

A Comprehensive Review of Medicinal Plants in the Treatment of Gastroenteritis

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Date of Submission: 10-12-2024

Date of Acceptance: 20-12-2024

ABSTRACT:

Acute gastroenteritis is a prevalent infectious disease syndrome that manifests as a mix of vomiting, diarrhoea, nausea, and stomach discomfort. In the US, foodborne bacteria constitute the cause of 48 million of the more than 350 million acute gastroenteritis cases that occur each year. This Gastroenteritis continues to be a major global health concern, particularly in underdeveloped nations where access to traditional medical care may be restricted. Because they contain a variety of bioactive chemicals, medicinal herbs have long been used as a primary or supplementary therapy for the treatment of gastroenteritis. The effectiveness and mode of action of a few typical medicinal plants used in traditional medicine to treat gastroenteritis are examined in this article. Numerous preclinical and clinical investigations have demonstrated the potential anti-inflammatory, antibacterial, and gastroprotective qualities of plants like Aloe vera, Ginger (*Zingiber officinale*), and Peppermint (*Mentha piperita*). Their active ingredients, which include menthol, gingerol, and polysaccharides, modulate gut flora, lessen intestinal spasms, and ease symptoms like diarrhoea and stomach pain in order to achieve their therapeutic goals.

KEYWORDS: gastroenteritis, rotavirus, herbal plants, diarrhoea

I. INTRODUCTION:

The term "gastritis" refers to inflammation of the stomach and intestines, which can cause a variety of symptoms, ranging from infections with no symptoms to minor complaints to potentially fatal illnesses. An infection of the digestive tract called gastroenteritis causes diarrhoea. More frequently than not, a virus causes vomiting, while bacteria are considerably less likely to cause it. An infection of the digestive tract called gastroenteritis causes diarrhoea. It is primarily caused by a virus that makes vomiting more common than by germs.

Acute infectious diseases typically spread in close quarters, such as daycare centres, elderly homes, and cruise ships. Numerous viruses can cause symptoms, but in everyday clinical practice, the actual virus that is causing the problem is typically not found. Therapy is usually consistent and focused on symptoms, regardless of the viral aetiology. Two main mechanisms are accountable for acute gastroenteritis: injury to the intestinal villous brush boundary, which causes the intestinal contents to be absorbed and cause aseptic diarrhoea, and toxin release that results in the release of chloride ions by binding to certain enterocyte receptors. (1)

The primary mechanism of gastroenteritis:

The proximal small intestine experiences excessive fluid secretion due to the action of a luminal toxin produced by entero-pathogens or minimally invasive microorganisms.

Damage to the ileum or colonic mucosa due to inflammation or cytotoxicity, which may cause haemorrhage. The bacteria enters the reticuloendothelial system through the mucosa and helps the case of typhoid fever by concentrating on the patient's state of hydration.

An estimated 2.2 million people die from diarrheal illness each year, with over 1.7 billion cases worldwide being documented. The burden of diarrheal illness is very important for the development of inadequate nourishment, inadequate resources, and extremely bad sanitation. Diarrhoea and vomiting are common symptoms of gastroenteritis, a fairly common ailment mostly affecting children and usually caused by a virus called Rotavirus. Adult cases are typically brought on by the norovirus, which is typically linked to winter vomiting or bacterial food poisoning. When diarrhoea lasts more than 30 days, it's referred to as chronic diarrhoea. While the aetiology of diarrhoea is non-infectious, it is becoming more common in high-income nations and can be infectious,

meaning it can be caused by bacteria, viruses, or parasites. Food intolerances and drug reactions are the main causes of diarrhoea in affluent nations. An example of an intestinal ailment is irritable bowel syndrome, which can also include Crohn's disease, ulcerative colitis, and celiac disease. In the aforementioned case, bacterial stool cultures and other laboratory testing for infectious aetiology are helpful for a conclusive diagnosis of both infectious and non-infectious gastroenteritis. The clinical diagnosis of gastroenteritis frequently relies on many symptoms. Symptoms of gastroenteritis typically include belching, diarrhoea, flatulence, gagging, indigestion, nausea, cramping in the stomach, or vomiting. Dehydration, exhaustion, fever, chills, lethargy, lightheadedness, or loss of appetite are among the typical whole body symptoms.(2)

Signs and symptoms:

Most of the stomach infection are spread through contamination food and water cause pain And diarrhea.

- ❖ Nausea and vomiting □
- ❖ Diarrhea □
- ❖ Loss of appetite □
- ❖ Fever □
- ❖ Headache □
- ❖ Abdominal pain □
- ❖ Abdominal cramps

Types of gastroenteritis:

1. Viral gastroenteritis
2. Bacterial gastroenteritis
3. Amoebic dysentery
4. Bacillary dysentery(4)

Viral gastroenteritis:

Acute viral gastroenteritis outbreaks happen most often in the winter. Most the Children under the age of five are most commonly affected by acute viral gastroenteritis.

The ratio of sexes is about equal. In industrialised nations, the average child under the age of five has 2 .2 episodes of diarrhoea year; in poor nations, this number is substantially higher. Over 200,000 child deaths worldwide are attributed acute viral gastroenteritis, with the majority of these cases occurring in underdeveloped nations. Most viral pathogens spread by person-to-person contact, contaminated food, and polluted water through the faecal-oral pathways and There have been reports of SARS-coronavirus, rotavirus, and norovirus outbreaks that may have been caused via airborne transmission(5)

Bacterial gastroenteritis:

The intestinal issue known as "bacterial gastroenteritis" is brought on by bacteria. Nausea, vomiting, fever, diarrhoea, cramping in the abdomen, and discomfort are among the symptoms. In extreme circumstances, you could get electrolyte imbalance and dehydration.

There are occasions when antibiotics are used to treat bacterial gastroenteritis(6)

Amoebic dysentery:

Infection with amoebiasis is particularly prevalent in tropical regions with untreated water. It spreads by ingestion of raw food, including fruit, that may have been tainted with contaminated drinking water(7).

Bacillary dysentery:

An intestinal ailment known as bacillary dysentery is brought on by a kind of Shigella bacteria that are present in the human gut. Clinical attributes. Shigella infection may be asymptomatic or merely cause illness(8)

Diagnosis:

Acute gastroenteritis is characterised by a sudden start of diarrheal illness that may or may not include fever, vomiting, nausea, or abdominal discomfort. Acute gastroenteritis causes 300 paediatric fatalities, 200,000 hospital admissions, and 1.5 million office visits in the US annually. A child's recent history of fluid intake and output should be considered while evaluating them for acute gastroenteritis. If parents do not notice vomiting, a decrease in oral intake, or a drop in urine production, then significant dehydration is unlikely. The most effective method of assessing hydration status is the physical examination. Based on the results of a physical examination, the degree of dehydration can be assessed using the four-item Clinical Dehydration Scale. Stool microbiological testing is not usually required in children with moderate illness when viral gastroenteritis is the most likely diagnosis. Gentle Children with mild gastroenteritis can be treated at home. When treating mild dehydration, oral rehydration therapy which involves giving the child half-strength apple juice before moving on to their preferred liquids is the cornerstone of treatment and works just as well as intravenous rehydration in avoiding hospitalisation and ER visits. For mild dehydration, oral rehydration solutions are advised. If necessary, a prescription for ondansetron may be given to stop vomiting and increase tolerance to oral rehydration

solutions. For individuals with severe dehydration (i.e., signs of shock or more than 10% dehydration), as well as children who do not respond to oral rehydration therapy plus an antiemetic, hospitalisation and intravenous fluids are advised. In young children, hand washing, nursing, and rotavirus immunisation lower the risk of acute gastroenteritis.(9)

Treatment :

Most people with gastroenteritis recover within a few days without the need for medical treatment, as long as they stay properly hydrated. To help keep yourself comfortable and prevent dehydration while you recover, try the following: Avoid dairy products, caffeine, alcohol, and nicotine. Avoid sugary, fatty, or highly seasoned (spicy)foods. Drink plenty of liquid every day, taking small, frequent sips, including clear thin broths or soups, diluted non-caffeinated sports drinks (e.g., Powerade or Gatorade), and rehydration formulas(e.g., Gastrolyte)that are available without prescription from a pharmacy. Make sure that you get plenty of rest. Avoid taking non-steroidal anti-inflammatory drugs (NSAIDs), such as aspirin, ibuprofen, and diclofenac, for pain relief as they can make your stomach more upset.

Medical Treatment:

If the patient is not able to take fluids by mouth because of vomiting, an IV may be inserted to restore fluids back into the body for rehydration. A surgeon, toxicologist, gastroenterologist, or other specialist's evaluation. Antibiotics are generally not given until a specific bacterium has been identified as using wrong antibiotics. Treatment with Oral Rehydration (ORT)

This is the cornerstone of treatment and ought to be applied to all mild to moderate acute gastroenteritis cases. A well-balanced combination of glucose and electrolyte salts makes up ORT. Oral rehydration salts (ORS), which contain glucose, potassium chloride, sodium chloride, and trisodium citrate, are a pharmaceutical product that can be purchased. Through the co-transport of salt and glucose via the SGLT1 protein and active probiotics for therapy, water can be absorbed across the intestinal lumen even when diarrhoea is still present.

Prevention:

Rotavirus is the primary cause of diarrhea-associated illness and mortality in children under the age of five. Thankfully, several nations now

have access to secure and reliable rotavirus vaccinations. The prevalence and severity of disease in both upper-class and lower-class settings are significantly reduced with the introduction of universal childhood vaccination against rotaviruses. Consequently, all national immunisation programmes should incorporate rotavirus vaccinations, as recommended by the World Health Organisation in 2009. Norovirus is currently known to be the primary cause of outbreaks and occasional occurrences of diarrheal sickness in adults. It causes approximately 21 million episodes of diarrheal illness yearly in the United States, of which 5.5 million are foodborne. The lack of a cell culture system to replicate the virus, the high genetic diversity of norovirus strains, and the apparent lack of long-term protection produced by natural infection have all hampered efforts to develop effective norovirus vaccines. The interaction between noroviruses and their putative cellular receptors, histo-blood group antigens, has been the subject of recent research that could shed light on the creation of particular antiviral drugs. The norovirus is now known to be the primary cause of adult cases that occur sometimes, and it offers a helpful new public health tool for quickly identifying norovirus outbreaks. Comparable to the prosperous PulseNet network for foodborne bacterial molecular typing and NoroNet in Europe, CaliciNet will allow cases with comparable sequence fingerprints to be linked into disease clusters that might share an exposure. This connection will be especially helpful in situations where illnesses are linked to low-contamination food products and it may be challenging to determine whether a person was exposed to a common food source using only epidemiologic techniques.(11)

Path physiology of gastroenteritis:

Different bacterial species can induce gastritis, and they all have distinct effects on the gastrointestinal tract. Certain bacteria can penetrate the gastrointestinal tract and adhere to the intestinal mucosa, or lining, from which they release toxins. The intestinal mucosa cells are not attacked by these bacteria. They release toxins that affect the absorption of nutrients, resulting in mal-absorption. Additionally, these toxins cause the mucosal cells to release water and electrolytes. This will manifest as copious watery diarrhoea and vomiting, which usually begins 12 to 48 hours after intake. Other bacteria cause bleeding and ulcers by attacking the mucosal cells. This results in inflammatory diarrhoea, which occasionally is accompanied by

bloody diarrhoea. The patient also experiences severe abdominal pain. The common signs and symptoms of bacterial gastroenteritis, such as fever, nausea, vomiting, abdominal discomfort, and diarrhoea, are brought on by this gastrointestinal inflammation and irritation(12)

General medicinal plants used in the treatment of gastroenteritis:

1. Ginger:

The scientific name of ginger is *Zingiber officinale*. It belongs to the family *Zingiberaceae*. It consists of phytochemical constituents like flavonoids, coumarin, and cineole. And pharmacological activities are anti-inflammatory, anti-oxidant, anti-diabetic and anti-emetic activities. A traditional cure for nausea and vomiting has long been the use of ginger (*Zingiber officinale*). Additionally possessing anti-inflammatory and antioxidant qualities are the active phenolic chemicals found in ginger, namely gingerols, zingiberene, and shogaols. Studies have looked into the antiemetic properties of ginger in relation to motion sickness, pregnancy, anaesthesia, surgery, and nausea and vomiting brought on by chemotherapy.⁹ to 25 Ginger can effectively manage vomiting without causing any negative effects when taken at levels up to 2g/day. Ginger may have several different modes of action in addition to its general anti-inflammatory properties. These mechanisms may include modulating gastrointestinal and esophageal motility as well as inhibiting 5-HT₃ and muscarinic acetylcholine (M₃) receptors. There are no data on the pharmacological effects of ginger that have been studied in humans.⁽¹³⁾ In addition to its basic anti-inflammatory effects on kids. Nonetheless, there is no evidence to support the widespread use of ginger-based dietary supplements, which are becoming more widely accessible on the market, for the treatment or prevention of paediatric vomiting. Consequently, the goal of the current randomised trial was to determine whether ginger may lessen children's vomiting related to AGEs.⁽¹⁴⁾

2. Chamomile:

The scientific name of chamomile is *Matricaria chamomilla*. It belongs to the family *Asteraceae*. It consists of phytochemical constituents like flavonoids, sesquiterpenes, coumarins and volatile oils. And pharmacological activities like anti-inflammatory, anti-ulcer, analgesic and antiparasitic activities. The TCM literature lists chamomile's numerous applications,

and it's one of the most often utilised herbal remedies for dermatitis, mild infections, cramping, and stomach issues. For thousands of years, Greece, Rome, and ancient Egypt have used chamomile. The herb was originally extensively documented in Uyghur medicine in China. The 10th-century Uyghur medical text known as the "Zhu Medical Canon" refers to chamomile as "Bamu Nai." It smells and tastes slightly bitter. The herb nourishes the stomach and nerves. It is widely used to treat persistent headaches, constipation, inadequate sweating, joint swelling, and abnormalities of the urinary system. Pharmacopoeia containing chamomile include those from Germany, Europe, the United States, Britain, and other countries. It is an ingredient in numerous formulations used in traditional medicine, including Unani and Homoeopathy, as well as Zukamu, Fufang Munizi, and Strong Madsiri Ayat honey ointment. Additionally, the primary active component of many mouthwash formulations is chamomile. When taken orally, this herb reduces gastrointestinal symptoms and pain brought on by functional digestive problems. Applying chamomile essence topically as a lotion or powder can heal skin conditions, wounds, haemorrhoids, and inflammation of the eyes, nose, and throat in addition to keeping mosquitoes away⁽¹⁵⁾

3. Peppermint:

The scientific name of peppermint is *Mentha piperita*. It belongs to the family *Lamiaceae*. It consists of phytochemical constituents like flavonoids, phenolic acids and alkaloids. And pharmacological activities like anti-inflammatory, anti-bacterial, antioxidant activities. For centuries, people have used peppermint as a digestive aid, to help with post-meal digestion, and to ease symptoms of nausea, flatulence, and vomiting. The effectiveness of peppermint in treating postoperative nausea and esophageal dysmotility is a physiological finding that is also hypothesised to play a part in the genesis of NVP. It has been demonstrated, but its efficacy in treating NVP has not been studied. Anecdotal evidence suggests that peppermint relieves nausea in women with NVP while also having a calming impact on the stomach. It can be consumed in little doses as a tea (typically mixed with ginger to make a tasty beverage), as peppermint-flavored sweets, or as an indirect inhalation of peppermint oil used in aromatherapy. For the latter, a lot of expectant mothers. Though peppermint is seen to be a safe

and soothing medicine, it should be used with caution because it contains a lot of volatile oils that might cross the placenta. As such, it should only be used sparingly as a tea, not as a tincture or essential oil to be consumed.(16)

4.papaya.

The scientific name of papaya is carica papaya. It belongs to the family caricaceae .It consists of phytochemical constituents like flavonoids,tannins and phenols.And pharmacological activities like anti-inflammatory,anti-microbial ,antioxidant activites.In tropical and developed nations, papaya (*Carica papaya* L.) is utilised as a natural cure for dysbiosis. Aside from its broad dispersion, not much data has been presented regarding the substance's physiological impact on humans or its shown effectiveness. Previous clinical studies showed that consuming papaya preparations improved patients' symptoms of heartburn, constipation, and irritable bowel syndrome (IBS). We investigated the clinical effects of the papaya preparation Caricol® in a double blind, placebo-controlled research design, in keeping with these prior encouraging clinical observations.It contains enzymes that can help with digestion and reduce inflammation,which may help heal digestive problems(17)

5.Fenugreek:

The scientific name of fenugreek is *trigonella foenum graceum*.It belongs to the family Fabaceae. It consists of phytochemical constituents like flavonoids, tannins and phenols.And pharmacological activities like anti-inflammatory, anti-microbial, antioxidant activites Fenugreek seeds cause the stomach to absorb sweets more slowly and to produce more insulin. It's supposed to release trapped energies and reduce internal inflammation. Fenugreek reduces inflammation with its antioxidant and anti-inflammatory properties fenugreek relieves inflammation in the body, including that caused by cancer, renal problems, TB, boils, bronchitis, mouth ulcers, and infections of the tissues under the skin. It was found that fenugreek had therapeutic properties, which included the ability to regulate nutritional and metabolic problems like diabetes. fenugreek relieves inflammatory Fenugreek relieves inflammation in the body, including that caused by cancer, renal problems, TB, boils, bronchitis, mouth ulcers, and infections of the tissues under the skin. It was found that fenugreek had therapeutic properties, which included the ability to

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6.Banana:

The scientific name of banana is *Musa paradisiaca* Linn. It belongs to the family Musaceae. .It consists of phytochemical constituents like phenolic compounds,phytosterols and biogenic amines .And pharmacological activities like anti-bacterial,anti-fungal,anti-ulcer activites.Clinically helpful diets have been discovered for the treatment of paediatric diarrhoea (Nurko et al., 1997), and studies on children's diarrhoea have also shown that dietary fibre has antidiarrheal properties (Brown et al., 1993). Green bananas have long been used as a traditional treatment for a variety of digestive issues, including diarrhoea in children. It was recently shown in our ICDDR,B inpatient facility that giving diarrheal children green bananas increased nutritional absorption, corrected aberrant mucosal permeability, and expedited their clinical recovery (Rabbani et al. 2001, 2004). The high concentration of amylase-resistant starch found in green bananas is assumed to be the mechanism underlying their antidiarrheal properties. This starch ferments into short-chain fatty acids in the colon, which in turn promotes the absorption of salt and water by the colon (Binder).(19)

7.Turmeric:

The scientific name of turmeric is *curcuma longa*. It belongs to the family zingiberaceae .It consists of phytochemical constituents like curcuminoids, eugenol and flavonoids.And pharmacological activities like anti-inflammatory,anti-microbial ,antioxidant activites.In order to alleviate symptoms like fever and diarrhoea, curcumin was primarily used to treat inflammatory illnesses like bronchitis, colds, parasitic worms, leprosy, arthritis, and inflammations of the bladder, liver, kidney, and skin. Furthermore, curcumin may also be helpful in treating neurological conditions like Alzheimer's disease. Curcumin has most recently shown chemopreventive and anti-cancer properties in a number of human cancers. Because curcumin is more bioavailable in the gastrointestinal tract, it may specifically decrease the growth of

gastrointestinal malignancies, such as those of the mouth, oesophagus, intestines, stomach, and colon. Curcumin has also been proposed as a treatment for bacterial and parasite infections, Crohn's disease, irritable bowel syndrome, and other digestive disorders. Curcumin may suppress neutrophil chemotaxis and chemokines, which may affect the immunological response in addition to its effects on colonic epithelial cells [180]. As the first cells to arrive at the site of inflammation, neutrophils are essential for the innate immune responses. Trans epithelial neutrophil migration contributes to tissue damage, inflammation persistence, and compromised epithelial barrier function in inflammatory bowel disease (IBD). Additionally, curcumin may inhibit IBD-related endothelial activation, which is necessary for the binding and recruitment of leukocytes into the bloodstream during the inflammatory response. Curcumin suppressed the activity of Akt/MAPK/NF- κ B in primary cultures of human translocation of the p65 NF- κ B subunit after tumour induction. (19)

8. Fennel:

The scientific name of fennel is *Foeniculum vulgare*. It belongs to the family Apiaceae. It consists of phytochemical constituents like phenolic compounds and essential oils. And pharmacological activities like anti-inflammatory, anti-microbial, cardiovascular activities. Fennel, or *Foeniculum vulgare*, is a species of flowering plant belonging to the Apiaceae family. People have used it for millennia due to its purported anti-inflammatory and antipathogenic qualities, making it one of the oldest medical plants in the world. Because it helps with digestion and breath freshening, it is used as a snack (*mukhvas*) after meals in several nations in Southeast Asia. In rats, fennel oil significantly prevented the stomach ulcers caused by ethanol. When column fractions are screened against MDR strains of *Mycobacterium tuberculosis*, fennel oil extract has been demonstrated to have *in vitro* antifungal activity. An chemical molecule called anethole, a significant component of fennel oil, is used extensively as a flavouring and has also been demonstrated to have anti-proliferative effects on prostate cancer cells. It is a derivative of the aromatic chemical phenylpropene, which is found in large quantities in nature. Apart from the advantageous impacts of fennel oil, the role of fennel seed extract in inflammatory bowel disease mediating pathways. (20)

9. Aloe vera:

The scientific name of aloe vera is *Aloe barbadensis miller*. It belongs to the family Asphodelaceae. It consists of phytochemical constituents like phenolic compounds, amino acids, and anthraquinones. And pharmacological activities like anti-inflammatory, wound healing etc. Aloe vera has been used in traditional medicine for a very long time. It treats infections, worm infestation, skin conditions, constipation, and colic in traditional Indian medicine (Heber 2007). Additionally, it is used to treat type 2 diabetes mellitus (DM; Coronado et al. 2004) in Mexican Americans and hypertension in Trinidad and Tobago (Lans, 2006). It is frequently advised in Chinese medicine to treat fungus-related illnesses (Heber 2007). Aloe vera is one of the few herbal remedies that is widely used in Western culture, and it is used extensively in the food, pharmaceutical, and cosmetic industries. Regarding health, Aloe vera's topical and oral application medicinal claims span a broad spectrum of illnesses, although however, not many claims have been the focus of thorough clinical research. Clinical trials on Aloe vera have been carried out for a variety of illnesses, including skin problems, gastrointestinal disorders, diabetes mellitus, burn and wound healing management, and constipation. (21) Although there is conflicting data supporting the efficacy of aloe vera preparations in treating gastrointestinal problems such as ulcers and inflammatory bowel disease, they are commonly advocated for this purpose. Clinical data supporting the effective treatment of 12 patients with peptic ulcers with Aloe vera gel (given in a strong liquid petrolatum emulsion) was published in 1963 (Blitz, Smith, and Gerard 1963). Aloe vera was not found to have any beneficial effects in a 3-month randomised controlled trial of 58 patients with irritable bowel syndrome (Davis et al. 2006). Although not definitive, the results of a recent official evaluation of Aloe vera gel's safety and effectiveness in treating ulcerative colitis were encouraging. 44 participants in a randomised controlled study with Oral administration of 100 mL Aloe vera gel twice daily for four weeks to thirty subjects with mild to moderately active ulcerative colitis produced clinical remission and improvement more frequently than in the placebo group (14 subjects); however, despite encouraging trends, the results did not reach statistical significance. There were slight but statistically significant improvements in the Aloe vera group's

histology scores and the basic clinical colitis activity index.(22)

10.Marshmallow root:

The scientific name of Marshmallow root is *Althaea officinalis*. It belongs to the family Malvaceae. It consists of phytochemical constituents like coumarins, starch, polyphenols and flavonoids. And pharmacological activities like cough suppressant, gut health and diuretic activities. *Althaea officinalis* L. or marshmallow (Family: Malvaceae) is a downy, annual, or perennial plant native of Asia, Europe, and the United States. Roots, flowers, and leaves of the plant have been used to treat catarrh in the respiratory system, irritating cough, asthma, bronchitis, sore throat, skin wounds, peptic ulceration, cystitis, gastritis, ventricular ulcer, quinsy, diabetes, urethritis, urinary gravel, and a variety of inflammations in nasal or oral cavities. *A. officinalis* is also used as a demulcent, diuretic, emollient, laxative, anti-infective, and immunomodulation remedy. According to previous reports in the literature, aqueous extracts and polysaccharides in this plant present medicinal attributes. *A. officinalis* contains mucilage, and is very soothing for the mucosal membranes and it coats lining of the esophagus and stomach wall, also Deters et al. have proved effective stimulation of epithelial cells using aqueous extracts and polysaccharides of *A. officinalis* roots, which can demonstrate the traditional use of this plant for treatment of irritated mucous membranes with tissue regeneration. *Anchusa strigosa* *Anchusa strigosa* Bank et Sol, bugloss or alkanet (Family: Boraginaceae).(23). Marshmallow is high in mucilage, because its slippery nature soothes irritated mucus membranes of the digestive tract. More. Demulcent herbs, such as , slippery elm, and bladderwrack, are high in mucilage(24).

II. CONCLUSION:

Herbal plants such as ginger, chamomile, peppermint, papaya, fenugreek contain anti-inflammatory activities that can help managing gastroenteritis symptoms. Furthermore supplements including vitamin C, vitamin A and zinc have showed promise improving gastric problems. However, herbal medicines should be used with caution because they may interfere with drugs or cause negative effects. Individuals with gastroenteritis should always consult health practitioner before introducing the herbal therapies into their regimen.

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