

PART 3: FEATURES OF SOME IMPORTANT PLANT FAMILIES.

4 MAJOR FAMILIES OF W.A FLOWERING PLANTS

The Myrtaceae, Proteaceae, Fabaceae, and Orchidaceae are some of the most commonly seen plant families in WA.

MYRTACEAE FAMILY (MYRTLES)

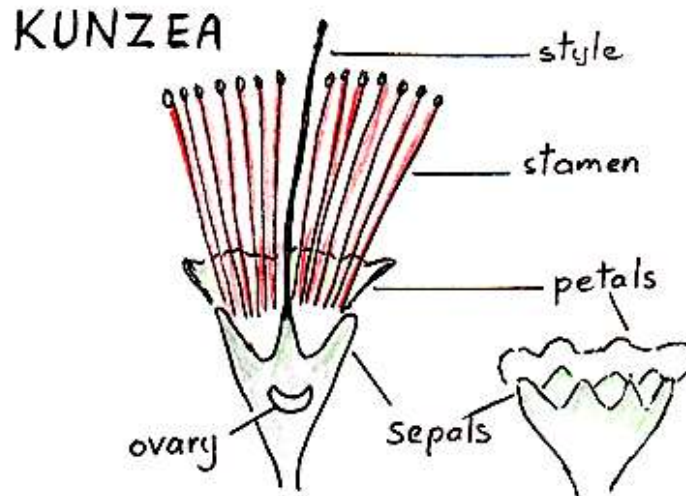
This family is large and complex, found in the Southern Hemisphere. Around half the genera are native to Australia.

Characteristics are:

- Plants are woody – small shrubs to tall trees
- Stamens are frequently in large numbers and dominate the flower
- Aromatic oil glands in the leaves when crushed
- Mostly woody fruit – capsules, some berries

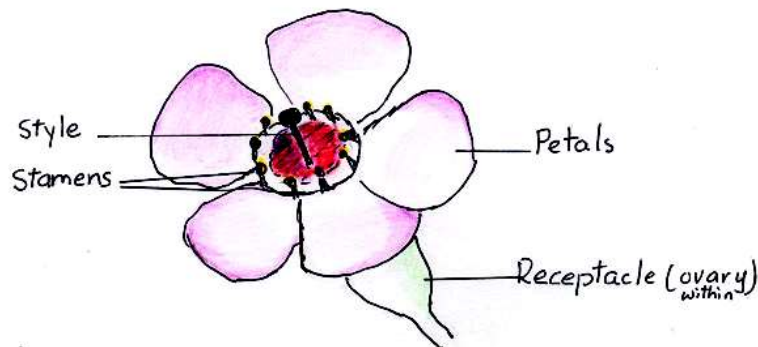
Myrtaceae can be divided into 2 groups

1. Stamens usually LONGER than the petals (dominates the flower)









2. Stamens usually not longer than the petals (don't dominate the flower)





CHAMELAUCIUM




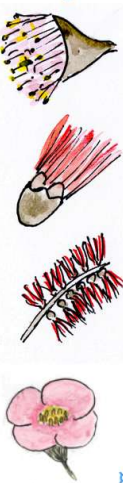


GROUP ONE MYRTACEAE EXAMPLES

GENUS	FEATURES	IMAGE
<p>Eucalyptus & Corymbia (gums)</p>	<ul style="list-style-type: none"> ● buds with an operculum ● sepal and petals fused to form the operculum ● only stamens displayed on the open flower ● Corymbia flowers arranged in a Corymb ● Eucalyptus flowers arranged in clusters 	
<p>Calothamnus (claw flower or one-sided bottlebrush)</p>	<ul style="list-style-type: none"> ● flowers typically red ● stamens united in four or five bundles ● short alternate leaves 	
<p>Callistemon (bottlebrush)</p>	<ul style="list-style-type: none"> ● free stamens ● anthers attached at back ● flowers in spikes ● calyx (sepals) lobes deciduous 	
<p>Beaufortia</p>	<ul style="list-style-type: none"> ● stamens arranged in clusters ● anthers attached at base (vertical anther) ● bilobed appearance of anther 	
<p>Melaleuca (paper barks)</p>	<ul style="list-style-type: none"> ● stamens united in bundles ● each bundle contains 5 stamens ● anthers attached on side 	
<p>Kunzea</p>	<ul style="list-style-type: none"> ● stamens free ● flowers in heads or spikes below end of the bush ● anthers attached at back ● sepals and petal deciduous ● persistent calyx 	

GROUP 2 MYRTACEAE EXAMPLES

GENUS	FEATURES	IMAGE
Agonis (peppermint)	<ul style="list-style-type: none"> • flowers clustered together in heads • usually white • leaves alternate or clustered • leaves have peppermint like scent • weeping foliage 	
Chamelaucium (Wax flower)	<ul style="list-style-type: none"> • petals have waxy texture • style shorter than petals • 5 petals • flowers white or pink 	
Darwinia (Mountain bells)	<ul style="list-style-type: none"> • flowers in clusters surrounded by bracts (modified leaves) • bracts can be longer or shorter than the flowers 	
Verticordia (Feather flower)	<ul style="list-style-type: none"> • calyx-lobe deeply divided into hair-like structures • petals usually entire but sometimes divided 	

SUMMARY TABLE OF MYRTACEAE

Common Genera	Leaves	Flowers	Seeds	Comments
Agonis Beaufortia Corymbia Callistemon Calytrix Darwinia Eucalyptus Eremaea Hypocalymma Kunzea Leptospermum Melaleuca Syzygium Thymotome	Various sizes: oil glands in leaves - scent produced when crushed. 	Small petals, stamens can be longer or shorter than the petals. 	The fruit have a hard ovary wall that contains the seeds. 	Flowers are often a bundle of stamens e.g. gum tree flowers or bottlebrushes. In eucalyptus and corymbia the flowers have a cap (<u>operculum</u>): that is pushed off as the stamen open. The petals and sepals are in the cap. 

Some the 54 genera of Myrtaceae in Western Australia are are Hypocalymma, Baeckea, Scholtzia.

PROTEACEAE FAMILY

This family has great diversity of form but has a very distinctive floral structure. Slightly more than half the genera of this family are found in Australia. Third largest family in WA.

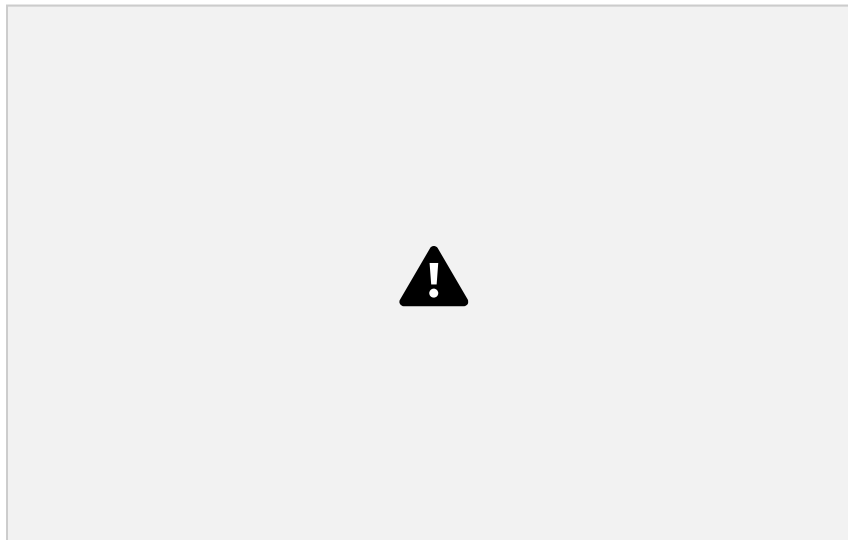
Some features are

- ground cover, shrubs and trees
- cluster roots - adaptation for low soil phosphate
- in some genera the inflorescence can have up to 1000 eg banksia
- single perianth (sepals and petals) in four parts (tepals) with four stamens

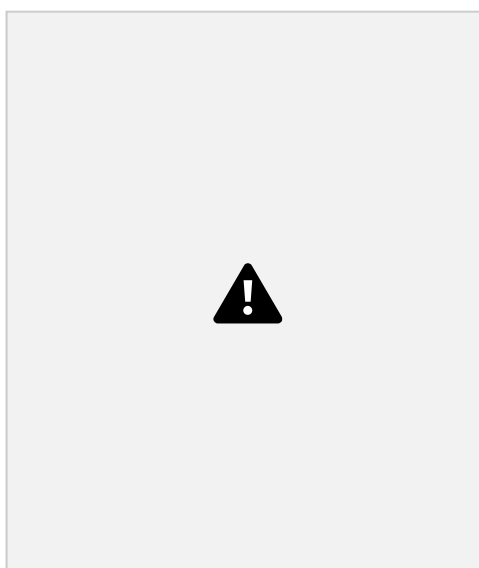
STRUCTURE OF THE PROTEACEAE FLOWER Perianth (sepals and petals) in four parts (tepals) with four stamens.



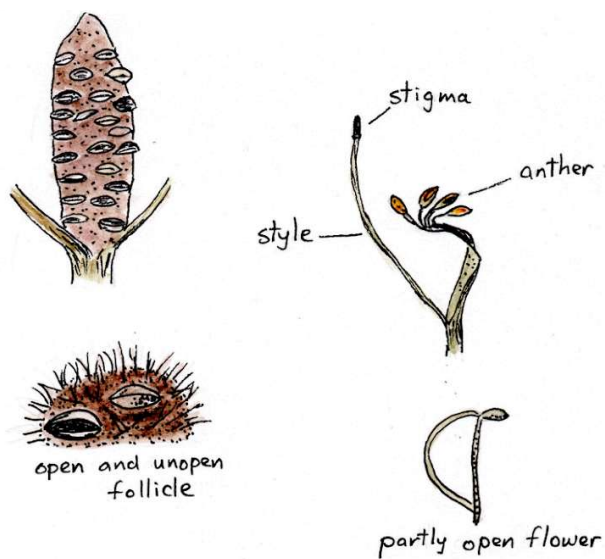
PROTEACEAE FLOWER STRUCTURE



Grevillea flower with thin walled fruit








Hakea flower with woody walled fruit





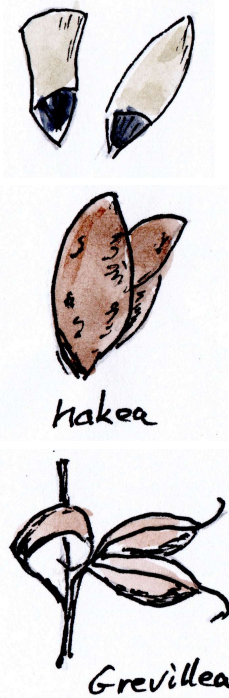

Banksia flower with woody walled fruit

PROTEACEAE EXAMPLES

GENUS	FEATURES	IMAGE
<p>Adenanthos (Woolly bush)</p>	<ul style="list-style-type: none"> • has very small single flowers embedded in the foliage 	
<p>Banksia (including the former genus Dryandra)</p>	<ul style="list-style-type: none"> • flowers in cone like structures or clustered flower heads (as in former Dryandra genus) • not surrounded by large bracts 	
<p>Grevillea</p>	<ul style="list-style-type: none"> • flowers in racemes • stamens in cup-shaped cavity • thin walled, deciduous follicle (dry fruit) which splits along one side 	
<p>Hakea</p>	<ul style="list-style-type: none"> • flowers usually terminal or axillary • thick walled seed follicles which persist on the plant until they open, splitting along both sides to reveal 2 winged seeds 	
<p>Conospermum (Smoke bush)</p>	<ul style="list-style-type: none"> • flowers are small • perianth (petals and sepals) often woolly, white or blue 	

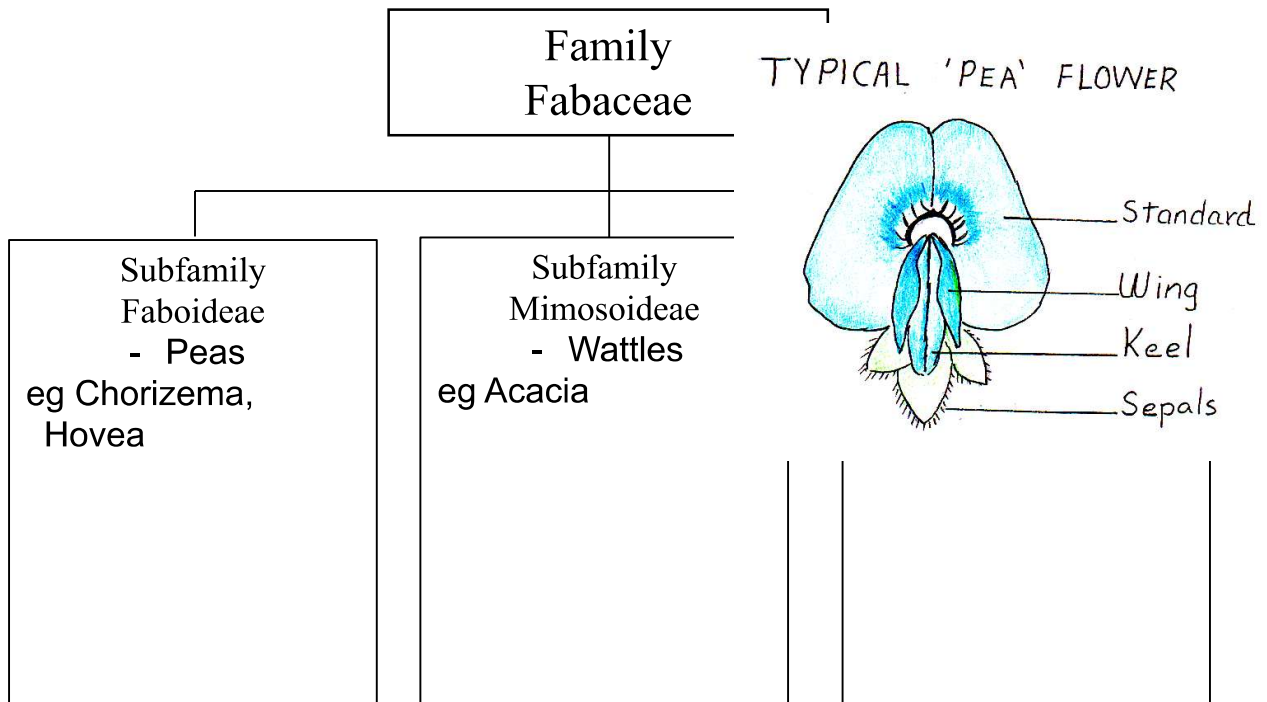
In Western Australia there are 682 species (99% endemic) in 16 genera.
Some other genera of Proteaceae are Isopogon, Petrophile, Synaphea, Leucodendron.

SUMMARY TABLE OF THE PROTEACEAE

Common Genera	Leaves	Flowers	Seeds	Comments
<p>Banksia Grevillea Hakea Adenanthos Stirlingia Conospermum Isopogon Petrophile</p>	<p>Often an obvious difference between the upper and lower surfaces of the leaf. The lower surface is often lighter in colour or furry.</p> <p>Leaves are often toothed or divided.</p> 	<p>Tube like flowers with a prominent stigma. Flowers are often small but clustered in large cylindrical heads as in banksias.</p> 	<p>Seeds always winged.</p> <p>Fruit splits to reveal two winged seeds</p> 	<p>Banksias have fruiting bodies arranged in hard 'cones'.</p>  <p>Grevilleas and hakeas have seed pods arranged singly. Grevilleas have thin-walled seed 'pods', hakeas have woody pods.</p>

FABACEAE FAMILY

- Most of these plants have root nodules containing nitrogen fixing bacteria.
- Fruit is a legume pod.










SUBFAMILY FABOIDEAE (PEAS)


Pea flowers have

- one large petal (standard)
- two side petals (wings)
- two fused petals (keel) which encloses the ovary and stamens



NOTE: Peas can be difficult to identify as the flowers are often very similar. Leaf and seed pod shape and size need to be considered eg *Daviesia* have triangular pods, *Gastrolobium* have rounded pods.

GENUS	FEATURES	
Chorizema (Flame peas)	<ul style="list-style-type: none"> ● keel often beaked or shorter than wings ● free stamens 	
Daviesia (Bitter peas)	<ul style="list-style-type: none"> ● prickly with leaves at odd ● triangular fruit ● flowers red, orange or yellow 	
Gastrolobium (Poison pea)	<ul style="list-style-type: none"> ● leaves are opposite or whorled ● two stipules at base of the leaf ● ten free stamens. 	
Hardenbergia (Native wisteria)	<ul style="list-style-type: none"> ● purple flowers ● three leaflets (compound leaf) 	
Hovea	<ul style="list-style-type: none"> ● purple flowers ● simple leaves 	
Jacksonia (Stinkwood)	<ul style="list-style-type: none"> ● often leafless ● calyx (sepals) usually reflexed 	
Kennedia (Scarlet runner)	<ul style="list-style-type: none"> ● three leaflets with stipules at base ● flowers red or black 	

Templetonia (Cockies tongues)	<ul style="list-style-type: none">• anthers alternately long and short• flowers red, yellow, brown, often large	
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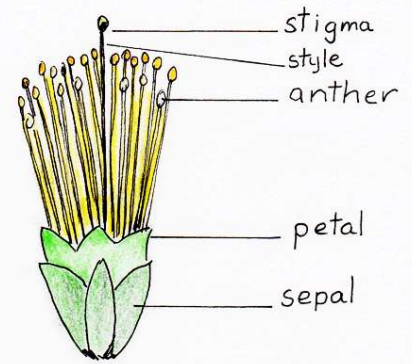
Some other ~90 genera of Western Australian Fabaceae include Bossiaea, Crotalaria, Gompholobium, Swainsona, Isotropis.

SUBFAMILY MIMOSOIDEAE (WATTLES)

- flowers small white or yellow
- inflorescence globular or cylindrical (3-130 flowers)
- sepals and petals small
- showy stamens



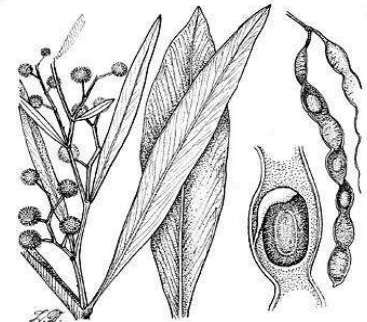
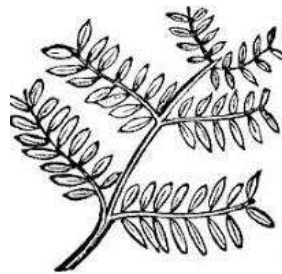
ACACIA



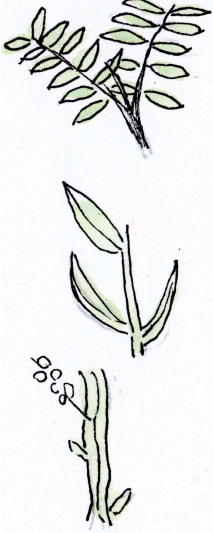
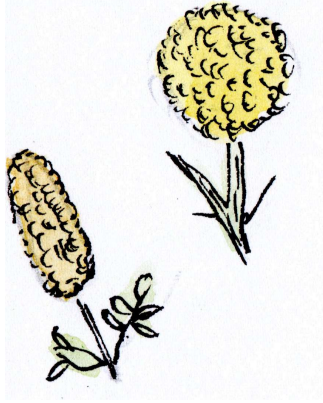
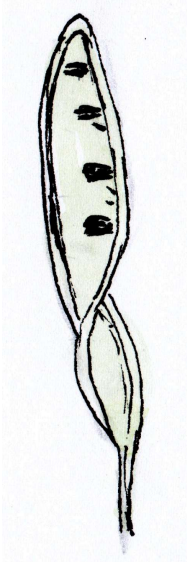
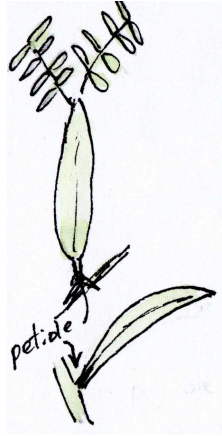
Individual flowers in inflorescences of globular heads or cylindrical spikes (3-130 individual flowers)

Leaves

- 2 types of Acacia leaves –
 - true leaves – feathery, bipinnate
 - Phyllodes
- fruit a legume



MIMOSOIDEAE SUMMARY TABLE

Leaves	Flowers	Seeds/fruits	
<p>Variable leaf and phyllode shape</p> 	<p>Usually yellow but sometimes white/cream. Flowers are ball or cylindrical shaped with petals barely visible. Stamens prominent</p> 	<p>Seeds in long flattened pods which split in two.</p> 	<p>Many wattles have phyllodes rather than true leaves. Phyllodes are derived from the leaf stalk (petiole) and are usually rigid and sometimes prickly.</p> 

SUBFAMILY CAESALPINOIDEAE



Cassia



Senna

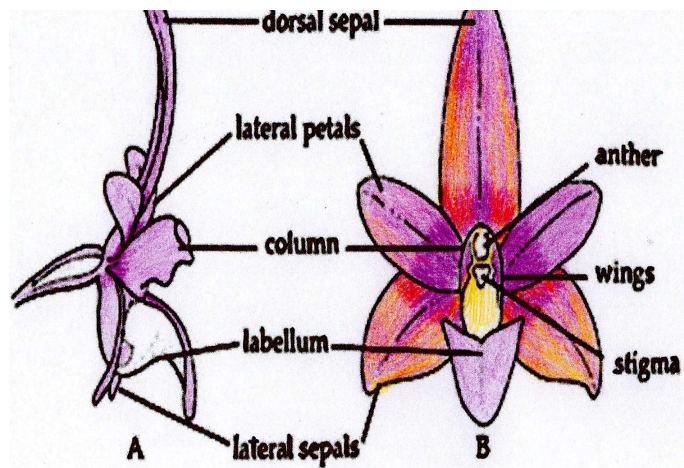
MONOCOTS

ORCHIDACEAE (ORCHIDS)

Orchid flowers consist of

- three petals, one modified as the labellum which is very different in size and shape from the others,
- three sepals,
- male and female flower parts combined form a column,
- pollen in clusters called pollinia

Orchid flower








Western Australian orchids are geophytic (grow in the ground) and die back after flowering leaving a bulb underground.

Pollination is often by deception. Some orchid flowers attract a male insect pollinator by mimicking the female's scent or shape. Others use scent to trap the insect, ensuring pollination occurs as the insect leaves the flower, while others have the appearance of a different flower.

Seeds are extremely small with no endosperm for nutrition for the developing embryo. The tiny dust like seeds can be dispersed by wind. Each plant can produce 100,000 seeds annually.

Germination requires an association with specific fungi, which provide nutrition, this association that continues throughout the orchid plant's life.

GENUS	FEATURES	IMAGE
<p>Caladenia (Spider, fairy, cowslip orchids)</p>	<ul style="list-style-type: none"> • most have long narrow petals and sepals • labellum with ornamental calli (small projections) • hairy leaves and flower stalk 	
<p>Diuris (Donkey orchids)</p>	<ul style="list-style-type: none"> • ear like petals • hanging lateral sepals which are very different from the dorsal sepal. 	
<p>Microtis (Mignonette, leek orchids)</p>	<ul style="list-style-type: none"> • single onion like leaf • small flowers in a raceme 	
<p>Pterostylis (Greenhoods orchid)</p>	<ul style="list-style-type: none"> • dorsal sepal and petals united to form a hood over the column • lower sepals united at base • multiple leaves. 	
<p>Thelymitra (Sun orchids)</p>	<ul style="list-style-type: none"> • all petals and sepals similar in size and shape 	

There are 42 genera of orchids in Western Australia. Others include Drakeae (hammer orchids), Elythranthera (enamel orchids).

OTHER EXAMPLES OF PLANT FAMILIES FOUND IN KINGS PARK

Many other families are represented by the approximately 3000 species in the Kings Park Botanic Gardens. Some families and their genera you will come across include:

- Haemodoraceae – Anigozanthos, Conostylis, Haemodorum
- Asteraceae – the everlastings
- Goodeniaceae – Dampiera, Leschenaultia
- Rutaceae – Boronia, Pilothea

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