Botanical name

Acacia tetragonophylla F.Muell., Fragm. 4: 3 (1863)

The botanical name is derived from the Greek *tetragonos* (four-angled, square) and *phyllon* (a leaf), and refers to the phyllodes which are more or less square in cross-section.

Common names

Kurura (or Curara), Dead Finish. The common name Dead Finish refers to the fact that travellers are halted by its prickly thickets (Elliot and Jones 1982).

Aboriginal names in Western Australia are Tjilkaru (Ashburton region) and Wakalpuka (Warburton region) (Reid 1977); for central Australian aboriginal names see Latz (1995).

Characteristic features

Prickly glabrous large plants. Phyllodes clustered in groups of normally 2-6 at mature nodes, straight, rigid, normally with 5 longitudinal nerves, ending in a very sharp, needle-like point. *Heads* globular and many-flowered, peduncles long. *Pods* curved to openly coiled (often twisted following dehiscence). *Funicle/aril* bright yellow and encircling the seeds.

Description

Habit. Glabrous, diffuse, often straggly, much-branched, prickly *shrubs* or *trees* 2-5(-6) m tall and 1-4(-6) m wide, the branches entangled.
Bark. Grey, slightly fissured and rough at base of stems otherwise smooth.
Phyllodes. Clustered in groups of normally 2-6 at the nodes, occurring singly on new shoots, usually pentagonal to compressed in cross-section, mostly 1-5 cm long and about 1 mm wide, rigid (soft and pliable when young), straight, green; *longitudinal nerves* 5 (sometimes 7), rather prominent, normally longitudinally grooved between the nerves when dry; *apices* narrowed to a slender, needle-like, pungent point 1-2 mm long.
Heads. 1-5 within axil of phyllodes, globular, 8-9 mm in diameter when fresh, golden, densely 50-90-flowered; *peduncles* 10-30 mm long.
Flowers. 5-merous; *sepals* free.
Pods. Raised over seeds and slightly to markedly constricted between them, normally 6-10 cm long and 4-6 mm wide, curved to openly 1 1/2 coiled, often twisted following dehiscence, thinly crustaceous to coriaceous or sub-woody.
Seeds. Longitudinal in the pods, 4-5.5 mm long, 3-3.5 mm wide, black; *funicle/aril* bright yellow and encircling seed.

Taxonomy

The phyllodes on *A. tetragonophylla* occur singly on actively growing new shoots but with age additional phyllodes develop to form a cluster (fascicle) which is ultimately borne on nodose, dwarf lateral branchlets. This phyllode arrangement is rare in the Australian acacias but is common in many from Africa and the Americas.

Related species. Close relatives of this species are unknown. *Acacia tetragonophylla* is not likely to be confused with any other Australian *Acacia* on account of its clustered, linear, spiny phyllodes.

Variants. Considering its very wide geographic range *A. tetragonophylla* is a relatively invariate species. However, plants with unusually broad, flat phyllodes

occur near North West Cape, Western Australia and an arborescent form (to 6 m tall) with pendulous branches is reported from near Adavale in Queensland

Distribution

Widespread in arid and semi-arid areas of Australia where it extends from Western Australia throughout southern Northern Territory and most of South Australia to near Charleville in Queensland and Brewarrina in New South Wales.

Acacia tetragonophylla is not very common in the Kalannie region.

Habitat

Over its extensive range *A. tetragonophylla* occurs in a wide variety of habitats. It is commonly associated with water courses and is a frequent component of Mulga (*A. aneura*) communities; it also occurs in skeletal soils on rocky hills. *Acacia tetragonophylla* grows on soils ranging from sand to clay, both acidic and alkaline in areas with a median annual rainfall of 100-450 mm (Thomson 1987). O'Connell and Fox (1995) summarize the habitat variation within this species, focusing on the Western Australian populations.

Recorded from the following Kalannie region Land Management Units. Colluvial Flat-Earth; Red Brown Earth; Shallow Soil over Granite; Colluvial Flat-Solodic; Sandy Loam over Clay.

Conservation status

Not considered rare or endangered.

Flowering

Based on collections at the Western Australian Herbarium *A. tetragonophylla* is known to flower from September to November over its very extensive geographic range. However, in South Australia the flowering period is recorded by Whibley & Symon (1992) as being June to October.

In the Kalannie region plants of this species were in bud, at anthesis and post-anthesis in mid-August 1997.

Fruiting

Over the extensive geographic range of this species pods with mature seeds have been collected from October to January.

Plants from the Kalannie region were sterile in early December 1996. This suggests that local conditions (the timing and/or intensity of rainfall perhaps being the most important) influence pod-set in this species. Indeed, Davies (1976) reported that in the Murchison region of Western Australia seed production on plants of *A. tetragonophylla* was correlated with both summer and winter rainfall and that temperature also seems to play a role in seed set (if too cold then developing seeds are killed).

Following dehiscence the coiled and twisted pods remain attached to the plants for a long period. The pod valves act as shelves on which the seeds (encircled by their brightly coloured aril) are displayed for dispersal (Davidson and Morton 1984). Dispersal agents include both both birds and ants (Davidson and Morton 1984; O'Dowd and Gill 1986).

It is normally difficult to collect pods by hand on account of the prickly foliage (stout gloves are recommended). Gently beating of the plants and collecting the pods and seeds on a ground sheet is probably a more efficient way of collection; however, the prickly phyllodes again may cause problems, especially for plants where the foliage extends to ground level and when phyllodes become dislodged with the pods.

Biological features

Longevity. Suggested to have a life span of >50 but <100 years (Jurado *et al.* 1991)
Growth characteristics. A hardy, drought tolerant species that can persist under extremely harsh conditions. Mature plants are believed to be slow-growing. O'Connell and Fox (1995) reported that in the Pilbara and Goldfield areas of Western Australia plants of *A. tetragonophylla* regenerate from their root stock following fire, however, seedling growth after fire has not been observed. Latz (1995) regarded the central Australian plants of this species as fire-intolerant.
Pests and diseases. After heavy summer rains caterpillars may completely strip plants of their phyllodes and this can subsequently lead to reduced fruit production (Davies 1976). O'Connell and Fox (1995) reported that spur-throated locust may occur in large numbers on Pilbara plants of this species.
Weed potential. Plant numbers may increase rapidly in some Mulga communities after their exclosure from grazing but this species rarely forms thickets (O'Connell and Fox 1995).
Wood. Close-grained, heavy and tough, reddish brown with pinkish stripes and smells of violets when cut (Simmons 1981). Air dry density is 1 164 kg/m^3, based on 6 samples tested (G. Pronk, pers. comm.).

Propagation

Propagate from seeds or cuttings (Elliot and Jones 1982).

O'Connell and Fox (1995) reported germination responses ranging from 30-80% by using the conventional method of pouring boiling water onto the seed and allowing it to cool to room temperature; about 10% germination resulted from seed that was not pre-treated in this way. The age and quality of the seed, its period of storage, and the length of time it was boiled for all affected the rate of germination (see O'Connell and Fox 1995 for details).

Revegetation

Although *A. tetragonophylla* tolerates slight to moderate salinity under natural conditions this species has little scope for use in salinity control within the Kalannie region. It performed poorly in salt tolerance trials that have been conducted in the region (N. Dodd, pers. comm.).

This is one of the species recommended Wilcox *et al*. (1996) for revegetation on a variety of soil types in the Midlands and northern wheatbelt regions of Western Australia; it is regarded by Clarke (1997) as being suited to revegetating drainage lines in these areas. However, Rusbridge *et al.* (1996) reported that although *A. tetragonophylla* is commonly used in rehabilitation in the goldfields the results are generally poor.

Utilisation

Soils stabilisation. *Acacia tetragonophylla* is reported to be a useful soil binder in sandy areas of western New South Wales (Cunningham *et al.* 1981).
Live fence. For the reasons noted below this species has scope for growing as a live fence. If *A. tetragonophylla* were grown in combination with *A. colletioides* a particularly effective live fence could be produced.

Wildlife refuge. Because this species grows to large shrubs and has entangled branches and spiny phyllodes, it provides a good protected habitat for small animals and nesting birds.

Fodder. Poor to moderate nutritive value (crude protein content ranging from 6 to 16% according to Mitchell and Wilcox 1994) but regarded as a drought standby fodder in Western Australia and central Australia. According to Mitchell and Wilcox (1994) *A. tetragonophylla* is grazed, especially by goats, during periods of stress when other arid species have dropped their foliage. After grazing, or when phyllodes have dropped due to drought, new phyllodes appear on old branches. The species always produces forage for stock as the lowest limbs do not remain bare, in contrast to other arid zone *Acacia* species.

Seed for human food. There are many reports of the seeds of this species having been consumed by traditional aborigines (see references cited in Maslin *et al.* 1998); however, *A. tetragonophylla* is not one of the species highly recommended as a "human food" by Maslin *et al.* (1998). Although the seeds of this species are rarely produced in large numbers they are consumed by central Australian aborigines who usually cook them in the pods before eating (Latz 1995).

Aboriginal useage. Apart from consuming the seeds (see above) and grubs that are found in the roots of this species, aborigines have traditionally used various parts of *A. tetragonophylla* for medicinal purposes (see Latz 1995 for details). Boomerangs are made from the wood (van Vreeswyk 1995, cited in O'Connell and Fox 1995).

Wood products. The hard, fine-grained wood was used by early European settlers in Central Australia for whip handles (Latz 1995).

References

Clarke, M. (1997, in press). West Morawa catchment revegetation report. (To be published in 1998 by Agriculture W.A.)

Cunningham, G.M., Mulham, W.E., Milthorpe, P.L and Leith, J.H.. (1981). *Plants of western New South Wales*. (Government Printer: Sydney.)

Davidson, D.W. and Morton S.R. (1984). Dispersal adaptations of some *Acacia* species in the Australian arid zone. Ecology 65(4): 1038-1051.

Davies, S.J.J.F. (1976). Studies of the flowering season and fruit production of some arid zone shrubs and trees in Western Australia. Journal of Ecology 64: 665-687.

Elliot, W.R. and Jones, D.L. (1982). *Encyclopaedia of Australian Plants suitable for cultivation*. vol. 2. (Lothian Publishing Company.)

Jurado, E., Westoby, M. and Nelson, D. (1991). Seed size and dispersal in arid Australia. Journal of Ecology 79: 811-830.

Latz, P.K. (1995) *Bushfires and bushtucker: Aborigines and plants in central Australia*. (IAD Press: Alice Springs.)

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*. ed. 2 (University of Western Australia Press in association with the Department of Agriculture, Western Australia: Perth.)

O'Connell, K.A. and Fox, J.E.D. (1995). Ecological notes on *Acacia* species. *Acacia tetragonophylla* F. Muell. Mulga Research Centre Journal 12: 57-64.

O'Dowd, D.J. and Gill, A.M. (1986). Seed dispersal syndromes in Australian *Acacia*. In *Seed Dispersal*, chapter 3, pages 87-121 (Academic Press: Australia.)

Reid, E. (1977). The records of Western Australian plants used by Aboriginals as medicinal agents. (Pharmacy Department, Western Australian Institute of Technology: Perth.)

Wilcox, D.G., Lefroy, E.C., Stoneman, T.C., Schoknecht, N.R. and Griffin, E.A. (1996). *Trees and shrubs for the Midlands and Northern Wheatbelt*. (Agriculture W.A.: Western Australia.).

Rusbridge, S., Bradley, G. and G. (1996). *Plant Identification Handbook for Land Rehabilitation in the Goldfields of Western Australia.* (Published by the Goldfields Land Rehabilitation Group.)

Simmons, M.H. (1981) *Acacias of Australia*. (Nelson: Melbourne.)

Thomson, L.A.J. (1987). Australian acacias for saline, alkaline soils in the hot dry subtropics and tropics. In J.W. Turnbull (ed.) *Australian Acacias in developing countries. Proceedings of an international workshop held at the Forestry Training Centre, Gympie, Queensland, Australia, 4-7 August 1986*, pp. 66-69. Australian Centre for International Agricultural Research Proceedings No. 16.

Whibley, D.J.E. and D.E. Symon (1992). *Acacias of South Australia*. (South Australian Government Printer: Adelaide.)