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A Review on Herbal Plant Curcumin in the Manegement of Spinal Pain

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ABSTRACT

Curcuma Longa Linn. (C. Longa), popularly known as turmeric, belongs to the Zingiberaceae family and has a long historical background of having healing properties against many diseases. In Umami and Ayurveda medicine, C. longa has been used for liver obstruction and jaundice, and has been applied externally for ulcers and inflammation. However, there is a lack of literature on the therapeutic potential of C. Longa in contrast to curcuma. Hence, the present review aimed to provide in-depth information by highlighting knowledge gaps in traditional and scientific evidence about C. Longa in relation to curcuma. The relationship to one another in terms of biological action includes their antioxidant, anti- inflammatory, neuroprotective, anticancer, hepatoprotective, cardio protective, immunomodulatory, antifertility, antimicrobial, antiallergic, antidermatophytic, and antidepressant properties. Furthermore, in-depth discussion of C. Longa on its taxonomic categorization, traditional uses, botanical description, phytochemical ingredients, pharmacology, toxicity, and safety aspects in relation to its major compound curcuma is needed to explore the trends and perspectives for future research. Considering all of the promising evidence to date, there is still a lack of supportive evidence especially from clinical trials on the adjunct use of C. Longa and cur cumin. This prompts further preclinical and clinical investigations on curcuma.

Keywords: Inflammation, bioavailability, natural therapy, pain management, Curcuma longa, spinal pain, etc.

INTRODUCTION

The low back pain (LBP) represents the second leading cause of disability worldwide with an estimated 1% of the world population involved and represents a major welfare and economic problem in western countries. The traditional notion that acute nonspecific back pain is usually a benign, transient and self-limiting condition has been recently reconsidered with reports of 1-year recurrence rate of 20–44% and a lifetime recurrence of up to 72%. The actual, estimated lifetime prevalence rates of LBP and neck pain in adults are 91% and 66.7% respectively , but the incidence is disproportionally raising with respect to the population growth. Diagnostic assessment of the spinal pain can be a challenge especially in the case of disco genic and dysfunctional pain, due to the complex anatomy and function of the spine. Actually, the disco genic pain is considered a main cause of chronic LBP and disability, as a consequence of internal disc disruption (IDD) natural products have been employed in traditional medicine, and the have showed subtropics promise as a source of components for the development of novel pharmaceuticals. Turmeric is a Zingiberaceae (ginger) family herbaceous evergreen plant It Turmeric powder is often used in curries and mustards as a coloring and flavoring agent. Turmeric has traditionally been used to preserve mouth hygiene in India. Formillennia,it has been used for medical purposes in nations such as India and China to cure jaundice and other liver disorders.

Figure No.01 Curcuma Longa (Turmeric) Plant

GEOGRAPHICAL SOURCE

Curcuma Longa, commonly known as Turmeric, is native to South and Southeast Asia, with India being a primary origin. It is now widely cultivated in tropical and subtropical regions worldwide, especially in Asia, including China, Bangladesh, and Indonesia. It has also been introduced to some areas of Africa and other tropical countries. Geographical zone, zone any of the regions of the surface of Earth loosely divided according to latitude or longitude.

More Specific Details:-

¬ Origin:- While the exact origin is debated, it‘s generally believed to have originated in south or southeast Asia, with India being a likely candidate.
¬ Wide Distribution:-Curcuma Longa is now found in vary oust tropical and subtropical regions including.
Asia:-China, Indonesia, Bangladesh, Malaysia, Thailand, Myanmar, Pakistan, Japan, and other
Africa:-East Africa, West fricandeau some areas with alarmed wet tropical climate
Other Regions:-Jamaica, parts of the United Stateside the tropical countries.

TAXONOMICAL CLASSIFICATION

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Taxonomic Rank	Description
Kingdom	Plantae
Division	Magnoliophyta
Class	Liliopsida
Order	Zingiberales
Family	Zingiberaceae
Genus	Curcuma
Species	Curcuma longa L.

PHYSICAL CHARACTERISTICS -

Physical characteristics of turmeric (Curcuma longa) in a point-wise format:

- **Form**: Rhizome (underground stem)
- **Shape**: Cylindrical, elongated, and knobby with horizontal root scars
- **Size:** Typically, 5–15 cm long and 1–3 cm thick
- **Colour**: Outer surface is brownish-yellow to dark brown; inner part is bright yellow to orange-yellow
- **Texture**: Rough and wrinkled outer surface; fibrous inside
- **Odor:** Aromatic, warm, and slightly spicy smell due to essential oils
- **Taste:** Bitter and slightly pungent

DISTRIBUTION

Turmeric, scientifically known as Curcuma longa, is a perennial herbaceous plant known for its bright yellow rhizomes .It's character erizedby large, oblong leaves, yellow-white flowers, and under groundrhi zones that spread to form lumps. An upright, perennialherbto about 1m tall. The rhizome is thick and ringed with the bases of old leaves. Turmeric only reproduce via its rhizomes.

AIM

A Review on Herbal Plant Curcuma in the Management of Spinal Pain.

Objective

1. Anti-inflammatory and Antioxidant Properties: The consumption of Curcumin, has shown evidence, evidenced by animal studies, that it has anti-inflammatory effects, which could help alleviate pain, i.e., in lumbar radiculopathy

2. Neuropathic Pain: Evidence suggests cur cumin may reduce neuropathic pain as well by inhibiting pathways associated with pain signaling and inflammation in the form of the spinal cord.

3. Spinal Cord Injury: Studies indicated that curcuma improves neurological function and reduces secondary injury due to spinal cord injury

4. Clinical Applications: Although research has been promising in animal models, additional clinical trials are needed to determine dosing and effectiveness of curcumin in humans with spinal pain or spinal cord injury

5. Possible Benefits: Curcumin may help decrease neuropathic pain, as well as, inhibits inflammatory response associated with spinal cord injury and could contribute to neurological recovery.

METHODOLOGY

MATERIALS AND METHODS

Mainly curcuma use in the root of plant

- WASHING & DRYING

. MATERIALS AND METHODS

Curcuma is used in the root of plant

• WASHING & DRYING

1. Sorting and Initial Cleaning:

It is then cleaned by washing with water to remove loose soil and other dirt. Before processing, newly harvested turmeric rhizomes are sorted to separate damaged, rotten, or diseased roots.

2. Soaking and Disinfection:

If necessary, soak the rhizomes in water to loosen any dirt that has become hard. A mild disinfectant solution (for example, potassium permanganate or chlorine at 50–100 ppm) may be applied for the control of microbial load followed by thorough rinsing with potable water.

3. Boiling

The cleaned rhizomes are boiled or steamed at 80–90°C for 30–45 minutes. This step enhances cooler, reduces drying time and helps keep active compounds like curcuma..

4. Drying Methods:

The cured rhizomes get dried using any of the following methods: Shade drying (15–25 days for better curcuma preservation), Hot air oven drying (50–60°C for 12–16 hours) Sun drying (10–15 day) Solar drying (3–5 days), until they reach about 8–10% moisture content.

5 **.Post-Drying Handling and Storage**:

After drying, the rhizomes get cooled, packed into moisture-resistant bags and stored in a clean, dry, and ventilated place for maintaining quality as well as preventing pain contamination.

EXTRACTION

SOXHLET EXTRACTION

A. Process of Extraction

- ✓ The finely ground crude drug is put in a porous bag or "thimble" made of powerful filter
- ✓ paper that is put in the Soxhlet apparatus chamber in this technique.

- ✓ The flask Extracting solvent is heated and condensed in condenser by its vapors. The condensed Extracting drips into and extracts the crude drug through contact into the thimble.

- ✓ When the chamber liquid level increases to the top of the siphon pipe, the chamber siphon liquid material comes in the flask.
- ✓ About 20 gems of powder was filled in a thimble separately.
- ✓ The individual thimble was placed in extractor region of Soxhlet apparatus and subjected to extraction with 200 ml of methanol, petroleum ether ethanol and water successively up to 48 hrs. in each solvent.
- ✓ Each of solvent extract was concentrated separately using rotary evaporator.
- ✓ After concentration the extracts were preserved at 10°C in refrigerator for further phytochemical analysis.
- ✓ It is only used as a batch process on a tiny scale, but it becomes much more economical and feasible when transforminto a medium or large-scale ongoing Extraction method

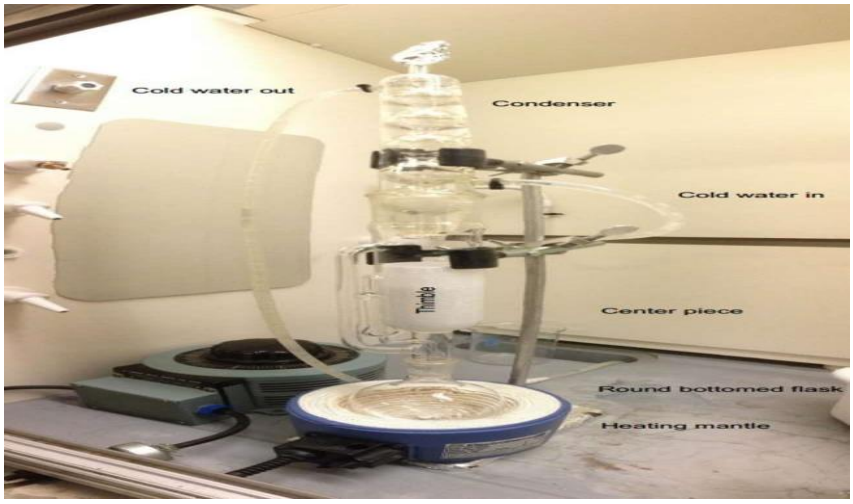

Figure no.02Soxhlet Extraction

EXTRACTION RESULT

Drug	Chemical constituents	Pharmacological uses
Curcuminoids (2–5%)	- Curcumin (major) - Desmethoxycurcumin (DMC) - Bisdemethoxycurcumin (BDMC)	Antioxidant, anti-inflammatory, anticancer
Essential Oils (2–7%)	- Ar-turmerone - α-turmerone - β-turmerone - Zingiberene - Corleone	Antimicrobial, neuroprotective, insecticidal
Polysaccharides	- unman A, B, C	Immunomodulatory effects
Proteins, Resins, Tannins	Present in minor amounts	Supportive biological activity
Minerals and Trace Elements	Iron, potassium, manganese, zinc, calcium	Nutritional benefits

RESULT

The Soxhlet extraction apparatus is commonlyused for extracting bioactive compounds from plant materials like Curcuma Longa (Turmeric). When using this method for CurcumaLonga, the results typically includes a concentrated extract that contains a variety of phytochemicals, depending on the solvent used and the extraction time. Here‘s a breakdown of what you get The phytochemicals extraction of Curcumin ofCurcuma Longa (Turmeric) Rhizome was done successfully by drying them room temperature and grounding them into fine powder material to increase its surface area to allow maximum solvent content. These powder was then extracted with acetone solvent. The whole process was done successfully in Soxhlet apparatus for 8 hours and TLC method isolated Curcuminoids and obtained crude Curcumin. Soxhletex traction powder type call yield’s between6.9% Curcumin.

CONCLUSION

- In this major project (synopsis), I will mention or include introduction of herbal medicine and its uses also my projected plant curcuma longa (Turmeric) and mentioned disease fungal. Plant introduction and project plant research background such as extraction process characterization process, reported biological activity and also mention phytoconstituents present in projected curcuma longa(Turmeric).
- The observation and results of this study provide the information that aqueous extract of Curcuma longa Rhizome have cancer protective effect which requires further experiment. It is recommended that further studies regarding pharmacokinetics, pharmacodynamics, toxicology and posology of aqueous extract of curcuma longa should be undertaken to develop it as a useful cancer protective agent for human.

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