CAYENNE

Capsicum frutescens L.

Family

Solanaceae, commonly referred to as the nightshade family which also includes potatoes, tomatoes and eggplants (for which the cayenne plant is a good growing companion).[1]

Parts Used

Fruit

Description

Cayenne is a shrubby, tropical perennial plant which can grow up to one to two metres tall. It is indigenous to Mexico, and Central America, but now grows in the subtropical and tropical zones of Europe, Asia, Africa and North America. Its branches and stems are hardwood and angular, and the greenish or yellowish-white flowers bloom in pairs or clusters. The leaves are broad, elliptical (broadest in the middle), puffy and wrinkled. In general cayenne is characterised by having small, conical, upright, spicy fruits, with a thin fruit wall, generally red, orange or yellow when ripe. However, variations in the shape, position, size and colour of fruits have been observed which has led to them being classified as domesticated. The most common example, previously considered as the only domesticated form for a long time, is the popular so-called “Tabasco pepper”, cultivated in the United States.[2 3]

Traditional Use

Cayenne, a stimulating herb made from the dried pods of chilli peppers, is well known for its pungent

taste and smell. It was first introduced to the world by the Caribbean Indians who gave it to Columbus. Since then its popularity has spread, and it has become an important spice particularly in Cajun and Creole cooking, and in the cuisines of southeast Asia, China, southern Italy and Mexico. Enlisting the "fight fire with fire" concept, people in subtropical and tropical climates consume cayenne regularly because it helps them tolerate the heat. Cayenne has the ability to make the consumer sweat and, as it evaporates, the sweat cools down the body. As well as being a popular spice used in many different regional styles of cooking, it has also been used medicinally for thousands of years.[4]

The common word "chilli" is often used for cayenne and other Capsicum genus plants. The word chilli has roots in the Aztec language. Cayenne is also known as cayenne pepper, or tabasco pepper, whereas *Capsicum annum* is known as, depending on the variety, paprika, chilli or capsicum (the larger, bell-shaped fruit that has a sweet taste). To say cayenne is hot is an understatement. It packs a potent punch that knocks your socks off. This thrills some and dismays others. The modern use of the word "spicy" as a synonym for "hot" is almost entirely the fault of cayenne. Despite its potency cayenne is perhaps one of our most underestimated herbs. Dr. Richard Shulze, one of America's foremost authorities on herbal medicine says "If you master only one herb in your life, master cayenne pepper. It is more powerful than anything else."[5 6 7]

The fruit pungency is due to alkaloid compounds known as capsaicinoids. They are commonly called capsaicin because it is the most prevalent among the seven capsaicinoids. It is thought this alkaloid evolved, as did many other plant alkaloids, as a protection against predators. Since capsaicin is oil soluble and not soluble in water, drinking water does not help relieve the hot sensation. Instead, thick cream, milk or yoghurt is said to neutralise the burn. This is not only due to the fats present but also the casein, a protein found in dairy products, which strips the capsaicin molecules from the receptors and "puts out the fire". Pungency is dependent on the genetic makeup of the plant and other environmental factors. Generally, the hotter the pepper the more capsaicin it contains. Among the cultivated peppers *C. frutescens* is one of the highest and *C. annuum* is the most variable in pungency. Chillis even have their own dedicated unit of measurement for heat called the Scoville Heat Unit (SHU). This was devised in 1912 by American pharmacist Wilbur Scoville who was researching the counterirritant (creating pain or inflammation in one area to lessen the pain in another) effects of chilli compounds. It is a subjective assessment derived from the capsaicinoid sensitivity by people experienced with eating hot chillis. Capsaicin can desensitise the testers, causing sensory fatigue, so although this measurement has its shortcomings,

as a broad indicator it is still acceptable and has been updated with more rigorous modern chemical analysis. The hottest chilli in the world is the Carolina Reaper. It registers over 2,200,000 SHUs. In comparison, Jalapeños register about 5,000 SHUs and cayenne at 30,000 to 50,000 SHUs. Capsicums have 0 SHUs, the "coolest" chilli on the scale.[8 9 10 11 12]

Cayenne is a circulatory stimulant that can be taken internally in very small amounts, or applied topically, to enhance circulation and blood flow. It can be used for cold hands and feet when there is insufficient peripheral circulation, for debility, warding of colds and to support a healthy heart. Cayenne has well known antioxidant properties such as carotenoids. A diet high in antioxidants has been shown to decrease free radical damage to the arteries and support the healthy functioning of the entire cardiovascular system. American herbalist Dr. John Christopher famously used cayenne to stop people from having heart attacks. His preferred method of administration was a hot tea made with one teaspoon of cayenne to one cup of water. One of the United States' most renowned herbalists, author Matthew Wood shares his experience: "In heart attack, Dr. Christopher always considered cayenne pepper to be a specific. He said he never lost a case. I have had three cases where the symptoms looked like heart attack and Capsicum (homeopathic 6x potency) relieved in all cases. This remedy works because it opens the peripheral capillaries, increases circulation to the periphery, and decreases the pressure on the heart from pooling of blood in the interior". It may also be useful for weight loss where it increases satiety, and therefore may be helpful in preventing overeating. The pungent principles are thought to stimulate and aid digestion, useful for flatulent dyspepsia, and to act as a counterirritant when applied externally, in the form of a cream, ointment or plaster, for problems such as rheumatic pains where it has a paradoxical action. In *The Eclectic Materia Medica, Pharmacology and Therapeutics* (1922) Eclectic medical doctor Harvey Wickes Felter wrote "Tincture of Capsicum is an important topical stimulant, rubefacient, and counterirritant. By its revulsive [obsolete synonym for counterirritant] action it often relieves local pain. Painted upon chilblains it quickly gives relief."[13 14]

Not known as a "gentle" remedy cayenne was the key ingredient in the Materia Medica of Samuel Thomson (with lobelia) because of its intense ability to bring "vital heat" to the body. Thomson was the founder of the alternative system of medicine known as "Thomsonian Medicine", which enjoyed wide popularity in the United States during the 19th century. According to Simon Mills this was during a time of drastic indications, such as savage infectious disease, so crude and heroic (aimed at saving a person's life despite the potential harm that it may come with) treatment was often the only life-saving option. Cayenne enabled early practitioners to develop a good reputation in primary health care and compare favourably to allopathic physicians.[15]

Constituents

Capsaicin and other capsaicinoids (including dihydrocapsaicin, norcapsaicin, nordihydrocapsaicin, nornordihydrocapsaicin, homocapsaicin, homodihydrocapsaicin), steroidal saponins, essential oils and flavonoids, phenolic acids, carotenoids, such as b-carotene and lutein, vitamin A, vitamin C and tocopherols, components known for their antioxidative properties.[16]

Actions

Circulatory stimulant, metabolic stimulant, stimulating diaphoretic, stimulating expectorant, immunostimulant, decongestant, antipyretic, carminative, antispasmodic, antimicrobial, analgesic, styptic, antioxidant, antihypertensive, rubefacient, counterirritant, antifungal.

Pharmacological Activity

Analgesic Activity

A recent Cochrane review found that when cayenne is topically applied as a plaster or cream it appears to reduce pain more than placebo and could be considered as a treatment option for chronic low back pain. Low back pain is a common condition and imposes a substantial economic burden upon people living in industrialised societies. There were 14 randomised controlled trials included (2050 participants) in the review of herbal medicines for back pain. The researchers found that cayenne cream or plaster probably produces more favourable results than placebo in people with chronic lower

back pain (three trials, 755 participants).[17]

Cardiovascular Activity

A randomised cross-over study at the University of Tasmania found that regular consumption of cayenne for four weeks increases the resistance of serum lipoproteins to oxidation. During the study 27 participants (13 men and 14 women) ate a 'freshly chopped chilli' blend (30g daily; 55 % cayenne chilli with water, sugar, salt, acetic acid and xanthan) and no chilli (bland) diets which was the participants' usual diet without any chilli. Use of other spices, such as cinnamon, ginger, garlic and mustard, was restricted to minimum amounts. Serum lipids, lipoproteins, total antioxidant status (TAS), serum total cholesterol, high-density lipoprotein (HDL) and triacylglycerols were analysed and measured and low-density lipoprotein (LDL) was calculated.[18]

While the species of chilli was not identified, findings from a large Mediterranean population-based cohort show that regular consumption of chilli pepper is associated with lower risk of total and cardiovascular disease mortality. Eating chillis regularly was also inversely associated with ischemic heart disease and cerebrovascular death risk. These findings are in agreement with, and corroborate, the main results of two earlier studies from China and the United States. Of interest, these findings suggest that the health advantages associated with chilli peppers are likely to be ascribed to the high content of capsaicin, which is far more abundant in chilli than in sweet non spicy peppers. Similar conclusions were reached by a study revealing a positive correlation between frequency of chilli consumption, but not sweet peppers, and muscle strength in adult males. However, Capsicum species contain a large variety of phytochemicals with well-known antioxidant properties, such as carotenoids (β-carotene), capsaicinoids (capsaicin) and flavonoids (quercetin and luteolin). Therefore, a possible synergistic activity of these bioactive compounds cannot be ruled out.[19]

Metabolic Stimulant Activity

Studies in humans have concluded that chilli pepper (species not identified) intake facilitates weight loss through activation of different receptors and improved control of insulin. Evidence from a large epidemiological study appears to corroborate the weight-loss properties of chilli peppers by showing inverse associations with incidence of overweight/obesity.[20]

A study evaluated the effect of 5g of fresh chilli pepper on glucose response after a glucose drink, and metabolic rate, in 10 healthy Thai women. Within 30 minutes after consumption of 5g of cayenne, plasma glucose levels during the absorption period were significantly inhibited. The metabolic rate immediately increased after ingestion and sustained for up to 30 minutes.[21]

Indications

- Poor or impaired peripheral circulation including cold hands and feet, chilblains, Reynaud's disease, neuropathy, shingles pain, rheumatoid arthritis, osteoarthritis, carpal tunnel syndrome, cardiovascular health, hypertension, hypotension, atherosclerosis
- Digestive problems including indigestion, flatulence, colic, parasites
- Debility, fatigue, depression, low libido, cluster headaches, migraine
- To support healthy immune function, upper respiratory infections, especially when there are symptoms of coldness and dampness, emphysema, to provide relief from mucous congestion, mild fever management when there are chills and or shivering
- Modulating inflammation, insulin resistance and type 2 diabetes, gestational diabetes, back pain, psoriasis
- Weight loss (due to increases satiety)
- Topically for toothaches, mouth pain from chemotherapy or radiation, bleeding, headaches, fungal infections, to relieve neuralgia, chilblains, diabetic neuropathy, psoriasis, osteoarthritis arthritis, rheumatoid arthritis, fibromyalgia, menstrual cramps other joint and muscle pain, including in the lower back, postmastectomy pain and as a gargle to relieve sore or inflamed throat, laryngitis

Energetics

Pungent, heating, drying. This means it is best

suited to people who tend to be cool.[22]

Use in Pregnancy

Likely to be safe when used in small amounts and topically. [23]

Contraindications

Occasional hypersensitivity may occur. Avoid contact with the eyes. Caution is advised in peptic ulcer and gastrointestinal reflux. Do not apply to broken skin. Contraindicated in children under age two. However, the German Commission E says cayenne may be used externally in older children as an ointment for muscle pain and as a deterrent for thumb sucking.[24]

Drug Interactions

Caution with anticoagulant/antiplatelet (such as warfarin) drugs as there is a theoretical risk of increased bleeding. Caution with antidiabetic drugs as there is a theoretical risk of additive effects. Caution with theophylline (used to treat lung diseases such as asthma, bronchitis and emphysema) as there is a risk of theoretical increased drug absorption and adverse side effects. While it may not be clinically significant monitor with ACE-inhibitors as there is a theoretical increased risk of drug-induced cough. Monitor with acid-reducing medication as there is conflicting data about improved or worsening outcomes. The combination of topical cayenne with analgesics and non-steroidal anti-inflammatory drugs (NSAIDs) may be beneficial with additive effects possible.[25]

Administration and Dosage

Liquid Extract:	1:3
Alcohol:	63%
Weekly Dosage:[26]	1 to 2mL

References

1. Capsicum frutescens L. World Flora Online c 2023 [Internet] (accessed 27 Jul 2023). Available from https://www.worldfloraonline.org/taxon/wfo-0001020090
2. Carvalho SI, Ragassi CF, Bianchetti LB, Reifschneider FJ, Buso GS, Faleiro FG. Morphological and genetic relationships between wild and domesticated forms of peppers (Capsicum frutescens L. and C. chinense Jacquin). Genet Mol Res. 2014 Sep 12;13(3):7447-64. doi: 10.4238/2014.September.12.11. PMID: 25222244.
3. Cayenne. IMGateway. c2001-2023 UnityHealth Proprietary Limited (accessed 24 Jul 2023). Available from https://www.imgateway.net/page.jsp?profRef=ProfHerbs_Cayenneph
4. Cayenne. IMGateway. c2001-2023 UnityHealth Proprietary Limited (accessed 24 Jul 2023). Available from https://www.imgateway.net/page.jsp?profRef=ProfHerbs_Cayenneph
5. Saleh BK, Omer A, Teweldemedhin B. Medicinal uses and health benefits of chili pepper (Capsicum spp.): a review. MOJ Food Processing & Technology. 2018;6.
6. Biser S. Curing With Cayenne: The Untold, Unknown, and Unpublished Facts About How to Cure with the Greatest Herb of All Time! University of Natural Healing:Virginia. 1997. p.10
7. Chauhan M, Kant C, Negi C, Chauhan P. Blood Circulation Stimulation Properties of Cayenne Pepper:A Review. IOSR Journal of Applied Chemistry, May 2018; 11,(5) Ver. I:78-83 DOI: 10.9790/5736-1105015743 www.iosrjournals.org
8. Bynum H, Bynum W. Remarkable Plants That Shape Our World. Thames & Hudson:London. 2014. p.66.
9. Saleh BK, Omer A, Teweldemedhin B. Medicinal uses and health benefits of chili pepper (Capsicum spp.): a review. MOJ Food Processing & Technology. 2018;6.
10. Farkas J, Mohácsi-Farkas Cs. Foods, materials, technologies and risks. in Encyclopedia of Food Safety, 2014.
11. O'Connell J. The Book of Spice. Profile Books:London. 2015 p.70
12. de la Forêt R. Cayenne Monograph. Herb Mentor c2023 LearningHerbs.com (updated 5 Apr 2021; accessed 17 Jul 2023). Available from https://herbmentor.learningherbs.com/herb/cayenne/
13. Mills S. The Essential Book of Herbal Medicine. Penguin:London. 1991. p.422
14. de la Forêt R. Cayenne Monograph. Herb Mentor c2023 LearningHerbs.com (updated 5 Apr 2021; accessed 17 Jul 2023). Available from https://herbmentor.learningherbs.com/herb/cayenne/
15. Mills S. The Essential Book of Herbal Medicine. Penguin:London. 1991. p.422
16. Ahuja KD, Ball MJ. Effects of daily ingestion of chilli on serum lipoprotein oxidation in adult men and women. Br J Nutr. 2006 Aug;96(2):239-42. doi: 10.1079/bjn20061788. PMID: 16923216.
17. Oltean H, Robbins C, van Tulder MW, Berman BM, Bombardier C, Gagnier JJ. Herbal medicine for low-back pain. Cochrane Database Syst Rev. 2014;2014(12):CD004504. Published 2014 Dec 23. doi:10.1002/14651858.CD004504.pub4
18. Ahuja KD, Ball MJ. Effects of daily ingestion of chilli on serum lipoprotein oxidation in adult men and women. Br J Nutr. 2006 Aug;96(2):239-42. doi: 10.1079/bjn20061788. PMID: 16923216.
19. Bonaccio M, Di Castelnuovo A, Costanzo S, Ruggiero E, De Curtis A, Persichillo M, Tabolacci C, Facchiano F, Cerletti C, Donati MB, de Gaetano G, Iacoviello L; Moli-sani Study Investigators. Chili Pepper Consumption and Mortality in Italian Adults. J Am Coll Cardiol. 2019 Dec 24;74(25):3139-3149. doi: 10.1016/j.jacc.2019.09.068. PMID: 31856971.
20. Bonaccio M, Di Castelnuovo A, Costanzo S, Ruggiero E, De Curtis A, Persichillo M, Tabolacci C, Facchiano F, Cerletti C, Donati MB, de Gaetano G, Iacoviello L; Moli-sani Study Investigators. Chili Pepper Consumption and Mortality in Italian Adults. J Am Coll Cardiol. 2019 Dec 24;74(25):3139-3149. doi: 10.1016/j.jacc.2019.09.068. PMID: 31856971.
21. Chaiyata P, Puttadechakum S, Komindr S. Effect of chili pepper (Capsicum frutescens) ingestion on plasma glucose response and metabolic rate in Thai women. J Med Assoc Thai. 2003 Sep;86(9):854-60. PMID: 14649970.
22. de la Forêt R. Cayenne Monograph. Herb Mentor c2023 LearningHerbs.com (updated 5 Apr 2021; accessed 17 Jul 2023). Available from https://herbmentor.learningherbs.com/herb/cayenne/
23. NatMed (US). Capsicum [Internet]. Somerville (MA): Therapeutic Research Center c2023 [updated Oct 18 2022; accessed Jul 26 2023]. Available from https://naturalmedicines.therapeuticresearch.com/databases/food,-herbs-supplements/professional.aspx?productid=945
24. Cayenne. IMGateway. c2001-2023 UnityHealth Proprietary Limited (accessed 24 Jul 2023). Available from https://www.imgateway.net/page.jsp?profRef=ProfHerbs_Cayenneph
25. Hechtman L. Advanced Clinical Naturopathic Medicine. Elsevier Australia:Chatswood. 2020. p. IT-15-16
26. The British Pharmaceutical Codex [review]. The British Medical Journal. 2 (3847): 605. 29 September 1934.