

Expert Herbal Reality Resource

Turmeric

Names

Botanical Name *Curcuma longa* L

Family: Zingiberaceae

Common names: Indian saffron (Engl), Kurkumawurzelstock, Gelbwurzel (Ger), rhizome de curcuma, safran des Indes (Fr), haridra (Sanskrit) haldi (Hindi), jianghuang (Chin)

Alternate botanical names: *Curcuma domestica* Val. *C. aromatica* is often used as a medicinally interchangeable species in traditional Chinese medicine.



Description

Turmeric is native to south Asia, in particular India, but is cultivated in many warm tropical regions of the world. It is a tall, stemless herb that can grow up to 1.5m in height and has characteristic large, pale green and elongated leaves. Turmeric flowers are a pale yellow colour. The root (technically rhizome) is oblong or cylindrical and often short-branched. The external colour of the rhizome is brown and internally ranges from yellow to bright yellow-orange. The rhizome consists of two parts: an egg-shaped primary rhizome and several cylindrical and branched secondary rhizomes growing from the primary rhizome. These two parts were once differentiated in the Western trade as *C. rotunda* and *C. longa*. In traditional Chinese medicine this differentiation is retained, the primary rhizome being called the 'tuber' and the secondary rhizome, the 'rhizome'.

Constituents

- Essential oil (2.5 to 5%), containing sesquiterpene bisabolones (including *ar*-turmerone 28%, β -turmerone 17% and curlone 14%), zingiberene, phellandrene, sabinene, cineole, borneol.
- Yellow pigments (3 to 6%) known as curcuminoids (diarylheptanoids and diarylpentanoids), 22 identified including curcumin (diferuloylmethane) and demethoxylated curcumins.

Turmeric's most prominent active constituent curcumin is generally referred to as if it was a single chemical entity. However it is actually a variable mixture of three diarylheptanoids: diferuloylmethane (curcumin I), desmethoxycurcumin (curcumin II), and bisdesmethoxycurcumin (curcumin III). Sample-to-sample variability of 'curcumin' significantly reduces the consistency of research findings for its effects and bioavailability.¹

Traditional use

Turmeric has been one of the most valued remedies in Ayurvedic medicine, as a heating and drying remedy that moves the circulation, and clears digestive-based toxins (*āma* or 'damp') especially from the lower abdomen and pelvic areas. This ties in closely with the Ayurvedic concept of supporting *agni* (fire) in the digestion.

Turmeric has a long list of traditional health uses across many cultures. In India, it is regarded as a stomachic, tonic and blood purifier and used for poor digestion, fevers, skin conditions, vomiting in pregnancy and liver disorders. Externally, it is applied for conjunctivitis, skin infections, cancer, sprains, arthritis, haemorrhoids and eczema. Indian women also apply it to their skin to reduce hair growth. Another common use is to promote wound healing.

In traditional Chinese medicine (TCM) different applications are attributed to the 'rhizome' and 'tuber'. Turmeric 'rhizome' is said to be a *blood* and *qi* with analgesic properties. It is used to treat chest and abdominal pain and distension, jaundice, frozen shoulder, amenorrhoea due to blood stasis and postpartum abdominal pain due to stasis. It is also applied to wounds and injuries. The 'tuber' has similar properties, but is used in hot conditions as it is considered to be more cooling. One particular application is viral hepatitis.

Traditional Thai medicinal uses include gastrointestinal ulcer, anal haemorrhage, vaginal haemorrhage, skin disease, ringworm, insect bites and to prevent the common cold.

In earlier Western herbal medicine, turmeric was regarded as an aromatic digestive stimulant and as a cure for jaundice.

Traditional actions

Traditional Ayurvedic characteristics are

Rasa (taste) Pungent, bitter, astringent.

Virya (action) Heating.

Vipaka (post-digestive effect) Pungent.

Guna (quality) Dry, light.

Dosha effect: strengthens all doshas, reduces excessive *pitta* and *vata*

Dhatu (tissue) All the tissues.

Srota (channel) Digestive, circulatory, respiratory, female reproductive.

What practitioners say

Digestion: Turmeric has widespread application to digestive problems. As a very widely consumed culinary spice it has long been favoured for reducing indigestion in many forms, including dyspepsia, colic and IBS. It can help to restore disturbed microbiome and can be considered in many inflammatory bowel diseases and even as part of a bowel cancer regime. The traditional focus on its role in igniting *agni* (see above) is possibly a key to its core prospect: turmeric really does seem to support more robust digestive functions.

Liver: Turmeric has a stimulant effect on the liver, increasing bile output and helping to dissolve and prevent gallstones. It is traditionally considered a blood 'purifier' and is often used for beautifying the skin and clearing systemic toxemia; eczema, urticaria, psoriasis and acne. As with many liver herbs it is also good for the eyes; a wash is used in conjunctivitis and styes.

Women's health: In Ayurvedic terms turmeric is used to clear *kapha* accumulations from the lower abdomen, uterus and *apanakshetra*. Fibroids, cysts, endometriosis, dysmenorrhoea, amenorrhoea and congestive pelvic inflammatory conditions and vaginal discharge may all be relieved. As a specific herb for *rasa dhatu* it also works on its secondary tissue *stanyasrotas* and is used to purify breast milk as well as to promote the flow of the menses.



Inflammation: Turmeric may reduce inflammation around the body. It is used in arthritic problems, dermatitis, and other skin problems. In Indian tradition it is favoured for *pitta-kapha* conditions and in this case mixed with more bitter herbs.



Circulation: Turmeric has circulatory stimulating and warming properties similar to ginger, chillies or black pepper. This leads to increased blood flow through the tissues, and is likely to accentuate its value in treating symptoms around the body that are worsened in the cold.

External: Turmeric is excellent for reducing pain as a topical application in bruises, infections, inflammations like mastitis, sprains and pain. Use it carefully as it is very staining to the skin and anything it comes into contact with.

Evidence

Although curcumin has been widely agreed as active principle of turmeric, and has even been cited as the beneficial agent instead of turmeric, it is insoluble in water, and rapidly converted to inactive metabolites in the gut, so is in fact extremely poorly absorbed into the tissues.ⁱⁱ Indeed perhaps only 1% of curcumin consumed actually gets through the gut wall into the body.ⁱⁱⁱ One review of more than 120 clinical trials found no successful clinical trial of curcumin that was fully double-blinded and placebo controlled, and concluded that it is an unstable, reactive, nonbioavailable compound and a highly improbable lead.^{iv}

It is therefore advisable to put aside the majority of research evidence for curcumin, usually based in the laboratory, and select only the few studies that relate to real-life human consumption of turmeric.

Fortunately, as one author has reported “*curcumin does not need to be absorbed to bring about its effects since it has profound effects on the intestinal wall and can effectively reduce inflammation by this mechanism*”.⁷ The following summary identifies research that follows the action of both curcumin and other turmeric constituents on the gut wall.

Effects on inflammation from gut wall. Curcumin has been shown to reduce the activity of gut wall proinflammatory factors, including cyclooxygenase-2 (COX-2), 5-lipoxygenase (LOX), inducible nitric oxide synthase (iNOS), TNF- α , IL-1, -2, -6, -8 and -12, TLR 4, and Nf-kappa- β .^v

Importantly curcumin mends intestinal cell wall junctions, blocks gut surface enzymes (eg alkaline phosphatase), transcription factors, and growth factors, and prevents bacterial or virus infection from the intestine.¹⁵ This may be the key to the wider effects on inflammation throughout the body. One research team has demonstrated that curcumin can decrease in the release of gut bacteria-derived lipopolysaccharide (LPS) into circulation by maintaining the integrity of the intestinal barrier function.^{vi} This could explain the role of curcumin in benefiting metabolic diseases such as diabetes, atherosclerosis, and kidney disease.^{vii} It has also shown promise in the management of local gut inflammatory disease,^{viii} including Crohn's disease.^{ix}

Prebiotic effects. Turmeric has been shown to beneficially alter the gut microbiome,^x with relatively more *Lactobacillus* and *Bifidobacter* populations and fewer pro-inflammatory *Enterobacteria* and *Enterococci*;^{xi} its effect in increasing bile flow adds to its stabilising effects on the microbiome.^{xii}

Effects on gut function. Adding turmeric to curry meals shortened small-bowel transit time, suggesting that turmeric can increase bowel motility.¹² Turmeric has calcium-channel blocking spasmolytic effects on the gut wall greater than either verapamil or curcumin alone.^{xiii} These findings added to the effect on bile above reinforce the view that turmeric can stabilise gut motility from either extreme.

Effects on leaky gut. Benefits have been observed in a number of test models.^{xiv,xv} The role of leaky gut in a wide range of autoimmune and other chronic inflammatory conditions is widely accepted.

Choleretic (bile eliminating) effects. Turmeric stimulates gallbladder emptying - by between 25-50%,^{xvi,xvii} bile acids are natural laxatives; however by increasing microbiotic metabolism to secondary bile acid levels turmeric can reduce consequent laxative action.^{xviii,xix} It also reverses the carcinogenic effect of bile acids in reflux oesophageal cancer, in part through suppression of COX-2 gene expression.^{xx} Bisacurone B was the most potent choleretic ingredient, followed by *ar*-turmerone, bisdemethoxycurcumin, demethoxycurcumin, and then curcumin.^{xxi}

Effects on circulation. Like active principles of other spices cayenne, ginger and black pepper, curcumin has a vanillyl group and can stimulate the transient receptor potential vanilloid receptor 1 (TRPV1) on the gut wall surface, leading to increased blood flow and muscle relaxation, and therapeutic benefits similar to those of ginger. In one study curcumin's observed benefits in test models of inflammatory bowel disease was abolished by the TRPV1 antagonist capsazepine. Follow-up *in vitro* observations suggest that the TRPV1 receptor is more sensitive to this effect in inflamed tissues.^{xxii}

Effects on gut-brain axis. It reduces markers of anxiety, depression and IBS via 5HT-dependent gut wall receptors.^{xxiii}

There are also other powerful constituents of turmeric that are likely to be more easily absorbed and have their own significant activity elsewhere in the body.^{xxiv} Particular interest has been in *ar*-turmerone which as well as being readily bioavailable,^{xxv} has shown to have promising anti-inflammatory,^{xxvi} anti-angiogenic^{xxvii} and neurorestorative^{xxviii} properties. Given the current interest in the inflammatory aetiology of mental health problems and neural disease, it is of interest that a role in modulating microglial inflammation has also been identified.^{xxix}

Safety

Turmeric has been safely consumed as a food item in relatively large quantities with no significant risk or adverse effect. A few people report short term digestive reactions to turmeric.

Dosage

4 g or a heaped teaspoon of powdered turmeric (or equivalent preparation) 1 to 2 times daily

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