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A Review on: Neutraceutical Chewable Curcumin Gummies and its Application

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Abstract: *Turmeric, a spice that has long been recognized for its medicinal properties, has received interest from both the medical/scientific world and from culinary enthusiasts, as it is the major source of the polyphenol curcumin. It aids in the management of oxidative and inflammatory conditions, metabolic syndrome, arthritis, anxiety, and hyperlipidemia. It may also help in the management of exercise- induced inflammation and muscle soreness, thus enhancing recovery and performance in active people. In addition, a relatively low dose of the complex can provide health benefits for people that do not have diagnosed health conditions. Ingesting curcumin by itself does not lead to the associated health benefits due to its poor bioavailability, which appears to be primarily due to poor absorption, rapid metabolism, and rapid elimination. Gummies or soft chew supplements rank on 2nd place in the most commonly used form by consumers. Not only do they taste good, but with the nutritional adding they help maintain a healthy immune system and protect your organism. The purpose of this review is to provide a brief overview of Curcumin.[1].*

Keywords: curcumin, turmeric, antioxidant,anti-inflammatory, polyphenol

I. INTRODUCTION

Turmeric is the rhizome or underground stem of ginger like plant. The plant is an herbaceous perrineal, 60-90 cm high with a short stem tufted leaf. Its flowers are yellow, between 10-15 cm in length and they group together in dense spikes, which appear from the end of spring until the middle session. No fruits are known for this plant. The whole turmeric rhizome, with a rough, segmented skin. The rhizome is yellowish-brown with a dull orange interior that looks bright yellow when powdered. Rhizome measures 2.5-7.0 cm (in length), and 2.5 cm (in diameter) with small tuber branching off. Turmeric held a place of honour in Indian traditional ayurvedic medicine. In ayurvedic it was prescribed for the treatment of many medical problems ranging from constipation to skin diseases. It was used as digestive aid and treatment for fever, inflammation, wounds, infections, dysentery, arthritis, injuries, trauma, jaundice and other liver problems. In Unani turmeric is considered to be sefest herb of choice for all blood disorders since it purifies, stimulates and builds blood. To most people in India, from housewives to Himalayan hermits, turmeric affectionately called the 'KITCHEN QUEEN', the main spice of kitchen. Long term use in turmeric, tulsi and trifala can be likened to a short term Pancha Karma treatment. Turmeric is relatively broad spectrum antifungal. Turmeric exhibits antioxidant activity and protect from free radical damage.

Curcumas also exhibits anti-tumor activities and prevent cancer. It inhibits the topoisomerase enzyme, which is required for cancer.[2]

Scientific classification Kingdom :
Plantae Subkingdom : Tracheobionta
Superdivision : Spermatophyta
Division : Magnoliophyta
Subclass : Zingiberidae
Order : Zingiberales
Family : Zingiberaceae
Genus : Curcuma Species : Longa
Scientific name : ***Curcuma longa***

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Fig. 1. Curcumin

II. MOLECULAR CONSTITUENTS IN TURMERIC

Turmeric has hundreds of molecular constituents, each with a variety of biological activities. For instance, there are at least 20 molecules that are antibiotic, 14 are known cancer preventives, 12 that are anti-tumor, 12 are anti-inflammatory and there are at least 10 different anti-oxidants. Infect, 326 biological activities of turmeric are known. This is also testimony to the use of whole herbs and not just isolated molecules. Speaking of molecules by far the most researcher in turmeric are the three gold-coloured alkaloids curcuminoids viz. Curcumin, Demethoxycuccumin and Bisdemethoxycurcumin (Figure 1). Most of the research done is with 95% curcuminoids extract of turmeric, through in its raw state turmeric is only 3-5% curcuminoids. The yield of essential oil in various parts is 1.3% in leaf, 0.3% in flower, 4.3% in root and 3.8% in rhizome. The composition of essential oils [1] obtained from root, rhizome, leaf and flower and nutritional composition of Curcuma longa are given in table-1 and 2 respectively.[3]

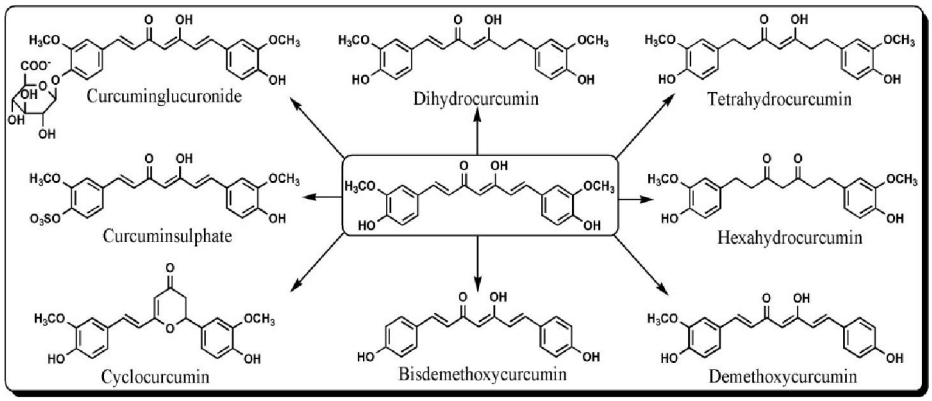

Fig.2 .Natural metabolites of turmeric and curcumin.

III. TURMERIC, CURCUMIN AND OUR HEALTH

Turmeric exhibits a wide range of biological activities [2] (Figure 2) and is used in traditional medicines.[4]

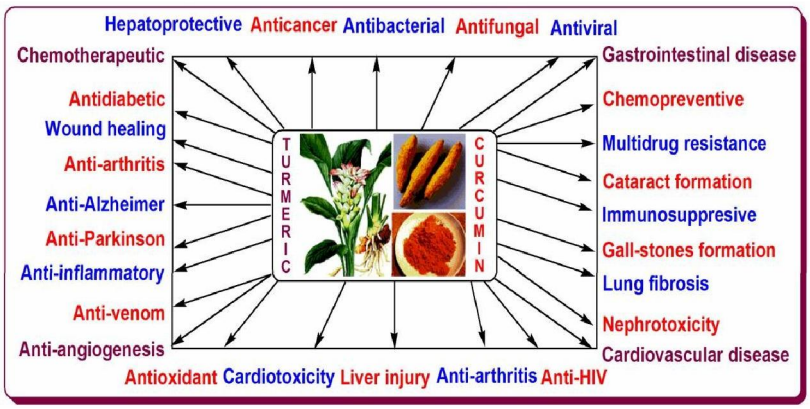

Fig. 3. Medicinal properties of turmeric and curcumin

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CULTIVATION

Turmeric can be cultivated in diverse tropical conditions, to upto 1,600 meters from the sea level, with temperatures varying from 20-40 ºC, and rainfall above 1500 mm. It is a nine-month crop sown in July and harvested in April. Turmeric thrives in well- drained, fertile, sandy and black, red or alluvial loams, rich in humus and uniform in texture. Rich loamy soils having natural drainage and irrigation facilities are the best. Turmeric cannot stand water stagnation or alkalinity.[5]

HARVESTING AND CURING

The crops are ready for harvest in seven to nine months depending upon the time of sowing. The harvest is carried out during January to March. It matures in about 9 months. The marketing season is from February to May. The leaves of crop turns dry and are light brown and yellowish in colour on maturity, height of crop around 1.5 feet after the complete growth with maximum 8-10 branches with cracks development on the soil signifies good yields of turmeric. The land is ploughed and the rhizomes are carefully lifted with a spade. Harvested rhizomes are cleaned of mud and other extraneous matter adhering to them. The green rhizomes are boiled in water, which are spread out on a clean floor and allowed to dry in the sun for about 15-20 days. They are stirred 3-4 times to ensure uniform drying. The rounds and figures are dried separately. The former takes more time to dry. When fully dried, turmeric becomes hard and stiff. The dries turmeric is rubbed against the hard surface of the drying floor or trampled under feet covered with piece of gunny cloth and the scales and the root bases are separately by winnowing. Rhizomes for seed are generally heaped in the shade of these or in well-ventilated sheds and covered with turmeric leaves.[1]

TURMERIC AND ITS CONSTITUENTS PLAY AN IMPORTANT ROLE IN OUR LIFE. WHICH ARE GIVEN BELOW

- Turmeric has been found to have a hepatoprotective characteristic similar to that ofsilymarin [6].
- The volatile oils and curcumin and turmeric exhibit potent anti-inflammatory effects
- Turmeric and curcumin are also capable of suppressing the activity of several commonmutagens and carcinogens in a variety of cell types in both in vivo and in vitro studies
- Turmeric extract and the essential oil inhibit the growth of a variety of bacteria, parasites and pathogenic fungi.
- Turmeric's protective effects on the cardiovascular system include lower cholesterol and
- triglyceride level, decreasing susceptibility of low density lipoprotein (LDL) to lipid peroxidation and inhibiting platelet aggregation [7].
- Constituents of turmeric exert several protective effects on the gastrointestinal tract.
- Turmeric oil exhibited potent anti-trypsin and anti-hyaluronidase activity.
- Constituents of turmeric affect Alzheimer's disease [8].
- Extract of turmeric suppresses symptoms associated with arthritis [9].
- Turmeric and its extract inhibit angiogenesis [10].
- Turmeric constituents can induce radioprotection.8
- Turmeric constituents inhibit proliferation of vascular smooth muscle cell [11].
- Turmeric lower serum cholesterol levels [12].
- Constituents of turmeric block the replication of HIV[13].
- Turmeric constituents stimulate muscle regeneration [14].
- Turmeric enhances wound healing [13].
- Turmeric extract reduces the incidence of cholesterol gall bladder stone formation.[14]
- Turmeric constituents protects against cataract formation in lenses
- Turmeric protects against pancreatitis
- Turmeric extract corrects cystic fibrosis defec.
- Turmeric suppresses the induction of adhesion molecules.
- Turmeric constituents inhibit androgen receptor and androgen receptor (AR)-relatedcofactor.

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- Constitutions of turmeric inhibit farnesyl protein transferase (FTPase).
- Turmeric constituents inhibit scarring .
- Turmeric oil containing turmerones exhibited a potent antioxidant activity in β-carotene linoleate model system and the phosphomolybdenum method.
- Turmeric volatile oils suppress acute oedema

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