


Perilla frutescens

See shiso for further discussions of the two distinct botanical varieties. Also see Perilla for a survey of the genus and economic uses.

Perilla	
	
<i>P. frutescens</i> var. <i>crispa</i> forma <i>discolor</i> Makino	
Scientific classification	
Kingdom:	Plantae
(unranked):	Angiosperms
(unranked):	Eudicots
(unranked):	Asterids
Order:	Lamiales
Family:	Lamiaceae
Genus:	<i>Perilla</i> L.
Species:	<i>P. frutescens</i>
Binomial name	
<i>Perilla frutescens</i> (L.) Britton	

Perilla frutescens (L.) Britt. (syn. *Perilla nankinensis* (Lour.) Decne., etc.) is a cultivated plant of the mint family Lamiaceae. It is the species identification encompassing two distinct varieties^[1] of traditional crop in East Asia:

1.) *P. frutescens* var. *crispa* the aromatic leafy herb called by its Japanese name *shiso*, which in turn is a loan word from Chinese: 紫蘇; pinyin: *zi-su*; Wade–Giles: *tsu-su*.^[2] The plant occurs in red (purple-leaved) or green-leaved forms. It also has a less fashionable translated name "**beefsteak plant**", but starting around the 1980s, with the rise of popularity of Japanese cuisine, it has become increasingly more chic for the mass media to use refer to it as *shiso*^[3]
2.) *P. frutescens* var. *frutescens*, the oilseed crop, source of **perilla oil**. This variety is used as an ingredient in Korean cuisine, both "**wild sesame**" (lit. tr. of *deulggae*), and "sesame leaves", which are green. It is known in Japan as *egoma* (where *e-* (荳) is equivalent to Chinese: 荳; pinyin: *ren*; Wade–Giles: *jen*^[4] and Korean:*im*).

The genus name **perilla** is also a frequently employed common name^[5] applicable to both varieties.

Description



Though now lumped into a single species of polytypic character, the two cultigens continue to be regarded as two distinct commodities in the Asian countries where they are most exploited. While they are morphologically similar, the modern strains are readily distinguishable. Accordingly the description separately or comparatively for the cultivars.

Foliage

As a case in point, both varieties have foliage that outwardly look the same: broad ovate leaves which are serrate, arranged opposite. But the green *shiso* leaf

(pictured left) is easily differentiated from "sesame leaf" of the same color (Korean: Hangul: 들깨; RR: *deulggae*; MR: *kkaenip*) by taste and fragrance. The shiso's distinctive flavor comes from its perillaldehyde component, present only in low concentration in the wild sesame foliage. Meanwhile, Korean investigators in recent years found that in the Korean perilla, the most active aroma compounds were perilla ketone, (*Z*)-3-hexenal (green), egoma ketone and isoegoma ketone.^[6]

The red (purple) forms of the shiso (forma *purpurea* and *crispa*) comes from its pigment, called "perilla anthocyanin" or shisonin anthocyanin.^[7] The color is present in both sides of the leaves, as well as the entire stalk, and flower buds (calyxes).

The red crinkly-leafed (called *chirimenjiso* in Japan) was the form of shiso first examined by Western botany, and Thunberg named it *P. crispa* (the name meaning "wavy or curly"). That Latin name was later retained when the shiso was reclassified as a variety.

There are also bi-colored cultivars (var. *Crispa* forma *discolor* Makino; カタメンジソ (*katamenjiso*Help:Installing Japanese character sets)^[8]) which are only red on the bottom (see pictured, top right). There is also green crinkly-leafed cultivars (called *chirimenaajiso*, from *viridi-crispa*).

Sizes and seeds

It has been noted that the wild sesame grow taller (60~150 cm) and yield larger softer seeds, while the shiso are shorter (40~100 cm?) and produce harder smaller seeds.^{[9][10]}

Citable source for diameter difference is wanting, but comparison of seeds by mass shows shiso to weigh about 1.5g per 1000 seeds,^[11] whereas the oilseed weighs 4g per 1000 seeds.

The flawed assertion that "the seeds are difficult to distinguish even by scanning electron microscope" is taken out of context, since the original source actually discusses the carbonized grain excavated lodged in crumbs of breadlike food excavated from Yayoi period or even Jomon Period strata.^[12]

Origins and distribution

Suggested native origins are mountainous terrains of India and China, although some books say Southeast Asia.

It spread throughout China some time in remote antiquity. One of the early mentions on record occurs in *Renown Physician's Extra Records* (Chinese: 名醫別錄; pinyin: *Míng Yī Bié Lù*), ca. 500 AD., where it is listed as *su* (蘇), and some of its uses are described.

The perilla was introduced into Japan around the 8th to 9th century.^[13]

The species was introduced into the Western horticulture as an ornamental, and in the United States became naturalized and established in a widespread area, and may be considered weedy or invasive.

Taxa and synonyma

The classification *Perilla* is confused,^{[14][15]} partly because botanist struggled with how to distinguish the two distinct cultigens (as different spp. or varr.).

An early example of dividing the two cultigens into different species is found in Matsumura's nomenclature book in 1884,^[16] where the synonym *P. arguta* Benth.^[17] is applied to shiso, and the synonym *P. ocymoides* L. was applied to the oilseed perilla.

The species name *P. ocymoides* or *P. ocimoides* has been used to denote the oilseed variety for a long time, especially by the Japanese,^[18] so it should not be considered a synonym for either cultigen interchangeably.

It is well-established that the two varieties are cross-fertile. It has been cautioned that the desired essential oil yield will be compromised if the seed for sowing becomes hybridized, and that "it is very difficult to distinguish genuine perilla seed from hybrid seed".^[19] The escaped types no longer retain the distinctive shiso fragrance and are not fit for consumption.

English common names

The scarlet-leaved form of shiso was introduced into the West, around the 1850s,^[20] when the ornamental variety was usually referred to as *P. Nankinensis*. This red-leafed border plant eventually earned the English-language name "**beefsteak plant**".^[21] This was the English equivalent name was in standard usage over a period, authoritative Kenkyūsha's New Japanese-English Dictionary.^[22] Due to that legacy, the old-fashioned name remains in circulation today

Other common names are: "perilla mint",^[23] "Chinese basil",^[24] or "wild basil" are in use as well.

The alias "wild coleus"^[25] or "summer coleus" probably describe ornamental varieties.

The red shiso or *su tzu* types are called purple mint or purple mint plant.

It is also called rattlesnake weed in the Ozarks, because the sound that the dried stalks make when disturbed along the footpath is reminiscent of the rattlesnake rattling sound.^[26]

Culinary use

The red perilla has red leaves and used mostly in fish stews in China. Koreans make pickled "wild sesame" perilla leaves with red chili powder and soy sauce. Oil extracted from *P. frutescens* var. *frutescens* "is still used to cover cookies in rural areas of Korea". Sometimes, the seeds are ground and added to soup for seasoning in Korea.

The Japanese shiso leaves come in green, red, and also bicolored, and crinkly (*chirimen-jiso*) varieties, as noted. Parts of the plants eaten are the leaves, flower and buds from the flower stalks, fruits and seeds, and sprouts.

Japanese use green shiso leaves raw with sashimi. Dried leaves are also infused to make tea. Wikipedia:Citation needed The red shiso leaf is not normally consumed fresh, but needs to be e.g. cured in salt. The pigment in the leaves turn from purple to bright red color when steeped in umezu, and is used to color and flavor umeboshi.

Industrial use of oil

Until around the Sengoku period (early 16th century) in Japan, perilla oil was important for fueling oil lamps,^[27] until being overtaken by rapeseed oil.

The oilseed contains drying oil elements and imported in bulk as a substitute for linseed oil into the United States from Japan, until the supply was interrupted by war.^[28]

Ornamental use

The red-leaved shiso, in earlier literature referred to as *Perilla nankinensis*, became available to gardening enthusiasts in England ca. 1855. By 1862, the English were reporting overuse of this plant, and proposing *Coleus vershaeffeltii*^[29] or *Amaranthus melancholicus* var. *Ruber* made available by J. G. Veitch as an alternative.

It was introduced later in the United States, perhaps in the 1860s.^{[30][31]}

Chemical composition

The oilseed variety contains about 38-45% lipid.^[32] Expressed from these seeds, the perilla oil exhibits one of the highest proportions of omega-3 (α -linolenic acid (ALA) fatty acids of any seed oil, at 54-64% and only 14% linoleic acid, an omega-6 fatty acid. This unusual n6:n3 ratio gives this crop potential for an alternative to other seed oils.

The Japanese type (i.e. shiso) contain only about 25.2-25.7% lipid,^[33] but still contain a comparable 60% ratio of ALA fatty acid.^{[34][35]}

References

- [1] , p.245-
- [2] , p.651
- [3] , evidence abounds in restaurant reviews and food sections. In the NY Times archives, , review of Gyosai restaurant, seems to be the earliest instance among hundreds of usage that has amassed over the years.
- [4] , p.652
- [5] ,p.82
- [6] , *J. Agric. Food Chem.*, 2009, 57 (24), pp 11537–11542
- [7] p.151
- [8] encyc.
- [9] Encycl. states egoma seeds are about 1.2 mm, slightly larger than shiso seeds. However egoma seeds being grown currently can be much larger.
- [10] , egoma, sometimes classed *P.frutescens* var. *Japonica*, exhibited sizes of 1.4 mm < sieve caliber <2.0 mm for black seeds and 1.6 mm < sieve caliber <2.0 mm for white seeds.
- [11] This is based on 650 seeds/gram reported by a purveyor Nicky's seeds (<http://www.nickys-nursery.co.uk/seeds/pages/altsal1.htm>); this is in ballpark with also quotes 635 per gram, though it is made unclear which variety
- [12] carries SEM photos of such perilla in paleo-bread (two photos at top right).
- [13] , citing: (in Japanese).
- [14] ,p.245 "...taxonomically confused because of their morphological similarity."
- [15] p.1 "nomenclature of *P.* is confusing..", similar assessments are made by other works, and here as elsewhere is cited for the comprehensive taxonomical study.
- [16] , p.136
- [17] , p.677-8
- [18] e.g. occurs in Encyclopedia, though the genus name is misspelt
- [19] ,p.687-
- [20] "Perilla Nankinesnsis, a new and curious plant with crimsn leaves.."; An earlier issue (Vol. 21, Oct. 1853) , p.240, describe it being grown among the "New Annuals in the Horticultural Society's Garden"
- [21] , "name beefsteak plant.. from the bloody purple-red color.."
- [22] Kenkyusha's (1954 edition) was verified.
- [23] , p.1 after Wilson et al., 1977
- [24] , p.3
- [25] , p.1 after Duke, 1988

- [26] ,p.306-8
- [27] Gay, Suzanne (2009). The Lamp-Oil Merchants of Iwashimizu Shrine: Transregional Commerce in Medieval Japan. *Monumenta Nipponica*, 64:1, 1–51. p. 14
- [28] , etc.
- [29] , Pl. 96
- [30] , "Perilla nankinesis was one of the first of the many ormanental foliated plants brought into the gardens and greenhouses of this country within few years. "
- [31] ,p.306-8 gives mid-19th century as introductory period into the US.
- [32] Hyo-Sun Shin, "Ch. 9 Lipid Composition," in , p.93-, citing Sonntag 1979, Vaughan, 1970.
- [33] Hyo-Sun Shin, in , p.93-, citing Tsuyuki et al., 1978
- [34] gives 58%
- [35] , gives 62.3% red, 65.4% green shiso

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