Nettle leaf has been widely employed for centuries, while cinnamon has been utilized in the Chinese herbal tradition for millennia. Recently, cinnamon has been widely acclaimed for its abilities to lower glucose, triglycerides, and LDL, and other dysglycemic parameters. However, this traditional Chinese botanical has other qualities, largely ignored, which may preclude its use as a stand-alone herb for treating diabetes and other inflammatory conditions.

*Cinnamomum Aromaticum / Cassia / Gui Zhi / Ròu Gùi (Bark and Twig)*

*Cinnamomum zeylanicum* is the true Ceylon cinnamon, the inner bark of the evergreen tree from Sri Lanka. Cassia or "bastard cinnamon" (*Cinnamomum aromaticum*) is more common, especially in the U.S. Its tannins are mildly astringent and its catechins relieve nausea, vomiting, griping and diarrhea. Cinnamon's carminative actions relieve gas and gut distention. Its efficacy against vaginal and rectal *Candida albicans* infections, thrush, *H. pylori* and UTIs (*E. coli* strains) are well-documented. Cinnamon is a strong inhibitor of aflatoxin molds and inhibits PGE2 production to reduce pain.

The polymeric polyphenols richly dispersed in cinnamon have demonstrated effects upon enhancing insulin signaling and optimizing blood glucose levels. Cinnamon contains glutathione and MHCP flavonoids, which make adipocytes far more responsive to insulin. As little as 1/8th of a teaspoon can triple insulin's efficacy, according to James Duke, PhD, botanist author of *The Handbook of Medicinal Herbs*.

A recent meta-analysis (eight studies) has shown statistically significant effects of whole cinnamon and cinnamon aqueous extract upon fasting blood glucose in type 2 diabetics and insulin-resistant subjects. Studies using the traditional Chinese herbal formula *jiaotai* (containing cinnamon as a chief herb and including coptis root and others) were performed on both the whole formula and its individual components to examine effects upon ectopic fat accumulation in type 2 diabetic rats. A metformin group was compared to the experimental herbal and control groups.
The four herbally treated groups, characterized by significant disease (fatty degeneration in liver, heart and muscle) as measured by multiple parameters, were histologically returned to a near normal state. The group treated with the synergistic formula showed the best effects, superior to metformin. Positive results were attributed to improved insulin resistance and decreased fat accumulation.

More specifically, cinnamon has been found in *in vitro* studies to activate peroxisome proliferator-activated receptors (PPARs), which are transcription factors regulating insulin resistance and adipogenesis. A water extract of cassia upregulated PPARs gamma and alpha and their target genes in adipocytes, and was shown to be an effective tool in the management of obesity-linked diabetes mellitus and hyperlipidemias.

Chinese cassia has prevented serotonin-induced gastric ulcers in lab animals at a very low dose and prevented lesions from other ulcerogenic agents such as ethanol. The mechanism of therapeutic action is though to be the promotion of gastric blood flow, rather than inhibition of gastric acids. This maintains protein digestion and underscores the stimulatory qualities of the herb.

Utilized for centuries in traditional Chinese medicine, cassia is considered one to be one of the 50 most important herbs in the Chinese pharmacopeia. Because of its heating nature, it is never used alone, especially for a *yin* (fluids) deficiency state, which is the classification of diabetes in TCM.

A metabolic stimulant, *gui zhi* is a pungent herb that induces sweating and warms the acupuncture channels. It is always used for diabetes in combination with other herbs that restore fluids and have a cooling nature. The difficulties of using an herb which acts singly as a warming agent for patients with inflammatory disease are immediately apparent. Thus, cinnamon is considered to be unsuited for use as a singleton herb for this metabolically hot, fluid-depleting condition.

While cinnamon’s multiple effects on dysglycemies are positive, cassia has not been used alone for sugar disorders in the five millennia of its use in the traditional Chinese system. European health agencies have issued warnings against excessive cassia consumption due to its coumarin content.

Both cinnamaldehyde and styrene are found in the herb. Styrene, a benzene derivative found in varying levels in some foods, is a suspected toxin of the kidneys, GI system and lungs. Studies of cinnamaldehyde show that it increases plasma catecholamine concentration. Reaching the adrenals through systemic circulation, it causes epinephrine release through mechanism(s) outside of the cholinergic system.
It is prudent to caution diabetics against daily consumption of this popular stimulating, heating, drying herb. A true example of "the whole is greater than the sum of its parts," cinnamon use for diabetes is best in the context of a balanced, complete formula, rather than as a single herb.

**Nettles / *Urtica Dioica* (Leaves and Leaf Extract)**

Nettles have been utilized in Europe for centuries. The flavonoid-rich leaf hairs, which produce a "sting" if applied topically (traditional use), provoke a local histaminic reaction, downregulating prostaglandin production. Dried nettle leaves can be made into a pleasant-tasting tea and added in small amounts to sauces and soups.

It is important to distinguish between nettle leaf and nettle root. The leaf, rich in flavonoids and inhibitory to both LOX and COX, is utilized as an antiinflammatory primarily for arthritis, UTIs and rhinitis. The root, rich in lectins, has hormonal actions, preventing the conversion of testosterone to DHT, directly benefiting BPH and age-related hair loss for both males and females.

Nettle leaf reduces inflammatory cytokine production in a dose-response relationship, upregulating secretion of IL-1-beta, which antagonizes PGE-2 synthesis. Use of nettle leaf in one study allowed knee arthritis patients to reduce NSAID use by 50 percent. Another study of 9,000 OA and RA patients demonstrated clinical improvement in 82 percent, with 26 percent discontinuing NSAIDs.

The leaves contain flavonol glycosides, tannins and sterols, plus high levels of minerals including calcium, potassium, magnesium, zinc, selenium, iron and absorbable silicon dioxide. Like vitamin D, silica is needed for bone maintenance and calcium utilisation. A deficiency can manifest as osteoporosis and brittle hair and nails.

Human studies have confirmed the anti-inflammatory actions of nettle leaf bioflavonoids, which interrupt the production and activity of proinflammatory cytokines, prostaglandins and leukotrienes. Destruction of hyaline cartilage in both OA and RA is inhibited. Benefits have been demonstrated for gout, due to increased excretion of uric acid. The anti-platelet action of nettles may be due to its anti-inflammatory organic acids, as well as vitamin K content. Concurrent anticoagulant drug use is a contraindication for nettle use.
An application of nettle leaf for Crohn's disease has recently emerged. The long-term use of the nettle extract IDS 30 has been effective in the prevention of chronic colitis, and may be a new therapeutic tool to extend remission in inflammatory bowel disease and other rheumatic diseases. This is very important because the monoclonal antibody drugs in current use have deleterious side effects and prohibitive costs.

Botanicals can attenuate gut mucosal function, oxidative stress, phase I and phase II detoxification, cytokine production, NO/iNOS, mitochondrial status, the initiation of inflammatory cascade, and inhibit COX and LOX enzymes without deleterious side effects. While selective COX-2 inhibitors are associated with increased coagulation and hypertension, and aspirin has GI effects, herbal anti-inflammatories mildly inhibit COX-1 as well as COX-2, producing a modest, but important blood-thinning effect as well as anti-inflammatory actions.

The neuromodulatory behavior of herbs is an exciting new area of study. The influence of botanicals upon the emerging Syk pathway, the important ATP-stealing set of reactions that drive cancer induction, will be the focus of part 5 of this ongoing series.

**Resources**

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