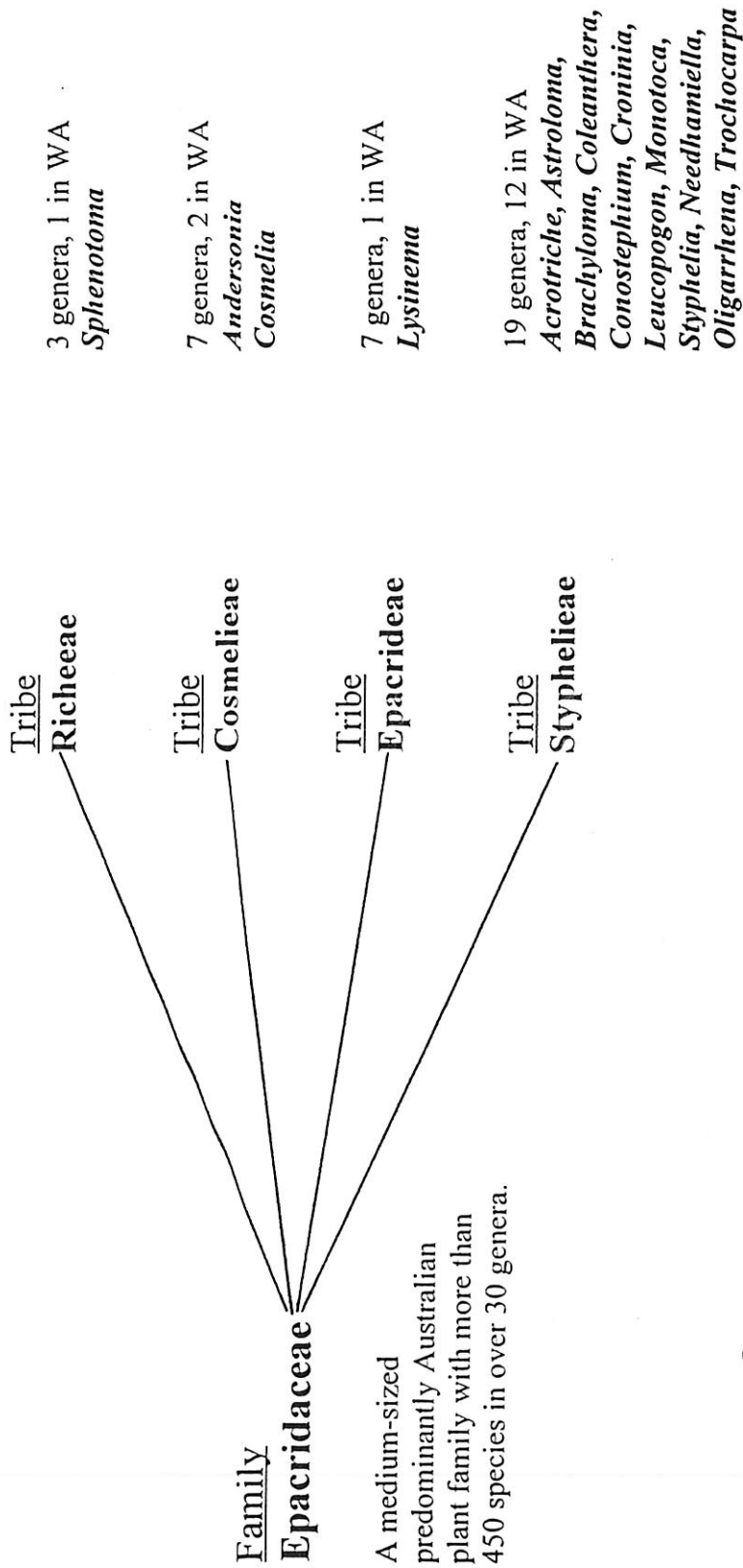


# Synopsis of the plant family Epacridaceae in Western Australia



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## KEY TO TRIBES

- |   |   |                    |
|---|---|--------------------|
| 1 | Stems with annular leaf scars<br>( <i>Sphenotoma</i> )  | <b>Richeae</b>     |
| 1 | Stems without annular leaf scars  |                    |
| 2 | Leaves sheathing, or if not sheathing, then with stamens<br>free from corolla                   | <b>Cosmelieae</b>  |
| 2 | Leaves not sheathing  |                    |
| 3 | Style attenuated from the ovary;<br>fruit indehiscent, usually a drupe                          | <b>Styphelieae</b> |
| 3 | Style inserted in a deep depression at apex of ovary;<br>fruit a capsule<br>( <i>Lysinema</i> ) | <b>Epacrideae</b>  |

## KEY TO WA GENERA WITHIN COSMELIEAE

- |   |                                  |                   |
|---|----------------------------------|-------------------|
| 1 | Stamens inserted on corolla tube | <i>Cosmelia</i>   |
| 1 | Stamens free from corolla tube   | <i>Andersonia</i> |

## KEY TO WA GENERA WITHIN STYPHELIEAE

- 1     Anthers completely exerted from the corolla tube
- 2     Anthers free *Styphelia*
- 2     Anthers connate or connivent
- 3     Anthers connate in a cone around the style,  
filaments glabrous *Coleanthera*
- 3     Anthers connivent or slightly cohering around the style,  
anthers and filaments enveloped in dense wool *Astroloma stomarrhena*
- 1     Anthers wholly or partially enclosed in the corolla tube
- 4     Corolla lobes broadly induplicate (rolled or folded inwards)  
in bud, hairs restricted to midline of corolla lobes *Needhamiella*
- 4     Corolla lobes valvate or rarely imbricate in bud,  
and hairy or glabrous, not as above
- 5     Corolla tube conical in upper part, or cylindrical for whole length,  
with very small erect, glabrous lobes; anthers prominently 2-lobed. *Conostephium*
- 5     Corolla tube cylindrical or campanulate, lobes spreading  
or recurved; anthers entire (excluding *Croninia kingianus*)
- 6     Corolla tube either with hairs or scales inside near the base or with  
hairy scales or tufts of reflexed hairs descending into the tube from the  
throat.
- 7     Corolla lobes bearded; corolla tube with 5 tufts of hairs near the base  
(*Astroloma baxteri* is an exception with 5 deflexed fringed scales rather  
than tufts and with glabrous corolla lobes). *Astroloma*
- 7     Corolla lobes glabrous; corolla tube with 5 hairy scales or tufts of  
reflexed hairs descending into the tube from the throat. *Brachyloma*
- 6     Corolla tube glabrous below the throat (a few with hairs evenly  
distributed below the throat), may be glabrous or hairy on the corolla  
lobes and in the throat itself.
- 8     Drupe 8-10-celled, separating into 8-10 pyrenes ("nutlets") *Trochocarpa*
- 8     Drupe 5 or less-celled (except *Acrotriche* with 2-10 cells),

- 9 COROLLA LOBES + TUBE GLABROUS
- 10 Stamens 2; corolla lobes 4 *Oligarrhena*
- 10 Stamens 5; corolla lobes 5 *Monotoca*
- 9 Corolla lobes and often also throat hairy; ovary 2-10-celled
- 11 Corolla lobes with erect tufts of hair near apex and reflexed hairs in throat; ovary 2-10-celled; flowers greenish *Acrotriche*
- 11 Corolla lobes hairy, though sometimes only or mainly in the lower half; ovary 2-5-celled; flowers white, cream or red
- 12 Corolla 20-30 mm long *Astroloma*
- 12 Corolla < 15 mm long, usually white but sometimes cream or pink/red  
(*Leucopogon oxycedrus*, *L. rubicundus*, *L. strictus*)
- 13 Corolla usually < 10 mm long, but if more then flowers pendulous (excluding *Leucopogon strictus*) *Leucopogon*
- 13 Corolla 10-15 mm long, ± erect
- 14 Ovary and base of style hairy; anthers shortly 2-lobed *Croninia*
- 14 Ovary and style glabrous; anthers entire *Astroloma xerophyllum*

## Ongoing taxonomic reassessment within Epacridaceae

Recent morphological and molecular studies of the plant family Epacridaceae as a whole and in particular the Tribe Styphelieae (A reassessment of relationships within Epacridaceae – J.M. Powell et al, *Annals of Botany* 77: 305-315, 1996; Relationships and generic concepts within Styphelieae – J.M. Powell et al, *Aust. Systematic Botany* 10, 15-29 1997) support a number of significant changes at the subfamily and generic levels.

The table of family relationships on page 1 is a summary of the new supra-generic concept as it affects WA genera. While morphological studies indicated that the tribes Richeeae, Cosmelieae and Styphelieae formed more or less natural groupings within the family, the tribe Epacrideae was less well defined. Further studies using an expanded morphological database will probably result in changes to the boundaries of Epacridaceae. Indeed the authors of a recently published paper (Archerieae: A new tribe in Epacridaceae – D.M. Crayn & C.J. Quinn, *Aust. Syst. Botany* 11, 1998) recognise a fifth tribe - Archerieae, previously embedded in Epacridaceae, with as many as another 3 to follow

Below is a summary of proposed changes at the generic level affecting WA taxa. Some of these changes are very well supported by the recent studies and will certainly be formalised; others are more tentative at this stage and await further study, particularly at the molecular level.

- The WA genus *Sphenotoma* may be combined with the eastern Australian *Dracophyllum*.
- Those WA taxa currently in the genus *Astroloma* may be recombined into 5 genera:
  - The majority of species (ie. those having 5 hair tufts or a continuous ring of hairs below the middle of the corolla tube, with hairy corolla lobes) would remain in *Astroloma*.
  - *Astroloma stomarrhena* may be combined with *Coleanthera* and *Styphelia* into a single genus, or be recognised as a monotypic genus.
  - *A. baxteri* and *A. xerophyllum* may also be recognised as 2 more monotypic genera.
  - *A. ciliatum* and *A. foliosum* would form another genus.
- WA *Leucopogon* species may be recombined into 4 genera:
  - The majority of species (ie. Those having sterile anther tips) would remain in *Leucopogon*.
    - WA examples include *L. australis*, *L. glabellus* and *L. verticillatus*. It is estimated that at least 50 of the 110 or so species within this group are currently unnamed.
    - Another group currently within *Leucopogon*, characterised by a cone-like gynoeceum and narrow cylindrical fruit, would form another genus “*Gynoconus*”. This will contain ca 18 species, half of which are currently unnamed. WA examples include *L. cymbiformis*, *L. pogonocalyx* and *L. tamminensis*.
    - Those species characterised by long styles, twisted corolla hairs and without sterile anther tips form another large group “*Axonanthus*” with ca 80 species, many in WA, eg. *L. oxycedrus*, *L. conostephioides* and *L. hamulosus*.
    - A small group of 4 *Leucopogon* species (including the WA *L. rubicundus*) to be combined with the eastern Australian genus *Lissanthe*.
- *Oligarrhena* to be combined with *Monotoca*.
- At least 2 currently unnamed taxa within the tribe Styphelieae to form a new genus “*Pseudactinia*”.

## WEST AUSTRALIAN GENERA WITHIN EPACRIDACEAE

### 1) *Acrotriche* R.Br.

Ca 14 species across southern & eastern Australia, with 5 in WA.

#### Major distinguishing features:

- Leaves non-sheathing; margins flat or revolute.
- Inflorescence a spike or irregular cluster.
- Flowers bracteate, bibracteolate; (4)5-merous; hypogynous disc present, annular.
- Calyx usually exceeded by corolla.
- Corolla valvate and tubular with tufts of hair at corolla lobe tips; throat closed by hairs; glabrous in tube below the throat; green or yellow-green.
- Stamens inserted in throat of corolla tube, becoming exerted or remaining included within the tube.
- Style attenuate from ovary.
- Ovary with 2-10 cells.
- Fruit a fleshy drupe.

#### Confusing genera:

With its greenish flowers and hairs confined to the apices of the corolla lobes and in the throat, *Acrotriche* is distinct from all other genera apart from *Trochocarpa*. The latter differs in having a drupe composed of 8-10 readily separable pyrenes ("nutlets").

2) *Andersonia* R.Br.

Ca 35 taxa, a number of which have yet to be formally named (pers. comm. K. Lemson) confined to SW Australia.

**Major distinguishing features:**

- Leaves usually sheathing, occasionally non-sheathing; margins flat.
- Inflorescence of solitary axillary flowers or clustered into heads.
- Flowers bracteate, bracteolate; 5-merous, hypogynous disc present, annular (lobed) or of separate scales.
- Calyx usually exceeding corolla or  $\pm$  equalling corolla.
- Corolla valvate and tubular (tube cylindric or contracted above the ovary); tube and lobes variously hairy or rarely glabrous; white, pink, purple or blue.
- Stamens free from corolla tube; mostly included to slightly exerted from tube.
- Style from a depression at the top of the ovary.
- Ovary 5-celled.
- Fruit a capsule.

**Confusing genera:**

Generally quite distinct but may be confused with *Sphenotoma*, which has annular leaf scars and the throat of the corolla almost closed by longitudinal folds at the base of the lobes. Those species without sheathing leaf bases and with white flowers may be confused with *Lysinema* but the latter characteristically has imbricate bracts and bracteoles which grade into sepals.

This genus is being revised by K. Lemson and the work is close to completion.



### 3) *Astroloma* R.Br.

Between 25 & 35 taxa across southern Australia with 21 named and 6 unnamed in WA.

#### Major distinguishing features:

- Leaves non-sheathing; margins flat, concave or revolute.
- Inflorescence of solitary axillary flowers.
- Flowers bracteate, bracteolate; 5-merous; hypogynous disc present, annular (truncate or lobed).
- Calyx exceeded by corolla to  $\pm$  equalling corolla.
- Corolla valvate and tubular (elongated and cylindric); lobes markedly shorter than tube, usually erect or spreading (but revolute in *A. stomarrhena*); lobes hairy (glabrous in *A. baxteri*); tube usually with 5 hair tufts or a ring of hairs towards the base (absent in *A. ciliatum* and *A. foliosum*, may be obscure or absent in *A. xerophyllum*); red in most species but several have cream corollas and in *A. xerophyllum* they are white.
- Stamens inserted in throat of corolla tube; becoming exerted (prominently so in *A. stomarrhena*) or remaining included; filaments glabrous (hairy in *A. stomarrhena*), flattened or terete.
- Style attenuate from ovary.
- Ovary with 5 cells.
- Fruit a fleshy drupe.

#### Confusing genera:

May be confused with red/pink-flowered *Leucopogon* species but the latter lack hairs towards the base of the corolla tube and have usually shorter corollas (<12 mm).

*A. ciliatum* and *A. foliosum* also lack hairs towards the base of the tube but have flowers 20-30 mm long. The white-flowered *A. xerophyllum* may be confused with *Leucopogon* species but has large erect flowers 10-15 mm long with glabrous apices to the corolla lobes.

*Brachyloma* can be separated by its glabrous corolla lobes.

Currently being revised by A.J.G. Wilson.

4) *Brachyloma* Sonder

Ca 12 taxa in southern and eastern Australia with 5 named and 1 unnamed in WA.

**Major distinguishing features:**

- Leaves non-sheathing; flat or revolute.
- Inflorescence of solitary axillary flowers.
- Flowers bracteate or ebracteate, bibracteolate; 5-merous; hypogynous disc present, annular (lobed or toothed).
- Calyx exceeded by corolla.
- Corolla imbricate and tubular (tube short); lobes about the same length as tube, spreading; lobes glabrous; tube with tufts of hairs or ciliate scales reflexed in the throat, otherwise glabrous; pink or red (WA species).
- Stamens inserted in throat of corolla tube; included or partially exerted.
- Style attenuate from ovary.
- Ovary with 4-5 cells.
- Fruit a fleshy drupe.

**Confusing genera:**

Only likely to be confused with *Astroloma*, which has usually larger flowers and hairy corolla lobes (excluding *A. baxteri*).

5) *Coleanthera* Stschegl

Three taxa confined to south-west Australia.

**Major distinguishing features:**

- Leaves non-sheathing; flat or concave.
- Inflorescence of solitary axillary flower or 2 or 3 together.
- Flowers bracteate, bibracteolate; 5-merous; hypogynous disc absent (or very obscure).
- Calyx exceeded by corolla.
- Corolla valvate and tubular (tube short), lobes long, usually longer than tube, distinctly revolute; lobes and throat hairy, glabrous below the throat; white or pink.
- Stamens inserted in throat of corolla tube; becoming exserted; filaments glabrous, long; anthers cohering above the middle in a cone.
- Style attenuate from ovary.
- Ovary with 5 cells.
- Fruit a fleshy or non-fleshy drupe.

**Confusing genera:**

With its prominently exserted stamens and revolute corolla lobes, *Coleanthera* is close to *Styphelia* but differs from that genus in having cohering anthers.

*Astroloma stomarrhena* is also similar but has hairy filaments.

6) *Conostephium* Benth

At least 7 named and 1 unnamed species restricted to south-west Australia.

**Major distinguishing features:**

- Leaves non-sheathing; flat or revolute.
- Inflorescence of solitary axillary, usually pendulous flowers.
- Flowers bracteate, bracteolate (bracteoles appressed to sepals); 5-merous, hypogynous disc present or absent, when present of separate scales.
- Calyx exceeded by corolla,  $\pm$  equalling corolla or with corolla scarcely exceeding calyx.
- Corolla valvate and long tubular, often conical in upper part; lobes much shorter than tube, erect; lobes glabrous, variously hairy in the throat and below; white and purple, red or pink.
- Stamens inserted half way down corolla tube or lower; anthers usually deeply divided into 2 lobes.
- Style attenuate from ovary.
- Ovary with 5 cells.
- Fruit a non-fleshy drupe.

**Confusing Genera:**

Its long tubular corolla, short erect lobes and completely included anthers make *Conostephium* a distinctive genus.

7) *Cosmelia* R.Br.

One species confined to far south-west Australia.

**Major distinguishing features:**

- Leaves sheathing; flat or concave.
- Inflorescence of solitary flowers, terminating axillary branchlets or with peduncles covered with leaf like bracts which pass gradually into sepals.
- Flowers bracteate, bracteolate; 5-merous; hypogynous disc present, annular.
- Calyx  $\pm$  equalling corolla or scarcely exceeded by corolla.
- Corolla imbricate, tubular; lobes shorter than tube, glabrous throughout; purple to red.
- Stamens inserted in throat of corolla tube; remaining included in tube; filaments flattened.
- Style from a depression at the top of the ovary.
- Ovary with 5 cells.
- Fruit a capsule.

**Confusing Genera:**

Large purple-red flowers and sheathing leaves are a unique combination within W.A. Epacrids.

8) *Croninia* J. Powell

One species confined to south-west Australia.

**Major distinguishing features:**

- Leaves non-sheathing; flat.
- Inflorescence of solitary, axillary flowers.
- Flowers bracteate, bracteolate; 5-merous; hypogynous disc present, annular.
- Calyx exceeded by corolla.
- Corolla valvate and tubular; lobes markedly shorter than tube, thick and fleshy, slightly spreading; lobes and tube hairy throughout; white.
- Stamens inserted in throat of corolla tube; scarcely exerted from tube; anthers bifurcate.
- Style from a depression at the top of the ovary, hairy.
- Ovary with 5 cells.
- Fruit a hairy, non-fleshy drupe.

**Confusing Genera:**

Formerly included in *Leucopogon* from which it differs in having the following character combination:

Large fleshy flowers (10-15 mm).

Bifurcate anthers.

Hairy ovary and hairy style from a depression at the top of the ovary.

9) *Leucopogon* R.Br.

As currently recognised comprises over 150 species mostly in southern and eastern Australia but also in parts of South East Asia and New Zealand. At least 110 named species and 16 unnamed in W.A.

**Major distinguishing features:**

- Leaves non-sheathing; flat, concave or revolute.
- Inflorescence of solitary, axillary flowers or in terminal or axillary spikes or racemes.
- Flowers bracteate, bibracteolate; 5-merous; hypogynous disc present or absent, when present of separate scales.
- Calyx length variable in relation to corolla.
- Corolla valvate and tubular (tube short to long), lobes vary from  $\pm$  the same length as tube to much shorter than tube, spreading or reflexed; lobes and throat hairy, but usually glabrous below the throat.
- Stamens inserted in throat of corolla tube; becoming at least partially exerted or remaining included; filaments glabrous, terete; a large group of species (the true *Leucopogons* refer section "Taxonomic reassessment within *Epacridaceae*") have anther apices that are sterile tipped and so paler and often recurved.
- Style attenuate from ovary.
- Ovary with 5 cells.
- Fruit a fleshy or non-fleshy drupe.

**Confusing Genera:**

The small flowered species with sterile tipped anthers are usually quite distinctive. Those with longer tubular flowers may be mistaken for *Astroloma*, see "Confusing Genera" under that genus for differences.

*Styphelia* and *Coleanthera* have anthers fully exerted from tube and revolute corolla lobes. *Oligarrhena*, *Monotoca* and *Needhamiella* all have  $\pm$  glabrous corolla lobes and *Acrotriche* has hairs confined to tips of the lobes.

See under *Croninia* for characters separating that genus.

### 10) *Lysinema* R.Br.

Five species restricted to south-west Australia. A number of infra-specific taxa may be recognised within *L. ciliatum*.

#### Major distinguishing features:

- Leaves non-sheathing; margins flat, or concave.
- Inflorescence of solitary, axillary flowers or aggregated in spikes or heads.
- Flowers bracteate, bracteolate; (4) 5-merous; hypogynous disc present, of separate scales.
- Calyx usually exceeded by corolla.
- Corolla valvate and tubular (tube cylindrical); tube hairy or glabrous, lobes always glabrous; white or cream.
- Stamens free from corolla tube or adnate (slightly to corolla tube); becoming exerted or remaining included in the tube.
- Style from a depression at the top of the ovary.
- Ovary with 5 cells.
- Fruit a capsule.

#### Confusing Genera:

Quite distinct with its combination of non-sheathing leaves, glabrous corolla lobes and with characteristic, imbricate rows of bracts and bracteoles grading into sepals. The long corolla tube and style from a depression at the top of the ovary distinguish *Lysinema* from other genera with ± glabrous corolla lobes – *Needhamiella*, *Monotoca* and *Oligarrhena*.



11) *Monotoca* R. Br.

Ca 12 taxa across southern and eastern Australia with 4 in south-west Australia.

**Major distinguishing features:**

- Leaves non-sheathing; margins flat or revolute.
- Inflorescence of solitary, axillary flowers or aggregated in spikes or racemes.
- Flowers bracteate, bibracteolate; (4) 5-merous; hypogynous disc present, annular (lobed or toothed).
- Calyx exceeded by corolla.
- Corolla valvate, campanulate; tube and lobes  $\pm$  glabrous (except *M. tamariscina* which usually has relatively conspicuous hairs on the lobes); white or cream.
- Stamens inserted in throat of corolla; becoming exserted or remaining included.
- Style attenuate from the ovary.
- Ovary of 1-2 cells.
- Fruit a fleshy drupe.

**Confusing Genera:**

Most likely to be confused with *Oligarrhena* which always has 4-merous flowers with only 2 fertile stamens.

May also be confused with *Leucopogon* from which it can be separated by its glabrous or sparsely hairy corolla lobes.

*Needhamiella* differs in having inflexed tips to the corolla lobes and a usually reddish corolla tube and white lobes.

12) *Needhamiella* L. Watson

One species confined to south-west Australia.

**Major distinguishing features:**

- Leaves non-sheathing; margins concave.
- Inflorescence of solitary, axillary flowers.
- Flowers bracteate, bibracteolate; 5-merous; hypogynous disc present, annular (cup shaped).
- Calyx exceeded by corolla.
- Corolla valvate (induplicate valvate), tubular (cylindric); lobes with inflexed tips and usually a few hairs in a central band; tube usually glabrous; tube usually reddish, lobes white.
- Stamens inserted below the middle of the tube; remaining included.
- Style attenuate from ovary.
- Ovary 2 celled.
- Fruit a non-fleshy drupe.

**Confusing Genera:**

Can be separated from *Acrotriche* and *Leucopogon* by having only sparsely hairy corolla lobes and stamens inserted below the middle of the tube.

The differences between *Needhamiella* and *Monotoca* are listed under the latter genus.

13) *Oligarrhena* R.Br.

One species confined to south-west Australia.

**Major distinguishing features:**

- Leaves non-sheathing; margins flat.
- Inflorescence a spike.
- Flowers bracteate, bibracteolate; 4-merous; hypogynous disc present, of separate scales.
- Calyx exceeded by corolla.
- Corolla valvate, campanulate; tube and lobes glabrous; white or cream.
- Stamens 2 (unique in *Stypheliae*) sometimes also with 2 staminodes, inserted in throat of tube; remaining included.
- Style attenuate from ovary.
- Ovary of 2 cells.
- Fruit a fleshy/non fleshy drupe.

**Confusing Genera:**

Easily distinguished by its consistently 4-merous corolla with 2 fertile stamens.

14) *Sphenotoma* (R.Br.) Sweet

At least 7 taxa restricted to south-west Australia.

**Major distinguishing features:**

- Leaves sheathing; margins flat.
- Inflorescence a spike or head.
- Flowers bracteate, bracteolate; 5-merous; hypogynous disc present, annular or of separate scales.
- Calyx exceeded by corolla.
- Corolla imbricate, tubular (tube narrow, almost closed by longitudinal folds at base of the lobes); lobes markedly shorter than tube to about the same length, spreading; lobes and tube usually glabrous; white, sometimes yellow in throat.
- Stamens inserted in corolla tube; remaining included within the tube.
- Style from a depression at the top of the ovary.
- Ovary 5 celled.
- Fruit a capsule.

**Confusing Genera:**

The sheathing leaf bases separate *Sphenotoma* from all genera apart from *Cosmelia* and *Andersonia*.

The latter genus lacks the annular leaf scars and longitudinal folds at the base of the corolla lobes that are characteristic of *Sphenotoma*. A further difference from *Andersonia* is the presence of free stamens in that genus.

*Cosmelia* has red-purple flowers unknown in *Sphenotoma*.

Currently being revised by Kristina Lemson.

15) *Styphelia* Smith

Ca 12 species across southern Australia with 6 in south-west Australia.

**Major distinguishing features:**

- Leaves non-sheathing; margins flat, concave or revolute.
- Inflorescence of solitary, axillary flowers or 2-3 together.
- Flowers bracteate, bibracteolate; 5-merous; hypogynous disc present, annular or of 5 separate scales.
- Calyx exceeded by corolla, usually coloured.
- Corolla valvate and tubular (elongated and cylindric); lobes usually shorter than tube, distinctly revolute; lobes and throat hairy; glabrous below the throat (except for *S. hainesii* which has 5 tufts of hair near the base); white, cream or red.
- Stamens inserted in throat of corolla tube; becoming exserted, filaments glabrous, long.
- Style attenuate from ovary.
- Ovary 5 celled.
- Fruit a fleshy or non-fleshy drupe.

**Confusing Genera:**

Close to *Coleanthera* but without the cohering anthers.

The prominently exserted stamens and revolute corolla lobes also ally it with *Astroloma stomarrhena* but the latter can be distinguished by its very hairy filaments.

16) *Trochocarpa* R.Br.

Ca 6 species in southern and eastern Australia and South East Asia. One in south-west Australia.

**Major distinguishing features:**

- Leaves non-sheathing; flat or convex.
- Inflorescence a few flowered spike.
- Flowers bracteate, bibracteolate; 5-merous; hypogynous disc present, annular or of 5 separate scales.
- Calyx exceeded by corolla.
- Corolla valvate and tubular (cylindric) or campanulate; lobes usually shorter than tube; lobes and throat hairy (in W.A. species), glabrous below the throat.
- Stamens inserted in throat of the tube, becoming partially exerted from tube.
- Style attenuate from ovary.
- Ovary usually 10 celled.
- Fruit a fleshy drupe with the endocarp separating into distinct pyrenes (nutlets).

**Confusing Genera:**

The W.A. species *T. parviflora* is rarely collected and strongly resembles some species of *Acrotriche*. See note under that genus for distinctions.

## GLOSSARY

Adnate	Fused to an organ of a different kind.
Annular	Forming a ring.
Attenuate	Tapering gradually.
Bifurcate	Divided into 2 branches.
Bract	A leaf like structure, different in form from the foliage leaves associated with an inflorescence or flower.
Bracteole	A bract like structure borne on pedicel or calyx of flower.
Campanulate	Bell shaped.
Capsule	A dehiscent fruit of two or more united carpels.
Connivent	Converging.
Disc	A nectariferous organ developed between the stamens and ovary.
Drupe	An indehiscent fruit with the seeds enclosed in a stony layer (endocarp) which is embedded in succulent tissue (mesocarp) surrounded by a thin outer layer (epicarp).
Gynoecium	All the carpels or pistils of a flower collectively.
Hypogynous	Borne below the ovary.
Imbricate	Overlapping.
Included	Not protruding beyond enclosing organ.
Induplicate	Margins overlapping and rolled inwards.
Revolute	With the margins rolled inwards on the lower surface.
Sheathing	Clasping or enveloping the stem.
Valvate	Meeting without overlapping.

## AIDS TO IDENTIFICATION IN WA EPACRIDS

\* Not all species within the genus exhibit this character

\*\* Character not consistent on all flowers

Leaves sheathing	<i>Andersonia</i> *, <i>Cosmelia</i> , <i>Sphenotoma</i>
Flowers in dense spikes or heads	<i>Andersonia</i> *, <i>Leucopogon</i> *, <i>Lysinema</i> *, <i>Monotoca</i> *, <i>Oligarrhena</i> , <i>Sphemotoma</i>
Flowers 4-merous	<i>Acrotriche</i> ***, <i>Lysinema</i> **, <i>Monotoca</i> **, <i>Oligarrhena</i>
Hypogynous disk absent or very obscure	<i>Coleanthera</i> , <i>Conostephium</i> *
Calyx exceeding corolla or ± equalling corolla	<i>Andersonia</i> *, <i>Astroloma</i> *, <i>Conostephium</i> *, <i>Cosmelia</i> **, <i>Leucopogon</i> *
Calyx prominently coloured	<i>Andersonia</i> , <i>Styphelia</i> *
Corolla imbricate (not valvate)	<i>Brachyloma</i> , <i>Cosmelia</i> , <i>Sphenotoma</i>
Corolla tube much longer than lobes	<i>Andersonia</i> *, <i>Astroloma</i> , <i>Conostephium</i> , <i>Cosmelia</i> , <i>Croninia</i> , <i>Leucopogon</i> *, <i>Lysinema</i> , <i>Sphenotoma</i> , <i>Styphelia</i>
Corolla with ± glabrous lobes	<i>Andersonia</i> *, <i>Astroloma</i> * ( <i>A. baxteri</i> ), <i>Brachyloma</i> , <i>Conostephium</i> , <i>Cosmelia</i> , <i>Lysinema</i> , <i>Monotoca</i> *, <i>Needhamiella</i> **, <i>Oligarrhena</i> , <i>Sphenotoma</i>
Corolla with revolute lobes	<i>Coleanthera</i> , <i>Styphelia</i> , <i>Astroloma stomarrhena</i> , <i>Leucopogon</i> * (usually recurved rather than revolute)
Corolla with hairs below the throat	<i>Andersonia</i> *, <i>Astroloma</i> *, <i>Conostephium</i> *, <i>Croninia</i> *, <i>Leucopogon</i> * (few species), <i>Styphelia</i> * ( <i>S. hainesii</i> )
Corolla lobes with hairs confined to tips	<i>Acrotriche</i> , <i>Trochocarpa</i>
Corolla pink/red	<i>Andersonia</i> *, <i>Astroloma</i> *, <i>Brachyloma</i> *, <i>Coleanthera</i> *, <i>Conostephium</i> *, <i>Cosmelia</i> , <i>Leucopogon</i> *, <i>Needhamiella</i> (tube reddish), <i>Styphelia</i> *
Stamens prominently exerted beyond tube	<i>Coleanthera</i> , <i>Styphelia</i> , <i>Astroloma stomarrhena</i>
Stamens inserted half-way down tube or lower	<i>Conostephium</i> , <i>Needhamiella</i> , <i>Sphenotoma</i> *



Stamens free from tube	<i>Andersonia, Lysinema*</i> (partly adnate)
Style from a depression at the top of the ovary	<i>Andersonia, Cosmelia, Croninia, Lysinema, Sphenotoma</i>
Ovary with > 5 cells	<i>Acrotriche, Trochocarpa</i>
Ovary with 1-2 cells	<i>Leucopogon*</i> , <i>Monotoca, Oligarrhena, Needhamiella, Acrotriche*</i>
Fruit a capsule	<i>Andersonia, Cosmelia, Lysinema, Sphenotoma</i>

## REFERENCES

Blackall & Grieve IIIB – The only reference to the family in W.A. as a whole. Last revised in 1981. Variable in its usefulness, depending on genus. More or less reflects current taxonomy in the following genera: *Acrotriche*, *Coleanthera*, *Styphelia*, *Cosmelia*, *Needhamiella*, *Trochocarpa*, *Sphenotoma*.

Can still be used with caution for the remaining genera but be aware that a number of new taxa have been recognised, although at this stage, many of these have not been published.

K. Lemsom recognises numerous new species in *Andersonia*. These will be published in the near future.

*Leucopogon* presents special difficulties, not only are there numerous new names in the genus, both published and informal phrase names, but many species are enormously variable as currently circumscribed. There may be as many as 50 new species in *Leucopogon* (sens strict) according to J.M. Powell. (Relationships and generic concepts within Styphelieae. Australian Systematic Botany 10 (1997).)

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