Zingiber officinale Roscoe
ዝንጅብል

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Local and common names: **ዝንጅብል** Zinjibil**, ጅንጅብል** Jinjibel (Amh, Tig); Jinjiibila *(*Oro); Sinjibil, Sinsibila (Som); Ginger (En**g**)

Voucher number and identification: GA067/AHRI/2025

Synonym: *Z. officinale* has eighteen known synonyms, among which *Zingiber sianginensis*, *Z. officinale* var. *rubrum* and *Z. sichuanense* are the later published names.

Varieties recorded in Ethiopia

There are no interspecific taxa recorded in the Flora of Ethiopia and Eritrea. However, a wide range of *Z. officinale* varieties are cultivated globally, of which Ethiopia maintains substantial genetic diversity. Much of this diversity originates from germplasms introduced from abroad, while some others consist of locally collected farmers varieties and landraces. However, only two varieties, Boziab and Yali, which were developed by Tepi Agricultural Sub-Center (now Tepi National Spice Research Center) of Jimma Agricultural Research Center, have been officially registered and released for multiplication.

Family: Zingiberaceae

Botanical and habitat distribution

Z. officinale is a perennial herb that produces fleshy, branched rhizomes with a distinct spicy aroma. Its pseudostems, formed by leaf sheaths, rise to about one meter in height. The leaves are lanceolate, narrow, and arranged alternately, typically reaching 15-30 cm in length. Inflorescences are borne separately on shoots emerging from the rhizome, producing cone-like spikes with overlapping green bracts, often tinged with purple. The small flowers are yellowish-green with purple lips and creamy markings. It is predominantly cultivated in the lowland areas of Ethiopia, at altitudes ranging from 500-1500 masl, mainly under bimodal rainfall conditions.

Conservation status

The IUCN Red List reports that data are deficient to determine the conservation status of ***Z. officinale*.** However, POWO reports that the species is not threatened, which broadly corresponds to the IUCN category of Least Concern.

Propagation method

Z. officinale is propagated vegetatively through rhizome division since it rarely produces viable seeds. Healthy rhizome pieces containing viable buds are selected and planted in moist, fertile, and well-drained soil. The crop thrives in warm, humid climates and benefits from partial shade. Regular watering is essential during the growing season, and harvesting generally takes place eight to ten months after planting, once the aerial shoots wither.

Cultivation in botanic garden

The plant was established in AHRI-ALERT botanic garden in April 2024 using seedlings donated by the Tepi National Spice Research Center (Accession number 0120).

Ethnomedicinal uses

In the Ethiopian traditional medicine**, *Z. officinale*** is used as decoctions or powdered rhizome for the treatment of colds, sore throat, headache, and respiratory infections. It is also employed as a digestive aid and stimulate appetite. In addition, its warming properties make it a common household remedy for flu-like symptoms and as part of spiced tea preparations. Globally, *Z. officinale* has long been valued for the management of nausea, vomiting, motion sickness, and indigestion. It poultices and oil are also applied externally to reduce joint and muscle pains and is widely integrated into culinary practices for both its flavour and health-promoting purposes.

Major phytoconstituents

The rhizome contains a diversity of bioactive constituents, notably gingerols (6-gingerol, 8-gingerol, 10-gingerol), shogaols, paradols, and zingerone and sesquiterpenes such as zingiberene, β-bisabolene, and monoterpenes including camphene and borneol.

Pharmacological and safety evidences

Preclinical evidences

***Antimicrobial effect*:** Alcoholic extracts and essential oil of ginger rhizome showed antimicrobial effect against Gram-positive and Gram-negative bacteria including Pseudomonas aeruginosa, Staphylococcus aureus, Bacillus subtilis, Bacillus licheniformis, Klebsiella pneumoniae and Escherichia coli. It also found to suppress the growth of fungal species such as Fusarium oxysporum, Penicillium oxalicum, and Trichoderma viride.

***Antiemetic effect*:** Ginger extracts were found antiemetic. The bioactive compounds in ginger, such as gingerols, suppress vomiting by improving stomach motility. By increasing gastric tone and accelerating the rate of stomach emptying, these constituents provide a peripheral defines against nausea.

***Analgesic and Anti-inflammatory effects*:** The essential oil of ginger prolonged the latency time toward thermal stimulus in mice. It also blocks the synthesis of inflammatory mediators such prostaglandins and inhibits nitric oxide production. The anti-inflammatory effect is largely attributed to gingerols and shogaols, which modulate cyclooxygenase and lipoxygenase pathways.

***Antihyperlipidemic effect*:** The hydroalcoholic ginger extract improved the lipid profile by lowering triglycerides, total cholesterol, and LDL, while simultaneously boosting HDL levels, in hyperlipidemic animals.

***Antioxidant effect*:** *Z. officinale* exhibits antioxidant properties through the direct sequestration of superoxide and hydroxyl radicals. Furthermore, freeze-dried aqueous extract exhibited DPPH scavenging activity.

***Other pharmacological effects*:** Ginger extract is reported to exhibit as a bronchodilator and providing cardioprotective, neuroprotective, and anti-proliferative effects. Ginder was also found to play an important role in the inhibition of type 1 hypersensitivity reaction.

Clinical evidences

Several trials have shown ginger's efficacy in reducing nausea and vomiting related to pregnancy, chemotherapy, and motion sickness. Meta-analyses further indicate its benefits in alleviating pain and improving function in osteoarthritis patients. Ginger has also been shown to aid digestion, reduce bloating, and improve gastric emptying in functional dyspepsia.

Safety

Ginger is generally considered safe when taken at the recommended dose. Ginger oil's oral LD50 values in several animals surpass 5000 mg/Kg. Most adverse effects are mild and dose-dependent, including gastrointestinal discomfort such as heartburn or diarrhoea. At high doses, mouth irritation has been reported. Because of its mild antiplatelet activity, ginger should be used with caution in patients on anticoagulant therapy such as warfarin.

Product registration

In India, ginger has been used as common ingredients in many registered traditional herbal medicinal products, dietary supplements and cosmetics.

Research gaps and recommendations

Despite global recognition of ginger's medicinal potential, there is a scarcity of clinical research specific to Ethiopia that evaluates its effectiveness in locally relevant disease contexts such as respiratory infections and febrile illnesses. Furthermore, traditional preparations vary widely in dosage and method of administration, and thereby awaiting standardization. Future research should focus on validating traditional Ethiopian uses through controlled clinical studies, developing dosage guidelines, and exploring opportunities for value addition, such as the production of standardized ginger extracts, teas, or phytopharmaceuticals that can contribute to both public health and economic development.

References

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