

## Xylopia

**Botanical Name:** *Xylopia aethiopica*, (Dunal) A. Rich  
**Family:** Annonaceae  
**Commercial name:** Ethiopian/Guinea pepper, Spice tree, Negro pepper  
**Local Names:** Ethiopian – Konde-berbere, Ghana – Hwentia, Sierra Leone –  
 Hewe, Ivory Coast – Fonde, Togo – Akatapure, Nigeria – Sesedu, Kimba,

### Traditional and Modern Medicinal Uses

The fruits of *Xylopia aethiopica* tree are the parts most commonly used for commercial applications. Medicinally, the fruits are used as a cough-medicine, a calmativ, purgative and repulsive to pain. The fruit is a common ingredient of the Yuroba. In Liberia, the spice is smoked and inhaled for respiratory ailments. The fruit is often incorporated in preparations for enema and external uses, calling on its repulsive properties for pains in the ribs, chest and generally for any painful area, lumbago (low back and waist pains), neuralgia (pains in the nerves) and in the treatment of boils and skin eruptions. The fruit decoction is useful in the treatment bronchitis and dysenteric conditions, and as a medicine for bulimia (eating disorder). The seeds of the plant are mixed with other spices, rubbed on the body as cosmetic and scent, and as perfume for clothing. The crushed, powdered fruit mixed with shea butter and coconut oil is used as creams, cosmetic products and perfumes. Even the odiferous roots of the plant are employed in tinctures, administered orally to expel worms and other parasitic animals from the intestines, or in teeth rinsing and mouth wash extracts against toothaches. The fruits mixed with its roots are used in the treatment of rheumatism. Despite all the medicinal applications, the dried fruits are important as flavorings to prepare local soups of West Africa, and is also known as African pepper.

### Botanical Background

*Xylopia aethiopica* (Dunal) A. Rich is a slim, tall tree of about 60–70 cm in diameter that can reach up to 15–30 m tall, with a straight stem and a slightly stripped or smooth bark. The fruits are rather small and look like twisted bean-pods. When dry, the fruit turn dark brown, cylindrical, 2.5 to 5 cm long and 4 to 6 mm thick.



**Figure 1.** The fruits from *Xylopia aethiopica* still attached to the tree (left), a close up of the green (center) and the sun dried fruit (right).

The contours of the seeds are visible from outside. Each pod contains 5 to 8 kidney-shaped seeds of approximately 5 mm in length. The hull is aromatic, but not the seeds.

### **Pharmacological Properties and Chemical Composition**

The plant contains anonaceine, an alkaloid, and rutin, a volatile aromatic oil and a fixed oil. A pharmacological investigation of fruit extract against skin infection has shown modest activity against gram-positive organisms. The plant contains high amounts of copper, manganese, and zinc. Key constituents are diterpenic and xylopic acids, and these within the fruit extracts show activity as an antimicrobial against gram positive and negative bacteria. However, it has not been shown to be effective against *E. coli* (Iwu 1993). Xylopic acid has also demonstrated activity against the fungus *Candida albicans*.

The essential oil has been well characterized with linalool,  $\beta$ -trans-ocimene,  $\alpha$ -farnesene,  $\alpha$ -pinene,  $\beta$ -pinene, myrtenol,  $\beta$ -phellandrene, and 3-ethylphenol as the major volatile constituents (Tairu *et. al.* 1999). Researchers describe that the intense ‘pepperish note’ of the oil of the fruit largely comes from linalool and provides that characteristic aroma of the ground, dried, smoked fruits of *Xylopia aethiopica*. The essential oil yield varies from 2.0% to 4.5%. The essential oils of the stem bark (0.85%) and the leaves (0.5%) of *X. aromatica* have also been investigated. The bark oil consists mainly of  $\alpha$ -pinene, trans-pinocarveol, verbenone and myrtenol and differs significantly from that of the leaf oil (spathulenol, cryptone, beta-caryophyllene and limonene).

### **Ecology and Methods of Cultivation of Xylopia**

*Xylopia* is native to the lowland rainforest and moist fringe forest in the savanna zones of Africa, but largely located in West, Central and Southern Africa. These trees are widely distributed in the humid forest zones of West Africa especially along rivers in the drier area of the region (Tairu, *et. al.*, 1999). In tropical and highlands of Africa (from Ethiopia to Ghana), both species *X. aethiopica* and *X. striata* occur and both are used for local cooking. In South America, a third species is of interest, *X. aromatica* (burro pepper), which has found similar applications among Brazilian Indians. The tree prefers high rainfall areas and well-drained soils. While *X. aethiopica* thrives in the forest regions, the tree can also be found in transitional zones. Loamy and sandy loamy soils are conducive for the cultivation of the plant. The plant can successfully be intercropped with other staple food items in the first four years.

Propagation is easily accomplished by seeds. Seedlings are transplanted to the field within three to five months after sowing. The plant grows rapidly the first three years. Trees are planted eight meters apart. In West Africa, the tree flowers twice per year, in March to July and in October to December. Fruiting takes place in December to March and June to September. Harvesting time runs from February to May and again from August to October. The fruits are harvested with the inflorescence. After picking, the fruits are sun-dried for four to seven days. After drying, the fruits are removed from the inflorescence stalks. Fruits should not be dried on the ground, but on a protective cloth, net, screen or shelving system to minimize any microbial contamination. Typical fruit yields are about two to three metric tons per annum per hectare.

### **Selected References**

- Iwu, M.W., A.R. Duncan, and C.O. Okunji. 1999. New antimicrobials of plant origin. p. 457–462. In: J. Janick (ed.), Perspectives on new crops and new uses. ASHS Press, Alexandria, VA.
- Tairu, A.O., T. Hofmann, and P. Schieberle. 1999. Identification of the key aroma compounds in dried fruit of *Xylopia aethiopica*. p. 474–478. In: J. Janick (ed.), Perspectives on new crops and new uses. ASHS Press, Alexandria, VA.

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