



A Comprehensive Review on Antiulcer properties of Herbal drugs

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ABSTRACT

Herbal medicines are very useful in treating various human ailments. The plants and herbs consumed in its natural state have proved to have lesser side effects and are cost effective too. Recognition of this fact has created a demand for herbal medicines, both in developing and developed countries across the globe. Peptic ulcer disease in clinical practice is one of the common gastrointestinal disorders where duodenal ulcer, gastric ulcer, NSAIDs triggered ulcer and stress ulcer are common forms of peptic ulcer. Gastric ulcers are commonly found in the geriatrics and in the lower socio-economic class of people. Most synthetic drugs are used to treat peptic ulcers, but they cause adverse effects of various kinds. For its ethnic, ethno botanical and ethno pharmacological use, herbal medicines are therefore exceptional. In this review, attempts were made to know the natural antiulcer drugs with their recommended drug portion, screening method and sort of extract used for appraisal and observations to show its usage. The reason for this assessment is to assemble literature and the antiulcer residences of the herbal medicines used frequently. Different plants such as *Allium sativum*, *Centella asiatica*, *Lawsonia inermis*, *Ocimum sanctum*, *Sesbania grandiflora*, *Adansonia digitata*, *Ficus religiosa*, *Glycyrrhiza glabra*, *Cynodon dactylon*, have been shown to be involved in antiulcer care.



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INTRODUCTION

Peptic ulcers are acid-induced abscess found in the stomach and duodenum characterized by assets mucosa with the defect extending into the sub-mucosa or muscularis propria (Vimala and Shoba, 2014). Peptic ulcers are most frequently found on the lower skin, uttermost parts of the body and in

the GI tract, almost everywhere they can fight. There are various forms of ulcers such as peptic ulcer, oesophageal and genital ulcer. Many people are affected by peptic ulcers. It is considered as abrasion of "Tummy" or "Duodenal" lining (Bhowmik et al., 2010). Commonplace varieties of peptic ulcers are known as "Duodenal" as well as "Gastric ulcer". These ulcers are also called as ulceration. A person may have at the same time both duodenal and gastric ulcer. Abscess is found inside the tummy, with the symptom of ache. Lesions are especially common within the aged. A few other signs may additionally consist of weight reduction, nausea, and vomiting. Although humans with peptic ulcers have regular or decreased production of acid, it may also occur without the presence of acid (Wandre et al., 2013). Duodenal ulcers are visible at the beginning of the small intestine and are characterized by too much ache with a burning sensation within the higher part of the abdomen that may disturb the sufferers sleep.

Ache occurs usually when the belly is empty and gets alleviated after ingesting. Peptic ulcer is more common in male youth. In the duodenum, ulcers that are present on each the anterior and posterior partitions of duodenum (Brooks, 1985). Symptoms such as severe abdominal pain, bloody stools, cramps, and bloody vomiting may be life-threatening in some cases (Sharma and Bhatt, 2014). Pathophysiology involves an imbalance between “aggressive” and “defensive” variables. Acid, *Helicobacter pylori*, and pepsin are “defensive” variables. Prostaglandin, mucin, bicarbonate and, nitric oxide are “defensive” variables (Hoogerwerf and Pasricha, 2001). The cause of peptic ulcers were once thought as spicy food or stress and a closer look has revealed that the reasons could be the difficulty in encompassing the bacterial infection or in response to a couple of drugs during a treatment, especially NSAIDs (Marshall and Warren, 1984). The main etiological variables correlated with peptic ulcers are *H. pylori*, NSAIDs, acid, mental stress, alcohol, and smoke (Malfertheiner et al., 2009). The *H. pylori* (gram-negative bacteria) remains pressing among the Mucous and intestinal epithelium and is strategically intended to live in an aggressive belly placing (Longo et al., 2012). The present research was performed to examine medicinal plants deemed to be gastro-protective and ayurvedic relief agents for ulcers and gathering pieces of evidence of their effectiveness and biological processes in contemporary research (Nadkarni's, 1996).

FINDINGS AND DISCUSSION

Allium Sativum

Allium sativum from the Liliaceae family is often cited as garlic and locally referred to as Vella-pundu. It has evolved at some stage in India. The pungent volatile oil is the main phytochemical whereas albumen, starch, mucilage, sugar and aromatic oil are also present. Garlic is an excellent treatment for maggots in the Ayurveda, oil of mustard or coconut fried infecting ulcers, and ulcerations. Aggregate of the all extracts with three or four components of ordinary or aqueous was used as a wound and foul ulcers washing lotion (Azamthulla et al., 2009). *Sativum* bulb juice has been administered orally to cysteamine intoxicated peptic ulcer in rats at doses between 250 and 500 mg / kg in recent studies. The extract significantly improves gastric ulcer healing and prevented rodents from developing experimental gastric and duodenal ulcer. Essential oil, allinase, and allicin are regarded as important phytochemicals (Azamthulla et al., 2009).

Aloe Vera

It belongs to the Liliaceae family is generally said as “aloe gel”. It is locally stated as “Kattalai” determined throughout India. The phytochemicals are emodin, aloin, and saponins (Borra, 2011). In Ayurveda, for chronic ulcer treatment, Aloe leaves are used effectively in America. The pain first decreases and the ulcers cure after a few weeks. In the latest research, Aloe vera powder changed into blended with gum acacia. For indomethacin intoxicated gastric ulcer, leaf extract was given through the mouth in experimental animals at a dosage of 200 mg/kg. Its concentrate has been exposed to control specific antiulcer action. Functional components is regarded barbaline, isobarbolone, and saponins (Borra, 2011).

Azadirachta Indica

It belongs to the Meliaceae family is native to almost all of India and Bengal and grows there. It is often referred to as “neem” and is locally referred to as “vembu.” The functional components of this plant are, nimbidine, saponine, flavonoid and phenolic. This contains a margosine, bitter alkaloid and Seeds contain around 10–31% of a set natural bitter oil. The oil includes fatty acids that are free and volatile. The unstable fatty acids are likely a combination of stearic and oleic acids with little lauric acid (Divakar et al., 2001). In Ayurveda, a concoction of greens combined with sesame seed is really effective in unhealthy ulcerations. This extract of leaf is safe for pylorus ligation and restriction of cold pressure has stomach ulcer triggered in rats in recent studies (Pillai and Santhakumari, 1984). Active elements are isomeldenin, nimbin, nimbinene, and quercetin. Neem bark and leaves are filled with tannins and oil.

Balsamodendron Mukul

Balsamodendron mukul which belongs to Burseraceae family is often called gum-gugul, grown in Rajputana, Bengal, Assam, khandesh, and Mysore, known regionally as “Gukkulu”. Antiulcer Activity: Mixed with coconut oil or lime juice it is used for treating ulcer. Guggul gum is applied as a plaster or as a lotion in indolent ulcers (Kottaimuthu, 2008).

Carica Papaya

It belongs to family Caricaceae is usually called Papaya and is domestically referred to as Papalipazham, developing in sure areas and a few of the countries. Chymopapain, papain, caposide, pectin, carpaine, and carotenoids are chemical compounds found in the above plant. It is generally utilized in natural medicines. Its ripe drupe is nutritious and can be prepared without recurrent ulcer. Sun-dried fruits could be prepared as lettuce, stew, and jel-

Table 1: Compiled Information about the Scientific Name, Phytoconstituents and Therapeutic Uses of several plants.

Sl. No.	Scientific Name of plant	Phytochemicals	Therapeutic uses
1	Allium Sativum (Liliaceae)	Essential oil, allinase, allicin	Antimicrobial, duodenal ulcer
2	Aloe barbadensis (Liliaceae)	Emodin, aloin, saponins	Gastric ulcer
3	Azadirachta Indica (Meliaceae)	Nimbidine, saponine, flavonoid	Stomach ulcer
4	Balsamodendron Mukul (Burseraceae)	Flavonoid, terpenes	Indolent ulcers, Antimicrobial
5	Carica Papaya (Caricaceae)	Papain, caposide, pectin, carpaine	G.I.T problems, Stomach ulcer
6	Euphorbia Neriifolia (Euphorbiaceae)	Euphorbon, resin, latex, calcium malate	Gastric ulcer
7	Centella Asiatica (Umbelliferae)	Crystalline Vellarin, Tannin, Sugar	Stomach ulcer
8	Indigofera Tinctorial (Papilionaceae)	Indicans (Glucosides)	Gastric ulcer
9	Lawsonia Inermis (Lythraceae)	Hanno, tannin, tannic acid	Injuries and abscesses
10	Mangifera Indica (Anacardiaceae)	Saponins, flavonoids, tannins	Stomach ulcer
11	Mimosa Pudica (Fabaceae)	Quercetin, Naringin, Saponins, Tannins	Gastric ulcer
12	Momordica Charantia (Cucurbitaceae)	flavonoids, saponins and sterols	G.I.T problems, Stomach ulcer
13	Hibiscus Rosa Sinensis (Malvaceae)	Flavonoids, quercetin anthocyanins	Gastric ulcer
14	Galega Purpurea (Papilionaceae)	glucoside, and querritrin or quercetin	Antimicrobial, Gastric ulcer
15	Ocimum Sanctum (Lamiaceae)	Alkaloids, saponins tannins, flavonoids	Intestinal illnesses
16	Myrica Nagi (Myricaceae)	saccharin, salts, and tannin	Gastric ulcer
17	Sesbania Grandiflora (Fabaceae)	saponin and tannins	Antimicrobial, Gastric ulcer
18	Psidium Guyava (Myrtaceae)	cellulose, tannin, volatile oil, mineral salts	Stomach ulcer
19	Phyllanthus Niruri (Euphorbiaceae)	saponins, flavonoids, starches and glycosides	Gastric ulcer
20	Odina Wodier (Anacardiaceae)	Tannin, potassium carbonate	persistent ulcers, chronic ulcer
21	Moringa Oleifera (Moringaceae)	Tannins, alkaloids ,saponin, quercetin	Stomach ulcer
22	Adansonia Digitate (Malvaceae)	Tartrate, Glucose, Gum and Potash acetic acid	Syphilitic ulcer

lies, whereas the mature fruit is usually served fresh are free of shell and core. The intake of the unripe fruit of the plant was correlated with the effect of antiulcer (Indran and Mahmood, 2008). Research findings have shown that, Papaya administered with ethanol at concentrations 50 and 100mg / kg doses orally in rats with gastric ulcer caused significant reduction in ulcer. The extract shielded the stomach mucosa from the impact of ethanol. Carica papaya extract considerably decreased the quantity of stomach juice and stomach acid. Active components include, chymopapain and papain are commonly known to help with G.I.T problems (Drenth et al., 1971).

Euphorbia Neriifolia

This shrub belongs to family Euphorbiaceae and is frequently referred to as prevalent dairy conserve. It's known as Ilaikkalli regionally. It is a leafless shrub is found in Southern India and cultured in Bengal. Gum, euphorbon, resin, latex, calcium malate and so on are the viscose components in the above plant. In Ayurveda, herb extract is used mostly with fresh or clarified food to treat ulcer sores (Ahmed et al., 2011).

Centella Asiatica

Centella Asiatica Umbelliferae is often referred to as Asian penny-wort and is referred to locally as Vaelarai. This tiny plant is widespread in India and grows abundantly in humid areas. Chemicals in the above plant are rich in true Crystalline Vellarin, the main ingredient of plants, fibers, and some fat Aromatic flesh, Tannin, Sugar and Gum (Jamil et al., 2007). The substance in Herbal medicine, for ulcers might be given three times each day in 3 to 5 grain portions; at a similar minute, a segment of the moulder could be sprinkled on the new leaves, abscesses or ideally healing potions (Gohil et al., 2010).

Indigofera Tinctoria

This plant belongs to family Papilionaceae is also referred to as "true indigo" but is commonly recognized as Neelum Avari. It's a small stright plant and is commonly grown in North India, particularly in Bihar, Sind, south India, Bombay, and Madras. Main ingredients in the whole herbal product are Indicans (Glucosides), the soluble component of luc-Indigo or Indigo-White, obtained from the ferment of clean green plants (Divya et al., 2017). In Ayurveda, squashed leaves are utilized in different skin conditions as an energizer poultice or mortar and for purifying and mending sore and ulcers. Dried linen is also used to sprinkle abscesses (Divya et al., 2017).

Lawsonia Inermis

Lawsonia inermis (Lythraceae) is frequently

referred to as henna and is locally referred to as maruthoni, common throughout India, for the most part developed as a support and nursery plant. Concoction segments are leaves in this plant that produce a coloring substance 12-15% Hanno, tannin, tannic acid, and alcohol soluble olive-green resin. Oil yielding seeds. The plant also contains glucoside (Chaudhary1 and Poonia, 2010). In Ayurveda, a leafy ointment is used to mend injuries and abscesses (Semwal et al., 2014).

Mangifera Indica

It belongs to family Anacardiaceae is regularly alluded to as "mango tree" and commonly known as Mangaai. Saponins, flavonoids, tannins, sterols are chemicals in this plant (Lima et al., 2006). In Ayurveda, rice bran oil leaf extracts have been dissolved and orally administered for ulcer. Customarily, antiulcer activity is recorded in the plant (Parvez, 2016). Active components reported are, Mangiferin (Ediriweera et al., 2017).

Mimosa Pudica

This plant which belong to family Fabaceae is frequently called as "touch me not" will be popularly known as Thottal Sinungee. It is growing throughout the world's tropical countries and many subtropical areas. Phytochemicals in the whole plant include Flavonoids, Quercetin, Naringin, Saponins, Tannins, Gums and Mucilage (Vinothapooshan and Sundar, 2010). In Ayurveda, crisp leaves and seed decoction is eaten for a bowel ulcer (Vimala and Shoba, 2014). In the latest study, ethanolic extract of *Mimosa pudica* leaves has been recorded to have dose-dependent antiulcer activity and these leaf extracts can be helpful in the therapy of ulcer as a natural antioxidant (Azmi et al., 2011). The main active components is alkaloid, mimosine (Azmi et al., 2011).

Momordica Charantia

It belongs to family Cucurbitaceae which is as often as possible alluded as "Bitter gourd". Locally it is alluded to as Pavakka-Chedi. The above mentioned plant is harvested in gardens crosswise over india for its herbal extract (Rao et al., 2011). In Ayurveda, the whole powdered plant is used to clean infected as well as other stubborn abscesses and to treat injuries; combined with Long Pepper, Cinnamon, Chaulmugra oil and rice it forms a beneficial ointment in endangering Ulcers (Rao et al., 2011). In the most recent investigations, watery and alcoholic concentrate of this organic product is utilized exclusively at dose range of 200 and 400 mg/kg against pyloric sphincter, headache medicine and Stress Ulcer in rodents. It is observed that at these concen-

trations there is a considerable decline in the record of ulcer comparative with control (Rao *et al.*, 2011). Active components include flavonoids, saponins and sterols.

Hibiscus Rosa Sinensis

It belongs to family Malvaceae is often referred to as “Changing Rose” and is referred to as “Chembaruthi” in private. It is indigenous to China and is generally developed throughout India as an elaborate plant. Flavonoids, quercetin, anthocyanins, kaempferol, cyanidine and hydrocitric corrosive are synthetic compounds in this plant (Udayakumar, 2011). In the medication of society, the Hibiscus root, in Kanyakumari region, Tamil Nadu, Rosa sinensis is customarily used to treat ulcer among the kani clans (Srivastava *et al.*, 2013). In the most recent examinations, the concentrates of watery and liquor from this plant roots had significant antiulcer property in 250 and 500 mg/kg pyloric sphincter rodents. Hence, it has been experimentally shown that, these concentrations have adequate potential as an antiulcerogenic operator (Srivastava *et al.*, 2013). Quercetin and flavonoids are considered as the main phytochemicals.

Galega Purpurea

It belongs to family Papilionaceae and is generally alluded to as the “purple tephrosia”, privately alluded to as Kolluk-kay-welai, and is being found all over India, especially in Southern India. The plant grows on rocky surface. Phytochemicals in this plant are glucoside, and querritrin or quercetin (Johnson-Saint, 1927). In Ayurveda, the root of this plant is crushed to fine powder which is mixed with honey and applied on ulcers.

Ocimum Sanctum

Ocimum Sanctum (Lamiaceae) is much of the time alluded to as “heavenly basil” and is privately alluded to as tulsii. Tulsii’s name suggests the exceptional one. It is one of the Indian subcontinent’s holy herbs for Hindus. Alkaloids, saponins tannins, flavonoids and sterols are phytochemical compounds in this plant (Ghangale *et al.*, 2009). In Ayurveda, Indian medicinal products explain the plant’s use in a multitude of diseases. For many years, millions of Indians take the new leaves as Prasad. A tea made with Tulsii leaves is widely used for intestinal illnesses (Singh and Majumdar, 1999). In rodents with ibuprofen, indomethacin, liquor and stress-incited ulceration, sanctum was directed intraperitoneally at dose range of 1, 2, and 3mL/kg. It decreases ulcer in a dose dependent manner (Singh, 1999). Active components include, fixed oil eugenol (Dharmani *et al.*, 2004).

Myrica Nagi

It belongs to family Myricaceae and generally alluded to as the “Myrtle bag”. Locally it’s miles known Asmarudam-Pattai. It is a subtropical Himalayan evergreen herb, aboriginal of Shimla, area of Syihet and south to Singapore and furthermore present in the ridge of Khasia and Burma. It’s a tree that is widely grown in Japan and China. Within this herb, phytochemicals are saccharin, salts, and tannin (Ganesan *et al.*, 2008). An emollient produced in Ayurveda by wounding the bark and washing it in liquid and mixing it in Indian meal until it gets the right consistency to treat Scrofulous abscesses (Tukina). At the point when bubbled, natural products survive a type of wax named Myrtle wax that is utilized to treat ulcers (Ganesan *et al.*, 2008).

Sesbania Grandiflora

Sesbania Grandiflora (Fabaceae) is as often as possible alluded to as “Basna” and is privately alluded to as “Akathi”. It is a decorative plant found in Western Himalayan fields in Sri Lanka. Saponins, tannins and triterpenes are chemicals in this plant (Bhalke *et al.*, 2010). In the prescription of people Sesbania grandiflora leaves are set up as a sauce and received orally by the Valaiian clan of alagarkoil hills, madurai locale, Tamil Nadu, India. 50mL of leaf decoction is taken by the ancestral and country populace of Sirumalai Hills, Dindigul area, Tamil Nadu, India, orally on a vacant stomach as a vermifuge. Leaves are bubbled in bovine milk and taken orally for the treatment of peptic ulcers in Kikuku town, Muleba locale, Tanzania. Paliyar tribals in Tamil Nadu, India, orally take the cooked leaves for ulcer (Bhalke *et al.*, 2010). In Recent Studies, the concentrate of ethanol extract of leaf from *S. Graniflora* was controlled orally at a portion of 400 mg/kg in rodents with ibuprofen, ethanol and peptic ulcer brought about by indomethacin. The concentrate impressively hindered mischief to the gastric mucosa and diminished the discharge of basal gastric corrosive (Sertié *et al.*, 2001). Phytochemicals like saponin and tannins are taken into account (Sertié *et al.*, 2001).

Psidium Gujava

It belongs to family Myrtaceae normally called as “guava” and is alluded to referred as the koyya tree. The above plant is grown almost throughout India and is widespread in Bengal. Concoction parts of the whole Plant are barks that contain Tannin, tar, and calcium oxalate gems of 27.4 percent. Leaves incorporate pitch, fat, cellulose, tannin, volatile oil, mineral salts and chlorophyll (Umana *et al.*, 2012). Leaf decoction is used locally in Ayurveda for unfortunate ulcers and is a convincing wash for turgid

Gums and Ulceration of the mug ([Kamath et al., 2008](#)). The methanol leaf extract with Guava was orally administered to rodents in portions of 500 and 1000 mg/kg for 10 days of ethanol-instigated stomach Ulcer. The reported phytochemicals are quercetine, guaijaverine ([Joseph and Priya, 2011](#)).

Phyllanthus Niruri

It belongs to family, Euphorbiaceae which is also known as Stonebreaker or Seed-Under-Leaf. It's named Kizhkay Nelli privately. It is prevalent in Southern, and central India and extends to ceylon. Alkaloids, tannins, saponins, flavonoids, starches and glycosides are noted phytochemicals from this plant ([Okoli et al., 2009](#)). In Ayurveda, the entire plant beat with root and rice water is used for ulcers ([Okoli et al., 2009](#)). In ongoing experiments, the ethereal themetanolic component concentrate of *P. niruri* was orally instilled in experimental animals at a portion of 400mg / kg and impressively impeded indomethacin-prompted ulcer production ([Cipriani et al., 2008](#)).

Odina Wodier

It belongs to family Anacardiaceae also known as "odiyamaram". It is usually grown in the warm regions of India. Phytochemicals of the bark contains tannin and ash which contains significant amount of potassium carbonate ([Ojha et al., 2014](#)). Bark made as fresh juice is a good treatment for persistent ulcers. Bark in powdered form is used for chronic ulcer.

Moringa Oleifera

It belongs to family Moringaceae and is alluded to as "drum-stick", Horse radish plant and is privately alluded to as murungai. It is indigenous to the locale of the Western Himalayas. Flavonoids, Tannins, alkaloids, saponin, quercetin, zeatin and terpenoids are phytochemicals present in this plant⁽⁴⁶⁾. Antiulcer Activity: In the drug of society, the therapeutic estimation of the various parts of the plant in old stories medication has for some time been recognized. The leaf tea treats Pechiparai Hills, Tamil nadu, India's Kani tribals' stomach ulcers. Oleifers are generally eaten in Pakistan and antiulcer movement has been recorded ([Ruckmani et al., 1998](#)). Oleifera was given orally in portions of 125, 250 and 500 mg/kg in rodents with Pylorus-ligated, Ethanol, Cold restriction and Peptic Ulcer ibuprofen instigated. The example indicated reduces in the emission of Ulcer and Pepsin corrosive. Main active ingredients include, quercetine, beta-sitosterol and beta-carotene ([Swati and Kansara, 2013](#)).

Adansonia Digitate

Adansonia Digitata from the Malvaceae family is

much of the time alluded to as Monkey-bread tree or Africa's Boabab. It is privately alluded to as Paparapuli. It is considered as one of the world's greatest and enduring plants, for the most part found in Gujarat, Bombay, Ceylon and Coromandal Coast. Above this plant, concoction segments are mash containing adhesive, Phobaphenes or Tartrate, Glucose, Gum and Potash acetic acid derivation and different Salts. Albuminoids, Gum, Salt, Glucose are found in a leaf. Bark incorporates wax, solvent and insoluble tannin, corrosive gum, sodium and potassium albuminous carbonate and chloride, and adansonin glucoside ([Sundarambal et al., 2015](#)). In Ayurveda, the crisp extract of the Leaf blended with ginger powder and the communicated extract of the new *Salvadora indica* origin are applied to slothful syphilitic ulcer with extensive advantage. Leaves are utilized to advance touchy fiery ulcers and poultices ([Varudharaj et al., 2015](#)).

The compiled information about the scientific name, phytoconstituents of few plants which has the potential of anti-ulcer activity are provided in Table 1.

By this report, it is understood that on various diseases, a vital role is played by medicinal plants. Our results of the analysis show that the above described medicinal plants can prevent ulcer with the concept of the underlying mechanism stated. It has been documented that a number of botanical substances have antiulcer activity. Then we found that substances like Alkaloids, flavonoids, glycoside, terpenoids, tannins, steroids, saponin and many others, with their particular therapeutic importance, have antiulcer activity. The drug's antiulcer activity can be due to free-radical scavenging properties, inhibition of gastric acid secretion providing strength of gastric mucosal barrier, decrease in vascular permeability and MDA material, enhancement of gastric mucosal cytoprotective mechanisms, elevation of glutathione rates, etc. Due to the presence of essential phytoconstituents in respective plant extracts, the different mechanism of ulcer inhibition can occur. The results of this study indicate that leaf extracts and whole part of some medicinal plant have good potential for use in the disease of peptic ulcer. According to comparison herbal medicines, these have mucoprotective function and gastric anti-secretory effects. Even at relatively high concentrations these extracts are non-toxic.

CONCLUSIONS

Gastric ulcer, one of the most common gastrointestinal disorder, was thought to arise out of an imbalance between protective and aggressive factor. It is

inferred from this analysis that plant extracts in animal models have significant antiulcer activity.

Conflict of Interest

None.

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