Prunus persica var. nucipersica

Scientific Name

***Prunus persica* var. *nucipersica* (Suckow) C.K. Schneid.**

Synonyms

Amygdalus persica var. *nectarina* Aiton, *Amygdalus persica* var. *nucipersica* Suckow, *Prunus nucipersica* Borkh., *Prunus persica nucipersica* (Suckow.) C.K. Schneid, *Prunus persica* var. *nectarina* (Aiton.) Maxim., *Prunus persica* var. *nucipersica* (Borkh.) C.K. Schneid., *nom. Illeg, Persica vulgaris* Mill. var. *nectarina* (Aiton) Holub.

Family

Rosaceae

Common/English Names

Fresh Nectarine, Nectarine, Smooth-Skinned Peach, Table Nectarine.

Vernacular Names

Chinese: You Tao, Yu T'ao;
Czech: Broskvoň Obecná Nektarinka;
Danish: Nektarin;
Dutch: Nectarine, Naakte Perzik;
Eastonian: Nektariin;
Finnish: Nektariini;
French: Brugnon, Nectarine, Nectarine De Table, Pêche À Peau Lisse;
German: Nektarine, Nektarinenbaum;
Hungarian: Csupaszbarack, Kopaszbarack, Nektarin;
Italian: Nettarina;
Japanese: Yutou, Nekutarina, Nekutarin, Zubaimomo;
Korean: Poksunga Namu;
Maltese: Nuċiprisk;
Portuguese: Nectarina;
Russian: Nektarin;
Spanish: Nectarina;
Swedish: Nektarin.

Origin/Distribution

Nectarine is a smooth-skinned variety or mutation from the peach, *Prunus persica*. Several genetic studies have concluded in fact that nectarines are created due to a recessive gene in its peach parent. Nectarines have arisen many times from peach trees, often as bud sports. Its origin is unknown. Peaches probably originated from China, being one of the first fruit crop domesticated about 4,000 years ago.

T.K. Lim, *Edible Medicinal And Non-Medicinal Plants: Volume 4, Fruits*,
DOI 10.1007/978-94-007-4053-2_56, © Springer Science+Business Media B.V. 2012

Agroecology

Nectarines have similar agro-ecological requirements as peaches. Both are cool temperate species requiring a winter chill period for flowering and fruiting. On average, most cultivars have chill requirements of 600–900 hours, though some newer cultivars have lower winter chill requirement of 350–400 hours. Nectarines are sensitive to spring frost. They grow best in full sun for optimum yield and high quality coloured fruits. Nectarines like peaches thrives best in deep, well-drained, sandy loam to sandy clay loam with a preferred pH near to 6.5. Poorly drained soils and waterlogged soil should be avoided.

Edible Plant Parts and Uses

The ripe fruit and skin can be eaten fresh out of hand. The fresh fruit can be used in ice creams, pies, jams. The fruit can also be cooked and dried for later use. Flowers are edible, eaten in salad or used as a garnish. A tea can be brewed from the flowers. A white liquid can be distilled from the flowers, having a flavour similar to the seed. The seed kernel can be eaten raw or cooked. However it is best avoided raw especially if it is bitter because of hydrocyanic acid as cases of toxicity have been reported. The gum from the stem has been reported to be used for chewing.

Plate 1 Nectarine blossoms

Plate 2 Nectarine fruits and leaves

Botany

A small, vigorous, deciduous tree 3–7 m high with a spreading crown of 3 m and dark brown scabrous bark. Petiole 10–15 mm, longitudinally grooved with reniform nectaries. Leaves alternate, simple, lanceolate, oblong-lanceolate to elliptic-lanceolate, 7–15 × 2–3.5 cm, apex acuminate, base cuneate, margin finely serrate or serrulate, green, both surfaces glabrous (Plates 2 and 3). Flowers solitary, opening before leaves, 2–3.5 cm in diam. Pedicel very short 4–4.5 mm. Hypanthium green with a red tinge, shortly campanulate, glabrous. Sepals 5 ovate to oblong, upper surface glabrous, lower pubescent; petals pink (Plate 1) or white, alternately arranged to sepals, orbicular, apex rounded, base narrows at point of attachment, both upper and lower surfaces glabrous; Stamens – numerous 30–(−44)–50, filament white, 14–17 mm, anther reddish; ovary glabrous, style slightly longer than stamens. Drupe globose to subglobose, (3–)5–7(−10) cm in diameter, glossy golden yellow with

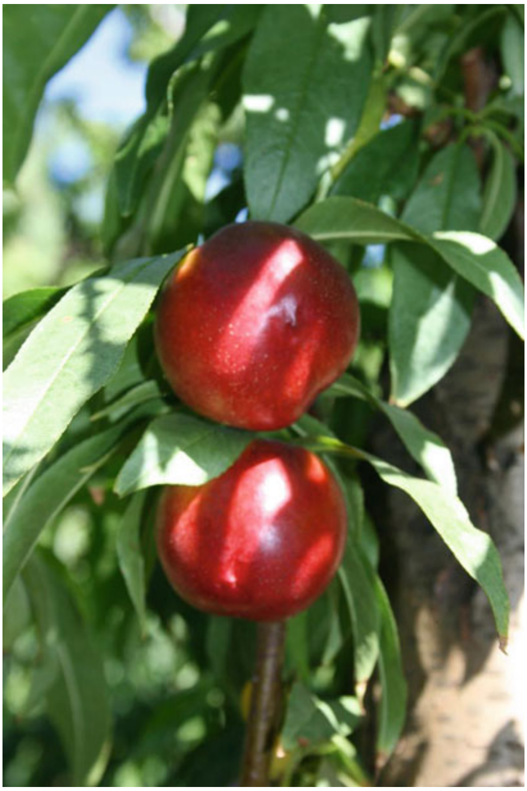

Plate 3 Ripening nectarines

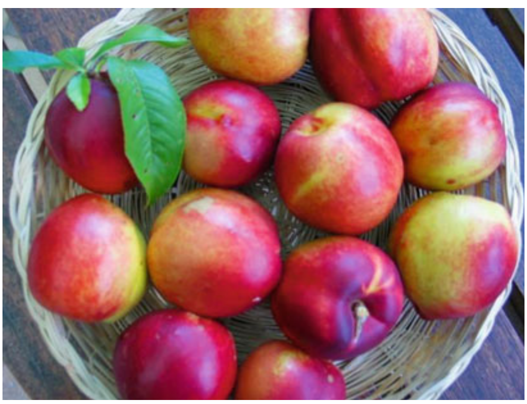

Plate 4 Harvested nectarines

large blushes of red or completely red to maroon (Plates 2, 3, 4, 5, 6, 7, 8). The skin exocarp is thin, smooth, enclosing the firm, fleshy, juicy sweet to acid sweet mesocarp, white or yellow or orangey-yellow (Plates 6, 7, 8) free-stone or cling-stone. The bony endocarp (pit) large, ellipsoid to suborbicular, compressed on both sides, surface longitudinally and transversely furrowed and pitted, surrounding a single, large, ovate seed.

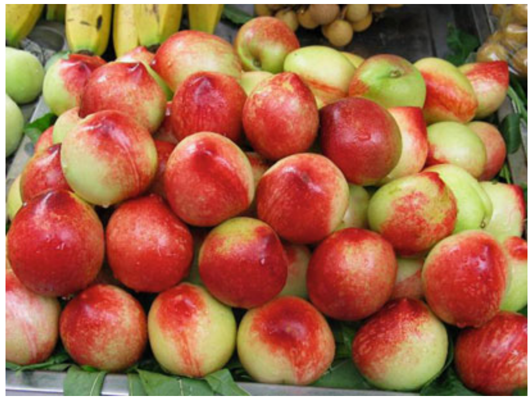

Plate 5 Mature but unripe nectarines on sale in a north Vietnam market

Plate 6 Ripe golden-yellow fleshed nectarine

Plate 7 Ripe white-fleshed nectarines

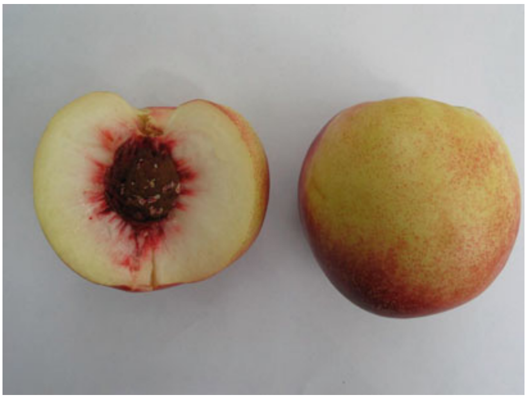

Plate 8 Whole and halved white-fleshed nectarine

Nutritive/Medicinal Value

Food value of raw, nectarine fruit (refuse 9% pit) per 100 g edible portion was reported as follows (USDA 2011): water 87.59 g, energy 44 kcal (185 kJ), protein 1.06 g, total lipid (fat) 0.32 g, ash 0.48 g, carbohydrate 10.55 g; fibre (total dietary) 1.7 g, total sugars 7.89 g, sucrose 4.87 g, glucose 1.57 g, fructose 1.37 g; minerals – calcium 6 mg, iron 0.28 mg, magnesium 9 mg, phosphorus 26 mg, potassium 201 mg, sodium 0 mg, zinc 0.17 mg, copper 0.086 mg, manganese 0.054 mg; vitamins – vitamin C (total ascorbic acid) 5.4 mg, thiamin 0.034 mg, riboflavin 0.027 mg, niacin 1.125 mg, pantothenic acid 0.185 mg, vitamin B-6 0.025 mg, folate (total) 5 µg, total choline 6.2 mg, betaine 0.2 mg, vitamin A 332 IU (17 µg RAE), vitamin E (α-tocopherol) 0.77 mg, β-tocopherol 0.01 mg, γ-tocopherol 0.01 mg, δ-tocopherol 0.01 mg, vitamin K (phylloquinone) 2.2 µg, lipids – fatty acids (total saturated) 0.025 g, 16:0 (palmitic acid) 0.023 g, 18:0 (stearic acid) 0.002 g; fatty acids (total monounsaturated) 0.088 g, 16:1 undifferentiated (palmitoleic acid) 0.002 g, 18:1 undifferentiated (oleic acid) 0.086 g; fatty acids (total polyunsaturated) 0.113 g, 18:2 undifferentiated (linoleic acid) 0.111 g, 18:3 undifferentiated 0.002 g, β-carotene 150 µg, β-cryptoxanthin 98 µg, lutein + zeaxanthin 130 µg; amino acids – tryptophan 0.005 g, threonine 0.009 g, isoleucine 0.009 g, leucine 0.014 g, lysine 0.016 g, methionine 0.006 g, cystine 0.005 g, phenylalanine 0.011 g, tyrosine 0.007 g, valine 0.013 g, arginine 0.009 g, histidine 0.008 g, alanine 0.017 g, aspartic acid 0.568 g, glutamic acid 0.034 g, glycine 0.011 g, proline 0.010 g, and serine 0.018 g.

Sugars (glucose, fructose, sucrose and sorbitol) and organic acids (citric, malic, shikimic and fumaric acid) in fruits were identified in all cultivars of peach and nectarine studied in Slovenia (Colaric et al. 2004). Sucrose was the major sugar and malic and citric acids were the predominant organic acids. The content of fructose ranged from 6.76 to 12.97 g/kg, glucose from 5.43 to 11.11 g/kg, sucrose from 46.14 to 70.7 g/kg and sorbitol from 0.40 to 2.80 g/kg of fruits. The content of citric acid ranged from 1.71 to 8.34 g/kg, malic acid from 3.2 to 8.05 g/kg, shikimic acid from 127 to 809 mg/kg and fumaric acid from 1.56 to 6.09 mg/kg of fruits. The content of total sugars ranged from 61.53 to 93.70 g/kg and the content of total organic acids ranged from 7.06 to 14.69 g/kg of fruits.

The volatile components in nectarine fruit were found to consist of 10 lactones, 8C_6 aldehydes and alcohols, 8 terpenoids, 3 esters, and 4 other compounds. Besides C_6 components a series of saturated and unsaturated γ and δ lactones ranging from chain length C_6–C_{12} with concentration maxima for γ and δ decalactone formed the major class of constituents (Engel et al. 1988).

Glycosidically bound volatile constituents of yellow-fleshed clingstone nectarines (cv. Springbright) were identified and quantified at three stages of maturity (Aubert et al. 2003). Forty-five bound aglycons were identified in yellow-fleshed nectarine. Thirty were terpene derivatives, and the most abundant ones were (E)- and (Z)-furan linalool oxides, linalool, α-terpineol, (E)-pyran linalool oxide, 3,7-dimethylocta-1,5-diene-3,7-diol, linalool hydrate, 8-hydroxy-6,7-dihydrolinalool, (E)- and (Z)-8-hydroxylinalools, and (E)- and (Z)-8-hydroxygeraniols. The group of C_{13} norisoprenoids included 3-hydroxy-β-damascone, 3-hydroxy-7,8-dihydro-β-ionone, 3-oxo-α-ionol, 3-hydroxy-7,8-dihydro-β-ionol, 3-hydroxy-β-ionone, 3-oxo-7,8-dihydro-α-ionol, 3-hydroxy-5,6-epoxy-β-ionone, 3-oxo-retro-α-ionol (isomers I and II), 3-hydroxy-7,8-dehydro-β-ionol, 4,5-dihydrovomifoliol, and vomifoliol. Generally, levels of bound compounds, in particular monoterpenols and C13 norisoprenoids, increased significantly with maturation. δ-decalactone was the only lactone found in the enzymatic hydrolysate of yellow-fleshed nectarine, but its level was much lower than that of its free form.

The phenolic compounds hydroxycinnamates, procyanidins, flavonols, and anthocyanins were detected and quantified in nectarine cultivars (Tomás-Barberán et al. 2001). As a general rule, the peel tissues contained higher amounts of phenolics, and anthocyanins and flavonols were almost exclusively located in this tissue. No clear differences in the phenolic content of nectarines were detected between white flesh and yellow flesh cultivars. There was no clear trend in phenolic content with ripening of the different cultivars. Some cultivars, however, had a very high phenolic content. For example, the white flesh nectarine cultivar Brite Pearl (350–460 mg/kg hydroxycinnamates and 430–550 mg/kg procyanidins in flesh) and the yellow flesh cv. Red Jim (180–190 mg/kg hydroxycinnamates and 210–330 mg/kg procyanidins in flesh), contained 10 times more phenolics than cultivars such as Fire Pearl (38–50 mg/kg hydroxycinnamates and 23–30 mg/kg procyanidins in flesh).

The gum exudate polysaccharide from the trunk of nectarine (PPNEC) was found to compose of arabinose, xylose, mannose, galactose, and uronic acids in 37:13:2:42:6 Molar ratio and had molecular weight of 3.93 × 106 g/mol (Simas-Tosin et al. 2009). Methylation analysis of PPNEC indicated a highly branched structure with relatively high amounts of di- (16%) and tri-O-substituted (9%) Galp units and non-reducing end-units of Araf (26%) and Xylp (17%). Combination with 13C NMR data, showed the presence of α-l-Araf (non-reducing end, 3-O-, 5-O-, and 2,5-di-O-subst.), β-l-Arap (4-O- and 2,4-di-O-subst.), β-d-Galp (3-O-, 2,3-di-O-, 3,6-di-O-, and 3,4,6-tri-O-subst.), and α- and/or β-d-Xylp non-reducing end-units. PPNEC had structures similar to those of polysaccharide from peach tree gum, although in different proportions and with a lower molecular weight.

Antioxidant Activity

Gil et al. (2002) reported on the antioxidant capacities, phenolic compounds, carotenoids, and vitamin C contents of nectarine as follows. The ranges of total ascorbic acid (vitamin C) (in mg/100 g of fresh weight) were 5–14 mg (white-flesh nectarines), 6–8 mg (yellow-flesh nectarines); total carotenoids concentrations (in μg/100 g of fresh weight) were 7–14 μg (white-flesh nectarines), 80–186 μg (yellow-flesh nectarines), and total phenolics (in mg/100 g of fresh weight) were 14–102 mg (white-flesh nectarines), 18–54 mg (yellow-flesh nectarines). The contributions of phenolic compounds to antioxidant activity were much greater than those of vitamin C and carotenoids. There was a strong correlation (0.93–0.96) between total phenolics and antioxidant activity. Anthocyanin, carotenoids and vitamin C play important role in the antioxidant capacity of ripened nectarine fruits and their content was strongly dependent on harvest date (Ghasemi et al. 2011). Total phenol content and flavonoids decreased with nectarine fruit maturity and ripening. Sucrose levels in ripened nectarine decreased due to conversion to fructose or glucose. Antioxidant capacity and contents of total phenolics, anthocyanins, flavonoids, and vitamin C of peach and nectarine were found to be influenced by genotype and flesh colour traits (Cantín et al. 2009; Abidi et al. 2011).

Traditional Medicinal Uses

As described for peaches.

Other Uses

Similar to those described for peaches.

Comments

Nectarine is easily propagated from semi-hardwood or hardwood cuttings and by bud-grafting as they do not come true from seeds.

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