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# Acacia tortilis

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# SEED LEAFLET

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# *Acacia tortilis* (Forssk.) Hayne

## Taxonomy and nomenclature

**Family:** Fabaceae (Mimosoideae) Subspecies: *A. tortilis* subsp. *heteracantha* (Burch.) Brenan, *A. tortilis* subsp. *raddiana* (Savi) Brenan, *A. tortilis* subsp. *spirocarpa* (A. Rich.) Brenan, *A. tortilis* subsp. *tortilis*

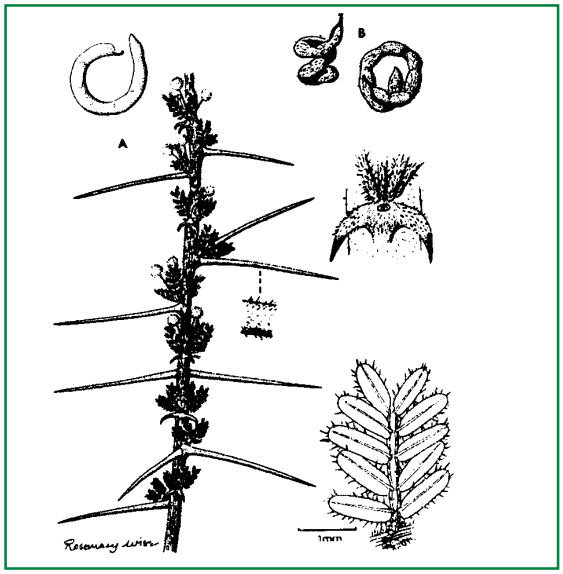
**Synonyms:** *Acacia fasciculata* Guill. & Perr., *A. heteracantha* Burch., *A. litakunensis* Burch., *A. maras* Engl., *A. raddiana* Savi, *A. spirocarpa* A. Rich., *A. spirocarpoides* Engl., *Mimosa tortilis* Forssk.

**Vernacular/common names:** Apple ring acacia, umbrella thorn.

## Distribution and habitat

Widespread throughout the savannah and dry zones of Africa, from Senegal to Somalia and south to South Africa; in Asia in Israel, Jordan and southern Arabia to Iran. Subsp. *raddiana* has successfully been introduced to India from Israel.

A very drought-resistant species that grows in areas with as little as 40 mm rain/year and with temperatures reaching up to 50°C. In the countries that fringe the Sahara it is often the species that extends furthest into the desert. It is found growing from below sea level and up to 2000 m altitude and tolerates light night frost. It favours alkaline soils and avoids waterlogged sites, but apart from that it will grow on a wide range of sites.




A, subsp. *radiana*; B, subsp. *spirocarpa*. From: Acacias of Kenya.

## Uses

A slow-growing species but grows relatively fast on dry soils.

It is an important fodder tree in many arid areas. Pods and leaves have a good level of digestible protein (mean = 12%) and energy 6.1 MJ/kg dry matter, as well as being rich in minerals. Seeds are high in crude protein (38%) and phosphorus, an element usually scarce in grasslands.

The pods require milling to increase digestion in cattle. Over 90% of the flowers abort and drop from the trees, providing an additional important forage. The wood is excellent for fuelwood production and the tree resprouts vigorously when coppiced. Although used for a number of purposes, the timber is neither strong nor durable.

## Botanical description

A very variable species. It can be multi-stemmed shrubs (ssp. *tortilis*), or trees up to 20 m tall with rounded (ssp. *raddiana*) or flat-topped (ssp. *heteracantha* and *spirocarpa*) crowns.

Bark is grey-brown-black, rough and fissured. The spines are in pairs, some short and hooked up to 5 mm long, mixed with long straight slender spines up to 10 cm long. The presence of these two types of thorns distinguishes *A. tortilis* from other African acacias.

Leaves are smooth to densely pubescent, 1-7 cm long, with 2-14 pinnae each with 6-22 pairs of leaflets. Flowers white or pale yellowish-white, fragrant, in round heads, solitary or in fascicles.

## Fruit and seed description

**Fruit:** a contorted or spirally twisted pod, yellow-brown, 5-15 cm long, with longitudinal veins and slightly constricted between the seeds. There are 5-18 seeds/pod. Semi-dehiscent, i.e. the ripe pods open but remain on the tree without releasing the seed.

**Seed:** elliptic, slightly compressed, 6 x 35 mm, olive green to red brown, smooth. The surface is darker inside the horseshoe-shaped pleurogram. There are 10,000-50,000 seeds/kg depending on subspecies.

## Flowering and fruiting habit

Flowering is prolific with up to 400 flowers/meter twig and seed setting is normally high. The time from flowering to fruit maturity can be three to four months or more, being timed towards the end of the dry season. Fruit

drop can be spread over a number of months. Some pods may be retained in the dense thorny crown for months after maturity.

| Locality | Flowering |
|---|---|
| **subspecies *spirocarpa*** | |
| Zambia | Nov-Dec |
| Mozambique | Jan-Feb |
| Malawi | Jan-Feb |
| Zimbabwe | Mar-Apr |
| Namibia | Mar-Apr |
| East Africa | Jan-Mar and Aug-Dec |
| **subspecies *raddiana*** | |
| East Africa | Jan-Feb and Sep-Oct |
| West Africa | Sep-Nov |
| India | May-June |
| **subspecies *tortilis*** | |
| East Africa | Apr, Aug and Nov |
| **subspecies *heteracantha*** | |
| southern Africa | Nov-Feb |

## Harvest

The seeds are mature when the pods change colour from green to yellow/light brown. To avoid infestation by insects, the pods should be harvested from the tree by shaking them down from the canopy on to tarpaulins. Pods that have been lying on the ground for some time are often infested. It is possible to afterripen seed extracted from pods that still have patches of green.

## Processing and handling

The pods are dried in the sun and extracted by pounding the pods in a mortar or a sack or with a flailing thresher. After threshing, the material should be sieved and cleaned by winnowing or in an air screen cleaner.

## Storage and viability

The seeds are orthodox and stores well in airtight containers at 0-5°C at 5-7% moisture content. Tests have shown germination of 77-98% after 7-9 years' storage at 4°C and elevated $CO_2$ concentrations.

## Dormancy and pre-treatment

The seeds are hard coated and must be pretreated to germinate well. Boiling water is poured over the seeds before they are soaked in water for 24 hours. Scarification with 50% concentrated sulphuric acid for 40-50 minutes followed by washing in cold running water and then drying in the shade overnight is an alternative method.

Seeds of various dimensions have varying scarification requirements.

## Sowing and germination

The seeds are sown in seedbeds, followed by pricking into pots. Young plants need protection from browsing for at least 3 years. Trees should be planted at wide spacing. Early growth is slow.

## Phytosanitary problems

Infestation of seeds by insects is a major problem.

## Selected readings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Habit of subsp. *spirocarpa* growing at 2000 metres on the scarp of the Cherangani Hills, northern Kenya. Photo: Chris Fagg, OFI.


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