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ORIGINAL RESEARCH

Turmeric: An Important Medicinal Plant in the Treatment of Many Diseases: A review Study

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ABSTRACT

Curcumin, or Turmeric is a yellow polyphenolic pigment from the Curcuma longa L. It extracted was from the rhizomes of the plant as yellow-brown powder. Turmeric is used as a pulp for the skin and is useful in bruises and swelling, and is placed on excess hair, reducing its growth. Turmeric is also used to activates the liver to secrete bile and increases gastric motility. In addition to increases the dissolution of gallstones. Because it is bile and contains essential oils and water-soluble dyes, so it prevents colic, carminative, regulates menstruation, and contains curcumin, the yellow dye, which has an effect that exceeds cortisone in skin diseases, and it is an antioxidant and more powerful than vitamin E. In addition, Turmeric lowers blood pressure. In recent decades, their biological activities have been extensively studied. Thus, this review aims to offer an in-depth discussion of Turmeric applications for on health promotion and disease prevention.

Keywords: Curcumin, skin, vitamin E, health promotion and disease prevention.

INTRODUCTION

Since ancient times, people have traded a variety of herbs for their therapeutic and medicinal properties (Stojanoski;1999). All plants that are used medicinally fall under the category of medicinal plants, which can range in size from large to small. The medicinal plant contains an active ingredient in one or more of its members or in all of its parts. This active ingredient may be one or more compounds that have physiological effects in the treatment of diseases in either their pure form upon extraction or in their natural state (Ali Mansour Hamza, 2006).

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Many techniques have been used to obtain its benefits because some of them need to be boiled while others need to be consumed directly or mixed with other ingredients (Kelly;2009).

Global research has been done to confirm their efficacy, and some of the results have sparked the development of plant-based medications. The annual market value of products made from medicinal plants surpasses $100 billion worldwide (Sofowora etal;2013).

The uses include human food directly for consumption, medicine to cure a variety of ailments, flavorings, and spices. Additionally, it's employed in the production of drinks with stimulants, and many non-industrial industries use therapeutic herbs. The most significant pharmaceutical sectors (Abdullah and Hussam, 2017).

According to (Essien et al.2012), the existence of phytochemical content is typically what gives these plants their therapeutic properties. The most significant phytochemicals are alkaloids, tannins, flavonoids, and phenolic compounds.

Curcumin or Turmeric

The Arabic term "Kourkoum," which implies saffron, is where the Latin word "Curcuma" comes from. It thrives in warm, muggy weather and needs a lot of water. Its pseudostem is short big oblong leaves, too. There is a major rhizome underground or mother rhizome, with several subsidiary rhizomes that branch out. They have a pale yellow, reddish color and are pyriform, oblong, or ovate. Brown or golden in color (Figure 1). It is light yellow just produces flowers and not fruit. (Parthasarathy et al ;2008; Trujillo et al;2013).

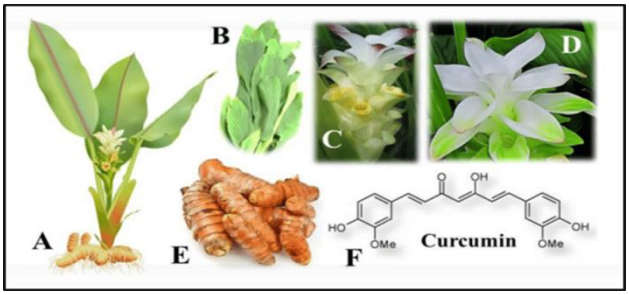

Figure 1: Turmeric (Curcuma longa L.) plants are with the following features: (A) A highly branched standing C. longa plant with cylindrical rhizomes of yellowish to orange color. (B) Broad long and simple leaves with long petioles (leaf stems) grow from branching rhizomes that lie just below the surface of the soil. (C) Inflorescence is terminal, spike-shaped, and cylindrical, having laterally green united bracts with reddish spots. (D) It produces very pretty, tall white flower spikes. (E) C. longa rhizomes with yellowish to orange color. (F) The natural and major bioactive compound of the C. longa plant (Khanal et al;2021).

Turmeric is an important genus in the Zingiberaceae family, consisting of about 110 species distributed in Asia. Tropical and Pacific Oceans (Nair, 2019). The largest distribution of this genus is found in India, Myanmar and Thailand. It extends to Korea, China, Australia and the South Pacific. Most species of this genus are perennial plants. It grows well in the tropics where a humid permanent climate and relatively light soils are required (Ravindran, et al ;2007).

Curcumin was first isolated as“yellow coloring matter”from.Curcuma longa by Vogel and Pelletier in 1815. (Bandyopadhyay et al;2014). It exists as ketoenol tautomers. The keto form is predominant in neutral and acidic conditions, whereas the enol form predominates in alkaline conditions. It is insoluble in water, has an acidic and neutral pH; and soluble in methanol, ethanol, dimethylsulphoxide and acetone (Trujillo et al;2013, Prasad et al;2014). Turmeric is used as a food seasoning, as a coloring for prepared foods and sauces, as well as a dietary supplement (Christell, 2010).

Since turmeric is the main source of the polyphenol curcumin, it has drawn interest from both the medical and scientific communities as well as food enthusiasts. Turmeric has long been known for its medicinal benefits (Hewlings and Kalman;2017).

Geographical distribution

The geographical origin of turmeric is Southeast Asia (Nair, 2019), and the greatest diversity has been found. The types of turmeric in India, Myanmar and Thailand, and the geographical distribution of turmeric in the world can be summarized according to (Ravindran et al., 2007).

Table (1): Geographical distribution of turmeric in the world

Approximate number of species	The state
20-16	Bangladesh
25-20	China
45-40	India
25-20	Colombia
30-20	Malaysia
15-10	Nepal
15-12	Philippines
40-30	Thailand
110-100	Total

Biological efficacy of turmeric:

Due to the presence of curcuminoid and sesquiterpenoid molecules, the therapeutic qualities are attributed. The most significant curcuminoid, curcumin, is utilized as an anti-inflammatory, antioxidant, and even beneficial against cancer and HIV (Srimal ;1997, Aggarwal et al; 2007, Aggarwal and Sung 2009).

Curcumin's antioxidant, anti-inflammatory, and lipophilic properties help AD sufferers' cognitive abilities. A rising body of research suggests that the key event in Alzheimer's disease pathogenesis is influenced by oxidative stress, free radicals, beta amyloid, brain dysregulation brought on by bio-metal toxicity, and aberrant inflammatory responses. The overall memory in AD patients has improved as a result of curcumin's several benefits, including diminished Beta-amyloid plaques, postponed neuronal degeneration, metal-chelation, anti-inflammatory, antioxidant, and reduced microglia production (Mishra and Palanivelu;2008).

Turmeric is used to treat diseases associated with abdominal pain, while in ancient Hindu medicine it is used as an antidote. In the treatment of inflammation, sprains and swelling, and in Ayurvedic medicine, curcumin is an effective treatment for systemic diseases Various respiratory diseases, for example, asthma and allergies, as well as liver disorders, anorexia and rheumatism Colds and Sinusitis (Christel;2010).

Turmeric's anti-inflammatory properties:

According to Edeas (2006) that curcumin has anti-inflammatory properties and can be used against several diseases such as psoriasis, which is caused by many inflammatory reactions of the immune system, research has shown a scientific study on the effectiveness of curcumin as an antirheumatic drug, where researchers compared its antirheumatic power with The strength of phenylbutazone in 18 subjects, the results showed that curcumin has activity similar to phenylbutazone when the dose is 1200 mg per day.

Clinically, curcumin has already been used to reduce postoperative inflammation. Safety assessment studies indicate that both turmeric and curcumin are well tolerated at a very high dose without any toxic effects. Curcumin has the potential to develop modern medicine to treat various diseases (Ishita et al; 2004).

Turmeric's anti-cancer properties:

A significant healthcare concern is morbidity and mortality from cancer. Alternative medicine focuses on creating effective anti-cancer treatments

that are non-toxic, sustainable, and cheap (Hewlings and Kalman;2017).

In his research against cancer, Wang et al (2020) indicated that curcumin has antifungal activity for tumors, especially melanoma in mice, it was found that the percentage of tumors in mice treated with oxide Nitric acid (NO) was 96%, while the proportion of tumor-bearing mice in the treated groups With curcumin exceeded 7%, this shows that tumor-generating nitric oxide in mouse skin is exposed for stress through the curcumin compound given orally, the researcher also proved that curcumin stimulates death autologous cancer cells by inhibiting the link between Carcinogènes and DNA.

Turmeric's Antioxidant Properties:

Due to its antioxidant characteristics, curcumin effectively guards against harm brought on by the actions of free radicals. Curcumin's advantageous traits come from its capacity to lower elevated cellular peroxysome levels (Edeas, 2006).

Turmeric's antimicrobial Properties:

Plants engage in interactions with numerous microbial communities for a variety of reasons, such as promoting growth, improving yields, and controlling disease. In turn, the host plants provide the bacteria with food and shelter (Reiter and Sessitsch; 2006).

There have always been substances and extracts made from many natural sources, particularly plants. Numerous studies have been done on the effectiveness of turmeric against fungi and fungal diseases, and (Upendra et al., 2011) demonstrated that adding turmeric powder to the cultivation of plant tissues resulted in a significant inhibition of fungal contamination.

The effect of turmeric on the levels of vital compounds in the blood

1.1 The effect of turmeric on cholesterol levels in the blood:

According to an Indian study, which involved 10 participants taking 50 mg of curcumin once a day for seven days and increasing HDL (high-density lipoprotein) levels by 29% at the same time, there was a 6.11% decrease in blood cholesterol levels. These findings demonstrated that humans' heart and vascular disorders are prevented by the turmeric plant (Edeas;2006).

1.2 The effect of turmeric on blood sugar levels:

According to studies that demonstrated the effectiveness of turmeric in treating diabetes (Sajithlal et al., 1998), curcumin (Nishiyama et al., 2005), in his study, reduced the complications associated with diabetes. This was accomplished by activating pancreatic cells to stimulate the production of insulin.

The cosmetic uses of turmeric:

Because it contains antioxidants and anti-inflammatory agents, turmeric was the first cosmetic product to employ its yellow hue in hair dye and skin care products. It also decreases the formation of facial hair and acne and improves skin tone in cells whose acid has been damaged. Al-Nawawi, it is employed in the production of soap, cosmetics, and fragrances. (karthikeyan and Gopinath ,2018).

Other uses for turmeric

Skin glow:

Numerous physiological and pharmacological processes are carried out by curcumin and other curcuminoids found in Curcuma longa (Ramirez-Tortosa etal;1999). It has been reported that turmeric extract is used in topical and oral preparations as a cosmetic or skin care product. It is asserted to be useful in treating aging skin brought on by sun exposure, skin injuries, increased thickness, and decreased suppleness. There is not much

experimental evidence to back up these statements (Maho and Yoshiyuki;2009).

Sebaceous glands produce sebum, which is a significant bodily secretion. Sebum makes up roughly 95% of the entire amount of lipids in skin. Sebum has a different composition during synthesis than when it reaches the skin's surface, where it is made up of triglycerides, free fatty acids, wax, squalene, sterols, and glycophospholipids. Sebum has a significant role in humans in defending skin against toxic chemicals and germs. By holding onto water, it also strengthens the skin's emollient function (Aaron and Robert ;2009).

Help heal wounds:

Since the dawn of Ayurveda, curcumin, a naturally occurring polyphenolic compound, has been used for its potent anti-inflammatory and therapeutic effects. Curcumin's capacity to reduce reactive oxygen species, promote the deposition of collagen, promote the creation of granulation tissue, and ultimately speed up wound contraction were all documented in several trials for curcumin application at the wound site. The ability of curcumin to treat wounds has been extensively studied, however due to its poor solubility, quick metabolism, and short plasma half-life, its use in treating wounds has been constrained (Kumari etal;2022).

Treat psoriasis:

The skin, as well as occasionally the joints, bones, tendons, ligaments, nails, and mucosal membranes, are all affected by the chronic, inflammatory, cell-mediated disease known as psoriasis. The "vulgaris" clinical form, which is distinguished by erythematous round or oval lesions covered in white-silver scales, is the most frequently documented, despite the fact that it may manifest with other clinical variants. Even though they can affect various parts of the body, cutaneous lesions are typically symmetrically distributed on the scalp, lumbar-sacral region, elbows, and knees (Lotti et al;2010).

The potential use of curcumin in the treatment of psoriasis has been highlighted in an increasing number of research over the past few years. There are numerous examples of its therapeutic effectiveness. The first is that curcumin may lessen oxidative stress in psoriatic lesions due to its antioxidative properties (Barygina et al;2013).

Recent research from two distinct investigations suggested that the therapeutic effectiveness of curcumin may also be influenced by its capacity to inhibit the phosphorylase kinases, which are elevated in psoriatic patients (Heng etal;2000).

The findings of Varma et al. regarding the use of curcumin at 25 and 50 M doses in the therapy of psoriatic-like cells (HaCaT cells), in vitro, are also intriguing. The authors demonstrated how curcumin might stop the growth of cells that resembled psoriasis by inhibiting the production of pro-inflammatory cytokines like interleukin 17, tumour necrosis factor-, interferon-, and interleukin-6. Additionally, curcumin greatly improved the function of the skin's barrier by up-regulating involucrin (iNV) and filaggrin (FLG) (Varma et al;2017).

Treat scabies:

Azadirachta indica ADR (also known as "Neem") and Curcuma longa (also known as "Turmeric") have both been used in the Ayurvedic and Sidha systems of medicine (Indian systems of medicine) to treat chronic ulcers and scabies. Neem and turmeric were combined to make a paste that was applied to 814 persons to treat their scabies. Within 3 to 15 days of treatment, a cure was attained in 97% of cases. We find that for the villages in impoverished nations, this is a highly affordable, easily accessible, effective, and acceptable way of treatment. So far, we have not observed any hazardous or negative reactions (Charles et al;1992).

Fights depression:

Curcumin has attracted researchers' interest in recent years and exhibits a wide range of characteristics that appear relevant to the

pathophysiology of depression. Curcumin probable mechanisms of action with a focus on the several systems that Major depressive disorder (MDD) can affect. Numerous studies have shown that curcumin is effective at regulating the levels of neurotransmitters, inflammatory pathways, excitotoxicity, neuroplasticity, disturbances of the hypothalamus, pituitary, and adrenal glands, insulin resistance, oxidative and nitrosative stress, and the endocannabinoid system, all of which may be involved in the pathophysiology of MDD (Ramaholimihaso et al;2020).

Reduces asthma attacks:

Since bronchial asthma is a chronic inflammatory illness of the airways, there are several available treatments, none of which have the ability to alter the course of the disease. Various in vitro and in vivo animal investigations have demonstrated that the yellow dietary pigment curcumin has a variety of pharmacological properties, chief among them an anti-inflammatory effect that may be important in the treatment of bronchial asthma (Abidi et al;2014).

Treat Irritable bowel syndrome (IBS):

In the absence of anatomical problems, irritable bowel syndrome (IBS) is a very common illness of the gut-brain axis that is defined by stomach pain and discomfort along with changed bowel patterns. Despite the significant incidence and disease burden of IBS around the world, no answers for its underlying pathophysiology have been provided. There is no specific drug for the treatment of IBS; instead, supportive therapy is frequently the most effective course of action. Recent research on both animals and people has shown that turmeric, or curcumin, has therapeutic potential for the treatment of IBS (Jafarzadeh et al;2022).

preparing turmeric syrup:

A concentrated herbal extract is combined with sugar and alcohol to create herb syrup. The decoction was used to make herbal syrup. Herbal decoction and sugar are used to help preserve and thicken the recipe. As a result, the formula has a longer shelf life. Additional sweets can also improve the flavor of some herbs. The syrup that is produced is excellent! It is described as a concentrated mixture of sugar and water, with or without other flavoring or therapeutic substances, that is thick and sticky (Jadhao et al;2022, Naji et al;2023).

The turmeric samples were cleaned of any impurities, chopped into small pieces with a commercial cutter, and dried in an ordinary oven at 50°C.Using a grinder, the dried turmeric was ground into a fine powder before being sieved through mesh size 40. 50 grams of powdered turmeric were macerated in 500 mL of 90 percent ethanol in water for 24 hours (Tanaka et al., 2008).To create an ethanolic extract, the macerate was altered and the supernatant evaporated using a vacuum rotary evaporator at 50°C.The ethanolic extract was then purified using n- hexane, separated twice, and mixed with amprotab (1 part extract:19 part amprotab) before being measured using FTIR spectroscopy and analyzed using HPLC (Al-Zuharri ,2011).

CONCLUSIONS:

According to the findings, C. longa could be used by the pharmaceutical industry to create new pharmaceutical products. However, in order to determine effective and secure dosages of C. longa and its primary bioactive ingredient, curcumin, suited for treating a number of disorders, human clinical trials and quality control studies are required.

The usual method for obtaining turmeric's health benefits is through long-term, low-dose food ingestion. For turmeric to be used rationally in the treatment of human diseases, a precise understanding of the effective dose, safety, and mechanism of action is necessary. If turmeric is to be used for addressing human needs and enhancing human welfare, additional clinical investigations are required. Turmeric has a number of beneficial effects on the body, including digestive, antibacterial, antiviral, anti-inflammatory, anti-tumor, antioxidant, and antiseptic properties. Numerous substances,

including curcumin, volatile oil, and curcuminoids, which have been discovered to have strong pharmacological activities, have been identified by phytochemical research of turmeric (Sahdeo Prasad and Bharat B. Aggarwal;2011).

Turmeric is known as the "yellow root" and has a long history in many different cultures. It is necessary to raise public understanding of its conventional applications, advantages, drawbacks, and conduct more research using improved bioavailable formulations. This ancient spice will gradually enter the dermatology toolbox of the future (Gopinath and Karthikeyan;2018, Ali et al 2021).

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