SPECIFIC BOTANICALS AS AN AID FOR ACID REFLUX

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The lower esophageal sphincter (LES) is a ring of muscle at the entrance to the stomach. If functioning normally, the LES closes as soon as food passes through it. With improper closure, acid produced by the stomach may move up into the esophagus. This may cause symptoms such as heartburn. If these symptoms happen at a frequency greater than twice a week, it is classified as acid reflux disease or gastroesophageal reflux disease (GERD).[1]

Specific herbs have demonstrated the ability to provide beneficial attributes to aid with symptoms of acid reflux, or GERD. These herbs will be discussed below.

Meadowsweet ***(Filipendula ulmaria)***. Meadowsweet is a perennial herb in the Rosaceae family. It typically grows in damp meadows to a height of about four feet, and is noted for attracting wildlife. It contains tannins and salicin, a plant salicylate.[2,3] It is recognized as possessing numerous medicinal properties, including; stomachic, anti rheumatic, as well as astringent and antacid properties. It is also noted to have mild urinary antiseptic properties.[4]

In animals, the above ground parts of meadowsweet have been demonstrated to decrease motor activity, lower temperature, induce muscle relaxation, and potentiate the effect of narcotics.[4] Also, the flower extract has been noted to increase life expectancy, decrease vascular permeability, increase bronchial, intestinal, and uterine tone, and in animals to promote the excretion of uric acid. *In vitro*, it has bacteriostatic activity.[4] The medicinally applicable parts of meadowsweet are the above ground parts. Meadowsweet aqueous extracts contain high concentrations of tannins with strong astringent effects.[4] The active ingredients include flavonoids, phenol glycosides and essential oil.[5]

Cautions: Avoid in asthmatics. Avoid with concurrent aspirin use, as theoretically, meadowsweet might have an additive effect with other salicylatecontaining drugs, such as aspirin. Salicin, however, is not noted as possessing the antiplatelet effects of aspirin.[6] Also, due to the potential risk of Reye's syndrome, Meadowsweet is not recommended for children under 12 years of age, as a consequence of its salicylate content.[7] It should not be used in conjunction with choline magnesium trisalicylate (Trilisate), nor with narcotic drugs, as meadowsweet can potentiate narcotic effects.[8]

Okra ***(Abelmoschus esculentus).*** Okra is a flowering plant in the mallow family. It is an annual herb widely cultivated in tropical, subtropical and warm temperate climates for its edible green seed pods. Okra fruit contains a high percentage of water (80.7%), along with an abundant amount of pectin, mucilage, starch, and a low percentage of fat (4%).[9] It has also been demonstrated to possess strong antioxidant activity.[10]

Okra has long been a favorite vegetable, in the southern United States. The green pods are used when young, sliced into soups and similar dishes to impart a thick, viscous or gummy consistency. [11]

There are numerous folkloric health benefits[12] of okra, which include;

- A decoction of young okra fruit is beneficial in the treatment of inflammation of the mucous membranes, especially of the respiratory tract, accompanied by excessive secretions.
- Okra leaves are used for inflammation
- Okra's mucilage binds with cholesterol and bile acids and expelled through stool from the body.
- Okra is rich in fiber that absorbs water and improves the bulk of stool, thus is very effective against diarrhea and constipation.
- Okra is believed to smooth the skin, and prevent the eruption of pimples and acne.
- Okra's mucilage acts as a lubricant and a laxative for the intestinal tract facilitating the easy passage of waste.
- A decoction of okra is used to treat fever, headache and arthritis.
- Okra aids in lowering the blood sugar level by blocking the absorption of sugar in the intestinal tract.
- Okra juice used to treat diarrhea with fever and related abdominal pains.

The fruit of the okra plant *(Abelmoschus esculentus (L.) Moench)* is used in traditional Asian and African medicine as a mucilaginous food additive, which functions as a protective agent against gastric irritation and inflammatory diseases.[13] Lengsfeld C., et al. established that okra had antiadhesive qualities in the gastrointestinal tract, in which it was demonstrated to almost completely inhibit the bacterial adhesion of *Helicobacter pylori*. They attributed the antiadhesive properties to "the blocking capacity of specific Helicobacter surface receptors that coordinate the interaction between host and bacterium."[13] Likewise, a standardized aqueous extract of fresh okra (Okra FE), noted to contain a substantial amount of glycoproteins, was also demonstrated to block the adhesion of *H. pylori*

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to gastric epithelial cells.[14] In this study, utilizing *in vitro* and *in situ* conditions the authors recognized a "multi targeted, focused inhibition," which they correlated to the "strong reduction of *H. pylori* adhesion to gastric epithelial cells."[14] The mucilage derived from okra was also found to be a superior suspending agent, and thus may be used as a natural suspending agent. [15]

Eyebright *(Euphrasia officinalis).* Eyebright contains a naturally high content of iridoid glycosides, including aucubin. Several *in vitro* investigations have correlated this constituent with hepatoprotective properties, as well as antimicrobial activity.*[16]*

Aucubin has been demonstrated to be a specific inhibitor of NFkappaB activation in mast cells. Specifically, aucubin was demonstrated to inhibit antigeninduced nuclear translocation of p65 subunit of NFkappaB,[17] and the subsequent degradation of IkappaBalpha, thus preventing the activation of NFkappaB, and in turn resulting in a decrease in inflammation.

In addition to allergies and allergy associated conditions, orally administered eyebright is used to treat a number of related conditions, including inflammation of the nasal mucous membranes, allergic rhinitis, common cold, bronchial conditions, and sinusitis.[18] Historically, it has been used orally for coughs, conjunctivitis, earaches, epilepsy, headaches, hoarseness, inflammation, jaundice, ophthalmia, rhinitis, skin ailments, sore throat and cancer.[18]

Marshmallow *(Althaea officinalis)* – Marshmallow's habitat is salt marshes, damp meadows, the sides of ditches, by the sea, and on the banks of tidal rivers.[19] Orally, marshmallow leaf and root are used for respiratory tract mucous membrane inflammation, dry cough, gastric mucosa inflammation, diarrhea, peptic ulcers, constipation, and urinary tract inflammation or urinary calculus. The German E Commission monographs denotes the following uses for Marshmallow; a) irritation of the oral and pharyngeal mucosa and associated dry cough, and b) mild inflammation of the gastric mucosa. [20]

Upon investigation of the antitussive activity of different polysaccharides on experimentally induced cough in cats, scientists in Slovakia investigated various polysaccharides purified from flowers and plants. They segregated these compounds on the basis of chemical composition. Their results revealed that these polysaccharides exhibited stronger and more efficacious coughsuppressing activity then current nonnarcotic drugs used in practice. The most expressive activity was observed with marshmallow polysaccharides. [21,22]

Plantago asiatica *(Great Plantain)* – The Natural Medicines database denotes the oral use of great plantain "for cystitis with hematuria, bronchitis, colds, and for irritated or bleeding hemorrhoids. It is noted for its antiseptic, antiinflammatory, and antibacterial uses.[23] The chemical compounds of plantain include mucilage, iridoid glycosides, including aucubin and catapol, as well as tannin. Plantago is also noted to have a high vitamin K content.[24] Internally it is used for "catarrhs of the respiratory tract, inflammatory, and alterations of the oral and pharyngeal mucosa." [24]

Plantago also has immunomodulatory actions, according to a study by Huang DF, et al. In this study examining the immunomodulatory effects of plantago, they noted that dendritic cells, which play significant role in primary response of the immune system, expressed higher levels of MHC class II molecules, and major costimulatory molecules such as CD80 and CD86. Additionally, an increase in the antigen presenting abilities to allogeneically naïve or syngeneically primed T lymphocytes was also noted.[25] A watersoluble polysaccharide from the seeds of *Plantago asiatica* L. was also demonstrated to possess antioxidant activities, albeit at a lower activity than that of ascorbic acid.[26]

Cautions: Due to its high vitamin K content, the use of Plantago is not recommended in conjunction with Warfarin (Coumadin).[23]

The primary symptoms of dyspepsia include upper abdominal pain, belching, nausea, vomiting, abdominal bloating, early satiety, and abdominal distention (swelling). The combination of the five herbs noted above, along with pepsin, included to aide in the degradation of food proteins into peptides, may be beneficial in suppressing the effect of acid in the stomach, and as such offer relief for the symptoms of dyspepsia, acid indigestion, or sour stomach. Thus this herbal combination may offer aide for temporarily suppressing these symptoms.

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