



Assessment of Gastric Acidity Modulation by Pracid-H Herbal Syrup: A Comprehensive Evaluation

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Abstract Pracid-H syrup contains Zingiber officinale, Plumbago zeylanica, Amomum subulatum, Piper nigrum, Trachyspermum ammi, Cumium cyminum, Piper longum, Syzygium aromaticum, Mentha spicata, Allium sativum and Ferula foetida. Gastric acidity modulation by Pracid-H Herbal Syrup was assessed.

Keywords Gastric Acidity, Pracid-H Herbal Syrup, Zingiber officinale, Plumbago zeylanica, Amomum subulatum, Piper nigrum, Trachyspermum ammi, Cumium cyminum, Piper longum

1. Introduction

An acid is a chemical compound that, when dissolved in water, has a distinctively unpleasant taste, the capability to change the color of blue litmus paper to red, and the capacity to react with bases and specific metals (such as calcium) to form salts. Acidity refers to a pathological state characterized by an excessive production of gastric acid in the stomach. Gastroesophageal Reflux Disease (GERD) is a condition characterized by the regurgitation of acidic digestive fluids from the stomach into the esophagus. A peptic ulcer is a type of ulcer that occurs in the mucous lining of the digestive system, specifically in the stomach or the first part of the small intestine known as the duodenum[1-3].

The abdomen is a significant anatomical region that encompasses all the structures located between the chest and the pelvic region. The stomach is a component of the abdomen and plays a role in the process of digestion. Abdominal pain can arise from various causes such as muscle strain, indigestion, constipation, gas-related pain, stomach cramps accompanied by bloating or diarrhea. However, if the pain becomes intense and excruciating, it requires medical attention. The location of stomach pain is a crucial indicator. Common abdominal discomfort that is not localized to one specific place might be indicative of various conditions, such as irritable bowel syndrome, appendicitis, diabetic ketoacidosis, injury, Crohn's disease, pancreatitis, sickle cell anemia, urinary tract infection, viral gastroenteritis, and lead poisoning [4-5].

Consumption of acidic food, alcohol, smoking, stress, drugs, inadequate water intake, insufficient dietary fiber, irregular eating patterns, lack of physical activity, stress, artificial additives in food, consumption of spicy food, and the side effects of medication and physical and mental stress can all contribute to the development of ulceration.



The pH of the human body falls within the range of 7.35 to 7.45, with an average value of 7.40. A pH at this level is optimal for numerous biological activities, with one of the most crucial being the oxygenation of blood. Furthermore, a significant number of the compounds formed during biological events in the body undergo ionization when the pH is neutral. This ionization process hinders the efficient usage of these compounds [6].

An acidemia is characterized by a pH below 7.35, while an alkalemia is characterized by a pH above 7.45. The human body possesses compensatory mechanisms to maintain a pH level within the necessary narrow range, which is crucial for its proper functioning. This discussion aims to provide a fundamental comprehension of acid-base balance in the body, along with a structured strategy to dealing with patients who have illnesses that lead to changes in pH levels [7-8].

Zingiber officinale, often known as ginger, is a plant species.

Ginger, the underground stem of the plant *Zingiber officinale*, belonging to the ginger family (Zingiberaceae), has been used for medicinal purposes for over 2000 years. Ginger's therapeutic benefits can be attributed to the existence of compounds such as gingerol, paradol, and shogaols [9].

Since ancient times, the rhizomes have been utilized in traditional medicine to alleviate a wide range of ailments such as arthritis, rheumatism, sprains, muscular discomfort, sore throats, cramps, hypertension, dementia, fever, infectious diseases, catarrh, nervous disorders, gingivitis, toothache, asthma, stroke, and diabetes. Ginger is utilized as a home remedy and is highly beneficial in the treatment of numerous gastrointestinal conditions such as constipation, dyspepsia, belching, bloating, gastritis, epigastric discomfort, gastric ulcerations, indigestion, nausea, and vomiting. Scientific research has confirmed the effectiveness of ginger in traditional medicine. Ginger has demonstrated efficacy in preventing gastric ulcers caused by nonsteroidal anti-inflammatory medicines (NSAIDs) such as indomethacin and aspirin, as well as reserpine, ethanol, stress (hypothermic and swimming), acetic acid, and *Helicobacter pylori*-induced gastric ulcerations in experimental animals [10-11].

Plumbago zeylanica, sometimes known as Chitraka, is the scientific name of the plant.

This text focuses on *Plumbago zeylanica*, namely its phytochemistry, scientifically confirmed pharmacological properties, and traditional and folk medical usage. *P. zeylanica*, also referred to as 'Chitraka', is widely acknowledged in several traditional medical systems for its efficacy in treating a range of human ailments, typically in the form of paste or powder. The primary constituents of plants are primarily composed of naphthoquinones and steroidal chemicals. Various components of this plant have long been believed to possess medicinal properties, such as antifungal, antitumor, cardiovascular, rheumatic, hepatoprotective, antipyretic, antidiabetic, and nephroprotective effects [12-14].

Amomum subulatum, often known as Black Cardamom. *Amomum subulatum* Roxb., also known as large cardamom, is a fragrant and therapeutic spice that originates from the Eastern Himalayas and is classified under the Zingiberaceae family. It serves as a taste enhancer and preservative in various coffee varieties, alcoholic beverages, sweets, drinks, and tobacco products. The primary ingredient responsible for the aroma in large cardamom is volatile oil, which makes up 2-4% of the entire composition. Within this volatile oil, 1,8-cineole is the predominant active compound, comprising 60 to 80% of the total volatile oil. The alcohol and aqueous extracts of large cardamom have been found to possess allopathic, analgesic, anti-inflammatory, antibacterial, antioxidant, antiulcer, cardio-adaptogenic, and hypolipidaemic properties. Large cardamom, along with its powder, oleoresin, and essential oils, possesses numerous applications in both cooking and medicine [15-17].

Piper nigrum, commonly known as black pepper. *Piper nigrum* L. is often regarded as the most superior spice globally, mostly because of its potent component, piperine. *Piper nigrum*, along with its secondary metabolites, is utilized for many purposes such as pharmaceuticals, preservation, pest control, and larvicidal compounds. The biological role of this species is elucidated through various experiments, which demonstrate that both peppercom and secondary metabolites of *Piper nigrum* possess a wide range of beneficial properties. These include antiapoptotic, antibacterial, anti-colon toxin, antidepressant, antifungal, antidiarrheal, anti-inflammatory, antimutagenic, anti-metastatic, antioxidative, antipyretic, antispasmodic, antispermato-genic, antitumor, antithyroid, ciprofloxacin potentiator, cold extremities, gastric ailment relief, hepatoprotective, insecticidal, intermittent fever treatment, and larvicidal activities. Other functions of this species include safeguarding against oxidative stress



induced by diabetes. Piperine protects against oxidation of various chemicals, reduces lipid peroxidation in mitochondria, inhibits aryl hydroxylation, enhances the bioavailability of vaccines and sparteine, increases the bioavailability of active compounds, delays the elimination of antiepileptic drugs, prolongs orocecal transit time, influences and activates the biomembrane to absorb a variety of active agents, increases serum concentration, reduces mutational events, exhibits tumor inhibitory activity, inhibits mitochondrial oxidative phosphorylation, stimulates growth, and has a chemopreventive effect [18-20].

Trachyspermum ammi, usually referred to as 'Ajwain', is found across India and is primarily grown in Gujarat and Rajasthan. The fruit has stimulant, antispasmodic, and carminative effects. It is traditionally employed as a significant therapeutic agent for conditions such as flatulence, atonic dyspepsia, diarrhea, abdominal tumors, abdominal aches, piles, bronchial issues, loss of appetite, galactagogue, asthma, and amenorrhea. Medically, it has been scientifically demonstrated to have multiple pharmacological effects, including antifungal, antioxidant, antimicrobial, antinociceptive, cytotoxic, hypolipidemic, antihypertensive, antispasmodic, broncho-dilating actions, antilithiasis, diuretic, abortifacient, antitussive, nematocidal, anthelmintic, and antifilarial properties [21-23].

Cumin, scientifically known as *Cuminum cyminum* L., is a little herbaceous plant that is classified under the Apiaceae family. This plant species is cultivated throughout the Middle East, India, China, and various Mediterranean nations, such as Tunisia, for multiple purposes. The fruit of this plant, commonly referred to as cumin seed, is mostly utilized for culinary and medicinal applications. Cumin has been extensively utilized in traditional medicine for the treatment of several ailments, such as hypolipidemia, cancer, and diabetes [24-26].

Piper longum, often known as Pipali, is a plant species that is indigenous to the Indo-Malaya region. It is classified under the family Piperaceae. *Piper longum* Linn., a member of the Piperaceae family, has been employed as a medicinal agent for the management of diverse clinical disorders. The indigenous community utilizes the herb for its cardiovascular properties, anti-inflammatory effects, and as a culinary seasoning. The fruits are mostly utilized as culinary spices and preserves. They also possess strong medicinal properties and are commonly employed in traditional medicine to treat bronchitis, cough, cold, snakebites, and scorpion stings. Additionally, they are used as a contraceptive. The plant extracts contained various bioactive phytochemicals such as alkaloids, flavonoids, esters, and steroids. The essential oils derived from the roots and fruits were found to have antimicrobial, antiparasitic, anthelmintic, mosquito-larvicidal, antiinflammatory, analgesic, antioxidant, anticancer, neuro-pharmacological, antihyperglycaemic, hepato-protective, antihyperlipidaemic, antiangiogenic, immunomodulatory, antiarthritic, antiulcer, antiasthmatic, cardioprotective, and anti-snake-venom properties. The pharmacological features of this substance were ascribed to its antioxidative and antiinflammatory actions, as well as its capacity to regulate several signaling pathways and enzymes [27-29].

Clove (*Syzygium aromaticum*) is indigenous to Indonesia but is currently cultivated in several regions worldwide, including the state of Bahia in Brazil. This plant is a highly abundant source of phenolic chemicals, including eugenol, eugenol acetate, and gallic acid. It has significant potential for use in pharmaceuticals, cosmetics, food, and agriculture. The primary phytochemicals included in clove oil are predominantly eugenol (70-85%), with eugenyl acetate (15%) and β -caryophyllene (5-12%) following as secondary constituents. Their compounds yield biological advantages, including antibacterial, antifungal, insecticidal, antioxidant, and anticarcinogenic properties. The phytoconstituents of clove consist of a diverse range of chemical components, including monoterpenes, sesquiterpenes, phenolics, and hydrocarbon compounds [30-33].

Mentha spicata, sometimes known as Pudina, is a species of plant in the Lamiaceae family. It is widely grown around the world for its distinctive fragrance and its economic importance. *Mentha spicata*, commonly known as spearmint, is renowned not only as a flavoring agent in traditional cuisine but also for its extensive use in traditional medicine. It is particularly recognized for its therapeutic effects in treating ailments such as cold, cough, asthma, fever, obesity, jaundice, and digestive disorders. *M. spicata* has been found to have a diverse array of biological effects, such as antibacterial, antifungal, antioxidant, hepatoprotective, antidiabetic, cytotoxic, anti-inflammatory, larvicidal activity, antigenotoxic potential, and antiandrogenic properties. A phytochemical examination of several components of *M. spicata* identified 35 chemical compounds, which can be classified as phenolic acids, flavonoids, and lignans [34-36].



Garlic *Allium sativum*, a member of the Liliaceae family, includes a variety of beneficial minerals, vitamins, and other chemicals that are used for human health. The composition of this substance includes a significant amount of sugar, protein, fat, calcium, potassium, phosphorus, sulfur, iodine, fiber, and silicon, as well as many vitamins. In addition, garlic possesses pharmaceutical properties and is utilized to treat a wide range of conditions, such as hypertension and high cholesterol, cancer, liver protection, parasitic infections, inflammation, oxidation, fungal infections, wound healing, asthma, arthritis, sciatica, lower back pain, bronchitis, chronic fever, tuberculosis, rhinitis, malaria, persistent skin diseases including leprosy, leucoderma, skin discoloration, and itching, indigestion, colic pain, spleen enlargement, hemorrhoids, fistula, bone fractures, gout, urinary disorders, diabetes, kidney stones, anemia, jaundice, epilepsy, cataracts, and night blindness [37-39].

Ferula asafoetida, belonging to the family Umbelliferae, is a perennial herbaceous plant that exhibits monoecious characteristics. The oleo-gum-resin of *Ferula asafoetida* is the exudate produced from the rhizome of this plant. *Asafoetida* is indigenous to central Asia, spanning from eastern Iran to Afghanistan. It has been utilized in folk phytomedicine since ancient times in traditional medicine to treat various neurological conditions (such as epilepsy, paralysis, hysterias, and depression), gastrointestinal issues (including intestinal parasites, flatulence, weak digestion, and stomach ache), respiratory ailments (such as influenza and asthma), and reproductive disorders (such as premature labor, unusually painful and difficult menstruation, leucorrhoea, and infertility). Traditionally, it possesses carminative, antispasmodic, digestive, aphrodisiac, emmenagogue, sedative, and diuretic effects. Recent studies have demonstrated the pharmacological and biological effects of antispasmodic, hypotensive, antinociceptive, antioxidant, anxiolytic, aphrodisiac, antiviral, antidiabetic, gastric anti-ulcer, antiseptic, nephroprotective, neuroprotective, and anticancer activities in both animal models and people [40-42].

Pracid -H Syrup Composition

Sr. No.	Ingredient	Latin name	Part of plant	Quantity	Proof of Concept
1	Sonth	<i>Zingiber officinale</i>	Kand	100 mg	API I/I
2	Chitrak	<i>Plumbago zeylanica</i>	Root	100 mg	API I/I
3	Badi ilaichi	<i>Amomum subulatum</i>	Fruit	100 mg	API I/I
4	Kali mirch	<i>Piper nigrum</i>	Seed	100 mg	API I/III
5	Ajwain	<i>Trachyspermum ammi</i>	Seed	100 mg	API I/I
6	White jeera	<i>Cuminum cyminum</i>	Seed	100 mg	API I/I
7	Pipali	<i>Piper longum</i>	Fruit	100 mg	API I/I
8	Long	<i>Syzygium aromaticum</i>	Leaf	100 mg	API I/I
9	Pudina	<i>Mentha spicata</i>	Puspvrant	100 mg	API I/VI
10	Rason	<i>Allium sativum</i>	Kand	100 mg	BPN
11	Kala namak	<i>Unaqua sodi chloridum</i>	Khanij	100 mg	BPN
12	Saindha namak	<i>Sodii chloridum</i>	Khanij	100 mg	BPN
13	Suddha hing	<i>Ferula foetida</i>	Niryas	100 mg	BPN
14	Sugar	40%	API I/VI
15	Sodium benzoate	0.5%

Inclusion Criteria

Patients with the subsequent standards have been taken into consideration eligible:

- Age 18–70 years;
- Heartburn and/or acid regurgitation on ≥ 2 days/week for ≥ 2 months earlier than the study;
- Partial healing reaction to a widespread dose of PPIs on ≥ 2 months of treatment;
- Impedance-pH tracking advantageous for esophageal acid reflux, DeMeester rating extra than 14, absence of alkaline reflux, and suitable esophageal emptying; and
- Mental popularity permitting us to apprehend the protocol.

Exclusion Criteria

The contributors with the subsequent standards have been now no longer decided on or excluded from this study:

- (a) A records of hypersensitive reactions to the drugs used on this study;
- (b) Extreme systemic disease, pregnancy, lactation, alarm features, motility disorders, or GERD complications;
- (c) Concomitant use of different PPIs, histamine H₂-receptor antagonists, prokinetic drugs, natural medicines, vitamins, or minerals weeks earlier than the study; and
- (d) Records of esophageal or gastric surgery, Schatzki ring, achalasia, esophageal motility disorders, esophageal candidiasis, or poisonous eosinophilic esophagitis (3,4).

Interventions and Treatments

Patients who presented with Acidity symptoms were referred to confirm the diagnosis and evaluate if they complied with the other requirements to be part of the study, being exempt from the exclusion criteria. The selected patient treated with Syrup Pracid-H Thrice a day.

Result and Discussion

This study included a nonobese 58 patients with no history of tobacco or alcohol consumption and a body mass index of 25 kg/m². The treatment distribution and the scores on the GerdQ questionnaire obtained are shown in Table below:

Questions/frequency	0 days	1 day	2-3 days	4-7
How often did you have stomach contents (liquid or food) moving upwards to your throat or mouth (regurgitation)?	3	2	1	1
How often did you have nausea?	-	-	-	-
How often did you have pain in the center of the upper stomach?	5	3	2	1
How often did you take additional medications for your heartburn and/or regurgitation other than those your physician told you to take	3	3	2	0
How often did you have difficulty getting a good night of sleep because of your heartburn and/or regurgitation?	5	2	2	1

Scoring information: GerdQ score was calculated as the sum of these scores, giving a total score ranging from 0 to 18. Those with a score of 8 or more have a high likelihood of having gastroesophageal reflux disease (GERD), and those with less than 8 have low or no likelihood.

However in this study based on the questionnaire design, Syrup Pracid expressing results nearly or equal to PPI.

In conclusion, there was no significant improvement in the patient GERD symptoms. Syrup Pracid-H, recommended for GERD treatment.

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