

## Investigation of Treatment Mechanisms of Psycho-Digest Distilled on Digestive Diseases

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### Abstract

There are a wide number of digestive system disorders, which impose a substantial influence on morbidity and mortality rates, worldwide. Ethno medicinal plant studies have become of particular interest and have become increasingly more valuable in the development of health care and conservation programs in different parts of the world. In developing countries, medicinal plants continue to be a main source of medication. It has been estimated that approximately 88% of the inhabitants of underdeveloped countries rely mainly on traditional medicine for their primary form of medicinal health care. This review investigates the available studies on the pharmacological effects of some medicinal plants (*Aloysia triphlla*, *Citrus aurantium*, *Echium amoenum*, *Lavandula stoechas*, *Melissa officinalis*, *Valeriana officinalis*, *Viola odorata*, *Salix aegyptica* and *Cinnamomum zelanicum*) on digestive diseases. The present article incorporated a detailed interpretation of the these nine medicinal plants, emphasizing its therapeutic uses, pharmacological properties and mechanism of action based on preclinical and clinical studies, safety issues along with the current research potential of the medicinal plants.

**Keywords:** Anti-inflammatory intestine effects; Digestive problems; Gastric ulcer; Medicinal plants

### Introduction

There are a wide number of digestive system disorders, which impose a substantial influence on morbidity and mortality rates, worldwide. The World Health Organization [1] reported that digestive system disorders, particularly diarrhea, was the fifth leading cause of global mortality, as approximately 100 million people died worldwide in 2012 from these types of disorders. Ethno-medicinal plant studies have become of particular interest and have become increasingly more valuable in the development of health care and conservation programs in different parts of the world. The WHO has recognized the role of traditional medicine in the primary health care system [1-3]. In developing countries, medicinal plants continue to be a main source of medication. It has been estimated that approximately 88% of the inhabitants of underdeveloped countries rely mainly on traditional medicine for their primary form of medicinal health care [1]. Nine medicinal plants distilled (Psycho-Digest) that is the combination of nine medicinal plants (Table 1) *Aloysia triphlla*, *Citrus aurantium*, *Echium amoenum*, *Lavandula stoechas*, *Melissa officinalis*, *Valeriana officinalis*, *Viola odorata*, *Salix aegyptica* and *Cinnamomum zelanicum*. It has therapeutic properties on controlling digestive disorders such as (gastric ulcer, inflammatory of intestine, crohn's, wounded colitis (ulcerative colitis), gastrointestinal infections and constipation), depression, anxiety, Alzheimer's, memory enhancement as well as diabetes. The present article incorporated the mechanism of action of nine medicinal plant's components that used in Psycho-Digest to treat mentioned diseases.

### Gastric Ulcer

Gastric ulcer is a global issue. It is the imbalance between aggressive agents (acid, pepsin and heliobacter pylori), and defense factors (mucus, prostaglandins, biocides, nitric acid, and growth hormone) [2]. The gastric mucosa contains large quantities of prostaglandin. These arachidonic acid metabolites regulate the release of bicarbonate and mucus, also inhibit secretion of the inactive cells. On the other hand, they are important for the mucosal circulation and for the restoration of epithelial cells [3]. The compounds present in

the psychedelic may stimulate the physiological system by increasing the secretion of bicarbonate, alkalizing the gastric environment, neutralizing the excess acid, and increase pH. The combination of verbosaccoside reduces the gastrin secretion and reduces acid secretion from the interstitial cells. And its anti-secretion effects on gastrin are highly dependent on H<sup>+</sup> -K<sup>+</sup> ATPase pump inhibition [2]. Polyphenolic compounds such as tannin and flavonoids have protective effects on gastric mucus [4]. Flavonoids, having antioxidant properties, neutralize free radicals and help inhibition of ulcers. On the other hand, lipolysis inhibition prevents penetration of the necrotic agent to gastric mucus [5-7]. It also repels deep-necrosis ulcers and prevents widespread lamination of the epithelium. Flavonoids have a wide range of pharmacological effects, such as preventing the oxidation of low molecular weight lipoproteins, preventing platelet aggregation, and the stability of immune cells, thus, in the treatment of gastrointestinal disorders, viral infections, swelling and gastric ulcers [8]. One of the compounds in Psycho-Digest is mucilage. The pectin mucilage protective layer can eliminate deep necrotic ulcers and prevent the widespread lamination of the epithelium [9]. One of the other medicinal properties of mucilage is their anti-burning properties. These compounds provide a delicate protective layer on the stomach membrane and prevent the effects of irritating agents on the stomach surface. Therefore, they are used to treat gastrointestinal ulcers and throat and mucous membrane infections [10]. Tannins, due to their limitations, are used in surface and digestive hemorrhages, which in this case precipitate with surface-layer proteins and restore the underlying tissue. Vitamin C in the drug prevents the spread of free radicals as antioxidants. Changes in gastric motility play an important

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Plant	Plant part used	Bioactive compounds	Screened activity
<i>Aloysia triphlla</i>	The medicinal part is the oil of vervain as a distillate of the fresh twigs and the dried leaves and stems.	Limoneno, Linalol, $\beta$ -Ocimeno, $\alpha$ -Ciclocitral, Z-p-Menten-2,8-dienol, E-Verbenol, -Crisantemal, E-Isocitral, $\alpha$ -Citral and E-Nerolidol	digestive aid, antimicrobial, antispasmodic, analgesic, diuretic plant, besides, it is used as a treatment for cold, insomnia and anxiety
<i>Cinnamomum zelanicum</i>	The medicinal parts are the cinnamon oil extracted from the bark, the cinnamon bark of younger branches and the cinnamon leaf oil.	cinnamaldehyde, eiterhineugenol, cinnamyl alcohol, o-methoxycinnamaldehyde and cinnamic acid.	Antibacteria, fungistatic, promotes motility and increases gastric secretions.
<i>Citrus aurantium</i>	The medicinal parts are the juice, peel and oil of the fruit and flowers.	limonene, citral, linalyl acetate, geranyl acetat, citronellyl acetat, methyl anthranilate, lipophilic flavinoids, including sinensetin, nobiletin and furocoumarins.	Treatment of neurological disorders such as seizures and weakness of the nerves, abdominal spasms and antitumour.
<i>Echium amoenum</i>	The medicinal parts are flowers and leaves.	Rich source of anthocyanins including sanding and delphinidin. Methanol extract of <i>Echium amoenum</i> flower Significantly high in phenol and flavonoids. Phenols and polyphenols including flavonoids have been found to be broadly found in food products, it has been shown to have significant antioxidant activity.	effects of relaxation, sputum, blood purification, an enormous amount of beneficial diseases, anti-cough and asthma, mucus, laxative, diuretic, lactate and for the treatment of rheumatism, Essential biology, neurological problems, colds and chronic renal failure, and is also useful in pancreatitis.
<i>Melissa officinalis</i>	The medicinal parts are the oil extracted by distillation, the dried leaves, the fresh leaves and the whole plant.	Citral a, neral (citral "S), citronellal, linalool, geraniol, geranylacetate, methyl citronellate, trans-P-ocimene, 1-Octen- 3-ol. Glycosides, Flavonoids (cynaroside, cosmosiin, rhamnocitrin, isoquercitrin).	Antioxidant, antidepressant, anti-nxiety and anticonvulsant, antifatulence, Dyspepsia treatment and Treatment of digestive and intestinal disorders of the nervous origin.
<i>Salix aegyptica</i>	The medicinal parts are the flowers, fruit and leaves.	Glycosides, salicylic acid, salicin, salicortin, salicin, Tannins and flavonoids.	Antipyretic, antiphlogistic, analgesic, anti-inflammatory and antipyretic effects.
<i>Lavandula stoechas</i>	The medicinal parts are the essential oil extracted from the fresh flowers and/or the inflorescences, the flowers collected just before opening and dried, the fresh flowers and the dried flowers.	Linalool, linalyl acetate, cis-ocimene, terpinene-4-ol, betacaryophyllene, lavandulyl acetate, Tannins, rosmaric acid linalyl acetate and linalool.	Anticonvulsive, anxiolytic, antidepressant, anticonflict effects, bile and antifatulence,
<i>Valeriana officinalis</i>	The medicinal parts are the carefully dried underground parts and the dried roots.	Valeriana-epoxy-triacylates, iridoide monoterpenes, isovaltrate, isovaleroxyhydroxy, bomyl acetate, isoeugenyl valerenate, isoeugenyl isovalerenate, alpha-methylpyrrolketone and chlorogenic acid.	Antidepressant, anxiolytic, sedative insomnia, Disposal of gastric gas and antispasmodic.
<i>Viola odorata</i>	The medicinal parts are the essential oil from the leaves, the dried flowers, the air-dried leaves collected during the flowering season, the flowering herb, the dried rhizome, the fresh aerial parts collected during the flowering season and the whole plant.	salicylic acid methyl, beta-nitropropionic acid, Alkaloids and saponin.	Antimicrobial, broncho-secretolytic, fever, inflammation of the oral mucosa, nervous strain, coughs, throat inflammations, insomnia hysteria and headache.

Table 1: Nine medicinal plants with evidence of their activities.

role in wound spreading or inhibition. Smooth muscle expansion is a protective factor for mucus. This expansion causes the opening of the gastric mucus and increases the extent of the stimulation site and the effect of acid on the mucus decreases [11]. The compounds present in the Psycho-Digest have anti-spasmodic and anticholinergic effects on the smooth muscle of the gastrointestinal tract that are probably related to blockage of cholinergic receptors of the nervous system of the vagus, which reduces the secretion of gastric acid [12]. One of the effects of this drug is its anti-ulcer effect, which is probably due to the protective role of acid and pepsin, which prevents the release of hydrogen ion by creating a viscous protective layer. This layer prevents the effect of acid on the gastric mucosa and is effective in treating stomach ulcers. The compounds in the drug can release endogenous secretin, which is a type of gastrointestinal agent. Also, the pacemaker, with its mechanism of increasing glycoprotein and suppressing the activation of pepsinogen, has its therapeutic effect on the treatment of gastric ulcer. The compounds present in Psycho-Digest increase the level of myosin and glutathione and reduce the amount of histamine in the stomach, resulting in a significant protection against gastrointestinal ulcers [13].

## Anti-inflammatory Intestine Effects

Inflammation of the intestine is an inflammatory disease due to overactive oxygenation ( $O_2$ ). Polyphenols are the main ingredients with anti-oxidative and anti-inflammatory properties and play an important role in preventing inflammation of the intestine. The compounds in the pyrexia regulate the immune system's responses by boosting the system and modulating inflammation caused by pathogens and preventing the production of inflammatory cytokines [14]. Also, the Salisin in this diet turns into salicylic acid after metabolism. Salicylic acid plays a major role in anti-inflammatory effects [15]. Verbacoside (combining glycoside phenylpropanoid), eliminating free radicals and inhibiting lipid peroxidation.

The nerve protecting mechanism of verboscoside in the drug is effective in regulating the digestive factors and regulating gene expression, which reduces the receptors associated with inflammation [16]. Gammalinolinic acid (GLA) is an unsaturated fatty acid found in boulevard, willow and violet flowers. GLA is metabolized to dihomogammalinolenic acid a prostaglandin prodrug with anti-inflammatory properties and immune regulation. Increasing the use

of GLA through the activation of the 15-hydroxyl derivative blocks the conversion of arachidonic to the luteoyl and acts as a competitive inhibitor of PGE2 and LTS, thus inhibiting inflammation [17].

### Anti-Crohn's Effects

Crohn's disease is an inflammatory intestine disease that can affect the various parts of the gastrointestinal tract from the mouth to the anus. This disease can affect all layers of the intestine and even cause fibrosis. There is a close correlation between Crohn's disease and the nervous system, because members of the body and the brain are in direct communication, emotional stress can affect the symptoms of Crohn's disease or any other chronic disease, and it is evident that during these nervous pressures these reactions intensify. Therefore, considering the effects of Psycho-Digest, it can also be helpful in improving the nervous system in the treatment of this disease. The mechanism of the effect of depression and anxiety on the gastrointestinal tract with the release of cortisol from hormone stress causes the digestive tract to stop. As the digestive tract of food and toxins enter the circulatory stream through intestinal leakage, it is invaded by the immune system, thereby releasing cytokines and ultimately causing inflammation and swelling in various parts of the digestive system. Researchers have also shown that *E. coli* is associated with Crohn's disease. Therefore, in view of the positive effects of the active ingredients in the psychedelic, in controlling bacterial digestive system bacteria, including *E. coli*, it can be used in the treatment of this disease.

### Wounded Colitis (ulcerative colitis)

It is a form of inflammatory bowel disease that affects the intestines, especially the large intestine, including the retrograde (colon) and rectum (rectum). The main cause of the disease seems to be bacteria and viruses. Stress and living in urban environments can also exacerbate the disease. Due to its antibacterial and viral effects, its positive effect on stress and anxiety has a significant role in reducing the effects of ulcerative colitis. It also reduces immune responses, and the effect on metabolism and lowering blood glucose can improve the course of the disease. The amount of vitamin C in the drug combinations reduces the amount of adrenal corticosteroid hormones that make up the weakening of the digestive system and immune system. On the other hand, vitamin C protects lymphoid tissues due to its antioxidant properties and improves the immune system by increasing their effectiveness [18]. The compounds in the drug reduce inflammation, which seems to control inflammation by reducing the pathways of arachidonic acid in the pathway for lipoxygenase, as well as inhibiting the cyclooxygenase pathway and reducing the production of prostaglandin in the colon.

### Gastrointestinal Infections

Intestinal viruses, especially human neuroviruses, are the major cause of food-borne diseases in developed countries. The researchers said that the compounds contained in the cicatrican essential oil used in the cytokines, through the inactivation of bacteriophage T4 [19], reduced the incidence of gastrointestinal infections caused by the consumption of food contaminated with neuro viruses [20]. The pacemaker has anti-microbial, antioxidant, anti-fungal and antiprotzoan effects. Anti-microbial effects of the compounds present in the drug against *Pseudomonas aeruginosa*, enterococcal faecalis, *Staphylococcus aureus*, salivary epidermal *Staphylococcus*, *Vibrio parahaemolyticus* caused by the effect of cinnamaldehyde [21]. The components of cinnamaldehyde, ovanol and various terpenes in the pseudodynthesis have antibacterial properties against *Helicobacter*

*pylori* and are effective in the treatment of patients with gastric ulcer, duodenal ulcer and gastric cancer [22].

### Gastrointestinal Diseases Associated with the Nervous System

Phenolic compounds (phenolic acids and flavonoids) naturally have a reactive antioxidant activity (oxidation-reduction), as well as iron chelating agents [23,24]. Also, the active ingredients of cinnamaldehyde, gamma agglutinin, estrogen azogol, ergo-tryptenol, campanecistrol, epithapine, corridine, cirrhizic acid, cyamic acid, coumarin and vanillic acid decrease the concentration of local oxygen by neutralizing single oxidants. The intermediate metal ions and their combined catalyst are disrupted, in the polar phase and lipid phase, they can eliminate the free radicals of the initiator and stop the chain reactions [25]. They are also capable of recycling alpha tocopherol from lipoprotein particles into a two-layer membrane and converting it into an active antioxidant form. On the other hand, they can inhibit many oxidizing enzymes [26]. Therefore, it is useful in the treatment of gastrointestinal disorders caused by nerve disorders. The intestinal nervous system acts as a semi-independent and directly affects smooth muscle, endovascular cells and blood vessels, and facilitates seborrhea-related secretions and movements. Serotonin is effective in regulating gut and intestinal secretions [27,28]. 95% of the total serotonin is in the gastrointestinal tract and about 5% in the brain. Serotonin is primarily released by enterochemophilic cells and, to a lesser extent, by nerve cells and mast cells [27,29]. The stimulation of the inner part of the endoplasmic network facilitates the release of serotonin and activates the peristaltic reflexes. Following the movement of some of the contents within the endoplasmic network of the intestine, the release of serotonin begins, and activates the neurons in the intestine, which synapse with the internal neurons in the pre-mucosal neural network. The occurrence of a messenger cascade facilitates the smooth contraction of the closure of the end of the contents of the intestine and ultimately the recovery of the muscle located at the far end, relaxing; therefore, the contents of the intestine go unilaterally and digestive problems are resolved [27,30]. On the other hand, compounds in the drug, such as Viollet, Linalil acetate, Amino acid and Valyotrium, as well as their role, have greatly contributed to reducing stress, and given the fact that under severe stressful conditions, serotonin levels decrease [31]. Therefore, with the use of medication and increased serotonin levels, the risk of digestive diseases also decreases.

### Constipation Treatment

Constipation is not a disease, but it can be a sign of different causes. This condition can be inherited or result of endocrine disorders, or diseases of the nervous system, colon diseases, or the effects of drugs and toxins. Reducing the movement of the colon, reducing the frequency of bowel movements, decreasing the volume of stool and increasing its hardness will definitely cause constipation. Constipation also occurs due to stool dehydration that has long remained in the colon. Mucilage present in the psychedelic leads to the accumulation of water and electrolytes in the colon space resulting in increased intestinal movements. These compounds increase the permeability of the mucus and thus allow water to penetrate through the pores. These compounds also increase the synthesis of prostaglandins and cAMP, thereby increasing the release of water and electrolytes. Another effect of the drug is due to the presence of other zenoides and other active metabolites called rin anthrons in the large intestine, which affects the lower parts of the large intestine. After the use of paclitaxel and absorption by the digestive system, free active anthraquinones are

released into the large intestine. Due to the performance of these compounds, the absorption of water and electrolytes from the large intestine decreases and the volume and pressure of the intestinal contents increase. This condition stimulates the movement of the large intestine and prevents obstruction and excretion [32,33].

## Future Direction

Considering therapeutic potential of these nine medicinal plants in terms of their efficacy and adaptability is such that combination of them as one organic product can be noticed in future Table 1, since digestive problems are becoming more epidemic around the world especially in developing countries as an organic product by using local knowledge can reduce many problems associated with the use of chemical drugs and their side effects to a large extent.

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