Select Herbals Targeted to Eradicating Gastrointestinal Dysbiosis

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Dysbiosis is the classic term for an imbalance of gastrointestinal microflora, indicating an increase in abnormal or noncommensal flora, with a coinciding decrease in commensal or normal flora. An increase in pathogenic bacteria, including *Shigella flexneri* and *Salmonella enteritidis*, opportunistic bacteria, including *Klebsiella pneumoniae*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and *Clostridium difficile*, and yeasts, including *Candida albicans* in the lower bowel is typically associated with dysbiosis.[1] In addition to the intestinal tract, dysbiosis of the mouth is also known to occur, and is associated with dental carries.[2] There are numerous factors correlated with dysbiosis, including a poor diet, physical and/or psychological stress, and the overuse of antibiotics, which in turn results in depressed immunity. Psychological stress has been demonstrated to decrease the level of secretory IgA, resulting in decreased mucosal immunity.[3] In addition to other coinciding factors, intestinal dysbiosis has been implicated as the root cause of bowel inflammation.[4] The root cause of many chronic degenerative diseases is correlated to the health of the bowel; consequently optimizing bowel health offers a significant advantage for long lasting health benefits.

Select herbs are well recognized in promoting the synergistic healing of damaged intestinal tissue, resulting predominately from dysbiosis. These herbs include:

Stemona sessilifolia (root) - The active principals of *Stemona* are its alkaloids. These alkaloids exert antifungal, antibacterial and pesticidic properties. It is typically indicated for acute and chronic cough; cough in phthisis (wasting syndrome), whooping cough, cough occurring with or after the common cold, and for cough due to exopathogens. Its action is said to be warm in nature, rather than dry, and its use is considered calming to the entire respiratory center. It also has proven effectiveness for the eradication of louse, parasites,[5] and worms (pinworms).[6, 7, 8]

Artemisia absinthium, Wormwood (shoots, leaves) – In Traditional Chinese Medicine (TCM) Artemisia has been used as an antiparasitic agent for more than 1,000 years,[9] as well as an antihelmintic since primordial times. Its parasitic properties are attributed partially to its α-santonin content.[10] It is also regarded as a potent and rapidly acting antimalarial herb.[11, 12] Its primary actions are noted to include cholagogue (inducing bile flow), digestive, appetite stimulating and wound healing, of which all are attributed to its essential oils and amaroids.[13] Following ingestion, the artemisinins are rapidly absorbed and subsequently penetrate the blood-brain barrier, and as in the case of malaria, accumulate into parasite infected erythrocytes. In turn these parasite infected erythrocytes are phagocytized by the leukocytes, thus subsequently eliminated.

In addition to its antiparasitic properties, the essential oil also possesses antimicrobial activity. *In vitro*, its use has been demonstrated to retard the growth of the parasite *Plasmodium falciparum*,[14] and has a confirmed 94.5% success rate in hookworm eradication.[13] It has also been demonstrated to exhibit hepatoprotective activities, partially via its inhibition of microsomal drug metabolizing enzymes (MDME).[15]

Artemisia intake has also been demonstrated to have an action in the stimulation the bitter receptors in the taste buds of the tongue, which in turn triggers a reflexive increase in stomach acid secretion. With intake a significant increase in the production of alphaamylase, lipase, and other digestive secretions has been demonstrated.[16] Bitter taste receptor activation has been associated with a rapid change in the level of second messengers. Recent research has correlated the ingestion of bitter stimuli with an initiation of both a cellular and molecular responses in the endocrine cells of the GI tract, postulating that "some elements of taste-specific signaling are operative in enteroendocrine cells."[17]

Brucea javanica (fruit) – The active constituents of *Brucea javanica* are the quassinoid compounds bruceantin and brucein C.[18] It possesses properties designated as beneficial to multiple bodily systems, including the digestive and circulatory systems, and the large intestines. Both the roots and fruits of *Brucea javanica* are used as popular agents against diarrhea, dysentery and fever.[19] *In vitro* studies have verified that *Brucea javanica* extracts are effective as amoebicides,[20] and clinical studies have shown it to be an effective agent in the treatment of amoebic dysentery[21, 22] and malaria.[23] In animal studies *B. javanica* has been demonstrated to play a role in immunological regulation, as evidenced by its killing effect on the cysts associated with Pneumocystis carnii pneumonia.[24] Other reports have illustrated its activity against various non-commensal organisms including *Shigella* species (*S. shiga, S. flexneri, S. boydii*), *Salmonella* species (*S. lexington, S. derby, S. typhi type II*) and *Vibrio* species (*V. cholerae, V. inaba and V. cholerae ogawa*).[25]

Pulsatilla chinensis (rhizome) – The root (rhizome) of *Pulsatilla chinensis* has been described as possessing anodyne (pain relieving), anti-inflammatory, antispasmodic, astringent and sedative properties.[26, 27, 28] It is noted as an effective agent for bacterial and amoebic dysentery,[27, 28] and is traditionally used in the treatment of malaria, nose bleeds and hemorrhoids, as well as externally to treat infestation with

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Trichomonas vaginitis.[27, 16] It is also thought to clear toxicity and lower fever.[29] The active compound in the root is the lactone protoanemonin, which is recognized as the bactericidal agent.[16]

Picrasma excelsa (bark) – Also referred to as Quassia, this herb is considered a powerful simple bitter, hence its use as a digestive aide. The two main ingredients are quassin and neoquassin. Traditional use is as a remedy for roundworms, as an insecticide, and as a remedy for headlice. It is also used as a remedy for digestive disorders, and for parasites.[30] Orally it is used for anorexia, indigestion, constipation, fever, or as an anthelmintic for thread worms, nematodes, and ascaris.[31] A recent study with *P. excelsa* noted a moderate inhibition of the cytochrome P450 (CYP) enzyme 1A1. This enzyme is a known activator of carcinogens.[32]

Acacia catechu (stem) – The herb *Acacia catechu* is typically utilized for its astringent and antioxidant properties. The catechins isolated from this herb have significant antioxidant and antimicrobial properties. In many parts of the world chewing sticks are made out of the stem, and because of its antimicrobial properties it is considered a valuable component for dental care.[33] The chief phytoconstituents of the heartwood are catechin and epicatechin.

Hedyotis diffusa – *Hedyotis diffusa* is one of the most popular herbs used in traditional Chinese medicine (TCM). It has been demonstrated to possess antioxidant,[34] antiinflammatory, hepatoprotective,[35] neuroprotective,[36] and antitumor properties.[37] Its active principles include anthraquinones,[38, 39] iridoid glucosides,[36, 34] triterpenoids,[40] and flavonoids.[36, 34]

Yarrow (Achillea millefolium) (leaf, flower) – The indications for the use of Yarrow, as approved by the German Commission E include loss of appetite, dyspeptic complains and liver/gallbladder issues. The actions of its flavonoids are indicated as cholagogic (bile flow stimulant), and as a vitalizer in increasing the production of stomach acid. It also possesses both anti-edema and anti-inflammatory attributes.[13] Yarrow is recognized for its relaxant property on smooth muscles, thus may aide with the relief of stomach cramps[41] associated with dysbiosis. In one study utilizing Yarrow, an anti-Staphylococcal activity was demonstrated.[42]

Dill (***Anethum graveolens***) (seeds) – As a popular flavoring agent, dill has a history of use as an aromatic herb and spice exceeding 2000 years.[43] It is said to have a calming effect on both the autonomic nervous and digestive systems, as well as having carminative and stomachic properties.[44] It is also indicated as a diuretic, antispasmodic and antibacterial agent, an expectorant, and as a pancreatic stimulant.[45]

The fruits (seeds) contain 1-4% essential oil, of which the primary compounds are corvone, limonene and α-phellandrene, representing 30-60%, 33% and 21%, respectively.[43, 46] Potent antibacterial activity has been demonstrated with both aqueous and organic extracts of the seeds.[47, 48, 49] The compounds D-limonene and D-carvone, have been demonstrated to possess strong activity against the species *Aspergillus niger*, *Saccharomyces cerevisiae* and *Candida albicans*.[50, 51, 52] Its activity against both Gram negative and Gram positive bacteria, as well as fungi and molds has also been demonstrated.[53] Aside from its beneficial attributes towards eradicating these species, its primarily use is for the calming action it exerts on the digestive system, and as such aids in reducing gastrointestinal irritation.

By virtue of the combination of Eastern and Western herbs, the select botanicals discussed above afford a broad anti-dysbiosic effect, even with low dosing. In addition to providing an unfriendly environment for bowel pathogens, this combination of herbs is safe for continual use for up to eight weeks, as it has a low toxicity, and affords minimal irritation to the gut lining. By providing constituents to support the healing and maintenance of the digestive epithelial lining, as well as to eradicate non-commensal flora, the above mentioned herbals affords potent healing properties.

Cautions:

- Artemisia is not recommended concurrently with drugs that thin the blood, drugs that reduce stomach acid, or drugs that prevent or lessen seizures. Additionally, consumption may intensify the effects and side effects of alcohol.[54]
- Yarrow is contraindicated with blood thinners, particularly coumarin. As it contains simple coumarin components,[55, 56] it may interfere with anticoagulants and blood pressure medications. Additionally, yarrow may be contraindicated concurrently with the use of drugs that minimize or reduce the production of stomach acid.[41]

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