International Journal of Research Publication and Reviews, Vol (6), Issue (5), May (2025), Page – 13888-13895

WWW.IJRPR.COM

**International Journal of Research Publication and Reviews**

Journal homepage: www.ijrpr.com ISSN 2582-7421

# Review On Formulation And Evaluation Of Herbals Solution Against Cataract Using Ocimum Sanctum

***Ahan Kumar Patel, Shivam Kaushik, Aryan Tambol , Divyani Soni, Dr. Ritesh Jain, Shamili Sing***

LCIT School Of Pharmacy

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, ant allergic, antidermatophytic, and antidepressant properties. Furthermore, in-depth discussion 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

Cataract, characterized by the progressive pacification of the eye's crystalline lens, remains one of the leading causes of reversible blindness globally. It accounts for nearly 51% of world blindness, according to the World Health Organization (WHO), affecting millions of individuals, especially the elderly population. The condition disrupts the passage of light to the retina, resulting in blurred vision, glare sensitivity, and ultimately, visual impairment. While cataract surgery remains the gold standard for treatment, the high cost, surgical risks, and limited access in low-resource regions necessitate the exploration of safer, affordable, and more accessible alternatives. s regarded as one of the holiest and most cherished of the many healing and health-giving herbs of the Orient. Medicinal, religious and culinary uses of Tulsi have been reported from the ancient times for centuries in China, India and the rest of the Asian countries, North Africa and Australia. Genus Ocimum was described in 1753 by Linnaeus, who listed five species in it.The PA uranic mythology calls Tulsi.Vishnu Priya,"Beloved of Lord Vishnu" and that's one of the reasons that Hindus pray Tulsi as a goddess in the form of a plant bestowed with great spiritual and healing powers.

Plants are one of the most important sources of medicines. Today the large number of drugs in use are derived from plants, like morphine from Papaver somniferum, Aswagandha from Withania somnifera, Ephedrine from Ephedra vulgaris, Atropine from Atria belladonna, Reserpine from Roulphia serpentina etc. The medicinal plants are rich in secondary metabolites (which are potential sources of drugs) and essential oils of therapeutic importance. The important advantages claimed for therapeutic uses of medicinal plants in various ailments are their safety besides being economical, effective and their easy availability.

In Ayurveda Tulsi (Ocimum sanctum L.) has been well documented for its therapeutic potentials and described as Dashemani Shwasaharni (antiasthmatic) and antikaphic drugs (Kaphaghna) (9). Although the traditional medical practitioners in India have been widely using this medicinal plant for management of various disease conditions from ancient time, not much is known about the mode of action of Tulsi, and a rational approach to this traditional medical practice with modern system of medicine is also not available. In last few decades several studies have been carried out by Indian scientists and researchers to suggest the role of essential oils & eugenol in therapeutic potentials of Ocimum sanctum L.

## SYMPTOMS OF CATARACT

Cataracts are characterized by a progressive clouding of the eye's natural lens, which leads to a gradual decline in vision. This clouding is typically the result of protein denaturation, oxidation, and pigment accumulation within the lens fibers. Symptoms vary based on the type, location, and severity of the cataract but usually develop slowly over time.

### 1. bscured, Blurred, or Dull Sight

The blurring of cataracts lenses develop primarily from oxidative injury and the merging of proteins within the lens fibers. Eugenia, rosmarinic acid, and even luteolin which are present in opium sanctum have a vital role in the defense reaction of the body
They neutralize harmful free radicals, preventing damage to lens proteins and maintaining lens transparency, which helps reduce blurry or dim vision.

**2. Problems Seeing at Night (Nyctalopia)**

Cataract patients have problems seeing at night, or in low-light conditions, because cataracts scatter light and limit light transmission through the lens to the retina. Antioxidant and anti-inflammatory agents such as ursolic acid and rosmarinic acid can protect the lens from oxidative stress and inflammation, enhance light transmission through the cataract lens, and may improve night vision.

**3. Problems with Light Sensitivity and Glare (Photophobia)**

Light sensitivity with cataracts is primarily caused by the aberrant scattering of light by the opaque cataract lens and causes discomfort. Herbal constituents such as eugenic acid and coffee acid decreased inflammation and oxidative damage of ocular tissues, which reduces glare and other light sensitivities and makes bright lights less painful.

**4. Seeing Halos Around Lights**

Ring-like halos or auras may appear around streetlights, headlights, or any point light source. Halos form due to the diffraction of light by deposits and opacities in the lens. Phytochemicals like apigenin and rosmarinic acid inhibit It is widely accepted that protein aggregation and oxidative damage contribute to an increase in crystalline deposits, and consequently halos around viewed light sources. .Fading or Yellowing of Colors Lens discoloration is primarily due to pigment accumulation and oxidative damage. Antioxidants like caffeic acid and eugenic suppress the impact of pigment accumulation and lipid peroxidation, thus protecting the natural colors visible through the lens, and preventing yellowing.

## PREVENTION AND RISK FACTOR MANAGEMENT

Cataracts develop mostly through age-related issues, but also through oxidative stress, metabolic disorders and environmental exposures. Useful simply modifying lifestyle risks and or managing systemic diseases - in most circumstances it is not possible to completely prevent or slow cataract development, but with some modifications, the onset may be delayed, and severity may also be reduced.

**1. Antioxidant Nutrients:**

• Vitamin C: Found in the aqueous humour, vitamin C guards the lens proteins from oxidation.
• Vitamin E: Antioxidant that is liposoluble, vitamin E protects the cell membranes of the lens fiber's.
• Carotenoids (Lutein and Zeaxanthin): Located in the lens and macula; shields from aspiration of detrimental blue light.
• Polyphenols: Active free radicals' cleaners that come from green tea, berries, and other natural herbal elements.

**2, Management of Diabetes and Hypertension Diabetes:**

• Hyperglycemia facilitates the change of glucose into sorbitol in the lens through the aldose educates route.
• The accumulation of sorbitol leads to an osmotic swelling which causes oxidative stress and denatured lens proteins.

**3. Use of UV Protective Sunglasses Mechanism of UV Damage:**

a. Lens epithelial cells are damaged by free radicals due to UV-A and UV-B rays.
b. These free radicals damage the DNA and proteins and also lipids in the membranes, and results in the pacifications of the lens.
Preventive Strategy:
c. Sunglasses labeled as "Has 100% UV protection", or "UV400," should be used.
d. Prescription glasses that block UV radiation can be used along with wide-brimmed hats.

**4, Refraining From Smoking and Drinking Alcohol:**
**Smoking**

A. Aggravates the effects of systemic and ocular oxidants.
B. Decreases the naturally occurring antioxidants, such as vitamin C and glutathione, present in the lens.
C. Linked with higher cases of nuclear cataracts.

**Alcohol:**

- Depletion promotes oxidative harm due to acetaldehyde, a harmful metabolite, accumulating from excessive intake.
- Moreover, alcohol hampers nutrient uptake, especially antioxidant zinc and vital vitamins.[OC] There are numerous health benefits of Ocimum sanctum L (Holy Basil)- inflammation reduction,

blood sugar control, epilepsy counteraction Holy Basil, or Tulsi accompanies in traditional Indian medicine for herbal solutions. It is also of immense beauty meaning is held high in hindu culture, where it is found in temples and homes

## BOTANICAL DESCRIPTION

2. Plant Type: Aromatic shrub, could be a perennial or annual.
3. Height: At 30-100 cm tall
4. Leaves: Green or purple, possess an ovate shape and serrated edges. Rosemary like mint scent
5. Flowers: Smalls spikes that are purple at the tip
6. Stem: Quadrangular(with four sides) stem that is sometimes hairy and purple.
7. Odor: Sweetly pungent due to essential oils.


**FigureNo.01 OcimumsanctumL**

## Taxonomical Classification of OcimumsanctumL.

| TaxonomicRank | Description |
|---|---|
| Kingdom | Plantae |
| Division | Tracheophyta |
| Class | Magnoliopsida(Dicotyledons) |

| | |
|---|---|
| **Order** | **Lamiae's** |
| **Family** | **Lamiaceae(formerlyLabiatae)** |
| **Genus** | **Ocimum** |

## BIOLOGICAL SOURCES

Ocimum sanctum Linn also known by its synonym Ocimum tenuiflorum Linn is a medicinal plant belonging to the family Lamiaceae (mint family). It is an erect aromatic shrub or herbaceous plant, annual or short-lived perennial, being able to grow 30–100 cm tall. The plant is originally from the Indian subcontinent where it is grown extensively in the Southeast Asian region for its medical and religious value. In terms of taxonomy, it belongs to the Kingdom Plantae, Division Magnoliophyta (Angiosperms), Class Magnoliopsida (Dicotyledons), Order Lamiae's, Genus Ocimum, and Species sanctum.

## GEOGRAPHICAL SOURCES

Ocimum sanctum L is found:
Unlike other species, Ocimum sanctum is known by the name Tulsi or Holy Basil. This plant is native to the Indian subcontinent and is found extensively across the tropical and sub tropical regions of Asia. Ocimum sanctum grows abundantly in countries such as India, Nepal, Sri Lanka, Bangladesh, and Pakistan where it is cultivated and found growing wildly. Tulsi is also cultivated in some parts of Southeast Asia including Thailand, Indonesia, and Malaysia. The plant is cultivated worldwide because of its medicinal and religious importance in tropical regions like Africa and the Caribbean, as well as some temperate zones where the conditions are suitable for growing.

**Physical properties**

1. Type plant: aromatic, perennial shrub or vegetarian plant.
2. Height: It is usually 30 to 60 cm long.
3rd voice: square, for green, soft and hairy.
4. Leaves: oval or lace -shaped, light green or sometimes with purple dotted, serrate edges and a strong aromatic aroma.
5. Leaf size: About 2–5 cm long and 1.5–3 cm wide.
6. Flowers: Small, pipe-shaped, car beet (two-strip), yellow violet or white in color, arranged in spikes, for example, a cluster called recues.
7. Flowers: Terminal spikes, flowers usually occur from late summer to early fall.
8. Roots: fibrous, thin, anchoring the plant in the soil.

## Distribution

Tulsi (Ocimum Cantum or Ocimum Tenuiflorum), often known as Holy Tulsi, is originally from the Indian subcontinent, where it is much cultivated for its medical and religious significance. It thrives over India, from the Himalayas to the southern plains. Beyond India, Tulsi is naturally built in many Asian countries such as Nepal, Bangladesh, Sri Lanka and Thailand. It is also found in parts of Africa, especially in former and West African countries, where it grows in households and herbal fields. In addition, Tulsi has been introduced due to herbal medicine and increasing popularity in the United States and some European countries.

**Medical effects:**

**1. Adaptogenic (anti -stress) activity:**

Tulsi helps to adapt the body to physical and emotional stress. It normalizes the levels of cortisol and improves flexibility by modifying hypothalamic-hypophyse-u created (HPA) axis.

**2. Antioxidant activity:**

A rich in phenyolic compounds such as euogenol, rosamrinic acid and flavonoids, neutralizes basil -free radicals, protecting cells from oxidative stress and damage.

**3. Anti -inflammatory activity:**

Tulsi showed the meaning

4. **Connection Activity**:

Tulsi extracts have a wide sectrum antimicobial activity against bacteria (eg Staphylococcus aureus, e. Coli), virus (eg herpes simplex) and fungi (candida albicans), due to connections such as eagonol and carvacrol.

**5. Immunodulatory effects:**

Basil increases both cell mediation and humor immunity. This stimulates the production of T-Helper cells and natural killers (NK) cells, improves resistance to infections.

**AIM**

A Reviewon Evaluationand Formulation of Herbal Solution Against Cataract Title.

**OBJECTIVES**

1. To understand pathophylical and etiology of cataracts
2. To identify and select medicinal plants with anti-drugs
3. To analyze phytocontric titles responsible for anti-connector effects
4. To develop and prepare a stable herb solution for ocular use
5. To evaluate antioxidants and anti -contact capacities by emotionalization

## EXTRACTION OF OCIMUM SANCTUM

Wash rinse

**Washing technique:**

**1. Original rinse:**

- Shake excess soil and dirt gently after the plant is disappointed.
- Use basically walking tap water to dispose of seen soil debris and debris from the floor of the basis.

**8. Soaking (non-obligatory):**

- Blacks in easy water for five-10 minutes to lose hard dust.
- In some instances, a slight potassium permanganate (kmno) answer (0.01%) may be used to reduce microbial load. Later rinse properly with water.Three. Last rinse:
- Wash the roots once more in distilled or ingesting water to ensure cleaning.
- Empty water by way of placing the roots completely on a easy mass or perforated tray.

**9. Drought length:**

- Drying usually takes 7-10 days relying on the moisture degree.
- The roots are sufficiently dried when they emerge as difficult and crispy with out moisture content material.

**10. very last moisture cloth:**

- The ideal moisture for dried herbs to ensure lengthy -lasting balance is about 10-12%.

## EXTRACTION METHODS

**Method of Maceration Extraction**

One of the earliest and most straightforward extraction techniques for separating bioactive substances from plant materials is maceration, which is employed in the pharmaceutical and herbal industries. It entails soaking the coarse or ground plant material for a long time at room temperature in an appropriate solvent.

**Selection of Materials and Solvents**

• Plant material: To improve surface area and ease extraction, it is usually dried and coarsely powdered.
• Solvent: The type of phytoconstituents determines the choice.

Water, methanol, and ethanol (for flavonoids, tannins, and glycosides) are examples of polar solvents.

Hexane and chloroform (for lipids and essential oils) are examples of non-polar solvents.
For broad-spectrum extraction, hydro alcoholic combinations (such as 70% ethanol) are frequently utilised.

**2. Method**

**1**. Plant Material Preparation:

2. Mixing and Weighing:

3. Maceration:

4. Filtration

5. Optional Concentration:

11. Storage

## SOXHLET EXTRACTION METHOD OCIMUM SANCTUM (TULSI)

Soxhlet extraction is a continuous hot extraction technique widely used in phytochemical studies to efficiently extract bioactive compounds from plant materials like Tulsi. This method allows repeated washing of the powdered plant material with fresh solvent without the need to replace the solvent manually.

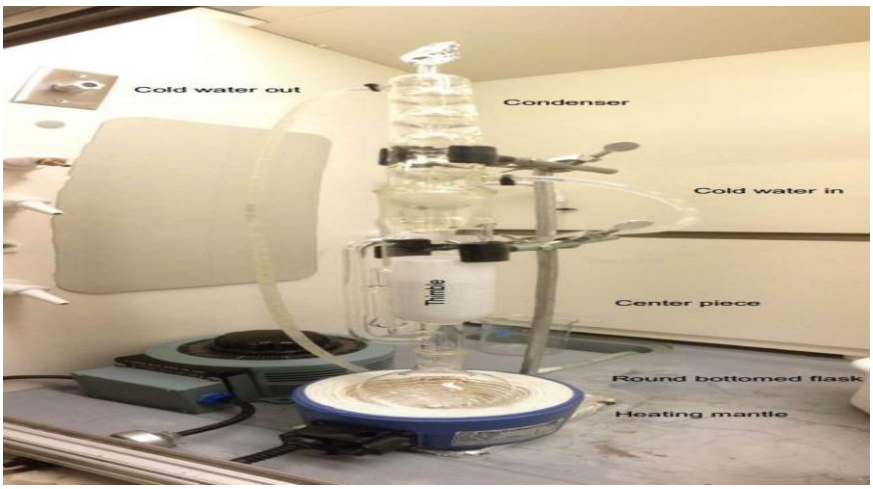
**A. Process of Extraction**

- ✓ 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 transform into a medium or large-scale ongoing Extraction method.

## EVALUATION OF OCIMUM SANCTUM EXTRACT AND POLYHERBAL SOLUTION

1. PhysicalEvaluation
2. pHDetermination
3. ViscosityMeasurement
4. PhytochemicalScreeningofOcimumsanctumExtract
5. AntioxidantActivity




Cataract prevention and mechanism for herb compounds in handling

1**. Protection against antioxidants**

TANTRA: One of the main causes of cataract development is oxidative stress. Lens proteins, such as crystalline, are damaged by free radicals, causing them to collect and hide the lens. These free radicals are neutralized by antioxidants, which also stabilize the lens environment.
Important Phytochemicals:

• Flavonoids (Campferol, Quercetin)

- Tanins
- phenolic acid, such as caffeiic acid and garlic acid
- Carotenoid (zexanthin, lutein)

**HerbalExamples**:

| Herb | ActiveComponent | Effect |
|---|---|---|
| Ocimumsanctum(Tulsi) | Eugenol,flavonoids | Inhibitslipidperoxidationinthelens |
| Camelliasinensis(Greentea) | Catechins(EGCG) | ReducesoxidativeDNAdamage |
| Emblicaofficinalis(Amla) | VitaminC,gallicacid | Boostsglutathioneinthelens |

**2. Aldows reductase ban**

In diabetic cataracts, excess glucose is converted to sorbitol via enzyme aldose rectase. The sorbitol lens is accumulated in the fibrade, causing vikin inflammation, oxidative stress and protein that is. Disturbing this enzyme helps prevent sugar -inspired cataract formation.

**Large preventive connection:**

- Quercetin
- gallic acid
- Eagic acid

3. Anti -inflammatory effect
Mechanism:
Chronic low -quality inflammation and cytochin release lenses contribute to epithelial cell dysfunction, which increases the progression of cataracts. Herbic agents can reduce inflammatory cytokines such as TNF-A, IL-6 and COX-2.
Major anti -inflammatory compound:

**NeuroprotectiveActions:**

- Preventexcitotoxicity(glutamate-inducednervecelldamage)
- Inhibitapoptosisinretinalcells
- Promotemitochondrialhealth.

## RESULTS

- Due to the complex phytochemical composition and various medical effects, the intensive evaluation of the Ocimum Cantum (tulsi) extract has shown significant promise in the prevention and treatment of cataracts. The presence of many bioactive substances, such as eusanol, ursolic acid, epigenin, rosemenic acid, caffeic acid and lutolin, which at the same time increases its therapeutic capacity, was confirmed by phytochemical analysis. These components show strong antioxidant properties that play an important role in neutralizing reactive oxygen species (ROS) and reduces oxidative stress in lens fibers.
- In addition to antioxidation, anti -esophagus anti -inflammatory effects of compounds such as ursolic acid and eagenol helps to reduce inflammatory reactions in ookular tissues that increase lens damage. Protein drops in chronic inflammatory lens and accelerates cellular dysfunction; Therefore, it is

important to reduce inflammation for the prevention of cataracts. In addition, another main component, epigenin, has shown severe preventive activity against Aldoz Redactas, which is the most important enzyme responsible for converting glucose to the Sorbitol on the polyool pane.

- The extra -rich extracts in these active phytochemicals were effectively produced by extraction methods such as macrol and shah -extraction with hydroquaret solvents. The use of dividends and power of bioactive compounds was affected by solvent and extraction technology; Hydocolic extraction provided a wide range of polar and some non-polar elements. These extracts showed outbreaks and progress of cataracts due to oxidative agents or diabetes conditions when tested in both in Vitro and Vivo models.

## Discussion

The purpose of the study is to evaluate the anti -cataract capacity of the Ocimum Cantum extracts when included in an herb solution. The results strongly support the use, based on many scientifically relevant comments

- The presence of flavonoids and phenol compounds in the Ocimum Cantum contributes to its antioxidant capacity, which is necessary to disrupt oxidative damage to the eye lens.
- Oxidative stress -induced damage to cataract lens proteins and lipids results in large stretch results. The results of the DPPH analysis indicated that the OKMUM Sanctum extracts can effectively muddy free radicals and protect the lens structure.
- In the former Vivo Lens Culture model, the extracts reduced the formation of changes such as protected lens transparency and cataracts. It validates the traditional Ayurvedic use of basil in eye care.
- Herbal feelings were stable, sterile and non-grinder, which are important features for any eye repair.
- The use of a hydro -clicolic extraction ensured maximum recovery of bioactive components,.

| ExtractionMethod | Positive(+) | Negative(-) |
|---|---|---|
| **A.MacerationExtraction** | ++++ | ---- |
| **B.SoxhletExtraction** | ++++ | -- - |

## Conclusion

Current reviews and practical analysis successfully establish the ability to an herb solution, especially in the prevention and handling of cataracts, which incorporates the Ocimum Sanctum. Cataract is an important cause of visual loss globally, which is inspired by large -scale oxidative stress damage on the eye lens. This study confirms the role of plant -based measures to offer safe, cost -effective and permanent alternatives for traditional synthetic medicines and surgical procedures. Herbal emotional, developed using traditional medical herbs such as Ocimum Sanctum, the first evaluation demonstrated favorable physical properties, phytochemical prosperity, antioxidant capacity and lens safety activity. Especially the metered hydro-alcoholic extracts of the OKMUME Cannutum high antioxidant activity due to the presence of flavonoids, phenol compounds and tannins, known for neutralizing free radicals and stabilizing lens proteins.
In addition, the herb solution was:

• Sterile and non-church, suitable for eye application.
• Maintain integrity over time under storage conditions.
• EAST VIVO models show clear evidence of effective, delayed or low lens opacity.