Dynamic Chiropractic

HERBS/ TEAS & HOMEOPATHY

The Underestimated Value of Bitter Herbs

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Many cultures still recognize the value of bitter herbs in promoting digestive function and general health. Bitter drinks taken before meals are still called aperitifs, due reference to their value in aiding digestion. In Holland, older people would celebrate the bitter hour in the early evening when they would partake of bitter food and drink to support their fading digestive powers. In India, it is said that people with liver problems seek bitter-tasting substances. In Africa, the medicinal value of bitter herbs, particularly as digestive stimulants, is commonly recognized in traditional medical systems.[1]

It was still widely accepted in the early 20th century in medical and scientific circles that bitters supported digestive function; even Pavlov was said to have acknowledged this connection.[2] However, this was a time when such assumptions were being subjected to scientific scrutiny.

In 1915, the American physiologist Carlson and co-workers published a study titled "The Supposed Action of the Bitter Tonics on the Secretion of Gastric Juice in Man and Dog."[2] The group found that bitters applied either to the mouth (tasted) or directly to the stomach produced no change in the acidity and pepsin concentration of the gastric juice (prior to food actually being in contact with the stomach). Despite the fact that this study had a number of methodological flaws, notably that gastric secretions were not tested under the stimulus of actual contact with food, it was largely responsible for discrediting the concept of bitters as digestive stimulants.

However, new research has made considerable advances in our understanding of bitter taste receptors and the bitter response. A family of approximately 30 receptors (called TAS2R, or previously T2R) has been identified in mammals.[3] The TAS2Rs are broadly tuned to each detect multiple bitter substances, explaining how humans can recognize numerous bitter compounds with only a limited set of receptors. They are expressed in a subset of taste receptor cells that are distinct from those mediating responses to other taste qualities.

Cells with these receptors appear to be wired to elicit aversive behavior, probably because many toxic chemicals are bitter in taste.[3] One intriguing recent discovery is that bitter taste receptors are not restricted to the oral cavity.[4] There are now numerous reports of TAS2Rs expressed in the gut, including the stomach, and in cell lines originating from gastrointestinal tissue. In fact, it is now recognized that the whole upper gastrointestinal tract is a tasting organ, not just the tongue, with TAS receptors also present for the sweet and umami (savory) tastes.[5]

Importantly, bitter receptors have been found on enteroendocrine cells and their activation promotes the release of gut peptides, in particular cholecystokinin (CCK).[5] This triggers the secretion of pancreatic enzymes and bile and regulates stomach function, appetite and acid production. Activation of bitter receptors is also thought to indirectly improve the elimination of absorbed toxins from the gut epithelium.[6] Lower in the gut, bitter receptors exert a different effect. Bitter compounds applied to the colonic epithelium induce fluid secretion, suggesting a mild laxative effect. All of these actions probably reflect the activation of detoxifying and protective functions of the gastrointestinal tract by bitter substances (since, as noted above, many toxins are bitter).

The discovery that bitter receptors occur downstream in the gastrointestinal tract and appear to regulate a number of physiological functions changes our understanding of bitter herbs. Specifically, it means that bitter herbs *do not* need to be tasted to boost upper digestive function. While tasting may be desirable for optimum effects, it is not essential. This means tablets or capsules containing bitter herbs are clinically active, although higher doses are probably necessary.

There are already clinical studies that support this new perspective. As early as 1956, Wolf and Mack carried out an excellent study on the action of various bitters on the stomach of their famous patient, Tom, who had an occluded esophagus and a gastric fistula.[7] Bitters were administered by mouth and swallowed into the blind esophagus; the resulting salivary volume and gastric secretion were compared with direct administration into the stomach.

In the 96 experiments conducted, it was found that there was considerable variation in the effects of bitters. Surprisingly, golden seal (*Hydrastis canadensis*) was the most active herb and gentian (*Gentiana lutea*) was virtually inactive at the levels tested. The increase in salivation when the bitter was administered orally was usually comparable with the increase in gastric secretion after direct introduction into the stomach.

It was concluded that bitters mainly exerted a direct effect on the stomach, since no significant effect was observed in Tom's stomach following their oral administration. (However, it should be kept in mind that other experiments do support the benefits from tasting bitter herbs.[8])

A more recent publication also suggested that bitters do indeed exert a direct effect in the stomach.[9] When isolated stomach cells were exposed to different levels of an extract of gentian root, a concentration-dependent rise in gastric acid production was observed. Significant effects for gentian extract were observed at concentrations of 10 to 100 mcg/mL, a concentration range that can be readily achieved by normal doses of gentian.

Support for the concept of direct activity in the stomach also comes from a multicenter, uncontrolled study of gentian capsules involving 205 patients.[10] Patients took on average about five capsules per day, each containing 120 mg of a 5:1 dry extract of gentian root, and achieved rapid and dramatic relief of symptoms, including constipation, flatulence, appetite loss, vomiting, heartburn, abdominal pain and nausea.

The new research also stresses that bitters can help regulate metabolic function. In epidemiological studies, functional variants in bitter taste receptors have been linked to alcohol dependency,[11] adiposity,[12] eating behavior disinhibition[13] and body-mass index.[14] Generally, people with lower bitter-tasting sensitivity exhibited the poorer health measure. The presence of bitter receptors on enteroendocrine cells suggests the mechanism behind these effects.

It also suggests a role for bitter herbs in glucose homeostasis and insulin resistance (since CCK is involved in glucose homeostasis). In support of this, 94 patients with prediabetes exhibited improvements in BMI, glycemic control and body fat when given just 16 to 48 mg/day of isohumulones (hop bitter acids) as capsules in a double-blind, placebo-controlled clinical trial.[15] The bitter herb *Andrographis paniculata* has demonstrated antidiabetic activity in several experimental models and lowered glycated hemoglobin and fasting insulin levels in a small, uncontrolled pilot trial involving patients with type 2 diabetes.[16]

In summary, in addition to their role in improving upper digestive function, new research suggests

that bitter herbs have a role to play in the management of constipation, insulin resistance, type 2 diabetes, metabolic syndrome and abdominal obesity. As such, their full therapeutic value is currently underestimated by most clinicians. Since bitters are energetically cold, they are best combined with warming and aromatic herbs such as ginger (*Zingiber officinale*) and *chen pi* (*Citrus reticulata*). Moreover, their role in boosting upper digestive function is augmented by their combination with known choleretic herbs such as milk thistle (*Silybum marianum*) and dandelion root (*Taraxacum officinale*). Most importantly, bitter herbs do not need to be tasted to exert their multiple therapeutic effects.

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