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Review Paper

Natural Remedies on Antiulcer

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ABSTRACT

The purpose of this review is to learn more about the medicinal plants ability to prevent ulcers. of essence, it is an inflammatory rupture of the mucous membrane or skin that lines the digestive tract. The most prevalent condition affecting the gastrointestinal tract gastrointestinal tract is ulceration, which is mostly caused by an imbalance between the defensive and aggressive The erosion of the stomach and duodenal lining is known as a peptic ulcer. Duodenal and stomach ulcers are the two varieties. To treat ulcers, a variety of synthetic drugs are available. However, these drugs are more expensive and probably have more side effects than natural therapy. According to the literature, many ayurveda physicians and traditional healers treat ulcers with a variety of medicinal plants and polyherbal combinations. The ideal objectives of treating peptic ulcer illness are to reduce discomfort, heal the ulcer, and stop it from coming again. An attempt has been made to learn about the different medicinal plants that can be used In this review, efforts have been made to learn about various medicinal plants that may be utilized to treat or prevent peptic ulcers in both modern science and Ayurveda.

INTRODUCTION

Ulcers are caused by outwardly irritated dead tissue that erodes the. One feature of ulcers, which are open sores, i.e. the shedding of inflammatory dead tissue from the skin or mucous membrane.^{1,2} Vaginal, oesophageal, peptic, and oral ulcers are among the many types of ulcers. "Ulcus" (genitive: ulceris), a Latin word meaning sore, wound, or ulceris the root of the English word ulcer. Vaginal, oesophageal, peptic, and oral ulcers are among the

many types of ulcers.³ A peptic ulcer is a painful sore or wound those forms on the inner lining of the stomach, small intestine (usually the duodenum), or oesophagus, caused by the excessive erosion of the mucosal lining.⁴ This erosion occurs as a result of the digestive acids in the stomach coming into direct contact with the sensitive underlying tissues.⁵ The term "peptic" refers to pepsin, the enzyme involved in the digestive process, while "ulcer" refers to a break

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or hole in the lining of an organ.⁶ Peptic ulcers are among the most common gastrointestinal conditions worldwide, affecting millions of people each year.⁷

1.1 TYPES OF PEPTIC ULCER

1. Gastric ulcer:

These ulcers are referred to as gastric ulcers when they develop in the stomach.⁴ In the elderly age range, ulcers are prevalent.⁸

2. Duodenum ulcer:

Duodenal ulcers are the name given to ulcers that develop in the duodenum.⁵ Men are the main victims of duodenal ulcers, which are more prevalent in younger adults.⁹ Ulcers may form on the duodenum's anterior and posterior walls.¹⁰

1.2 Causes

Causes

Genetic Factors

Spicy Foods and Caffeine

Stress

Excessive Alcohol Consumption

Nonsteroidal Anti

Inflammatory Drugs (NSAIDs)

Helicobacter pylori (H. pylori) Infection

Fig 1. Causes of peptic ulcer

1.3 Peptic ulcer symptoms and indicators:

sign and symptoms

Indigestion

Nausea / vomiting

Heartburn

Burning stomach

suffering

Bloating and fullness

Appetite loss

Fig.2 Signs & Symptoms of peptic ulcer

1.5 Pathophysiology:

The most common peptic ulcers are caused by an imbalance between the stomach's defense and destructive mechanisms. HCl, pepsin, ethanol, NSAIDs, stress, smoking, and H. pylori infection are among the harmful elements. Mucus-bicarbonate barrier, mucin secretion, prostaglandins, and antioxidant enzymes are examples of defense factors. One *Helicobacter pylori* infections and pharmacological reactions, especially to NSAIDs (non steroidal anti-inflammatory medicines), are two causes of peptic ulcers. By staying between the mucous layer and the gastric epithelium, the Gram-negative bacterium *Helicobacter pylori* is able to endure in the harsh environment of the stomach. *Helicobacter pylori* initially reside in the antrum before progressively migrating to the closer areas of the stomach.¹¹

1.6 Prevalence:

Approximately 10% of people worldwide suffer from ulcers, of which 5% are stomach ulcers. Peptic ulcers are more common in men than in women. For men, the prevalence is between 11% to 14%, whereas for women, it is 8% to 11%. The current study reviewed medicinal plants included in ayurveda materials that are thought to have gastroprotective and ulcer-healing properties. The retrieved research either clearly show how efficient these herbs are or indirectly show how effective they are on the mechanisms involved in treating peptic ulcers.¹²

HERBAL PLANTS USED AS ANTIULCER ACTIVITY

1. *Zingiber officinalis* Roscoe

Zingiber officinalis Roscoe sometimes referred to as ginger, is a spice that is used as a flavoring agent and is a member of the Zingiberaceae family. Proliferative, hepatoprotective, anti-inflammatory,



anti-migraine, antiemetic, anti-inflammatory, antimicrobial, antithrombotic, anti-analgesic, and anti-osteoarthritic properties are among the plant's reported pharmacological properties.¹³ Although ginger encourages stomach secretions, its powdered rhizome has long been employed as a traditional treatment for gastrointestinal issues, including peptic ulcers.¹⁴

Anti-ulcer activity: - Ginger has been found to contain a number of anti-ulcer chemicals, such as α -curcumene, 6-gingerol, and 6-shogaol.¹⁵ The most noteworthy is 6-gingerol, which exhibited stronger anti-ulcer efficacy and less pungency than 6-gingerol and 6-shogaol.^{17, 18} Ginger may potentially have antiulcer properties because of its strong thromboxane synthetase inhibition.¹⁹ Ginger in high dosages most likely irritates the stomach.



Figure-1: *Zingiber officinale* Roscoe

2. *Morus alba* Linn:

White mulberry is a popular name for *Morus alba* Linn is a member of the Moraceae family. Around the world, white mulberry is grown wherever silkworms are kept. White mulberry leaves are the main feeding source for silkworms. There are multiple names for the plant in several languages, including Tamil: Muskets, Malayalam: Malbari, English: Mulberry, Hindi: Tut, and Sanskrit: Tutam. Tribes in this nation have long used this

widely growing plant to treat conditions such as diabetes, influenza, eye infections, nosebleeds, asthma, coughing, edema, insomnia, and wound healing.²⁰ The fruit of the mulberry has long been used as a remedy to treat weakness, exhaustion, anemia, early graying of the hair, and to replenish the blood and kidneys. Additionally, it is used to treat older patients' constipation, tinnitus, dizziness, and urine incontinence.²¹

Additionally, was found that β cell regeneration lowered blood glucose levels.²² **Anti-ulcer activity:** Rats with artificially produced stomach ulcers showed antiulcer activity from plant leaf extracts.²³ Chinese medicine has long utilized the white mulberry for therapeutic purposes; practically every component of the plant is used.²⁴ The greatest source of health-promoting phytochemicals that may be utilized as a vegetable is found in mulberry leaves. Higher levels of quercetin, which lowers the oxidation process both in vivo and in vitro, are found in mulberry leaves.



Figure-2: *Morus alba* Linn

3. *Aegle marmelos*:

Aegle marmelos, often referred to as a "bale tree". The plant that grows most commonly belongs to the Rutaceae family in India. On a local level, it is referred to as "vilvam." This plant contains chemical constituents include flavonoids, tannins, and saponins.²⁵ In folk medicine, antiulcer activity. The Kani tribes in Tamil Nadu, India's Kanyakumari area, have long utilized the fruit of *A. marmelos* to treat ulcers.²⁵

In current research. Rats with Aspirin and pylorus-ligated stomach ulcers develop ulcers, and for 21 days, an aqueous extract of leaves is administered orally at a dose of 1gm/kg daily.²⁶

Active Constituents:- Luvangetin, a pyranocoumarin isolated from the seeds.²⁷



Figure -3: *Aegle marmelos*

4. *Mangifera indica*:

Mangifera indica (Anacardiaceae) is commonly known as "mango tree." "Mangaai" is the local term for it. It is cultivated throughout India. Among this plant's chemical constituents include flavonoids, alkaloids, sterols, saponins, and tannins²⁸. Leaf extracts were dissolved in rice bran oil and taken orally to heal ulcers. According to traditional reports, the plant has antiulcer properties²⁹.

In current research. Rats with gastrointestinal lesions were given the flower decoction orally in increments of 250, 500, and 1000 mg/kg that are dosage dependant. Consequently, the extract significantly reduced the amount of gastric juice and the acidity of the stomach³⁰. Components that are active: - Mangiferin³¹



Figure -4 : *Mangifera indica*

5. *Aloe vera*:-

"Aloe gel" is the popular term for aloe vera, which is a member of the Liliaceae family. Locally, it is known as "kattalai," and it is present throughout India. This herb contains the chemical components emodin, isobarbaloin, and aloin³². In America, leaves are effectively used as a cure for chronic ulcers locally. Initially, the pain subsides as the ulcers heal after a few weeks³³.

In current research. solution of aloe vera powder and gum acacia was given orally to rats at a dose of 200 mg/kg to prevent stomach ulcers caused by indomethacin. Significant antiulcer action was demonstrated by the extract, which was on par with control³⁴.

Components that are active:-Saponins, isobarbolin, and barbalin are regarded as



Figure-5: *Aloe vera*

6. *Annona squamosa*:-

The common name for *Annona squamosa* (Annonaceae) is “custard apple.” It is cultivated in gardens all over India which is locally called as “sitapalam.” Alkaloids, flavonoids, saponins, and tannins are all present in this plant. Seeds are the source of oil and resin.; an acrid principle is present in seeds, leaves, and immature fruits.³⁵

According to recent studies, leaves ground applied on unhealthy ulcers as a paste without water³⁵

Rats were shielded from ethanol-induced stomach ulcers and pylorus ligation by the aqueous leaf extract.³⁶

Components that are active:- Tannic acid is taken into account.



Figure-6:-*Annona squamosa*

7. *Beta vulgaris*:-

Beta vulgaris (Chenopodiaceae) is commonly known as “beetroot” also known as sugar beet, it is native to the Mediterranean shores and is currently widely grown in Europe and America. In several regions of India, it is also grown in gardens for the meaty roots and leaves. Red and white are the two varieties. This plant's chemical components include the active principle “betin.”³⁷

Ayurvedic antiulcer activity:- For all types of ulcers and running sores, a root decoction with a little vinegar added works wonders.³⁷



Figure-7:*Beta vulgaris*

8. *Hibiscus rosa sinensis*.

Hibiscus rosa sinensis (Malvaceae) is commonly known as “changing rose.” It is locally called “chembaruthi.” Originally from China, it is now widely grown throughout India as an ornamental plant. Flavonoids, anthocyanins, quercetin, cyanidin, kaempferol, and hydrocitric acid are some of the chemical components of this plant. In folk medicine, antiulcer activity³⁸. For many years, the Kani tribes in Tamil Nadu, India's Kanyakumari district have used the root of *H. rosa sinensis* to treat ulcers³⁸.

In current research: At dosages of 250 and 500 mg/kg, In rats with pylorus ligation, *H. rosea sinensis* root extracts in both aqueous and alcohol form showed potent antiulcer effects. Therefore, the potential of these extracts as an antiulcerogenic agent has been demonstrated by science³⁹. components that are active. Quercetin and flavonoids are taken into consideration.



Figure-8:*Hibiscus rosa sinensis*

9. *Ocimum sanctum* Linn

Ocimum sanctum, a member of the Lamiaceae family, is significant due to its potential for therapeutic use. The chemical components of the two types of *Ocimum sanctum*—black (Krishna Tulsi) and green (Rama Tulsi)—are comparable⁴⁰. There are *Ocimum sanctum* plants all over the Indian subcontinent. An essential part of the Hindu sacred tradition is Tulsi. Ayurveda and Siddha systems of medicine use various plant parts to prevent and treat a wide range of ailments. Many conditions, including wounds, bronchitis, liver illnesses, catarrhal fever, ophthalmia, lumbago, hiccough, ophthalmia, stomach disorders, genitourinary disorders, skin diseases, different poisonings, and psychological stress disorders, can be treated at home with tulsi^{41,42}. Additionally, it contains demulcent, diuretic, expectorant, alexiteric, vermifuge, febrifuge, fragrant, stomachic, and carminative qualities.

Anti-ulcer activity:

The fixed oil's lipoxigenase inhibitory, histamine antagonistic, and antisecretory properties gave it a notable antiulcer impact. Antibacterial, anti-inflammatory, antihypertensive, cardioprotective, antipyretic, immunomodulatory, antioxidant, chemopreventive, central nervous system depressant, antifertility, anti-stress, anti-cataract, anticoagulant, hepatoprotective, and radioprotective are among the plant's reported pharmacological properties⁴³.



Figure-9: *Ocimum sanctum*

10. *Carica papaya*:-

"Papaya" is a common name for Caricaceae. Locals refer to it as "papali-pazham." It can be seen growing in many subtropical areas and all tropical countries. Among this plant's chemical constituents are papain, chymopapain, pectin, carposide, carpaine, carotenoids, and antheraxanthin⁴⁴.

Folk Medicine's Antiulcer Activity: Tropical folk treatments use it extensively. Ripe fruit can be eaten, and unripe fruit can be prepared to treat indolent ulcers. The unripe fruit can be cooked and added to salads, jellies, and stews, but the ripe fruits are usually eaten raw, without the skin or seed. Consuming the plant's immature fruit has been associated with a lower risk of developing ulcers⁴⁴.

In current research: - Rats were given oral administration of *C. papaya* aqueous seed extract at 50 and 100 mg/kg to stop stomach ulcers caused by ethanol oral doses of 50 and 100 mg/kg of *C. papaya* aqueous seed extract to prevent ethanol-induced stomach ulcers. The extract shielded the stomach mucosa from the effects of ethanol. The volume and acidity of gastric juice were considerably decreased by *C. papaya* extract⁴⁵.

Components that are active. Papain and chymopapain are well known for their ability to help with gastrointestinal tract disturbances and digestive issues⁴⁶.



Figure-10: *Carica papaya*

11. *Tamarindus indica*

Plant belongs from family Caesalpiniaceae are the "tamarind tree" as they are commonly known. The local term for it is "puli; puliyam-pazham." Originally from South India, this evergreen tree is planted all over India and Burma. The pulp of this plant includes 25–40% invert sugar, gum, pectin, malic and acetic acids, 5% tartaric acid, 4% citric acid, and 8% potassium tartaric acid. Seeds contain lipids, albuminoids, fiber, 63.22% carbohydrates, and ash that contains phosphate and nitrogen. Fruit contains tiny amounts of oxalic acid ⁴⁷.

Ayurvedic antiulcer activity : The leaves are used as a wash for indolent ulcers and their decoction promotes good behaviour ⁴⁷. In the pylorus ligation-induced ulcer model, the methanolic extract of *T. indica* seed coat at 100 and 200 mg/kg significantly reduces the amount of gastric juice in total, as well as the free and total acidity of gastric output as compared to control. components that are active ⁴⁸. They take tannins is active component.



Figure-11: *Tamarindus indica*

area call it "murungai." It is native to Asia Minor, Arabia, Africa, India, Pakistan, as well as the sub-Himalayan and Western areas. This plant's chemical components include terpenoids, alkaloids, flavonoids, saponin, tannins, zeatin, quercetin, and kaempferol ⁴⁹.

Folklore medicine : Many elements of the plant have long been recognized for their medicinal properties in folk medicine. The leaf tea is used by the Kani tribal people of Tamil Nadu, India's Pechiparai Hills, to treat stomach ulcers. It has been demonstrated that *M. oleifera* flower buds, which are frequently consumed in Pakistan, have antiulcer qualities. The alcoholic leaf extract of *M. oleifera* was administered orally to rats at 125, 250, and 500 mg/kg to prevent stomach ulcers brought on by aspirin, ethanol, cold restraint stress, and pylorus ligation. The extract demonstrated reductions in acid pepsin secretion and ulcers ⁵⁰.

Components that are active:- Beta carotene, beta sitosterol, and quercetin are thought to



Figure-12: *Moringa oleifera*

12. *Moringa oleifera* : -

The Moringaceae family is popularly referred to as the "drum-stick, horse radish tree." People in the

Plants and their antiulcer activity

Plant Name	Family	Common Name	Part Used	Active Constituent	Medicinal Use
<i>Zingiber officinalis</i> <i>Roscoe</i>	Zingiberaceae	Ginger	Rhizome	Curcumene , 6- gingesulphonic acid and 6- shogaol	Antiulcer, hepatoprotective, anti-inflammatory, anti- migraine, antiemetic, antimicrobial, anti- osteoarthritic

<i>Morus alba</i> Linn	Moraceae	White mulberry	Leaves	Quercetin	Antiulcer, diabetes, influenza, eye infections, urine incontinence to replenish the blood and kidneys urine incontinence
<i>Aegle marmelos</i>	Rutaceae	Vilvam, bale tree	Leaves	Luvangetin, pyranocoumarin	Antiulcer, Antidiabetic, Anti-inflammatory, cardioprotective, Hepatoprotective, analgesic
<i>Mangifera indica</i>	Anacardiaceae	Mango, Mangai	Leaves, Flowers	Mangiferin	Antiulcer, antioxidant, Hypoglycemic effect, Anti microbial, Anti- cancer, Wound healing
<i>Aloe vera</i>	Liliaceae	Kattalai,	Leaves	Saponins, isobarboline, barbalin	Antiulcer, Anti cancer Antioxidant, Laxative Effect, Skin-protective Hepatoprotective
<i>Annona squamosa</i>	Annonaceae	Sitapalam	Leaves	Tannic acid, saponins	Antiulcer, Anticancer Antiparasitic, wound healing activity, Antidiabetic, Anticonvulsant activity
<i>Beta vulgaris</i>	Chenopodiaceae	Beetroot	Roots	Betin	Antiulcer, Anticancer, Antihypertensive, Erogenic, Anti-anemic, Neuroprotective Cardioprotective effect
<i>Hibiscus rosa sinensis</i>	Malvaceae	Changing rose, Chembaruthi	Roots	Quercetin, flavonoids	Hepatoprotective, Antiulcer, Analgesic, Antifertility, Uterotonic, Anthelmintic effects
<i>Ocimum sanctum</i> Linn	Lamiaceae	Holy basil, Tulsi	Leaves	Fixed oil eugenol	Antiulcer, Antidiabetic, Thrombocytopoietic, Hepatoprotective, Gastroprotective
<i>Carica papaya</i>	Caricaceae	Papaya	Fruits, Seeds	Papain, chymopapain	Antiulcer, Digestive Aid, Antioxidant, immunomodulatory, Hypoglycemic, Wound healing, Cardioprotective
<i>Tamarindus indica</i>	Caesalpinaceae	Tamarind tree	Leaves	Tannins	Antiulcer, Anthelmintic, Hepatoprotective, Anti-inflammatory, Antipyretic
<i>Moringa oleifera</i>	Moringaceae	Drum-stick, Horse radish tree	Leaves	Beta carotene, beta sitosterol, quercetin	Antiulcer, Antifatigue Neuroprotective, Hepatoprotective, Antipyretic effects

CONCLUSION

This study clearly shows the importance of medicinal herbs in the treatment of a variety of diseases. Numerous herbal plants and plant extracts have potent antiulcer effects in animal models. Compared to reference herbal medications, it exhibits mucoprotective and gastrointestinal anti-secretory properties. Even at comparatively high quantities, the extract is non-toxic. According to our review's findings, the aforementioned medicinal plants may help prevent ulcers by using the dose-dependent principle. Numerous botanical compounds have been shown to have antiulcer properties.

Lastly, it should be mentioned that compounds with antiulcer properties, like flavonoids and tannins, are very important for treatment. According to the study's findings, there is a good chance that several medicinal plant extracts, including leaf and plant extracts, could be used to treat peptic ulcer illness

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