



Study of Phytomedicine is special reference to curcuma longa (turmeric)

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Abstract:

The Zingiberaceae family plant *Curcuma longa* produces the rhizomes of the turmeric plant, which is a highly valued spice in India. The majority of Indian curry powder contains turmeric. It acts as an organic antiseptic. Because of its beautiful colour, the spice is frequently referred to as "Indian saffron." hue. Curcumin (deferulolylmethane), Demethoxycurcumin, along with its bide-methoxy counterpart, are the three primary curcuminoids found in turmeric. With its dynamic ingredients curcumin and curcuminoids, turmeric appears to be much more than just a spice used to colour Indian curries yellow. Its exceptional molecular structure gives it potent antioxidant and anti-inflammatory qualities. It is often utilized to add colour and flavour to cuisine in Turmeric powder is used in traditional Indian medicine To Treat a wide range of illnesses.

Keywords: Indian saffron, curcuminoids and curcuma longa

Introduction:

The root, or rhizome, of a plant that resembles ginger is called turmeric. The plant is a herbaceous perennial that grows to a height of 60 to 90 cm on a short stem. and tufted leaf. Its yellow blooms range in colour from 10 to 15 ranging in length from cm to form thick clusters of spikes that emerge As at the conclusion of spring through The middle of the session. There are no known fruits on this plant.

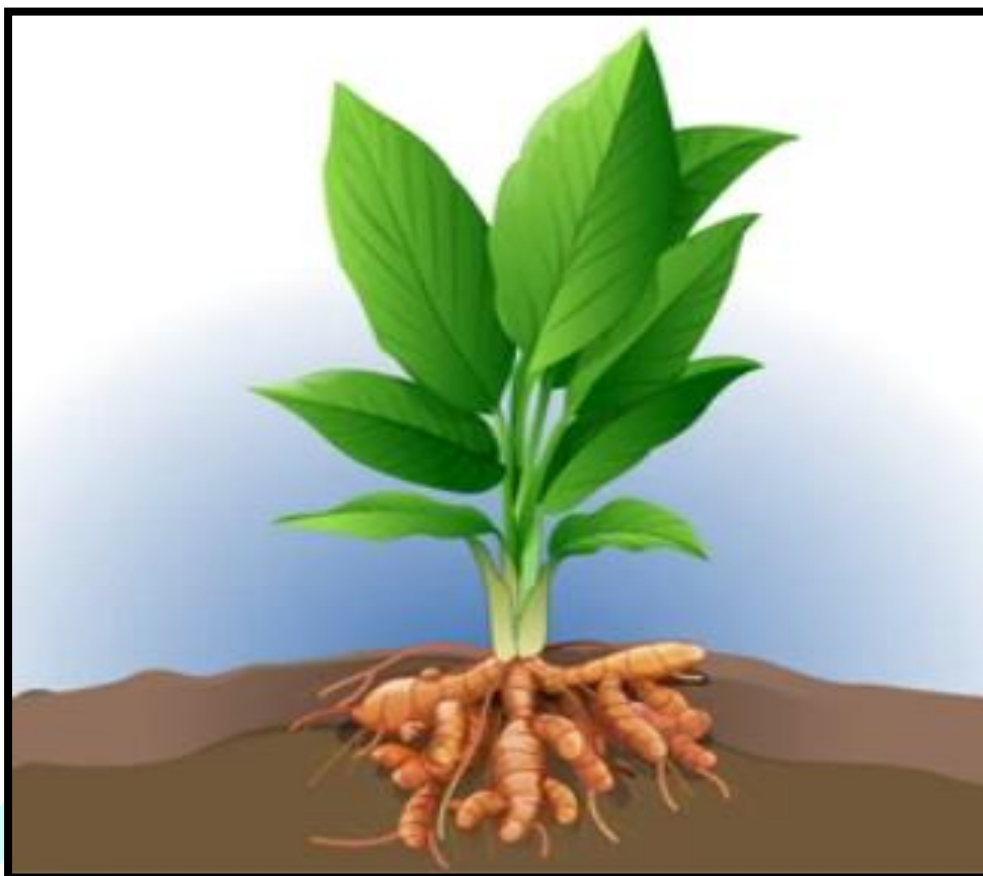


Fig: plant of Turmeric

the entire rhizome of Turmeric, featuring a rough, divided surface. When ground into a powder, the dull orange inside of the yellowish brown rhizome becomes bright yellow. Rhizome diameter and length range from 2.5 to 7.0 cm, Has a little Tuber branches of. turmeric was in Place. of respect in conventional Indian Ayurvedic treatment. It was recommended in Ayurveda for the treatment of numerous illnesses, from skin conditions to constipation. In addition to being used as a digestive aid, it was also used to treat liver issues, arthritis, trauma, fever, inflammation, wounds, infections, dysentery, and other conditions. Turmeric is regarded in Unani as being se Fest is the go-to herb for any blood condition because it stimulates, purifies, and increases blood. Turmeric is referred to as the "KITCHEN QUEEN" by most Indians, including housewives and hermits living in the Himalayas, and is the primary spice used in cooking. Extended usage of triphala, tulsi, and turmericis comparable to a brief Pancha Karma therapy. Given its broad spectrum antifungal properties, turmeric.

Plant overview**Typical name**

Curcuma, saffron from India.

Alternative terms:**Table: alternative terms of turmeric**

English	Indian saffron
Sanskrit	Ameshta
Bengali	Halud
Hindi	Haldi
Tamil	Ameshta
Telugu	Haridra
Indonesian	Kunyit
French	Curcuma
malay	kunyitbasah.

The living origin.

The Turmeric is The *Curcuma longa* Linn. rhizome. often known as the curcuma domestic valetton, which belongs to the family Zingiberaceae. plants.

Geographical source:

Cambodia, China, India, Nepal, Indonesia, Madagascar, Malaysia, the Philippines, and Vietnam are among the countries where it is frequently found.

Indian scenario:

West Bengal, Tamil Nadu, Maharashtra, and Madras are the usual locations for it.

Family: Zingiberaceae.

Taxonomy

Table: taxonomy of turmeric

Name in Science	curcuma longa
Sub-kingdom	Tracheobionta -Vascular plants
Kingdom	Plantae
Division	magnoliophyta flowering Plants
Super division	Spermatophyta
Class	lilliopsida- Monocoty Ledons
Subclass	zingiberidae
Genus	Curcuma L. curcuma
Order	zingiberales
Species	curcuma longa l

Natural setting:

Turmeric, a popular Indian spice that is a member of the ginger family (Zingiberaceae), contains curcumin as its primary curcuminoid. Desmethoxycurcumin is one of the two more curcuminoids. furthermore bis desmethoxycurcumin. turmeric's yellow colour is attributed to polyphenols called Curcuminoids. Curcumin is tautomeric in at least two forms: enol and keto. Both In The solid phase and the enol form in solution has greater energy stability. The curcumin method is a technique that uses curcumin to calculate the amount of boron. When Together with boric acid, it forms rosocyanine, a reddish-colored compound is created. curcumin can be used as a food colouring because of its vivid yellow colour.

Macroscopic characteristics:

up to 4 3 cm across and centimetre long. thickness, The primary rhizome of round turmeric is elliptical or pear-shaped (Fig.). Leaf scars surround the upper portion, while scars from the lower portion identify the roots and secondary rhizomes. Slices are made before it dries. The long turmeric's secondary rhizomes are 0.5–1.5 cm thick, elongated, rarely branching, and Indistinctly Ringed.



Fig: turmeric

The process of scalding before drying eliminates the rhizomes' vitality, turning the grains into lumps that are given a bright yellow hue by the oil and curcumin mixture that is released from the oil cells. The product is tough, hard, and sinks in water as it is now marketed. The supple, glossy, and orange-yellow surface is shattered. The cross section reveals that the rind is thicker than that of ginger, making up nearly 25% of the rhizome's thickness. Scraping will not be able to remove it.

Chemical components:

Curcumin (diferuloylmethan), demethoxycurcumin, bisdemethoxycurcumin, and cyclocurcumin are among the polyphenolic curcuminoids that make up the major constituent groups. The yellow colour is caused by curcumin (3–4%), which is made up of three curcumins: I (94%), II (6%), and III (0.3%). About 2% to 5% of the root is made up of yellow-pigmented curcuminoids, which are primarily constituted of 85% curcumin, 10% demethoxycurcumin, and 5% asdisedmethoxycurcumin. The component with the most research is curcumin. Sesquiterpene is another ingredient in turmeric (6S)-2-methyl-6-(4-hydroxyphenyl)-3-methyl-2-hepten-4-one (zingiberone, Bisabolene, turmeronol, atlantone, and germacrone), caffeic acid, protein, carbs, and resins.

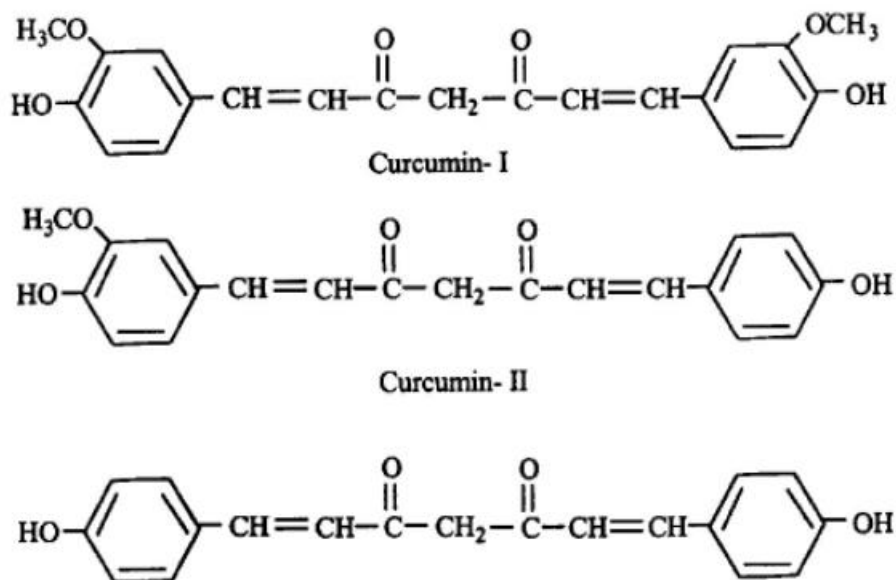


Fig: Various curcumin

Common applications:

- Before being used in ayurvedic preparations, the gum resin of Commiphoramukul (Guggul) must be purified with this material.
- Turmeric is used in veterinary medicine to treat animal wounds and sores.
- Turmeric powder is sprinkling around the vessels to be protected and used as an ant and mosquito repellent.
- The components of turmeric are vital to our existence.
- It has been discovered that turmeric shares silymarin's hepatoprotective properties.
- Turmeric, curcumin, and volatile oils all have strong anti-inflammatory properties.
- Turmeric's constituents have a number of gastrointestinal tract-protective properties.
- Turmeric's ingredients have an impact on Alzheimer's illness.
- Turmeric extract reduces the signs and symptoms of arthritis.
- Angiogenesis is inhibited by turmeric and its extract.
- Radioprotection can be induced by components of turmeric.
- The components of turmeric prevent vascular smooth muscle cells from proliferating.
- Serum cholesterol levels are lowered with turmeric.
- Components in turmeric prevent HIV from replicating.

Turmeric phyto-chemical screening:

Water extract, extracts of methanol, ethanol, and benzene, chloroform Extract, acetone Extract, And petroleum ether extract were all screened phytochemically. The primary Phenolic chemicals make up the chemical components, And terpenoids Such as Diarylpentanoids, triterpenoids, alkaloids, monoterpenes, sesquiterpenes, diterpenes, and curcuminoids have been found. Curcumin (60%) as well as desmethoxy, monodemethoxy, bisdemethoxy, dihydrocurcumin, and cyclocurcumin After rhizomes were steam-distilled, an essential oil (5.8%) was produced. It contained phelladrene(1%), sabinene (0.6%), cineol (1%), borneol (0.5%), zingiberene (25%) and sesquiterpenes (53%). The compound curcumin (diferuloylmethane) (3–4%)—which is made up of

curcumin I (94%), curcumin II (6%) and curcumin III (0.3%)—is what gives yellow colour. Curcumin's demethoxy and bis-demethoxy derivatives have also been discovered. Prothrombin and activated partial thromboplastin time have been markedly extended by curcumin and its derivative bisdemethoxycurcumin, whereas thrombin and activated factor X activities have been suppressed.

pharmacological characteristics:

Alzheimer's disease: Research indicates that curcumin can scavenge free radicals more effectively than tetrahydrocurcumin and vitamin E (α -tocopherol). The research demonstrated the relationship between The blood-brain barrier (BBB) is maintained by curcumin and AD. Curcumin has the ability to traverse the BBB and shield it from disruption and degradation by fending off harm from ONOO. According to these research, curcumin can identify A β plaques, which may be a sign of Alzheimer's disease. Through macrophages, curcumin may also indirectly prevent the production of A β plaque.

Analgesic action: The rhizome powder works well to relieve inflammation and sprains. Applying hot a paste of Turmeric combined with a little lime and saltpetre is a common treatment for sprains.

Antibacterial activity: Every leaf and rhizome extract was evaluated for its antibacterial properties. promising application Using the essential oil of turmeric rhizome as a cutting-edge, natural antimicrobial substance for the avoidance of treatment of boil infections as an alternative to chemical medications. To validate the results, more human and sick animal in-vivo clinical trials are needed.

Anti-carcinogenic activity: It is now known that turmeric's antioxidants block the free radicals that cause cancer. Turmeric has been tested and shown to have anticancer properties. Both anticancer and antioxidant Curcumin's encouraging effects were found to be caused by inducing apoptosis in human leukaemia cells; this was investigated and found to be positively proven. encouraging research on Dietary Curcumin's selective suppression of human colon cancer cells' cyclooxygenase (cox)-2. It has been demonstrated that curcumin suppresses human breast cancer cells.

Anticoagulant property: Curcumin's anticoagulation action has demonstrated that it prolongs blood clotting periods, as demonstrated by Prothrombin, thrombin, and activated partial thromboplastin times. examination in contrast to the blood sample used as a control. Prothrombin and activated partial thromboplastin time have been markedly extended by curcumin and its derivative bisdemethoxycurcumin, whereas thrombin and activated factor X activities have been suppressed.

Anti-diabetic effect: When diabetic rats were given an oral dose of *Curcuma longa*'s aqueous rhizome extract, their levels of TG, TC, and LDL were dramatically decreased, but their levels of HDL. The results suggest that *Curcuma longa* rhizome aqueous extract may be useful as a medication to prevent atherosclerosis, which is one of the main effects of diabetes, by lowering serum lipid levels, specifically low density lipoprotein, triglycerides, and total cholesterol.2JU

anti-fertility activity: Studies on experimental animals have indicated that turmeric has anti-fertility properties. Rats exposed to a dosage of aqueous extracts and petroleum ether experienced 100% anti-implantation effects. given orally between the first and seventh day of pregnancy at a rate of 200 mg/kg Body Weight. Research on curcumin's potential as an intrauterine device revealed that it decreased Human Sperm Motility And may pave The way for the creation of innovative intravaginal contraceptives. According to the test findings, turmeric exhibited a specific immobiliser of sperm impact besides having antihuman immunodeficiency virus (HIV) characteristics that had been previously researched. An analysis of male albino rats revealed that turmeric had a contraceptive effect, and the treated group's sperm motility and density decreased. It is believed that turmeric has an impact on androgen production, either via blocking The activity of leydig cells or the hypothalamic-pituitary axis, which stops spermatogenesis.

Anti-hyperlipidemic: Studies have shown that curcumin, or turmeric, lowers the digestive tract's absorption lowering LDL (low-density lipoprotein) and increasing HDL (high-density lipoprotein) of cholesterol levels. It may also prevent serum LDL from peroxidizing, which raises the risk of atherosclerotic plaques. It is It has been observed that when curcumin was administered to Rats given cholesterol saw a 50% decrease in serum and hepatic cholesterol levels.

Anti-inflammatory activity: Rheumatic symptoms are frequently linked to inflammatory changes in the joints. Turmeric is said to have anti-inflammatory and heat potency. It resolves the underlying causes and pathogenic alterations in inflammation. It was also observed that in animal models, including acute and chronic, oral dosages of Curcumin have strong anti-inflammatory properties.

antioxidant activity: Curcumin has demonstrated strong antioxidant activity, effectively scavenging oxygen free radicals. It shares characteristics with vitamins C and E in terms of antioxidants. Haemoglobin or lipids may be shielded from oxidation by it.

Skin care's healing potential:

Antifungal, anti-protozoan, antiviral, and antibacterial properties of turmeric oil have been demonstrated. Turmeric demonstrated broad-spectrum antibacterial activity in an antibiotic property screen. Curcumin's polyphenols and terpenoids have anti-free radical effects. Furthermore, the skin-protecting and healing properties of its high antioxidant content. It has the ability to dramatically minimize the generation of H₂O₂, superoxide anions, and nitrite radicals by activated macrophages, which are examples of reactive oxygen species (ROS).

Hepatoprotective activity:

Turmeric is thought to be beneficial for liver-related conditions. Patients with jaundice or even infectious diseases should include turmeric in their diets since it is a good treatment for jaundice Hepatitis.

Diseases of the respiratory system:

Turmeric is widely recognised as a Kaphahara remedy (phlegmatic disorders are referred to as "Kapha" and Kaphahara is the remedy that cures them). Turmeric has anti-purulent and anti-inflammatory properties in the natural world. It has been stated that in a clinical investigation, the volatile oil of turmeric taken orally proved to be quite efficient in treating the condition.

In Conclusion:

The Ancient Indians utilized Turmeric as a natural wonder, making it one of the planet's most important and powerful plants. Turmeric is showing promise as a therapy for numerous illnesses, ranging from Alzheimer's disease to cancer. One important weapon in the fight against HIV/AIDS may be turmeric. Because curcumin has the ability to affect several cellular targets, it has become a popular subject for study. In-depth, carefully clinical studies under observation are currently required to fully explore its capacity. Since curcuminoids are found. The benefits of turmeric powerful pharmacological characteristics in vitro and in vivo, as well as curcumin's proven therapeutic and chemopreventive capabilities, make turmeric a priceless natural medicine.

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