The wonders of New Zealand flora

William Stanger

Fig. 1 Silver leaves of *Astelia* species among the grasses on Mt Arthur

In the beginning, what is now New Zealand was part of the supercontinent Gondwana. Then 85 million years ago a large section of Gondwana broke off and sailed away into the Pacific Ocean to form Zealandia. In the process, Zealandia sank into the depths of the sea and drifted away from Australia. While mostly under the sea, it stood at the junction of the Australian and Pacific plates. Tectonic plate shifts led to a very small part of the submerged continent being lifted above the water line, forming New Zealand. Over the last 1.8 million years, vast changes have made the islands we know today. The Southern Alps rose up, volcanoes erupted, and glaciers carved out lakes and valleys.

Some of New Zealand's plants provide evidence of its history. Both the kauri (*Agathis australis*) and various species of *Podocarpus* have close relatives in continents once part of Gondwana. For example, *Agathis* is part of the Araucariaceae family and its relatives the Araucaria species can be found in Chile, Norfolk Island and Brazil. There are 19 more species of *Agathis* native to the Western Pacific countries of Australia, Indonesia, Malaysia, Philippines, Fiji, New Caledonia and Celebes, Indonesian Sulawesi.

The NZ kauri, a close relative of the monkey puzzle (*Araucaria*), is the largest *Agathis* species. Kauri forest occurs naturally only in the northern part of North Island, north of latitude 38° south, but it will grow happily throughout the country. Much of the kauri forest has been lost to logging and land clearance, and the trees are now threatened by kauri dieback (*Phytophthora agathidicida*). Visitors to the forests are encouraged to disinfect their shoes before and after visiting, and in some areas boardwalks have been constructed to minimise contact with the roots, to help protect these precious trees. The majestic Tane Mahuta (Lord of the Forest) (fig. 2) is the biggest kauri in the country, 52m tall and 14m in circumference, while Te Matua Ngahere (Father of the Forest) is considered to be the oldest, alleged to be 2000 years old.

Much of the flora and fauna on these remote islands have evolved in isolation; 80% of the flora, around 2500 indigenous vascular plants, is endemic. Numerous species exhibit unusual characteristics. Many have a divaricating growth habit, their tangled

Fig. 2 William with majestic Tane Mahuta

Fig. 3 *Pseudopanax ferox*

stems branching off at wide angles, and frequently the leaves do not fully expand and their flowers are buried in the centre of the plant. Examples include *Coprosma acerosa*, *Corokia cotoneaster* and *Muehlenbeckia astonii*. Two theories suggest why many NZ plants evolved this way: either as an effective defence against grazing moa, now-extinct flightless birds, or to withstand the harsh exposed conditions.

Another common characteristic is that the juvenile leaf shape or growth habit is distinctly different from that of the adult plant. Again, unpalatable juvenile foliage may have been a defence against browsing moa; once out of reach, the foliage takes on its adult form to maximise photosynthesis in the strong light of the canopy. Good examples are *Pseudopanax crassifolius* and *P. ferox* (fig. 3).

Similarly, plants such as *Sophora microphylla* and *Prumnopitys taxifolia* have a divaricating or twisted form as juveniles, adopting a more conventional shrub or tree form once mature. Whatever the reasons, these plants make NZ's flora one of the most fascinating on the planet.

However, the flora is not noted for colourful, flamboyant flowers. Many plants are wind-pollinated, with minute, inconspicuous blooms, mostly white or cream; the theory is that native pollinating insects are generally unspecialised, negating the need for an array of colour and complex patterns. *Pachystegia insignis* (fig. 4) is one of the most attractive white flowers, accompanied by handsome fleshy leaves. *Libertia grandiflora* has an abundance of small white flowers; it can withstand dry conditions but prefers dappled shade – an open aspect leads to scorched leaf tips.

Of course there are some major, spectacular exceptions. Pohutukawa and the northern and southern rata – known as NZ's native Christmas trees – are covered in brilliant red flowers in summer. Interestingly, the ratas often start as epiphytes.

A number of trees have mast seeding with, at irregular intervals, synchronous production of large quantities of seed within a plant population. The native beeches (*Fuscospora* and *Lophozonia*) and rimu (*Dacrydium cupressinum*) are examples. In some cases this produces an abundant food source every few years for the native invertebrates and birds. Unfortunately, this occasional abundance of

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Fig. 4 *Pachystegia insignis*

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Fig. 5 *Lobelia physaloides*

food means a consequential abundance of introduced pest species.

Sadly, much of the flora is under threat. One of the biggest problems is possums, introduced from Australia in 1837 to establish a fur trade. Before you take the view that 'all things cute and furry must be saved', remember that this marsupial will eat just about every part of a plant, which significantly affects its growth, providing less food for the native fauna. Along with other introduced critters like hedgehogs, rats and stoats, possums will eat birds' eggs and chicks; it does not help that many native birds are ground nesting.

Invasive exotic plants such as gorse (*Ulex europaeus*), seen covering vast swathes of hillside, and lupins (*Lupinus polyphyllus*) can fix nitrogen, giving them a huge advantage over the native plants on poorer soils. In more recent times, though, it has been realised that gorse can be a great nursery crop for native plants to grow through. Once the natives form a canopy the gorse is shaded out, better than using weed-killer. *Pinus radiata* is used widely in NZ forestry but it has escaped, changing natural ecosystems. Alas the list goes on, with many a futile hour spent trying to eradicate Chilean flame creeper (*Tropaeolum speciosum*) and Chinese privet (*Ligustrum sinense*).

What NZ plants lack in flower power they make up for in foliage texture and colour. Think of the bold, purple leaves of *Phormium tenax* Purpureum Group, the silver leaves of *Astelia chathamica* (fig. 1) and the silver clouds of *Corokia cotoneaster*. Additionally, there is the dramatic foliage of *Rhopalostylis sapida* (nikau palm) and the native *Cordyline* species.

Another feature of NZ plants is their fruit. *Coprosma* illustrates this perfectly: its fruit comes in an amazing array of colours, including white, orange, yellow, red, iridescent blues, shades approaching black, and translucent, milky hues. *Coprosma acerosa* is a wonderful plant, drought tolerant and low-growing, with orange stems and translucent white or blue fruits occasionally with intricate patterns. Many selections of *Coprosma*, *Corokia* and *Pittosporum* can be used for topiary and low hedges. The hybrids and cultivars offer a range of foliage colours, more-original alternatives to box. *Lobelia physaloides* (fig. 5) has incredible metallic-purple berries.

NZ is home to some highly ornamental grasses. *Austroderia richardii* (Toe Toe) is perhaps the most

Fig. 6 *Cyathea medullaris*

Fig. 7 *Cyathea dealbata*

Fig. 8 *Myosotidium hortensia*

graceful of all the pampas with 12ft-tall, elegantly curving, gently nodding flowerheads produced relatively early above tough mounds of evergreen foliage. It will tolerate wind, pollution and apparently deer. Happy in sun or part-shade in moist soil, it can tolerate some drought. *Chionochloa* has a graceful tussock form and *C. flavicans* is further enhanced by a weeping habit. They do best in an open aspect with good air movement. *C. f.* forma *temata*, not as common in cultivation, is very attractive: its individual florets have a looser, 'frothy' look, and the leaves often have a glaucous tinge. Its cliff and rocky habitats mean it is used to a degree of root restriction and good air movement; in overly stable, seasonally damp conditions, it can grow, and die, too quickly; better with a restricted root zone. Planting on a slope will provide good air movement.

Hebes are some of NZ's most spectacular flowering plants and a utopia for pollinating insects. Knowledge of where hebes come from is needed for long term success. A hebe may hail from a moist climate, but the effects of wind and topography must also be considered; many species of northern *Hebe* grow in exposed situations on sloping ground such as cliffs, conditions not easily created in the garden. Wind is a major component of the habitats hebes have evolved in, as is salt. Also, many southern NZ species experience cold weather. Philip Smith of O2 Landscapes has trialled hebes in Auckland's mild climate: with the main criterion a dense habit, the best species were *H. parviflora*, *H. stenophylla*, *H. diosmifolia*, *H. pubescens* subsp. *sejuncta* and *H. treadwellii*.

Other highly notable flowering plants include *Clianthus* and *Sophora*. Before 2001 only three species of *Sophora* were recognised in NZ, *S. microphylla* being a catch-all for a number of distinctive forms which are now described as distinct species. Now there are eight recognised species in NZ. *S. chathamica* has larger and more densely packed foliage, it does not pass through a divaricating juvenile phase, and flowers at an earlier age than *S. microphylla*. Its tubular golden-yellow flowers in spring provide an abundance of nectar for native birds.

There are about 200 fern species, ranging from 20m-high tree ferns to filmy ferns just 20mm long. Unfortunately for us in the UK, the more ornamental tree ferns, *Cyathea dealbata* and *C. medullaris*, are not as hardy as the *Dicksonia* species. *C. medullaris* (fig. 6) is the tallest and has wonderful black frond stalks.

Silvery *Cyathea dealbata* (fig. 7) is a national symbol. The new growth of many NZ ferns is emblazoned bright red, particularly in the genus *Blechnum*, handsome plants and adaptable to a wide range of conditions.

There are many more fascinating and beautiful plants such as *Prumnopitys taxifolia* with hammered bark and *Fuchsia excorticata* with peeling cinnamon bark. If you want more flower power, consider *Brachyglottis*, *Hoheria*, *Clematis paniculata*, and *Leptospermum*. For bold foliage and startling blue flowers try Chatham Island forget-me-not (*Myosotidium hortensia*) (fig. 8).

If you happen to visit NZ and want to see some of its floral wonders in gardens, you could do no better than Otari-Wilton Bush (fig. 9) and Te Kainga Marire. They are not just collections of plants, but show highly orchestrated plant associations demonstrating the ornamental value of the flora. They also show plants grouped together, reflecting natural communities and different habitats. The native borders at Broadfield Garden are worth seeing, while Dunedin Botanic Garden has a good native section. The West Coast Treetop Walk (fig. 10) is a great way to get up into the forest canopy and appreciate the native trees and epiphytes. A trip up Mt Arthur and through Arthur's Pass (Kahurangi National Park) gets you up high to see the alpines. For a garden that combines the native flora with exotics, Omaio is the place to go. It is full of ideas that visitors could try out for themselves, even in gardens in Britain.

Fig. 9 Otari-Wilton Bush

Fig. 10 The West Coast Treetop Walk

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