Citrus japonica 'Meiwa'

Scientific Name

***Citrus japonica* Thunb. 'Meiwa'.**

Synonyms

Citrus japonica (Thunb.) 'Nagami' × *Citrus japonica* (Thunb.) 'Marumi', *Fortunella x crassifolia* Swingle pro sp. (sensu Swingle and Reece), *Fortunella crassifolia* Swingle.

Family

Rutaceae

Common/English Names

Meiwa Kumquat, Large Round Kumquat, Sweet Kumquat.

Vernacular Names

Brazil: Kumquat, Kunquat, Laranja De Ouro, Laranja Dos Orientais, Laranja De Ouro Dos Orientais (Portuguese);
Chinese: Chang An Jin Gan, Hou Ye Jin Ju, Jin Dan, Jin Gan, Jin Ju (Fruit), Jin Dan Ju, Ju He (Medicinal Name), Ning Bo Jin Gan, Ning Bo Jin Gan; gīm-gam (Hokkien);
French: Kumquat Doux, Kumquat Meïwa;
Hungarian: Nagy Kumkvat;
Italian: Meiwa Kumquat;
Japanese: Meiwa Kinkan, Nippon Kinkan, Ninpo, Neiha Kinkan;
Korean: Geumgyul;
Nepali: Muntala;
Taiwan: Ning Po Chin Kan;
Thai: Somchíd;
Vietnamese: Cam Quất, Kim Quất.

Origin/Distribution

Citrus japonica is a native of southern China. *Citrus japonica* 'Meiwa' is thought to be a natural hybrid between the oval *Citrus japonica* (Thunb.) 'Nagami' and the round *Citrus japonica* (Thunb.) 'Marumi'. Meiwa kumquat is extensively grown in China and in cooler subtropical areas elsewhere including USA and Australia.

Agroecology

Kumquat including Meiwa kumquat are much hardier than other citrus plants such as oranges. The Meiwa kumquat requires a hot summer, ranging from 25°C to 38°C, but can withstand frost down to about −10°C without injury. It grows in the tea regions of China where the climate is too cold for other citrus fruits. Although slightly less cold-hardy than Nagami it is increasing in popularity.

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Edible Plant Parts and Uses

Its edible uses are as described for Marumi and Nagami kumquats. The fresh fruits are eaten raw or can be preserved, pickled or made into maramalade, candies and jellies. Kumquat fruits are also boiled or dried to make a candied snack called *mứt quất*. Like Nagami kumquats Meiwa kumquats are also used as martini garnish, sliced and added to salads or processed into a liqueur in a clear spirit or vodka.

Plate 1 Meiwa kumquat fruits and leaves

Botany

Meiwa kumquat tree is slow-growing, shrubby, compact, 2.4–4.5 m tall, the branches light-green and angled when young, thornless or sparsely spiny. Leaves are elliptic-lanceolate to ovate-lanceolate, 4–9 cm by 2.5–3.5 cm (Plate 1), apex subacute to obtuse, base broadly cuneate, margin crenulate, glossy green, weakly conduplicate, borne on narrowly winged petioles. Flowers fragrant in 1–3 flowered axillary clusters, petals 5, white, 6–9 mm; stamens 15–25, ovary glabrous, globose to subglobose with one style and globose stigma. Fruit globose, subglobose to short oval-oblong, 2.5–3.2 cm diameter, golden-yellow to orangey-yellow, with a smooth thick sweet rind and 4–7 juicy orange segments containing few 2–4 small ovoid, monoembryonic seeds or seedless (Plates 1 and 2).

Plate 2 Harvested Meiwa kumquats

Nutritive/Medicinal Value

The nutrient composition of raw kumquat (*Fortunella* spp.) (exclude 7% seeds) per 100 g edible portion is reported as: water 80.85 g, energy 71 kcal (296 kJ), protein 1.88 g, total lipid 0.86 g, ash 0.52 g, carbohydrate 15.90 g, total dietary fibre 6.5 g, total sugars 9.36 g, Ca 62 mg, Fe 0.86 mg, Mg 20 mg, P 19 mg, K 186 mg, Na 10 mg, Zn 0.17 mg, Cu 0.095 mg, Mn 0.135 mg, vitamin C 43.9 mg, thiamine 0.037 mg, riboflavin 0.090 mg, niacin 0.429 mg, pantothenic acid 0.208 mg, vitamin B-6 0.036 mg, total folate 17 μg, total choline 8.4 mg, vitamin A 290 IU (15 μg RAE), vitamin E (α-tocopherol) 0.15 mg, total saturated fatty acids 0.103 g, 14:0 0.004 g, 16:0 0.090 g, 18:0 0.004 g;total monounsaturated fatty acids 0.154 g, 16:1 undifferentiated 0.021 g, 18:1 undifferentiated 0.137 g; total polyunsaturated fatty acids 0.171 g, 18:2 undifferentiated 0.124 g, 18:3 undifferentiated 0.047 g; α-carotene 155 mcg, β- cryptoxanthine 193 μg, and luetin + zeaxanthin 129 μg (USDA 2011).

The essential oil of kumquat peel contains much of the aroma of the fruit, and is composed of 71 volatile compound of which the monoterpene (8) limonene, makes up around 93% of the total (Koyasako and Bernhard 1983). Besides limonene and α-pinene (0.34%), both monoterpenes, the oil is unusually rich (0.38% total) in sesquiterpenes (13) such as α-bergamotene (0.021%), caryophyllene (0.18%), α-humulene

(0.07%) and α-muurolene (0.06%), and these contribute to the spicy and woody flavour of the fruit. Carbonyl compounds make up much of the remainder, and these are responsible for much of the distinctive flavour; these compounds include esters (13) such as isopropyl propanoate (1.8%) and terpinyl acetate (1.26%); one ketone, carvone (0.175%); and a range of aldehydes (8) such as citronellal (0.6%) and 2-methylundecanal. Other oxygenated compounds include alcohols (11) such as nerol (0.22%) and the furanoid, trans-linalool oxide (0.15%).

The IC_{50} values of superoxide (O_2^-)- and 1-diphenyl-2-picrylhydrazyl (DPPH)-radical scavenging activity in the skin of Meiwa kumquat decreased in the days after full bloom (DAFB) from 60 DAFB to harvest (Kondo et al. 2005). In contrast, the IC_{50} values of those in the flesh increased with DAFB. The IC_{50} values of DPPH in the skin under high photosynthetic photon flux density (PPFD), and O_2^- in the flesh at a light crop load were higher than those of the control. The IC_{50} of O_2^-- and DPPH-radical scavenging activity in fruit that had been administered ethephon treatment were lower than those in the untreated control. Ethephon-treated fruit also inhibited lipid peroxidation in the red blood cell system. Ascorbic acid or β-cryptoxanthin concentrations in the skin or flesh were higher under high PPFD, at a light crop load, and with ethephon application. These results suggested that environmental and growing factors may regulate the antioxidant compounds in the fruit, influencing antioxidant activity.

Other Uses

In Vietnam, kumquat bonsai trees are used as a decoration for the Tết (Lunar New Year) holidays.

Comments

Meiwa kumquat has larger fruits than Marumi kumquat but the fruits are smaller and more globose than Nagami kumquat.

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