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Ginger (*Zingiber officinale*): An integrative review covering Pharmacognostic profile, pharmacological activities, clinical applications, analytical evaluation, safety profile, and market insights

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Abstract

Preferential health prevention is emphasized in the traditional Indian medical system, which also uses pharmaceutical research to combat illness. With a 2500-year history of therapeutic usage, ginger (*Zingiber officinale*) is one of the most significant species utilized in many Ayurvedic and Siddha formulations. Ginger is used as a food ingredient and has been suggested as a treatment for a number of ailments. Clinical evidence supports its use in the treatment of a number of illnesses, including cancer, emesis, metabolic dysfunction, bone abnormalities, and vascular problems. Ginger contains about 400 bioactive substances, including zingerone, paradols, shogaols, and gingerols, all of which have been linked to a variety of biological functions. The history, nutritional value, health advantages, phytochemistry, biological activity, side effects, herb-drug interactions, therapeutic usage, and different Ayurvedic formulations including ginger are the chapter's highlights. In order to support the development and advancement of Siddha and Ayurveda, this chapter aims to motivate aspiring academics and businesspeople to work in a variety of sectors.

Keywords: *Zingiber officinale*, phytochemistry, pharmacology, preclinical and clinical aspects, safety profile, uses, market scenario

Introduction

Ginger is a subtropical plant that is grown for its subterranean roots or rhizome. The root's colour from ivory to pale green, and its skin is tan. Its flavour is spicy and slightly sweet. Domesticated by Austronesian peoples, ginger originated in Maritime Southeast Asia. *Zingiber officinale* is a member of the *Zingiberaceae* family and is also known by the synonym Zingiber^[1]. The most useful component of the plant is the rhizome. Although ginger can be cultivated in a wide range of locations, it thrives in warm, humid climates with well-drained soil at elevations between 300 and 900 meters (1000 and 300 feet). Based on data from several nations, India is the world's greatest producer of ginger, followed by China and Nigeria. For more than 250 years, ginger has been utilized in Indian and Chinese traditional medicine^[2]. Ginger has recently been brought to a number of tropical nations, where a variety of chemotypes have emerged^[3]. It is thought to have originated in Southeast Asia. Rhizomes are used to spread it. The rhizomes produce upright, green stems that range in height from 30 to 90 cm. The stem is covered by the base of the leaves. The dark green, narrow, lanceolate leaves have a noticeable midrib and measure 15 to 20 cm in length. The tiny, yellowish, speckled flowers are carried on spikes and have purple speckles on their lips. The green leaves of the plants become yellow around the age of nine months^[1].

Ginger is a very adaptable root that may be cooked and eaten in many different ways. Fresh ginger comes as a whole root and has a spicy-sweet flavour. The root is often sliced or grated and added to recipes. Compared to the fresh root, dried ginger has a stronger flavour and is sold in powdered form. Dried or freshly minced ginger can be used to make ginger tea. Fresh ginger is soaked in brine, salt, spices, and herbs to create pickled ginger, which has a variety of flavours and is either pale pink or whitish. Some people use ginger candy, which is made of crystallized ginger in the form of hard or chewy candies, as a treatment for colds and sore throats. Supplements containing powdered ginger are often administered as pills or capsules. Ginger root is used to obtain ginger essential oil.

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