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A Review on Herbal Potential for Treatment of Peptic Ulcer

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ABSTRACT

Peptic ulcers (PUs) are mucosal lesions in the gastrointestinal tract, often caused by Helicobacter pylori infection. or non-steroidal anti-inflammatory drugs (NSAIDs), leading to significant pain and complications like bleeding, perforation, and obstruction. While conventional medicine offers treatments, a substantial portion of the global population, particularly in developing nations, continues to rely on herbal medicine due to perceived compatibility with the human body and fewer side effects. This review explores the therapeutic potential of various medicinal plants in treating peptic ulcers.

The paper discusses the types of peptic ulcers (duodenal, gastric, esophageal), their common signs and symptoms, and underlying causes, emphasizing the roles of H. pylori and NSAIDs. It then delves into the mechanisms of action of herbal remedies, including their antioxidant activity, stimulation of mucosal proliferation, inhibition of acid production, and increased mucus production. A comprehensive list of plants with documented antiulcer activity is provided, along with their common names, biological and geographical sources, key chemical constituents, and traditional or scientifically validated uses. Notable examples include Brassica oleracea (cabbage), Musa sapientum (banana), Cocos nucifera (coconut), Glycyrrhiza glabra (liquorice), Trigonella foenum-graecum (fenugreek), honey, Allium sativum (garlic), Moringa oleifera (drumstick), Acacia arabica (acacia gum), Aegle marmelos (bael), Aloe barbadensis miller (aloe vera), Annona squamosa (custard apple), Carica papaya (papaya), Mangifera indica (mango), Ananas comosus (pineapple), Zingiber officinale (ginger), Beta vulgaris (beetroot), Azadirachta indica (neem), Tamarindus indica (tamarind), and Solanum nigrum (blackberry nightshade).

These medicinal plants contain natural compounds like flavonoids, tannins, and terpenoids suggests promising therapeutic applications with potentially lower adverse effects compared to synthetic drugs. The paper concludes by advocating for further research, regulatory oversight, and the integration of traditional Ayurvedic knowledge with modern medicine to develop effective and safer anti-ulcer medications.

I. INTRODUCTION

Herbal medicine is practiced worldwide, with notable traditions in Chinese, Indian, and European cultures. Each region has its own rich history of utilizing herbal remedies. The philosophies of traditional medicine share some similarities but are quite distinct from modern Western medicine. With the advancements in Western medicine, both synthetic and herbal drugs must meet international standards for quality, safety, and efficacy. Herbal drugs have the benefit of being accessible to patients in regions where specific traditional medicines are practiced. However, the development process for herbal drugs intended for global use must differ from that of synthetic drugs[1].Ayurvedic medicines primarily sourced their raw materials from plants, typically in the form of crude drugs like dried herbal powders, extracts, or various mixtures of plant-based products[2]. Ayurveda, Siddha, and Unani-Tibb. are ancient healthcare practices that have thrived for centuries. In addition to these systems, diverse tribal communities in the country have a long-standing tradition of utilizing herbs for medicinal purposes[3]. In the modern era, a significant portion, around 75-80%, of the global population still relies on herbal medicine, particularly in developing nations, for basic healthcare needs. This preference is attributed to herbal remedies being more compatible with the human body and having fewer adverse side effects

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compared to synthetic pharmaceuticals. Preliminary screening of medicinal plants has revealed the presence of important secondary metabolites such as flavonoids and tannins, which are known for their active role in treating ulcers. Ethnomedicinal herbs documented in materia medica contain valuable information regarding their antiulcer properties. Several researchers have conducted experiments validating the efficacy of these medicinal plants in treating ulcers [4,5].

Peptic Ulcer

The word peptic comes from the Greek word peptikos, which meaning to digest. Peptic ulcers (PUs) are mucosal lesions that progress to the layer of muscularis mucosae, forming a hollow surrounded by acute or chronic inflammation [6]. Peptic ulcer, also known as PUD or peptic ulcer disease, is an ulcer (defined as mucosal erosions equal to or greater than 0.5 cm) of an area of the gastrointestinal tract that is usually acidic and thus extremely painful [7]. The degree of mucosal layer damage depends on an individual's vulnerability to the toxicity of non-steroidal anti-inflammatory drugs (NSAIDs) and the virulence of Helicobacter pylori. The mucosa layer is uniquely able to withstand damage brought on by high peptic acid concentrations, bile inflow, and pepsin [8] . Gastrointestinal (GI) bleeding is a sign of digestive tract disorder that could be visible from the stool's color darker than the standard color (black) because there is blood in the feces. However, sometimes it cannot be detected from the color of the faeces [9] . Recurrences of ulcers might be seen. Consequently, a herbal remedy is applied. Compared to conventional medicine, herbs provide effective protection against ulcers and have fewer side effects [10] . Diet does not play an important role in either causing or preventing ulcers [11] .

TYPES OF PEPTIC ULCER

i. **Duodenal ulcer**
ii. **Gastric ulcer**
iii. **Esophageal ulcer**

Duodenal ulcer

Duodenal ulcers are included in the wide category of disorders known as peptic ulcer disease. The sickness condition and clinical manifestation resulting from a disruption in the mucosal membrane of the stomach or duodenum, the first part of the small intestine, are referred to as "peptic ulcer disease". Ulceration is the outcome of damage to the mucosal surface that extends underneath the superficial layer. A patient presents with symptoms of upper abdomen discomfort or dyspepsia [12] . A duodenal ulcer is usually caused by a bacteria called helicobacter pylori, or H. pylori. The bacteria can inflame the protective lining of your duodenum, causing more stomach acid to be produced. If the protective lining is damaged, an ulcer can form [13] .

Gastric ulcer

Gastric ulcers are open, inflamed sores in the lining of your stomach. They are also known as Stomach ulcers [14] . Variations in these defences could lead to alterations in the mucosa of the stomach, which could eventually cause erosion and ulcers. The stomach mucosa is shielded by prostaglandins, mucus, growth hormones, and an adequate blood supply [15] .

Esophageal ulcer

A distinct rupture in the esophageal mucosal membrane is known as an esophageal ulcer. According to projections, esophageal ulcers will arise in 2% to 7% of cases of gastro - oesophageal reflux disease. Normally, the lower esophageal sphincter (LES) stops stomach contents from refluxing back up into the throat. However, when the LES weakens, this protective mechanism is weakened, which increases the risk of ulceration by exposing the esophageal mucosa to stomach acid [16] .

COMMON SIGNS AND SYMPTOMS OF PEPTIC ULCER

- Abdominal pain, classically epigastric, strongly correlated with mealtimes. In case of duodenal ulcers, the pain appears about three hours after taking a meal and wakes the person from sleep.
- Bloating and abdominal fullness.
- Waterbrash (a rush of saliva after an episode of regurgitation to dilute the acid in esophagus, although this is more associated with gastroesophageal reflux disease).
- Nausea and copious vomiting.
- Loss of appetite and weight loss, in gastric ulcer.
- Weight gain, in duodenal ulcer, as the pain is relieved by eating.
- Hematemesis (vomiting of blood); this can occur due to bleeding directly from a gastric ulcer or from damage to the esophagus from severe/continuing vomiting.
- Melena (tarry, foul-smelling feces due to presence of oxidized iron from hemoglobin).

Rarely, an ulcer can lead to a gastric or duodenal perforation, which leads to acute peritonitis and extreme, stabbing pain [17]

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CAUSES OF PEPTIC ULCER DISEASE

H. pylori infection and taking NSAIDs are the two most common causes of peptic ulcers [18].

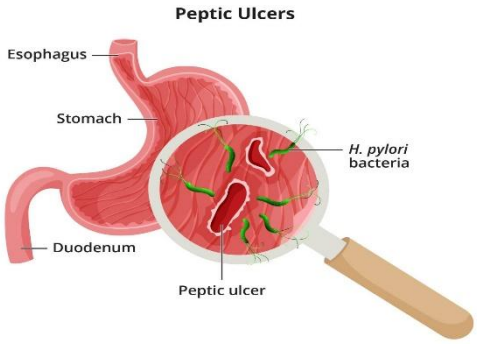

Fig 3: H. pylori infection [18]

Helicobacter pylori

A gram-negative bacillus called H. pylorus is detected in the cells of the gastric epithelium. 90% of duodenal ulcers and 70% to 90% of stomach ulcers are brought on by this bacterium. People with lower socioeconomic status are more likely to develop pylori infection. and is frequently learned during childhood. Numerous virulence elements in the organism allow it to attach to and inflame the stomach mucosa. Stomach ulcers result from hypochlorhydria or achlorhydria, which is caused by this [19] .

NSAIDs

The gastric mucous membrane protects itself from gastric acid with a layer of mucus, the secretion of mucous is aroused by certain prostaglandins. Use of NSAIDs block the function of cyclooxygenase (cox-1), that is essential for the production of those prostaglandins [20] . The second most frequent cause of PUD after H. pylori infection is the use of NSAIDs. The use of COX-2 selective NSAIDs or their combination with a gastroprotective drug are just a couple of the many strategies that are available to prevent NSAID and aspirin-associated gastroduodenal ulcers and Their sequelae. The most well-liked and efficient preventive medications are PPIs [21] . As many as 30% of adults taking NSAIDs have GI adverse effects. Factors associated with an increased risk of duodenal ulcers in the setting of NSAID use include history of previous peptic ulcer disease, older age, female sex, high doses or combinations of NSAIDs, long-term NSAID use, concomitant use of anticoagulants, and severe comorbid illnesses [22] .

Factors responsible for increasing gastric acid secretion are:

- **Stress:** In view of researchers, stress as a potential cause or a least complication, in the event of ulcers. Psychological stress will influence the event of biological process ulcers. Burns and head trauma, however, can lead to physiological stress ulcers, that are reportable in several patients who are on mechanical ventilation. A study of peptic ulceration patients in a Thai hospital showed that chronic stress was strongly related to an enhanced risk of peptic ulceration, and a mixture of chronic stress and irregular mealtimes was a big risk issue.
- **Zollinger- ellison syndrome:** it is a rare gastrin secreting tumors, also cause multiple and troublesome to heal ulcers.
- **Smoking:** Studies show that cigarette smoking can increase a person's probability of obtaining an ulceration. Smoking additionally slows the healing of existing ulcerations and contributes to ulcer return.
- **Caffeine:** Beverages and foods that contain caffeine can stimulate acid secretion within the stomach. This worsen an ulceration; however, the stimulation of stomach acid cannot be attributed only to caffeine.
- **Alcohol:** Ulcers are very common in people that have cirrhosis of the liver, an illness usually connected to serious alcohol consumption.
- **Genetic factor:** Individuals with blood group O are more prone to develop peptic ulceration than those with different blood groups. Genetic influences seem to possess bigger role in duodenal ulcers as proof by their incidence in family's monozygotic twins and association with HLB-B5antigen [20] .

FACTORS OF PEPTIC ULCER

There are two factors responsible for peptic ulcer.

i. Internal factors
ii. External factors

Internal Factors

- Imbalance between aggressive and defensive factor
- Acid over secretion, pepsin secretion
- Stress physical and physiological
- Ulcer produce in association of other disease like cirrhosis, renal failure, pancreatitis, lung disease etc.
- Mucosal damage decreased, bicarbonate secretion

External Factors

- NSAIDS and other medication
- H. Pylori infection
- Alcoholism a smoking[23]

COMPLICATIONS

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6.1 Bleeding in the stomach or duodenum: Bleeding can be a slow blood loss that leads to too few red blood cells, called anemia. Or you can lose enough blood so that you need to be in a hospital or get blood from a donor. Severe blood loss may cause black or bloody vomit or black or bloody stools.

6.2 A hole, called a perforation, in the stomach wall: Peptic ulcers can eat a hole through the wall of your stomach or small intestine. This puts you at risk of infection of your abdomen, called peritonitis.

6.3 Blockage: Peptic ulcers can keep food from going through the digestive tract. The blockage can make you feel full easily and cause you to vomit and lose weight.

6.4 Stomach cancer: Studies have shown that people infected with H. pylori have an increased risk of stomach cancer [24].

6.5 Penetration is when the ulcer continues into adjacent organs such as the liver and pancreas. Scarring and swelling due to ulcers causes narrowing in the duodenum and gastric outlet obstruction. Patient often presents with severe vomiting. Cancer is included in the differential diagnosis (elucidated by biopsy), Helicobacter pylori as the etiological factor making it 3 to 6 times more likely to develop stomach cancer from the ulcer [25, 26].

TREATMENT OF PEPTIC ULCER

Ayurvedic medicine has been found effective in treating ulcers, especially when used topically. It can act as a rinse for haemorrhagic ulcers and wounds if employed as a gargle. Additionally, when the tender leaves are crushed and applied as a poultice, they can help stimulate healing and act as an astringent for ulcers [27].

Emergence of Herbal Drugs To Treat Ulcer

Since ancient times, herbs have been utilised to cure a wide range of illnesses. Known as phytotherapy, the use of medicinal plants to treat a wide range of illnesses dates back to the dawn of humankind. A growing interest in alternative therapies and the usage of herbal products, particularly those made from medicinal plants, has also emerged in recent years. The key ingredients in brand-new medications are plant extracts and their crude oil, which have produced encouraging outcomes. leads to the treatment of stomach ulcers as well. Flavonoids, tannins, and terpenoids, among other active compounds in herbal remedies, have antiulcer properties. The main source of possible novel medicines is thought to be medicinal plants. Further education of doctors and patients on herbal medicine is therefore required, as well as laws to regulate the quality of herbal products, particularly for upcoming randomised trials to ascertain efficacy. Regarding the safety of numerous goods in cases of digestive and other diseases. Finally, combining modern medicine with Ayurvedic expertise may result in preferred anti-ulcer medications made from therapeutic plants that have less adverse effects [28].

MECHANISM OF ACTION:

Studies in humans and animal models suggest that herbal medicines exert their beneficial effects on gastric ulcer via multiple mechanisms, including antioxidant activity, stimulation of mucosal proliferation, inhibition of acid production and secretion, increased mucus production, as well as inhibition of inflammation.

Antioxidant activity

It is well known that oxidative stress and peptic ulcers are related. It is most likely because of their antioxidant characteristics that some herbal remedies are beneficial for stomach ulcers [29] . Several mechanisms may contribute to the antioxidant activity of flavonoids in addition to free radical release, i.e., degradation of metallic ion, inhibition of oxidant enzymes or the production of free radicals by cells, and reactivation of a tocopherol from -tocopheroxyl radicals. They promote the formation of gastric mucosa, reduce mucosal acid release, inhibit pepsinogen production and reduce ulcerogenic ulcers [30] .

Stimulation of mucosal proliferation

The healing of ulcers requires mucosal proliferation. Some herbal remedies that aid in ulcer healing work by promoting cell division. The elevation of epidermal growth factor and its receptor expression may be the cause of how herbal medicine stimulates cell division [29] .

Inhibition of acid production

Acid production can be reduced to treat peptic ulcers. Gastric acid secretion is decreased by many herbal medications with anti-gastric ulcer action. Inhibition of H(+)/K(+)-ATPase function, as seen in animal models of gastric ulcer, or activation of prostaglandin E2 production may be the causes of herbal medicine-induced reductions in acid production [29].

PLANT USED FOR TREATING PEPTIC ULCER

There are many herbs, nutrients, and plant products that have been found to play a role in protecting or helping to heal stomach and peptic ulcers. Few human trials are available, but many have show good potential in animal or in vitro studies.

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A variety of botanical products have been reported to possess antiulcer activity but the documented literature has centred primarily on pharmacological action in experimental animals. Except for a few phytogenic compounds (i.e. aloe, liquorice and chilly), limited clinical data are available to support the use of herbs as gastro-protective agents and thus, the data on efficacy and safety are limited. Despite this, there are several botanical products with potential therapeutic applications because of their high efficacy and low toxicity. Finally, it should be noted that substances such as Flavonoids, aescin, aloe gel and many others, that possess antiulcer activity are of particular therapeutic importance as most of the anti-inflammatory drugs used in modern medicine are ulcerogenic. Active principles of antiulcer activity are Flavonoids, terpenoids and tannins [31] .

The following drugs are used for treatment of peptic ulcer:

PLANT USED FOR TREATING PEPTIC ULCER	
❖ ***Brassica Oleracea***	❖ ***Aloe Barbadensis Miller***
❖ ***Musa Sapientum***	❖ ***Annona Squamosa***
❖ ***Cocos Nucifera***	❖ ***Carica Papaya***
❖ ***Glycyrrhiza Glabra***	❖ ***Mangifera Indica***
❖ ***Trigonella Foenum-Graecum***	❖ ***Ananas Comosus***
❖ ***Honey***	❖ ***Zingiber Officinale***
❖ ***Allium Sativum***	❖ ***Beta Vulgaris***
❖ ***Moringa Oleifera***	❖ ***Azadirachta Indica***
❖ ***Acacia Arabica***	❖ ***Tamarindus Indica***
❖ ***Aegle Marmelos***	❖ ***Solanum Nigrum***

Table no. 1: Plant Name [32,33]

PLANT PROFILES

The Natural Herbs

- Demulcent herbs:

Help to coat and soothe the irritated mucous membranes. These can provide symptomatic relief quite quickly.

- Astringent herbs:

Help to frighten and tone the mucous membrane to help the wound they can also limit any infection Antimicrobial herbs: Can address infection of the wound. In the case of a peptic ulcer, we want to helicobacter herbs that awe specific to Pylori such as goldenseal or garlic. Vulnerary herb: Help to heal wounds.

- Bitter herbs:

Help to stimulate digestive secretions (often a lack of digestive secretion is the underlining cause of the ulcer) [32].

1. *Brassica Oleracea*

Common name :- cabbage

Family :- Brassicaceae

Biological source :- It is obtain from leaf

Geographical source: - It is found in Eastern Mediterranean, Greece and the Aegean Islands

Chemical constituents: - Lysophosphatidic acid (LPA) [34]

Cabbage is a best remedy for a stomach ulcer, being a lactic acid food; cabbage helps to produce secretion of amino acid that stimulates blood flow to the stomach lining. This in turn helps strengthen the stomach lining and heal the ulcer. Plug cabbage contains a good amount of vitamin-C. Which has been found to be particularly beneficial for patient with Pylori infection. Also experiments indicate that fresh carrot juice contains an anti-peptic ulcer factor (vitamin).

Method of uses:

Cut one half of a raw head of cabbage and two carrots in to small pieces and put them in a blender to extract the juice. Drink one half of this juice before each meal and at bed time. Repeat daily for a few weeks. Be sure to use fresh juice each time [35].

2. *Musa Sapientum*

Common name:- Banana

Family :- Musaceae

Biological source :- It is obtain from fruit

Geographical source :- It is found in Southeast Asia

Chemical constituents:- a) Phenolics b) Carotenoids c) Phytosterols [36]

Banana used for stomach ulcer treatment both ripe and unripe bananas are very effective. There are certain antibacterial compounds in banana that

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inhibit the growth of ulcer causing Pylori. Banana also protects the system by wiping out the acidity of gastric juice. This helps reduce inflammation and also strengthens the stomach lining.

Method of uses: To treat an ulcer eat at least three ripe bananas a day .If you do not eating banana, you can make banana milk shakes. Alternatively, peal two or three bananas and cut them and to thin slices. Put the slices in the dried banana pieces in the sun until they become dried. Grind the dried banana pieces in to a fine powder. Mix together two tab teaspoon of honey. Take this mixture three times a day for about a week [37] .

3. *Cocos Nucifera*

Common name :- coconut

Family :- Arecaceae

Biological source :- It is obtain from fruit .

Geographical source :- It is found in African and southeast Asian countries

Chemical constituents:- a) caprylic acid, b) capric acid, c) lauric acid, and d) myristic acid [38]

Coconut is very good for people, suffering from stomach ulcer because of its anti-bacterial qualities. It kills the bacteria that cause ulcer. More ever, coconut milk and coconut water have anti-ulcer properties.

Method of use:

Drink few cups of coconut fresh milk tender coconut water daily. Also eat the Kernel of the tender coconut follow this treatment for at least one weak to get +vet result. Alternatively take one table spoon of coconut oil in the morning and another at night for one week. As coconut oil is mainly composed of medium chain fatty acid, it can be easily digested [39]

4. *Glycyrrhiza Glabra*

Common name: - Liquorice

Family: - Fabaceae

Biological source: - It consists of subterranean peeled and unpeeled stolons, roots and subterranean stems

Geographical source: - It is found in China, Europe, India, Iraq, Japan, Kurdistan, Spain, Turkey, and the United States.

Chemical constituents: - Glycyrrhizin and Glycyrrhizin acid [40].

Several studies suggest that licoricey works effectively for treating and preventing stomach ulcer. It helps the stomach and intestine produce more productive mucous that forms a coating over the stomach lining. This in turn eases the pain form ulcer and speeds up the healing process.

Method of use: Mix one half tea spoon of licoricey root powder in one cup of water. Cover it and let it sit over night the next morning, add one cup of cooked broken white rice in to this infusion and eat it. Repeat daily for one week to get +vet result [41].

5. *Acacia Arabica*

Common name: - Acacia gum & Babul

Family: - Leguminosae

Biological source: - Acacia is the dried gummy exudation obtained from the stems and branches.

Geographical source :- It is found in Anglo-Egyptian Sudan and the northern Sahara, southwards to northern Nigeria, Uganda, Kenya, Tanzania and southern Africa, Arabia, Kordofan (North-East Africa), Sri Lanka and Morocco . In India it is found chiefly in Punjab, Rajasthan and Western Ghats [42].

Chemical constituents: - a) Gallic Acid, b) Dicatechin, c) Quercetin, d) Robidandiol, e) B-Amyrin, f) Hentriacontane, g) Betulin, h) Sitosterol, i) Kaempferol-3 Chlorogenic Acid, And j) Glucoside Isoquercetin [43] .

Uses: - The mucilage of acacia is employed as a demulcent. It is used extensively as a vital pharmaceutical aid for emulsification and to serve as a thickening agent. It finds its enormous application as a binding agent for tablets, for example, cough lozenges. It is used in the process of 'granulation' for the manufacturing of tablets. It is considered to be the gum of choice by virtue of the fact that it is quite compatible with other plant hydrocolloids as well as starches, carbohydrates and proteins. It is used in combination with gelatine to form conservates for micro-encapsulation of drugs. It is employed as colloidal stabilizer [42].

6. *Aegle Marmelos*

Common name :- Bael

Family :- Rutaceae

Biological source :- It is obtain from entire plant [44] .

Geographical source: - It is found in Indian Peninsula, Burma, Bangladesh, Ceylon, Thailand and Indo–China [45] .

Chemical constituents: - a) Marmin [46], b) D-limonene [47]

Uses :- Antiulcer Activity [48]

7. *Aloe Barbadensis Miller*

Common name :- Aloe vera

Family :- Asphodelaceae (Liliaceae)

Biological source :- It is obtain from leaves .

Geographical source :- It grows mainly in the dry regions of Africa, Asia, Europe and America. In India, it is found in Rajasthan, Andhra Pradesh, Gujarat, Maharashtra and Tamil Nadu [49] .

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Chemical constituents :- a) Aloin, b) Isobarbaloin, c) Emodin

Uses :-

The extract showed significant antiulcer activity comparable to control.

In America, leaves are successfully utilised to treat localised chronic ulcers.

Significant antiulcer activity was seen in the extract [50] .

8. *Annona squamosal*

Common name :- a) Sugar apple, b) Sitaphal, c) Custard apple.

Family :- Annonaceae

Biological source :- It is obtain from fruit

Geographical source :- Custard apple is originated from West Indies and South America. It is commonly cultivated in Thailand and India .

Chemical constituents :- Annona squamosa consist of alkaloids, phenolic compounds, flavonoids, saponins, tannins, phytosterols, carbohydrates, proteins and amino acids. Fruits consist of 28% of sugar, iron, calcium, carotene, thiamine, ascorbic acid. Root and stem give Borneol, Car-3-ene, Farnesol, Geraniol and Limonene [51].

Uses :-

- In Ayurveda it is used unhealthy ulcers are treated by applying a paste produced from leaves without any water.
- In current studies rats exposed to pylorus ligation and ethanol-induced Stomach Ulcers were prevented by the aqueous leaf extract.
- Prevent high blood pressure and promote good digestion.
- It is a used as a antioxidant, anticancer and anti-inflammation [52] .

9. *Carica papaya*

Common name:- Papaya

Family :- caricaceae

Biological source :- It is obtain from entire plant

Geographical source :- Papaya plant are grown in numerous parts of the world including India, South Africa and Australia [53] .

Chemical constituents :- a) Pectin, b) Carposide, c) Carpaine, d) Carotenoids

Uses :-

- Its extract is used decreased the amount of gastric juice and stomach acidity.
- Unripe fruit can be used in salads, jellies, and stews.
- The leaves are used to make medicine [54] .

10. *Mangifera Indica*

Common name :- Mango

Family :- Anacardiaceae

Biological source :- It is obtain from fruit

Geographical source :- It found in South Asia

Chemical constituents :- a) Alanine, b) Glycine, c) T-Aminobutyric Acid, d) Kinic Acid, e) Shikimic Acid And f) The Tetracyclic Triterpenoids Cycloart-24-En-3β,26diol, g) 3-Ketodammar-24 (E)-En-20S,26-Diol, h) C-24 Epimers Of Cycloart-25 En 3β,24,27-Triol And i) Cycloartan-3β,24,27-Triol [55].

Uses :-

- Leaf extracts were dissolved in rice bran oil and given orally for ulcer.
- Traditionally the plant is reported to have antiulcer activity.
- The extract significantly reduced the gastric juice volume and gastric acidity.
- They help treat or prevent diseases, improve intestinal flora [56] .

CONCLUSION

Peptic ulcers, a prevalent and often debilitating condition, pose significant health challenges worldwide. While conventional pharmacological interventions offer relief, the increasing global reliance on herbal medicine, particularly in developing nations, underscores a preference for natural remedies due to their perceived compatibility with the human body and fewer associated side effects. This comprehensive review has illuminated the multifaceted potential of various medicinal plants in the management and treatment of peptic ulcers.

The paper systematically detailed the types, symptoms, and etiological factors of peptic ulcers, emphasizing the critical roles of Helicobacter pylori infection and NSAID use. Crucially, it explored the diverse mechanisms through which herbal medicines exert their gastroprotective and ulcer-healing effects, including antioxidant activity, promotion of mucosal proliferation, inhibition of acid secretion, and enhancement of mucus production. A wide array of plants, from common dietary items like cabbage and bananas to traditional medicinal herbs such as liquorice and aloe vera, were identified and profiled for their antiulcer properties, chemical constituents, and traditional uses.

This review highlights a persistent gap in extensive clinical trials. This limitation necessitates further rigorous research to conclusively validate their therapeutic potential in humans, establish optimal dosages, and ensure long-term safety.

In conclusion, it's clear that nature offers a treasure trove of potential solutions for dealing with ulcers. These medicinal plants are packed with natural compounds like flavonoids, tannins, and

terpenoids that show real promise for healing without as many harsh side effects as some conventional drugs. To truly harness this power, we need to bring together ancient Ayurvedic wisdom with modern scientific methods, along with clear rules and regulations. This collaborative effort is key to discovering and developing safer, more accessible, and truly effective anti-ulcer medicines for everyone around the globe.

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