

Use of Turmeric for skin infection

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ABSTRACT –

Turmeric (*Curcuma longa*), and its primary bioactive component curcumin, have been used for centuries in traditional medicine (Ayurveda) to treat skin disorders, wounds, and infections. Due to increasing bacterial resistance to conventional antibiotics, there is growing interest in utilizing curcumin as a natural, low-cost, and safe antimicrobial agent for skin and soft tissue infections (SSTIs).

Turmeric, botanically known as *curcuma longa*, Linn, grows in tropical & subtropical regions throughout world, the turmeric possesses high nutritional value. Extensive research within last half a century has proven that most of these activities, associated with turmeric are due to curcumin. The medicinal properties of Turmeric include anti-inflammatory anti-oxidant, anti-coagulant, anti-diabetic, etc. It is effectively used in diabetes, various malignant disease, Alzheimer's disease & other chronic disease, The present paper reviews the Introduction, Taxonomical classification, Pharmacological activities, Ethanobotany, Uses of turmeric in traditional system, along with the current trends in the research on Turmeric

Keywords:

Curcuma longa, curcumin ayurvedic medicine, pharmacology.

INTRODUCTION -

Skin infections are among the most common health problems affecting individuals of all age groups worldwide. They are caused by a wide range of pathogenic microorganisms such as bacteria, fungi, viruses, and parasites, leading to conditions like acne, eczema, dermatitis, boils, wounds, and fungal infections. These infections not only cause physical discomfort but may also result in complications such as inflammation, delayed wound healing, scarring, and secondary infections. Although conventional antimicrobial agents are widely used for the treatment of skin infections, their prolonged use has been associated with adverse effects, high cost, and the increasing problem of antimicrobial resistance. Therefore, there is a growing need for safer, cost-effective, and natural alternatives for the management of skin infections. Medicinal plants have been used since ancient times for the treatment of various skin disorders due to their therapeutic properties and minimal side effects. Among these, turmeric (*Curcuma longa*) holds a significant place in traditional systems of medicine such as Ayurveda, Unani, and Siddha. Turmeric is a perennial herb belonging to the family Zingiberaceae and is widely cultivated in India and other parts of Asia. The rhizome of turmeric is well known for its medicinal value and has been extensively used as an antiseptic, anti-inflammatory, and wound-healing agent in traditional medicine. The major bioactive constituent of turmeric is curcumin, along with other curcuminoids and essential oils, which are responsible for its pharmacological activities. Curcumin exhibits a wide range of biological properties including antimicrobial, anti-inflammatory, antioxidant, and immunomodulatory effects. These properties make turmeric particularly effective in the treatment and prevention of skin infections. Turmeric has been traditionally applied topically in the form of pastes, powders, and ointments to treat cuts, burns, wounds, acne, and various microbial skin infections.

Recent scientific studies have supported the traditional use of turmeric by demonstrating its inhibitory activity against several pathogenic microorganisms such as *Staphylococcus aureus*, *Escherichia coli*, and *Candida* species, which are commonly responsible for skin infections. In addition to its antimicrobial activity, turmeric promotes faster wound healing by reducing inflammation, preventing oxidative damage, and enhancing tissue regeneration. Unlike synthetic drugs, turmeric is generally safe, well tolerated, and

economical, making it suitable for long-term use.

This project aims to emphasize the importance of natural herbal remedies like turmeric in modern pharmaceutical practice and encourages further research into the development of turmeric-based topical formulations for effective and safe treatment of skin infections.

The turmeric is known as the "Golden Spice" as well as the "Spice of Life". Turmeric has been used as medicinal for thousands of years. The medicinal properties of turmeric are known for thousands of times. The scientific name of turmeric is "*Curcuma longa*". It belongs to the family "*Zingiberaceae*". In terms of medicinal properties, turmeric is useful in various conditions, anti-inflammatory, cholagogue; hepatoprotective, blood-purifying, antioxidant, liver detoxifier and regenerator, antiasthmatic, anti-tumor, antiparasitic, stomachic, and carminative properties.



Chemical Ingredients

Chemical ingredients- Turmeric contains a coloring matter called as curcuminoids and essential oil. The principal element of the coloring matter is curcumin I in addition with small amounts of curcumin III, curcumin II and dihydrocurcumin. The essential oil contains mono- and sesquiterpenes like zingiberene, α -phellandrene, sabinene, turmerone, ar-turmerone, borneol, and cineole. Choleric action of the essential oil is attributed to β -tolylmethyl carbinol. The essential oil also contains α - and β -pinene, camphene, limonene, terpinene, terpinolene, caryophyllene, linalool, isoborneol, camphor, eugenol, curdione, curzerenone, cur-lone, AR-curcumenes, β -curcumene, γ -curcumene. α - and β -turmerones, and curzerenone.

Taxonomy:-Kingdom: Plantae Class = Liliopsida

Sub class = commelinids. Order = Zingiberales Family = Zingiberaceae. Genus = *Curcuma*.

Species = *Curcuma longa*

The wild turmeric is called *Curcuma aromatica* & the domestic species is called *Curcuma longa*.

Chemical Tests:

1. Turmeric greasepaint on treatment with concentrated sulphuric acid forms red colour.
2. On addition of alkali result to Turmeric greasepaint red to violet colour is produced.
3. With acetic anhydride and concentrated sulphuric acid Turmeric results violet colour. Under UV light this colour is seen as a violent red luminescence.
4. A paper containing Turmeric extract produces a green colour with borax result.
5. On addition of boric acid a sanguine- brown colour is formed which, on addition of alkalis, changes to greenish-blue.

Pharmacological Activities.

(i) Turmeric in respiratory diseases:

Turmeric is well accepted as kaphahura drug. Turmeric is anti-inflammatory and anti-purulent in nature. It is reported that volatile oil of turmeric as oral drug in a clinical trial was found very effective in treatment of bronchial asthma. Fresh rhizome, proved effective against whooping cough & other coughs & in dyspnea. A report of clinical trials in respiratory diseases such as bronchial asthma, bronchitis, bronchiectasis & tropical eosinophilia revealed turmeric could play a vital role as an adjuvant in improving airway resistance. Anti-asthmatic property of curcumin had been tested in guinea pig model.

(ii) Turmeric in urinary disorders:

Some recent experimental Studies suggested that the administration of curcumin is promising approach in the treatment of renal disorders. In Brunes (Darussalam), turmeric rhizome is used to cure urinary infection as a traditional method. Curcumin and curcumioids as oral drug to prevent the formation of urinary calculi. The nephroprotective effect of curcumin was analyzed in rat Curcumin protected ADR induce proteinuria, albuminuria, hyperlipemia, & urinary excretion Curcumin restored renal function

(iii) Turmeric in Jaundice conditions:

For curing hostility, turmeric paste was applied over the body of case, conjurer carried out magical expatriation of complaint. After that, turmeric was washed off & people believed that complaint also got washed off together with turmeric. Turmeric is effective in treating hostility & is recommended in diet of cases suffering from hostility or indeed pestilent hepatitis. Clinical trial with turmeric and phyllanthus fraternus for treating pestilent hepatitis has proved veritably effective without any side goods.

(iv) Antitumor, anticancerous activity:

Dietary turmeric could be effectively used as a chemopreventive agent in benzo-pyrene induced forestomach tumors in swiss mice. An ethanolic extract of a turmeric as well as an ointment containing curcumin, is reported to produce remarkable symptomatic relief in patients proved that present in with external cancerous lesions. It is now provide that antioxidants present in turmeric neutralize carcinogenic free radicals. In the course of a search for antitumor agents the extract of turmeric was found to be effective in inducing apoptosis or programmed cell death in human myeloid leukaemia cells. The chemopreventive effect of curcumin was assayed during promotion stages of colon cancer. The inhibition of adenocarcinomas of colon was reported as dose dependent. Curcumin treatment during initiation stages as well as throughout promotion stages increased apoptosis in colon tumors, compared with groups receiving azoxymethane and control death.

(v) Turmeric in digestive system:

Turmeric is traditionally used spice and has formed an essential component in Indian fashions from time old. In the digestive System, turmeric acts as a carminative and defensive against intestinal gas conformation. The hot energy of turmeric enables it as a digestive & goad. Turmeric is an important element of the group of medicines indicated for diarrhea, in Ashtanga for diarrhoea, in Ashtanga hridaya and Susruta samhita, two of

the most reputed lexicans Ayurveda. Turmeric is anti-flatulent digestive, goad due to its hot energy. It's reported to have anti-spasmodic exertion, inhibiting inordinate peristaltic movements of intestine. Anti-flatulent conduct of turmeric or curcumin in experimental creatures. Curcumin enhanced intestinal lipase, sucrase and maltase exertion. Turmeric greasepaint increased mucin stashing in rabbits & therefore acted as a guarding, agent against annoyances. Curcumin blocked indomethacin, ethanol & stress convinced gastric ulcers in experimental rats.



Cultivation:-

Turmeric is a imperishable condiment, 60 – 90 cm high with a short stem and tufted leaves; the rhizomes, which are short and thick, constitute the turmeric of commerce. The crop requires a hot and wettish climate, a liberal water force and a well- drained soil. It thrives on any soil- loamy or alluvial, but the soil should be loose and brickle . The field should be well prepared by ploughing and turning over to a depth of about 30 cm and freeheartedly manured with cropland and green coprolites. Sets or fritters of the former crop with one or two kids are planted 7 cm deep at distance of 30 – 37 cm from April to August. The crop is ready for harvesting in about 9 – 10 months when the lower leaves turn unheroic. The rhizomes are precisely dug up with hard picks, washed, and dried.

Ethanobotany:-

The genus *Curcuma* contains many taxa of economic, medicinal, ornamental and cultural importance. Throughout the world India Stands as largest producer of turmeric and its cultivation is done in 150000 hectares in India. Ethnobotany is the interdisciplinary study of the direct, traditional, and functional relationships between human societies and plants. It combines botany with anthropology, archaeology, and pharmacology to understand how indigenous cultures use plants for food, medicine, shelter, and ritual. Coined by John

Harshberger in 1895, it bridges cultural knowledge with scientific plant research, particularly focusing on traditional medicine and, often, medicinal plant usage.

Ethno (as in ‘ethnic’) refers to people, culture, a culture’s collective body of beliefs, aesthetic, language, knowledge, and practice. Botany is the study of plants—from the tiniest fern or blade of grass to the tallest or oldest tree. Botany includes all the wild plants and the domesticated species. Domesticates are species that we humans have selected over time from the wild plant species, then tamed and trained to optimally produce for us: food, fibers, medicine, materials, and more. The domesticated species are both the subject and object of agriculture. Ethnobotanical knowledge encompasses both wild and domesticated species, and is rooted in observation, relationship, needs, and traditional ways of knowing. Such knowledge evolves over time, and is therefore always changing and adding new discoveries, ingenuity and methods.

The impacts of modern human societies on traditional cultures and natural habitats have caused huge losses of individual species, and profoundly disrupted communities of species (plant, animal and fungal). Displaced or dispersed peoples—who may have passed along hundreds of generations of observations and customs via oral tradition—lose their languages, the names of things, and their place in the web of relationships. Sometimes new relationships develop as people migrate, and this generates new or modified ethnobotanical knowledge.



Turmeric covers 6 of total area under spices in country, which are substantially used for domestic purpose as seasoning and occupies only 8 of total product is exported annually & rest is consumed in domestic market. Maximum area under turmeric is in Andhra Pradesh followed by Maharashtra, Tamil Nadu, Orissa, Karnataka & Kerala. The rubric curcumaL. (Zingiberaceae) contains numerous taxa which are economically important as food, seasoning and as coloring, medicinal and cosmetic accoutrements. Turmeric having anti-seditious, choleric, anti-microbial, nonentity repellent, anti rheumatic, poisonous, anti-fibrotic anti-diabetic, anti-viral anti-hepatotoxic as well as anti-cancerous parcels in day to day domestic use as a folk lore drug from time old, with curcumin Oleoresin oil painting & other complex composites it's recently gaining significance as implicit source of medicines for colorful affections. Turmeric oil painting is used as aromatherapy and in incense assiduity piecemeal from religious, artistic uses. It's being as an thick part of Ayurvedic system of drug in India and China.

Turmeric is bitter in taste & its action is" pungent- suchlike after digestion & metabolism. Being briskly, light, acrid, and inconvenience, it's suitable to reduce rotundity stimulate all functions and clear channels. The use of turmeric as a spice, a color, or dress is well known the world over. Turmeric has got a wide range of conditioning, parcels & uses as per the ancient traditional drug textbooks, some of which are as sweet goad, alcohol, carminative and anthelmintic. It's effective in treating liver inhibition and dropsy, is extremely used for ulcers & inflammation, cures, flatulence, dyspepsia, anorexia, intermittent, complications, eczema, sprain, bruises, injuries, seditious troubles of joints, small pax, funk spell, & purulent ophthalmia, cough, ring worm and other parasitic common cold wave, skin conditions, piles, catarrh, coryza, hysterical fits, relieves pain in scorpion sting, reduces idle bumps, and is used

in treatment of urinary conditions, leucoderma, conditions of blood, bad taste in mouth, elephantiasis, diarrhea, bronchitis & gonorrhea.

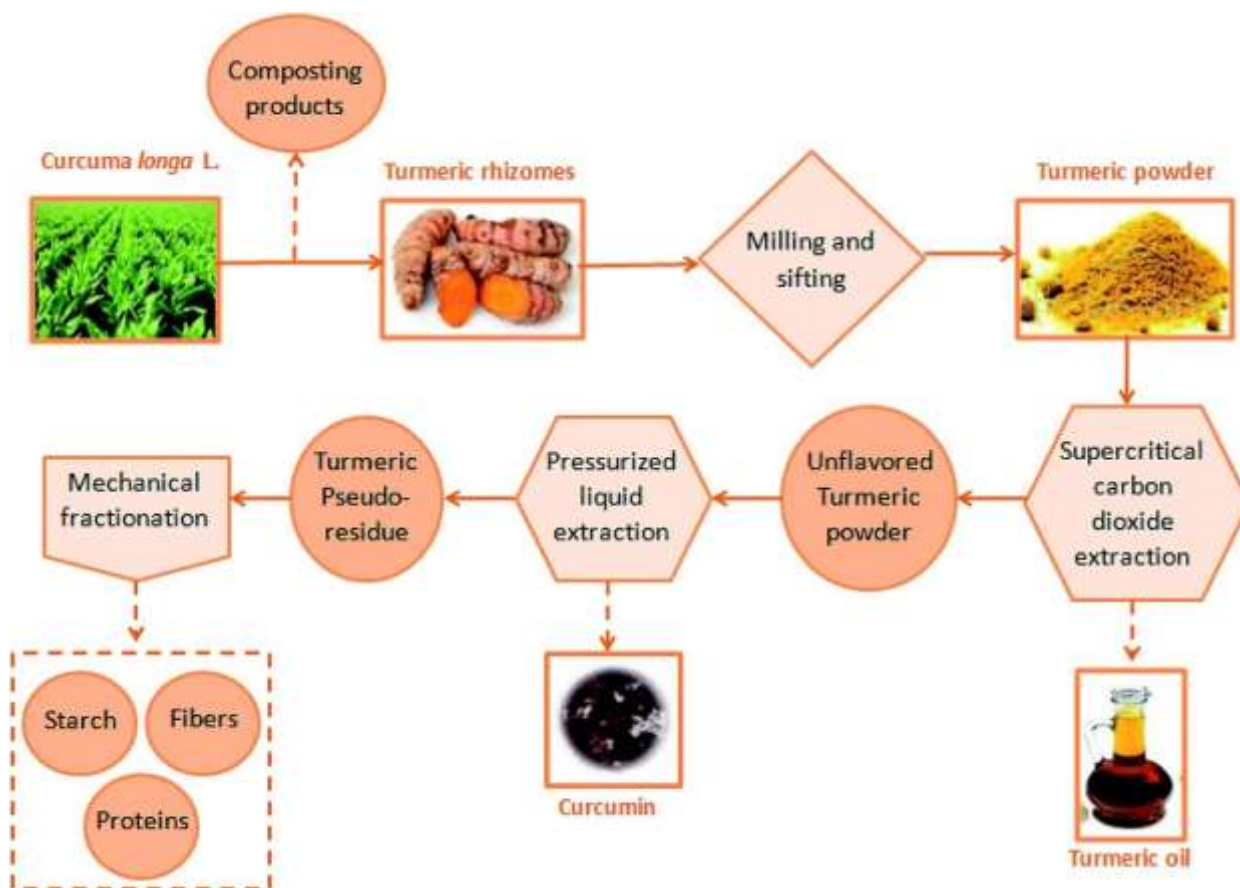
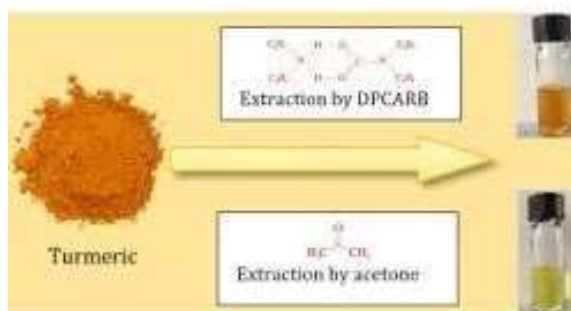
Extraction of Turmeric:

Brume distillation is used with unpredictable detergents to prize turmeric essential canvases. Then, an autoclave machine was used to produce controlled pressure and controlled temperatures to pass through the turmeric, after which the brume was cooled down using water and the essential canvases were attained. also, a analogous fashion was used with a unpredictable detergent, rather than the autoclave, where they were both hotted to 40°C. The birth took place by separating the unpredictable detergent from the solid oil painting after cooling down and filtering. Hydro- distillation is the last fashion used to prize turmeric oil painting, where the turmeric oil painting is passed through a hydro- distillation machine, yielding the essential canvases. Conventional Soxhlet birth is a traditional outfit generally used for the birth of lipids and accoutrements that aren't water-answerable. Soxhlet can indeed store these substances, maintaining their parcels. The study using the stock liquor after the insulation of curcumin from oleoresin contains roughly 40 oil painting. The insulation and identification of the antibacterial fragments from the leftover turmeric oleoresin were done by Soxhlet birth. The stylish birth was attained with 5 ethyl acetate in hexane, while the ar-turmerone, turmerone, and curlone were linked as the significant composites after gas chromatography analysis.

Turmeric extraction, primarily for isolating curcumin, involves drying and grinding rhizomes into powder, followed by solvent extraction using acetone, ethanol, or hexane. Soxhlet extraction (60–65°C for 6–8 hours) is highly efficient, often using acetone or 95% ethanol for maximum yield. Advanced methods include

ultrasound-assisted, microwave-assisted, and supercritical CO₂ extraction.

In order to extract turmeric oil, researchers have used steam distillation, hydro-distillation, and extraction using hexane. Hexane was combined with the oils after curcumin extraction and heated to 60 °C three times for one hour. The solvent was removed, which resulted in successful turmeric oil extraction. Extraction of curcumin from turmeric (*Curcuma longa*) is commonly achieved through solvent extraction techniques, with Soxhlet extraction using solvents like acetone, methanol, or ethanol yielding high amounts of curcuminoids. The process typically involves drying and grinding rhizomes, followed by 7-8 hours of extraction at temperatures around 50–60°C. Modern methods include ultrasound-assisted extraction (UAE) for higher efficiency and lower energy consumption.



Identification Tests:

Lead Chromate Test:-

To test the presence of chemicals in Turmeric greasepaint, mix a tablespoon of Haldi greasepaint with water. However, also it's real, if it settles down at the bottom and turns pale unheroic. On the other hand, thinned Haldi greasepaint will turn dark unheroic after putting it in water. An excellent turmeric adulteration

test, to check the presence of lead chromate, is to mix turmeric powder with water. Because lead chromate is a coloured pigment, it dissolves easily in water and forms streaks of the coloured solution, which indicates the presence of lead in turmeric.

Lead and its compounds are widely used throughout industry. They are found in lead acid storage batteries, paints, sheet metal, bearings, solder, piping, and ammunition. Lead arsenate is used in insecticides and herbicides. Lead chromate is used as a yellow pigment in paints, rubber, plastics, and ceramic coatings. House paints must have less than 0.05% lead.

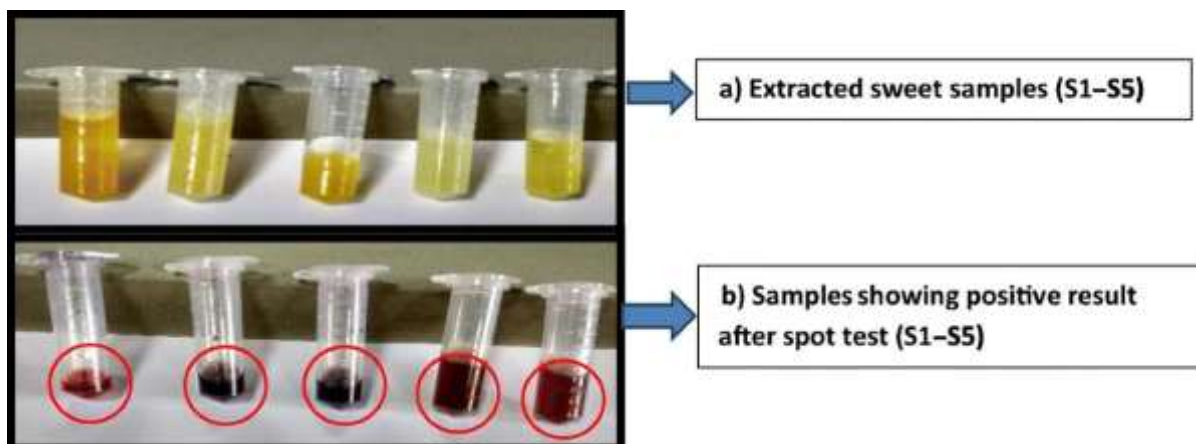
Various arts and hobbies involve lead-containing materials. Lead is found in artist's paints (certain pigments), ceramic glazes (particularly reds), solder used in stained-glass windows, and linings in containers used for distilling homemade whiskey. Certain Mexican, Middle Eastern, and Asian folk remedies and cosmetics contain lead.

In the past, lead solder was used to seal canned foods and lead pipes were used to carry drinking water. Tetraethyl lead was once routinely added to gasoline as an antiknock agent; certain vehicles may still use leaded gasoline (e.g., agricultural vehicles). Lead was commonly used in paint, with certain formulations containing up to 50% lead.

Metanil Test:-

To check whether your Turmeric is polished with the bright Metanil yellow. Add a pinch of turmeric greasepaint to a test tube, add a many drops of strong Hydrochloric acid. Shake it well. However, which may beget food poisoning, stomach cramps, If the result turns pink it indicates that there's a strong presence of Metanil.

The Metanil Yellow test is a chemical procedure used to detect the presence of Metanil Yellow, a non-permitted, toxic, and carcinogenic azo dye often used as an artificial colorant in turmeric powder, pulses (dal), and sweets.



Chalk Greasepaint Test:-

Turmeric is also thinned with pulverized chalk and to check that you need to add a tablespoon of Turmeric greasepaint in a test tube along with a many drops of water and Hydrochloric acid. However, also you must throw down the turmeric as it indicates the presence of chalk greasepaint in your Turmeric greasepaint If there are bubbles in the result.

The —Chalk| method easily indicates if your tire's tread has too much of an arc (convex shape of the tread) from too much pressure, or if it is slightly concave from a lack of pressure. Here are the simple tools you'll need to use the chalk method to figure out a satisfactory PSI for your tires: Chalk.

1. Hatch Cover Chalk Test (Maritime)

This is a visual inspection technique used to check the compression and alignment of ship hatch covers, ensuring they are watertight.

- **Procedure:** Chalk is applied evenly to the top edge of the compression bars (coamings). The hatch covers are then fully closed and secured.
- **Evaluation:** The hatch is reopened, and the rubber packing is examined. A continuous, thick chalk mark on the rubber indicates good, uniform compression.
- **Results:** Gaps or breaks in the chalk line indicate poor compression, which could lead to water leakage.
- **Limitation:** It is a preliminary check that does not guarantee complete weathertightness, as it cannot measure the actual, dynamic compression while the ship is at sea.

2. Oil-Chalk Test / Penetrating Oil Test (Welding/NDT)

This is a Non-Destructive Testing (NDT) method used to detect defects, such as surface-breaking cracks or pores, in weld joints, often in tank construction.

- **Procedure:** Wet chalk powder is applied to one side of the cleaned weld and allowed to dry. Low-viscosity oil (like diesel or kerosene) is applied to the opposite side.
- **Evaluation:** The joint is inspected after a set period (usually 4 hours) for yellow spots on the dry chalk.
- **Results:** The appearance of a yellow spot indicates that the oil has wicked through a leak in the weld via capillary action.
- **Standards:** Often conducted in accordance with API 650 or ASME Section V standards.



OIL CHALK TEST PENETRATING OIL TEST

Other uses of turmeric traditional system-

In traditional systems like Ayurveda, Siddha, and Unani, turmeric (*Curcuma longa*) is heavily used beyond cooking for its antiseptic, anti-inflammatory, and cleansing properties. Key uses include skin health (treating acne, wounds), digestive aid (relieving gas/indigestion), treating respiratory ailments (coughs, asthma), reducing inflammation (arthritis), and as a sacred dye.

Traditional Therapeutic & Household Uses:

- **Skin Care & Healing:** Applied as a paste to heal wounds, cuts, burns, rashes, and acne due to its antiseptic properties.
- **Digestive & Internal Health:** Used as a carminative to treat stomach pain, intestinal worms, and to reduce bloating. It is also known to help with liver issues and improve digestion.
- **Respiratory & Respiratory Issues:** Used to alleviate symptoms of the common cold, coughs, and sinus infections.
- **Inflammatory Conditions:** Traditionally used to manage arthritis, joint pain, and muscle soreness.
- **Ritual & Cultural Significance:** Used in Hindu weddings to signify prosperity (Haldi ceremony) and to dye the saffron-yellow robes of Buddhist monks and Hindu priests.
- **Natural Dye:** Used to dye fabric and textiles, particularly cotton and silk.
- **Oral Health:** Historically used in toothpaste mixtures to reduce plaque and improve gum health.



Conclusion-

Turmeric is one of the most precious & important factory on earth & is being used as a natural worder by ancient people of India. Turmeric is proving salutary in the treatment of numerous different health conditions from Cancer to Alzheimer's complaint. Studies at Jawaharlal Nehru contare for Advanced Scientific exploration in Bangalore, India shown that turmeric may play a vital part in fighting HIV/ AIDS, particularly HIV, type 110 Accordingly, agents that can modulate multiple cellular targets are now seductive objects of exploration. As this review has shown Curcumin is one similar agent and has implicit to treat colorful conditions. further considerably well controlled clinical trials are now demanded to completely

probe its eventuality. Anyhow of all these curcumin has established as foodstuff & also a natural drug because of its low cost, proven chemopreventive and remedial implicit & potent pharmacological conditioning of turmeric at in- vivo and in- vitro which made it a nature's precious medicine. Curcumin is fleetly moving from kitchen to the clinic.

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