

Botanical name

Acacia murrayana F.Muell. ex Benth., Fl. Austral. 2: 370 (1864)

The botanical name commemorates Dr James Patrick Murray who collected one of the type specimens (from Coopers Creek on the South Australia/Queensland border) when he was surgeon and plant collector on Alfred William Howitt's 1862 Expedition to retrieve the bodies of Burke and Wills (see Hall 1984 for biographical details).

Common names

Murray's Wattle, Colony Wattle, Sandplain Wattle, Fire Wattle, Powder Bark Wattle, and more; for central Australian aboriginal names see Latz (1995).

Characteristic features

Plants often suckering to form clonal thickets. Powdery white bloom on the stems on young plants and branches of mature plants. Phyllodes rather thinly textured, obscurely 1-nerved on each face, a small gland situated at the base of the thickened apical point. Heads globular, arranged in racemes, the peduncles and raceme axes slender and glabrous. Pods broad, flat but prominently rounded over seeds, papery. Funicle not expanded into an aril.

Description

Habit. Glabrous *shrubs* or *trees* 2-5(-8) m, often suckering to form clonal thickets, single- or multi-stemmed from the base, the crown bushy and often wide-spreading (3-8 m across, however, about 3-4 m wide in the Kalannie region).

Bark. Smooth, grey on main trunks of mature plants, white-pruinose on upper branches and on the stems of young plants.

Branchlets. Greenish yellow to reddish or light brown, often (lightly) pruinose.

Phyllodes. Variable in shape and size, linear to narrowly elliptic, sometimes oblanceolate, 5-15(-18) cm long, 1.5-8(-12) mm wide, thin and flexible, often drying finely longitudinally wrinkled, emitting a distinctive "rank" smell when crushed according to Mitchell and Wilcox (1994), glabrous, pale green to glaucous; with 1, somewhat obscure *longitudinal nerve* (midrib) on each face, lateral nerves obscure; *marginal nerves* yellowish; *apices* obtuse but terminated by a minute, thickened, +/- curved, non-pungent point; *gland* situated on upper margin of phyllode at the distal end of the pulvinus, a second gland situated at the base of the apical point.

Heads. Arranged in 2-10-branched racemes which are 1-6 cm long, globular, 8 mm in diameter when fresh, bright light- to mid-golden, densely 25-50-flowered; *raceme axes* slender; *peduncles* 4-10(-15) mm long, slender.

Flowers. 5-merous; *sepals* +/- free.

Pods. Narrowly oblong, flat but prominently rounded over seeds, 5-10 cm long, 8-12 mm wide, chartaceous, glabrous, light brown (greyish brown just prior to maturity), sometimes pruinose.

Seeds. Transverse to oblique in the pods, 4-5.5 mm long, 3-3.5 mm wide, shallowly depressed at the centre, dull, black; *funicle* not expanded into an aril.

Taxonomy

Related species. *Acacia murrayana*, together with four close relatives (*A. gelasina*, *A. pachyacra*, *A. praelongata* and *A. subrigida*) comprise the informal "*Acacia murrayana* group" (see Maslin 1995 for discussion).. Of these five species only *A. murrayana* and *A. subrigida* occur in the Kalannie region. Taxonomically the "*Acacia murrayana*" group is not far removed from the "*Acacia victoriae* group"

Acacia subrigida is most readily distinguished from *A. murrayana* by its narrower, non-flat, phyllodes, longer peduncles and +/- longitudinally arranged seeds. *Acacia victoriae* has shorter phyllodes, paler-coloured flower-heads, and (at least on young plants) spiny stipules.

Variants. Within *A. murrayana* there is marked variation in phyllode size and colour between plants from different areas. Plant with narrow phyllodes are common in Queensland but elsewhere (including the Kalannie region) the phyllodes are normally wider and the branchlets are pruinose; this latter form represents the entity described as *A. frumentacea* (a name which is currently treated as synonymous with *A. murrayana*).

Distribution

Widely distributed in the arid and semi-arid zones (100-500 mm annual rainfall) of Australia where it extends from the central-west coast of Western Australia (North West Cape and Shark Bay areas) eastwards though inland Western Australia, South Australia and Northern Territory to the western margin of the Great Divide near Mitchell (in Queensland) and Narrabri (in New South Wales).

Acacia murrayana is not common in the Kalannie region, being restricted to the western edge of Lake Moore in the northeast of the region.

Habitat

Over its extensive range *A. murrayana* occurs predominantly on deep red sands but it may also occur on clay loams; in central Australia it is most common on Spinifex sandplains and dune fields. It favours well-drained sites with access to run-on water such as the base of dunes, road verges and stream levees. It is tolerant of alkaline soils according to Elliot and Jones (1982) but results from glasshouse trials suggest that it is relatively salt-sensitive (Aswathappa *et al.* 1987). Further details on its ecology are given in Doran and Turnbull (1997).

In the Kalannie region it occurs on red or brown sandy loam, with some gravel.

Recorded from the following Kalannie region Land Management Units. Colluvial Flat-Earth; Sand over Gravel; Pediment; Shallow Soil over Laterite.

Conservation status

Although *A. murrayana* is not common within the Kalannie region in the broader context is not considered rare or endangered.

Flowering

Over its extensive geographic range *A. murrayana* flowers mainly from August to October (sometimes in November), depending upon local conditions.

In the Kalannie region plants of this species were in mature bud in early September 1997.

The plants flower profusely from an early age (17 months according to Ryan and Bell 1989).

Fruiting

Over its geographic range this species produces pods with mature seeds from November to January.

Plants in the Kalannie region were with mature seeds in early December 1996.

Acacia murrayana has moderately large seeds which occur in heavy pod crops during favourable seasons, especially by plants growing in moist niches. However, in south western Queensland it has been reported that much of the seed is removed by parrots prior to maturity (Allen 1949). The mature pods may be rapidly harvested by manual means and the seeds are easily separated from the chartaceous pods. Plants can be pruned to one main stem which would facilitate mechanical harvesting of pods using conventional shaking and catching technologies.

There are 19 900 viable seeds per kilogram (Doran and Turnbull 1997). There appears to be considerable variation in this statistic because a single sample counted by Angela Waters (Kalannie Tree Supplies) recorded about 52 000 seeds per kilogram (but this figure would have included both viable and non-viable seed).

Biological features

Longevity. Plants from central Australia are reported by Maconochie (1982) to be short-lived (10-25 years).

Growth characteristics. A fast-growing species which, according to Latz (1995), is highly fire-tolerant and drought-adapted (when above-ground parts are killed by fire and severe drought coppice shoots quickly appear from the roots). *Acacia murrayana* is a disturbance opportunist and its presence in large numbers indicates disturbance by fires, overstocking or road works.

Weed potential. Because of its root-suckering ability, especially in disturbed sites such as road verges, this species has the potential of becoming weedy.

Wood. Air dry density is 603 kg/m³, based on 10 samples tested (G. Pronk, pers. comm.).

Propagation

Propagate from seed.

Informal germination tests, using various hot water treatments, were conducted by Angela Waters (Kalannie Tree Supplies). Best results were obtained by boiling the seed for 5 minutes and letting it soak overnight prior to sowing. Simply soaking the seed overnight in just-boiled water resulted in a lower rate of germination. Untreated seeds showed very low rates of germination.

The following information is provided in Maslin *et al.* (1998). *Acacia murrayana* is an adaptable species capable of rapid growth when planted on favourable sites. The species should be able to be successfully grown on a wide range of well-drained soils (acid to alkaline sands, loams and texture-contrast types) in low rainfall areas (<500-600 mm yr⁻¹) across southern Australia. Waterlogged sites should be avoided, but supplementary watering/irrigation can be expected to enhance longevity and fruiting in very low rainfall areas (< 250-300 mm yr⁻¹). Planted specimens grow quickly during wetter years (>390 mm yr⁻¹), but plant health rapidly declines during dry periods (<150 mm yr⁻¹). Declining stands can be regenerated either by coppicing and/or shallow ploughing to stimulate root-suckering. It responds to pruning after flowering according to Elliot and Jones (1982).

Revegetation

Although relatively uncommon in the Kalannie region *A. murrayana* has potential for use in revegetation within the area. Plants of this species are fast-growing and are well-suited for providing windbreaks, visual screens and shade and shelter for stock

and wildlife. Because it commonly suckers it has good potential for providing soil stabilisation and salinity control on slightly to moderately saline sites. On the western margin of Lake Moore *A. murrayana* regenerates naturally in a small area where grazing had been excluded and which had previously been cropped for 20 years. *Acacia coolgardiensis* subsp. *effusa* showed very good regrowth within this same area.

Utilisation

Salinity control. See under Revegetation above.

Erosion control. Useful for erosion control according to Simmons (1987); see also above under Revegetation.

Windbreak. See under Revegetation above.

Shade and shelter. Useful as shade and shelter for stock and wildlife.

Visual screen. See under Revegetation above.

Wildlife refuge. See under Revegetation above.

Fodder. Although the phyllodes of *A. murrayana* are rarely consumed by stock the pods are sought after (Allen 1949; Chippendale and Jephcott 1963; Mitchell and Wilcox 1994). Dry matter digestibility of foliage was assessed by Vercoe (1989) as being below maintenance levels.

Wildlife. Allen (1949) reported that the seeds of this species are well-liked by parrots, and much seed is removed by the birds before it matures.

Wood products. Noted as highly suitable for the production of fuelwood and charcoal by Thomson *et al.* (1994).

Horticulture and amenity plantings. On account of its white stems and branches and masses of golden heads which appear in Spring this ornamental species has scope for amenity planting in arid and semi-arid areas.

Seed for human food. *Acacia murrayana* is one of the most promising species suggested by Maslin *et al.* (1998) for trialling in southern Australia as a source of seed for human food. However, it is emphasised that much more research is needed before this species can be recommended for food production; in particular, there is a need for comprehensive biochemical analyses to ascertain if any anti-nutritional or toxic components are present in the seeds. Nevertheless, the seeds of *A. murrayana* appear to have good nutritional characteristics and they were commonly used as a food by aboriginies (see Maslin *et al.* 1998 for details). Early European settlers sometimes roasted or burnt the mature seeds and ground them for use as a coffee substitute (Latz 1995).

Aboriginal useage. Apart from eating the seeds (see above) central Australian aborigines consume the gum exudate and grubs found in plants of this species.

References

- Allen, G.H. (1949). Notes on the plants of south western Queensland. Mimeo, 83p.
- Aswathappa, N., Marcar, N.E. and Thomson, L.A.J. (1987). Salt tolerance of Australian tropical and sub-tropical acacias. In: Turnbull, J.W. (ed.) *Australian Acacias in developing Countries*. ACIAR Proceedings No. 16, pp. 70-73.
- Chippendale, G.M. and Jephcott, B.R. (1963). *Topfeed. The fodder trees and shrubs of central Australia*. Extension Article No. 5. (Animal Industry Branch, Northern Territory Administration: Alice Springs.)
- Cunningham, G.M., Mulham, W.E., Milthorpe, P.L and Leith, J.H.. (1981). *Plants of western New South Wales*. (Government Printer: Sydney.)
- Doran, J.C. and Turnbull, J.W. (1997). *Australian trees and shrubs: species for land rehabilitation on farm planting in the tropics*. ACIAR Monograph No. 24.
- Hall, N. (1984). *Botanists of Australian Acacias*. (CSIRO: Melbourne.)

- Elliot, W.R. and Jones, D.L. (1982). *Encyclopaedia of Australian Plants suitable for cultivation*. vol. 2. (Lothian Publishing Company.)
- Latz, P.K. (1995) *Bushfires and bushtucker: Aborigines and plants in central Australia*. (IAD Press: Alice Springs.)
- Maconochie, J.R. (1982). Regeneration of arid zone plants: a floristic survey. *In: Barker, W.R. and Greenslade, P.J.M. (eds), Evolution of the Flora and Fauna of Arid Australia*, pp. 141–144. (Peacock Publications: Frewville.)
- Maslin, B.R. (1995). *Acacia* miscellany 14. Taxonomy of some Western Australian "Uninerves-Racemosae" species (Leguminosae: Mimosoideae: section Phyllodineae). *Nuytsia* 10(2): 181-203.
- Maslin, B.R., Thomson, L.A.J., McDonald, M.W. and Hamilton-Brown, S. (1998). *Edible Wattle Seeds of Southern Australia. A review of species for semi-arid regions of southern Australia*. (CSIRO, Forestry and Forest Products, Australian Tree Seed Centre: Canberra.)
- Mitchell, A.A. and Wilcox, D.G. (1994). *Arid shrubland plants of Western Australia*. (University of Western Australia Press & Department of Agriculture: Western Australia.)
- Ryan, P.A. and Bell, R.E. (1989). Growth, coppicing and flowering of Australian tree species trials in south-east Queensland, Australia. *In: Boland, D.J. (ed) Trees for the Tropics* ACIAR Monograph No 10, pp. 49-68.
- Simmons, M.H. (1987). *Growing Acacias* (Kangaroo Press.)
- Thomson, L.A.J., Turnbull, J.W. & Maslin, B.R. (1994). The utilisation of Australian species of *Acacia*, with particular reference to those of the subtropical dry zone. *Journal of Arid Environments* 27: 279-295.
- Vercoe, T.K. (1989). Fodder value of selected Australian tree and shrub species. Pages 95-100 in Boland, D.J. (ed.) *Trees for the tropics*. ACIAR Monograph No. 10.