

**Bioprospecting Potential of *Zingiber officinale* Roscoe
for Access and Benefit Sharing**



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1. Introduction

Ethiopia has issued a Proclamation on Access to Genetic Resources and Community Knowledge, and Community Rights (Proclamation No 482/2006) and Regulation 169/2009. Based on these legal frameworks, the country has been implementing the access and benefit sharing objective of the CBD (Convention on Biological Diversity). The Proclamation includes a range of issues such as ownership, user rights, and conditions for access, benefit sharing, types of benefits, powers and responsibilities among the others. The law bears the necessity of Prior Informed Consent (PIC) to access genetic resources or community knowledge. Following the PIC, the Ethiopian Biodiversity Institute shall negotiate on Mutually Agreed Terms (MAT) with the User of the genetic resources. Therefore, this review is done with the intention to encourage any bioprospecting company or an individual interested to work on *Zingiber officinale* Roscoe from Ethiopia.

2. The Plant Taxonomy and Morphological Description

Ginger, the root of the plant *Zingiber officinale* Roscoe, belongs to the Family Zingiberaceae, is globally one of the most commonly used spice and medicinal agent (Vasala, 2004). Ginger is said to be Indian in origin (Govindarajan, 1982a, b; Vasala, 2004). It is commonly known as by the local name *Zinjibil* (Amharic) and *Zinjibila* (Af. Oromo). It is a tropical plant and needs plenty of heat and humidity for good growth. It is a perennial rhizomatous plant with pale yellowish, thick lobed rhizome having tuberous joint. The plant may grow as high as 90 cm on cultivation (Sellar, 2001). Ginger has been cultivated for thousands of years as a spice and an important cash crop in India (Sivasothy *et al.*, 2011) and as preserves in sugar syrup or as sugar candy in China (Baliga *et al.*, 2003).

3. Ecology and distribution

Ginger needs warm, humid climate for good yield and cultivated well at an altitude of 1500 metres above sea level. It grows well in a climate with moderate rainfall with well-drained soil like sandy loam rich in humus. Growing ginger in the same soil year after year is not recommended, but rotating the crop is preferable. It is best to plant ginger in the pre-monsoon period, after burning the surface soil for the higher yield and reduce disease incidence (Sellar, 2001).

Ginger cultivation in Ethiopia started during 13th century. Arabs introduced it from India and Ethiopia has become the gate way for many Asian and many East European Countries since then. Yellow and brown areas of Ethiopia are the most suitable. The Yellow area has low rainfall or irregular climate, and the large grazing Brown area tends to have irregular climate. Ginger is cultivated in many places in Ethiopia such as Bahir Dar, Dejen, Debere Markos, Kola Dega Damot, Metekel and Agew Mider, Gamo, Galeb and Hamer Bako, Gofa and Konta, Wabe, Dolo and Genale, Sidama and Arero Gimbi, Nekemte, Horo Guduru and Arjo and all regions of Ilubabor and Jimma Zone (Endrias Geta and Asfaw Kifle, 2011; Vijayalaxmi and Sreepada, 2012).

Large-scale commercial production of ginger by farmers in Southern Nations, Nationalities and Peoples' Region (SNNPR) is practiced within the administrative Districts of Kacha Bira and Handaro-Tunto (both located in Kambata and Tambaro), Boloso Bombe and Boloso Sorie (both located in Wolaita Zone), and part of western Badawacho (Hadiya Zone) taking the leading position in the region as well as in the country (Endrias Geta and Asfaw Kifle, 2011).

4. Medicinal value

Ginger, the underground stem, or rhizome, of the plant *Zingiber officinale* Roscoe, is a medicinal plant that has been widely used in almost all countries in the world. Ginger has been used since ancient times as a spice. It still remains an important cooking spice around the world. In addition, ginger has been used historically for its medicinal value in a wide variety of diseases, especially gastrointestinal disorders, such as constipation, diarrhea, anorexia, colic, dyspepsia, nausea, vomiting, and motion sickness. Ginger has herbal medicine value. The main pharmacological activities of ginger and its compounds include immuno-modulatory, anti-tumorigenic, anti-inflammatory, anti-apoptotic, anti-hyperglycemic, anti-lipidemic and anti-emetic. Ginger is also a strong anti-oxidant and may either mitigate or prevent generation of free radicals (Vijayalaxmi and Sreepada, 2012).

5. Chemical composition

Phytochemical studies have shown that ginger rhizome contains 3-6% fatty oil, 9% protein, 60-70% carbohydrates, 3-8% crude fiber, about 8% ash, 9-12% water and 2-3% volatile oil

(Govindarajan, 1982a, b). The rhizomes also contain proteolytic enzyme zingibain, extractable oleoresins, vitamins and minerals (Govindarajan, 1982a, b). The non-volatile pungent phytochemicals of ginger consists of gingerols, shogaols, paradols and zingerone, which contribute to the warm pungent sensation in the mouth (Govindarajan, 1982a, b).

References

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