going west. In the last decade of the 1400's, and the first decade of the 1500's, both searches were successful in their own ways.

Columbus never found the Spice Islands that he was seeking, but found other "spice islands." While searching among the islands of the Caribbean (either on his first voyage in 1492, or on a later one), he found two plants that vaguely resembled the pepper he sought: in Jamaica a tree that bore berries that looked like black peppercorns but had a very different aromatic flavor, and in Hispaniola (the island that is now the Dominican Republic and Haiti) a smaller bush that bore a fleshy fruit with a "hot" taste. He brought both back to Spain; both were called "pimento" or "pimiento." The berry on the tree was allspice; the hot fruit was a *Capsicum* (what we now call a chili pepper) called "aji" or "axi" by the local Arawaks.

The hotly flavored fruit that he found, a *Capsicum*, was not a native originally of

Hispaniola. It had a long history of travel before that. Later Spanish explorers found variable but clearly related varieties (called "chillies" in the Nahuatl language of Peru) in Mexico, Peru, and Chile and archeological digs have since found pepper seeds as old as 7,000 B.C. The original Capsicum peppers were apparently native to Bolivia; the original source is thought to be near the city of Sucre, in the high Andes. By the time the Spanish and Portuguese "discovered" them, there were five different species and innumerable varieties under cultivation in most of the part of the western hemisphere that lies between Buenos Aires and south Texas. They were also, as far as I can determine, all hot. The Spanish tried them, enjoyed them, and took seeds home to Spain. The plants are perennial - some varieties can grow into a small tree - but they have the common feature of bearing usable fruit within the first year of growth. The "sweet" pepper is a developed variety.

The Portuguese navigators had a different kind of success. They headed south and then east, to find the Spice Islands. Early on, they also discovered America. En route to the Orient they landed in Brazil, where there were more of the "aji" (in Portuguese "achi"). Resupply ports were founded in Pernambuco and Bahia, Brazil, by the Portuguese in 1507. From there on, Portuguese ships reprovisioned in Brazil on their way south and east. They went on to what is now Cape-town, to the east coast of Africa, and the south coast of Persia, to Diu, Goa, and the Malabar Coast (near Cochin) in India, and eventually all of the way through what is now Indonesia, finally reaching the trading center at the heart of the true "spice islands," Ambon (Amboina) in the South Moluccas in 1511.

They apparently distributed pepper seeds all along the way! Although we do not have the lists of provisions that the Portuguese carried east from Portugal or Brazil, by the middle of the 1500's peppers were grown wherever the Portuguese had stopped in Africa, and it was noted that one of the peppers grown in India was called "achee," or "Pernambuco pepper." They must have introduced them even into the heart of "pepper country" in Ambon, where *Piper nigrum* was grown. After the Dutch captured Ambon from the Portuguese, they sent (in the mid-1600's) a dedicated botanist, Georg Rumpf, to be governor of that remote island. He obviously had a great deal of time on his hands, and prepared a gigantic manuscript, "Herbarium amboinense," which among the exotic tropical plants and the spices of the East Indies, included the first good botanical drawings of a Capsicum. He considered it to be a native of the East Indies, for it was widely used - but he noted that the native names were "chillie," "chilly," and "achar."



**Thai pepper is nearly as hot as Habanero. The best remedy for a pepper burn? Drink some milk. Note: always wear gloves when handling hot peppers.**

In the meantime, the small hot Capsicum peppers imported to Europe by the Spanish and Portuguese had become, like tomatoes, well known to botanists, physicians, and herbalists. They were used in the ornamental gardens of the rich, but not commonly for food in Europe, even though the Spanish and Portuguese settlers in America had added them promptly to their diet. However, the Capsicum peppers appeared in Europe again by a different route. The Turkish empire carried out its own imperialist expansion, and besieged the Portuguese in Ormuz (Persia) and Diu (India) in the early 1500's. Shortly afterward, what became known as "Indian peppers" or "Calicut peppers" appeared in the Balkans and in Germany, traded from Turkey. They were considered to be another one of the spices of the East Indies, and were called "peperi" or "piperi" by the Greek and Balkan people; they finally found their European home in Hungary, where the far-traveled fruits became the sweet spice powder known as paprika.

I have gone through this reconstruction of the spread of the "chili-pepper" because it is truly amazing. The evidence seems to be clear: that in 51 years from 1492, when Columbus found the "aji" in Hispaniola, to 1543 when Fuchs in Germany published a treatise that described the "Indian or Calicut" peppers newly arrived from the East, the plants has spread from North and South America, not just to a few palace gardens and herbariums in western Europe, but to common cultivation in Africa and India, and back to eastern Europe and were competing with the "true pepper" in its own stronghold.

One can ask why these peppers spread so far, so fast. Long ago, when I learned in high school about the "spice trade," my schoolbooks told me (rather superciliously, I see now) that Europeans yearned for spices because they covered up the bad taste of rotten meat. I never quite believed that story; no good cook would do such a thing. A better story was told to me by an Indonesian Moslem friend, from Sumatra. His story was that when one went on the Haj (the trip to Mecca) on a sailing dhow, one had to carry all of one's own food along for the entire trip, and that peppers were added in large quantities to prevent the cooked food from spoiling. Having eaten without ill effect the phenomenally peppery food that is kept and served luke-warm in Sumatran Moslem street-corner restaurants (and then gotten sick on food in the same country served in highly "sanitary" western-style hotels), I am tempted to believe him. Either the peppers kill the germs, or at least keep the flies away.

An alternative explanation was given by the Jesuit Father Jose de Acosta, in the latter part of the 1500's: "When Axi is taken moderately, it helps and comforts the stomacke for digestion: but if they take too much, it hath bad effects, for of its self it is very hote, fuming, and pierceth greatly, so as the use thereof is prejudiciall to the health of young folks, chiefly to the soule, for that it provokes to lust." With a recommendation like that, no wonder the use spread!

All of this would imply that all members of the genus are hot. They are not. The sweet, non-fiery pimento, the crisp and mild green bell pepper, the hot but well-flavored Anaheim chili, are all in the same species (*Capsicum annuum*) as are the Serrano, the Jalapeño, the cayenne, and that essence of concentrated hotness (with little other flavor)

the Thai pepper. While peppers provide the active ingredient of MACE®, they also provide a safe red color for other foods!

Much of the above information was obtained from a most remarkable book, "Peppers The Domesticated Capsicums," by Jean Andrews (University of Texas Press, 1984 [updated 1995]), which discusses the history, botany, economics, and culinary use of these remarkable plants. The book is illustrated by magnificent color plates drawn by the author.

## Appendix: heat levels of some commonly available pepper varieties

Aji Colorado	Hot
Aji Dulce	Hot
Anaheim	Hot
Ancho	Mild
Banana Supreme	Sweet
Bell Boy	Sweet
Bell Captain	Sweet
Big Bertha	Sweet
Big Chile	Sweet
Blushing Beauty	Sweet
Bolivian Rainbow	Hot
California Wonder Yellow	Sweet
California Wonder	Sweet
Cayenne	Hot!
Chocolate Beauty	Sweet
Cornos di Toro (Italian Bull Horn)	Sweet
Early Jalapeño	Hot
Eisley's Wax	Hot
Emerald Giant	Sweet
Fajita Bell	Mild
Fat and Sassy	Sweet
Fish	Hot
Floral Gem	Hot
Fresno	Hot

Garden Salsa	Hot
Golden Bell	Sweet
Golden Summer	Sweet
Gypsy	Sweet
Habañero	Hot!
Hungarian Wax	varies
Italian Long	Sweet
Jalapeño Early	Hot
Jalapeño	Hot
Jamaican Hot Red	Hot
Jamaican Hot Yellow	Hot
Jimmy Nardello Sweet	Sweet
Lemon Drop	Hot
Lipstick	Sweet
Long Sweet Italian	Mild
Marcone	Sweet
Mucho Nacho	Hot
Mulato Isleno	Mild
NuMex Big Jim	Hot
Paprika Supreme	Mild
Pasilla Bajio	Mild
Pepperoncini	Sweet
Pimento Elite	Sweet
Pimento	Sweet
Poblano Ancho	Mild
Pretty in Purple	Hot
Purple Beauty	Sweet
Red Beauty	Sweet
Red/Scarlet	Sweet
Round of Hungary	Sweet
Santa Fe Grande	Mild
Serrano	Hot
Super Chile	Hot
Sweet Banana	Sweet

Sweet Cherry	Sweet
Tabasco	Hot
Tamale/Sweet Italian	Sweet
Thai Hot and Thai Dragon (similar but not identical)	Hot!
Tolli's Sweet Italian	Sweet
Tri-Color Variegata	Hot
Twilight	Hot
Valencia	Sweet
Yellow Bell	Sweet
Yolo Wonder	Sweet