

# Flora of Tasmania *online*



## Introduction <sup>1</sup>

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The *Flora of Tasmania Online* is a publicly available resource for the dissemination of taxonomic information relating to the flora of the State of Tasmania. Currently the focus will be on the Angiosperms (flowering plants). The Flora contains keys, descriptions, distributional and habitat data etc for all taxa with appropriate referencing. For the first time the flora for the entire State of Tasmania (including Macquarie Is.) will be covered.

The Flora will be completed in parts and individual family accounts will be published on the website once written. All accounts are dated and numbered and so can be cited. Accounts will be revised with the advent of new discoveries and research. New accounts are treated as separate documents and will also be dated and numbered. Superseded accounts will remain available on the website.

1 This work can be cited as: Duretto MF (2009) Introduction, version 2009:1. In MF Duretto (Ed.) *Flora of Tasmania Online*. 7 pp. (Tasmanian Herbarium, Tasmanian Museum & Art Gallery: Hobart). ISBN 978-1-921599-45-3 (PDF). [www.tmag.tas.gov.au/floratasmania](http://www.tmag.tas.gov.au/floratasmania)

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## Other treatments and identification aids for the Tasmanian flora

Hooker (1855–1860), who described both vascular and non-vascular plants, and Rodway (1903), who covered the vascular flora only, produced the first accounts of the Tasmanian flora. Rodway (1914, 1916) later published accounts of the bryophytes. Bentham (1863–1878) added significantly to the knowledge of the Tasmanian vascular flora in his *Flora Australiensis*. Backhouse and Gunn (1835) compiled a list of plants found in Tasmania and often included common names and general notes on key characteristics, distribution, uses etc. A checklist of ferns and flowering plants found in Tasmania was compiled by Mueller (1875). The checklist formed the basis of the field guide or 'Hand-Book' produced by Spicer (1878). Spicer (1878) provided keys to taxa and limited information on distribution.

Curtis (1956, 1963, 1967, 1979) and Curtis & Morris (1975, 1994) incorporated the many changes and additions to the knowledge of the Tasmanian flora since 1903 when they produced *The Student's Flora of Tasmania*. This flora was produced in five parts and remains one of the main reference sources for the Tasmanian flora today. Parts 1–3 (Curtis 1956, 1963, 1967; Curtis & Morris 1975) covered the Gymnosperms and Dicotyledons, while Parts 4A (Curtis 1979) and 4B (Curtis & Morris 1994) dealt with the Monocotyledons. Parts 1–3 of the Flora were reprinted in 1993 without revision. Parts 4A (Curtis 1979), which covered the Orchidaceae, has been superseded by Jones et al. (1999).

Modern accounts of the ferns and their allies have been provided by Garrett (1996) for Tasmania, and Orchard (1998 and accounts therein; ABRS) for Australia. The conifers of Tasmania were covered by Hooker (1857), Rodway (1903) and in Part 1 of *The Student's Flora of Tasmania* (Curtis 1956; Curtis & Morris 1975). The number of species and their circumscription has not changed since 1975 though some taxa have had name changes. Workers could keep abreast of these changes in the various issues of the *Census of the Vascular Plants of Tasmania* (Buchanan 2005, 2008). Modern descriptions of the Tasmanian conifers are also available, in an Australian context, in the *Flora of Australia* series (Hill 1998; ABRS).

Jordon (2008) has produced a web-based resource, *Key to Tasmanian Vascular Plants* that allows users to identify Tasmanian *Vascular Plants* using an interactive key. This is a valuable resource with many useful photographs and some discussion on key characters.

Macquarie Island is a part of the State of Tasmania. Cheeseman (1919) gave the first account of the vascular flora for the island and a modern account is given in the *Flora of Australia* series (George et al. 1993). The environment and biology of the island, including vegetation types, is discussed by Selkirk et al. (1990). A bibliography of the flora of Macquarie Island has been compiled by the Australian National Botanic Gardens (1998).

There are several other regional floras and illustrated field guides available for Tasmania: eg., for Tasmania in general (Cameron 2000; Whiting et al. 2004; Simmons et al. 2008), Alpine Tasmania (Kirkpatrick 1997), the Outer Furneaux (Harris et al. 2001), King Island (Woolmore et al. 2002), The Midlands (Gilfedder et al. 2003), grasslands and grassy woodlands (Kirkpatrick et al. 1988), aquatic plants (Hughes & Davis 1989), plants found on stream bank (Glazik et al. 2004), orchids (Orchidaceae: Jones et al. 1999), grasses (Poaceae: Lane et al. 1999), *Eucalyptus* (Myrtaceae: eg. Nicolle 2006; Wiltshire & Potts 2007) and weeds in general (eg. Hyde-Wyatt & Morris 1975; Auld & Medd 1987; Parsons & Cuthbertson 2001; Richardson et al. 2007). The vegetation types of Tasmania, less Macquarie Island, are described by Reid et al. (1999) and Harris and Kitchener (2005).

The flora of Tasmania is also covered, in part, by the *Flora of Australia* series (ABRS) and the other state floras. These are invaluable identification tools, especially for more recently described and/or weedy taxa.

## Classification and arrangement of the families of Angiosperms

The *Flora of Tasmania Online* aims to provide a modern account of the Tasmanian flora. The classification and arrangement of families used in it differs, in some places significantly, to that used at the Tasmanian Herbarium to sort the c. 150,000 vascular plant collections housed there. The classificatory system used by the Tasmanian Herbarium and *A Census of Vascular Plants of Tasmania* (Buchanan 2005, 2008) is the Cronquist (1981) system

with few and minor variations. That is, genera are placed in the families recognised by Cronquist (1981). This system is also the classification system largely followed by the *Flora of Australia* series (ABRS).

The advent of molecular techniques in the 1980's has added much information on the classification and circumscription of species, genera, and especially families, and has led to some major changes. These changes are largely the result of recognising natural or monophyletic groups (for extended discussions see, for example, Kanis *et al.* (1999), APG II (2003), Stevens (2008)). Though the circumscription of many families has not changed, or the changes do not affect the Tasmanian flora, there are some significant changes. For example, genera traditionally placed in the Epacridaceae are now placed in the Ericaceae (see Stevens *et al.* 2004). There are many other examples of family changes and readers are directed to the Family/Genus Search Tool (under *Treatments*) for a complete list of genera found in Tasmania and what families they are classified into by Cronquist (1981), and thus in the collections at the Tasmanian Herbarium, and how they are treated in the *Flora of Tasmania Online*. Where changes have occurred these are discussed in the account of that family.

Also of great interest is that molecular studies have shown that the simple split between Dicotyledons and Monocotyledons is not so simple. Some families that have traditionally been classified as Dicotyledons, eg. Winteraceae, are more closely related to traditional Monocotyledons than they are to the core Dicotyledons. Furthermore, several families are very isolated and are sister to all other Angiosperms (Monocotyledons and Dicotyledons) (see APG II 2003; Haston *et al.* 2007; Stevens 2008; and references therein). That is, the majority of Dicotyledons and Monocotyledons are more closely related to each other than any of them are to these families. The only Tasmanian family in this group is Hydatellaceae (considered to be a Monocotyledon until 2007 - see Saarela *et al.* 2007). Other isolated families include Amborellaceae (New Caledonia), Austrobaileyaceae (NE Qld) and Nyphaeaceae (waterlilies; worldwide).

These discoveries change the way we classify Angiosperms. The major way in which they affect the *Flora of Tasmania Online*, apart from the circumscription of families, is the linear order in which they appear in the treatment. Haston *et al.* (2007) propose a numerical order for all families of Angiosperms that is followed here (see Family/Genus Search Tool under *Treatments*).

Workers are directed to the excellent Angiosperm Phylogeny Website (Stevens 2008) that draws together the wealth of information available on the phylogeny of Angiosperms. The site provides a large amount of data on the circumscription of orders and families, lists of genera, key characters, important papers, photographs and much more.

## Family Accounts

### *Accepted Scientific Names*

Families are circumscribed following APG II (2003) and Stevens (2008) in the linear order of families proposed by Haston *et al.* (2007) [see above]. A list of pertinent synonyms for each family is provided though the list is not exhaustive as it is Australian centric; for a more complete list see APG II (2003) and Stevens (2008).

The names used for genera, species, subspecies and varieties are those currently accepted by the Tasmanian Herbarium (see Buchanan 2008) though some treatments vary slightly. Names, authors and publication details are provided for all genera, species and subspecific taxa. Author and publication abbreviations follow *The International Plant Name Index* (IPNI).

Basionyms, where applicable, and pertinent synonyms, along with the author and publication details as with accepted names, are listed. The list of synonyms is not exhaustive and often only those that have been applied to the Tasmanian flora are provided. All names used in the various floras covering Tasmania (Hooker 1855–1860; Rodway 1903; Cheeseman 1919; Curtis 1956, 1963, 1967, 1979; Curtis & Morris 1975, 1994) and the latest census (Buchanan 2008) are accounted for. Also accounted for are names applied to the Tasmanian flora by Bentham (1863–1878) in his *Flora Australiensis*, and the *Flora of Australia* series (ABRS). Where possible, all

names with type material from Tasmania are also accounted for. No attempt has been made to apply all names listed by Backhouse and Gunn (1835), Mueller (1875) and Spicer (1878). For a more complete list of synonyms visit the *Australian Plant Name Index* (APNI) and the *Australian Plant Census* (APC) for generic, specific and subspecific taxa.

For all taxa homotypic names are separated by a ‘;’ and heterotypic names are separated by a ‘.’.

### ***Vernacular or common names***

Vernacular or common names are included here where these names are being used. Common names are an end result of cultural interaction with the landscape and biota. As such, the common name for a taxon may vary from area to area within a state, and differ between different groups of stakeholders. In addition, the common name for a taxon in Tasmania may or may not be the same as used in other states and territories of Australia and overseas. Common names do change with time and are easily coined.

The common names listed in the *Flora of Tasmania Online* are those seen in other floras, field guides etc and/or known to be in use. More than one common name has been listed for some taxa and where the common name varies from area to area this is indicated. Not all taxa have common names. The list provided here is not exhaustive.

There is sometimes a push to provide a consensus of common names for all taxa. Often though, the process provides another classification system, similar to the scientific names, that does not reflect the cultural, historical and regional aspects of common names. A standardized list of common names has been produced for Tasmania (Wapstra *et al.* 2005). The names listed in this publication have not been used extensively in the *Flora of Tasmania Online*.

### ***Illustrations***

A list of good illustrations and photographs is provided for most species, subspecies, varieties and forms.

### ***Species descriptions***

Descriptions are based on the herbarium specimens, and associated field data, housed at the Tasmanian Herbarium. Specimens from other herbaria have been used when available, especially in the case of rare taxa. The descriptions are based solely on Tasmanian material unless, in rare cases, there is insufficient Tasmanian material, and then this is stated. Flowering and fruiting times are gleaned from herbarium specimens as well as field observations.

### ***Naturalized taxa***

Naturalized taxa (families, genera, species, etc) are prefixed by an asterisk (\*). They are keyed out and described in the same way as native taxa.

### ***Distribution and ecology***

Data on distribution and ecology is based on information associated with the herbarium specimens as well as field data. A broad verbal description of distribution and ecology is given though the information is truncated for rare and/or endangered taxa. Information about the distribution of taxa outside Tasmania is gleaned from a variety of sources including taxonomic treatments, various state and national floras, APC, APNI etc.

The biogeographical regions of Tasmania used here are IBRA regions (Environment Australia 2000). Macquarie Island (MIS) is not discussed in the IBRA system and is added for completeness. The regions for Tasmania are: BEL (Ben Lomond); FLI (Flinders); KIN (King); MIS (Macquarie Island); TCH (Tasmanian Central Highlands); TNM (Tasmanian Northern Midlands); TNS (Tasmanian Northern Slopes); TSE (Tasmanian South East); TSR (Tasmanian

Southern Ranges); TWE (Tasmanian West).

Maps are not provided by the *Flora of Tasmania Online* though these can be easily created using the *Australia's Virtual Herbarium* (AVH) and the *Natural Values Atlas* (NVA). AVH sources data from herbarium specimens lodged at the major Australian herbaria. If a worker wishes to they can produce maps using only data from the Tasmanian Herbarium. NVA uses data from a variety of sources, including the Tasmanian Herbarium.

### ***Symbols used in accounts***

- \* taxon (family, genus, species etc) naturalized in Tasmania
- † taxon presumed extinct in Tasmania but found elsewhere. This includes taxa that were once naturalized in Tasmania
- †† taxon presumed extinct over its entire former range
- † after a region, eg. KIN†, indicates taxon presumed extinct in that region.
- ° after a region, eg. KIN°, indicates that specimens of this taxon from this region are not held at the Tasmanian Herbarium.

### ***Glossary***

A glossary is not provided by the *Flora of Tasmania Online*. Any of the national (eg. ABRS) and state floras, plus a host of publications and websites, provide good botanical glossaries.

### ***Key external resources***

Accepted names with synonymy & distribution in Australia (APC); author & publication abbreviations (IPNI); mapping (AVH, NVA); nomenclature (APC, APNI, IPNI).

## **References**

ABRS *see* Australian Biological Resources Study

APC (Australian Plant Census) <http://www.chah.gov.au/apc/about-APC.html>

APG II (2003) An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II. *Botanical Journal of the Linnean Society* **141** 399-436.

APNI (Australian Plant Name Index) <http://www.anbg.gov.au/cgi-bin/apni>

Auld BA, Medd RW (1987) *Weeds: an Illustrated Botanical Guide to the Weeds of Australia*. (Inkata Press: Melbourne).

Australian Biological Resources Study (ABRS) (Australian Government: Department of the Environment, Water, Heritage and the Arts). <http://www.environment.gov.au/biodiversity/abrs/index.html>

Australian National Botanic Gardens (1998) *Flora of Macquarie Island Bibliography*. <http://www.anbg.gov.au/library/macquari.html>

Australian Plant Census *see* APC.

Australian Plant Name Index *see* APNI.

Australia's Virtual Herbarium *see* AVH.

AVH (Australia's Virtual Herbarium) (Council of Heads of Australasian Herbaria) <http://www.anbg.gov.au/avh.html>  
<http://www.sapac.edu.au/avh/>

Backhouse J, Gunn RC (1835) *Index Plantarum, or an attempt towards a popular description, of some of the more common and remarkable indigenous plants, of Van Diemen's Land*. pp. 61–114. (*Ross's Hobart Town Almanack and Van Diemen's Land Annual for 1835* (James Ross: Van Diemen's Land, Hobart Town).

Bentham G (1863–1878) *Flora Australiensis*. Vol. 1–7. (Lovell, Reed and Co.: London)

- Buchanan A (2005) *Census of the Vascular Plants of Tasmania*: 4th edition. Tasmanian Herbarium Occasional Publication No. 7 (Tasmanian Herbarium, Tasmanian Museum and Art Gallery: Hobart)
- Buchanan A (2008) *Census of the Vascular Plants of Tasmania*: web edition for 2008. (Tasmanian Herbarium, Tasmanian Museum and Art Gallery: Hobart). <http://tmag.tas.gov.au/tasmaniancensus>
- Cameron M (Ed.) (2000) *A guide to flowers and plants of Tasmania*. 3<sup>rd</sup> edn (Reed New Holland: Sydney)
- Cheeseman TF (1919) *The Vascular Flora of Macquarie Island*. Government Printer, Sydney.
- Cronquist AJ (1981) *An Integrated System of Classification of Flowering Plants*. (Columbia University Press: New York)
- Curtis WM (1956) *The Student's Flora of Tasmania Part 1 – Gymnospermae; Angiospermae: Ranunculaceae to Myrtaceae*. (Government Printer: Hobart)
- Curtis WM (1963) *The Student's Flora of Tasmania Part 2 – Angiospermae: Lythraceae to Epacridaceae*. (St. David's Park Publishing: Hobart)
- Curtis WM (1967) *The Student's Flora of Tasmania Part 3 – Angiospermae: Plumbaginaceae to Salicaceae*. (St. David's Park Publishing: Hobart)
- Curtis WM (1979) *The Student's Flora of Tasmania Part 4A – Angiospermae: Orchidaceae*. (St. David's Park Publishing: Hobart)
- Curtis WM, Morris DI (1975) *The Student's Flora of Tasmania Part 1 – Gymnospermae; Angiospermae: Ranunculaceae to Myrtaceae*. 2nd edition. (St. David's Park Publishing: Hobart)
- Curtis WM, Morris DI (1994) *The Student's Flora of Tasmania Part 4B – Angiospermae: Alismataceae to Burmanniaceae*. (St. Davids Park Publishing: Hobart)
- Environment Australia (2000) *Revision of the Interim Biogeographic Regionalisation for Australia (IBRA) and Development of Version 5.1 - Summary Report*. (Department of Environment and Heritage: Canberra). <http://www.environment.gov.au/parks/nrs/ibra/version5-1/summary-report/index.html>
- Garrett M (1996) *The Ferns of Tasmania: their ecology and distribution*. (Tasmanian Forest Research Council, Inc.: Hobart)
- George AS, Orchard AE, Hewson HJ, Thompson HS (1993) Oceanic Islands 2. *Flora of Australia* 50 (Australian Government Publishing: Canberra)
- Gilfedder L, Kirkpatrick J, Wapstra A, Wapstra H (2003) *The Nature of the Midlands*. (Midlands Bushweb: Longford).
- Glazik R, Askey-Doran M, Black L (2004) *Tasmanian Streambank Plants*. (Department of Primary Industries, Water & Environment: Hobart)
- Harris S, Buchanan A, Connolly A, Stewart A (2001) *One Hundred Islands: The Flora of the Outer Furneaux*. (Department of Primary Industries, Water & Environment: Hobart)
- Harris S, Kitchener A (2005) *From Forest to Fjaeldmark: Descriptions of Tasmania's Vegetation*. (Department of Primary Industries, Water & Environment: Hobart)
- Haston E, Richardson JE, Stevens PF, Chase MW, Harris DJ (2007) A linear sequence of Angiosperm Phylogeny Group II families. *Taxon* **56** 7–12.
- Hill R (1998) Pinophyta. *Flora of Australia* **48** 545–596.
- Hooker JD (1855–1860) *The Botany of the Antarctic Voyage. Part III. Florae Tasmaniae*. (Lovell Reeve: London)
- Hughes JMR, Davis GL (1989) *Aquatic Plants of Tasmania*. (Department of Geography, The University of Melbourne: Melbourne)
- Hyde-Wyatt BH, Morris DI (1975) *Tasmanian Weed Handbook*. (Tasmanian Department of Agriculture: Hobart)
- IBRA – see Environment Australia (2000)
- International Plant Name Index see IPNI
- IPNI (International Plant Name Index) <http://www.ipni.org/index.html> or <http://www.us.ipni.org/index.html>
- Jones D, Wapstra H, Tonelli P, Harris S (1999) *The Orchids of Tasmania*. (Melbourne University Press: Melbourne)
- Jordon G (2008) Key to Tasmanian Vascular Plants, version 5.1. (University of Tasmania: Hobart). <http://www.utas.edu.au/dicotkey/>
- Kanis A, Crisp MD, Orchard AE (1999) *Classification, Phylogeny and the Flora of Australia*. *Flora of Australia* **1** 125–147.
- Kirkpatrick J (1997) *Alpine Tasmania: an illustrated guide to the flora and vegetation*. (Oxford University Press: Melbourne)
- Kirkpatrick J, Gilfedder LM, Fensham R (1988) *City parks and cemeteries: Tasmania's remnant grasslands and grassy woodlands*. (Tasmanian Conservation Trust: Hobart)
- Lane P, Morris D, Shannon G (1999) *Common grasses of Tasmania: An agriculturalists' guide*. (Tasmanian Environment

Centre Inc.: Hobart)

Mueller F (1875) Census of the Plants of Tasmania, instituted in 1875. *Papers and Proceedings of the Royal Society of Tasmania* **1874** 72–95.

*Natural Values Atlas* see NVA.

Nicolle D (2006) *Eucalypts of Victoria and Tasmania*. (Blooming Books: Melbourne)

NVA (Natural Values Atlas) (Department of Primary Industries and Water: Hobart) <http://www.dpiw.tas.gov.au/inter.nsf/WebPages/LJEM-6TV6TV?open>

Orchard AE (1998) Ferns, Gymnosperms and Allied Groups. *Flora of Australia* 48. (ABRS/CSIRO: Canberra)

Parsons WT, Cuthbertson EG (2001) *Noxious Weeds of Australia*. 2<sup>nd</sup> edition. (CSIRO Publishing: Collingwood)

Reid JB, Hill RS, Brown MJ, Hovendon MJ (1999) *Vegetation of Tasmania*. (Australian Biological Resources Study: Canberra)

Richardson FJ, Richardson RG, Shepherd RCH (2007) *Weeds of the South-east: an Identification Guide for Australia*. (RG & FJ Richardson: Meredith)

Rodway L (1903) *The Tasmanian Flora*. (Government Printer: Hobart)

Rodway L (1914) *Tasmanian Bryophyta Vol. 1. Mosses*. (The Royal Society of Tasmania: Hobart)

Rodway L (1916) *Tasmanian Bryophyta Vol. 2. Hepatics*. (The Royal Society of Tasmania: Hobart)

Saarela JM, Hardeep SR, Doyle JA, Endress PK, Mathews S, Marchant AD, Briggs BG, Graham SW (2007) Hydatellaceae identified as a new branch near the base of the angiosperm phylogenetic tree. *Nature* **446** 312–315.

Selkirk PM, Seppelt RD, Selkirk DR (1990) *Subantarctic Macquarie Island: environment and biology*. (Cambridge University Press: Cambridge)

Simmons M, Wapstra H, Wapstra A (Eds) (2008) *A Guide to Flowers and Plants of Tasmania*. (Launceston Field Naturalists Club Inc.: Launceston).

Spicer WW (1878) *A Handbook of the Plants of Tasmania*. (J.Walch & Sons: Hobart Town).

Stevens PF, Luteyn J, Oliver EGH, Bell TL, Brown EA, Crowden RK, George AS, Jordon GJ, Ladd P, Lemson K, McLean CB, Menadue Y, Pate JS, Stace HM, Weiller CM (2004) *Ericaceae*. In K Kubitzki (Ed) *The Families and Genera of Vascular Plants: Vol. VI Flowering Plants Dicotyledons Celastrales, Oxalidales, Rosales, Cornales, Ericales*. pp. 145–194 (Springer: Berlin)

Stevens PF (2008) Angiosperm Phylogeny Website. Version 9, June 2008. <http://www.mobot.org/MOBOT/research/APweb>

Wapstra H, Wapstra A, Wapstra M, Gilfedder L (2005) *The little book of common names for Tasmanian plants*. (Department of Primary Industries, Water and Environment: Tasmania: Hobart)

Whiting J, Roberts J, Reeves R, Tayler F, Tayler V (2004) *Tasmania's Natural Flora*. (Tasmania's Natural Flora Editorial Committee: Ulverstone)

Wiltshire R, Potts B (2007) *EucaFlip: life-size guide to the eucalypts of Tasmania*. (School of Plant Science, University of Tasmania & CRC for Forestry: Hobart)

Woolmore E, Finzel E, Barnes R, Wapstra H, Wapstra A, Rollins L, Fitzgerald N, Warman R (2002) *King Island flora a field guide*. (King Island Natural resource Management Group: King Island)

**Note:** Web addresses can and do change: a list of current web addresses will be maintained on the *Flora of Tasmania Online* website [[www.tmag.tas.gov.au/floratasmania](http://www.tmag.tas.gov.au/floratasmania)].