

## Plant remedies for peptic ulcer – A review

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### ABSTRACT

An ulcer is an erosion in the lining of the stomach or duodenum. An ulcer in the stomach is called a gastric ulcer and that ulcer in the duodenum is called a duodenal ulcer. Together, ulcers of the stomach and duodenum are referred to as peptic ulcers. Peptic ulcer disease, encompassing gastric and duodenal ulcers, is the most prevalent gastrointestinal disorder. Generation of free radicals, decrease in mucosal defensive factor or increase in mucosal injurious factors causes peptic ulcer. Hence, through this review, we explore the possibility about some plants and their constituents that may be used in treatment or prevention of peptic ulcer. Peptic ulcer, usually occurs due to poor recreation, little rest, and lack of physical exercise, due to the consumption of chocolates, candies, coffee, cigarettes, alcohol, stress causing segregation of acid in the stomach, due to the consumption of antacid medications, and due to side effects that can cause constipation such as baking soda, white soda, alkalizing products, magnesium, and aluminum hydroxide. The present study was aimed to elaborate on various herbs such as *Aloe vera*, *Azadirachta indica*, *Carica papaya* Linn., *Allium sativum*, and *Mangifera indica* which are used in treating peptic ulcer in various parts of the world.

**KEY WORDS:** Gastric, Medicinal plants, Peptic ulcer, Phytochemicals, Treatment

### INTRODUCTION

Peptic ulcer is a chronic and recurrent disease and is the most predominant of the gastrointestinal diseases.<sup>[1]</sup> Now, it has become a common global health problem affecting a large number of people worldwide, and also still a major cause of morbidity and mortality.<sup>[2]</sup> Many herbs, nutrients, and plant products have been found to play a role in protecting or helping to heal stomach and peptic ulcers. In spite of the progress in conventional chemistry and pharmacology in producing effective drugs, the herbal medicine might provide a source of treatment by many people in the world. In many cultures, herbal knowledge was said to have been handed down through divine and spiritual forces.<sup>[3]</sup> Peptic ulcer is an excoriated area of the gastric or duodenal mucosa caused by action of the gastric juice. Equilibrium lacking between the mucosal defensive factors and gastric aggressive factors is the main etiology of peptic ulcer.<sup>[4]</sup> The traditional medical approach for the treatment of ulcers is with

antacids, histamine-2 blockers, and proton pump inhibitors (PPIs). Cimetidine, famotidine, nizatidine, and ranitidine are examples of histamine-2 (H<sub>2</sub>) blockers. The most commonly prescribed classes of medications in the primary care setting and treatment of acid peptic diseases are PPIs. Our nature has provided us various medicinal plants that became the storehouse of remedies to treat peptic ulcer. This article reviews the properties of some medicinal plants that exhibit antiulcer activity.

### PLANTS IN PEPTIC ULCER

#### *Aloe vera*

Family: *Euphorbiaceae*

Common name: Chinese Aloe, Indian Aloe, True Aloe, Barbados Aloe, Burn Aloe, First Aid Plant.

Distribution: It is widely distributed in the Deccan, the seacoast districts, and Kashmir. It is common all over tropical and sub-tropical India and also found in Burma; it is abundant in deciduous forests of Madhya Pradesh. It grows in tropical and subtropical parts of Ceylon, Malay Peninsula, and China.

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**Description:** Leaves are green to gray-green, thick and fleshy, with some varieties showing white flecks on the upper and lower stem surfaces. Serrated margin of leaves and has small white teeth.

**Traditional uses:** Widely used in the traditional herbal medicine of many countries. *A. vera*, called *kathalai* in Ayurvedic medicine, is used as a multipurpose skin treatment.<sup>[5]</sup> This may be partly due to the presence of saponin, a chemical compound that acts as an antimicrobial agent.

**Chemical composition:** Amino acids, anthraquinones, enzymes, minerals, vitamins, lectins, monosaccharide, polysaccharides, salicylic acid, saponins, and sterols.<sup>[6]</sup>

*A. vera* in peptic ulcer: *A. vera* used as juice which benefits in consumption and relief of digestive issues such as heartburn and irritable bowel syndrome, although it bears significant potential to be toxic when taken orally.<sup>[5]</sup> *A. vera* can reduce vasoconstriction and improves ulcer healing. Lectins in *A. vera* inhibit acid secretion.<sup>[6]</sup>

### ***Azadirachta indica***

**Family:** *Meliaceae*

**Common name:** Neem, nim, Indian lilac, nimmi, limbo, limda.

**Distribution:** Neem is a native tree of India, a tropical tree, especially suited to semi-arid conditions. It is now grown in many Asian countries and in the tropical regions of the western hemisphere. Neem is considered a part of India's genetic biodiversity.

**Description:** It is a medium to large tree having short, straight bold, furrowed, dark brown to gray bark, and dense rounded crown of pinnate leaves.

**Traditional uses:** Used in India for over two millennia for their medicinal properties. Ayurvedic practitioners believe neem products are antifungal, antidiabetic, antibacterial, antiviral, contraceptive, and sedative. Skin diseases are mainly treated by Ayurvedic and Unani medicines which neem is the main ingredient component. Neem oil is also used for healthy hair, to improve liver function, detoxify the blood, and balance blood sugar levels. Neem leaves have been also been used to treat skin diseases such as eczema and psoriasis.

**Chemical composition:** Active compounds found in the neem tree are Azadirachtin, Nimbin, Nimbidin, Nimbidol, Sodium nimbinatate, Quercetin.

*Azadirachta indica* in peptic ulcer: *A. indica* significantly inhibited gastric ulceration induced by indomethacin. This action was accompanied by

a dose-dependent decrease in total gastric acidity. It was proposed that *A. Indica* probably acts through histamine H<sub>2</sub> receptor. Hence, used in the treatment of peptic ulcer.<sup>[4,7]</sup>

### ***Carica papaya* Linn.**

**Family:** *Caricaceae*

**Common name:** Papaya, Paw Paw, Kates, Papaw.

**Distribution:** Papaya is a tropical America origin, besides that it is also origin from southern Mexico and neighboring Central America. Now, the papaya is familiar in nearly all tropical regions of the old world and the Pacific Islands and has become naturalized in many areas.

**Description:** Commonly and erroneously referred to as a "tree," the plant is properly a large herb growing at the rate of 6–10 ft. The 5-petalled flowers are fleshy, waxy and slightly fragrant, oval to nearly round, pyriform, or elongated club-shaped, 6–20 in (15–50 cm) long, and 4–8 in (10–20 cm) thick; weighing up to 20 lbs (9 kg).

**Traditional uses:** *C. papaya* can be used for the treatment of a numerous diseases such as warts, corns, sinuses, eczema, cutaneous tubercles, glandular tumors, blood pressure, dyspepsia, constipation, amenorrhea, general debility, expel worms and stimulate reproductive organs, and man.<sup>[8]</sup>

**Chemical composition:** Papain, carotenoids, pectin, carposide, carpaine, pseudocarpaine, dehydrocarpines, chymopapain, crypto glavine, *cis*-violaxanthin, and antheraxanthin.

*C. papaya* in peptic ulcer: The fruits are reported to possess antiulcer activity.<sup>[8]</sup> Papaya has peptine and it is alkaline in nature. Therefore, when the alkaline secretions pass over the burnt walls of the stomach, the impact of acidic secretions is lessened, and slowly it tends to heal, if the alkaline supply continues. Thus, the stomach ulcer is cured.

### ***Allium sativum***

**Family:** *Liliaceae*

**Common name:** Garlic.

**Distribution:** Typically, it is grown in a temperate climate, similar to those of central Asia. It can be seen growing in the south and also north hemispheres but typically only by farmers.

**Description:** *A. sativum* is a bulbous plant. It grows up to 1.2 m (4 ft) in height. Its hardiness is USDA Zone 8. It produces hermaphrodite flowers. Pollination occurs by bees and other insects.

Traditional uses: This has been taken to relieve problems such as coughs and fevers or applied externally to prevent greying of hair and to improve skin conditions such as eczema and scabies.

Chemical composition: *A. sativum* contains carbohydrates, proteins, steroids saponins, and fats. Mucilage and volatile oil. The volatile oil is chief constituents. It contains ally, properly disulfide and diallyl, and disulfyl allin and allacin.<sup>[9]</sup>

*A. sativum* in peptic ulcer: Garlic shows activities in protecting the gastric mucosa against ethanol-induced gastric ulcers. Garlic has a protective effect on acidified ethanol-induced gastric ulcer and gastric acid secretion. Thus, garlic is beneficial in the prevention of ulcer formation and reduction in acid secretion.<sup>[10]</sup>

### ***Mangifera indica***

Family: *Anacardiaceae*

Common name: Mango.

Distribution: The cultivated mango probably originated in Indo-Burma, notably the Assam-Chittagong Hills, where many mango wild relatives still grow, but its progenitors are not known. The mango has been cultivated in India for several millennia; it spread to other parts of Southeast Asia about 1500 years ago and to the east coast of Africa about 1000 years ago. Further, spread to Australia, East Africa, and the Americas has been within the past few 100 years.

Description: *M. indica* is a dark green, umbrella-shaped crown that is large evergreen tree and up to 20 m tall. Leaves are simple, leathery, and oblong-lanceolate, on flowering branches up to 50 cm on sterile branches, curved upward from the midrib. Flowers radially symmetrical usually have 5 spreading petals, 3–5 mm long, 1–1.5 mm broad, streaked with red, and imbricate, with the median petal prolonged like a crest at the base. Moreover, fruit an irregularly egg-shaped and slightly compressed fleshy drupe, 8-12 (max. 30) cm long, attached at the broadest end on a pendulous stalk. The skin smooth, greenish-yellow, and sometimes tinged with red.<sup>[11]</sup>

Traditional uses: Used in Rasayana formula which is an Ayurvedic practice, clearing digestion and acidity due to pitta (heat), sometimes with other mild sour and Shatavari (*Asparagus racemosus*) and Guduchi (*Tinospora cordifolia*). In this system of traditional therapeutics, several medicinal properties are attributed to different components of the mango tree, both as food and medicine. It is antidiuretic, antidiarrheal, antiemetic, and cardiac healing herb.

Chemical composition: Mangiferin is extracted from Mango at high concentrations from the young

leaves (172 g/kg), bark (107 g/kg), and from old leaves (94 g/kg).<sup>[5]</sup> Allergens are present in the fruit peel and can trigger contact dermatitis in sensitized individuals.

*A. sativum* in peptic ulcer: The ethanol plant leaf and petroleum ether extracts reported antiulcer activity. The mangiferin, polyphenolic constituent of the plant, has an antiulcer activity.<sup>[12,13]</sup>

## **CONCLUSION**

Peptic ulcer is a severe gastrointestinal disorder occurring due to an imbalance between the aggressive factors such as acid, pepsin, *Helicobacter pylori*, and defensive factors as bicarbonate secretion, prostaglandins, gastric mucous, and innate resistance of the mucosal cellular factors. This article highlights the various phytochemicals of the plants and herbs are used for the treatment of peptic ulcer and it is evident that plant extracts have significant antiulcer activity due to the presence of phytochemicals. Hence, plant products may be a safe option for the management of peptic ulcer as they have less side effects.

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