

Persoonia Geebungs or Snotty Gobbles



Persoonia juniperina Prickly Geebung.

Photo: Natalie Tapson, West Coast of Tasmania, flickr CC BY-NC-SA 2.0

A very good friend whose passion is Australian natives and in particular indigenous plants in the Gippsland region mentioned Geebung. Initially I thought of Banjo Paterson's poem, The Geebung Polo Club. It was the Geebung Polo Club made of hardy, muscular and strong mountain men against the soft bellied city blokes and ponies of the Cuff and Collar team. Needless to say they were all bludgeoned to death. No man was left standing. What remains is their gravestones and the ghosts of horses and men.

Whilst out walking in the bush at Mallacoota, a year after the horrendous bushfires, my attention was directed to a bright green shrub with dark, flaky, papery bark, red stems with broad flat smooth leaves and yellow flowers issuing from a blackened trunk. It was most impressive. The name of this plant was *Persoonia levis* otherwise known as Broad Leaf Geebung and further on was *Persoonia linearis*, Narrow leaved Geebung.

Persoonia is in the family Proteaceae. The family name comes from that of the Greek sea-god, Proteus who could change form willy - nilly. It was used by Linnaeus because the first examples of this family seen by him were all different.

There are about 80 genera with over 1700 species, mainly in the Southern Hemisphere and mostly in tropical and temperate regions. Due to their mainly Southern Hemisphere distribution there are high areas of diversity in Australia and the southern tip of Africa. There are about 46 genera with about 1100 species in Australia.

The common characteristic of the Proteaceae is the unusual flower structure: 4 stamens situated opposite (and often joined with) the 4 initially fused flower segments which separate with development; the superior ovary has a single compartment. In most of the genera (particularly *Hakea*, *Lomatia*, *Grevillea*, *Banksia*, *Telopea*) initially the style is usually hooked or doubled back however there is the tendency to straighten and become more prominent when the stigma emerges from the perianth.

Despite the common structural similarities of the single flower there is diversity in flower inflorescences, plant appearance, leafed features and fruit formation amongst family members.

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Persoonia levis, Broad Leaf Geebung.
Left: in Mallacoota, Vic. Photo: Tilly Brunton
Right: in Nowra, NSW. Photo: Cas Liber, Wikimedia Commons CC BY-SA 2.5



Persoonia chamaepitys Dwarf Pine or Fir, (prostrate), Photo: Tilly Brunton



Persoonia linearis Narrow-leaf Geebung. Photo: John Tann, Deua National Park, NSW, flickr CC BY 2.0

Persoonia

Persoonia is a genus of a 100 species all endemic in Australia. This group of plants with small, yellow bell shaped flowers, differ from the general appearance of the more familiar family members of Proteaceae, where the pistil is the most conspicuous part. Persoonias are about one-tenth of the Australian members of the family, but are less well known.

The genus *Persoonia* was formally described in 1798 by James Edward Smith. The generic name is in honour of an 18th-19th century Dutch mycologist and biologist, Christiaan Hendrik Persoon. Smith did not name a type species, but in 1988, *Persoonia lanceolate* Lance leaved Geebung, was nominated as the species in question. It is a NSW species from the Central Tablelands District, first cultivated in England in 1791. In 1794, *P. linearis* Narrow leafed Geebung, was also cultivated and by the 1850s there were over 20 species that had been introduced to English horticulture.

Persoonia are commonly known as Geebungs in NSW and Victoria and Snottygobbles in W.A. 'Geebung' is derived from the Aboriginal name Jibbong referring to the succulent edible fruit which was a traditional food across Australia. Language names: Geebung: Dharuk, Sydney region; Jibbong: Wiradjuri, Central NSW.

Snottygobbles: A colloquial term in Western Australia for the genus *Persoonia*. This name comes from the snot – like appearance of the contents of the fruit that Persoonias produce. The colonials would have associated the squishy fruit of the *Persoonia* with the squishy fruit of the Yew trees *Taxus baccata*, which have a squishy fruit with a hard centre known as “snotty gogs” or “snotty globs”. Unfortunately no Noongar name, also transmitted by oral tradition, appears to have survived. The fruits of *Persoonia* sought out for bushtucker *P. saccata* and *P. longifolia* were known as “snottygobbles”. Incidentally they are also attractive and handsome *Persoonia* shrubs. *Persoonia* fruit, as well as being an important food source for the Aboriginal people, is an invaluable food for native animals.

Description

The numerous species of *Persoonia* are dwarf to tall shrubs or small trees, or prostrate creepers; bark smooth and hard to somewhat papery and soft; leaves mainly alternate, sometimes opposite or subopposite, rarely in whorls, simple, entire, glabrous to hairy; inflorescence usually leafy terminal or axillary racemes; flowers mainly yellow, bisexual, tubular with 4 spreading to reflexed tepals, exterior glabrous or hairy; fruit a 1 or 2 celled drupe, glabrous (free of hairs) or hairy.

All the species have similar yellow flowers, solitary or in small clusters, initially cylindrical, but opening into 4 equal perianth- segments which are recurved in the upper portion. There is a single stigma on the top of the ovary surrounded by four stamens. The fruit is always a drupe (fleshy and often grape-like, usually greenish), the style frequently persisting.

Persoonia linearis unripe fruit.
 Photo: Allthingsnative, Wikimedia
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At maturity the globose to elliptical fruit is yellow or yellow-green and beneath the skin is a small amount of sweet succulent pulp impregnated with fibres from the hard stone. The pulp is edible and easily chewed off but it is said that it is like nibbling sweet cotton wool.

Distribution and Habitat

Persoonia is distributed in all states of Australia with greater concentration in subtropical to temperate regions of south-western Western Australia, and eastern areas from Queensland to eastern Victoria. They are widespread in non-arid regions. Only one species *P. pertinax*, is found in the Great Victoria Desert with a few other species extending marginally into the



arid zone. There are two species, *P. falcata* and *P. tropica* which occur in tropical regions. Several species reach the alpine zone in Tasmania and the mainland Australian Alps but few extending above 1500m altitude. Persoonias are found near coastal regions to higher mountains but are generally more common in heathland and sclerophyll forests. They are also found in mallee shrub-land and on margins of rainforest. Most species occur in well-drained acidic soils such as sand or sandstone-based soils which are low in nutrients however one species *Persoonia graminea* prefers a swampy habitat. The largest diversity of species is found in regions with soils derived from sandstones and granites.

Persoonia juniperina

Persoonia juniperina, commonly known as Prickly Geebung, is a species which is represented in the Geelong Botanic Gardens. Sadly it is the sole survivor of a number of species of *Persoonia* (about 12) which were planted in 2001 in the 21st Century Garden. It appears that Persoonias are one of the less well known members of the family Proteaceae despite being widely distributed throughout Australia.

Persoonia juniperina is endemic to south-eastern Australia. Frequent and widespread in southern heaths and heathy open forests and especially on near coastal sandy soils. In our local region of Geelong: the Brisbane Ranges-Steiglitz, Anglesea and Airey’s Inlet.

It is a small erect to spreading bushy shrub that may grow to a height of 0.3m to 2m with smooth bark, hairy young branches and stiff, prickly foliage. Leaves are alternate, flat and stiff, narrow-linear, concave above, bright green. They are 8-30mm long and 1-3mm wide, with sharp points and are densely hairy when young, glabrescent when mature. Flowers Yellow and hermaphroditic. The perianth is cylindrical, 9-13mm long, with 4 segments that curl-back when the flower opens. A yellow anther remains attached to each of these segments which are scattered with white hairs outside. The style is thick and straight and the stigma is located at the tip, projecting beyond the anthers. Styles are 6-9mm long, and are persistent. Flowers have a single ovary. The flowers are born singly or in groups of up to forty on a rachis (leaf axils) up to 150mm long which grows into a leafy shoot after flowering, each flower on a hairy pedicel 0.8-3mm long. Most plants only have a few flowers open at one time. The flowers do not have pollen presenters in contrast to other members of the Proteaceae family. Flowers are most likely insect pollinated. Flowering (Dec-March). Fruits Green to indigo, succulent but sour, ovoid drupes, 6-10mm long with 2 seeds. Habitat Sandy soils in sclerophyll forests and woodlands along the coast and nearby ranges.

In 1805, French naturalist Jacques Labillardiere formally described *Persoonia juniperina* from specimens he collected from Tasmania.



Persoonia juniperina Image: Labillardière, *Novæ Hollandiæ plantarum*, 1804, Wikimedia Commons, Public domain

P. juniperina is classified in the lanceolate group, a group of 54 closely related species with similar flowers but foliage is quite different. These species within the group will often interbreed with each other when in the same area.

Members of the genus *Persoonia* have some features such as an indistinct inflorescence, lack of pollen presenter and invertebrate pollinators indicating to researchers that the reproductive biology of this genus may differ from other members of the Proteaceae family.

Two species had been studied before and *Persoonia juniperina* was the third species that was researched to examine factors which influence fruit production. It was shown that *P. juniperina* was partly self-pollinating but cross pollination led to greater fruit product.

Pollination

There are over 1500 native Australian bees and many of our

wild flowers such as *Persoonias* need them to survive. *Persoonias* are extremely difficult to grow (as evidenced in the GBG) and many are rare and endangered. The most important element in ensuring that *Persoonias* have viable seed production is the presence of pollinators in their habitat. After extensive studies of *Persoonia* species it has been found that they are pollinated by a variety of native bees especially species of *Leioproctus*. *Leioproctus carinatifrons* and *Leioproctus cladocerapis* (Colletidae) known as *Persoonia* Bees, who are specialist pollinators of the Geebung flower. The flattened head and shiny smooth faces assists them to dig deep down into the base of the tiny *Persoonia* flower to drink the nectar. The females also have spines on their legs allowing them to effectively gather pollen grains whilst drinking nectar. Another species of *Leioproctus* subgenus *Filiglossa* also specialises in feeding on *Persoonia* flowers but evidently they are pollen and nectar “thieves” not proficient pollinators. There is some conjecture about the introduced honey bee (*Apis mellifera*) who is a frequent visitor to *Persoonia* flowers and is in competition with the native bees for nectar and pollen and whether it is an effective pollinator and if it has deleterious effect on native bee populations. A research study has suggested that poorer reproductive success in rare *Persoonia* species is associated with lower pollinator effectiveness believed to be influenced by frequent fires and introduced honey bees. A calamity for rare *Persoonia* species which may be faced with extinction.

Evidently the flowers of *Persoonia levis* are unable to fertilise themselves (self-incompatible) and require outcrossing to another plant.

Native mammals such as wallabies, kangaroos and possums feed on the fleshy fruit as well as large birds such as Currawongs and Emus, who can pass the seed unchanged, therefore assisting in seed dispersal. Parrots feed on unripened fruit and thus seed and therefore are unhelpful in seed dispersal.

Impact of Bushfires

Noting that the habitat of *Persoonia* species is in sclerophyll forests which are fire prone areas, it would appear that *Persoonia* species have adapted to these frequent conflagrations. Several species of *Persoonia*, “paper-barked” species, regenerate by resprouting from the trunk and large branches. Thick papery bark shields the underlying epicormic buds from the flames. A number of species develop lignotubers from which many stems resprout beneath soil level following a fire. Most species have the capacity to reshoot from bare leafless wood. Fire-sensitive species survive by regenerating by seedlings that arise from a seedbank in the soil left after a fire. It may take a year or 4 for seeds to germinate.

Increasing their Profile and Special Features

Persoonias may lack the large inflorescences of some other members of the family such as *Banksia* and *Grevillia* but their redemption is their bark and foliage rather than flowers. Generally Persoonias have hard greyish to blackish bark but a conspicuous feature to a limited number of species is their loose and flaky bark which has a blackish exterior and a spectacular eye catching coppery red inner area.

There is a wide variation in foliage ranging from pine – like leaves which can be smooth or hairy to leaves that are broad, linear and long. The new growth of some species is flushed with rusty to reddish tones eg. *P. arborea*. *Persoonia arborea*, Tree Geebung, is a large shrub or small tree endemic to Victoria. It occurs in high rainfall mountain ash forest to the north-east of Melbourne. It is listed as vulnerable. It is restricted to the ranges of the headwaters of the Latrobe and Yarra River. The floricultural industry has been interested in some of the *Persoonia* species because of their hanging branchlets and straight stems.

Most species produce yellow flowers and a minority species produce cream flowers eg. *P. gunni*, or orange flowers: *P. chamaepitys*. The species that have more spectacular show of flowers are *P. acerosa*, *P. pinifolia* and *P. tenuifolia*. Grape like fruits for some species are a decorative feature. Some are purely green however some are green with purplish stripes or streaks.

Scientific research for antibiotics from plants and fungi conducted in the 1940s had reported that the most potent agent against *Staphylococcus aureus* and *Salmonella typhi* microbes, from 1200 plants screened, were three *Persoonia* species. Further investigations suggested that the fruits of *P. juniperina* inhibited the typhoid causing bacteria and *P. pinifolia* had similar antibacterial effects but the fruit had to be only partly ripe, between the green and purple stage, not too young, not too old.

More recent research of extracts prepared from ripening fruit from a hybrid of two *Persoonia* species was found to inhibit the growth of pathogenic bacteria (gram positive and negative) and the fungus (*Phytophthora cinnamomi*).

Cultivation and Propagation

Persoonias are not common in cultivation and that is due to the difficulties in propagation. Persoonias require well drained acidic soil in a sunny to semi-shaded site. They prefer sand, sandy loam, loam and clay loam. They dislike prolonged wet periods but successfully tolerate extended dry periods. Persoonias respond well to pruning. Germination from seed is difficult, even in the wild. Seed may take 4 years to germinate. The most advantageous method is taking cuttings from young vigorous plants which have not produced flowers.

Usually there are no predator problems with Persoonias. Some Persoonias are susceptible to the Cinnamon Fungus which can be exacerbated by watering during summer.

Traditional Uses

The succulent fruit of *Persoonia* was a traditional food source across much of the Australian continent.

Timber was used for making of tools such as axe handles, boomerangs, spear throwers and music sticks. *Eucalyptus agglomerata* bark used for fishing lines was strengthened by soaking it in a solution of the Geebung (*P. laurina*) bark in water.

Some species of *Persoonia* were sought after for use in bark pictures due to their flaky bark and because their inner parts had striking tones of purple, red and brown.

There were a number of medicinal uses of the bark and inner wood shavings which were used as infusions for treatment of eye disease. Tea made from the leaves were used for the treatment of chest congestion, colds, sore throats and diarrhoea. Juice from *P. linearis* fruit is reported to have been used for skin infections and skin disorders.

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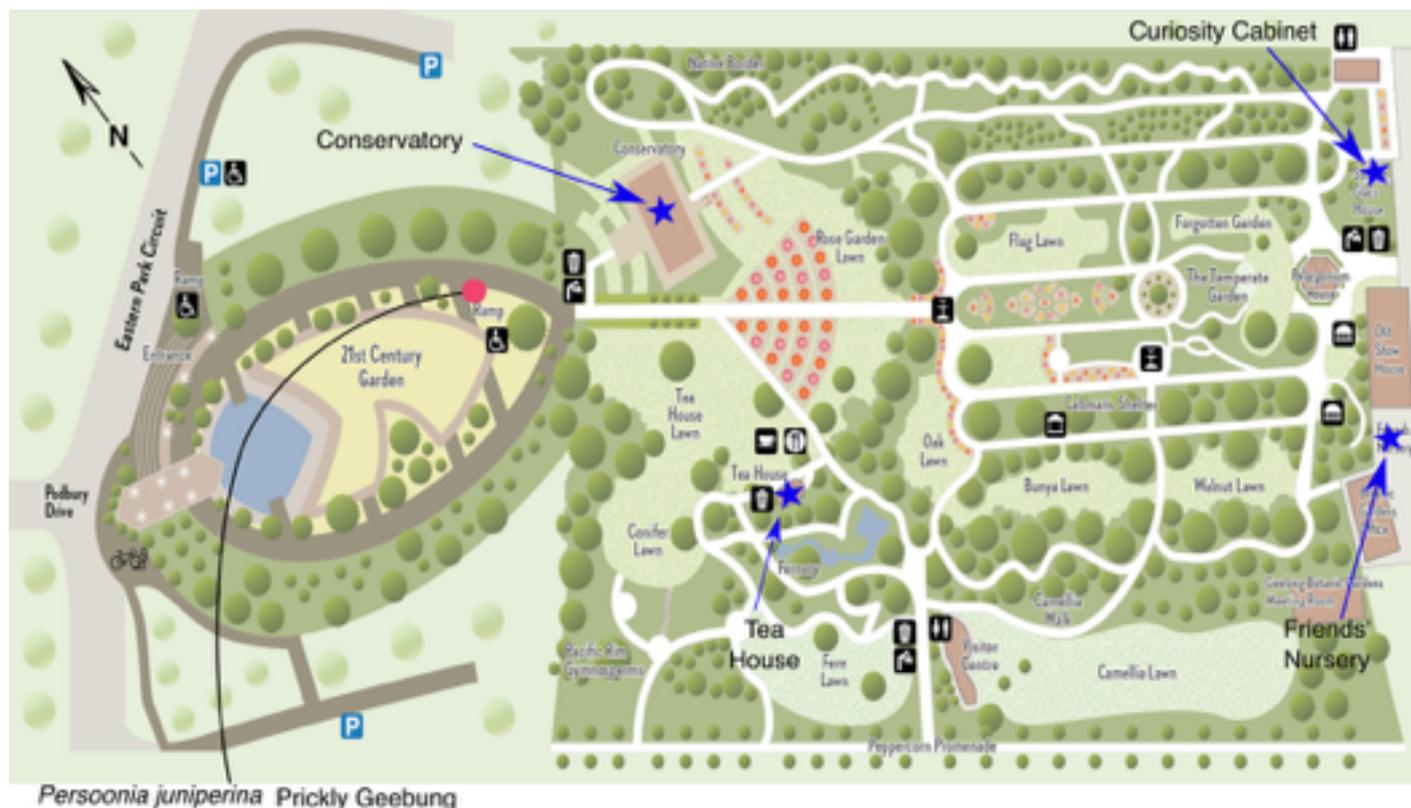
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PERSOONIA Linearis

P. J. Redouté pinx.

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PERSOONIA à f^les Linéaires.

Lemaire Sculp.

Persoonia linearis Narrow-leaved Geebung. Image: Redouté and Duhamel du Monceau, *Traité des arbres et arbustes que l'on cultive en France en pleine terre*, Flickr, CC BY 2.0