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A REVIEW ON ANTIULCER ACTIVITY

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ABSTRACT

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Over the past decades, herbal medicine has become a thing of global significance with medicinal and economic implications. Wide spread use of herbs throughout the globe has raised serious concerns over its quality, safety, and efficacy. Our investigation showed that these investigated medicinal plants could prevent ulcer in a dose-dependent manner. Histological studies revealed that these medicinal plants did not show any acute toxicity. Preliminary photochemical screening of this medicinal plant identified the presence of important secondary metabolites like flavonoids and tannins. A peptic ulcer in the stomach is called a gastric ulcer. One that is in the duodenum is called a duodenal ulcer. Peptic ulcers happen when the acids that help you digest food damage the walls of the stomach or duodenum. The most common cause is infection with a bacterium called *Helicobacter pylori*. Another cause is the long-term use of non-steroidal anti-inflammatory medicines (NSAIDs) such as aspirin and ibuprofen. Stress and spicy foods do not cause ulcers, but can make them worse. As many as 70-90% of ulcers are associated with *Helicobacter pylori*, a spiral-shaped bacterium that lives in the acidic environment of the stomach. Ulcers can also be caused or worsened by drugs such as aspirin and other NSAIDs. There has been considerable pharmacological investigation in to the antiulcer activity of some compounds. In this work, we have reviewed the literature on different medicinal plants for anti-ulcer activity, this article reviews the anti-peptic, gastro protective of the most commonly employed herbal medicines and their identified overall active constituents has been reported.

INTRODUCTION: Ulcer is a common disorder of the gastrointestinal system, which causes much discomfort to patients, disrupting their daily routines and causes mental agony. It is generally more common in those who keep themselves in hurry, become worry and consume curry ¹. Peptic ulcer disease can be characterized by inflamed lesions or excavations of the mucosa and tissue that protect the gastrointestinal tract. Damage of mucus membrane which normally protects the oesophagus, stomach and duodenum from gastric acid and pepsin causes peptic ulcer ².

Natural products from plants are a rich resource used for centuries to cure various ailments. The use of natural medicine in the treatment of various diseases like peptic ulcer is an absolute requirement of our time ³.

Therefore, alternative approach in recent days is the research of medicaments from traditional medicine. The use of phytoconstituents as drug therapy to treat major ailments has proved to be clinically effective and relatively less toxic than the existing drugs.

Diverse chemical compounds have been isolated from medicinal plants with antiulcer activity (Lewis and Hanson, 1991). This is an important reason to investigate antiulcer effects in medicinal plants with traditional use in gastric diseases⁴.

Achyranthes aspera

- **Family:** Amaranthaceae
- **Common name:** Prickly Chaff Flower, Devil's Horsewhip
- **Part used:** Whole plant, root, seeds
- **Extract:** Ethanolic
- **Chemical constituent:** Seeds contains saponins A and B. They are glycosides of oleanolic acid. The carbohydrate components are the sugars D-glucose, L-rhamnose, D-glucuronic acid (= Saponin A). Saponin B is the fl-D-galactopyranosyl ester of Saponin A. In the unripe seeds saponins, oleanolic acid, amino acids and hentriacontane, a long chained carbohydrate⁵.
- **Roots:** Ecdysterone and oleanolic acid have been isolated.
- **Shoots:** An aliphatic dihydroxyketone 36, 37-dihydroxy henpentacontan-4-on and triacontanol could be found (4). Two long chain compounds, isolated from the shoots, have been characterized as 27-cyclohexylheptacosan-7-ol and 16-hydroxyñ 26-methyl heptacosan-2-on by chemical and spectral investigations⁶.
- **Use:** Obstetrics and gynaecology, antiulcer. For snake bites, the ground root is given with water until the patient vomits and regains consciousness, Crushed leaves rubbed on aching back to cure strained back⁷.

Alchornea castaneaefolia

- **Common name:** Iporuru, Iporoni, Iporuro, Ipururo, Ipurosa, Macochihua, Niando, Pajaro
- **Family:** Euphorbiaceae
- **Extract:** ethenolic, hydroethanolic⁸

- **Useful part:** Leaves, bark, root
- **Chemical constituents:** Alchorneine, Alchorneinone, Alkaloids, Anthranilic acid, Gentsinic acid Yohimbine, flavonoids, glycosides.
- **Use:** Antioxidant, antifungal, anti-inflammatory, antibacterial, antiulcer⁹

Anogeissus latifolia

- **Family:** Combretaceae
- **Common name:** Dhawa, Ghatti, Gum Ghatti, Indian Gum Tree, Indian Sumac
- **Useful part:** Roots, bark, leaves, fruits.
- **Extract:** Methanolic
- **Chemical constituents:** The leaves, bark and heartwood yield quinic and shikmik acids; leaves contain gallotannin (90–95% of the tannins). The young leaves and shoots contain 50% tannins (dry basis). The bark contains 12–18% tannins. Heartwood contains gallic acid, ellagic acid, its derivatives, quercetin and myricetin. The gum is mainly the calcium salt of a complex, high molecular weight polysaccharic acid (ghattic acid). The gum is a substitute for Gum Arabic¹⁰.
- **Use:** Wounds and ulcers, inflammations, diabetes, haemorrhages, haemoptysis, diarrhoea, dysentery, haemorrhoids, skin diseases, liver diseases, and general debility.

Bauhinia variegata

- **Family:** Fabaceae (Leguminosae)
- **Common name:** Orchid-tree, poor-man's orchid, mountain-ebony
- **Extract:** Ethanolic, methanolic and aqueous¹¹
- **Useful part:** Root, bark, leaves
- **Chemical constituents:** carbohydrates, glycosides, furanoids, flavonoids, tannins, phenolic compounds, proteins, gums and mucilages, flavonol glycoside, 5, 7, 3', 4'-tetrahydroxy-3-methoxy-7-O-alpha-L

rhamno pyranosyl(1→3)-O-beta-galactopyranoside¹²

- **Use:** Antibacterial, antifungal, antiulcer, hepato-protective, antioxidant, anti-hyperlipidemic, bronchitis, leprosy, tumors¹³.

Ficus religiosa

- **Family:** Moraceae
- **Common name:** Peepal
- **Extract:** Ethanolic, methanolic
- **Useful part:** Stem, bark, Leaves, Tender Shoots, Latex, Seeds, Fruits
- **Chemical constituent:** Triterpenoids, Flavonoids, Saponins, Steroids, Tannins and Phenolic compounds, Carbohydrate, Protein¹⁴
- **Use:** antidiabetic, cognitive enhancer, wound healing, anticonvulsant, anti-inflammatory, analgesic, antimicrobial, antiviral, hypolipidemic, antioxidant, immunomodulatory, antiasthmatic, parasympathetic modulatory, esterogenic, antitumor, antiulcer, anti-anxiety, antihelmintic, endothelin receptor antagonistic, apoptosis inducer and hypotensive¹⁵.

Jasminum grandiflorum

- **Family:** Oleaceae
- **Common name:** Chameli
- **Extract:** Hydro-alcoholic, methanolic, ethanolic, aqueous
- **Useful part:** Leaves, flower
- **Chemical constituents:** Alkaloids, Terpenoids, Steroids, Fatty acids, Flavonoids methyl anthranilate, indole, benzyl alcohol, benzyl acetate and the terpenes linalool and linalyl acetate¹⁶.
- **Use:** Ulcerative stomatitis, skin diseases, ulcers, wounds healing, antibacterial, antioxidant^{17, 18}

Lagenaria siceraria

- **Family:** Cucurbitaceae
- **Common name:** Bottle gourd
- **Extract:** Methanolic
- **Part used:** Fruit
- **Chemical constituent:** Flavonoid, steroids, polyphenol, saponins, carbohydrate proteins¹⁹
- **Use:** Antioxidant, antihyperlipidemic, antihyperglycemic, cardiotoxic, hepatoprotective, immunomodulatory²⁰

Musa paradisiacal

- **Family:** Musaceae
- **Common name:** Banana
- **Extract:** Aqueous extract, methanolic
- **Useful part:** Root, leaves, trunk
- **Chemical constituent:** Carbohydrates, Catecholamines such as norepinephrine, serotonin, dopamine tryptophan, indole compounds. Several flavonoids and related compounds (Leucocyanidin, quercetin and its 3-O-galactoside, 3-O-glucoside, and 3-O-rhamnosyl glucoside Serotonin, nor-pinephrine, tryptophan, indole compounds, tannin, starch, iron, crystallisable and non-crystallisable sugars, vitamin C, B-vitamins, albuminoids, fats²¹.
- **Use:** Haemostatic, Coccidiostat, Diuretic effect, diarrhoea, dysentery, intestinal lesions in ulcerative colitis, diabetes, sprue, uremia, nephritis, gout, hypertension and cardiac disease^{22, 23, 24}.

Nerium indicum

- **Family:** Apocynaceae
- **Common name:** Kaner
- **Extract:** Methanolic
- **Useful part:** Root, leaves, whole plant²⁵

- **Chemical constituent:** Alkaloids, glycosides, carbohydrates, tannins, phenolic compounds and flavonoids²⁶
- **Use:** Cardiotonic, diaphoretic, diuretic (promotes excretion), emetic²⁷. Decoction of leaves has been applied externally in the treatment of scabies and to reduce swellings²⁸. The oil prepared from the root bark is used in the treatment of leprosy and skin diseases of scaly, nature²⁹. The whole plant is believed to have anti-cancer properties³⁰⁻³¹.

Oxystelma esculentum

- **Family:** Asclepiadaceae
- **Common name:** Dudhia Lata
- **Extract:** Petroleum Ether, Methanol, Chloroform, Water
- **Useful part:** Leaves, petiole, stem, root and rhizome³²
- **Chemical constituent:** Tannins, flavonoids, terpenoids, cardiac glycosides and alkaloids
- **Use:** The juice is used in gleet, gonorrhoea, pain in the muscles, cough and given to children as an astringent, antiseptic, depurative, galactagogue properties. The root is considered specific for jaundice and the milk sap is used as a wash for ulcers. In Ayurveda, the plant is a diuretic, aphrodisiac, antihelmintic and anti-bronchitis, is useful in leucoderma and the fruit is expectorant, antihelmintic. The fruit juice is used in gonorrhoea and pain in muscles³³.

Polyalthia longifolia

- **Family:** Annonaceae
- **Common name:** False Ashoka tree
- **Extract:** Ethanolic, aqueous, methanol³⁴
- **Useful part:** Whole plant
- **Chemical constituent:** Steroids, alkaloids, biterpenoids, carbohydrates, amino acids, essential oil, phenolics and flavonoids³⁵

- **Use:** Antiulcer, hepatoprotective, anti-inflammatory, antibacterial³⁶ oil used as emollient, moisturizer.

Prunus amygdalus

- **Family:** Rosaceae
- **Common name:** Almond
- **Extract:** Methanolic, Phenolic, Ethanolic and Water
- **Useful part:** Seed, fruit
- **Chemical constituents:** One sphingolipid, 1-O-beta-D-glucopyranosyl-(2S,3R,4E,8Z)-2-[(2R)-2-hydroxy hexadecanoylamino]-4, 8-octadecadiene-1, 3-diol, and four other constituents, beta-sitosterol, daucosterol, uridine, and adenosine³⁷. Other chemical compounds in the almond include 3 major components: betulinic acids, oleanic, and ursolic^{38, 39}. Other acids (corosolic and maslinic) have been identified as aldehydes. Antioxidant flavonoids quercetin, isorhamnetin, quercitrin, kaempferol, and morin have been isolated^{40, 41}.
- **Use:** Antiulcer, anti-HIV, anti-inflammatory and in vitro antiproliferative activities^{38,39} antidiabetic⁴².

Psidium guajava

- **Family:** Myrtaceae
- **Common name:** Common guava
- **Extract:** Methanol, acetone and N, N-dimethyl formamide (DMF) fractions⁴³
- **Useful part:** Roots, bark and leave
- **Chemical constituents:** Guava is rich in tannins, phenols, triterpenes, flavonoids, essential oils, saponins, carotenoids, lectins, vitamins, fibre and fatty acids⁴⁴.
- **Use:** Hepatoprotective⁴⁴, anti-diarrheal, anti-hypertensive, hepatoprotective, antioxidant, anti-microbial, hypoglycemic and antimutagenic activities⁴⁵.

TABLE 1: ANTIULCER PLANTS AND THEIR ACTIVITY

PLANT NAME	FAMILY	COMMON NAME	CHEMICAL	USE
<i>Achyranthes aspera</i>	Amaranthaceae	Prickly Chaff Flower, Devil's Horsewhip	Seeds: saponins A and B. roots: ecdysterone and oleanolic acid shoots: an aliphatic dihydroxyketone 36,37-dihydroxyheptacosan-4-on 27-cyclohexylheptacosan-7-ol	Obstetrics and gynecology, Antiulcer. For snake bites the ground root is given with water until the patient vomits and regains consciousness
<i>Alchornea castaneaeifolia</i>	Euphorbiaceae	Ipuro, Ipurosa, Macochihua Nian do, Pajaro	Alchorneine, Alchorneinone, Alkaloids, Anthranilic acid, Gentisinic acid Yohimbine, flavonoids, glycosides	Antioxidant, antifungal, anti-inflammatory, antibacterial, antiulcer
<i>Anogeissus latifolia</i>	Combretaceae	Dhawa, Ghatti, Gum Ghatti, Indian Gum Tree	quinic and shikmic acids, quercetin and myricetin.	wounds and ulcers, inflammations, diabetes, haemorrhages, haemoptysis, diarrhoea, dysentery, haemorrhoids, skin diseases, liver diseases
<i>Bauhinia variegata</i>	Fabaceae (Leguminosae)	Orchid-tree, poor-man's orchid, mountain-ebony	carbohydrates, glycosides, furanoids, flavonoids, tannins, phenolic compounds,	antibacterial, antifungal, <i>antiulcer</i> , and hepatoprotective, <i>antioxidant antihyperlipidemic</i> , <i>bronchitis</i> , <i>leprosy</i> , <i>tumors</i>
<i>Ficus religiosa</i>	Moraceae	Peepal	Triterpenoids, Flavonoids, Saponins, Steroids, Tannins and Phenolic compounds, Carbohydrate, Protein	antidiabetic, cognitive enhancer, wound healing, anticonvulsant, anti-inflammatory, analgesic, antimicrobial, antiviral, hypolipidemic, antioxidant, immunomodulatory, antiasthmatic,
<i>Jasminum grandiflorum</i>	Oleaceae	Chameli	Alkaloids, Terpenoids, Steroids, Fatty acids, Flavonoids, methyl anthranilate, indole, benzyl alcohol, benzyl acetate and the terpenes linalool and linalyl acetate.	Use: ulcerative stomatitis, skin diseases, ulcers, wounds healing, antibacterial, antioxidant
<i>Lagenaria siceraria</i>	Cucurbitaceae	Bottle gourd	Flavonoid, steroids, polyphenol, saponins, carbohydrate proteins	antioxidant, antihyperlipidemic, antihyperglycemic, cardiotoxic, hepatoprotective, immunomodulatory
<i>Musa paradisiacal</i>	Musaceae	Banana	Carbohydrates, Catecholamines such as norepinephrine, serotonin, dopamine tryptophan, indole compounds	Haemostatic, Coccidiostat, Diuretic effect, diarrhoea, dysentery, intestinal lesions in ulcerative colitis, diabetes, sprue, uremia, nephritis, gout, hypertension and cardiac disease'
<i>Nerium indicum</i>	Apocynaceae	Kaner	alkaloids, glycosides, carbohydrates, tannins, phenolic compounds and flavonoids ²⁶	cardiotonic, diaphoretic, diuretic (promotes excretion), emetic Decoction of leaves has been applied externally in the treatment of scabies and to reduce swellings
<i>Oxystelma esculentum</i>	Asclepiadaceae	Dudhia lata	Tannins, flavonoids, terpenoids, cardiac glycosides and alkaloids	gleet, gonorrhoea, pain in the muscles, cough and given to children as an astringent. antiseptic, depurative, galactagogue properties
<i>Polyalthia longifolia</i>	Annonaceae	False ashoka tree	steroids, alkaloids, biterpenoids, carbohydrates, amino acids, essential oil, phenolics and flavonoids	antiulcer, hepatoprotective, anti-inflammatory, antibacterial ³⁶ , oil use as emollient, moisturizer
<i>Prunus amygdalus</i>	Rosaceae	almond	-sitosterol, daucoesterol, uridine and adenosine ³⁷ . Other chemical compounds in the almond include 3 major components: betulinic acids, oleanic, and ursolic	Antiulcer, anti-HIV, anti-inflammatory and <i>in vitro</i> antiproliferative activities. ³⁸ , ³⁹ antidiabetic ⁴²
<i>Psidium guajava</i>	Myrtaceae	Common guava	tannins, phenols, triterpenes, flavonoids, essential oils, saponins, carotenoids, lectins, vitamins, fibre and fatty acids	Hepatoprotective ⁴⁴ , anti-diarrheal, antihypertensive, hepatoprotective, antioxidant, antimicrobial, hypoglycemic and antimutagenic activities ⁴⁵

CONCLUSION: From this study, it is clear that the medicinal plants play a vital role against on various diseases. Various herbal plants and plants extracts have significant antiulcer activity in animal models. It has mucoprotective activity and gastric anti-secretary when compared with that of reference herbal drugs. The extract is non-toxic even at relatively high concentrations.

Our review results show that above-mentioned medicinal plants could prevent ulcer with the principle on dose-dependent. A variety of botanical products have been reported to possess antiulcer activity. Finally, it should be noted that substances such as flavonoids and tannins that possess antiulcer activity are of particular therapeutic importance. The results of this study indicate that extracts of leaves and plants extracts of some medicinal plant have good potentials for use in peptic ulcer disease.

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