

Turmeric (*Curcuma longa L.*): from traditional medicinal applications to its novel roles as active antioxidative, anti-inflammatory, anti-cancer, and anti-diabetic substance

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Abstract

Background: This comprehensive research article analyzes the remedial and anticancer properties of *Curcuma longa L.* [Zingiberaceae], also known as *C. longa* and turmeric. Turmeric is an herbaceous perennial plant from the *Curcuma* genus that prospers in mainly Eastern Asia and has been used for decades in parts of Southeast Asia and India as an alternative herbal remedy for anti-inflammation and wound healing. The aim of this research article was to explore the possibilities and opportunities of turmeric and curcumin, a significant curcuminoid of turmeric, as a solution for antioxidant, anti-inflammatory, anti-cancer and anti-diabetes therapies, through various clinical studies. Reviewed studies described bioavailability of turmeric as an implication.

Methods and Findings: Content for this research review was gathered searching for “*C. longa*,” “turmeric;” “curcumin;” “turmeric and antioxidant;” “turmeric and anti-inflammatory;” “turmeric and anti-diabetes;” “turmeric and cancer;” “turmeric therapies;” and “turmeric therapies” through public electronic databases such as PubMed and Google Scholar. Journals included Journal of Translational Medicine, BMC Complementary and Alternative Medicine, and the International Journal of Radiation Oncology. Over fifty articles were reviewed that used clinical and preclinical trials to test remedial properties and antioxidant, anti-inflammatory, anti-cancer and anti-diabetes possibilities of turmeric. Studies were focused on the therapeutic components of turmeric and:

- Antioxidant activity
- Anti-inflammatory activity
- Anti-cancer activity
- Anti-diabetes activity

Conclusions: *In vitro* and *in vivo* studies have shown turmeric to alleviate the pain of inflammation in diseases such as rheumatoid arthritis and psoriasis, promoting the overall response of the immune system by acute inflammation and alleviating chronic inflammation. Turmeric been shown to assist with anti-inflammation and assist in preventing and battling cancer through its cytotoxic activities while boosting apoptosis to control the growth and distribution of cells [47-52]. Additionally, turmeric assists with the pain and inflammation involved with diabetes. Authors

suggest that curcumin, a significant curcuminoid of turmeric and an anti-inflammatory and anti-cancer molecule, is a key component of turmeric that assists with anti-inflammation, anti-cancer, and anti-diabetes [52]. Curcumin pathways are explored in Pathway of Curcumin in *Curcuma longa L.* (Diagram 1). Turmeric may be a leading candidate for aiding the aforementioned medical conditions and diseases with additional research.