Australian Plants Society NORTH SHORE GROUP
Ku-ring-gai Wildflower Garden

INTRODUCTION to Walks & Talks

AUSTRALIAN NATIVE PLANTS – NAMING THE PLANTS AND MAKING A START WITH THEIR IDENTIFICATION

Did you know that,

- The person who introduced the 'binary' system for classification of plants and animals (that is, describing them in terms of genus + species) was the Swedish botanist Carolus Linnaeus
- Linnaeus died in the same year that the first fleet arrived in Australia
- By and large the traditional method of plant classification using plant morphology has been found to be consistent with classification based on DNA analysis

The Botanical Naming of Plants

	BOTANICAL NAME	COMMON NAME(S)
	*Banksia serrata*	Old Man Banksia Saw Banksia Saw Leaf Banksia
	*Bidens pilosa*	Cobbler's Peg Farmer's Friend Spanish Needle Herbe d'aiguille
	*Ceratopetalum gummiferum*	Christmas Bush (in NSW)
	*Prostanthera lasianthos*	Christmas Bush (in Victoria)

To the newcomer the botanical name of a plant can seem quite strange. Using botanical names rather than common names, however, has many advantages. Botanical names are universal – they are the same regardless of the language being used. The names are based on

Greek or Latin words, and their botanical use is world-wide. Their use also overcomes the problem of some plants having several common names (see *Bidens pilosa*, above) or of two plants having the same common name (see the two plants above called Christmas Bush). The botanical name often gives an indication of some distinguishing feature of a plant. *Banksia serrata*, for example, is a *Banksia* with serrated leaves.

Genus and Species

Every plant has a two-part botanical name. The first part is the **genus** and the second is the **species**, e.g. *Banksia* (genus) *serrata* (species). The genus always starts with a capital letter, the species with a lower case letter. The **genera** (plural of 'genus') are grouped into **families.** The *Banksia* genus, for example, belongs to the Proteaceae family-

Family:	**Genus:**	**Species:**
Proteaceae	*Banksia*	*serrata*

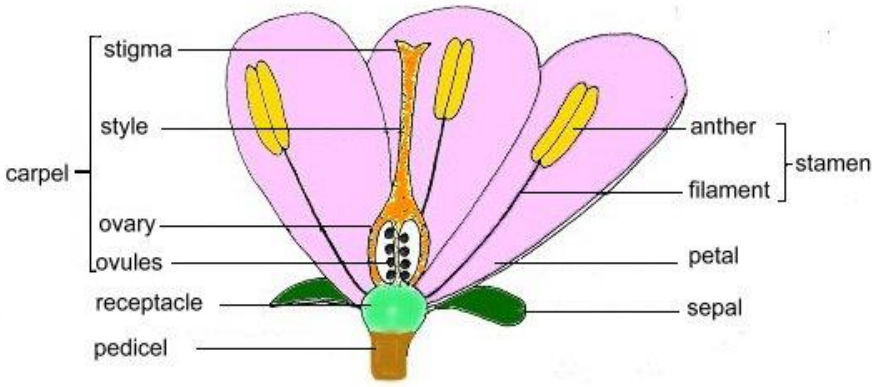
Occasionally - to accommodate groups of similar plants - a plant family is divided into various **'sub-families'** or sometimes even further into **'tribes'**:

Family	**Sub-Family**	**Tribe**	**Genus**	**Species**
Ericaceae	Styphelioideae	Epacrideae	*Epacris*	*longiflora*

Flowers and their Use in Plant Identification

Some fundamentals:

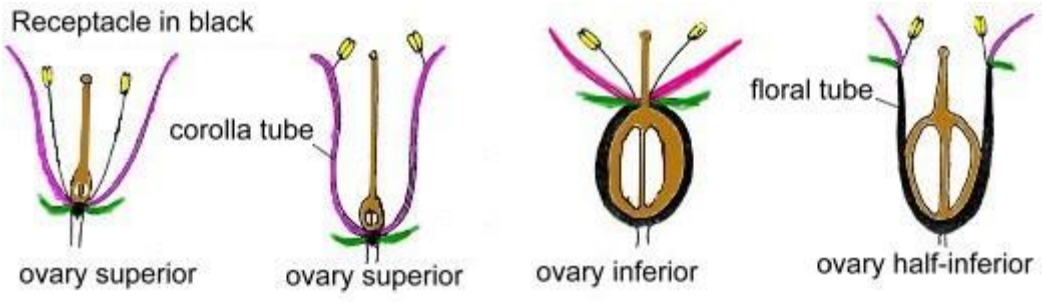
1. It is important to distinguish between a **flower** and an **inflorescence**. An inflorescence is a cluster of flowers on a stem. (For various types of inflorescences see 'Further Notes A'.)
2. Flowers are generally **bisexual** having male and female organs on the one flower. Sometimes, though, flowers are **unisexual**, having male and female organs on separate flowers. (For more information on unisexual flowers see 'Further Notes B'.)
3.The parts of a bisexual flower are as shown in this diagram



The outer whorl of sepals is called the **calyx** (a calyx of sepals).
The next outer whorl of petals is called the **corolla** (a corolla of petals).
The combination of all the sepals and petals together is called the **perianth**.
Sometimes the perianth consists of a single whorl of identical parts rather than separate whorls of sepals and petals. These parts are then called **tepals**. (This is a distinguishing feature of the Proteaceae Family where just four tepals are present.)
Coming now to the reproductive parts of the flower –
the **carpel** (consisting of a **stigma**, a **style**, an **ovary** and **ovules)** is the female part of the flower. (Often several carpels are fused or partly fused together within the flower. This combination of carpels is often called the **pistil**.)

The **stamens (**each one consisting of an anther and a filament) are the male parts of the flower. (There are always many – sometimes very many - stamens within the flower.)

A flower has a **superior ovary** when the base of the ovary is located above where the petals, sepals and stamens are attached. It has an **inferior ovary** when the ovary lies below where the petals, sepals and stamens are attached. Many intermediate or half-inferior arrangements are possible.

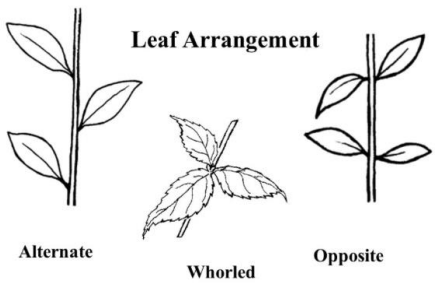


4. Flowers can be **regular** or **irregular**. A regular flower can be rotated around a vertical axis to produce several identical arrangements. For an irregular flower this is not possible (A plane drawn through the centre of the flower, however, will divide the flower into two parts that are the mirror image of each other.)

Leaves and Their Use in Plant Identification

Some fundamentals:

1. Leaves can be fleshy, soft, leathery, hard or even spiny.
2. An important attribute is the presence or absence of **oil glands** within the leaf. When present oil dots can often be seen by looking through the leaf towards the sky or detected by crushing the leaf and smelling.
3. Leaf arrangement on the stem can be **alternate**, **opposite** or **whorled**.



4. Leaf shapes are very variable and can be a very useful identifying feature. (For a comprehensive display of these arrangements see ‘Further Notes C’.}

Fruits and Their Use in Plant Identification.

To classify fruits the first division made is into **fleshy** and **dry** fruits.
Fleshy fruits are subdivided into **those derived from a single flower** and **those derived from an inflorescence**. Berries (e.g. tomatoes) and drupes (e.g. Persoonia fruit) come from single flowers while synconium (e.g. figs) comes from an inflorescence.
Dry fruits are subdivided into **those that are dehiscent** (split open) and **those that are indehiscent** (don't split open). Follicles (e.g. Grevillea fruit), legumes (e.g. peas) and capsules (e.g. eucalypt fruit) are dehiscent while cypsellas (e.g. daisy seeds) and caryopsis (e.g. grass seeds) are indehiscent.
(For a fuller account of fruits see 'Further Notes D'.)

Identification of Native Plant Families

1. The first step in identifying a plant species is determining the plant family to which the plant belongs. A scheme is now described in which knowledge of just a few characteristics of a plant allows us to do this. (The scheme applies only to members of eight dicotyledon families but the wide abundance of plants in these eight families makes it a useful initial approach for all dicotyledon plants.) These three characteristics are:

- whether or not there are oil glands in the leaves
- whether the flowers are regular or irregular
- whether the ovaries of the flowers are superior or inferior

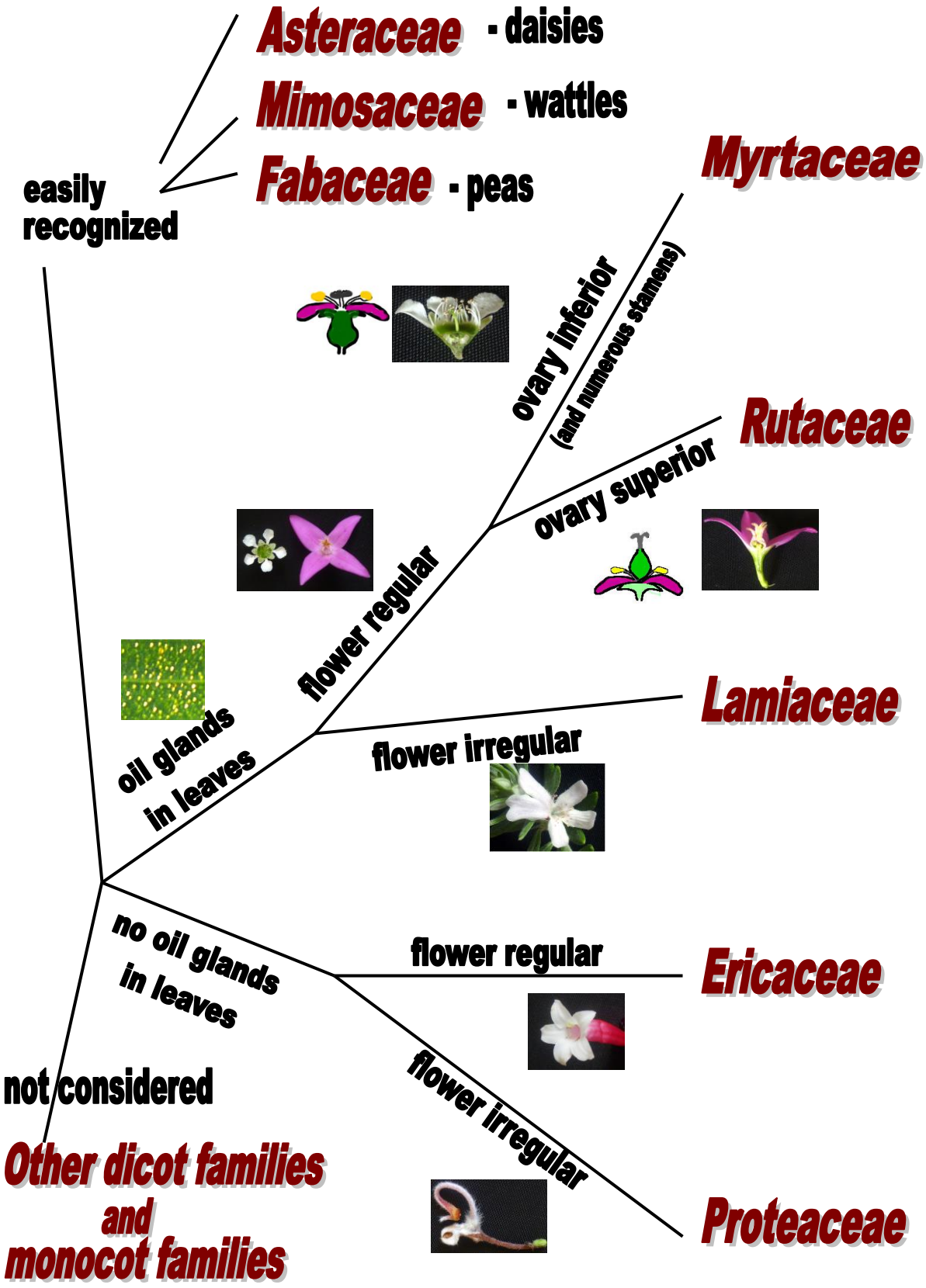
The scheme is rather simplistic and other characteristics often need to be considered. Although *Westringia fruticosa*, for example, does not show significant oil glands it has a flower shape (2-lipped petals) characteristic of the family Lamiaceae and is placed there; and although *Persoonia* species have regular – not irregular - shaped flowers they have a flower structure characteristic of the family Proteaceae (sepals and petals combined into a so-called 'perianth') and are placed there. There are many such anomalies.
The scheme has been adapted from one suggested by Dr Joan Webb.

2. Other dicot families are not considered in the scheme. Some commonly occurring plants in these families are as follows:

Scientific Name	**Common Name**	**Family**
Actinotus helianthi	Flannel Flowers	Apiaceae
Actinotus minor	Lesser Flannel Flower	Apiaceae
Platysace linearifolia	Narrow-leaf Platysace	Apiaceae
Allocasuarina distyla	She-oak	Casuarinaceae
Bauera rubioides	Dog Rose	Cunoniaceae
Ceratopetalum gummiferum	Christmas Bush	Cunoniaceae
Hibbertia species		Dilleniaceae
Dampiera stricta		Goodeniaceae
Scaevola ramosissima	Fan-flower	Goodeniaceae
Pittosporum undulatum		Pittosporaceae
Pomaderris intermedia		Rhamnaceae
Dodonaea triquetra	Hop Bush	Sapindaceae
Stylidium graminifolium	Trigger Plant	Stylidiaceae
Pimelea linifolia		Thymelaeaceae
Tetratheca ericifolia		Elaeocarpacea

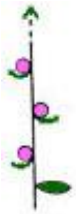
3. Monocots are not considered in the scheme nor are primitive plants such as ferns. Monocots as a group are distinguished by having flowers with only 3 petals whereas dicots have 4 or 5 petals. Some monocots belong to clearly distinguishable families such as grasses, orchids, reeds, etc.

Identification of Native Plant Families

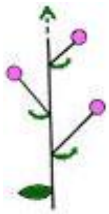


Further Notes A

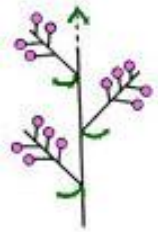
Spike:
flowers sessile
e.g. *Callistemon* sp.



Raceme:
flowers pedicellate
e.g. *Hardenbergia violacea*

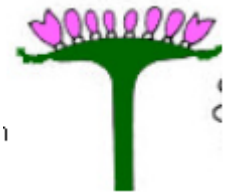


Panicle:
main axis has branches which may be further branched e.g. *Dianella* sp.

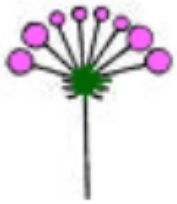


Corymb:
all the flowers are at the same level though the pedicels arise at different levels e.g. *Poranthera* sp.

Head:
a dense cluster of more or less sessile flowers
e.g. Asteraceae a group of florets sessile on a common receptacle



Umbel:
All flowers arise from one point at the top of the peduncle
e.g. *Actinotus* sp.



Further Notes B

When flowers are **unisexual** (i.e. with separate male and female flowers) :

- the plant is described as **"monoecious"** when male and female flowers are on the same plant.

Cucumber flowers - female flower on top, male flower below

- the plant is described as **"dioecious"** when male flowers are on one plant and female flowers are on another plant.

Male *Allocasuarina distyla*

Female *Allocasuarina distyla*

Further Notes C

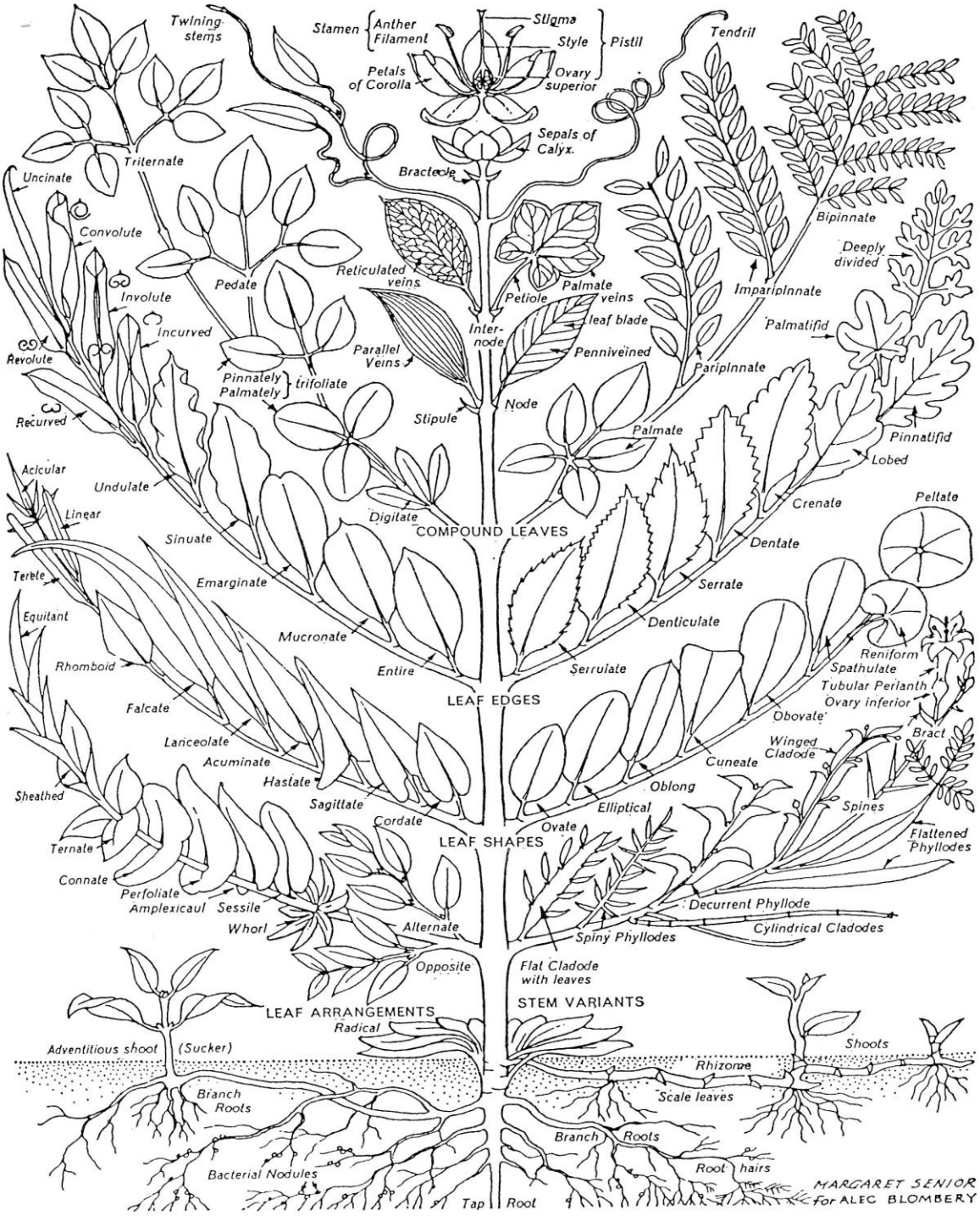


FIG. 2. A diagrammatic drawing of an imaginary plant showing different characteristics mentioned in this book.

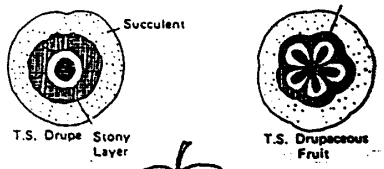
Australian Native Plants, Alec Blombery, 3rd ed., 1977.

Further Notes D

KEY TO MAIN TYPES OF SIMPLE FRUITS

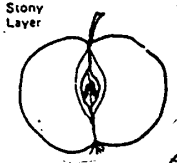
A. FRUIT FLESHY, often brightly coloured

B. Seed or seeds enclosed in fleshy and woody inner layers, e.g. *Persoonia*
DRUPE

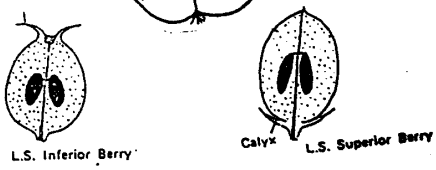


B*. Inner layer fleshy, no inner woody layer

C. Ovary inferior. Main fleshy layer formed from swollen top of stem, e.g. apple
POME



C*. Ovary inferior or superior. Fleshy tissue from ovary wall, e.g. *Austromyrtus*
BERRY



A* FRUIT DRY WHEN MATURE

D. Fruit not splitting open when ripe

E. Wing present on 1-seeded fruit, e.g. *Allocasuarina*
SAMARA

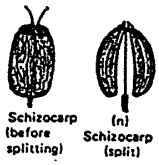
E* No wing present

F. Single seed loose inside the fruit, e.g. *Clematis* and *Cyperus*
CYPSELLA (c), ACHENE (a) and NUT (n)

F*. Single seed fused to ovary wall, e.g. all grasses (Poaceae)
CARYOPSIS (GRAIN)

D*. Fruit splittiing open or apart when ripe

G. Fruit separating into carpels which shed with seed when ripe, e.g. *Geranium*
SCHIZOCARP



G*. Fruit splitting open by valves releasing seed when ripe

H. Fruit from a single carpel

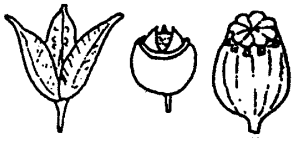
I. Fruit opening on one side only, e.g. *Grevillea*
FOLLICLE

I*, Fruit opening along two sides, e.g. *Dillwynia* and *Acacia*
LEGUME (POD)

H*. Fruit from a compound ovary, i.e. from two or more fused carpels

J. Two valves separating from base upward, leaving seeds on partition, e.g. *Cardamine* (Brassicaceae) SILIQUA

J*. Fruit splitting in different ways by opening valve (lid), or by pores e.g. *Leptospermum, Hibiscus,* poppy CAPSULE



Adapted from Gwen Harden and John Williams, How to Identify Plants, UNE, 1984.
Illustrations from Beadle et al, Flora of the Sydney Region, Reed, 3rd ed., 1982.

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