



# New Zealand alpine plants

## Native plants

A very special and unusual group of plants occupies the harsh alpine zone of New Zealand's rugged mountains. Just above the treeline, shrubs such as hebes, coprosmas, turpentine scrub and mountain toatoa form a zone of dense, low and very tough vegetation. A bit higher snow grasses and tussocks dominate, with alpine daisies, buttercups, eyebrights and orchids providing a splash of summer colour. Higher still, in the fellfield zone, only the most resilient plants can survive, including edelweiss, some hebes and vegetable sheep.

Other specialized habitats are also home to alpine plants. Plants with certain adaptations can endure and thrive in the hostile habitats of scree slopes, snow banks and cushion moorland, an area in the Central Otago mountains that is New Zealand's equivalent of the arctic tundra.

Alpine plants have to cope with extremely cold, windy and dry conditions. They often grow in infertile soil or shattered rock, with great changes in temperature from searing heat to extreme cold. They are often lashed by gale force winds. As a result, most alpine plants don't grow very large in response to the limited resources available. A low-growing, compact form also gives them some protection from the wind, cold, snow and ice.

### Where are they found?

The alpine zone is the area between the upper limit of trees (the treeline) and the lower limit of permanent snow. In New Zealand the treeline is around 1500 metres above sea level in the North, lowering to 900 metres at the bottom of the South Island. This variation

in treeline is caused mainly by latitude and distance from the coast.

The North Island's mountains are mainly volcanic and support a much lower diversity of alpine plants than the South Island. Northwest Nelson and Fiordland are hotspots for alpine plant biodiversity, with the Nelson region containing about 80% of all New Zealand's alpine species.

Sundew B. Smith





## Alpine plant facts

- Many alpine plants have wiry, tough branches with densely packed leaves at the tips to reduce wind battering. Their leaves are also generally small and tough, which makes them less easily frozen or dried out and less likely to be damaged by wind, hail and snow. Hairs on the leaves prevent air movement over the leaf surface and thereby protect the leaves from the cold.
- Another feature of many alpine plants is a deep root system that provides strong anchorage. Water and available nutrients often lie far below the surface in mountain habitats. Plants with deep root systems are better able to exploit available resources.
- Cushion plants such as vegetable sheep are actually a collection of thousands of tiny individual plants. Individual alpine plants would not survive on their own but by growing in closely packed clusters, they trap warm air and moisture and protect themselves from wind and movements of snow down a slope.
- White and yellow flowers dominate the New Zealand alpine flora. This is because most of our alpine plants are pollinated by flies, moths and beetles, which cannot detect different colours, rather than bees and butterflies, which are attracted to brightly coloured flowers.
- Some alpine plants such as the sundew have come up with a novel way of getting food in a very nutrient-poor environment. The sundew is covered in sticky hairs that can trap insects and then release enzymes that slowly dissolve its prey.



Vegetable sheep

## Did you know?

One of the great puzzles of New Zealand botany is the origin of the more than 600 species of native alpine plants. The New Zealand mountains – and thus our alpine habitats – are relatively young (2 million years old) and were formed after the break-up of Gondwanaland. Yet we have an incredible array of alpine plants, almost all of which (93%) are found only in New Zealand. How did this many species evolve in such a short space of time?

Botanists today generally agree that alpine plants arose in New Zealand in two different ways. Some plants arrived from the mountains of Australia and New Guinea via the prevailing westerly winds. Other species probably evolved from native lowland plants that managed to survive in and adapt to the new alpine environments.

Another force that helped speed the evolution of our alpine flora was the very recent ice age in New Zealand, which ended only around 10,000 years ago. This ice age caused many areas where alpine plants grow today to be covered in ice and snow, forcing plants to restrict their ranges to ice-free zones. After



Gentians J. Gardiner

the ice age, as alpine plants regained their former distributions, they would have undergone a period of isolation from, and then regrouping with other alpine species, which in a relatively short time could have led to the formation of many new species.

## Threats

Alpine habitats and the plants that grow in these places are extremely fragile and easily disturbed. During the past few decades, human activity has increased in alpine environments and our disturbance is probably the biggest threat to alpine plants. In addition, browsing by mammals such as hares, chamois and thar is also a significant problem.

Climate change also poses a direct threat to alpine plants. Recent predictions by botanists Stephen Halloy and Alan Mark suggest that with a temperature rise of 3°C, up to half of our indigenous alpine species could become endangered or even extinct by 2100 as a result of the loss of alpine areas by forest encroachment, habitat fragmentation, invasion by introduced species and direct climatic effects.

## How can you help?

If you visit the alpine zone, please be very careful to stick to marked paths and avoid crushing or trampling the vegetation. Because alpine plants grow very slowly, they cannot quickly re-grow leaves or flowers that are lost. They are often hard to see and can be quickly destroyed by a few misplaced footprints.

## Further information

For more information about alpine plants and their habitats, please contact your local Department of Conservation office.



Silky alpine buttercup