



## Review Article

### THERAPEUTIC EFFECT OF *HARIDRA* (*CURCUMA LONGA* LINN.) IN GENERAL AND ORAL HEALTH- A REVIEW

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#### Article info

##### Article History:

Received: 10-12-2014

Accepted: 13-01-2015

**KEYWORDS:** *Haridra*, *Haldi*, *Curcuma longa* Linn., Turmeric, Anti-inflammatory, Antioxidant.

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#### ABSTRACT

*Haridra* has been in use for thousands of years as a dye, flavouring and a medicinal herb. Ancient Indian medicine has touted turmeric as an herb with the ability to provide glow and lustre to the skin as well as vigour and vitality to the entire body. In *Charaka samhita*, *Haridra* found in *Lekhaneeya gana*, *Kushtaghna*, *Kandughna*, *Krimighna*, *Shirovirechana gana* and *Sushruta samhita* mentioned under *Haridradi*, *Mustadi*, *Slesmashamana gana*. Since turmeric has antimicrobial, antioxidant, astringents and other useful properties, it is quite useful in dentistry also. Curcumin, the most active polyphenolic constituent, is the active ingredient in the traditional herbal remedy and dietary spice turmeric and is obtained from the rhizome *Curcuma longa* Linn. with a range of beneficial properties, including anti-inflammatory, antioxidant, chemopreventive and chemotherapeutic activity. The pleiotropic activities of curcumin derive from its complex chemistry as well as its ability to influence multiple signalling pathways. The objective of this article is to highlight various uses of turmeric in the dental field.

#### INTRODUCTION

Herbal medicines are drugs of plant origin used to treat diseases and to attain or maintain a condition of improved health. Herbs with medicinal properties are a useful and effective source of treatment for various diseases. Medicinal plants have been used as a traditional treatment agent for numerous human diseases since ages in many parts of the world. In rural areas of the developing countries, they continue to be used as the primary source of medicine. About 80% of the people in developing countries use traditional medicines for their health care.<sup>1</sup>

**Synonyms:** *Haridra*, *Kanchani*, *Nisha*, *Yoshitpriya*, *Varavarnini*, *Hattavilasini*, *Krimighni*, *Peeta*, *Gauri*.<sup>2</sup>

#### Classical Categorization<sup>3</sup>

**Charaka:** *Lekhaneeya gana*, *Kushtaghna*, *Kandughna*, *Krimighna*, *Shirovirechana gana*.

**Sushruta:** *Haridradi*, *Mustadi*, *Slesmashamana gana*.

**Vagbhata:** *Haridradi*, *Mustadi gana*.

**Effect on Doshas:** *Haridra* is *Kaphavatanashaka*, *Pittasarak* by *Ushna veerya*, *Pittashamak* by *Tikta rasa*. *Haridra* used in *Tridosha*.

#### Morphology

Turmeric is an erect perennial herb, but is grown as an annual. The leaves shoots rarely exceed 1m in height and are erect, bearing 6-10 leaves with the leaf sheaths forming a pseudo-stem. The thin petiole is rather abruptly broadened to the sheath.

Lamina is lanceolate, acuminate and thin, dark green above and pale green beneath with pellucid dots. It is usually 30cm long and 7-8 cm wide, and is rarely over 50 cm long.

Turmeric (*Haldi*), a rhizome of *Curcuma longa*, is a flavourful yellow-orange spice. Its plant is 3 feet in height and has lance-shaped leaves and spikes of yellow flowers that grow in a fleshy rhizome or in underground stem. An orange pulp contained inside the rhizome constitutes the source of turmeric medicinal powder.<sup>1</sup> Components of turmeric are named curcuminoids, which include mainly curcumin (diferuloyl methane), demethoxycurcumin, and bisdemethoxycurcumin. Curcumin (diferuloylmethane) is a polyphenol derived from *Curcuma longa* plant, commonly known as turmeric. The active constituents of turmeric are the flavonoid curcumin

(diferuloylmethane) and various volatile oils including tumerone, atlantone, and zingiberone. Other constituents include sugars, proteins, and resins. The best-researched active constituent is curcumin, which comprises 0.3-5.4% of raw turmeric. Curcumin has been used extensively in *Ayurvedic* medicine for centuries, as it is nontoxic and has a variety of therapeutic properties including antioxidant, analgesic, anti-inflammatory, antiseptic activity, and anti-carcinogenic activity.<sup>4</sup>

Many people are familiar with turmeric as a traditional Middle-Eastern spice, but few know of its medicinal virtues. Turmeric, otherwise known as *Circuma longa*, is a member of the ginger family, Zingiberaceae. The Latin name is derived from the Persian word, kirkum, which means saffron, in reference to the rhizomes vibrant yellow-orange color. It is indigenous to Southeast Asia, but has long been used and cultivated throughout India. Turmeric is highly valuable for the influence it exerts on the digestive system and the liver.

### THERAPEUTIC ACTIONS OF TURMERIC

The active constituent of turmeric is known as curcumin. It has been shown to have a wide range of therapeutic actions of curcumin.

1. It protects against free radical damage because it is a strong antioxidant.<sup>5</sup>
2. It reduces inflammation by lowering histamine levels and possibly by increasing the production of natural cortisone by the adrenal glands.<sup>6</sup>
3. It protects the liver from a number of toxic compounds.<sup>7</sup>
4. It has been shown to prevent platelets from clumping together, which in turn improves circulation and help protection against atherosclerosis.<sup>8</sup>
5. Laboratory tests have found that turmeric is antimutagenic, as it potentially helps prevent new cancers that are caused by chemotherapy or radiation which are used in treating existing cancers. It effectively inhibits metastasis (uncontrolled spread) of melanoma (skin cancer) cells<sup>9-10</sup> and may be especially useful in deactivating the carcinogens in cigarette smoke and chewing tobacco.
6. Curcumin inhibits HIV in test tubes, though human trials are needed to determine if it has any usefulness for treating humans with this condition.<sup>11-12</sup>
7. Curcumin is also useful for reducing inflammation and symptoms such as pain and stiffness in the joints. Turmeric in the diet may prevent pain from arthritis, bursitis, and tendonitis.<sup>13</sup>
8. A separate double-blind clinical trial found that curcumin was superior to placebo or phenylbutazone (a non steroidal anti-inflammatory drug [NSAID]) for alleviating post-surgical inflammation.<sup>14</sup>

9. Turmeric in the diet increases the production of enzymes that digest fats and sugars and stop cholesterol from forming gallstones. Turmeric is helpful for people with indigestion. Results in people with stomach or intestinal ulcers have not shown it to be superior to a placebo and have demonstrated turmeric to be less effective than antacids.<sup>15,17</sup>

10. Preliminary research indicates a possible benefit of oral curcumin supplementation for chronic anterior uveitis (inflammation of the iris and middle coat of the eyeball).<sup>16</sup>

11. Turmeric is exceedingly useful in the treatment of urinary disorders such as diabetes mellitus.<sup>18</sup>

12. Turmeric stimulates the secretion of bile, anti-inflammatory, anti-bacterial, eases stomach pain and an antioxidant. Turmeric in the diet increases the production of enzymes that digest fats and sugars and stops cholesterol from forming gallstones.<sup>19</sup>

13. When applied to the skin and exposed to sunlight, turmeric is strongly anti- bacterial.

14. It can be used for parasitic infections.

15. Fresh juice from the rhizome or a paste prepared from turmeric or decoction is often used as a local application as well as internally in the treatment of leprosy, snake bites, and vomiting associated with pregnancy.<sup>21</sup>

16. In case of smallpox and chickenpox, turmeric is applied as a powder or as a paste to facilitate the process of scabbing.<sup>22,23</sup>

17. Turmeric powder with alum powders are mixed in a proportion of 1:20 and is blown into an ear that has chronic discharge or otorrhoea.

### ORAL & DENTAL APPLICATION OF TURMERIC

#### Dental problems

Turmeric can be used in following ways for relief from dental problems:<sup>24</sup>

- Rinsing the mouth with turmeric water (boil 5 g of turmeric powder, two cloves, and two dried leaves of guava in 200 g water) gives instant relief.
- Massaging the aching teeth with roasted, ground turmeric eliminates pain and swelling.
- Applying a paste made from 1 tsp of turmeric with ½ tsp of salt and ½ tsp of mustard oil provides relief from gingivitis and periodontitis. It is recommended to rub the teeth and gums with this paste twice daily.

#### Pit and fissure sealant

It has been found that tinted pit and fissure sealant is useful for applying to tooth surfaces for the prevention or reduction of dental caries. This sealant can be produced from a composition comprising a polymerizable resin system containing acrylic monomer and at least one colorant selected from the

group consisting of Annatto extract, turmeric extract, and  $\beta$ -Apo-8-Carotenol.<sup>26</sup>

### Dental-plaque detection system

Caries or periodontal diseases are thought to be infectious diseases caused by bacteria present in dental plaques and it is known that the removal of dental plaques is important for the health of oral cavities. However, dental plaques are not easy to identify by the naked eye and it is difficult to confirm their attachment site and extent precisely. Accordingly, dental plaques are generally stained with dental-plaque staining agents, which contain dyes, to reveal their locations in order to uncover the attached dental plaques.

The dental-plaque detection system includes a dental-plaque staining agent, which contains at least one selected from the yellow pigment of beni-kaji, turmeric extracts, and curcumin; and a light-emitting apparatus, which outputs light having a wavelength within a range of 250 to 500 nm to visualize an object in the oral cavity where the dental-plaque staining agent is attached. A yellow pigment of beni-kaji and turmeric are known as staining agents also used for other purposes.<sup>26</sup>

### Periodontal problems

Topical application: Applying a paste made from 1 tsp of turmeric with  $\frac{1}{2}$  tsp of salt and  $\frac{1}{2}$  tsp of mustard oil provides relief from gingivitis and periodontitis. It is recommended to rub the teeth and gums with this paste twice daily.<sup>4</sup>

**Mouth wash:** In a study by Waghmare et al. about 100 subjects were randomly selected. Both gingival index and plaque index were recorded at 0, 14, and 21 days. It was concluded that chlorhexidine gluconate as well as turmeric mouthwash can be effectively used as an adjunct to mechanical plaque control methods in prevention of plaque and gingivitis. Turmeric mouthwash prepared by dissolving 10 mg of curcumin extract in 100 ml of distilled water and 0.005% of flavouring agent peppermint oil with pH adjusted to 4 is found to be as effective as most widely used chlorhexidine mouthwash. Though chlorhexidine gluconate has been found to be more effective when antiplaque property was considered. The effect of turmeric observed because of its anti-inflammatory action. Reduction in total microbial count was observed in both the groups.<sup>27</sup>

### Anticancer properties

Curcumin has been found to possess anticancer activities because of its effect on a variety of biological pathways involved in mutagenesis, oncogene expression, cell cycle regulation, apoptosis, tumorigenesis, and metastasis. It potentiates the effect of chemotherapy and acts as an enhancer of radiotherapy. Also, it is found to arrest carcinomatous cells in the G2/M phase of cell cycle, in which cells are more susceptible to cytotoxic effects of radiotherapy.<sup>28</sup>

### Precancerous lesions

Its role in the treatment of various precancerous conditions like oral submucous fibrosis, leukoplakia, and lichen planus has also been studied. Turmeric extract and turmeric oil have demonstrated oncopreventive activity in vitro and in vivo animal experiments. The local symptoms of burning sensation and pain were reduced and partial reversal of opening of the mouth was also observed.<sup>29</sup>

### CONCLUSION

The benefits of turmeric include analgesic, antibacterial, anti-inflammatory, anti-tumor, anti-allergic, antioxidant, antiseptic, antispasmodic, appetizer, astringent, cardiovascular, carminative, cholagogue, digestive, and diuretic. There are many uses of turmeric in dentistry. The use of plants and herbs for dental care is a very common indigenous system of medicine and we must include it in our everyday life. Turmeric is considered a safe, nontoxic, and effective alternative for many conventional drugs due to its distinguished therapeutic properties and multiple effects on various systems of the body. Its role in the treatment of cancers is very promising. However, there is scarcity of information and research in this field. Therefore, further research is required to determine the optimal dosage, bioavailability, and bio-efficacy of curcumin-based drugs.

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**Cite this article as:**

Tiwari Ranjana, Tripathi V.D. Therapeutic Effect of Haridra (*Curcuma Longa* Linn.) in General and Oral Health- A Review. *AYUSHDHARA*, 2014;1(2):40-43.

**Source of support: Nil, Conflict of interest: None Declared**