



# Flora of South Australia

5th Edition | Edited by Jürgen Kellermann

## KEY TO FAMILIES<sup>1</sup>

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The sequence of families used in this *Flora* follows closely the one adopted by the Australian Plant Census ([www.anbg.gov.au/cbab/apc](http://www.anbg.gov.au/cbab/apc)), which in turn is based on that of the Angiosperm Phylogeny Group (APG III 2009) and *Mabberley's Plant Book* (Mabberley 2008). It differs from previous editions of the *Flora*, which were mainly based on the classification system of Engler & Gilg (1919).

A list of all families recognised in this *Flora* is printed in the inside cover pages with families already published highlighted in bold. The up-take of this new system by the State Herbarium of South Australia is still in progress and the S.A. Census database ([www.flora.sa.gov.au/census.shtml](http://www.flora.sa.gov.au/census.shtml)) still uses the old classification of families. The Australian Plant Census web-site presents comparison tables of the old and new systems on family and genus level. A good overview of all families can be found in Heywood et al. (2007) and Stevens (2001–), although these authors accept a slightly different family classification.

A number of names with which people using this key may be familiar but are not employed in the system used in this work have been included for convenience and are enclosed on quotation marks.

1. Plants reproducing by spores and not producing flowers (**“Ferns and lycopods”**)
  2. Aerial shoots either dichotomously branched, with scale leaves and 3-lobed sporophores or plants with fronds consisting of a simple or divided sterile blade and a simple or branched spikelike sporophore ..... Class **Psilotopsida**
  - 2: Aerial shoots not dichotomously branched (the fronds of Gleicheniaceae superficially resemble dichotomously branched stems) or absent; sporangia on the underside margins or embedded in the bases of the fronds or axillary
    3. Sporangia solitary, sessile in the axils, or embedded in the bases, of the leaves (sporophylls); leaves small (rarely long and linear), undivided ..... Class **Lycopodiopsida**
    - 3: Sporangia usually many on the undersurface or the margins of the leaves; leaves large (in the Marsileaceae the numerous sporangia are contained in woody sporocarps), usually divided or pinnatisect (*Azollaceae* have small leaves but include the only free-floating fern species) ..... Class **Polypodiopsida**
- 1: Plants with male (pollen-producing) and female (ovuliferous) structures in flowers or cones; fertilised ovules forming seeds (**Spermatophyta**)
  4. Ovules and seeds naked, carried on cone scales; perianth 0 ..... Class **Pinopsida**
  - 4: Ovules enclosed in an ovary; seeds enclosed in a fruit; perianth usually present ..... Class **Magnoliopsida**

<sup>1</sup> This work can be cited as: Jessop, J.P. (2012). Key to families (version 1). In: Kellermann, J. (ed.), *Flora of South Australia* (ed. 5). 18 pp. (State Herbarium of South Australia: Adelaide). [www.flora.sa.gov.au/ed5](http://www.flora.sa.gov.au/ed5)

<sup>2</sup> State Herbarium of South Australia, DENR Science Resource Centre, PO Box 2732, Kent Town, SA 5071, Australia.

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### Class **PSILOTOPSISIDA**

- 1. Dichotomously branched aerial shoots with scale leaves and 3-lobed sporophores ..... **Psilotaceae**
- 1: Fronds consisting of a simple or divided sterile blade and a simple or branched spikelike sporophore ..... **Ophioglossaceae**

### Class **LYCOPODIOPSISIDA**

- 1. Leaves basal, clustered together, at least 3 cm long ..... **Isoetaceae**
- 1: Leaves most often cauline, less than 2 cm long
  - 2. Perennials; spores of one kind only (homosporous) ..... **Lycopodiaceae**
  - 2: Annuals; spores of two kinds, each produced in a different type of sporangium (megaspores and microspores) ..... **Selaginellaceae**

### Class **POLYPODIOPSISIDA**

- 1. Spores of two types; sporangia borne in stalked or sessile woody sporocarps or singly in leaf axils; generally aquatics or occurring in temporarily inundated habitats
  - 2. Rhizomes free-floating, bearing leaves usually c. 2–30 mm long along their length ..... **Salviniaceae** (including Azollaceae)
  - 2: Rhizomes in the soil, leaves simple and linear or petiolate with 2 or 4 leaflets ..... **Marsileaceae**
- 1: Spores of one type; sporangia borne on the undersurface of leaves or in stalked pinnate (comb-like) clusters
  - 3. Sporangia borne in stalked pinnate (comb-like) clusters ..... **Schizaeaceae**
  - 3: Sporangia scattered or aggregated into groups on the undersurface of or submarginal on the leaf
    - 4. Sporangia not protected by an indusium or modified leaf margin even when immature
      - 5. Arborescent, developing a thick trunk to 12 m tall; stipe bases scaly ..... **Cyatheaceae**
      - 5: Not arborescent; trunk not developed; stipe bases scaly, hairy or glabrous
        - 6. Fronds pseudodichotomously branched ..... **Gleicheniaceae**
        - 6: Fronds pinnate to tripinnate
          - 7. Stem short, erect; two stipule-like structures present at the base of the stipe ..... **Osmundaceae**
          - 7: Stem tufted or creeping; stipule-like structures absent
            - 8. Rhizome and/or fronds bearing scales, with or without hairs as well
              - 9. Frond glabrous; rhizome scaly ..... **Pteridaceae**
              - 9: Frond hairy with prominently segmented eglandular hairs; rhizome scaly ..... **Aspleniaceae**
              - 8: Rhizome and fronds bearing hairs only ..... **Dennstaedtiaceae**
      - 4. Sporangia protected by an indusium (true indusium) or modified leaf margin (false indusium) at least before maturity when the indusium may be shed
        - 10. Sori marginal or submarginal
          - 11. Indusium 2-lipped or cup-like
            - 12. Arborescent, developing a tall thick trunk; indusium 2-lipped; stipe bases hairy ..... **Dicksoniaceae**
            - 12: Non-arborescent, trunk not developed; indusium cup-like ..... **Dennstaedtiaceae**
          - 11: Indusium variable but neither 2-lipped nor cup-like

13. Indusium (true) opening towards the frond margin ..... **Lindsaeaceae**
- 13: Indusium (true or formed by the inrolled frond margin) opening towards the costa
14. Fronds lanceolate to narrow-triangular, bipinnate to decompose
15. Rhizome short, erect, densely scaly; sori borne on a vascular commissure joining the vein endings ..... **Pteridaceae**
- 15: Rhizome long-creeping, usually hairy (but scaly in *Histiopteris*); sori terminal on free veins ..... **Dennstaedtiaceae**
- 14: Fronds linear-oblong to narrow-lanceolate, pinnatifid to pinnate or, if bipinnate to tripinnate, the segments on long filiform stalks
16. Sori terminal on free veins; fronds uniform ..... **Pteridaceae**
- 16: Sori borne on vascular commissures parallel with the costa; sterile and fertile fronds slightly or markedly different from each other **Blechnaceae**
- 10: Sori on the lower surface of the fronds
17. Sori linear ..... **Aspleniaceae**
- 17: Sori rounded
- 18 Indusium hairy ..... **Thelypteridaceae**
- 18: Indusium glabrous ..... **Dryopteridaceae**

### Class PINOPSIDA

1. Adult leaves long and linear ..... **Pinaceae**
- 1: Adult leaves scale-like ..... **Cupressaceae**

### Class MAGNOLIOPSIDA

The following four families are treated as “**Basal Angiosperms**” in the text but in this key are inserted as follows:

- “Monocotyledons”: Hydatellaceae (*Trithuria*);
- “Dicotyledons”: Nymphaeaceae (*Nymphaea*), Lauraceae (*Cassytha*), Ceratophyllaceae (*Ceratophyllum*).

1. Embryo with 1 cotyledon; leaves almost always with parallel nerves; perianth frequently of two whorls of three parts ..... “**Monocotyledons**”
- 1: Embryo with 2 cotyledons; nerves of the leaves usually branching pinnately and often reticulate; perianth usually in 1 or 2 whorls of 4 or 5 parts ..... “**Dicotyledons**”

### “MONOCOTYLEDONS”

1. Free-floating fresh-water plants
2. Leaves at least 5 cm long, with a large bladder-like petiole (water hyacinth) ..... **Pontederiaceae**
- 2: Leaves not differentiated from the stems; plant thallus-like, to 15 mm long (duckweeds) ..... **Araceae** (genera formerly in the Lemnaceae)
- 1: Terrestrial, epiphytic or parasitic, if aquatic then with the roots in the soil
3. Fully submerged aquatics or with leaves or flowers floating
4. Perianth of 4 parts; stipules axillary (fresh or brackish water) ..... **Potamogetonaceae**

- 4: Perianth of 0–3 or 6 parts; stipules 0 or paired or with an auriculate leaf sheath
5. Plant with a short tuberous rhizome; perianth-segment 1, conspicuous ..... **Aponogetonaceae**
- 5: Plant with creeping rhizomes or stolons; perianth-segments 0 or 2 or more
6. Flowers bisexual
7. Stems and rhizomes covered with long persistent fibres; carpel 1 (marine) ..... **Posidoniaceae**
- 7: Stems and rhizomes not covered with fibres; carpels at least 4, free (fresh water or rarely marine) ..... **Potamogetonaceae**
- 6: Flowers unisexual
8. Leaves with a distinct blade and petiole and opposite or whorled, or linear and whorled; flowers bracteate; ovary inferior (fresh water or marine) ..... **Hydrocharitaceae**
- 8: Leaves linear, alternate or subopposite; flowers ebracteate; ovary superior
9. Leaves with 3 veins, ligulate; pollen filiform
10. Stems lignified, wiry, bearing conspicuous annular scars; roots branched (marine) ..... **Cymodoceaceae**
- 10: Stems herbaceous, with annular scars; roots not branched (marine) ..... **Zosteraceae**
- 9: Leaves with 1 median vein, eligulate; pollen globose
11. Carpels 3, free, each with 1 style and an expanded stigma (fresh water or marine) ..... **Potamogetonaceae**
- 11: Carpel 1, style 1; stigmas 2 or 3, linear (fresh water) ..... **Hydrocharitaceae**
- 3: Terrestrial or, if aquatic, then with leaves and flowers supported above the water surface
12. Trees or shrubs with pinnate or palmate leaves (palms) ..... **Areaceae**
- 12: Herbs or rarely shrubs or trees, always with simple leaves
13. Perianth 0 (or in the Poaceae possibly represented by the lodicules)
14. Flowers in dense cylindrical spikes divided into a male region above or below a female region
15. Spike subtended by a large spathe (arums) ..... **Araceae**
- 15: Spike without a spathe (bulrushes) ..... **Typhaceae**
- 14: Flowers solitary or in spikes, racemes, panicles or umbels but, if unisexual, then the sexes not in separate parts of a cylindrical spike
16. Flowers unisexual, in a group surrounded by 4–6 spreading bracts ..... **Hydatellaceae**
- 16: Flowers bisexual or unisexual, each flower or group of fused unisexual flowers subtended and often enclosed by a bract
17. Fruit membranous, splitting on 1 side to release a smooth translucent seed ..... **Centrolepidaceae**
- 17: Fruit indehiscent
18. Ligule at the base of the leaf blade; leaf base surrounding the stem but the margins very rarely fused (grasses) ..... **Poaceae**
- 18: Ligule usually 0; leaf base usually completely encircling and fused round the stem (sedges) ..... **Cyperaceae**
- 13: Perianth present
19. Ovary superior (or somewhat semi-inferior in Haemodoraceae)
20. Perianth conspicuous, petal-like; flowers bisexual
21. Anthers 6
22. Carpels 3, fused
23. Flowers single and terminal on multi-branched perennial shoots ..... **Dasyogonaceae** (*Calectasia*)
- 23: Flowers in umbels, racemes or panicles, if single then not on multi-branched perennial shoots

24. Flowers in umbels or single terminating long unbranched leafless stems or in *Colchicum* the base of the flower at ground level during flowering and only carried up when in fruit
25. Bracts at the base of the pedicels at least 3 ..... **Colchicaceae**
- 25: Bracts at the base of the pedicels 1 or 2
26. Filaments fused to the perianth for at least 20 mm ..... **Agapanthaceae**
- 26: Filaments attached at the base of the perianth ..... **Alliaceae**
- 24: Flowers in racemes or panicles
27. Stems branched; leaves cauline, less than 4 cm long ..... **Asparagaceae**
- 27: Stems simple or, if branched, the leaves either all basal or absent at flowering or the largest leaves more than 5 cm long
28. Flowers sessile, bisexual, in dense cylindrical spikes at least 30 cm long ..... **Xanthorrhoeaceae** (*Xanthorrhoea*)
- 28: Flowers pedicellate, if sessile then unisexual and spikes less than 30 cm long
29. Plants dioecious; leaves basal; perianth lacking nectaries ..... **Asparagaceae** (*Lomandra*)
- 29: Flowers bisexual; if plants dioecious the leaves along the stems and the perianth segments each with 1 or 2 nectaries
30. Aerial stem and inflorescence unbranched; flowers always 1 in the axil of each bract
31. Leaves not all basal (always present at flowering) ..... **Colchicaceae** (*Wurmbea*)
- 31: Leaves all basal (not always present at flowering)
32. Flowers yellow; filaments bearded; not forming bulbs ..... **Asphodelaceae** (*Bulbine*)
- 32: Flowers rarely yellow but, if so, filaments not bearded; bulbs ..... **Asparagaceae**
- 30: Aerial stem or inflorescence branched or, if simple, at least some bracts bearing more than 1 flower
33. Flowers at least 3 cm long
34. Flowers red, orange or yellow
35. Leaves bases laterally flattened ...  
..... **Hemerocallidaceae** (*Phormium*)
- 35: Leaves bases dorsio-ventrally flattened ..... **Asphodelaceae** (*Aloe*, *Kniphofia*)
- 34: Flowers greenish white ..... **Asparagaceae** (*Yucca*)
- 33: Flowers less than 3 cm long
36. Fruit a berry; aerial shoot perennial; anthers dehiscing apically (sometimes splitting introrsely later) ..... **Hemerocallidaceae** (*Dianella*)
- 36: Fruit a capsule; aerial shoot often lasting only a few months; anther dehiscence introrse
37. Perianth twisted spirally after flowering
38. Filaments bearded ..... **Hemerocallidaceae** (*Tricoryne*)
- 38: Filaments glabrous
39. Inflorescence perennial, divaricately branched .....  
..... **Hemerocallidaceae** (*Corynotheca*)

- 39: Inflorescence short-lived, simple or few-branched
  - 40: Flowers racemose .. **Hemerocallidaceae** (*Caesia*)
  - 40: Flowers corymbose . **Asparagaceae** (*Chamaescilla*)
- 37: Perianth not twisted spirally after flowering
  - 41: Anthers dorsifixed .....
    - ..... **Asphodelaceae** (*Asphodelus, Trachyandra*)
  - 41: Anthers attached at or near their base
    - 42: Inner three perianth-segments fringed ..... **Asparagaceae** (*Thysanotus*)
    - 42: Inner three perianth-segments not fringed
      - 43: Plant climbing ..... **Asparagaceae** (*Murchisonia*)
      - 43: Plant erect
        - 44: Leaves spirally arranged; anthers not coiling into a roll at dehiscence; seeds angular ..... **Asparagaceae** (*Arthropodium*)
        - 44: Leaves 2-ranked, perennial; anthers coiling into a roll at dehiscence; seeds flat .....
          - ..... **Hemerocallidaceae** (*Stypandra, Thelionema*)
  - 22: Carpels 6 or more, free ..... **Alismataceae**
  - 21: Anthers 3
    - 45: Leaves basal, linear
      - 46: Perianth of 6 petaloid segments ..... **Haemodoraceae** (*Wachendorfia*)
      - 46: Perianth of an outer calyx-like whorl and 3 inner petaloid segments ..... **Xyridaceae**
    - 45: Leaves cauline, linear-lanceolate to ovate ..... **Commelinaceae**
  - 20: Perianth membranous, scale-like or of bristles or filaments; flowers bisexual or unisexual
    - 47: Perianth of bristles or filaments or fused to form a sac-like structure enclosing the ovary and fruit ..... **Cyperaceae**
    - 47: Perianth of scale-like or petaloid segments
      - 48: Flowers unisexual, if bisexual the inflorescence a dense spike at least 30 cm long
        - 49: Leaves well-developed, linear (in *Lomandra juncea* stems form simple leaf-like structures), radical or in a rosette terminating massive stems
          - 50: Dioecious or, if flowers bisexual, then in spikes at least 30 cm long
            - 51: Flowers bisexual, sessile and in dense spikes at least 30 cm long ..... **Xanthorrhoeaceae** (*Xanthorrhoea*)
            - 51: Flowers unisexual, pedicellate or sessile, if sessile and in a dense spike the spike less than 15 cm long ..... **Asparagaceae** (*Lomandra*)
          - 50: Monoecious ..... **Eriocaulaceae**
        - 49: Leaves all reduced to scales on rhizomes and aerial stems ..... **Restionaceae**
      - 48: Flowers bisexual, inflorescence various but if a dense spike then less than 30 cm long
        - 52: Carpels fused
          - 53: Ovules numerous; inflorescence branched or flowers clustered (most rushes) ..... **Juncaceae**
          - 53: Ovules 1 in each cell; inflorescence a raceme or spike ..... **Juncaginaceae**

- 52: Carpels free ..... **Alismataceae**
- 19: Ovary inferior
  - 54: Male and female organs combined in a central complex, the column;
    - anther 1 (orchids) ..... **Orchidaceae**
  - 54: Male and female organs separate; anthers 3 or 6
    - 55: Anthers 3 ..... **Iridaceae**
    - 55: Anthers 6–12
      - 56: Water plants with floating leaves ..... **Hydrocharitaceae**
      - 56: Terrestrial plants; if growing in water then leaves erect above the water surface
        - 57: Inflorescence an umbel ..... **Amaryllidaceae**
        - 57: Inflorescence a cymose or panicle or flowers single
          - 58: Flowers solitary ..... **Hypoxidaceae**
          - 58: Flowers in cymes or panicles
            - 59: Leaves less than 15 cm long, entire ..... **Alstroemeriaceae**
            - 59: Leaves at least 90 cm long with prickly-dentate margins ..... **Asparagaceae** (*Agave*)

## “DICOTYLEDONS”

- 1. Branchlets jointed, ridged; leaves reduced to whorls of scale-like teeth; trees or shrubs ..... **Casuarinaceae**
- 1: Stems and leaves not as above; herbaceous or woody
  - 2. Flowers numerous, enclosed within a hollow fleshy receptacle; trees with latex ..... **Moraceae**
  - 2: Flowers exposed or concealed by bracts; only a few with latex
    - 3. Plants entirely parasitic for their mineral and water requirements
      - 4. Erect leafless root parasites, lacking chlorophyll ..... **Orobanchaceae**
      - 4: Parasitic on the aerial parts of the host, possessing chlorophyll (leaves and/or stems green)
        - 5. Leafless twiners
          - 6. Perianth in whorls of 4 or 5 ..... **Convolvulaceae** (*Cuscuta*)
          - 6: Perianth in whorls of 3 ..... **Lauraceae** (*Cassytha*)
        - 5: Not twining, usually producing leaves
          - 7. Leaves well-developed; flowers > 5 mm long, generally brightly coloured ..... **Loranthaceae**
          - 7: Leaves reduced to scales along flattened, jointed cladodes; flowers minute, inconspicuous ..... **Santalaceae** (*Korthalsella*)
    - 3: Plants not parasitic or, if partially so, then possessing both normal roots and chlorophyll
      - 8. Flowers unisexual and arranged within a cup formed by connate bracts; a number of male flowers on articulated filaments surrounding a female flower consisting of a stipitate 3-celled ovary (this group of unisexual flowers – a cyathium – may be mistaken for a single bisexual flower) ..... **Euphorbiaceae**
- 8: Not as above
  - 9. Perianth 0 or not consisting of a distinct calyx and corolla (excluding the Asteraceae which are characterised by having a 2-fid style, an inferior ovary and florets in a capitulum)
    - 10. Flowers unisexual
      - 11. Perianth 0
        - 12. Large woody shrubs or trees

- 13. Leaves opposite
  - 14. Leaves simple ..... **Oleaceae**
  - 14: Leaves pinnate ..... **Juglandaceae**
- 13: Leaves alternate
  - 15. Dioecious ..... **Salicaceae**
  - 15: Monoecious ..... **Betulaceae**
- 12: Small usually aquatic herbs ..... **Plantaginaceae** (*Callitriche*)
- 11: Perianth present
  - 16. Leaves opposite or whorled
    - 17. Stipules interpetiolar; ovary inferior ..... **Rubiaceae**
    - 17: Stipules 0 or not interpetiolar; ovary superior
      - 18. Leaves whorled
        - 19. Rootless aquatics ..... **Ceratophyllaceae**
        - 19: Evergreen shrubs ..... **Berberidaceae**
      - 16: Leaves opposite or in a half-whorl
        - 20. Leaves compound; climbers ..... **Ranunculaceae** (*Clematis*)
        - 20: Leaves simple
          - 21. Herbs with stinging hairs; style simple; stamens 4 ..... **Urticaceae**
          - 21: Shrubs or herbs; styles or style-branches 2 or 3; stamens 3–∞
            - 22. Ovary with 2–5 cells
              - 23. Ovary cells with 1 ovule ..... **Euphorbiaceae**
              - 23: Ovary cells with 2 ovules ..... **Picrodendraceae**
            - 22: Ovary with 1 cell
              - 24. Anthers 2, arising high on a long-tubular petal-like floral tube ..... **Thymelaeaceae**
              - 24: Anthers usually more than 2, not arising on a long-tubular floral tube; perianth herbaceous or scarious ..... **Chenopodiaceae**
  - 16: Leaves alternate
    - 25. Large trees; fruit a large nut enclosed in a cup below (acorn) ..... **Fagaceae**
    - 25: Shrubs, herbs or trees; fruit not as above
      - 26. Stipules ± scarious, united into a sheath ..... **Polygonaceae**
      - 26: Stipules free or absent
        - 27. Perianth-tube long and narrow, petal-like ..... **Thymelaeaceae**
        - 27: Perianth-tube 0 or short and not petal-like
          - 28. Trees or shrubs; perianth-tube broadly campanulate, petal-like ..... **Malvaceae**
          - 28: Not usually trees; perianth not as above
            - 29. Carpels ± free; anthers more numerous than the perianth-segments ..... **Gyrostemonaceae**
            - 29: Carpels 1 or fused; anthers usually not more numerous than the perianth-segments
              - 30. Stipules present
                - 31. Perianth and stamens inserted on a receptacular tube; fruits fleshy ..... **Rhamnaceae**
                - 31: Receptacular tube 0; fruit a capsule



- 32. Perianth closely enveloping the ovary and fruit ..... **Cannabaceae**
- 32: Perianth not closely enveloping the ovary or fruit
  - 33. Capsule 1-celled and 1-seeded
    - 34. Stellate hairs numerous ..... **Euphorbiaceae**
    - 34: Stellate hairs 0, simple hairs present ..... **Picrodendraceae**
  - 33: Capsule with more than 1 cell and/or more than 1 seed
    - 35. Seeds carunculate (*Chrozophora* seeds not carunculate; plant stellate-hairy) ..... **Euphorbiaceae**
    - 35: Seeds not carunculate; plants glabrous or with simple hairs ..... **Phyllanthaceae**
- 30: Stipules 0 or represented by nectariferous glands
  - 36. Stigma sessile or almost so; fruit fleshy ..... **Santalaceae**
  - 36: Stigma(s) borne on 1–3 styles; fruit usually dry
    - 37. Anthers 6 to many
      - 38. Style 1, simple ..... **Sapindaceae**
      - 38: Styles 3
        - 39. Leaves 2–5 at each node ..... **Picrodendraceae** (*Micranthemum*)
        - 39: Leaves solitary at each node ..... **Euphorbiaceae**
    - 37: Anthers fewer than 6; styles 2–3 or 1 and branched
      - 40. Perianth scarious ..... **Amaranthaceae**
      - 40: Perianth herbaceous ..... **Chenopodiaceae**
- 10: Flowers (or at least some flowers in each inflorescence) bisexual
  - 41. Spiny stem-succulents with numerous sepals, petals and stamens ..... **Cactaceae**
  - 41: Not as above
    - 42. Leaves 60–100 cm broad, palmately lobed; flowers and fruits c. 1 mm long, red ..... **Gunneraceae**
    - 42: Not as above
      - 43. Stamens more numerous than perianth-segments
        - 44. Perianth 0; stamens 2 ..... **Oleaceae**
        - 44: Not as above
          - 45. Perianth-segments 4 on a long tube; anthers 8 ..... **Thymelaeaceae**
          - 45: Perianth-segments usually 5–8 (petal-like staminodes sometimes numerous), if 4 then not on a long tube and anthers more than 8
            - 46. Carpels several, free ..... **Phytolaccaceae**
            - 46: Carpels 1 or fused
              - 47. Perianth fused to form an operculum on the bud ..... **Myrtaceae**
              - 47: Perianth not fused to form an operculum
                - 48. Leaves opposite
                  - 49. Ovary 1-celled; leaf bases not dilated and scarious ..... **Caryophyllaceae**
                  - 49. Ovary 2- or more-celled, if 1-celled the leaves with dilated scarious stipule-like bases

- 50. Herbs or small shrubs ..... **Aizoaceae**
- 50: Trees ..... **Sapindaceae**
- 48: Leaves alternate or apparently whorled
  - 51. Style 1, unbranched ..... **Sapindaceae**
  - 51: Styles 2 or more or single and deeply divided
    - 52. Stipules membranous and  
ensheathing ..... **Polygonaceae**
    - 52: Stipules 0, minute and  
caducous or well-developed  
but not membranous and ensheathing
      - 53. Stipules well-developed and persistent ..... **Rosaceae**
      - 53: Stipules 0 or minute and caducous
        - 54. Leaves opposite, if  
alternate then ovules  
single in each cell ..... **Aizoaceae**
        - 54: Leaves alternate or  
apparently whorled;  
ovules several in each cell ..... **Molluginaceae**
- 43: Stamens equal in number to perianth-segments or fewer
  - 55. Ovary entirely or almost entirely inferior; stipules present
    - 56. Perianth-segments in 2 whorls of 4 ..... **Rosaceae**
    - 56: Perianth-segments 5
      - 57. Inflorescence an umbel ..... **Apiaceae**
      - 57: Inflorescence cymose of flowers in a head
        - 58. Leaves opposite ..... **Rubiaceae**
        - 58: Leaves alternate ..... **Rhamnaceae**
  - 55: Ovary superior (or, if rarely inferior or half-inferior either  
stipules absent or perianth-segments and anthers not 5)
    - 59. Styles or style-branches more numerous than ovary cells
      - 60. Leaves opposite, subulate ..... **Caryophyllaceae**
      - 60: Leaves alternate (if opposite then flat)
        - 61. Stipules present
          - 62. Stipules scarious, ensheathing ..... **Polygonaceae**
          - 62: Stipules paired and not ensheathing
            - 63. Latex produced ..... **Euphorbiaceae**
            - 63: Latex not produced ..... **Rhamnaceae**
        - 61: Stipules 0
          - 64. Perianth scarious ..... **Amaranthaceae**
          - 64: Perianth herbaceous ..... **Chenopodiaceae**
  - 59: Styles or style-branches equal to ovary cells or fewer
    - 65. Stipules 0
      - 66. Ovary cells 1
        - 67. Perianth-segments 4 and anthers 2 or 8 ..... **Thymelaeaceae**
        - 67: Perianth-segments 4 and anthers 4, or perianth-segments 3 or 5
          - 68. Either ovary inferior or stigma sessile
            - 69. Glabrous shrubs or trees ..... **Santalaceae**
            - 69: Pubescent annuals ..... **Urticaceae**

- 68: Ovary superior and style developed
  - 70: Perianth-segments 4 ..... **Proteaceae**
  - 70: Perianth-segments 5
    - 71: Perianth scarious ..... **Amaranthaceae**
    - 71: Perianth wholly or partially petaloid
      - 72: Style 3-branched ..... **Basellaceae**
      - 72: Style simple ..... **Nyctaginaceae**
- 66: Ovary cells at least 2
  - 73: Leaves opposite, if alternate then ovules single in each cell ..... **Aizoaceae**
  - 73: Leaves alternate or apparently whorled; ovules several in each cell ..... **Molluginaceae**
- 65: Stipules present (sometimes small or caducous)
  - 74: Ovules several in each of 3–5 cells ..... **Aizoaceae**
  - 74: Ovules 1 or 2 in each of 1–3 cells
    - 75: Leaves compound or deeply divided ..... **Rosaceae**
    - 75: Leaves entire or almost so
      - 76: Ovary 1-celled with 1 ovule ..... **Ulmaceae**
      - 76: Ovary 3–5-celled, with 2 or more ovules in each cell ..... **Malvaceae**
- 9: Perianth consisting of a calyx and a corolla whorl
  - 77: Flowers in a capitulum; ovary inferior; style 2-fid; corolla tubular ..... **Asteraceae**
  - 77: Not as above
    - 78: Petals (or at least 1 or more of them) free or rarely (*Vitaceae*) cohering at the apex ..... **GROUP A**
    - 78: Petals all fused to form a complete ring or broken on one side only ..... **GROUP B**

## GROUP A

- 1. Ovary inferior
  - 2. Inflorescence an umbel
    - 3. Trees with numerous stamens ..... **Myrtaceae** (*Eucalyptus p.p.*)
    - 3. Herbs, climbers or shrubs with 5 stamens
      - 4. Leaves peltate or digitately lobed or compound, lacking spines ..... **Araliaceae**
      - 4. Leaves pinnately lobed or compound, if palmately lobed then spiny ..... **Apiaceae**
  - 2. Inflorescence a head, racemose or cymose or flowers solitary
    - 5. Stipules distinct
      - 6. Spines along the branches ..... **Rosaceae**
      - 6. Spineless or with branches terminating in spines
        - 7. Water plants with floating leaves ..... **Nymphaeaceae**
        - 7. Terrestrial shrubs or trees ..... **Rhamnaceae**
    - 5. Stipules absent
      - 8. Herbaceous; if woody then the ovary conspicuously winged
        - 9. Styles 2–4, very short; stigma papillose or plumose ..... **Haloragaceae**
        - 9. Style 1, long; stigma capitate or lobed ..... **Onagraceae**

- 8: Woody shrubs or trees
  - 10. Evergreen shrubs and trees; leaves not lobed ..... **Myrtaceae**
  - 10: Deciduous shrubs; leaves palmately lobed ..... **Grossulariaceae**
- 1: Ovary superior or half-inferior
  - 11. Styles 2 or more
    - 12. Ovary cell 1 (despite carpels sometimes being partly free distally)
      - 13. Leaves with stalked glands (insectivorous) ..... **Droseraceae**
      - 13: Leaves without stalked glands
        - 14. Dioecious ..... **Anacardiaceae**
        - 14: Flowers bisexual
          - 15. Sepals 2 ..... **Portulaccaceae**
          - 15: Sepals 4 or 5
            - 16. Flowers radially symmetrical
              - 17. Stamens up to 10; leaves without oil-glands
                - 18. Climbers with tendrils ..... **Passifloraceae**
                - 18: Herbs, shrubs or trees without tendrils
                  - 19. Herbs ..... **Caryophyllaceae**
                  - 19: Shrubs and trees ..... **Tamaricaceae**
                - 17: Stamens numerous; leaves with oil-glands ..... **Hypericaceae**
              - 16: Flowers bilaterally symmetrical ..... **Resedaceae**
  - 12: Ovary cells 2 or more or carpels completely free
    - 20. Leaves opposite or whorled
      - 21. Carpels free
        - 22. Succulent herbs ..... **Crassulaceae**
        - 22: Woody shrubs ..... **Rutaceae**
      - 21: Carpels fused
        - 23. Ovary cells 2
          - 24. Evergreen shrub with sessile trifoliolate leaves (appearing as a whorl of 6 simple leaves) ..... **Cunoniaceae**
          - 24: Deciduous tree with petiolate simple leaves ..... **Sapindaceae** (*Acer*)
        - 23: Ovary cells 3–5
          - 25. Stamens numerous ..... **Hypericaceae**
          - 25: Stamens 3 or 4
            - 26. Stamens 3; leaves stipulate ..... **Elatinaceae**
            - 26: Stamens 4 or more; leaves exstipulate ..... **Rutaceae**
    - 20: Leaves alternate or radical
      - 27. Carpels free or ovary deeply lobed
        - 28. Spiny woody plants ..... **Rosaceae**
        - 28: Spineless; woody or herbaceous
          - 29. Shrubs; leaves with conspicuous oil-glands ..... **Rutaceae**
          - 29: Herbs or woody; leaves lacking oil-glands
            - 30. Carpels several to numerous; herbs ..... **Ranunculaceae**
            - 30: Carpels 2 or 3; shrubs ..... **Dilleniaceae**
      - 27: Carpels strongly fused (styles fused or free)
        - 31. Stipules distinct; usually with stellate hairs ..... **Malvaceae**

- 31: Stipules 0 or minute and caducous; glabrous or with simple hairs
  - 32: Leaves simple; anthers 5 ..... **Linaceae**
  - 32: Leaves compound; anthers 10 ..... **Oxalidaceae**
- 11: Style 1 or stigmas sessile
  - 33: Ovary cell 1, sometimes incompletely divided
    - 34: Ovary half-inferior ..... **Rosaceae**
    - 34: Ovary superior
      - 35: Ovules along one suture of the ovary only ..... **Fabaceae**
      - 35: Ovules along several parietal placentas or basal or on a free central placenta
        - 36: Leaves opposite; flowers radially symmetrical
          - 37: Stamens numerous ..... **Cistaceae**
          - 37: Stamens 4–6 ..... **Frankeniaceae**
        - 36: Leaves alternate or radical (if very rarely opposite flowers bilaterally symmetrical)
          - 38: Sepals 2; petals 5 ..... **Portulacaceae**
          - 38: Sepals 3 or more; if 2 then petals 4
            - 39: Stamens 5
              - 40: Leaves stipulate ..... **Violaceae**
              - 40: Leaves exstipulate ..... **Pittosporaceae**
            - 39: Stamens 4 or 6 or more
              - 41: Sepals 2 or 3 ..... **Papaveraceae**
              - 41: Sepals 4
                - 42: Stamens 6 ..... **Brassicaceae**
                - 42: Stamens 12 or more
                  - 43: Shrubs or trees; leaves simple ..... **Capparaceae**
                  - 43: Herbs; leaves 3–5-foliolate ..... **Cleomaceae**
    - 33: Ovary completely divided into 2 or more cells or carpels wholly or partly free
      - 44: Petals 3; sepals 5 ..... **Polygalaceae**
      - 44: Petals 4–6; sepals 4–6
        - 45: Anthers up to twice as many as the petals
          - 46: Anthers 2–6
            - 47: Ovary with 2 cells
              - 48: Perianth and stamens on a tubular floral tube ..... **Lythraceae**
              - 48: Perianth and stamens arising at the base of the ovary
                - 49: Sepals 4; petals 4 ..... **Brassicaceae**
                - 49: Sepals 5; petals 5
                  - 50: Trees, shrubs or climbers without tendrils; leaves not lobed ..... **Pittosporaceae**
                  - 50: Climbers with tendrils; leaves deeply lobed ..... **Vitaceae**
      - 47: Ovary with 3–5 cells
        - 51: Leaves opposite
          - 52: Leaves compound
            - 53: Leaves palmate, exstipulate ..... **Sapindaceae** (*Aesculus*)
            - 53: Leaves pinnate or ternate, stipulate ..... **Zygophyllaceae**
          - 52: Leaves simple, exstipulate ..... **Rutaceae**
        - 51: Leaves alternate or radical

54. Anthers 4
55. Leaves pinnately compound ..... **Melanthaceae**
- 55: Leaves simple ..... **Aquifoliaceae**
- 54: Anthers 5
56. Glabrous annuals ..... **Celastraceae**
- 56: Various hairy or glandular (on leaves and/or calyx)  
perennials or annuals; if glabrous and eglandular then a dioecious shrub
57. 2 or more ovules in each ovary cell
58. Leaves and/or calyx hairy usually with stellate hairs ..... **Malvaceae**
- 58: Leaves and calyx glabrous but with immersed glandular dots ..... **Rutaceae**
- 57: 1 ovule in each ovary cell
59. Woody glabrous dioecious shrub ..... **Rhamnaceae**
- 59: Herbaceous hairy plants with bisexual flowers ..... **Geraniaceae**
- 46: Anthers 8–numerous
60. Ovary with 2 cells; if more than 2 then stamens numerous
61. Ovules 1 or 2 in each cell
62. Anthers opening by a terminal pore; glabrous or with simple  
hairs ..... **Elaeocarpaceae**
- 62: Anthers dehiscent longitudinally; hairs stellate ..... **Rutaceae**
- 61: Ovules numerous in each cell; anthers dehiscent longitudinally ..... **Lythraceae**
- 60: Ovary with 3–6 cells; stamens 8–12
63. Stamens 8; petals 5
64. Shrubs or trees; leaves compound or lobed
65. Flowers in panicles ..... **Sapindaceae**
- 65: Flowers axillary ..... **Zygophyllaceae**
- 64: Herbs; leaves peltate ..... **Tropaeolaceae**
- 63: Stamens 10 or 12; if 8 then petals 4
66. Herbaceous or softly woody; styles separating from the  
central column when seeds mature ..... **Geraniaceae**
- 66: Woody shrubs or trees; style simple, not as above
67. Exstipulate
68. Leaves 2-lobed or 2-foliolate ..... **Zygophyllaceae**
- 68: Leaves simple or 3- or more-foliolate
69. Leaves opposite ..... **Rutaceae**
- 69: Leaves alternate
70. Leaves bi- or tri-pinnate or, if once pinnate, the  
leaflets less than 1 cm broad ..... **Meliaceae**
- 70: Leaves once pinnate with leaflets 2–4 cm broad ..... **Simaroubaceae**
- 67: Stipulate
71. Fruit angled, winged or spiny ..... **Zygophyllaceae**
- 71: Fruit shallowly lobed or terete ..... **Nitrariaceae**
- 45: Anthers more than twice as many as the petals
72. Stamens numerous, united in a tube ..... **Malvaceae**
- 72: Stamens up to 15, free ..... **Nitrariaceae**

## GROUP B

1. Ovary inferior or half-inferior
  2. Flowers unisexual ..... **Cucurbitaceae**
  - 2: Flowers bisexual
    3. Leaves opposite, with interpetiolar stipules, or leaves whorled ..... **Rubiaceae**
    - 3: Leaves alternate, radical or opposite but stipules 0 or not interpetiolar
      4. Stamens opposite the petals and of the same number ..... **Primulaceae**
      - 4: Stamens alternating with and sometimes fewer than the petals
        5. Stamens 4 or 5, if 3 then the petals also 3
          6. Style terminated by a cup-shaped or 2-lipped indusium ..... **Goodeniaceae**
          - 6: Style simple, notched or 2- or 3-lobed
            7. Ovary with 1 cell ..... **Caprifoliaceae** (genera formerly in the Dipsacaceae)
            - 7: Ovary with 2–5 cells
              8. Herbs ..... **Campanulaceae**
              - 8: Trees, shrubs or woody climbers ..... **Caprifoliaceae**
          - 5: Stamens 1–3; petals 4 or 5
            9. Leaves alternate or radical ..... **Stylidiaceae**
            - 9: Leaves opposite ..... **Caprifoliaceae** (genera formerly in the Valerianaceae)
    - 1: Ovary superior
      10. Stamens fewer than the petals
        11. Stamens and ovary cells 1 or 2
          12. Leaves radical; small herbs ..... **Lentibulariaceae**
          - 12: Leaves cauline; trees, shrubs, woody climbers or herbs
            13. Corolla 4-lobed, if 5–8-lobed than leaves 3-foliolate
              14. Flowers radially symmetrical ..... **Oleaceae**
              - 14: Flowers bilaterally symmetrical ..... **Scrophulariaceae**
            - 13: Corolla 5-lobed; leaves simple ..... **Acanthaceae**
          - 11: Anthers and/or ovary cells more than 3
            15. Sepals 2; corolla radially symmetrical, split down one side ..... **Portulacaceae**
            - 15: Perianth characters not as above
              16. Anthers 3; leaves alternate ..... **Olacaceae**
              - 16: Anthers 2 or 4; leaves opposite or less often alternate
                17. Style arising between the 4 ovary lobes ..... **Lamiaceae**
                - 17: Style terminal
                  18. Leaves compound ..... **Bignoniaceae**
                  - 18: Leaves simple
                    19. Bracteoles at the base of the flowers conspicuous; seeds bearing hooks ..... **Acanthaceae**
                    - 19: Bracteoles at the bases of the flowers usually 0 or inconspicuous; seeds lacking hooks
                      20. Fruit with a long curved beak ..... **Martyniaceae**
                      - 20: Fruit not beaked
                        21. Fruit spiny ..... **Pedaliaceae**
                        - 21: Fruit not spiny
                          - 22: Fruit a drupe or schizocarp; seeds 1 or 2 in each cell..... **Verbenaceae**
                          - 22: Fruit and seeds not as above

- 23. Plants densely stellate-hairy, if puberulent or subglabrous then the fruit a drupe ..... **Lamiaceae**
- 23: Plants glabrous or with simple hairs; fruits dry ..... **Scrophulariaceae**
- 10: Stamens equal or more numerous than the petals
  - 24: Stamens numerous
    - 25: Stamens more conspicuous than the perianth; flowers in dense globular to cylindrical spikes; trees or shrubs ..... **Fabaceae**
    - 25: Stamens less conspicuous than the perianth; flowers not in dense spikes; herbs or shrubs
      - 26: Stamens fused to one another; calyx not spurred ..... **Malvaceae**
      - 26: Stamens free of one another; calyx spurred ..... **Ranunculaceae**
  - 24: Stamens 10 or fewer
    - 27: Stamens at least twice as numerous as the petals
      - 28: Flowers radially symmetrical; leaves opposite or whorled
        - 29: Flowers to 5 mm long ..... **Ericaceae**
        - 29: Flowers at least 10 mm long ..... **Rutaceae**
      - 28: Flowers strongly bilaterally symmetrical; leaves usually alternate
        - 30: Petals 5 ..... **Fabaceae**
        - 30: Petals 3 ..... **Polygalaceae**
    - 27: Stamens equal in number to the petals
      - 31: Stamens 5, united in a tube bearing fleshy appendages (the corona); pollen consolidated into pollen-masses (the pollinia); usually producing copious latex ..... **Apocynaceae**
      - 31: Stamens and pollen not as above
        - 32: Ovary cell 1
          - 33: Sepals 2 ..... **Portulacaceae**
          - 33: Sepals 4 or 5
            - 34: Styles 5 ..... **Plumbaginaceae**
            - 34: Style 1
              - 35: Stems slender, twining; land plants ..... **Pittosporaceae**
              - 35: Aerial stems erect or 0, or water plants
                - 36: Stamens opposite the petals ..... **Primulaceae**
                - 36: Stamens alternating with the petals
                  - 37: Leaves opposite
                    - 38: Herbs ..... **Gentianaceae**
                    - 38: Trees (mangroves) ..... **Acanthaceae**
                  - 37: Leaves alternate or radical
                    - 39: Leaves alternate; water plants with an open inflorescence of yellow or pink flowers ..... **Menyanthaceae**
                    - 39: Leaves radical; terrestrial plants with a head of blue flowers ..... **Goodeniaceae**
      - 32: Ovary cells 2–5
        - 40: Leaves all radical; the small flowers in a dense spike on a naked peduncle; corolla scarious ..... **Plantaginaceae**
        - 40: Leaves alternate, opposite or whorled, if radical then the flowers pedicellate; inflorescence not as above; corolla herbaceous
          - 41: Ovary cells 2 or 4
            - 42: Petals twisted in bud (i.e. aestivation contorted); flowers radially symmetrical



- 43. Leaves alternate; plants terrestrial ..... **Convolvulaceae**
- 43: Leaves opposite or radical, if alternate then plants aquatic
  - 44. Carpels fully united; without latex
    - 45. Herbs ..... **Gentianaceae**
    - 45: Shrubs ..... **Ericaceae**
  - 44: Carpels free but with their styles sometimes fused; with copious latex ..... **Apocynaceae**
- 42: Petals valvate or imbricate in bud, but not regularly twisted; flowers radially or bilaterally symmetrical
  - 46. Ovary with 2 cells
    - 47. Corolla radially symmetrical
      - 48. Ovules 1 or 2 in each cell ..... **Boraginaceae**
      - 48: Ovules 3 or more in each cell
        - 49. Leaves opposite
          - 50. Corolla 5-lobed or, if 4-lobed, then herbs ..... **Loganiaceae**
          - 50: Corolla 4 lobed; plants woody ..... **Scrophulariaceae** (*Buddleja*)
        - 49: Leaves alternate ..... **Solanaceae**
      - 47: Corolla bilaterally symmetrical
        - 51. Style bearing a capitate stigma ..... **Scrophulariaceae**
        - 51: Style bearing a cup-shaped indusium ..... **Goodeniaceae**
    - 46: Ovary with 4 cells
      - 52. Ovules 1 or 2 in each cell
        - 53. Stamens inserted on a disk at the base of the perianth ..... **Celastraceae**
        - 53: Stamens inserted on the corolla-tube
          - 54. Fruit separating into 4 nutlets; plants glabrous or more often with numerous hairs ..... **Boraginaceae**
          - 54: Fruit indehiscent, not separating; branched hairs always present ..... **Lamiaceae**
        - 52: Ovules 3 or more in each cell ..... **Solanaceae**
  - 41: Ovary cells 3 or 5
    - 55. Perennial herbs or annuals; stigmas 3 or 5
      - 56. Herbaceous vine; stigmas 2 ..... **Convolvulaceae**
      - 56: Herbaceous or woody; stigmas 1, 3 or 5
        - 57. Leaves entire; plants glabrous ..... **Celastraceae**
        - 57: Leaves pinnatisect; plants glandular-hairy ..... **Polemoniaceae**
    - 55: Shrubs; stigma single ..... **Ericaceae**

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