
HEALTH BENEFITS OF CURCUMIN: REVIEW

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Abstract

Turmeric is an aromatic Indian rhizomatous plant with well-known medicinal advantages. Curcuma longa (Turmeric) is an Indian rhizomatous medicinal plant of the Zingiberaceae family that is common and commonly used. The turmeric elements are curcumin, demethoxycurcumin (DMC), and bisdemethoxycurcumin (BDMC) and are generally recognized as curcuminoids. Curcumin is one of the most interesting elements of curcumin. Curcumin (1,7-bis(4-hydroxy-3-methoxyphenyl)-1,6-heptadiene-3,5-dione) or Diferuloylmethane is well-known for its various biological functions, like anti-viral, anti-oxidant, anxiety, anti-arthritis, anti-bacterial, anti-diabetic, anti-venom, anti-obesity, wound-healing, anti-asthmatic, anti-cancer, depression and anti-inflammatory, and other activities. The cooked, dried, washed and shiny rhizomes of curcuma longa are turmeric. Various clinical trials and their findings have been discussed here on these practises. Curcumin is a tautomeric compound found in organic solvents as an enolic form and in water as a keto form. This overview article describes Curcumin's numerous positions and practises.

Keywords: Curcumin, Health, Rhizomes, Turmeric.

I. INTRODUCTION

Turmeric is an Indian rhizomatous natural plant (*Curcuma longa*) of the ginger circle of relatives (Zingiberaceae) of anti-inflammatory medical advantages. The medicinal benefits of turmeric could be attributed to the presence of active concepts known as curcuminoids. Curcumin, demethoxycurcumin (DMC), and bisdemethoxycurcumin (BDMC) are collectively called curcuminoids. Those yellow coloured curcuminoids are isolated from *Curcuma longa* L. (turmeric) rhizomes[1].

One of the most exciting components of curcuminoid is curcumin, that's a small molecular weight polyphenolic compound and lipophilic in nature, consequently insoluble in water and additionally in ether but soluble in ethanol, dimethylsulfoxide, and different organic solvents.

Curcumin is stable at the acidic pH of the stomach. The alternative materials gift are risky oils including tumerone, atlantone and zingiberone and sugars, proteins and resins. The lively constituent of turmeric- curcumin is remoted from curcuma longa and it presents shade to turmeric. Such bioactive element has been very well investigated Curcumin (1, 7-bis (four-hydroxy-3methoxyphenyl)-1, 6-heptadiene-3, five- dione) is likewise called diferuloylmethane. It's miles a tautomeric compound current in enolic form in organic solvents and as a keto form in water. Turmeric is a plant recognized by means of its medicinal use, relationship again to 4000 years in the past in the Vedic way of life in India, in which it was used as a culinary spice and had a few religious significance[2].

Turmeric is the boiled, dried, wiped clean and shine rhizomes of curcuma longa. After harvesting the complete rhizomes are gathered. They are usually like hands 2 to eight cm long and 1 to two cm extensive having bulbs and splits. The dried rhizomes are further processed and reprocessed to obtain the turmeric powder. It has exclusive names in exclusive cultures and international locations. In Sanskrit, turmeric has at the least 53 one of a kind names[3].

Curcumin has been utilized in tradition as a scientific herb due to its diverse advantages along with: antioxidant, anti-inflammatory, antimutagenic, antimicrobial and several healing properties Curcumin shows terrible absorption, fast metabolism, and fast removal. Numerous agents have been introduced to enhance the bioavailability of curcumin. Most exciting one is piperine; it complements curcumin bioavailability by means of blockage of the metabolic pathway of curcumin. Piperine results in an growth of 2000% inside the bioavailability of curcumin Curcumin is an crucial factor within the root extract of Curcuma Longa. The foundation of this plant, that is yellow due to the presence of curcumin, has been used as a flavoring and coloring agent for food and medicinal drug in Asian countries[4].

Curcumin is to be had in numerous paperwork together with tablets, capsules and ointments. Curcuminoids had been permitted by means of the usa meals and Drug management (FDA) as “typically identified as safe” (GRAS). It's far the reason of this review to offer a quick evaluate of the potential fitness blessings of curcumin.

In natural and conventional remedy, turmeric is used for rheumatoid arthritis, continual anterior uveitis, conjunctivitis, skin most cancers, small pox, chook pox, wound restoration, urinary tract infections, and liver illnesses, strengthening the overall power of the frame, dispelling worms, regulating menstruation, dissolving gallstones, cleansing wounds, or even for diverse digestive issues, among different conditions. C. Longa has on its chemical composition more than 3% curcumin, 1.4% DMC and 1.2% BDMC[5].

Moreover, curcumin additionally showed a prominent protecting effect on bone density issues, including osteopenia osteoarthritis while assisting to relieve pain and swelling in mouth, gingivitis and Periodontitis.

A. Isolation of Curcumin: -

Curcumin is insoluble in water; an organic solvent has been used for its isolation. Developed a way for keeping apart CUR from ground turmeric. They magnetically stirred the floor turmeric in dichloromethane and heated at reflux for 1 h. The combination turned into suction-filtered, and the filtrate became focused in a hot-water bath keeping at 50o C. The reddish-yellow oil residue was triturated with hexane and the ensuing strong changed into gathered through suction filtration. Similarly TLC analysis (three% methanol and 97% dichloromethane) confirmed the presence of all three additives. Extraction of CUR from turmeric powder with the use of a solvent which include a aggregate of ethanol and acetone. Chemical analyses have shown that turmeric includes carbohydrates (69.4%), moisture (13.1%), protein (6.3%), fat (5.1%) and minerals (3.5%). The essential oil (5.8%) acquired via steam distillation of the rhizomes includes a-phellandrene (1%), sabinene (0.6%), cineol (1%), borneol (zero.5%), zingiberene (25%) and sesquiterpines (53%), curcumin (3-6%) is answerable for the yellow coloration[6].

B. Anti-viral activity of Curcumin: -

It's been confirmed that curcumin as a plant spinoff has a extensive variety of antiviral hobby against one of a kind viruses: papillomavirus virus (HPV), influenza virus, Hepatitis B virus (HBV), Hepatitis C virus (HCV), adenovirus, coxsackie virus, Human norovirus (hunov), breathing syncytial virus (RSV) and Herpes simplex 1 (HSV-1). Curcumin functionalized graphene oxide shown synergistic antiviral effect towards respiratory syncytial virus contamination. Breathing syncytial virus (RSV), which is taken into consideration because the fundamental viral pathogen of the decrease respiratory tract of infants, has been implicated in extreme lung sickness.

Developing a β -cyclodextrin (CD) functionalized graphene oxide (cross) composite, which displayed high-quality antiviral activity and curcumin loading successfully, showed that the composite should prevent RSV from infecting the host cells with the aid of without delay inactivating virus and inhibiting the viral attachment, which possessed the prophylactic and healing outcomes in the direction of virus. The antiviral impact of curcumin became a dose-dependent manner. Curcumin inhibit pastime of inosine-mono phosphate dehydrogenase (IMPDH) enzyme in both noncompetitive or aggressive way. Via inhibition of IMPDH this led to lessen the extent of intracellular guanine nucleotides which required for good enough RNA and DNA synthesis. Curcumin mechanism contain in viral access or other life cycle degrees instead of the replication of viral RNA. Therefore, with the aid of inhibition of IMPDH Curcumin have capability anti-proliferative, antiviral and antiparasitic consequences[7].

C. Anti-inflammatory activity of Curcumin

Curcumin possesses huge anti-inflammatory response in acute in addition to in continual models of infection. It's far as effective as phenylbutazone inside the carrageenan oedema take a look at however most effective 1/2 as robust in continual tests. Curcumin has been

demonstrated to be secure in six human trials and has proven anti-inflammatory interest. It is able to exert its anti-inflammatory pastime by way of inhibition of a number of one of a kind molecules that play a role in inflammation. Curcumin has been shown to regulate numerous transcription factors, cytokines, protein kinases, adhesion molecules, redox repute and enzymes which have been related to infection. Tumor necrosis issue α (TNF- α) is a first-rate mediator of infection in most sicknesses, and this effect is regulated through the activation of a transcription issue, nuclear factor(NF)- κ B. While TNF- α is stated to be the maximum effective NF- κ B activator, the expression of TNF- α is also regulated through NF- κ B. In addition to TNF- α , NF- κ B is also activated by using most anti-inflammatory cytokines; gram-poor micro organism; various ailment-causing viruses; environmental pollution; chemical, physical, mechanical, and psychological pressure; high glucose; fatty acids; ultraviolet radiation; cigarette smoke; and different disease-inflicting elements. consequently, retailers that downregulate NF- κ B and NF- κ B-regulated gene products have ability efficacy in opposition to several of those sicknesses. Curcumin has been shown to dam NF- κ B activation expanded via several unique anti-inflammatory anti inflammatory stimuli. Curcumin has additionally been proven to suppress irritation thru many extraordinary mechanisms beyond the scope of this overview, thereby assisting its mechanism of motion as a capability anti-inflammatory agent[8].

D. Anti-oxidant of Curcumin: -

Curcumin has been shown to enhance systemic markers of oxidative stress it can modulate the pastime of GSH, catalase, and SOD enzymes energetic inside the neutralization of freeradicals. There may be proof that it could boom serum sports of antioxidants together with superoxide dismutase (SOD) A recent systematic overview and meta-analysis of randomized manage records associated with the efficacy of supplementation with purified curcuminoids on oxidative stress parameters—indicated a great effect of curcuminoids supplementation on all investigated parameters of oxidative pressure which include plasma sports of SOD and catalase, as well as serum concentrations of glutathione peroxidase (GSH) and lipid peroxides. It is noteworthy to point out that every one of the research blanketed in the meta-analysis utilized a few kind of method to conquer bioavailability demanding situations, and four out of the six used piperine. Curcumin's impact on loose radicals is completed by way of several extraordinary mechanisms. It could scavenge one of a kind types of free radicals, along with reactive oxygen and nitrogen species (ROS and RNS, respectively) additionally, it is able to inhibit ROS-producing enzymes consisting of lipoxygenase/cyclooxygenase and xanthine hydrogenase/oxidase. Similarly, curcumin is a lipophilic compound, which makes it an green scavenger of peroxy radicals, therefore, like nutrition E, curcumin is also taken into consideration as a sequence-breaking antioxidant[9].

E. Anti-cancer of Curcumin: -

1/5th of the deaths worldwide annually are as a result of diverse kinds of cancers cancer is a end result of successive genetic and epigenetic changes resulting in apoptosis, uncontrolled cellular Proliferation, metastasis, and angiogenesis. Anti-cancer interest of curcumin has been

notably investigated recently, and vast upgrades in gastrointestinal, melanoma, genito-urinary, breast, and lung cancers were visible. Many studies talked about anticancer sports of curcumin alone or in aggregate with traditional chemotherapy pills in treatment of most cancers and its most cancers-related headaches.

In-vitro and in-vivo studies have indicated that curcumin prevents carcinogenesis via affecting number one methods: Angiogenesis and tumor increase. Curcumin analogs S1- S3 containing sulfone strongly inhibited the boom of human prostate, colon, lung and pancreatic most cancers cells. Medical studies of flora utilized in numerous types of ethnic remedy have caused the invention of many treasured tablets, inclusive of taxol, camptothecin, vincristine and Vinblastine[10].

II. CONCLUSION

Curcumin has display global used for its complete advantages for fitness, which seem to behave mainly via its anti-oxidant and anti-inflammatory mechanisms. Those blessings are quality accomplished when curcumin is mixed with agents together with, carbohydrates, piperine, which will increase its bioavailability considerably. Studies shows that curcumin can assist within the control of oxidative and anti-inflammatory anti inflammatory situations, metabolic syndrome, anti-anti-inflammatory, tension, and anti diabetic, hyperlipidemia. It could also assist inside the management of multification used of Pharmacological hobby in health and additionally enhance the health for body blessings for human health, hence improving healing and subsequent performance in energetic humans. In extra, a exceptionally sufficient dose can offer fitness benefits for humans that do not have identified health conditions.

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