

Ancient Tiritiri Matangi Part 24: Adventures in “Deep Time”. The First “Seed Plants” 6 (Spermatophytes).

The Rosid Eudicots found on Tiritiri Matangi today

In this issue we are looking at a large group of flowering seed plants 70,000 species strong, gathered together by plant taxonomists into a group called the Rosids. (Rose-like)

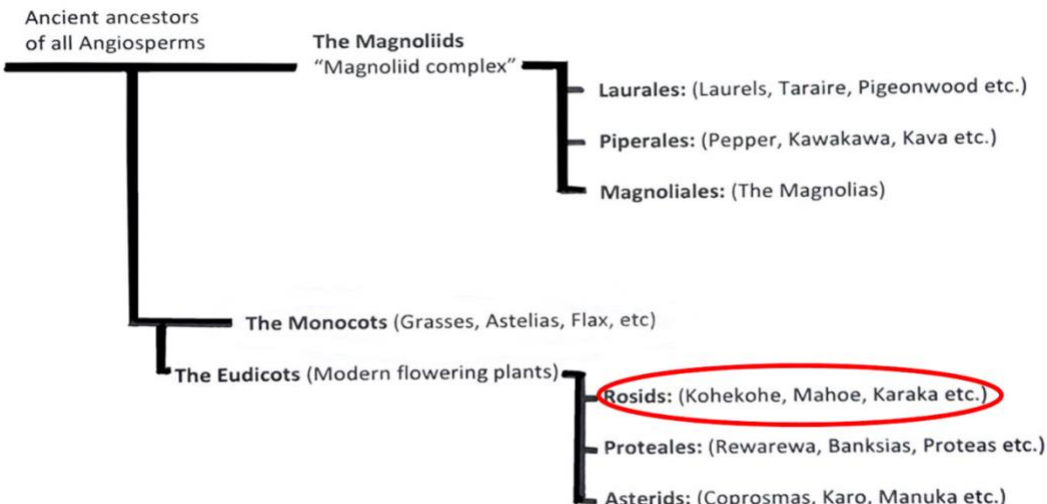
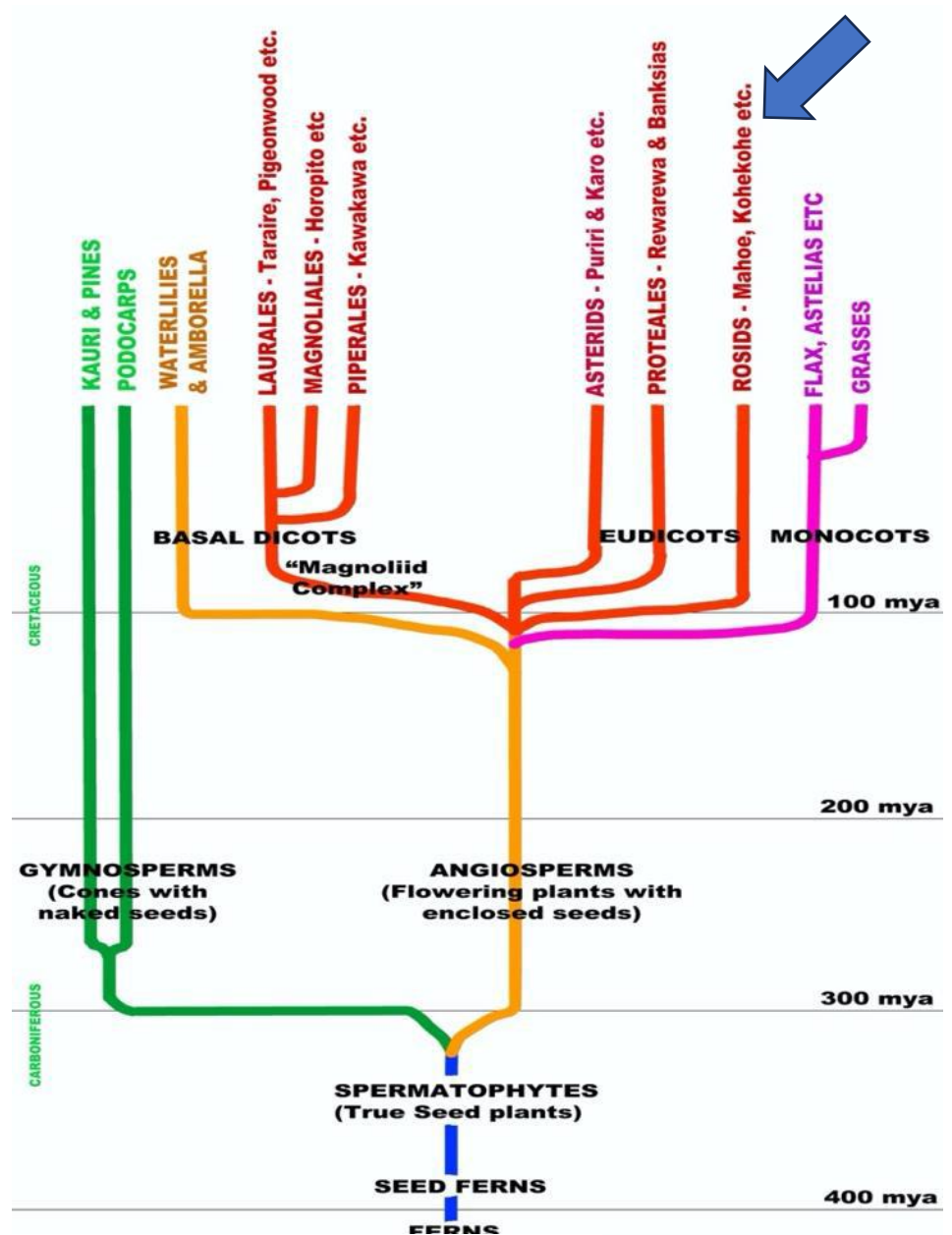
The story of the Rosid eudicots started when Aotearoa was just a small archipelago of islands off the east coast of Gondwana 125 million years ago.

Previously we looked at the appearance of the first seed plants (Spermatophytes) way back in part 15 of the “Ancient Tiri” series.

To recap, it is thought the very first seed plants appeared in the **Carboniferous period 350 million years ago**. Then we looked at how Angiosperms differ from the gymnosperms (conifers) in that they have **enclosed seeds** and reproduce using a wide variety of complex structures loosely termed “**flowers**”. We considered some of the most ancient members of this group such as the waterlilies and the magnoliids.

We looked at the appearance of the monocots, (the name refers to the **anatomy of the seeds** of these plants). A **monocot** seed has only **ONE cotyledon** (a “seed-leaf” which stores food for the growing seedling). By contrast, a **dicot seed** has **TWO cotyledons/** seed leaves.

We also saw that the term **EUDICOT** simply refers to those more **modern dicots** that appeared later.



“Molecular clock” studies (which analyse **differences in DNA** to estimate **when a particular group split from its ancestors**) suggest that the first eudicots – the **ROSID EUDICOTS** may have originated as **early as 125 million years ago**. These early ancestors have diversified into the 70,000 species we see today. The diagram (Left) shows how the Rosids are thought

to fit in to the overall picture.

So what features are diagnostic of this amazingly diverse group of plants? Put simply it refers to the arrangement of cell layers around and within the female ovules (these form the future seeds after pollination and fertilisation).

Apart from this one unifying feature, the Rosids are amazingly diverse in form and you would never guess that they are related! However, as a group they are considered to be Monophyletic (all sharing a common ancestor) thanks to evidence from modern molecular genetics. The Rosids consist of two groups, the Vitales (grape vines and Virginia creepers) and the Eurosids – (all the rest!). The Eurosids in turn are divided into two groups:

The Fabids (Legumes – the “peas and beans” group)



Mahoe: *Melyctis ramiflorus*



Kowhai: *Sophora microphylla*



Kumarahou: *Pomaderris kumerahou*



Native Broom: *Carmichaelia australis*



Karaka: *Corynocarpus laevigatus*

The Malvids (Kohekohe, Titoki, Kanuka, Manuka and Pohutukawa)



Titoki: *Alectryon excelsus*



Kohekohe: *Dysoxylum spectabile*



Pohutukawa: *Metrosideros excelsus*



Manuka: *Leptospermum scoparium*



Kanuka: *Kunzea ericoides*



Eucalyptus species

I included a photo of a eucalyptus flower because they also belong to the same Malvids Order.

Can you see a similarity between the flowers of the Pohutukawa the Manuka, Kanuka and the eucalyptus? They all have a dish shaped inner structure which fills with nectar to attract pollinating birds, insects, reptiles and Australian marsupials. Fossil pollen evidence tells us that the eucalypts were present here as part of the indigenous Aotearoa flora until a few million years ago when they disappeared.

So after this issue you should be able to talk to visitors about:

1. The stunning **variety** of the Rosids.
2. The **ancient origins** of the Rosids.
3. The intricate detail of the **ovule structure** that unites them as a group.
4. The similarity between the flowers of the Australian **eucalyptus** and some of our indigenous Rosids.

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