Curcuma Longa: A Medicinal Treasure

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Curcuma Longa Introduced

- Curcuma Longa is a plant of Asian descent commonly known as turmeric.
- Turmeric has light yellow flowers, and leaves as large as 2 ft long, but is famous for it’s bright orange rhizomes.
- The popularity of turmeric for culinary usage can be attributed to its importance in the composition of curry, a dietary staple in India.
- Turmeric has various medicinal uses due to its active compounds called, curcuminoids.
- Turmeric contains 92 different chemicals.
Useful Properties

- Anti-inflammatory
- Antibiotic
- Anti-oxidant
Anti-inflammatory Properties

Curcumin, a molecule that inhibits the molecules: phospholipase, lipooxygenase, COX-2, leukotrienes, thromboxane, prostaglandins, nitric oxide, collagenase, elastase, hyaluronidase, MCP-1, interferon-inducible protein, tumor necrosis factor, and interleukin-12. These molecules are involved in inflammation. Turmeric’s ability to inhibit these molecules enables it to have an Anti-inflammatory effect.
Antibiotic Properties

• The essential oil of turmeric extracted by its rhizomes contains anti-biotic properties.
Antioxidant Properties

- Protects haemoglobin from oxidation.
- Turmeric’s curcuminoid, curcumin, inhibits H2O2 induced damage in human keratinocytes and fibroblasts.
Medicinal Uses

Asian Traditional Medicinal Uses:
• Stomach tonic
• Blood purifier
• Wound healing
• Treatment of insect bites

Modern Medicinal Uses
• Treatment of Arthritis
• Treatment of Alzheimer’s disease
• Treatment of Peptic Ulcers
Arthritis Treatment

Turmeric’s anti-inflammatory property can be utilized to reduce the pain an individual with arthritis experiences.
Wound Healing

Turmeric has been used in healing wounds because of its external antibiotic property due to its volatile oil.
Research

Turmeric is one of the most scientifically investigated spices. Its large variety of properties and their applications make turmeric a very attractive subject for research.
Treatment of Peptic Ulcers

A clinical trial testing the treatment of peptic ulcers through the consumption of turmeric powder in Thailand produced results which supported the hypothesis that turmeric powder can reduce the size and eliminate a peptic ulcer. After 8 weeks of the turmeric treatment 76% of the patients no longer had peptic ulcers.
Turmeric in New York Times blog “Well”

Aside from scientific research Turmeric is a popular topic in many newspaper, and magazine articles.
Relevance to Class
Basics of Turmeric

**Synonym**: Indian saffron, Curcuma

**Family**: Zingiberaceae

**Biological Source**: consists of dried as well as fresh rhizomes of *Curcuma longa*.

**Active Constituents**: Curcumin

**Uses**: Condiment or spice; Colouring agent for ointments and creams
Classification of Curcuma Longa

- Kingdom: Plantae
- Phylum: Mannoliophyta
- Class: Liliopsia
- Order: Zingiberales
- Family: Zingiberaceae
- Genus: Curcuma
- Species: C. longa

- Monocot
- Angiosperm
# Morphological and Anatomical Characteristics of Curcuma Longa

<table>
<thead>
<tr>
<th>Character</th>
<th>Curcuma longa</th>
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<tbody>
<tr>
<td>Rhizome</td>
<td>Profusely branched, fingers up to 4th order</td>
</tr>
<tr>
<td>Color of Rhizome</td>
<td>Yellow</td>
</tr>
<tr>
<td>Xylem</td>
<td>Tracheids with spiral and scalariform thickening</td>
</tr>
<tr>
<td>Phloem</td>
<td>Sieve tube, 2 companion cells and phloem parenchyma</td>
</tr>
</tbody>
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Rhizome

- Variation of a root in plants
- Yellow
- The rhizome of the plant are branched into fingers called tertiary branches

Turmeric plant, rhizome and powder. Turmeric rhizome is the primary source of Curcumin.
**Xylem**

- conducts water and nutrients from roots to leaves
- cells die when they reach maturity
- tracheid
  - flute-like, slow movement of water

**Phloem**

- conducts nutrients primarily synthesized by the plant itself
- continues living after it reaches maturity
- have cytoplasmic extensions from one cell to next
- nutrients pass from one cell to the next through their cytoplasm
- types:
  - **sieve-tube members (STM)**, nutrients flow through these cells
  - **companion cells**, pack STM with nutrients
    - nutrients are used to make cellular energy or be stored as starch
Mature sieve tube elements do not have nuclei and have lost most of their organelles.

The companion cell is a fully functional cell with a nucleus.
Life Cycle of Curcuma Longa
• Bentivegna, Carolyn. *Vascular Plants: Fern to Angiosperm* [PowerPoint slides].
• Nutrition Remarks. (n.d.) Turmeric plant, rhizome and powder. Turmeric rhizome is the primary source of Curcumin. (diagram) Retrieved from http://www.nutritionremarks.com/professional-artwork-service-for-your-publication-or-presentation/