


New Zealand Plant Flowers

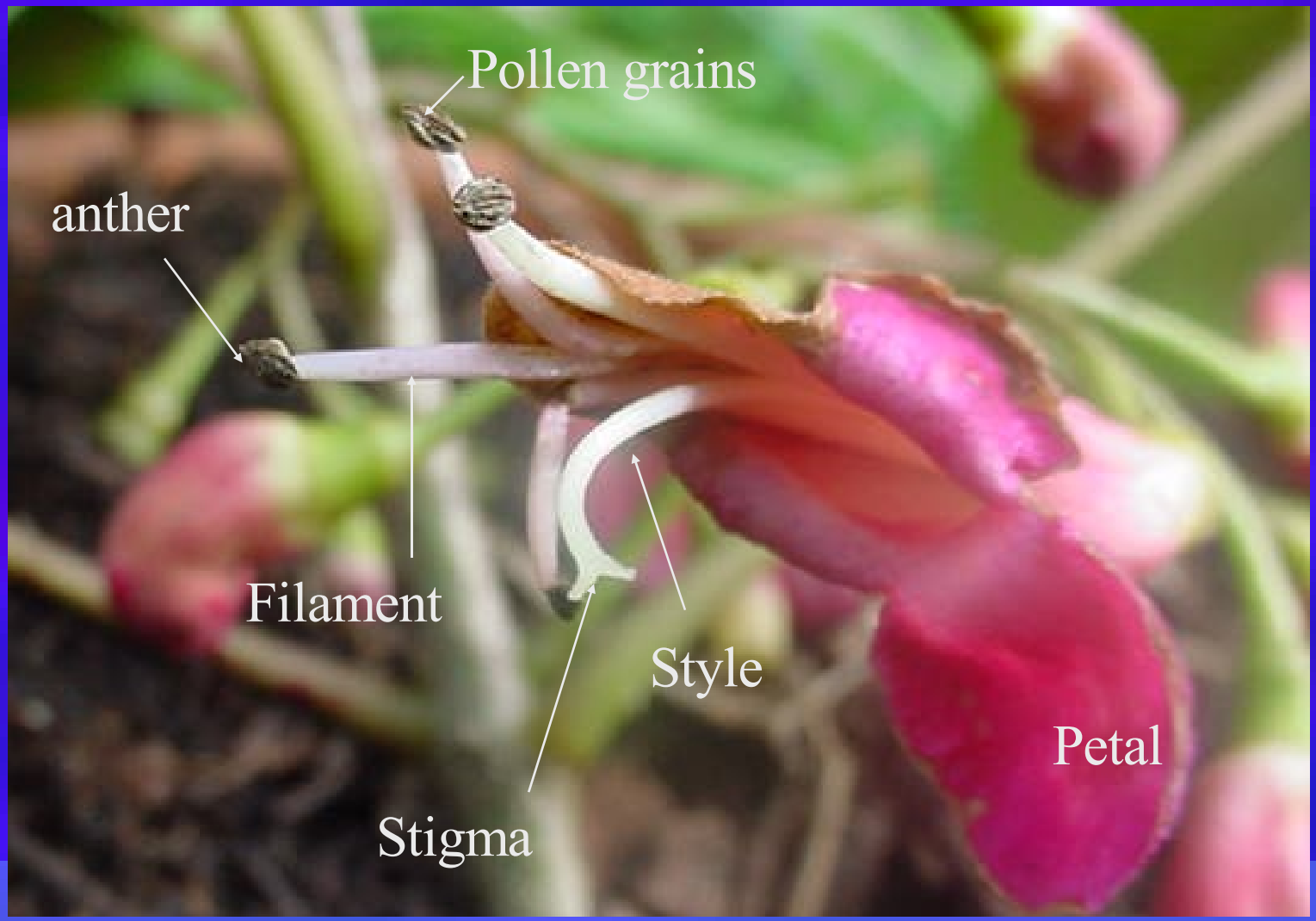
- Flowers are the means by which plants reproduce sexually .
- Flowers which are successfully pollinated and fertilised will develop into seeds.
- The seeds that germinate and grow into the next generation show the greatest variety if they are fertilised by another individual of the same species.
- Plants go to great effort to ensure they are not self pollinated.

The flower

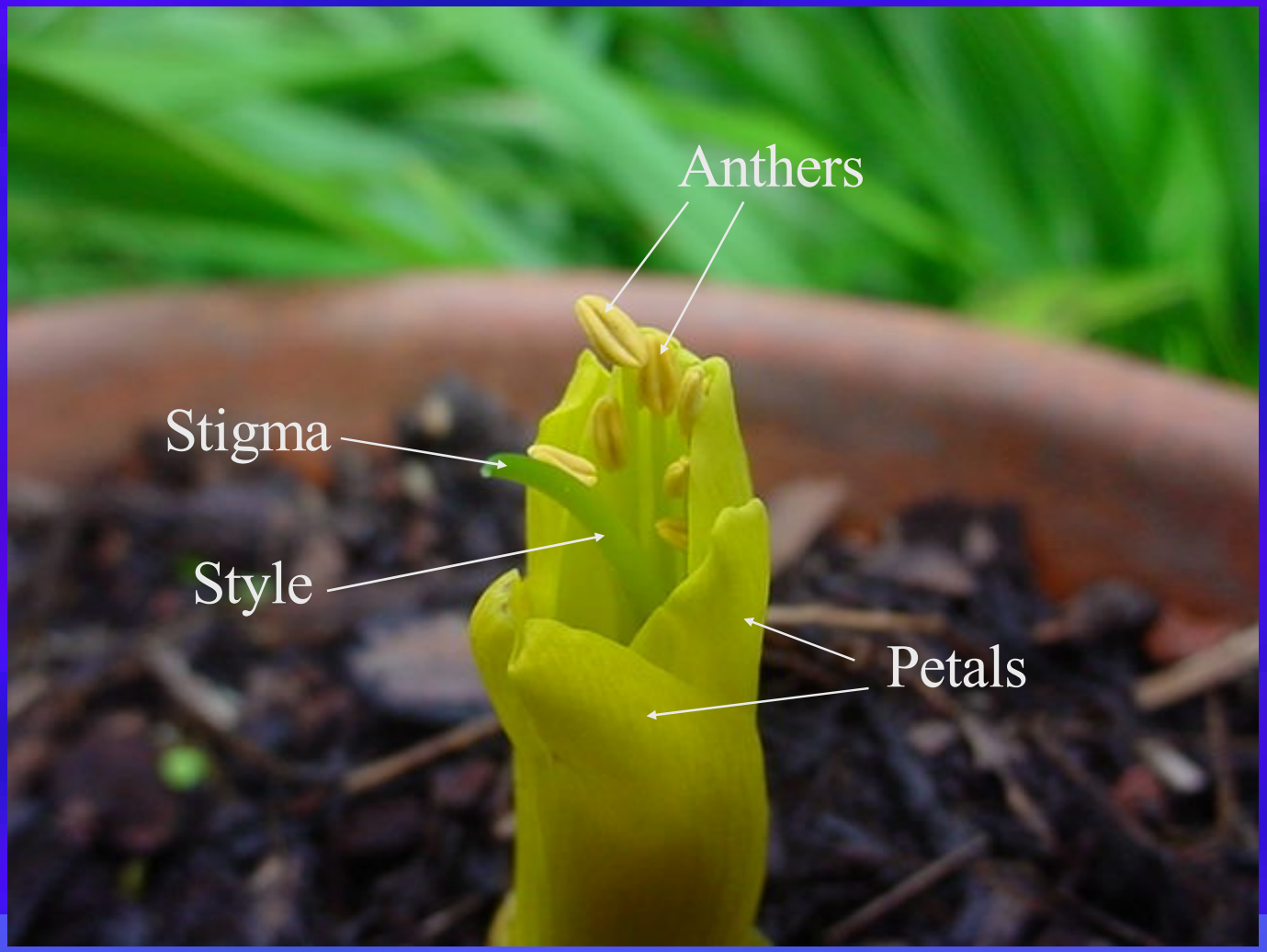
- The Pistil is the female organ and is in the centre of the flower.At its base is the ovary containing the eggs or ova. At its apex is the sticky stigma supported by a stalk called a style.

- The **stamen** is the male part and is usually arranged in groups that circle the ovary.
- They consist of a stalk known as the filament and an enlarged tip called the anther.
- The anther holds the male gamete or pollen
- The process by which the male pollen is conveyed to the female stigma is called ***Pollination***
- ***Fertilisation*** is the successful union of the male pollen with the female ova.

Vitex lucens *Puriri*

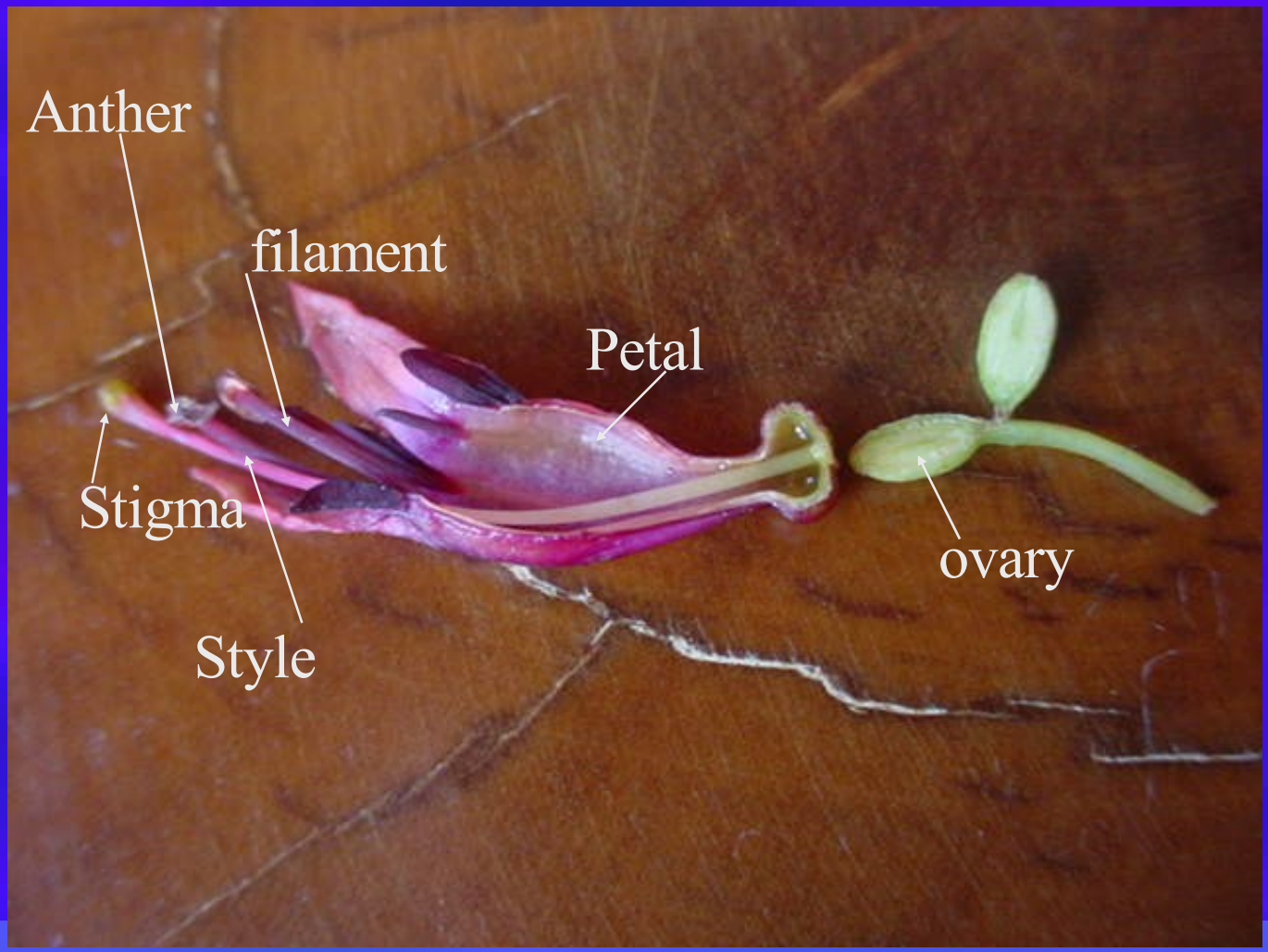


Sophora microphylla
Kowhai



Sophora microphylla

Fuchsia exorticata *Kohuhu*



Tree fuschia

Leptospermum scoparium
Manuka

Kanuka. Flowers differ from Manuka by being in bunches

Phormium tenax
Harakeke Flax

Phormioum cookianum
Mountain flax *Harakeke*

Pittosporum tenuifolium
Kohuhu

- The male stamens circle the female pistil
- The brightly coloured petals attract insects and birds.

New Zealand Plants have a high percentage of Dioecious flowers

- **Dioecious** plants have male and female flowers on **separate** plants.
- **Monoecious** plants have male and female flowers on the **same** plant.
- A characteristic of the the New Zealand flora is the high % of plants that have the sexes on separate plants (dioecious). Approx 12-13% of our flora are dioecious. (Britain 2-5%, South Australia, 3.9%., Hawaii 5%).

Dioecious flowers

- Having male and female flowers on separate plants accounts for the variability in seeding from year to year that some species exhibit because seeding will be determined by synchronising the time at which the male and female parts are functional. The environmental conditions that determine flowering would be more variable in separate trees than the same tree. There is more likelihood of reproductive failure if the nearest tree of the opposite sex is some distance away.
- An advantage of having male and female flowers on separate trees is that there is increased variation in the offspring as there can be no self pollination.

Karamu is dioecious with male and female flowers found on separate plants

Coprosma robusta female

Coprosma robusta male

Coprosma lucida shining karamu

Male flowers

female flowers

Pollenating vectors

- This term refers to the agent of pollenation or the way the pollen from the male flowers reaches the stigma of the female flowers.
- Bees, Ants, spiders and other insects
- Lizards
- Birds and Bats that fly
- Wind: Common In grasses
- Water: Common in primitive plants algae and mosses
- All plants have adaptations that encourage the work of the vector

- A bee visits a male flower of Clematis
- It will be feeding from the Nectary and at the same time coating its body with the plants pollen.
- Note the male stamens made of the filament and anther

Small, white or mauve flowers attract insects as pollinators

This long floret is called a raceme. Placing flowers in bunches is efficient for the pollinator

Tui visits Kowhai flower

Pimelia tomentosa

- Flowers that group in bunches are an advantage for insect pollination.

Pratia angulata

- This ground hugging herb allows insect pollination of the small white flowers.
- Purple berries are an attractive meal for lizards and birds.

Corynocarpus laevigatus *karaka*

- These small, dull and sticky sweet flowers are good food for ants and small insects

Saltmarsh ribbonwood
Plagianthus divaricatus

Melicope ternata *Wharangi*

Grisilinia littoralis

Hangehange

Melicytus microphylla

Tauhinau

Alseuosmia banksii

The single and inconspicuous flower has a beautiful strong scent to attract insects

Flowers may warm insects and make them a favourable environment to visit on a spring morning

- White flowers can act as solar radiators and reflect the suns rays onto the visiting insects
- NZ jasmine

Myoporum laetum *Ngaio*

Clematis paniculata
Puawananga

Hoheria populnea *hohere*

Linum monogynum

Metrosideros propinqua

Hibiscus diversifolius

Melicope simplex

Manuka

- A wide variety of petal colour can be found in manuka.

Mingimingi

Pittosporum tenuifolium

Melicytus macrophyllus

- These small and inconspicuous flowers are visited by ants.

Kawakawa male spike

Coprosma propinqua

This small male flower shows anthers and dull petals

Entelea arborescens *Whau*

Corokia budleoides

Pratia physaloides *koru*

Machaerina sinclarii

- Many grasses that are wind pollinated have stigmas and anthers that are shaped to catch the wind.
- The wind may blow pollen hundreds of kilometres.

Cortaderia toetoe

Large brightly coloured flowers are usually pollinated by birds

Rewarewa

Pohutukawa

Rabnothamnus solandri *Turepo*

Pittosporum crassifolium *Karo*

- The single white stigma waits ready for a bird to visit, hopefully bringing male pollen.

Sophora microphylla *kowhai*
New Zealand's National Flower

Sophora tetraptera *Kowhai*

Fuschia exorticata
Kotukutuku

Vitex lucens *Puriri*

Kumarahou

- Gum diggers soap
- A lather can be formed by rubbing the leaves and flowers vigorously with water.

Poroporo

Brachyglottis kirkii

- This tree daisy is a member of the Compositae family
- The massing together of the flowers in heads is conspicuous to insects.
- Insects may pass from flower to flower without loss of time

Kirks Tree Daisy
Brachyglottis kirkii

A floret

- How many flowers are in this picture?
- 12

Brachyglottis kirkii
Kirks tree daisy

The Flowers of the Compositae will develop into light wind blown seeds that travel on a whispy parachute.

Brachyglottis repanda *Rangiora*

- Another Compositae
- The seeds are wind dispersed as parachutes that carry a single seed.

Brachyglottis repanda
Rangiora

Brachyglottis albida

Pseudopanaxx arboreus

Cordyline terminalis

Fuschia procumbens

Wineberry

Arthropodium cirrhatum rengarenga lily

Carmichaelia aligera leafless broom

Cordyline australis cabbage tree

Nikau palm

Metrosideros robusta Pohutukawa

Libertia ixiodes

Carex secta

Fruits

Fruits

- Fruits hold the seeds of the plant.
- The main vectors of seed dispersal are wind and birds.
- Seeds that are dispersed by the wind are small and light.
- Seeds that are dispersed by birds are usually found inside a succulent, brightly coloured drupe or berry. Birds eat the berries, fly away some distance and pass the seeds in their droppings.

Pittosporum crassifolium *Karo*

- All Pittosporum have black sticky seeds found inside a 3 0r 5 valved woody capsule.
- The seeds adhere to the feathers and beaks of birds and are dispersed.

Pittosporum cornifolium

Entelea arborescens *Whau*

- The thorny woody capsules hold about 100 seeds.

Alectryon excelsa *Titoki*

The seeds are found external to the flesh of the berry

All Coprosma have 2 seeds per berry, are succulent and usually highly coloured.

Coprosma robusta

Karamu

Coprosma grandifolia

Coprosma lucida
Shining karamu

Coprosma acerosa

- Lizards have been observed eating Coprosma fruits

Fuschia procumbens

Dianella nigra

Desmoeschenus spiralis

This plant of the sanddunes has windblown seeds.

Belschmeidia tawa

This Drupe is a favourite food of the wood Pigeon *kukupa*

Pratia physaloides *Koru*

The berry of Koru is hollow inside with dozens of small seeds

Clematis paniculata

female flowers with developing ‘parachute’ seeds

Kawakawa spike

Rubus australis

The bush lawyer is a climber that is a member of the same genus as the introduced blackberry

Karaka

Metrosideros excelsa

- Pohutukawa has windblown seeds that are found inside a 4 valved woody capsule.
- There may be hundreds of seeds per capsule
- A large Pohutukawa tree can make 10 million seeds in a season.

Alseuosmia banksii karapapa

Pimelia tomentosa

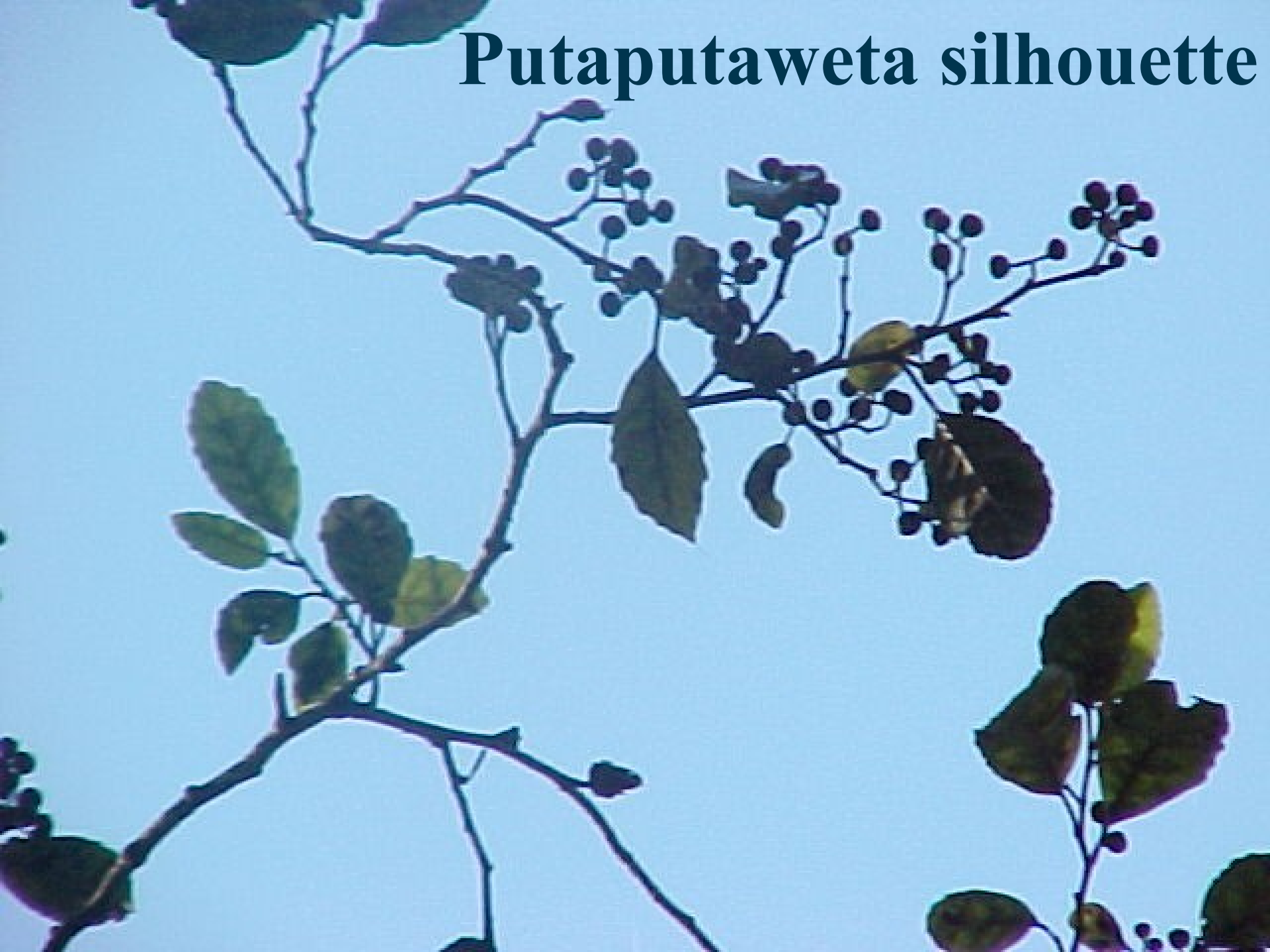
Sophora microphylla
Kowhai

This shows the development of the seed capsule from the flower

Pseudopanax arboreus

Hoheria populnea

Putaputaweta silhouette



Assignment
Answer the following questions email to tonyf@taipa.school.nz

- 1. Why do plants prefer to be cross pollinated.
- 2.What are 2 flower adaptations New Zealand plants have to ensure cross pollination is successful?
- 3.Why has New Zealand such a high percentage of dioecious plants?
- 4. What is a disadvantage and an advantage of having dioecious flowers.
- What are 3 methods of transport that seeds of plants can be dispersed
- List 3 NZ plants that are pollinated by Bees
- List 3 NZ plants that are pollinated by birds
- List 2 NZ plants that are pollinated by wind.
- **Glossary** give definitions for the following terms
  Germinate
  Dioecious
  Monoecious
  Pollination
  Fertilisation
  Vector
  Anther
  Stigma
  Style
  Ovary
- Petal
  sepal
- Filament