

CURCUMA CAESIA

- **Scientific Name:** Curcuma Caesia
- **Common Names:** Black Turmeric, Kali Haldi (Hindi), Nalla Pasupu (Telugu), Karumanjal (Malayalam)
- **Family:** Gingibaraceae
- **Plant Part Used:** Rhizome
- **Origin:** India
- **Method Used:** HPLC

TYPES OF TURMERIC:

Curcuma caesia (Black Turmeric)
Curcuma longa (Common Turmeric)
Curcuma aromatica (Wild Turmeric)
Curcuma amada (Mango Ginger)
Curcuma zedoaria (White Turmeric or Zedoary)
Curcuma aeruginosa (Green Turmeric)
Curcuma angustifolia (East Indian Arrowroot)
Curcuma alba (White Turmeric)



OVERVIEW OF TURMERIC

Turmeric (*Curcuma longa*), a vital plant in South Asia, holds immense historical and cultural significance as a medicine, condiment, and color additive. Known as "Indian saffron," turmeric's vibrant hue first garnered attention, later integrating into religious and socio-cultural traditions. It has been mentioned extensively in Ayurveda, the ancient Indian system of medicine, and its use dates back to the Vedic age, where it was referred to in Sanskrit as "Haridara," symbolizing its association with Lord Vishnu. Prominent ancient Indian physicians, like Charaka and Sushruta, documented turmeric's medicinal properties, highlighting its application in treating wounds, stomach ailments, and poisons.

Beyond its therapeutic uses, turmeric was employed in dyeing textiles and performing religious rituals. Its significance extended globally, as evidenced by references in the pharmacological works of Dioscorides, and its presence in the trade routes of the Indus Valley Civilization. Regions like the Greco-Roman world, Egypt, and the Middle East also valued this versatile herb.

BRIEF HISTORY ABOUT BLACK TURMERIC

Black Turmeric has been recognized as a medicinal herb containing mixtures of different bioactive compounds that may act individually, additively, or in synergy to improve health. The plant contains a good percentage of curcumin which possesses many curative properties, as usually reported from all the curcuma species. The multiple phytoconstituents like curcuminoids, oil content, flavonoids, phenolics, amino acids, protein and high alkaloids, found in the rhizome, are responsible for the antimicrobial, antitumor, anxiolytic, anti-inflammatory, antiulcer, CNS depressant and antioxidant activities. Vineela et al. The chemical structure of phenolic compounds having hydroxyl group attached to benzene ring in its structure provides the ability to act as free radical scavenger. Antioxidants have been reported to act as scavengers of singlet oxygen and free radicals in biological systems. Black turmeric, used in traditional and folk medicine, seems to be a promising source of active therapeutic agents. Further studies on isolation of active principle agents may play an important role in increasing its pharmaceutical and industrial significance. Being a species of the genus *Curcuma*, that has been known for its antimicrobial potential since ages, black turmeric should be seen as an important source of plant based antimicrobials. Such species are likely to provide safer alternates to the microbe-based antimicrobials which are increasingly reported for their side effects and drug resistance. In a field and market-based survey, conducted in Dirang area of Arunachal Pradesh, this medicinal herb was recorded with economic benefits in the local communities due to its high market price. The local communities should be encouraged to generate income through cultivation of this plant species at commercial scale.

POTENTIAL HEALTH BENEFITS

- **Anti-inflammatory:** Black turmeric contains compounds like curcuminoids, which have potent anti-inflammatory properties. This may help reduce inflammation associated with various conditions.
- **Antioxidant:** Black turmeric is rich in antioxidants, which help protect cells from damage caused by free radicals. This may contribute to overall health and well-being.
- **Neuroprotective:** Some studies suggest black turmeric may have neuroprotective effects, potentially benefiting brain health.
- **Digestive Health:** It may aid digestion and alleviate digestive issues.
- **Skin Health:** Black turmeric has been used topically for skin conditions due to its anti-inflammatory and antioxidant properties.

METHOD OF ANALYSIS OF BLACK TURMERIC

1. **Thin-Layer Chromatography (TLC):** This simple technique can be used to qualitatively identify the presence of certain compounds.
2. **High-Performance Liquid Chromatography (HPLC):** This advanced technique allows for the quantitative analysis of specific compounds, such as curcuminoids.
3. **Gas Chromatography-Mass Spectrometry (GC-MS):** This powerful technique can identify and quantify a wide range of volatile compounds in black turmeric.
4. **Spectroscopic Techniques:** These techniques provide information about the chemical structure and composition of black turmeric.
5. **Ultraviolet-Visible (UV-Vis) Spectroscopy:** This technique can be used to determine the concentration of certain compounds based on their light absorption properties.
6. **Fourier Transform Infrared (FTIR) Spectroscopy:** This technique provides information about the functional groups present in black turmeric, which can help identify specific compounds.
7. **Microscopic Analysis:** This technique involves examining the physical structure of black turmeric, which can help identify adulterants or contaminants.

APPLICATION

1. **Traditional Medicine:** Widely used in Ayurveda and traditional medicine systems in Southeast Asia for treating inflammation, digestive issues, and skin conditions.
2. **Nutraceuticals and Supplements:** Increasingly incorporated into dietary supplements and nutraceuticals due to its potential health benefits.
3. **Cosmetics:** Black turmeric extracts are finding their way into skincare products for anti-aging, anti-inflammatory, and antioxidant benefits.
4. **Food Industry:** Used as a natural food coloring and flavoring agent.
5. **Research:** Ongoing research explores its potential in various fields, including pharmaceuticals and nutraceuticals.

SAFETY & QUALITY

QUALITY

- **Authenticity:** Ensure the product is genuine black turmeric and not mislabeled or adulterated with other substances.
- **Purity:** Look for products free from contaminants like heavy metals, pesticides, and microbial impurities.
- **Potency:** The concentration of bioactive compounds like curcuminoids and other beneficial compounds should be adequate for desired effects.
- **Origin and Cultivation:** Prioritize products from sustainable and ethical sources with proper agricultural practices.
- **Processing and Storage:** Proper drying, grinding, and storage methods help preserve the quality and potency of black turmeric.

SAFETY

- **Proper Dosage:** Adhere to recommended dosage guidelines as excessive consumption may lead to side effects.
- **Potential Interactions:** Consult with a healthcare professional before using black turmeric, especially if you are pregnant, breastfeeding, taking medications, or have underlying health conditions.
- **Side Effects:** Be aware of potential side effects like stomach upset, diarrhea, and allergic reactions.
- **Quality Control:** Choose products from reputable suppliers with quality control measures in place.

MORPHOLOGICAL FEATURES

- **Rhizomes:** Dark bluish-black with a strong camphor-like aroma.
- **Leaves:** Broad, oblong, dark green with reddish midribs.
- **Flowers:** Pale yellow or pinkish with a reddish tinge.
- **Height:** Grows up to 1.5 meters.

CHEMICAL COMPOSITION

Black turmeric contains curcuminoids, camphor, ar-turmerone, sesquiterpenes, and flavonoids, which contribute to its medicinal properties.

CULTIVATION & GROWING CONDITIONS

- Climate: Prefers humid tropical and subtropical climates.
- Soil: Well-drained sandy loam with organic matter.
- Propagation: Through rhizomes.
- Harvesting: Takes 8–10 months; harvested when leaves dry up.

TRADITIONAL & SPIRITUAL USES

- Used in Tantric rituals and Ayurveda.
- Considered auspicious in Hindu ceremonies.
- Used in skin applications for glowing skin and reducing scars.

INDUSTRIAL & COMMERCIAL APPLICATIONS

- Used in pharmaceuticals, cosmetics, and Ayurveda.
- Extracted essential oils are used in aromatherapy and medicine.
- High demand in traditional medicine markets.

CONSERVATION & AVAILABILITY

- Rare species, often found in forested regions of Madhya Pradesh, Chhattisgarh, Odisha, and Assam.
- Included in the list of endangered plants due to overharvesting.

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