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Turmeric: A review of its' effects on human health

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Abstract

Turmeric, also called as *Curcuma longa*, is used as a flavouring agent, medicinal herb, and dye in Asian countries. In India where Ayurveda is a system of herbal medicine, turmeric is known for strengthening and warming the whole body. The main component in turmeric is curcumin, which has a wide range of properties, such as anti-inflammatory, antioxidant, antimutagenic, and antimicrobial. The main objective of this article is to review the importance and therapeutic properties of turmeric in oral health. Various databases like PubMed, Cochrane, Index Copernicus, EBESCO, etc., were searched to collect data about turmeric and oral health. The effectiveness of turmeric in the treatment of dental pain, periodontal diseases, oral cancers, and as a sealant, mouthwash, toothpaste, and subgingival as well as endodontic irrigant will be discussed.

Keywords: Anticancer, oral health, subgingival irrigant, turmeric, turmeric mouthwash

Introduction

India has always been recognized as a "Land of Spices" since very early period of recorded history. The history of Indian spices dates back to the beginning of the human civilization. There are several references coasted about Indian spices and their uses in the Vedas (6000 BC), by 'Manu' (4000 BC). According to the Bureau of Indian standards, 63 kinds of spices are grown in our country among them turmeric (*Curcuma longa* L.) is one of the most important spices crop. It is ranked third among the spices crop of India next to Chilli and black pepper. India is the largest producer and exporter of turmeric contributing 82 per cent of world production and 45 per cent in the export market. It occupies 6.6 per cent of total area under spices in India. The major items of exports are raw and dry rhizomes, turmeric powder, Curcumin and oleoresin. In our country the leading states of turmeric production are Andhra Pradesh, Orissa, Tamil Nadu, West Bengal, Assam, Bihar and Uttar Pradesh. Other than India, it is cultivated extensively in Bangladesh, Jamaica, Sri Lanka, Taiwan, China, Burma, Indonesia, Fiji and Thailand.



Fig 1: Turmeric

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Turmeric (*Curcuma longa* L.) is the native of Indo-Malayan region and belongs to the family Zingiberaceae. It is an erect, herbaceous, perennial plant but is grown as an annual.

It possesses an underground stem or rhizome which is thick and rounded with short blunt fingers. The leaves are tall, thin, light green in colour, lanceolate with a long stalk. Flowers are also borne in cone shaped spikes in the tuft of leaves. The spikes consist of a great number of thin, greenish-white, ovate bracts. Under the genus *Curcuma*, nearly 30 species have been recognized, some of the economically important species are *Curcuma longa* L. (Indian turmeric), *C. Aromatica*, Salib (Kasturi or wild turmeric), *C. angustifolia*, Roxb. (Indian arrow root), *C. Amada*, Roxb. (Mango ginger), *C. Zadoaria*, Rosc. (Kachura), *C. Xanthorrhiza* (Arrow root).

Turmeric is valued globally as a condiment, food colorant, dye, drugs and medicine. A compound Curcuminoid, present in turmeric acts as inhibitor of human immune deficiency virus type1 (HIV-1) integrase (Mazumder *et al.*, 1995). Turmeric oil is composed of several monoterpene and sesquiterpene compounds such as zingiberene, ar-turmerone and turmerone (Apisariyakul *et al.*, 1995). The main biological activities of the oil are carminative, antifatulence, antifungal and as an anti-platelet agent (Lee, 2006). Turmeric has been used in traditional medicine as a household remedy for various diseases, including biliary disorders, anorexia, cough, diabetic wounds, hepatic disorders, rheumatism and sinusitis (Ammon *et al.*, 1992). In old Hindu medicine, it is extensively used for the treatment of sprains and swelling caused by injury (Ammon & Wahl, 1991).



Fig 2: Plant of Turmeric

It has anti-cancer and anti-viral activities and hence finds use in the drug industry and cosmetic industry. 'Kum-Kum', popular with every house wife, is also a by-product of turmeric. It finds a place in offerings on religious and ceremonial occasions.

The rhizome contains yellow coloring component curcumin (3-9%), essential oil (5-6%) and oleoresin (6-13%). Curcumin is gaining more importance in food industries, pharmaceuticals, preservatives and cosmetics. The ban on artificial colour has prompted the use of curcumin as a food colorant. In pharmaceuticals it is valued for the anti-cancerous, anti-inflammatory, antiseptic, antimicrobial and antiproliferative activities (Srimal, 1997).

Turmeric being most important to growers, consumers and industries, there is pressing need to increase its productivity and quality to fulfil the increasing demands throughout nation and abroad. Genetic improvement may play a vital role in increasing production and productivity.

Ayurveda and lifestyle medicine

As a science of life and the world's oldest medical system, Ayurveda has a holistic approach to health and disease that focuses on preserving and promoting good health and preventing disease through healthy lifestyle practices. These practices include consumption of fresh, minimally processed foods, the use of Rasayanas (formulas) that eradicate ageing and disease, sophisticated detoxification practices and regular consumption of adaptogenic herbs that enhance the body's capacity to maintain balance in the midst of a variety of stressors.

Ayurveda's use of medicinal and culinary herbs draws upon India's incredible biodiversity with a variety that is unsurpassed by any medical system; yet, of all the herbs used, none has a status comparable to turmeric.

Turmeric: Herbal Medicine

Turmeric has anti-inflammatory, antioxidant, anticarcinogenic, antiviral, and antimicrobial properties. It also has potential therapeutic properties, which gives benefits in our day-to-day life. It is used as an antiseptic in disinfection of burns and cuts. It regulates insulin levels; thus, it has antidiabetic, antiapoptotic, antiangiogenic, and immunomodulatory properties. It prevents platelet aggregation (antithrombotic), cancer cell metastasis, and melanoma, and reduces chances of childhood leukemia. It also acts as natural painkiller due to its anti-inflammatory properties. Hence, it is used in the treatment of arthritis. It reduces blood cholesterol, helps in detoxification of liver and fat metabolism, strengthens the immune system, and also enhances wound healing.

Antioxidant activity of Turmeric

It has been shown that curcumin is an effective scavenger of oxygen free radicals. Its antioxidant function is like that of vitamins C and E. It can protect against oxidation by lipids or hemoglobin. The generation of reactive oxygen species (ROS) such as H₂O₂, superoxide anions and nitrite radical generation by activated macrophages can be significantly inhibited.

Anti-cancer effect of Turmeric

The activity of many common mutagens and carcinogens can be suppressed by turmeric and curcumin. Direct antioxidant and free-radical scavenging effects and their ability to indirectly increase glutathione levels have been correlated with the anticarcinogenic effects of turmeric and curcumin, thereby aiding in hepatic detoxification of mutagens and carcinogens and inhibiting nitrosamine production. It has also been shown that curcumin inhibits UV rays' mutagenic induction effect.

Photo-protection activity of Turmeric

This behavior is due to its role as an antioxidant. The lipids on the surface of the skin are mostly unsaturated. Therefore, free radicals strike them quickly. The sun's ultraviolet rays penetrate the skin and increase the harm these radicals do. Prolonged exposure to such radiation will weaken lipids, resulting in a degradation of the skin's texture. In laboratory studies, turmeric extract has been shown to be effective in suppressing inflammation and protecting epidermal cells from ultraviolet B-radiation damage.

Side effects of turmeric

While turmeric does provide potential health benefits, it creates some risks that are worth considering before

consuming large amounts.

Upsetting the stomach

The same agents in turmeric that support digestive health can irritate when taken in large amounts. Some participants in studies looking at the use of turmeric for cancer treatment had to drop out because their digestion was so negatively affected. Turmeric stimulates the stomach to produce more gastric acid. While this helps some people's digestion, it can negatively affect others.

Blood-thinning properties

The purifying properties of turmeric may also lead to easier bleeding more easily. The reason for this is unclear. Other suggested benefits, such as lowered cholesterol and lowered blood pressure, might have something to do with the way turmeric functions in your blood.

People who take blood-thinning drugs, such as warfarin (Coumadin), should avoid Trusted Source consuming large doses of turmeric.

Stimulating contractions

You may have heard that eating foods seasoned with curry can stimulate labor. Although there exists little clinical data to back up this claim, studies suggest turmeric can ease symptoms of PMS.

Pregnant women should avoid taking turmeric supplements because of its blood-thinning effects. Adding small amounts of turmeric to food as a spice should not cause health problems.

Conclusion

"Turmeric," the "Indian Saffron," is being widely used effectively in various medical conditions. It has shown effects from improving general well-being to being a treatment component of some cancers. Its use in oral health is also documented in several studies. Its easy availability and affordability make it a suitable candidate for use in various oral health remedies, especially in developing countries such as India. The anti-inflammatory, antimicrobial, and anticancer properties of turmeric and its other multiple therapeutic applications can be utilized to a wide extent not only in dentistry, but also for overall oral health conditions. Further research is required to prove its exact role, optimal dosages, and other pharmacokinetic properties. Thus, with such a wide variety of therapeutic applications, "turmeric" can be considered to be a boon for oral health in the future. The yellow pigment associated with curry powder, turmeric, and, to a lesser degree, ginger, is curcumin. Turmeric's anti-cancer, anti-inflammatory and photo-protection role may be closely linked to its antioxidant properties.

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