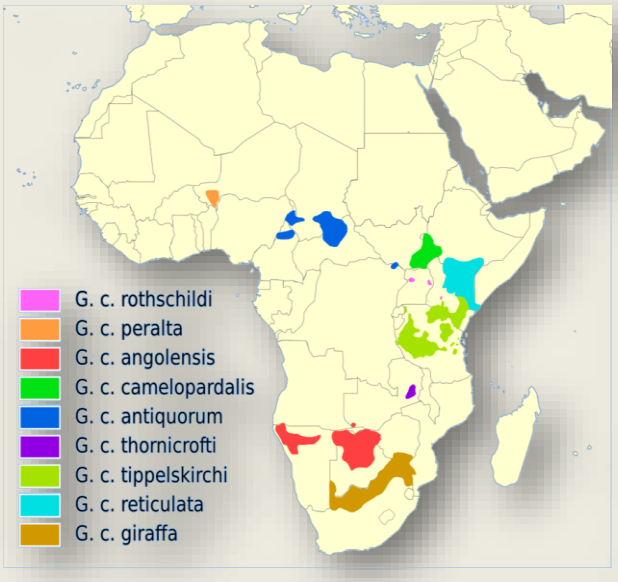
Acacia v Giraffe

Photo: Karen Marais

Acacia has long been a household name, not only in Australia but also in Africa where Acacia trees are the fodder of choice for giraffe. There is a remarkable association between Acacia trees and giraffe, all the more amazing as it seems that Acacia trees have some developed some remarkable defences to limit the grazing habits of giraffe.

Firstly, we need to get the name *Acacia* sorted. Until 2011, worldwide there were about 1,300 species in what has been known until recently as the genus ***Acacia***, and that included ~ 1,000 from Australia, ~ 150 from Africa, and a few from south-east Asia and the Americas. In that year, it was decided that Australian species retain the name *Acacia*, and that African species were variously divided between two genera, *Vachellia* and *Senegalia.* However, the name *Acacia* continues to be used as a *common name* for African species which are also variously known as *Fever Trees*, *Thorn Trees* and *Gum Arabic.*



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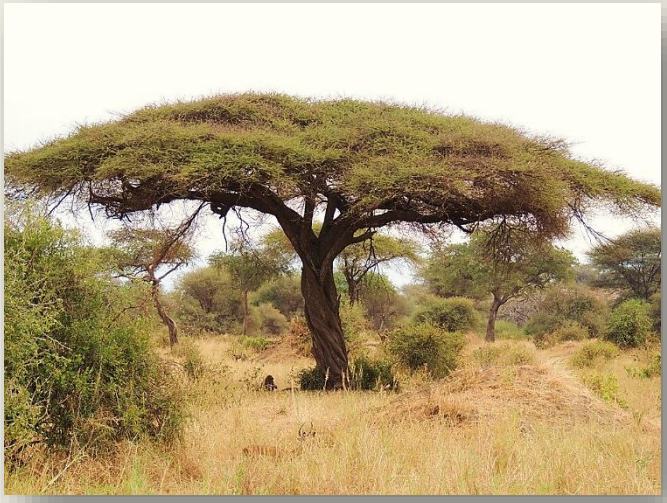
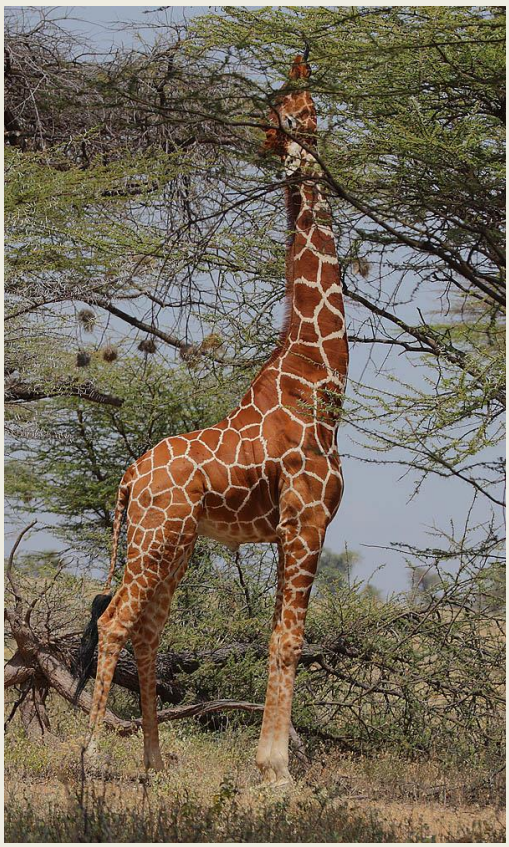
In 1758, Linnaeus classified Giraffe as one species, *Cervus camelopardalis*, but now the IUCN recognises one species, *Giraffa camelopardalis* and nine subspecies. They are now no longer present in much of their former range.

Giraffe are found in savannahs and woodlands and their grazing habits have shaped Acacia trees into iconic rounded crown trees with the lowest branches pruned so that they are almost horizontal, marking the maximum height at which these long-necked herbivores can graze.



Classic appearance of an African Acacia or Thorn Tree, now *Vachellia tortilis*, Photo: Robur.q / CC BY-SA (https://creativecommons.org/licenses/by-sa/3.0)

The problem for Acacia trees is that one giraffe eats about 34 kg of foliage every day, and also, if stressed, giraffe are known to pull bark off the branches. This can have a devastating effect on woodlands but Acacia trees have evolved mechanisms to fight back, the first line of defense being long, vicious thorns. To overcome this, giraffe, have evolved extremely long tongues and tough leathery lips to negotiate their way about the thorny obstacles.



Adult male Reticulated giraffe feeding high up on an acacia, in Samburu Park, Kenya. Steve Garvie from Dunfermline, Fife, Scotland / CC BY-SA. https://creativecommons.org/licenses/by-sa/2.0)

Acacias can also mount a chemical response to predation by producing tannins, a class of naturally occurring, astringent, polyphenolic biomolecules; they make your mouth pucker up when you drink black tea, wine or eat unripened fruit. For giraffe, tannins produced by Acacia trees are not only taste unpleasant but cause problems with digestion. The tannin concentration can happen extremely rapidly, for *Senegalia* (*Acacia*) *nigrescens*, it rises by 70% within two minutes of leaves being damaged and continues to rise for the next couple of hours.

If that were not enough, an Acacia tree under attack will release the gaseous hormone ethylene, signalling Acacia trees growing *downwind* to increase tannin biosynthesis so that giraffe must move *upwind* or *crosswind* away from the trees on which they have been grazing.

Foliage, thorns and flowers of an Acacia tree - tempting treats for giraffe. *Vachellia nilotica* – previously *Acacia scorpioides* – Photo: J.M.Garg / CC BY-SA (https://creativecommons.org/licenses/by-sa/3.0)

Believe it or not, Acacia trees have yet another line of defense, stinging ants that hollow out and live inside Acacia thorns and readily defend the trees from predators.

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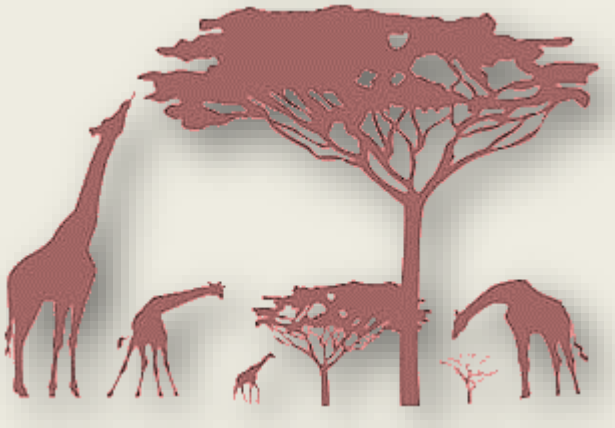

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