Citrus australasica

Scientific Name

***Citrus australasica* F. Muell.**

Synonyms

Microcitrus australasica var. *australasica* (F. Muell.) Swingle.

Family

Rutaceae

Common/English Names

Australian Finger Lime, Finger Lime, Native Finger Lime, Queensland Finger, Sauvage Lime.

Vernacular Names

French: Lime Digitée d'Australie;
German: Australische Limette.

Origin/Distribution

Citrus australasica is native to Australia, occurring in northern New South Wales and southern Queensland.

Agroecology

In its native range, it grows as an understorey shrub or small tree in dry and subtropical lowland and is rainforest, especially common in regrowth. In cultivation, *C. australasica* is hardy in tropical to temperate climates in well drained conditions.

Edible Plant Parts and Uses

The finger lime is enjoying popularity as a gourmet bush food and is being sold and served in restaurants and exported as fresh fruit. Its juicy vesicles resemble pearls of caviar which are often used as garnish or added into various food recipes. Boutique marmalades and pickles are also made from finger lime. Because of its acidic nature, finger lime is best used for cooking, jams, garnished sauces and drinks. Finger lime peel can be dried and used as a flavouring spice.

Botany

A medium to large armed, shrub or small tree, 2–6 m high with solitary axillary straight spines and compact crown. Leaves are small, glabrous, obovate to elliptic or more or less rhombic, 1–5 cm long by 3–25 mm wide, with notched apex, cuneate base, margins often crenate towards apex, oil glands numerous, aromatic when crushed and borne on 1–3 mm

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Plate 1 Leaves and flower buds of finger lime

Plate 2 Mature finger lime (A. Beattie)

wingless petioles (Plate 1). Flowers buds are small and pink in colour on short peduncles 1–3 mm long (Plate 1). The flowers are bisexual and have 6–9 mm long white oblong petals, short 1.5 mm long, free concave sepals and numerous stamens (20–25) with white filaments and yellow anthers, stout ovary with 5–7 locules with 8–16 ovules in each locule. Fruit is cylindrical- fusiform, finger-shaped, 4–8 cm long, sometimes slightly curved, coming in different colours, green to pinkish red to reddish-black (Plate 2); rind slightly rough, pulp green, yellow to pinkish red; seeds 5–6 mm long.

Nutritive/Medicinal Properties

Nutrient composition of the raw fruit (*Microcitrus australasica* var. *australasica)* was reported per 100 g edible portion as: energy including dietary fibre 336 kJ, moisture 65.5 g, protein 2.5 g, Nitrogen 0.40-g, fat 4.9 g, ash 0.7 g, dietary fibre 14 g, carbohydrate 12.4 g, Ca 50 mg, Cu 0.4 mg, Fe 0.8 mg, Mg 31 mg, K 290 mg, Na 9 mg, Zn 0.3 mg, and niacin equivalents 0.42 mg (Brand Miller et al. 1993).

The percentage and concentration of total phenolics in *Microcitrus australasica* var. *sanguinea* leaf, peel and juice were reported by Berhow et al. (1998) as: flavedo (outer pigmented layer of the peel): 40.9% (2.38 mg/g) flavone/flavonol, 0% (0 mg/g) flavanone, 2.5%

(0.4 mg/g) psoralen, 22.1%(0.4 mg/g) coumarin; juice: 11.2% (0.02 mg/g) flavone/flavonol, 0% (0 mg/g) flavanone, 0% psoralen, 74.1% (0.04 mg/g) coumarin.

Fifty-eight out of a total of 65 components were identified from peel oil of *Microcitrus australasica* var. *sanguinea*, bicyclogermacrene (25.9%), α-pinene (10.2%) and spathulenol (9.8%) were the main compounds (Ruberto et al. 2000). Peel oil of *Microcitrus australasica* fruit was found to contain: limonene 51.1%, sabinene 19.6%, β-pinene 7.9%, γ-terpinene 4.9%, geranial 2.0%, myrcene 1.5%, neral 1.2%, β-bisabolene 1.6%, α-pinene 1%, neryl acetate 0.1%, β-phellandrene 0.6%, (*Z*)-β-ocimene 0.7%, α-terpineol 0.4%, germarcrene D 0.2%, *trans*–α-bergamotene 0.4%, (*E,E*)-α-farnesene 0.4%, (*E*)-β-ocimene 0.3%, bicyclogermarcrene 0.3%, 3-carene 0.3%, α-thujuene 0.2%, β-emelene 0.2%, (*E*)-caryophyllene 0.2%, terpinene-4-ol 0.5%, terpinolene 0.2%, citronellal 0.2%, linalool 0.2%, geranyl acetate 0.2%, α-humulene 0.2%, *trans*-sabinene hydrate, 0.1%, globulol 0.1%, undecanal traces, citronellol traces, bornyl acetate traces, *cis*-limonene-1,2-oxide traces, *trans*-limonene-1,2-oxide traces, nonal traces, *allo*-ocimene traces, α-terpinene traces, α-phellandrene traces, camphene traces (Lota et al. 2002).

Limonene and isomenthone (7.5%) were found as the major volatile constituents of *Citrus australasica* peel extract (Delort and Jaquier 2009). Six new terpenyl esters were also identified: citronellyl 2-methylbutanoate; 1,8(10)-*p*-menthadien-9-yl propanoate; 1,8(10)-*p*-menthadien-9-yl 2-methylbutanoate; 1,8(10)-*p*-menthadien-9-yl 3-methylbutanoate; 1-*p*-menthen-9-yl 2-methylbutanoate; and 1-*p*-menthen-9-yl3-methylbutanoate. Other components included 6-methyloctanal, 4-methylnonanal and 8-methyldecananal.

Australian finger lime *Citrus australasica* was found to be a rich source of antioxidant compounds (Netzel et al. 2007). The radical scavenging activity and total phenolic contents were significantly higher than that of blueberry cv. Biloxi.

Brophy et al. (2001) indentified bicyclogermacrene (19–28%), germacrene-D (2–8%), δ-elemene (0.5–11%) and limonene (12–24%) as the main components of the leaf essential oil.

Other Uses

Finger lime is receiving considerable attention as a commercial food plant, and research is being carried out to develop selected, superior forms of the species and also to develop hybrids with exotic *Citrus* species.

Comments

Finger lime is commercially propagated by grafting or budding onto other *Citrus* rootstocks. It can also be grown from cutting but the strike rate is slow and also seeds but germination is erratic and seedlings may take from 5 to 15 years to reach maturity.

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