Frankincense and Turmeric:
A look at history and modern research

Indian frankincense (Boswellia serrata) is a large, deciduous tree found in the dry climates of India and Africa. Extracts of the gummy frankincense oleoresin, obtained from beneath the bark, have long been utilized in Ayurvedic (East Indian) and African medicine. The resin contains boswellic acids, and the ingredient Boswellia is usually standardized to boswellic acid content, ranging from a low of 30% to a high of 70% boswellic acids.

Traditional medicinal uses for Boswellia include treatment for rheumatism, menstrual disorders, bruising and skin disorders, wounds, and varicose veins. In modern times, evidence that Boswellia inhibits 5-lipoxygenase, an enzyme for leukotriene synthesis, has sparked interest in its possible role in helping with inflammatory conditions, including arthritis, IBD, allergies and asthma.

Multiple boswellic acids have been identified as having significant anti-inflammatory activity, including some that are specific inhibitors of 5-lipoxygenase. Boswellic acids reduce elevated enzyme levels found in inflammatory conditions, including glutamic pyruvic transaminase, glycohydrolase, and beta-glucuronidase. Boswellia extract may also inhibit TNF-alpha-induced inflammatory response, and human leukocyte elastase (HLE), which is involved in many pathologies of the lungs. Other mechanisms of action have been suggested, such as inhibition of microsomal prostaglandin E synthase-1 and the serine protease cathepsin G.

In human studies, various frankincense extracts have consistently shown promise in reducing symptoms of osteoarthritis. In two studies, significant improvements were reported after 1 week, and after 90 days, pain scores were reduced from 32% to 65%. In a preliminary study, a frankincense extract significantly decreased pain and stiffness scores compared to placebo in patients with osteoarthritis after 30 days. Other frankincense extracts have helped reduce knee pain and swelling, and overall stiffness, as well as improve functional ability. In two other clinical trials, frankincense significantly affected symptoms and disease markers of ulcerative colitis, improving from 70% to 82%.

Animal research has demonstrated dose-dependent analgesic activity, and effective anti-inflammatory activity has been seen in multiple animal studies, including studies with mice injected with an inflammatory agent, rats with laboratory-induced paw inflammation, and animals with arthritis and gout.

Boswellia triterpenoid acids have shown potential antiproliferative, apoptotic, cytotoxic, and cytostatic effects. One study found that Boswellia extract with significant boswellic acid content was more effective at inhibiting cancer cell growth than a pure AKBA (acetyl-11-keto-beta-boswellic acid, a pentacyclic triterpenoid from Boswellia).
Turmeric from the root of the southern Asian shrub, *Curcuma longa*, is used extensively for color and flavor in curry cuisines. Turmeric is in the Zingiberaceae (ginger) family, and has a long history of use in Ayurvedic medicine for the treatment of inflammatory disorders, sprains, and swellings, and in Chinese medicine for abdominal issues.

Since the 1940s, the active constituent curcumin has been extensively researched. Turmeric extract is typically standardized to curcuminoid content, with percentages ranging from 75% to 95%, and it is widely utilized for the treatment and prevention of inflammatory diseases. Acute and chronic inflammation is a major factor in the progression of obesity, type II diabetes, arthritis, pancreatitis, cardiovascular, neurodegenerative and metabolic diseases, as well as certain types of cancer. Curcumin mediates its anti-inflammatory effects by down-regulating pro-inflammatory signals (cyclooxygenase-2 [COX-2], prostaglandins, leukotrienes), cytokines, redox status, protein kinases, and inflammatory enzymes (collagenase, elastase, and hyaluronidase). Curcumin can inhibit inflammatory cell proliferation, invasion, and angiogenesis through multiple molecular targets and mechanisms of action. Curcumin can also induce apoptosis through mitochondrial pathways and activation of caspase cascades.

Research shows that some turmeric extracts can improve symptoms of osteoarthritis in humans. A turmeric extract concentrated to 75% curcumin reduced pain and improved functionality in patients with osteoarthritis of the knee after 2-3 months of treatment compared to pretreatment. Other studies used different curcumin concentrations and had similar results, reducing pain in osteoarthritic knees. Curcumin has also been studied for pruritus (itching).

In animal studies, curcumin has been shown to reduce pain, and to reduce joint inflammation from arthritis by inhibiting NF-kB activation. Curcumin may help protect cartilage by suppressing the production of matrix metalloproteinases, and help prevent rheumatoid arthritis by inhibiting cytokine macrophage migration inhibitory factor (MIF).

Curcumin has been researched for countless additional applications. For example, it may help induce gallbladder contractions, helping prevent gallstone production. Given its choleretic affects, its use is contraindicated in cholelithiasis until the size of the stones are known. It has antimicrobial, chemopreventive, apoptotic, and other anticancer effects, including reducing the carcinogenic effects of chemicals. Curcumin can inhibit monoamine oxidase (MAO) A and B, increasing serotonin, dopamine, and noradrenaline levels, which makes it helpful in mood disorders, particularly depression. Curcumin has been shown to support the normal functioning of the cardiovascular system, the gastrointestinal tract, the liver and kidneys, the lungs, and even the skin. It has been well studied in Alzheimer’s prevention and treatment.

The roles that curcumin can play in the body are too numerous to discuss fully in this short article, but it is worth mentioning one more: supporting blood sugar. There is extensive animal research showing that turmeric and its constituent curcumin may reduce levels of glucose and HbA1c and raise plasma insulin levels, potentially improving control of blood glucose. It may reduce diabetic neuropathic pain and prevent the development of diabetes-associated neuronal damage via multiple activities. It may help prevent diabetes-associated kidney dysfunction and damage, as well as diabetic retinopathy.
It’s no wonder that in the ancient world, wherever turmeric naturally occurred, it always found its way into the daily diet.

This article is provided for information only, and not as recommendation of any kind.

---

Bibliography


---

NutriCology® Education Series

2300 North Loop Road, Alameda, CA 94502
Phone: 800-545-9960 or 510-263-2000
Fax: 800-688-7426 or 510-263-2100
www.nutricology.com
NutriCology® Education Series

NutriCology® Education Series


NutriCology® Education Series

- Mehta, K., Pantazis, P., McQueen, T., and Aggarwal, B. B. Antiproliferative effect of curcumin (diferuloylmethane) against human breast tumor cell lines. Anticancer Drugs 1997;8(5):470-481.


