

Gum Arabic

from North Africa, and a potential new Australian source - *Acacia cambagei*

The name *Gum Arabic* is readily recognisable, but what is it, why is it important and where does it come from? The origins of this curious name are somewhat difficult to pin it down, but usually gum Arabic refers to the dried, hardened sap (exudate) of two trees from North and West Africa, *Senegalia senegal* and *Vachellia seyal*.

Gum Arabic is a complex of glycoproteins (proteins coated with the sugars arabinose and galactose) and complex carbohydrates. It forms soluble gels in water and is edible, making it a valuable additive in food production, a stabiliser in soft drinks, lithography, cosmetics, paint, textiles, printing, glue and also as a corrosion inhibitor.



Senegalia senegal

Photograph: Mouhamadoumansour, CC BY-SA 4.0
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Raw Gum Arabic. Photo: Tarig A. Eltom, CC BY 3.0
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Senegalia senegal is a small, thorny deciduous tree from the semi-



Acacia senegal (now *Senegalia senegal*) from Franz Eugen Köhler, Köhler's Medizinal-Pflanzen, Public domain, via Wikimedia Commons

desert regions of Sub-Saharan Africa, also Oman, Pakistan and the west coast of India.



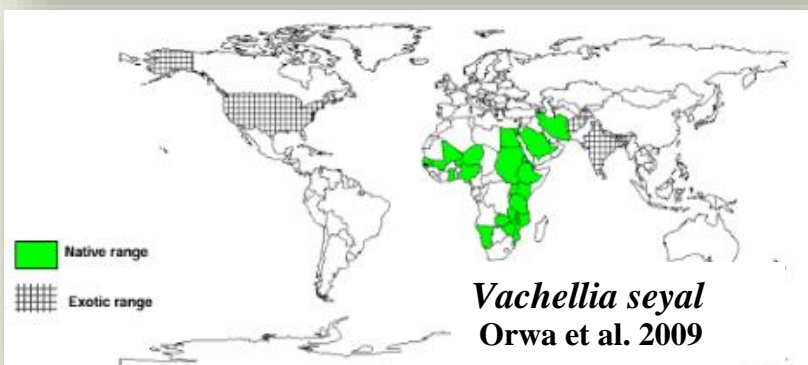
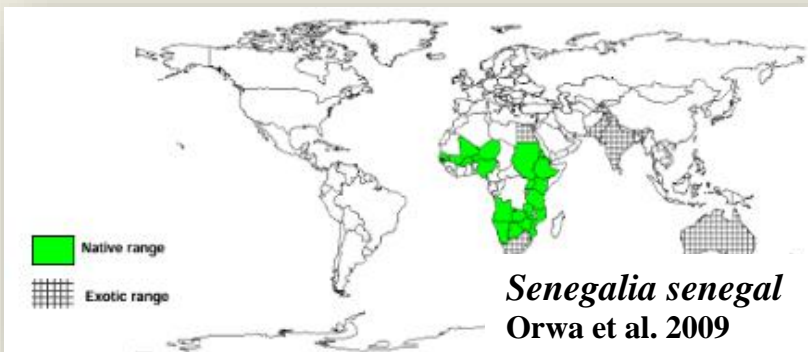
Acacia tree in Ein Khadra Desert Oasis, Nuweibaa, South Sinai, Egypt. Photograph: لا روسا, CC BY-SA 4.0 <<https://creativecommons.org/licenses/by-sa/4.0/>>, via Wikimedia Commons



Fig. 55. *Acacia Senegal* Willd. A Blütenzweig; B Kiesel; C aufgesprungenes Hülsen mit den S.; D Längsschnitt des S.; E Querschnitt Kieselstein. (Hegnau)

Acacia senegal in Paul Hermann Wilhelm Taubert, 1891, *Leguminosae* (1862-1897), in A. Engler (ed.): *Natürliche Pflanzenfamilien. Vol. III, 3*. Public domain, via Wikimedia Commons.

A related species, *Vachellia seyal* (Red Acacia, or Shittah Tree) is also a thorny tree, distributed from Egypt to Kenya and as far west as Senegal, often growing in damp valleys of the Sahara and on the Arabian Peninsula.



The gum is an exudate from a duct of the inner bark of the tree. Tapping begins when the trees are four to five years old and is done in summer when trees respond to stress by exuding more gum – trees on poor soils and limited water are the most productive. Both *Senegalia senegal* and



Gidgee Trees – *Acacia cambagei* Photo: Mark Marathon, CC BY-SA 3.0
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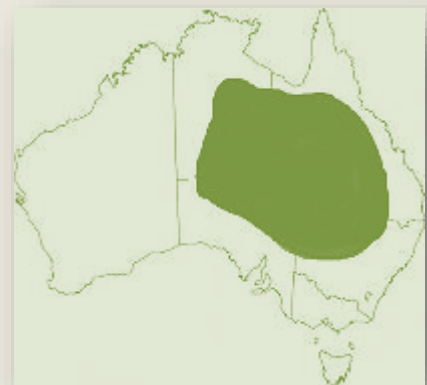
Vachellia seyal are legumes, therefore not reliant on artificial fertilisers.

Although Gum Arabic is traditionally sourced from these two species, it can be legally extracted from a range of other genera such as *Albizia*.

Recently, a new rival to the more traditional sources of Gum Arabic has been identified in Australia, *Acacia cambagei*, the Gidgee Tree. This is a small tree widespread throughout arid and semi-arid Queensland, Northern Territory, north-

western New South Wales and north-eastern South Australia. The various common names, *stinking wattle*, *stinking gidgee*, relate to a rather unpleasant smell, not dissimilar to sewage, gas or boiled cabbage.

Researchers recently compared the characteristics of Gidgee gum with traditionally sourced Gum Arabic and determined that the Australian *Acacia* had the potential to be a viable alternative in both the food and the pharmaceutical industries. Both species shared similar chemical compositions. The two African species face real global threats, including climate change, habitat decline, drought, fire, overgrazing and overharvesting, increasing the probability that this Australian *Acacia*, and others, may be developed to fill future depleted production levels of gum Arabic.



Approximate distribution of *Acacia cambagei* in Australia. Modified from Atlas of Living Australia

This Australian connection is not very surprising because the African and Australian species are closely related ‘Acacias’. Both *Senegalia* and *Vachellia* were previously grouped in the genus *Acacia* but following a

ruling from the International Code for Nomenclature in 2011, African *Acacia* species were moved to other genera, much to ire of many African botanists, of course.

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