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### PRINCIPLES FOR IDENTIFYING PLANTS

R.G. Silcock 03/86

In theory, a botanist can take an adequate, pressed plant specimen and work through from first principles, with the aid of an extensive library of taxonomic keys, and identify the plant. In practice, they only do this if they have not got a clue. Mostly they start by recognising, from experience and training, that it is a member of a particular family or genus of plants. If they do not recognise the species instantly they will go to a key for that group and start there. In all cases where they have any doubts about their conclusion, they then go to a herbarium and compare the specimen with an authenticated sample of that species.

You do not have that experience or training or herbarium to help you, so you need a few short cuts which will normally get you to the right part of a readily available book such as "Plants of Western NSW" or "Flora of Central Australia". From there you would try to match your specimen with an illustration or description given in the book. Even if you cannot be certain that you have the species correct, the genus will often be correct and that will usually be all you need to know to draw numerous workable and meaningful conclusions or recommendations.

#### **Firstly** - a few basics on plant taxonomy

With very few exceptions, Australian plants can be regarded as Monocotyledons or Dicotyledons. The exceptions are the mosses, ferns and conifers. Monocots are the grasses, bamboos, lilies, sedges and rushes - from seed they sprout a single (mono) leaf initially. The dicots have two seedling leaves (these can be highly modified) which generally appear first above ground, e.g., on Noogoora burr or mulga or beans. Dicots often have pretty flowers and broad or multi-bladed leaves, e.g., Noogoora burr, jacarandas, beans etc, while monocots generally have thin leaves relative to their length and no petals on the flowers, e.g., grasses, cumbungi, etc.

**Secondly** - within these broad groups, the species are lumped into families based on the structure and organisation of their flowers and fruits. This is why it is so important to collect good flowers and fruits on specimens if you want a definite identification to be made. Most plant books group their text around these family groups so that if you can pick the likely family that your plant belongs to, then your search is considerably narrowed.

**Thirdly** - plant size, leaf hairiness, petal colour etc., generally only become useful identifiers (despite their strong visual impact) once the family of the species is known. At this level of identification, all but the expert who is experienced in the region, will probably have to consult a book to be certain of his identification.

**Fourthly** - there is nothing really sacrosanct about a particular name that is given to a plant. Botanists delight in using the rule book to modernise the work of earlier generations - but the plant goes on unchanged. So poplar box is currently called *Eucalyptus populnea*, i.e., it is that species within the 800 odd species which belong to the genus *Eucalyptus* (the eucalypts).

This genus is one of many within the family Myrtaceae which is characterised by flowers with masses of thin stamens that produce gumnut-like fruits, e.g., the apple gums, tee trees, yellow box, etc. These differ from another dicot family Mimosaceae which contains the wattles because, though they both have big fluffy flowers with masses of thin stamens that produce gumnut-like fruits, for example, the apple gums, tee trees, yellow box, etc. These differ from another dicot family Mimosaceae which contains the wattles because, though they both have big fluffy flowers, the wattles produce an elongated pod quite unlike the Eucalypt nut. The classification system works in exactly the same way as for animals, e.g., *Bos indicus* is a member of the cattle genus *Bos* which, like *Ovis* (the sheep), is a group within the family Cavicornia which is part of the sub-order Ruminantia (the ruminants) of the order Ungulata (hoofed mammals). I guess monocots and dicots have a similar level in the plant hierarchy that Mammalia and Reptilia have in the Animal Kingdom.

What you people need to be able to do is:

- (A) Collect an adequate specimen so that it can be positively identified.
  - (B) Understand the mechanics behind identifying a plant from a textbook or taxonomic key.
  - (C) Develop a few rules of thumb which you can easily remember and pick, to allow you to guess to what family or genus the plant belongs.
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- (A) An adequate specimen should have flowers, fruits, leaves attached to stem and
    - (i) bark in the case of trees and woody shrubs,
    - (ii) the plant crown in the case of grasses and herbs.

The material should be relatively intact and healthy.

- (B) Understanding the mechanics of identification entails a knowledge of a few botanical terms. These are usually explained and illustrated in textbooks and are no more frightening than big names in medicine and vet work.

In essence, you will have to decide -

1. Whether it is a fern or conifer.
2. If neither of those, then is it a monocot or a dicot.
3. Then which families it may belong to, based in flower and fruit characteristics.

This is where your own perceptions become useful and may not have to conform to a book. You are working with a restricted subset of plants of a family. Yet, book keys often cover all species from a state, continent or the world and are much more complex and full of exceptions that will not concern you. Plant families are often global in their distribution but with unique genera or subgroups occurring in particular continents, e.g., the *Grevilleas* of Australia are an endemic genus of the world wide family Proteaceae; *Triodia* is an Australian genus of the family Gramineae.

(C) You people are usually quite O.K. at identifying trees and many shrubs (possibly because you rest frequently in their shade), but little plants that stock eat are of little value to you for your survival. The groups that I think you should be able to recognise are -

1. Grasses from sedges, lilies and rushes, that is, p 51-154 from p 155-206 in "Plants of Western NSW".
2. Acacias (p 356-375)
3. Eucalypts (p 517-32)
4. Daises - family Compositae (p 640-728)
5. Legumes -
  - Mimosa (p 375-77)
  - Cassia (p 377-82)
  - Peas (p 383-430)
6. Saltweeds (Chenopodiaceae) (p 236-81)
7. Malvaceae (p 478-92)
8. Wiregrasses (p 54-60)
9. Panicums (p 118-22)
10. Andropogoneae
11. Lovegrasses (p 97-105)
12. Mitchell grasses (p 60-62)
13. The major woody weeds

Once you can pick a plant as belonging to such groups, then you can use books and keys with some confidence, knowing you are in the right ballpark. Also you can often have a punt at the feed value, ecological importance and other things about the plant without knowing just which species it is. At the species level, there are plant characteristics which may be peculiar to that species, e.g., poisonous or annual or unpalatable which may not apply to the group in general, e.g., *Sclerolaena lanicuspis* is not particularly prickly compared to its burry relatives and therefore is readily eaten until very mature.

What I cannot do is turn you into botanists overnight. I can only point out key features of major plant species or families and leave you to select your key criteria for picking them again. There is no substitute for study and effort to gain some competence in this field - collect specimens, try to identify them, keep pressed specimens of key species, etc.

#### NOTES

- Grasses        no taproot, split sheathing leaf base, no petals, thin leaves - use the key on p 47-51.
- Acacia        trees or shrubs; fluffy yellow or cream flowers in balls or cylinders, large dark shiny seeds.
- Eucalyptus   trees, gum nut fruits, leaves alternate, capped flower bud, v. small seeds.
- Compositae   ring of petals, yellow centre to flower, thistle-like seeds, no trees.
- Mimosoideae   trees, shrubs, pinnate leaves, yellow fluffy ball flowers.
- Cassia        shrubs, deep yellow flowers, large petals, large seeds.
- Pea group     characteristic flower structure with keel and standard, 3 leaflets/leaf, often vines.
- Chenopods    shrubs or herbs, no petals; fleshy, bluish leaves, symmetrical fruits.
- Lovegrasses   much branched seedhead with flattened, ovate sections each with many subparts, small seeds like sandgrains, narrow leaves.
- Wiregrasses        3-awned seeds with a sharp point, thin leaf, non-hairy.
- Panicum        seedhead a panicle, small shiny seeds, often palatable, no awns or bristles.
- Andropogonae        grasses, silky seedheads, bluish leaves, often hairy nodes or pits in the fluffy seeds.
- Malvaceae     herbs, thick mealy surfaced leaves, hibiscus-shaped flowers, yellow or pink petals.
- Mitchell grasses   only 4 species, stemmy, not obviously hairy, hedge grazed, heavy clay soils only.