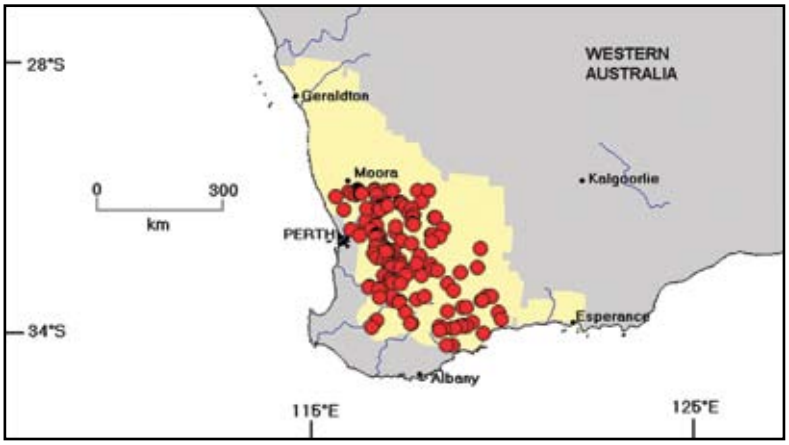
Acacia microbotrya Benth.

Common Name

Manna Wattle.

Special note

As discussed below under **Taxonomy** the concept of *A. microbotrya* adopted in this account is narrower than found in traditional definitions of the species (e.g. Maslin 2001 & 2001a). The taxon described here represents the 'typical' variant of the species (see under **Taxonomy** below) and it is likely that most of the previously published literature concerning *A. microbotrya* refers to this entity.



Map 41. Distribution of *A. microbotrya*.

Habit

Obconic or rounded shrubs or small trees commonly 2–4 (–5) m tall but reaching 6–7 m in well-watered, temperate sites, sometimes single-stemmed but more commonly dividing at or near ground level (often 0.3–1 m above the ground) into 2–4 stout, straight to sub-straight (sometimes crooked) main stems which are 6–20 cm dbh, crowns dense and spreading, often freely root suckering and often forming dense clonal clumps. Bark smooth but becoming rough towards base of main stems with age.

Botanical descriptions and illustrations/photographs are provided by Simmons (1987: the illustration here may be of var. *borealis*), Maslin *et al.* (1998) and Maslin (2001 & 2001a).

Taxonomy

Acacia microbotrya is referable to *Acacia* section *Phyllodineae*, a diverse, and probably artificial, group of about 408 species (Maslin 2001) which are characterized by having '1-nerved' phyllodes and flowers arranged in globular heads (see Maslin & Stirton 1998 and Maslin 2001 for discussion). More specifically this species is a Western Australian member of the Australia-wide '*Acacia microbotrya* group' (Maslin 1995). A number of other species from this group are detailed in this report, namely *A. bartleana*, *A. euthycarpa*, *A. retinodes*, *A. rivalis* and *A. wattsiana*. Species of section *Phyllodineae* are widespread in Australia with the main centres of richness located in temperate and adjacent semiarid areas of eastern, southeastern and southwestern Australia; species number greatly decline in the arid zone and in northern tropical/subtropical areas (Hnatiuk & Maslin 1988 and Maslin & Pedley 1988).

Map 42. Predicted area (blue) where *A. microbotrya* is climatically suited for cultivation; this area is derived from a bioclimatic analysis of the natural distribution (red circles, Map 41), see also Table 5. Target area shown in yellow.

Current studies being conducted by the first author and others show that there are at least three separate entities encompassed by what is generally called *A. microbotrya*. (1) Typical *A. microbotrya*

Figure 20 *Acacia microbotrya*

A – Roadside stand showing sucker regrowth. (Photo: B.R. Maslin)

B – Plant in open site showing dense, rounded crown. (Photo: B.R. Maslin)

C – Regrowth from rootstock following fire. (Photo: B.R. Maslin)

D – Mature adult plant (right) & mature sucker clump (left). (Photo: B.R. Maslin)

E – Gum exuded from stem. (Photo: B.R. Maslin)

F – Branch showing pale coloured heads (in racemes). (Photo: B.R. Maslin)

G – 22 month old plants in trial at Coorow, W.A. (Photo: B.R. Maslin)

occurs in areas south of about the latitude of Moora; these plants have cream to pale yellow heads, green phyllodes and develop into small, robust trees to about 4 m tall. It is these plants to which the name *A. microbotrya* is applied in the present account. (2) North of Moora the plants have light golden heads, often shorter and more bluish phyllodes, and are commonly slightly smaller in stature than their southern counterparts; these northern plants probably correspond to what has been described as both *A. microbotrya* var. *borealis* and *A. daphnifolia*. These plants are not considered to have significant potential as a wood crop and are therefore not dealt with in the present account. (3) In the Dandaragan–Badgingarrra area there exists a particularly robust form; these plants reach about 7 m in height, they have narrower pods than the other two forms and have light golden to lemon yellow heads. These plants are treated as *A. bartleana* here (see species profile above). The taxonomic and genetic work which is currently in progress is attempting to elucidate the patterns of relationships between these three entities.

Distribution and habitat

Widespread and common in the wheatbelt region of Western Australia (largely confined to the target area), where it extends from south of Moora south to near Katanning, with scattered occurrences around Ongerup and Lake King. It occurs on a variety of soil types including texture contrast soils derived from laterite, sands and sandy loam surrounding granite rock outcrops or clay loam near rivers and drainage lines. It is probably slightly to moderately salt tolerant.

Flowering and fruiting

Acacia microbotrya flowers earlier in the season than many other acacias in southwest Western Australia. Plants produce a great profusion of flowers from April to early July. Pods with mature seed have been collected from October to December, and occasionally in January. Natural stands of this species normally produce heavy pod crops; the seeds are large, easily collected, and are easily separated from the pods by manual threshing methods (Maslin *et al.* 1998).

Biological features

Acacia microbotyra is hardy, drought- and frost-tolerant, and fast-growing; it probably has a life span of about 20–30 years (Gardner 1957). It commonly suckers and is likely to coppice (it resprouts from near the stem base following fire). In Sandalwood host trials at Narrogin, Western Australia, *A. microbotrya* produced root suckers in 4 or 5 year old stands with no or minimal root disturbance (Jon Brand, pers. comm.).

Cultivation

Acacia microbotrya is used in direct seeding programs for regeneration and shelter belt plantings in the northern wheatbelt region of Western Australia (P. Ryan, pers. comm.).

Trials

Assessment trials of this species were recently established in plots on farmland at various locations in south-western Australia by the "Search" project (see Acknowledgements). At age 10 months plants of the best performing provenance of *A. microbotrya* showed an average survival of 69% and an average height of 134 cm. The 'best' plot was located on an upslope site with light soil in the northern Avon Wheatbelt IBRA region, with plants averaging 310 cm high. At this early age *A. microbotrya* showed the best preformance of the eight species that were included in these trials.

Performance results of 4 year old plants in Sandalwood trials at Dandaragan and Narrogin will be published in Brand *et al.* (in prep.).

Pests and diseases

Newbey (1982) reported *A. microbotrya* in southern parts of its range to be susceptible to attack by woolly caterpillars, but these can be controlled and the trees will recover.

Weed potential

There are no records of weediness involving this species despite the fact that it grows throughout much of the extensively disturbed cropping zone, produces prolific quantities of seed and has a vigorous suckering propensity.

Wood

The basic density values range from 654 kg/m^3 to 959 kg/m^3 (mean 832 kg/m^3) based on analyses of 30 wood samples by CALM's NHT-supported 'Search' project (unpublished data). Note: This study preferentially sampled young and adolescent plants.

Utilisation

Land use and environmental

The species is reported to be useful as a low windbreak and shelter plant (Elliot & Jones 1982, Simmons 1987) and for amenity planting in wheatbelt towns of the south-west of Western Australia (Maslin *et al.* 1998). It has been used in direct seeding programs for regeneration and shelter belt plantings in the northern wheatbelt region of Western Australia (P. Ryan, pers. comm.).

Fodder

According to Hussey (pers. comm.) the phyllodes of *A. microbotrya* are nutritious but the plants do not withstand grazing.

Tannin

In the early days the bark of *A. microbotrya* was often used in home tanning and as a source of 'manna gum' for export (Gardner 1957).

Human food

Acacia microbotrya is one of the promising species suggested by Maslin *et al.* (1998) for trialing as a source of seed for human food. The seeds and gum have been used as food items by Australian Aborigines (Meagher 1974).

Gum

Plants of this species often have reasonable quantities of gum exuded on the trunks and branches. The question of commercial potential of gum from this species is sometimes raised; however, apart from the difficulty (and cost) of collection, it is not of a particularly high quality (an analysis of gum characteristics is given in Anderson *et al.* 1985). This matter would need to be explored more thoroughly before dismissing it as a commercial possibility.

Sandalwood host

This species is currently in trials near Narrogin being assessed for its potential as a host for Sandalwood (*Santalum spicatum*).

Other uses

Reported to be useful as a source of honey or pollen (Elliot & Jones 1982; Simmons 1987).

Potential for crop development

Acacia microbotrya is regarded as being reasonably prospective for development as a crop plant for high volume wood production. It is ranked as a category 2 species and its growth characteristics suggest that it has potential as a phase crop and possibly also as a coppice crop (see Table 6). *Acacia microbotrya* is fast growing, hardy and adaptable to different sites (with a preference for loam soils). It produces a reasonable amount of woody biomass but the wood is moderately dense which lowers its attraction for use in reconstituted wood products. In terms of wood biomass production its close relative, *A. bartleana*, would seem slightly more prospective. *Acacia microbotrya* has a reasonable growth form but there is variation in stem straightness and the degree of branching. Therefore, selection of appropriate provenances will be necessary if this species is progressed as a crop for high volume wood products. The propensity for *A. microbotrya* to vigorously root-sucker may or may not be advantageous in cultivation, it depends whether or not this attribute is required (or expressed) for the system in which it is to be placed. However, successful development of this species as a phase crop may depend upon locating non-suckering provenances, if they exist. Also, because *A. microbotrya* produces large quantities of seed it would by appropriate to harvest plants before they reach biological maturity to avoid creating a soil seed bank that may lead to weed problems in adjacent or subsequent annual crops. For this technique to be viable the plants will need to have produced acceptable quantities of wood prior to the first pod crops being set. An alternative might be to treat seedling recruitment as a form of green manure. Although *A. microbotrya* is reported to regenerate from the base following fire, the vigour, frequency and other attributes of resprouting are unknown, therefore the potential of this species as a coppice crop cannot be adequately assessed at present.

Acacia microbotrya is widespread in the Western Australian wheatbelt (but absent from southeastern areas, east of Ravensthorpe) where it is reasonably well known and used in regeneration and nature conservation projects. Possible associated benefits that might be derived from gum, seed for human consumption or as a Sandalwood host plant require further investigation.

The area predicted to be climatically suitable for the cultivation of *A. microbotrya,* based on its natural climatic parameters, is shown in Map 42 . This analysis indicates that *A. microbotrya* has good prospects for cultivation throughout much of the target area in Western Australia and also large parts of South Australia and a few places in Victoria and New South Wales. The area predicted for growth of *A. microbotrya* in the west essentially equates to its area of natural occurrence. As this species has a reasonably broad edaphic tolerance it has the potential to be widely cultivated throughout the western target area.