



New Zealand Plant Groups



New Zealand is full of interesting, unique and rare plants. We have a vast number of different species that live in a wide range of habitats, such as the Hebe which with over 200 species can be found from the sunny shore line to icy mountain ranges and everywhere in between. Because New Zealand developed without many different species of large herbivores, our plants became very widespread and developed many new species and this is what has given us such a diverse plant library.

The smallest land plants that we find in the New Zealand bush are the **mosses and liverworts**. There are 550 species of moss and 500 species of liverworts in New Zealand. These simple plants grow in damp, cool and usually darker areas. You will find them attached to rocks, tree trunks or like carpets stretched across the ground. In fact, New Zealand is home to the world's largest leafy liverwort the **Schistochila appendiculata** which can grow over a metre in size. Mosses can be described as fluffy or furry looking whereas liverworts are shiny flat patches resembling a slice of fresh green liver. Neither of these two types of plants have stems, flowers or seeds and they have only very simple roots (little hairs called rhizoids) and leaves (called whorls). They are described as non-vascular plants which means that they don't have a system of tubes for transporting nutrients around (much the same as a human's circulatory system where blood moves through veins and arteries). Because they lack this system it limits the size that they can grow to. When a patch of bush or land is cleared mosses and liverworts are usually the first plants to grow. They form a thick carpet of many plants growing together. This is beneficial to them as it keeps them moist and close to other plants as it keeps the soil beneath them moist also. In order to reproduce, they require water as one phase of their reproduction involves movement through water and from this process they produce spores which grow into new mosses and liverworts. The **umbrella liverwort** (*Marchantia polymorpha*) has small cups on its surface that fling their reproductive parts away when hit by droplets of water. Mosses are slightly more complicated than liverworts and have a waxy coating that stops them from losing too much water. You can see mosses almost anywhere and the most widespread moss in the world is called **silvery bryum** which is described as an urban moss and is often found growing in cracks in footpaths and building. A very important moss that can be found throughout the world and is very successful at capturing carbon dioxide from the air is **sphagnum** moss. This moss is collected in New Zealand and sold to overseas countries such as Japan where it is used as a base to grow other plants.



Algae are also simple plants but these are usually found living and growing in water. These plants tend not to have any stems, roots, leaves or flowers and you have probably seen examples of algae at the beach. **Sea lettuce** is a commonly seen algae in New Zealand and can be found in the intertidal zone of a beach where the water is shallow so it can get plenty of sunlight. It is edible, which is why it is called lettuce but when it rots on the beaches it gives off a stinky sulfury smell like rotten eggs. Some algae like the seaweeds are large and others may only be a single cell or a collection of single cells in a thread. Euglena are a single celled algae that is found in most waterways. If it has plenty of nutrients then it blooms and forms green scum in the water. This blocks the light to other living things underneath and makes the water polluted and unhealthy. The larger algae species attach themselves to rocks or other submerged debris and have air pockets that allow them to float. A good example of this is **Neptune's necklace** which is seen in rock pools around New Zealand beaches. This seaweed has water and air filled bladders that look like beads of a necklace. Not only does this help it float but they also stop the seaweed from drying out during low tide. In fact, there are 850 native seaweeds in New Zealand ranging from the largest of the brown seaweeds, the Giant Kelp that grows in cooler ocean areas, to Gummy Weed that produces large amounts of slimy mucus to prevent itself from drying out. They also ooze this mucky mess when touched. Algae have chloroplasts and carry out photosynthesis so even though they are so diverse in shape and size, they are still classed as plants. For example the tiny algae **spirogyra** has spirals of chloroplasts that you can clearly see under a microscope. **Audouinella**, a type of red algae, can grow in dark, shaded spots under rocks or banks as it has a special type of chlorophyll.



Probably the plant that is most well known in New Zealand and how New Zealanders are known across the world is the **fern**. There are over 200 species of ferns growing in our bush, scrub and on the fringes of paddocks. They can be found growing as carpets across the forest floor or perched high up on tree trunks. Ferns are typically low-growing plants that cover exposed areas on the forest floor. They are able to cope with the lowered light levels and prefer the moist, darker areas as they rely on water for their

reproduction, much the same as mosses and liverworts. They can grow a lot bigger than their mossy cousins and tall tree ferns can be seen in large numbers covering the sides of streams and steep gullies, where their lush green feathery tops stand out amongst the other trees. The **mamaku** can grow 20 m in height and the well-known Silver fern or **ponga** is also a tall tree fern. **Kiokio, bracken, ring fern** and **spleenwort** all act as cover plants that grow after mosses have established themselves on newly cleared or fire damaged areas. Ferns don't have flowers as they use spores to reproduce which again makes them similar to mosses and liverworts. They are unusual because they have two separate life stages. The form that we see ferns in is the adult stage that produces and releases spores. The spores grow into the other stage which is a small heart shaped, water reliant structure that reproduces and makes the adult fern. Another feature that makes ferns unique is their leaves which are called fronds. These are a central stalk with a flat blade that is divided into segments. When they are young they are coiled and unfurl into the wider frond shape. This coil is called a koru.

Some of the largest trees of our forests such as the mighty **kauri** or towering **tōtara** are **gymnosperms**. Kauri trees are found in the northern areas of New Zealand and are highly protected. They were milled heavily in the past because their wood is so strong, straight and each tree contains a massive amount of timber. Even the gum of the kauri tree was used for varnish and many settlers found employment as gum diggers. The word gymnosperm comes from the Greek for 'naked seeds' because they don't have their seeds inside a protective ovary like flowering plants do. Gymnosperms are usually large trees that have cones instead of flowers. In New Zealand there are around 20 native species of gymnosperms. The beautiful kahikatea or white pine can be found towering in low lying forests at a huge height of 55 metres. This tree had many uses such as boat building, waka and because of their lack of odour, export butter boxes. Most gymnosperm timber is classified as hardwood because the trees themselves take a long time to grow and due to this, the wood they produce is very dense. **Mataī** or black pine has a unique cone style. It is almost like a fruit of a flowering plant as it has soft juicy fruit covered scales, instead of the hard scales found on a pine cone for example. The Kereru eats these sweet, purple scales and the seeds inside. They then fly away and spread the seeds. The trees have male cones that produce pollen which gets spread by the wind and when it lands in a female cone, it fertilises it to produce seeds. When ripe, the cones open and the seeds are released where they are usually spread by the wind. Formerly called red pine, the **rimu** tree is another large tree that was heavily milled for its strength and beauty. Many pieces of furniture were made from rimu timber. Gymnosperms can grow in a large range of areas but aren't well suited to the extreme cold of higher mountain levels. The introduced species of **radiata pine** is the main tree used to produce timber and paper in our modern era, as it grows a lot faster than our native gymnosperms but still produces strong, straight wood. It is said that many plants in this group have needle shaped leaves to help them live in colder, windier areas as this prevents the leaves from drying out or being damaged by snow and ice.

There are 2000 native **angiosperms** in New Zealand and these are probably the most diverse looking group of all the plant groups. They are the flowering plants, so they use flowers of all descriptions to reproduce. The reason there are so many is because by having bright coloured flowers they attract insects and use them to spread their pollen which is a much more effective method than relying on the unpredictable wind like gymnosperms do. Most flowers contain both male and female parts but in order to reduce self-pollination they don't come ready at the same time. The flower itself turns into a fruit containing the seeds. Fruits can be soft and juicy like strawberries or peaches but they can also be hard like walnuts and coconut. Many angiosperms are small like **flax** or **toetoe** but some grow into large trees like **kōwhai** or **pōhutakawa**. There are two main types of angiosperms and they are placed in these groups depending on the number of food storage (cotyledons) areas they have in their seeds. Think of a green pea which can be split into two even halves, whereas a corn kernel can't. The first type is the monocotyledon (like the corn kernel) they have one food storage area and green or white flowers. Monocotyledons also tend to use the wind for pollination and have straight vertical lines in their leaves. Think about the leaves of a flax bush or **cabbage tree**. The other type are dicotyledons (like the pea) which have two food storage areas, brightly coloured flowers and branching veins in their leaves, like a **hebe** and the **rātā** tree.

