



The

Chile Pepper Institute

N E W S L E T T E R

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The Chile Piquin: a Potential and Natural Industry in Sonora, Mexico. By: E. Zamora

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CHILE PIQUIN AS A WILD CROP

The chile piquin (*Capsicum annuum* L.) is a wild crop that grows on low-range mountain slopes and in some forest areas of Sonora, Mexico. Chile piquin originated in South America and has adapted very well to Mexican growing conditions.

Chile piquin can be found growing in the wild in many different areas of Sonora, including Arizpe, Rayón, Mátape, and Alamos. The wild chile piquin grows best at sea level, but it can thrive at elevations up to 2600 feet. Chile piquins develop better in shade and under native trees and bushes of the Sonoran Mountain Range. Most wild plantations of chile piquin are located on private ranches in the Sonoran Mountains where property owners allow people to collect chile piquin during the harvest season.



seed trays for growing seedlings. When chile piquin seedlings are ready for transplanting, partially shaded areas provide the best growing conditions.

In Sonora, chile piquin is transplanted during the rainy season, generally from July through August. Before transplanting, the land is prepared by eliminating weeds and pruning the undergrowth of trees and bushes where chile piquins will be established. Based on observations, providing shade for growing plants helps reduce transpiration wilt.

THE CHILE PIQUIN AS AN INDUSTRY IN SONORA

Because of the high price of dry chile piquins in domestic and overseas markets, this small and seasonal industry has grown in Sonora. The chile piquin, in its dried, mature form is a very important crop for Sonora's agricultural industry. In addition, many fresh produce markets sell the immature green pods as well. It is a very important industry for low-income people that provides seasonal jobs representing an important source of family income.

Chile piquins are a tradition among Sonoran people, who use the ground, dry fruit in many Sonoran regional dishes such as "menudo,"

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CHILE PIQUIN PROPAGATION

Birds are the natural dispersal agent of wild chile piquins. However, propagation by seed is also possible by collecting dry fruits, removing the seeds and then planting seeds in

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“gallina pinta,” and “cocido” which have been traditional dishes for many generations of families. The chile piquin is very hot, which makes it quite popular in most parts of Mexico.

HARVESTING DRY CHILE PIQUIN



Dry chile piquin is harvested from several wild areas of Sonora. Chile piquins are normally harvested in the red, mature stage, but are also harvested green in smaller quantities. However, the red chile piquin brings a higher price at the market and is more common in the important cities of Sonora. Harvest takes place during

September through late November and is done by hand.

The drying process for chile piquin is considered an artesian process of simple techniques. After harvesting, fresh red chile piquins are dried by spreading fruits over light fabric and placed directly in the sun for several days in order to dry the fruits.

A wild chile piquin plant will produce from ¼ - ½ lb. of green fruits, while a cultivated chile piquin plant will produce from 1 to 2.5 lbs of fresh green fruits. When red mature fruits are harvested, weights are reduced by 70 to 80%. According to several chile pepper collectors, a good harvest for a family is from 110 to 220 lbs. of mature, red fruits.

CHILE PIQUIN LOCAL MARKET

Although some chile piquin is exported to the United States, in Sonora chile piquin sales are limited to the domestic market. Usually, dry chile piquin is sold based on gallons or pounds. In 2005, the price of dry, red chile piquin was close to \$18 for 1 gallon and \$82 per pound in some cities of Sonora, Mexico.

In many fresh produce markets on the streets of Hermosillo, in Sonora, there are many vendors selling chile piquin both fresh green and dry red that are packed in small

plastic bags of different weights. The sale of green chile piquin is a very informal process and is packaged by several companies in different forms, such as sauces, ground chile piquin powder, and whole dry chile piquin fruits.

CHALLENGES

Domestication of chile piquin has been one of the biggest challenges for this industry in Sonora. The Mexican Government, through The Forestation National Program (PRONARE) and The Ministry of Environment and Natural Resources, regularly grows chile piquin chile seedlings in nurseries for distribution to interested people for transplanting and cultivating in home gardens. Recommendations and directions for the best cultivation practices are given to people interested in cultivating chile piquin for family consumption. Perhaps, the most important challenge when growing chile piquin is to try and grow it as a commercial field crop.

One of the other challenges is finding labor. Many growers left bountiful crops in the field to be plowed under due to lack of labor. An alternative solution for harvesting this kind of small chile pepper is to use a mechanical harvester.

CONCLUSION

In Sonora, the chile piquin industry offers a business opportunity

for many people including low-income farmers, laborers, and fresh market sellers.

Chile piquin sales

are important sources of extra cash for low income families.

Because most chile piquin crops are grown in the wild without the use of pesticides or fertilizers, it is considered a natural crop. This crop may become a large source of income for many families and small farmers if better growing practices were implemented.



CAJAMARCA

By: Paul Bosland

This year's special seed packet is an exciting new introduction offered exclusively by the Chile Pepper Institute. 'Cajamarca' is a *Capsicum chinense* that attracted my attention because of its tantalizing fruit color transitions.

'Cajamarca' is named after the city of Cajamarca, the capital of the region by the same name, and the most important city of the Northern Andes mountain range in Peru. Located in a beautiful valley, Cajamarca is a city of colonial charm, much like Cusco, but yet to be discovered by tourists.

Cajamarca has great historical significance because it was the site of the capture, ransom and execution of the Inca leader, Atahualpa, by the Spanish conquistador, Francisco Pizarro, in 1532. Peruvians remember

Cajamarca as the place where the Inca Empire came to an end, and because of the importance of the pre-Hispanic and colonial monuments, Cajamarca has been declared as an "American Heritage Site" by UNESCO. The Cajamarca region also expands into the Amazon Rainforest, where the 'Cajamarca' chile pepper originates.

'Cajamarca' is as appealing to the eye as it is to eat, with beautiful fruit that begins a vibrant violet unique to *C. chinense* and then changes to a rich red. The wonderfully fragrant aroma of 'Cajamarca' captures your attention with an intense, spicy-citrus fragrance and the classic habanero fruity undertone. It has the delayed heat characteristic of *C.*

chinense; the heat level is in the medium range for a *C. chinense* cultivar.

The lush green plants of 'Cajamarca' have semi-glossy foliage and will grow into a tall, upright bush generously loaded with fruits that will provide a bountiful harvest all summer. The fruit shape and size are much like the regular orange habanero: wrinkled, one inch to one and a half inch long Chinese lantern-type fruit with a tapered end.

'Cajamarca' is a chile pepper to show off in the pepper patch. It invites you to use your senses in exploring it through smell, sight and taste. I have no doubt that this chile pepper will become a classic cultivar in the years to come and will be held in high esteem by all chile pepper aficionados.



Cajamarca is famous for this unique, wide-brimmed hat worn by both men and women. It is made from paja, the mid-rib of a palm tree frond. The material is woven by hand, and the hat is shaped by the way in which this is done.



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The Chile Pepper Institute Newsletter

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RECIPE: Menudo

3 pounds beef tripe
 3 pounds hominy, frozen (not canned)
 3 pounds pigs feet, quartered
 1 large onion, diced
 1 bunch green onions, cut into 1/4-inch pieces, plus more chopped small for garnish
 1 bunch cilantro, chopped, plus more for garnish
 2 tablespoons fresh oregano leaves
 1 tablespoon freshly ground black pepper
 1 tablespoon red pepper flakes from dried New Mexican chile pods
 1 head of garlic
 2 tablespoons salt
 1 to 2 piquin chiles, minced, for garnish
 Lemon wedges, for garnish
 24 tortillas, warmed

Wash tripe thoroughly. Remove the excess fat from the tripe and cut it into bite-sized pieces. Rinse the hominy well in a colander under running water. Wash the pigs feet well also.

Combine all ingredients, except for garnishes, in a large pot with enough water to cover. Bring to a boil, and then reduce heat to low and simmer slowly until hominy opens and is cooked. Do not overcook. Skim the excess fat from the surface. It is best to refrigerate the menudo in order to remove all of the grease.

Ladle into bowls, and garnish with additional fresh cilantro, chopped green onions, minced chile piquins, and lemon wedges. Serve with warmed tortillas.

Publicity of Bhut Jolokia Increases Assam Exports 10-fold

This remote Indian region faces bloody insurgencies, widespread poverty and a major industry, tea farming - in deep decline. However, hope may be found in the form of a thumb-sized chile pepper with frightening potency known as the spiciest chile pepper in the world.

For generations, though, it's been loved in India's northeast, eaten as a spice, a cure for stomach troubles and, seemingly paradoxically, a way to fight the crippling summer heat. Now, though, with scientific proof that catapulted the Bhut Jolokia into the record books, northeast India is taking its chile pepper to the outside world.

Exporters are eagerly courting the international community of rabid chile-lovers, a group that has traded stories for years about a mysterious, powerful Indian chile pepper. Farmers are planting new fields of Bhut Jolokia; government officials are talking about development programs. Chances are no one will get rich. But in a region where good news is a rarity, the world record status has meant a lot of pride - and a little more

business.

'It has got tremendous potential' says Leena Saikia, the managing director of Frontal Agri Tech, a food business in

Assam that has been in the forefront of Bhut Jolokia exports. Last year, her company shipped out barely a ton of the fiery chile pepper pods. This year, amid the surge in publicity, the goal is 10 tons to nearly a dozen countries.

The scientific confirmation came earlier this year from New Mexico State University's Chile Pepper Institute, where spiciness is a religion. The Institute got its first Bhut Jolokia seeds in 2001, but it took years to

grow enough chile peppers for testing. Their results backed up by two independent labs and heralded by Guinness were astonishing. The chile pepper is known by any number of names across India's northeast. It's the poison chile in some areas, the king of the chiles in others. In Nagaland, it's eaten in nearly every meal, as a result, it is often called the Naga mircha - the "Naga chile."

Associated Press Oct 07



Chile Pepper Institute photo

Seed is available from the Chile Pepper Institute

Chile Peppers - A Hot Topic for Anesthesia Researchers

Devil's Revenge. Spontaneous Combustion. Hot sauces have names like that for a reason. Now, scientists are testing if the stuff that makes the sauces so savage can tame the pain of surgery. Doctors are dripping the chemical that gives chile peppers their fire directly into open wounds during knee replacement and a few other highly painful operations. These experiments use an ultra-purified version of capsaicin to avoid infection - and the volunteers are under anesthesia so they don't scream at the initial burn.

How could something searing possibly soothe? Bite a hot chile pepper, and after the burn your tongue goes numb.

The hope is that bathing surgically exposed nerves in a high enough dose will numb them for weeks, so that patients suffer less pain and require fewer narcotic painkillers as they heal. Chile peppers have been part of folk remedy for centuries, and heat-inducing capsaicin creams are a drugstore staple for aching muscles. But today the spice is hot because of research showing capsaicin targets key pain-sensing cells in a unique way. California-based Anesiva Inc.'s operating-room experiments aren't the only attempt to harness that burn for more focused pain relief.

Harvard University researchers are mixing capsaicin with another anesthetic in hopes of developing epidurals that wouldn't confine women to bed during childbirth, or dental injections that don't numb the whole mouth. And at the National Institutes of Health (NIH), scientists hope early next year to begin testing in advanced cancer patients a capsaicin cousin that is 1,000 times more potent, to see if it



can zap their intractable pain. Nerve cells that sense a type of long-term throbbing pain bear a receptor, or gate, called TRPV1. Capsaicin binds to that receptor and opens it to enter only those pain fibers - and not other nerves responsible for other kinds of pain or other functions such as movement.

These so-called C neurons also sense heat; thus capsaicin's burn. But when TRPV1 opens, it lets extra calcium inside the cells until the nerves become overloaded and shut down. That's the numbness.

Among early results: In a test of 41 men undergoing open hernia repair, capsaicin recipients reported significantly less pain in the first three days after surgery, Aasvang reported this month at a meeting of the American Society of Anesthesiologists. In a pilot U.S. study of 50 knee replacements, the half treated with capsaicin used less morphine in the 48 hours after surgery and reported less pain for two weeks. Ongoing studies are testing larger doses in more patients to see if the effect is real. There's a huge need for better surgical pain relief, says Dr. Eugene Viscusi, director of acute pain management at Thomas Jefferson University in Philadelphia, one of the test sites.

NIH hopes to test a capsaicin cousin called resiniferatoxin in advanced cancer patients whose pain no longer is relieved by opioids. Injections into the spinal columns of cancer-riddled dogs did more than temporarily numb - it severed some nerve connections.

The Associated Press - Oct 07

Report From the Singer Garden

Art Singer is a longstanding member of the Chile Pepper Institute and grows several varieties of chile peppers every year in his home garden. His 2007 garden had Kung Pao, serrano, cayenne, chocolate habanero and Red Savina habanero plants. He had several plants that were interspecific hybrids from the previous year's planting. He was curious with one particular plant that developed pods

late after the plant grew to a whopping 5 feet tall. He described the pods as "wrinkled jalapenos" but knew he had not planted any jalapenos in several years. After a taste test, which turned out to be quite hot, he decided to prolong the life of these plants by cloning. He took six cuttings and treated them with rooting hormone. The clones are currently overwintering in his home. He has great expectations for these hybrids come spring.

CAPSICUM NEWS

Drying Chile Peppers at Home

An Austrian chile pepper fan tried to take a shortcut by putting about two pounds of fresh chile peppers into his microwave oven. This experiment left tenants of an apartment house in Vienna coughing and with tears in their eyes. Even firemen could only enter the building with breathing apparatus. After locating the source of the fiery fumes, they ordered the guy to refrain from drying his hot chile peppers that way in the future.

AP wire service

Salsa's Been Hot for Centuries

A Smithsonian archaeologist has found evidence for what could be the seeds of salsa. Native farmers, using caves as seasonal shelter as long as 1,400 years ago in the southern Mexican province of Oaxaca, were eating a diet that would look very familiar in a modern Mexican kitchen. They ate corn, beans, squash, chiles, agave, tropical fruits and even avocados, said Linda Perry, a specialist in the Smithsonian's Archaeobiology Program.

"There's even fermented agave tequila." Perry said. "These people apparently loved their

chile peppers. Perry found evidence of 10 kinds of the fiery fruit in the little summer farming settlement. Some chile peppers were apparently grown near the caves. The rest the farmers brought with them, dried, when they headed for the fields to tend their summer crops. And what were they doing with their chile? Using it to flavor foods, or chopping it up to make a sort of proto-salsa, Perry guesses. Perry admits that is only a guess. "They didn't leave us any recipes, unfortunately," she said. "But all the components are there." Perry's analysis is being published in the Proceedings of the National Academy of Science. *Albuquerque Journal Dec 07.*



Koreans Eating Spiciest Food Ever

The kimchi that Koreans eat now is much spicier than it was just five years ago, a study has found. A team headed by Dr. Ku Kyung-hyung, of the Korea Food Research Institute released a report that shows the level of capsaicin has more than doubled in Korea's hallmark dish in the past five years. Annual consumption of chile pepper per person is 4 kilograms (8.8 pounds) in Korea, by far the highest in the world. Korean food experts agree that there has never been a time in the entire history of Korea when food was as hot as it is today. Hot dishes like fire chicken, chile short ribs, red noodles and spicy steamed seafood have become favorite items in Korean restaurants in the past two or three years and 70 percent of instant noodle varieties are spicy.

Some say people crave spiciness during times of crisis or social unrest. Kim Ju-hyeon, the Korea Food and Nutrition Foundation's head researcher shares this belief.

"After having come to Korea in the time of Toyotomi Hideyoshi's invasion in the 1590s, chile peppers firmly established their presence on the tables of ordinary Koreans by the 18th century," Kim said. "There was a surge in spicy food in Korea after the Asian financial crisis. This may be coincidence but it appears that people tend to want spiciness when things aren't going well."

Dr. Ku of the Korea Food Research Institute said that the Korean preference for spiciness is changing the taste of our traditional food. "Some people say the chemical compound capsaicin is good for dieting, and there indeed have been papers written on how the chemical protects our gastric membrane, but chile pepper is not composed of capsaicin alone, Ku added. *F fiery-foods.com*

Use of Chile Pepper Extracts on the Control of Insect Pests

A recent study on the use of chile pepper extracts on the control of insect pests was conducted. There has been increased interest in using natural products for pest control. Crude extracts from different species and varieties of hot chile peppers were prepared and tested under laboratory conditions for their insecticidal performance. Mortality was greatest (94%) when fruit extract of accession of a *C. annum* variety was sprayed on larvae of the cabbage looper, while crude extracts of a *C. frutescens* variety and another *C. annum* variety were repellent to the spider

BURNING QUESTIONS

Q. I am hoping you can answer a question I have about a type of hot pepper. In Italian restaurants they use red chile pepper flakes. This is a hot chile pepper. Can you tell me which chile pepper is used to make this. Thanks, Bob

A. These elusive pods known only to chile pepper aficionados as the red flakes at the pizza place are more than likely a medium heat New Mexican pod type or cayenne, allowed to fully mature and dry. We have tried several times to germinate seeds from these flakes to no avail.

Q. I have a small red chile pepper plant in my kitchen, the chiles are starting to shrivel up. I have tried not watering often and I have tried watering more. What am I doing wrong? Thank you! Lori

A. You are not doing anything wrong, this is a normal process for the chile pepper pods. Once the pods have fully matured they will start to dry on the plant, hence the wrinkling. They can be picked and dried at this point for later use as flakes or ground into powder for spice. Once the pods have been removed from the plant, it will go through a "resting" stage where it is putting energy and nutrients into root development, it will then start to produce new stems and leaves and subsequently a new round of flowers.

Q. We live in the United Kingdom, our summer has not been

the hottest but averaged around 65 degrees F for the most part. We have grown jalapenos and we are finding there is no heat in the pods, I have been growing these for around 30 years and never experienced it. My thoughts are the seed was poor or may be a variant. Is it possible that the lack of bright sunlight hours could cause a reduction in the production of capsaicin? I have grave doubts myself but other people are suggesting it, but as I have discovered the plants themselves were strong and healthy and the fruit was in good numbers.
Regards, Aidy



A. Environment plays a huge role in the development of capsaicinoids in hot chile peppers. When a plant is put under any type of stress while it is producing pods, it will produce a greater amount of capsaicinoids in those pods. Likewise, if a plant has ideal conditions it will produce milder pods.

News continued

mite. The differences in chemical composition of the crude fruit extracts that may explain the observed differences in mortality and repellency among accessions was also investigated.

Gas Chromatography-Mass Spectrometry analysis revealed that capsaicin and dihydrocapsaicin were not correlated with toxicity or repellency, indicating that the two capsaicinoids are not likely related to the effectiveness of chile pepper fruit extracts. Major compounds in hot chile pepper fruit extracts were detected and identified as pentadecanoic acid methyl



ester, hexadecanoic acid methyl ester, and octadecanoic acid methyl ester are likely related to cabbage looper mortality. Chile pepper extracts could be useful for managing populations of cabbage loopers and spider mites, which

could reduce reliance on synthetic pesticides. Further study is needed to investigate performance of hot chile pepper extracts under ultraviolet light and field conditions. *Environmental Science and Health*, July 07.

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