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A Recent Review on Extraction of Antioxidant and Anti-Inflammatory compounds from Turmeric Tincture in Health

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Abstract

Turmeric is fragrant, stimulating, and carminative in addition to being a mild diuretic. One of nature's most potent medicines is turmeric. Curcumin is the substance in turmeric that is active. In India, where it has been used for more than 2500 years, turmeric was probably first employed as a dye. In different studies it can be prove. Turmeric also having anti-diabetic, anti- inflammatory, anti-oxidant properties. But the Turmeric are not directly consumed by peoples so by making the tincture of Turmeric. It is easy to consume by patients. Tincture is an extract of plant dissolved in solvent. Tincture is prepared without disturbing the properties (Anti-Oxidant) of Turmeric. Turmeric extract has also been used to relieves stress, inflammation & smoothen blood circulation. It also used to natural ability to cleanse toxins from the body. Turmeric is one of the nature's most powerful healers. From cancer to Alzheimer's disease, turmeric is effective in treating a wide range of illnesses. In India, an ointment made with the spic is used as an antibacterial.

Keywords:- Turmeric, Tincture, Anti-Cancer properties, Curcumin.

1. Introduction

Approximately 90 % of the time, plants are utilized as the basis for medication in the traditional systems of Ayurveda, Siddha, and homeopathy. Plant sources are easily found in the environment, are safe, cost less money, and rarely have adverse effects. Understaning of chemicals. A finished, in-depth of research of the secondary metabolites of Indian medicinal plant species. India needed to intervene because they are in charge of the plants that have medicinal properties. Over millions of years, plants have evolved chemical defences to protect them from environmental hazards like UV radiation, reactive oxygen species, and microbial assaults. Consequently, phytochemicals are more physiologically active and less poisonous. Plant-based medication are in demand all round the world. They are extensively employed in a variety of fields, including human therapy, veterinary care, agriculture, and academic research. Plant-based medications are in demand all around the world. They are extensively employed in a variety of fields, including human therapy, veterinary care, agriculture, and academic research. Plants and plant parts are used for many purpose. Among them mostly plants are used for medicinal purpose. Plants which are used for medicinal purpose are Turmeric, Neem, Moringa, Papaya, Ginger, Cumin, Tulsi, Orange, Clove, Rose, Lemon, peppermint etc. Apart from medicinal use these plants are also used as food. From years of knowledge of the usage of turmeric in medicine is constantly growing. Turmeric, a blooming plant, is one of the key components in curry powder is a popular food coloring from the ginger family. To treat a variety of medical conditions include digestive and liver issues, wound healing and skin disease therapy. As an anti-inflammatory, turmeric has long been utilized in traditional medicine. The active component of turmeric is curcumin, has been demonstrated to have a variety of medicinal effects [1].

A prominent component of Ayurveda, Siddha medicine, traditional Chinese medicine, Unani, and the animistic rites of Austronesian peoples, Turmeric has a long history of USA a in Asia. It was used initially as a dye and then for its purported therapeutic properties. Along with Hinduism and Buddhism, the yellow dye travelled from India to Southeast Asia and is used to color the robes of monks and priests. Before the arrival of the Europeans, turmeric was also discovered in Tahiti,

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Hawaii, and Ester Island. The Austronesian peoples spread and used turmeric in Oceania and Madagascar, as shown by Linguistic and Indirect evidence. Even though they have never met with Indians, people in Polynesia and Micronesia commonly utilize turmeric in food and colors.

Over the years, the medical benefits of the spice have only begun to come to light. Recent studies have showed that turmeric is a natural wonder that has long been known for its anti-inflammatory effects and has proven helpful in the treatment of many different health conditions. Diseases ranging from Alzheimer's disease to cancer. Asian cosmetics such as turmeric water are used to give the skin a golden hue.

Domain

Kingdome	Plantae
Class	Liliopsida
Subclass	Zingiberidae
Phyllum	Curcuma Longa
Order	Zingiberales
Family	Zingiberaceae
Genus	Curcuma
Species	C.Longa
Botanical Name	Zingiberaceae Family

Table 1 Scientific classification of Turmeric

Turmeric is a close relative of ginger because it is a dried rhizome of a herbaceous plant. The spice's yellow hue has earned it the nickname "Indian Saffron" at times. The subterranean rhizome is utilized to give meals a particular flavor as well as a rich, permanent aroma. Orange in hue. The majority of turmeric sales are to consumers in industrialized nations in the form of this fine, dried yellow powder. Turmeric can be used as an antimicrobial for wounds and scrapes on the skin.

Although it is possible that South or South-East Asia is where turmeric originated, the Indian subcontinent is unquestionably the region where it was domesticated. India is currently the world's top producer of turmeric and the top consumer of its own output. A component of turmeric in Indian culture, it plays a significant role in curry foods, as well as being used as a cosmetic, a dye, and in the formulation of numerous traditional medicines.

- ✓ Manganese, Potassium, Zinc, Sodium.
- ✓ Antioxidants in your body
- ✓ Lower Cholesterol.
- ✓ Benefit with Depression
- ✓ May prevent Cancer
- ✓ May aid weight Loss?
- ✓ Lower the risk of heart disease

Medically we cannot use the Turmeric directly so we use the liquid foam of Turmeric. This Liquid foam is called Tincture. "Charles Warburg" was a physician and scientist. He was the Inventor of Warburg Tincture a medicine well known in the 19th century for the treating fevers. Concentrated liquid preparations of organic therapeutic herbs are called tinctures. They might single herbs or in combinations of several herbs that complement one another. The majority of tinctures are made using alcohols, which allows all of the herb's therapeutic components to throughout the course of a month. They also use cider vinegar and make glycerides. Depending on the type of herbs involved tincture can include various parts of the Plants some of the most common parts in herbal tincture include –Dried leaves, Berries, Bark, Roots, Fresh leaves People take tincture orally by using a dropper to place the liquid under their tongue. There are many herbs are use in tincture. like ; Ginger, Garlic, Peppermint, Papaya Leaves, Maringa Leaves, Cumin seed, White Willow, etc.

Antibacterial resistance is now a global issue that needs to be addressed. Study on developing Novel, inactive antibiotics, as well as the effectiveness of chemotherapy in treating various infections depends on prudent application to reduce the occurrence of resistant forms. The equivalent of 20 % of the variety of plants have undergone pharmacological or biological testing, and a significant portion of newly available antibiotics come from natural sources semi – artificial resource. As a result of the high expense of effective, antibacterial products in underdeveloped nations. A significant fraction of people use medicinal herbs to cure infectious diseases. World Health Organization (WHO) reports that more than 80 of the world's traditional remedies from the mainstay of the population's primary healthcare requirements. The therapeutic the chemical components in plants that cause a certain physiological function are what give them their worth to the human body. Alkaloids, flavonoids, and terpenoids are plants most significant bioactive compounds. The phenolic component and tannins based on ethno pharmacological data. The phytochemical information Is typically seen as a successful strategy in the development of new anti-body from higher plants, infectious pathogens. A perennial herbaceous plant, turmeric can grow up to a height of 1 m (3 ft. 3 in). It produces densely branching, cylindrical, scented, and yellow to orange flowers. The leaves are placed in two rows and are alternated. They are split into leaf groups. A fake stem is created from the sheaths of the leaves. Petiole length is 50 to a length of 115 cm (20-45 in). Simple leaf blades typically measure between 76 and 115 cm (30-45 in) rarely Longer than 230 cm (7ft 7 in) they range in breadth from 15 to 17 in (38-45 cm). They have an Oval to oblong shape that narrows near the tip. Stem bracts are present at the inflorescence's peak are seen if there are no

flowers. The three vivid yellow petals are combined to form a 3 cm long corolla tube. The three triangular are 1 to 1.5 cm long and feature soft-spiny top tips. Only the median stamen of the inner circle is fertile, despite the average corolla lobe being larger than the two lateral. The base of the dust bag has spurs. Staminodes are created from all other stamens. The labellum is longer than the outer staminodes. The labellum is obovate and has a yellow ribbon in the center. Its length ranges from 1.2 to 2.0 cm. underneath a persistent, trilobed sparsely hairy ovary adherent are three carpels. The fruit capsule has three sections that open. Numerous clinical trials have been conducted on turmeric and curcumin for a variety of human diseases and conditions, but no strong evidence of any anti-disease effect or health benefit has been found. As of 2020, there is no proof from science that curcumin lowers inflammation. There is mounting evidence that turmeric extracts may be helpful for easing knee osteoarthritis symptoms as well as for minimizing pain and muscle damage after exercise. There is solid proof that turmeric causes allergies[2][3].

2.1 Bioactive compound of turmeric

2.1.1 Chemical composition of Turmeric

According to a proximate analysis, turmeric comprises 6-13% moisture, 60-70 % carbohydrates, 6-8 % protein, 5-10% fat, 3-7% minerals (potassium, salt, calcium, iron, phosphorus), and trace levels of vitamins. It also contains 6-8% carbohydrates. Steam distillation produces essential oils that make up 3-7% of the turmeric rhizome and are primarily made of terpenoids such sesquiterpenoids. Additionally, 3-5% of the mixiyure is made up of more than 50 structurally similar chemicals called curcuminoids. Curcumin, Demethoxycurcumin, and Bisdemethoxycurcumin are the three main ones the composition of turmeric generally varies depending on the kind of soil used for growth, with Indian turmeric being prize for its excellent quality and high curcumin concentration. Essential oils and curcuminoids are considered to be well-defined secondary metabolites produced by curcuma plants[4][2].

2.1.2. Turmeric oil (essential oil)

More than 250 different terpenoids from the curcuma species make up the majority of the more than 250 essential oils that make up turmeric oil. Another significant group of turmeric's medicinal components is turmeric oil. Two isoprene units make up monoterpenes, which have the chemical formula C10H16. They can be found in ring-structured (mono-or- bi-cyclic) or linear (acyclic) forms. Modification processes like demethylation or oxygenation are used to create monoterpenoid derivatives. Parainfluenza virus II was significantly inhibited by this turmeric compound. Three isoprenoid units make up sesquiterpenes, which have the chemical formula C15H24, and their related sesquiterpenoid derivatives. The main three types of sesquiterpenoids are bisabolane, guanine, and germacrane and are found in the turmeric rhizome.

2.1.3. Vitamins

The main bioactive component of turmeric is curcumin. It contains anti-inflammatory qualities, and there is good proof that it helps treat a range of diseases, from depression to chronic pain. Due of its low absorption when taken alone, curcumin is frequently coupled with lipids or black pepper.

2.1.4. Polyphenols

Turmeric contains the flavonoid polyphenol curcumin, which is the primary active components. One of the most prevalent dietary flavonoids, quercetin can be found in a variety of foods, including fruits, vegetables, and beverages. Typically, turmeric plants contain 0.45% saponin, 1.08% tannin, 0.03% sterol, 0.82% phytic acid, 0.40% flavonoid, and 0.08% phenol in addition to 0.76% alkaloid.

2.1.5. Saponins

Due to the antioxidant qualities of saponins, flavonoids, and tannins, turmeric plants can increase sex hormones, lower cholesterol, prevent damaging cytotoxins, and reduce inflammation. Plants that contain turmeric exhibit antioxidant qualities and can be used to treat gastrointestinal illnesses including diarrhea and dysentery.

2.1.6. Anti-oxidant effect

The use of turmeric can improve the body's antioxidant defences. Antioxidents are primarily beneficial because they shield your body from free radicals. Curcumin is also considered as a chain-breaking antioxidants. Due to its chemical makeup, curcumin is a strong antioxidant that has ability to counteract free radicals.

2.1.7. Anti-inflammatory compound

Inflammation is quite significant. It aids in warding off outside intruders and aids in body damage healing. Although short term, acute inflammation is advantageous, it can be a problem if it persists and stars to destroy our body's own tissues. Inflammation has been identified in the development of many chronic disease and conditions. Scientists now think several illnesses and ailments may be impacted by chronic low level inflammation. These include Heart disease, Cancer, Metabolic syndrome, Alzheimer's disease, Various degenerative conditions [5], Because of this, anything that can be done to combat chronic inflammation may be useful in avoiding and treating these illnesses.

2.2 Effects of Turmeric on the prevention of Chronic Disease

2.2.1. Arthritis

Curcumin, a substance found in turmeric, is anti-inflammatory and may help those who suffer From Rheumatoid Arthritis (RA). According to research, a component of the turmeric spice can dramatically lessen knee discomfort in patients with osteoarthritis, but it won't lower swelling or alter cartilage. Over 250 million people are affected globally[6].

2.2.2. Cancer

Oncolytic Viruses attack specific cancer cells, but research also indicates that they may enhance the immune system's capacity to identify and eradicate tumors. Specifically targeting tumor cells, the viruses proliferate inside of them before eventually destroying the cells. Curcumin has been found in laboratory experiments to reduce the growth of cancer cells, and some animal studies have also demonstrated this. Clinical trials are being conducted this. Clinical trials are being conducted to see whether it can benefit human as well, although there is not yet adequate proof of the effect in people. Inflammation is fundamental to every stage of tumour development and therapeutic response. In order to manage cancer cells and inflammatory cells, STAT3 activation and interaction with NF-kB are crucial. Curcumin has been shown to have clinical therapeutic and prevention potential for cancer patients in in-vitro and in-vivo animal and human clinical studies for colorectal, liver, pancreatic, lung, breast, uterine, ovarian, prostate, bladder, kidney, renal, brain, non-Hodgkin lymphoma, and leukemia cancers. In India, regular turmeric use has been linked to decreased cancer rates, albeit there is no quantitative evidence of this association. On a number of targets, including those that regulate tumor growth, angiogenesis, metastasis, inflammation, invasion, and apoptosis, curcumin served as a modulator of intracellular signaling pathways. NF-kB pathways are often activated by most carcinogens, which causes the production of inflammatory. COX-2, LOX-2, iNOS, inflammatory cytokines, particularly TNF-, and chemokine's are examples of enzymes and mediators.

2.2.3. Allergy, Asthma and Bronchitis

The inflammation pathways important to the puzzling emergence of these chronic inflammatory illnesses are underpinned by the beginning and maintenance of asthma, allergies, and bronchitis. Inflammatory cytokines, such as T helper-2 CD4 T (Th2) cells and Th2- associated cytokines, as well as neutrophil airway inflammation linked to IL-17, are typically responsible for mediating that allergy, a proinflammatory condition. Exotoxin, MCP-1 and MCP-3 are important players in the inflammatory illness of asthma. Eosinophils are important players in allergic inflammation, and they adhere to human bronchial epithelial cells through an interaction with CD18 and ICAM-1. Curcumin has been demonstrated to improve antioxidant levels and aid in clearing congested airways in in-vitro and in-vivo studies. Curcumin plays a significant impact extracts that include anti-asthmatic components. The findings indicated that curcumin could be used in alternative anti-asthmatic therapy since it is essential in scavenging Nitric Oxide (NO), which can help asthmatic patients avoid bronchial inflammation[7][8].

2.2.4. Chronic kidney Diseases

Chronic Kidney Disease (CKD) is an inflammatory condition characterized by a progressive atrophy of the glomerular filtration rate (GFR) or the presence of abnormalities in the urine, such as white blood cells, protein, and red blood cells. Two of the main pathogenic variables that lead to the development of CKD are hypertension and diabetes mellitus (DM). These factors include meningeal cell proliferation, glomerular hypertrophy and sclerosis, extracellular matrix (ECM) buildup in the basement membrane of the glomerulus, and end-stage interstitial fibrosis. The authors employed induced schemes to examine the connection between renal, mitochondrial, and oxidative stress in other animal investigations. They discovered antioxidant enzyme activity, renal dysfunction, histological damage, and curcumin stress in both kidney tissue and mitochondria [5].

2.2.5. Skin Disease

Connective tissue disease known as scleroderma frequently results in fibrosis and vasculopathy of the skin and other organs. Scleroderma may cause by fibrosis, vascular abnormalities, and an increase in the formation of extracellular matrix, though the precise cause is yet unknown. Numerous studies have shown that people with scleroderma have higher levels of free radicals like hydroxyl and peroxynitrite radicals as well as 8-isoprostane, a sign of oxidative stress, in their serum. Given the immune system is activated and that perivascular infiltration of inflammatory cells characterize scleroderma, immune-suppression has been regarded as an important therapy. Scleroderma is characterized by an excessive buildup of Extracellular Matrix (ECM), which causes inflammation.

2.2.6. Metabolic Disease (Diabetes)

Cells in type 2 diabetes have decreased insulin signaling, which results in hyperglycemia and long-term consequences include heart, kidney, and liver problems. In the recent past, an increasing number of studies have demonstrated the crucial roles that inflammation and oxidative stress play in the etiology of diabetes. The transcription factor NF-kB is produced when macrophages are activated by dying on stressed cells, which results in the production of pro- inflammatory cytokines like TNF

and IL-6.

2.2.7. Increase the antioxidant capacity of the body.

One of the mechanisms thought to underlie many disease associated with ageing is oxidative damage. Free radicals, extremely reactive molecule with unpaired electrons, are involved. Important chemical compound like fatty acids, proteins, or DNA frequently react with free radicals. The main benefit of antioxidants is that they protect your body from free radicals. Due to the chemical makeup of curcumin, it is a strong antioxidant that has the ability to counteract free radicals. Additional animal and cellular research suggests that curcumin may inhibit free radical activity while promoting the activity of other antioxidants. To substantiate these advantages, additional human clinical research are required.

2.2.8. Lower risk of heart disease

In the world, heart problems are the leading cause of death. Many processes in the development of heart disease may be slowed down or stopped by curcumin. Enhancing the functionality of the endothelium, the lining of your blood arteries, is perhaps curcumin's most important benefit in terms of heart disease. One of the main causes of heart disease is endothelial dysfunction. When your endothelium is unable to control numerous elements, such as blood pressure and blood clotting, this occurs.

2.2.9. Help prevent cancer

Cancer is a condition marked by unchecked cell proliferation. Supplemental curcumin appears to have an impact on a wide range of cancer types. Studies on curcumin as a helpful herb in the treatment of cancer have revealed that it has an impact on the growth and development of the disease. Contribute to malignant cells dying reduce tumor angiogenesis (the development of new blood vessels). There is evidence to suggest that it may do so, particularly for tumors of the digestive tract like colorectal cancer.

Chemical Structure of compounds which having Anti-Oxidant Properties

2.3 Uses of Turmeric

2.3.1. Use in digestive health

Turmeric, a member of the ginger family, has historically been used in Indian, Chinese, and Western herbal treatments to treat ailments like poor digestion, stomach pain, and distension. As used in Ayurveda medicine, the World Health Organization recommended it in 1999 for Treatment of acid reflux, flatulence, and functional dyspepsia. Turmeric has been used as an-Inflammatory, to treat digestive and liver issues, skin illnesses, and wounds in both Chinese And Ayurveda medicine. Curcumin is a potent antioxidant as well.

2.3.2. Use in protect skin

Antioxidant and anti-inflammatory substance are found in turmeric. These qualities might give the skin a glow and luster. Additionally, turmeric may revitalize your skin by enhancing its natural glow. To find out if turmeric has any advantageous benefits on your skin, you might wish to attempt a face mask at home. The pigment responsible for dark patches and other types of hyperpigmentation, melanin, is inhibited by turmeric. Regular application of a turmeric-based lotion can aid in the natural fading of these blemishes, resulting in more even-toned skin. One of the key skin-whitening ingredients mentioned in Ayurveda is turmeric. It is well recognized to lighten dark spots and give the skin a healthy glow. This spice has a long-standing connection to Indian weddings. Turmeric is an interesting therapeutic choice for a number of skin disorders, including eczema and atopic dermatitis, because it has anti-inflammatory, antibacterial, and antioxidant qualities. Although you can remove the stains from turmeric with soap and warm water, it could take some time and scrubbing. Turmeric can readily stain your skin a brilliant, yellow-orange color.

2.3.3. Increase immunity

Along with boosting immunity, curcumin also facilitates detoxification. This helps prevent the flu and seasonal colds. It also has a substance called lipopolysaccharide, which has antiviral and antibacterial properties. Turmeric is being researched for its anti-inflammatory and antioxidant characteristics. It also assists your liver in modifying, inactivating, and eliminating toxins and excess substances created by your body (including hormones). Two North Shore dietitians discuss how they like to use this nourishing plant throughout the day. This flu season, whether you're trying to stay warm or strengthen your immune system[9][4].

2.3.4. Helps in blood detoxification

Blood clotting might be slowed by turmeric. The risk bleeding and bruising may rise if turmeric is used along with drugs that help reduce blood coagulation [10].

2.3.5. Strengthen hair & vision

Although turmeric is frequently used in lattes and curries, it is also beneficial for your hair. Turmeric will strengthen your hair and lessen breakage-related loss. One of the natural components that is supposed to lengthen the antigen (growth) phase of hair is turmeric, commonly known as Curcuma longa. One of the four stages of hair growth, this phase sees the development of new hair as the old hair is forced upward and out of the hair follicle [11].

2.3.6. Removes bad breath, strengthen teeth & gums.

As helping to treat gingivitis and periodontal disease, this mouthwash can helping to treat gingivitis and periodontal disease, this can help reduce inflammation and pain in general [12].

Conclusion:

From above studies we come to know that the Turmeric tincture having some compounds which having anti-cancer properties. And these compounds are decrease DNA damage and increase apoptosis of cancer cell. Turmeric tincture is used for the treatment of Anti-oxidant, relieves stress, inflammation & smoothen blood circulation. Natural ability to cleanse toxins from the body.

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