

**Bioprospecting Potential of *Commiphora africana*
for Access and Benefit Sharing**



Commiphora africana

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March, 2019

1. Introduction

Ethiopia is endowed with rich plant biodiversity and associated traditional knowledge which creates an environment for successful bioprospecting. However, like other developing countries, Ethiopia lacks financial resources to exploit the plant genetic resources significantly. The only option for Ethiopia is to collaborate with the developed nations or domestic investors and interested one in pharmaceutical, cosmetics and other companies alike and jointly explore them strategically and wisely.

The National Competent Authority, the Ethiopian Biodiversity Institute (EBI), through the Access Benefit Sharing Directorate, plays a practical role in the implementation of the Nagoya Protocol on Access and Benefit Sharing of Genetic Resources and Associated Community Knowledge. Based on Proclamation No 482/2006 and Regulation 169/2009 (Access to Genetic Resources and Community Knowledge and Community Rights), Ethiopia has been implementing the access and benefit sharing objective of the CBD. Both the Proclamation and Regulation include a range of issues such as ownership, user rights, conditions for access, benefit sharing, types of benefits, powers and responsibilities among others.

Therefore, the objective of this information is to encourage any bioprospecting company or an individual interested to work on the genetic resource, *Commiphora africana*, for ethno-medical and pharmacological uses, and industrial activities in the production of gums and resins, food and beverages.

2. Description of the Plant

Commiphora africana is one of the 60 gums and resins bearing species, which belongs to the Family Burseraceae and Synonym with *Heudelotia africana*. The name *Commiphora* is coined from Greek word (Kommi:-gum and Phero:- to bear) meaning “gum bearing”. It is known by the common name African myrrh, corkwood and poison-grub (English), and ‘Anqa’ (Amharic) (Azene Bekele, 2007; Wubalem Tadesse *et al.*, 2007).

It is a shrub or small tree sometimes reaching 10 m but usually not more than 5 m high with branches frequently terminating in spines, outer bark often papery and peeling, inner bark usually greenish with resinous aromatic sap and wood with milky latex. The resin of this species

is a raw material of myrrh which has been used for a wide variety of purposes (Azene Bekele, 2007; Gadir and Ahmed, 2014).

3. Distribution of *Commiphora africana*

Commiphora aricana is distributed mostly in East Africa, Arabia and India. It occurs in most Ethiopian regions, especially in much thorny bush, open savanna and desert of Dry and Moist Kolla agro climatic zones of Tigray, Afar, Gondar, Wollo, Wollega, Keffa, Showa, Gamo Gofa, Sidamo, Bale and Harerghe areas, 500-1,900 m a.s.l. (Azene Bekele, 1993).

The habitats of *Commiphora africana* are:- Acacia, Acacia-Commiphora, Commiphora-Boswellia, Combretum-Terminalia woodland, wooded grassland and bush-land, often on rocky slopes in areas with basement rocks but also on level sandy to loamy soil with minimal rainfall (Azene Bekele, 2007; Ermias Dagne, 2009).

4. Propagation

The plant can easily be propagated vegetatively by stem cuttings. The seeds are hard and are probably dispersed by animals and birds. They have hard coats which hinder the uptake of water, thus delaying germination (Vogt, 1995; Azene Bekele, 2007).

5. Significance

The essential oils of *Commiphora africana* have been used for a wide variety of purposes including cosmetics, aromatherapy and secondary metabolites. Typical applications of *Commiphora africana* include: Food and beverages, pharmacological uses and cosmetics (Gadir and Ahmed, 2014).

5.1. Ethno-medicinal uses

Commiphora africana is locally used for medicine (roots, bark, fruit, and resin), food (fruit), drink (bark tea), fodder (for camels, goats) and gum-resin. It is traditionally used for the treatment of several ailments because of its pharmacological activities. *Commiphora africana* is used for the treatment of a number of ailments such as healing wounds; relieving pains; treating dysentery, heart burns, snake-bites; as a plaster and spasms (Gadir and Ahmed, 2014).

Fruits of *Commiphora africana* are used for the treatment of typhoid fever, as a remedy for stomach problems, tooth-ache and as a stringent drug for bleeding gums. The powdered bark of *Commiphora africana* is mixed with porridge to cure malaria. The resin also has medicinal uses like disinfectants of wounds. The fumes of burnt resin are used as an insecticide and as an aphrodisiac (love drug is a substance that increases libido when consumed) (Okwute and Ochi, 2017).

5.2. Application in production of gums and resins

The best known products of *Commiphora africana* are myrrh, frankincense, American elemi and java almond, which are oleo resins and gums. Myrrh has aromatic acid and bitter taste. It is made up of volatile oil, gum and resin. Frankincense is mainly used in the preparation of perfumes and incense (Johnson *et al.*, 2012, Murthy *et al.*, 2016).

5.3. Application in Food and Beverage industry

Gum and resin are mainly used in the food and beverage industry, which are incorporated in a wide range of products. The major applications are: - adhesive thickeners, stabilizers, flavoring, fixatives and emulsifying agents in food products and clarification in beverages (FAO, 1995).

5.4. Pharmacological uses

Myrrh of *Commiphora africana* has found modern pharmacological applications for several disease treatments. Particularly, its unique chemical compositions, pharmacological activities and non-toxicity tend to support the safe use of this popular traditional drug in modern therapies (Michie and Cooper, 1991).

Commiphora africana oils have antibacterial and antifungal activities and rich in compounds that play important role in therapy. Its oil shows clear and high antiviral activity. The main chemical compounds in *Commiphora africana* oil are sesquiterpenes and sesquiterpene-lactones which have the antitumor properties (Gadir and Ahmed, 2014; Murthy *et al.*, 2016). The study by Nuhu *et al.* (2016) confirmed that *Commiphora africana* has anti-ulcer potential which justified the traditional uses of the stem-bark in ulcer treatment.

6. References

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