

MedChem & CADD-2013: Phytochemical constituents from *Acacia nilotica* Delile with kinase inhibitory activity**Augustine A. Ahmadu***Niger Delta University, Nigeria*

From the stem bark of *Acacia nilotica* (L) Delile, two new peltogynoids, acanilol A (1) and acanilol B (2) were isolated together with the known triterpene lupenone. The structures of the new compounds were established on the basis of their spectral data, mainly UV, NMR and mass spectrometry. The new compounds were tested as kinase inhibitors against CDK1, GSK3, CK1 and DYRK1A, and acanilol B was identified as a DYRK1A inhibitor, with an IC₅₀ of 19 μM.

Nineteen different species of *Acacia* in the Americas contain cyanogenic glycosides which, if exposed to an enzyme that specifically divides glycosides, can release hydrogen cyanide (HCN) in the "leaves". This sometimes leads to the poisonous death of cattle. An interesting fact is that when they are grazed for example by giraffes, some acacias release a toxin known as tannin. This makes the leaves inedible and causes the animal to seek "greener pastures". The toxin can be very dangerous to animals if swallowed and can be fatal. As a medicine, acacia is taken orally for high cholesterol, diabetes, irritable bowel syndrome (IBS) and obesity. The exudate gum from this tree is known as gum arabic and has been collected since Pharaonic times for the manufacture of medicines, dyes and paints.

It is also used to remove toxins from the body and as a prebiotic to promote "good" bacteria in the gut. Acacia is applied to the skin inside the mouth for inflammation of the plaque and gums (gingivitis). Part of the symbolism of acacia therefore includes resurrection, immortality, secret love, affection, friendship, elegance, renewal, courage, purity, etc. The black wood acacia (*Acacia melanoxylon*), a fast growing tree that grows in USDA zones 9 to 11 have roots so aggressive that they easily damage the sidewalks and foundations of buildings in

addition to invading the spaces of other plants. The acacia provides shelter (ants live inside the thorns) and food (they eat nectar). In return, the ants protect the plant from the herbivores. The acacia develops pea-shaped flowers composed of 5 petals. Acacia fiber is also said to be prebiotic (a non-digestible dietary ingredient in dietary fiber that can stimulate the growth of beneficial bacteria in the intestines).

Vachellia nilotica is a 5–20 m tall tree with a dense spherical crown, stems and branches usually dark to black in color, cracked bark, grayish-pink bar, and exuding poor reddish gum. The tree has fine, straight, clear and gray spines in axillary pairs, usually in 3 to 12 pairs, 5 to 7.5 cm (3 in) long in young trees, mature trees generally without thorns. The leaves are bipinnate, with 3–6 pairs of pinnules and 10–30 pairs of leaflets each, tomentose, rachis with a gland at the bottom of the last pair of pinnules. Flowers with globular heads, 1.2–1.5 cm in diameter, of shiny golden yellow color, arranged either axillary or whorls on peduncles 2–3 cm long situated at the end of the branches. The pods are strongly tightened, hairy, white-gray, thick and gently tomentose. Its seeds number around 8000 / kg. It has largely naturalized outside its original range, notably in Zanzibar and Australia.

Acacia gum is widely used as a food additive. In addition, as acacia fiber ferments slowly, it can reduce the side effects of fermentation. The production of intestinal gas resulting from fermentation can induce abdominal symptoms. The species name *nilotica* was given by Linnaeus from the best known range of this tree along the Nile. The *V. nilotica* plant then became in turn the type species of the Linnean genus *Acacia* (which do not all have thorns, even if they bear their

name). For the current reclassification of this species and other species historically classified in the genus *Acacia*, see *Acacia*.

Due to its high soluble fiber content, acacia fiber is said to help lower cholesterol, control blood sugar, protect against diabetes, and help treat digestive disorders such as irritable bowel syndrome. (IBS). When taken orally: *Acacia* is probably safe for most adults in amounts generally found in food. When taken orally in medicinal amounts, *acacia* is safe up to 30 grams per day has been used safely for 6 weeks. However, it can cause minor side effects, including gas, bloating, nausea, and loose stools.