

Herbs Used In Peptic Ulcer: A Review

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Abstract

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.¹ Symptoms include abdominal pain with severity relating to mealtimes, after around 3 hours of taking a meal; bloating and abdominal fullness; nausea, and copious vomiting; loss of appetite and weight loss etc. 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. And the present study was aimed to collect information on various herbs which are used in treating Peptic Ulcer in various parts of the world, depending upon the data's provided by various researchers.

Key Words: *Peptic Ulcer, Helicobacter pylori, Gastrin, Herbs.*

Introduction

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.¹ Symptoms includes abdominal pain, classically epigastric with severity relating to mealtimes, after around 3 hours of taking a meal (duodenal ulcers are classically relieved by food, while gastric ulcers are exacerbated by it); bloating and abdominal fullness; waterbrash (rush of saliva after an episode of regurgitation to dilute the acid in esophagus); nausea, and copious vomiting; loss of appetite and weight loss; 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 oxidized iron from hemoglobin).

Rarely, an ulcer can lead to a gastric or duodenal perforation, which leads to acute peritonitis.

This is extremely painful and requires immediate surgery. A history of heartburn, gastroesophageal reflux disease (GERD) and use of certain forms of medication can raise the suspicion for peptic ulcer. Medicines associated with peptic ulcer include NSAID (non-steroid anti-inflammatory drugs) that inhibit cyclooxygenase, and most glucocorticoids (e.g. dexamethasone and prednisolone).

In patients over 45 with more than two weeks of the above symptoms, the odds for peptic ulceration are high enough to warrant rapid investigation by EGD.^{2,3} The timing of the symptoms in relation to the meal may differentiate between gastric and duodenal ulcers: A gastric ulcer would give epigastric pain during the meal, as gastric acid production is increased as food enters the stomach. Symptoms of duodenal ulcers would initially be relieved by a meal, as the pyloric sphincter closes to concentrate the stomach contents, therefore acid is not reaching the duodenum. Duodenal ulcer pain

would manifest mostly 2-3 hours after the meal, when the stomach begins to release digested food and acid into the duodenum. Also, the symptoms of peptic ulcers may vary with the location of the ulcer and the patient's age. Furthermore, typical ulcers tend to heal and recur and as a result the pain may occur for few days and weeks and then wane or disappear. Usually, children and the elderly do not develop any symptoms unless complications have arisen.

Complications:^{4,5}

Gastrointestinal bleeding is the most common complication. Sudden large bleeding can be life-threatening. It occurs when the ulcer erodes one of the blood vessels, such as the gastroduodenal artery. Perforation (a hole in the wall) often leads to catastrophic consequences. Erosion of the gastrointestinal wall by the ulcer leads to spillage of stomach or intestinal content into the abdominal cavity. Perforation at the anterior surface of the stomach leads to acute peritonitis, initially chemical and later bacterial peritonitis. The first sign is often sudden intense abdominal pain. Posterior wall perforation leads to pancreatitis; pain in this situation often radiates to the back.

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.

Cause of Peptic Ulcer

Helicobacter pylori: A major causative factor (60% of gastric and up to 90% of duodenal ulcers) is chronic inflammation due to *Helicobacter pylori* that colonizes the antral mucosa. The immune system is unable to clear the infection, despite the appearance of antibodies. Thus, the bacterium can cause a chronic active gastritis (type B gastritis), resulting in a defect in the regulation of gastrin production by that part of the stomach, and gastrin secretion can either be decreased (most cases) resulting in hypo- or achlorhydria or increased. Gastrin stimulates the production of gastric acid by parietal cells and, in *H. pylori* colonization responses that increase gastrin, the increase in acid can contribute to the erosion of the mucosa and therefore ulcer formation.

NSAIDs: Another major cause is the use of NSAIDs (see above). The gastric mucosa protects itself from gastric acid with a layer of mucus, the secretion of which is stimulated by certain prostaglandins. NSAIDs block the function of cyclooxygenase 1 (cox-1), which is essential for the production of these prostaglandins. COX-2 selective anti-inflammatories (such as celecoxib or the since withdrawn rofecoxib) preferentially inhibit cox-2, which is less essential in the gastric mucosa, and roughly halve the risk of NSAID-related gastric ulceration. As the prevalence of *H. pylori*-caused ulceration declines in the Western world due to increased medical treatment, a greater proportion of ulcers will be due to increasing NSAID use among individuals with pain syndromes as well as the growth of aging populations that develop arthritis.

The incidence of duodenal ulcers has dropped significantly during the last 30 years, while the incidence of gastric ulcers has shown a small increase, mainly caused by the widespread use of NSAIDs. The drop in incidence is considered to be a cohort-phenomenon independent of the progress in treatment of the disease. The cohort-phenomenon is probably explained by improved standards of living which has lowered the incidence of *H. pylori* infections

Stress: Researchers also continue to look at stress as a possible cause, or at least complication, in the development of ulcers. There is debate as to whether psychological stress can influence the development of peptic ulcers. Burns and head trauma, however, can lead to physiologic stress ulcers, which are reported in many patients who are on mechanical ventilation.

An expert panel convened by the Academy of Behavioral Medicine Research concluded that ulcers are not purely an infectious disease and that psychological factors do play a significant role. Researchers are examining how stress might promote *H. pylori* infection. For example, *Helicobacter pylori* thrives in an acidic environment, and stress has been demonstrated to cause the production of excess stomach acid. This was supported by a study on mice showing that both long-term water-immersion-restraint stress and *H. pylori* infection were independently associated with the development of peptic ulcers.

A study of peptic ulcer patients in a Thai hospital showed that chronic stress was strongly associated with an increased risk of peptic ulcer, and a

combination of chronic stress and irregular mealtimes was a significant risk factor.

Gastrinomas (Zollinger Ellison syndrome): it is a rare gastrin-secreting tumors, also cause multiple and difficult to heal ulcers.

Smoking: Studies show that cigarette smoking can increase a person's chance of getting an ulcer. Smoking also slows the healing of existing ulcers and contributes to ulcer recurrence.

Caffeine: Beverages and foods that contain caffeine can stimulate acid secretion in the stomach. This can aggravate an existing ulcer, but the stimulation of stomach acid can't be attributed solely to caffeine.

Alcohol: While a link hasn't been found between alcohol consumption and peptic ulcers, ulcers are more common in people who have cirrhosis of the liver, a disease often linked to heavy alcohol consumption.

Genetic factor: People with blood group O appear to be more prone to develop peptic ulcer than those with other blood groups. Genetic influences appear to have greater role in duodenal ulcers as evidence by their occurrence in families monozygotic twins and association with HLB-B5 antigen.

Plant Used for Treating Peptic Ulcer⁶

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.

A variety of botanical products have been reported to possess antiulcer activity but the documented literature has centered primarily on pharmacological action in experimental animals. Except for a few phytochemical 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.

Some medicinal plants used in the treatment of ulcer:

<i>Ficus arnottiana</i> ,	<i>Gymnosporia motana</i>
<i>Alstonia Scholari</i>	<i>Azadirachta indica</i> ,
<i>Asparagus racemosus</i> ,	<i>Berberis asiatica</i>
<i>Bauhinia variegata</i>	<i>Aloe vera</i>
<i>Butea frondosa</i> ,	<i>Hibiscus rosa sinensis</i> ,
<i>Carica papaya</i>	<i>Astragalus membranaceus</i> ,
<i>Annona squamoza</i> ,	<i>Rheum emodi</i> ,
<i>Benincasa hispida</i>	<i>Curcuma longa</i>
<i>Eruca sativa</i> ,	<i>Uncaria tomentosa</i> ,
<i>Angelica sinensis</i>	<i>Ulmus rubra</i>
<i>Embllica officinalis</i> ,	<i>Althaea officinalis</i> ,
<i>Tinospora cordifolia</i>	<i>Brassica oleracea</i>
<i>Withania somnifera</i> ,	<i>Glycyrrhiza glabra</i>
<i>Centella asiatica</i>	<i>Crataeva nurvala</i> ,
<i>Moringa oleifera</i> ,	<i>Musa paradisca</i>
<i>Garcinia cambogia</i>	<i>Panax ginseng</i> ,

PLANT PROFILES

ASPARAGUS RACEMOSUS



Synonyms: Satavar ,Satavari, Shatamuli

Family:Asparagaceae

Geographical source:

It is found distributed throughout tropical Asia, Africa and Australia. In India, it is found in Himalayas upto an altitude of 1300 to 1400m and all tropical part of India. It occurs as wild plant in dry and deciduous forests of Maharashtra.

Morphology:

Shatavari has small pine-needle-like leaves that are uniform and shiny green. In July, it produces minute, white flowers on short, spiky stems, and in September it fruits blackish-purple, globular berries.

It has an adventitious root system with tuberous roots that measures about one meter in length, tapering at both ends, and for each plant number roughly a hundred⁷

Chemical constituent:

Shatavari roots contain 4 steroid saponin, shatavarin I-IV (0.2%). Shatavarin I is the major glycoside with 3 glucose and rhamnose moieties attached to sarsapogenin, whereas in shatavarin IV 2 glucose and 1 rhamnose moieties are attached. Flowers and fruits contain quercetin, rutin and hyperoside, while leaves contain diosgenin and hyperoside, while leaves contain diosgenin and quercetin.⁷

Use:

Asparagus racemosus (Shatavari) is recommended in Ayurvedic texts for prevention and treatment of gastric ulcers, dyspepsia and as a galactagogue. Generally the root is employed in diarrhoea as well as in chronic colic and dysentery problems. Root boiled with some bland oil, is applied in various skin diseases. Root is boiled in milk and the milk is administered to relieve bilious dyspepsia and diarrhoea and to promote appetite; root is also used in rheumatism. Tubers are candied and taken as a sweetmeat. Fresh root juice is given with honey as a demulcent. Boiled leaves smeared with ghee are applied to boils, smallpox, etc., in order to prevent their confluence. Juice of this drug taken with milk is useful in gonorrhoea.⁸

Pharmacological review:

Asparagus racemosus has been shown to mitigate the discomfort due to Amlapitta (Acid dyspepsia with or without ulcer) on 109 cases in a clinical Study at Central Research Institute for Ayurveda, New-Delhi.

TINOSPORA CORDIFOLIA

Synonyms: Guduchi, Amrutobali⁹



Family : Menispermaceae

Distribution : Guduchi is a climber found throughout tropical regions of India. In Himachal Pradesh, it is easily found as a robust climber mainly in areas like Una, Paonta, Hamirpur, and Kangra etc. It climbs over the highest trees and throws out aerial roots which reach the length of 30 feet. It grows up to the height of 1000 feet in India¹⁰

Morphology: Tinospora is a glabrous, climbing shrub with corky grey dotted bark. It is a perennial deciduous twinter with succulent stem and papery bark. The leaves are 10-20 cm in diameter, broadly ovate, deeply cordate and shortly acuminate. The flowers are small and greenish yellow on the old wood in 7.5-15cm long racemes; slender, usually solitary in the female and clustered in male. Fruits are red in colour and to shape of pea.¹⁰

Constituent:^{11,12} The active adaptogenic constituents are diterpene compounds including tinosporone, tinosporic acid, cordifolisides A to E, syringin, the yellow alkaloid, berberine, Giloin, crude Giloinin and a glucosidal bitter principle as well as polysaccharides, including arabinogalactan polysaccharide (TSP). Picrotene and bergenin were also found in the plant.

Use: Tinospora cordifolia and similar species like Tinospora crispa and Tinospora rumphii. They are used in Ayurvedic and herbal medicine as a hepatoprotectant, protecting the liver from damage that may occur following exposure to toxins, as well as in Thailand, Philippines. Recent research has demonstrated that a combination of *T. cordifolia* extract and turmeric extract is effective in

preventing the hepatotoxicity which is otherwise produced as a side effect of conventional pharmaceutical treatments for tuberculosis using drugs such as isoniazid and rifampicin.

According to the 1918 United States Dispensatory, the plant has a long history of use in India as a medicine and in the preparation of a starch known as Giloe-ka-sat or as Palo.

Pharmacological review: ¹⁰Pahadiya S et al has evaluated the radioprotective effect of an aqueous extract of *Tinospora cordifolia* (TC) against Co(60) gamma radiation in the dose of 5 mg/kg body wt to Swiss albino mice. It has shown significant protection in terms of survival percentage.

Grover JK et al has evaluated the extract of *M. charantia* (200 mg/kg), *E. jambolana* (200 mg/kg), *M. pruriens* (200 mg/kg) and *T. cordifolia* (400 mg/kg) was administered for 50 days in STZ induced diabetic mice, the plasma glucose concentration was reduced by 24.4, 20.84, 7.45 and 9.07% respectively.

Mary NK et al has evaluated *T. cordifolia* as antioxidant, anticoagulant, platelet antiaggregatory, lipoprotein lipase releasing, anti-inflammatory and hypolipidaemic activity in rats in the dose of 5 mg/kg. The extract has significantly ($p < 0.001$) enhanced release of lipoprotein lipase enzyme.

ERUCA SATIVA

Synonyms: Rocket(roquette) or Arugula,



Family : Brassicaceae

Distribution: It is a species of *Eruca* native to the Mediterranean region, from Morocco and Portugal east to Lebanon and Turkey.

Morphology: It is an annual plant growing 20–100 centimetres (8–39 in) in height. The leaves are deeply pinnately lobed with four to ten small lateral lobes and a large terminal lobe. The flowers are 2–4 cm

(0.8–1.6 in) in diameter, arranged in a corymb, with the typical Brassicaceae flower structure; the petals are creamy white with purple veins, and the stamens yellow; the sepals are shed soon after the flower opens. The fruit is a silique (pod) 12–35 millimetres (0.5–1.4 in) long with an apical beak, and containing several seeds (which are edible).¹³

Chemical constituent: Phytochemical investigations of the aqueous extract of *Eruca sativa* fresh leaves, afforded the presence of nine natural flavonoid compounds which were isolated and identified as kaempferol 3-O-(2"-O-malonyl- β -D-glucopyranoside)-4'-O- β -D-glucopyranoside (1), kaempferol 3,4'-O-diglucopyranoside (2), rhamnocitrin 3-O-(2"-O-methylmalonyl- β -D-glucopyranoside)-4'-O- β -D-glucopyranoside (3), 3-O-glucopyranoside (4), 4'-O-glucopyranoside (5), rhamnocitrin 3-O-glucopyranoside (6), 4'-O-glucopyranoside (7), kaempferol (8) and rhamnocitrin (9). Compounds (1) and (3) appear to be novel. Elucidation of the chemical structures of all the isolated compounds was determined by different spectroscopic methods in addition to the chemical and physical methods of analysis.¹⁴

Use: Rocket extract possesses anti-secretory, cytoprotective, and anti-ulcer activities against experimentally-induced gastric lesions. The anti-ulcer effect is possibly through prostaglandin-mediated activity and/or through its anti-secretory and antioxidant properties.

It has a rich, peppery taste, and has an exceptionally strong flavour for a leafy green. It is generally used in salads, often mixed with other greens, but is also cooked as a vegetable or used raw with pasta or meats in northern Italy and in coastal Slovenia.

Pharmacological review: A research team led by Dr Syed Rafatullah from Saudi Arabia validated the gastric anti-ulcer properties of EER on experimentally-induced gastric secretion and ulceration in albino rats. In this study, gastric acid secretion studies were undertaken using pylorus-ligated rats. Gastric lesions in the rats were induced by noxious chemicals including ethanol, strong alkalis, indomethacin and hypothermic restraint stress. The levels of gastric wall mucus (GWM), nonprotein sulfhydryls (NP-SH) and malondialdehyde (MDA) were also measured in the glandular stomach of rats following ethanol administration. The gastric tissue was also examined histologically. The extract was used in two doses (250 and 500 mg/kg body weight) in all experiments.

They found that the ethanolic extract of EER significantly and dose-dependently reduced the basal gastric acid secretion, titratable acidity and ruminal ulceration. Rocket extract significantly attenuated gastric ulceration induced by necrotizing agents (80% ethanol, 0.2 mol/L NaOH, 25% NaCl), indomethacin and hypothermic restraint stress. The anti-ulcer effect was further confirmed histologically. On the other hand, the extract significantly replenished GWM and NP-SH levels, as well as the MDA level significantly reduced by extract pretreatment.

They concluded that EER extract possesses antisecretory, cytoprotective, and anti-ulcer activities against experimentally-induced gastric lesions. The anti-ulcer effect is possibly through prostaglandin-mediated activity and/or through its anti-secretory and antioxidant properties.¹⁵

PANAX GINSENG

Synonyms: Kanji, Hangul Ren Shen, Asiatic ginseng, Red ginseng



Family : Araliaceae

Distribution: China, Korea, Vietnam, Japan.

Morphology : The *panax ginseng* plant grows best in cooler regions of the northern hemisphere and reaches a height of about one foot. The ginseng plant has yellowish-green umbrella shaped flowers that grow in a circle around a straight stem, with its 5 leaflets joined together at one point, it blooms in midsummer. The fruit is a bright crimson berry containing 1-3 wrinkled seeds the size of small peas.

Chemical constituent: The main active ingredient in the Panax species are a group of dammarane-type triterpenoid glycosides. They are referred to as saponins and termed as ginsenosides. In Russia they termed as panaxosides. These are in the ginseng root. There are more than 30 ginsenoside. One of them is

an oleanolic acid derivative. It is the type and composition of the ginsenosides which give their different qualities. There are 8 main ginsenosides and the composition in American and Asian is quite different. There are many more ginsenosides in American ginseng than there are in Asian ginseng. The most abundant ginsenoside in both species is ginsenoside Rb1. This ginsenoside is reported to have sedative effect. Ginsenoside Rg1 is said to have a stimulant effect. The levels of Rg1 in Asian ginseng are much higher than in American ginseng. Asian ginseng also contains ginsenosides Rf and Rg2, whereas American ginseng is virtually devoid of these ginsenosides. Pseudoginsenosides F11 is noted in American ginseng, but it is almost absent from Asian ginseng. The root of ginseng contains resin, sugar, starch, mucilage, a saponin, a volatile oil and several steroids compound. It contains strong anti-oxidant and another compound germanium.¹⁶

Use: Ginseng shows anti-ulcer activity due to the presence of ginsenoside Rb1. Both American ginseng (*Panax quinquefolius*) and Asian ginseng (*Panax ginseng*) roots are taken orally as adaptogens, aphrodisiacs, nourishing stimulants and in the treatment of type II diabetes, as well as for sexual dysfunction in men. The root is most often available in dried form, either whole or sliced. Ginseng leaf, although not as highly prized, is sometimes also used; as with the root, it is most often available in dried form.

This ingredient may also be found in some popular energy drinks, often the "tea" varieties; in these products, ginseng is usually present in subclinical doses and does not have measurable medicinal effects. It can be found in cosmetic preparations as well, but has not been shown to have clinically effective results.¹⁷

Pharmacological review: A polysaccharide fraction of the leaves from *Panax ginseng* prevented gastric ulcer formation in rats after administration of necrotizing agents (HCl-ethanol, ethanol) and after pylorus ligation. This effect was observed not only after oral, but also after systemic administration, suggesting a non-local effect. Rats administered tissue cultured and cultivated ginseng had reduced gastric secretion and acid output. However, pepsin activity was not affected. Specifically, the cultivated ginseng blocked histamine induced acid secretion.¹⁷

CARICA PAPAYA

Synonym: Papaya, Melon tree, Pawpaw, papaya, Tree melon



Family : Caricaceae

Distribution¹⁸ Though the exact area of origin is unknown, the papaya is believed native to tropical America, perhaps in southern Mexico and neighboring Central America. It is recorded that seeds were taken to Panama and then the Dominican Republic before 1525 and cultivation spread to warm elevations throughout South and Central America, southern Mexico, the West Indies and Bahamas, and to Bermuda in 1616. Spaniards carried seeds to the Philippines about 1550 and the papaya traveled from there to Malacca and India. Seeds were sent from India to Naples in 1626. 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. Seeds were probably brought to Florida from the Bahamas. Up to about 1959, the papaya was commonly grown in southern and central Florida in home gardens and on a small commercial scale. Thereafter, natural enemies seriously reduced the plantings. There was a similar decline in Puerto Rico about 10 years prior to the setback of the industry in Florida. While isolated plants and a few commercial plots may be fruitful and long-lived, plants in some fields may reach 5 or 6 ft, yield one picking of undersized and misshapen fruits and then are so affected by virus and other diseases that they must be destroyed.

Morphology¹⁹: Commonly and erroneously referred to as a "tree", the plant is properly a large herb growing at the rate of 6 to 10 ft (1.8-3 m) the first year and reaching 20 or even 30 ft (6-9 m) in height, with a hollow green or deep-purple stem becoming 12 to 16 in (30-40 cm) or more thick at the base and roughened by leaf scars. The leaves emerge directly from the upper part of the stem in a spiral on nearly horizontal petioles 1 to 3 1/2 ft (30-105 cm) long, hollow, succulent, green or more or less dark purple. The blade, deeply divided into 5 to 9 main segments,

each irregularly subdivided, varies from 1 to 2 ft (30-60 cm) in width and has prominent yellowish ribs and veins. The life of a leaf is 4 to 6 months. Both the stem and leaves contain copious white milky latex.

The 5-petalled flowers are fleshy, waxy and slightly fragrant. Some plants bear only short-stalked pistillate (female) flowers, waxy and ivory-white; or hermaphrodite (perfect) flowers (having female and male organs), ivory-white with bright-yellow anthers and borne on short stalks; while others may bear only staminate (male) flowers, clustered on panicles to 5 or 6 ft (1.5-1.8 m) long. There may even be monoecious plants having both male and female flowers. Some plants at certain seasons produce short-stalked male flowers, at other times perfect flowers. This change of sex may occur temporarily during high temperatures in midsummer. Some "all-male" plants occasionally bear, at the tip of the spray, small flowers with perfect pistils and these produce abnormally slender fruits. Male or hermaphrodite plants may change completely to female plants after being beheaded.

Generally, the fruit is melon-like, oval to nearly round, somewhat pyriform, or elongated club-shaped, 6 to 20 in (15-50 cm) long and 4 to 8 in (10-20 cm) thick; weighing up to 20 lbs (9 kg). Semi-wild (naturalized) plants bear miniature fruits 1 to 6 in (2.5-15 cm) long. The skin is waxy and thin but fairly tough. When the fruit is green and hard it is rich in white latex. As it ripens, it becomes light- or deep-yellow externally and the thick wall of succulent flesh becomes aromatic, yellow, orange or various shades of salmon or red. It is then juicy, sweetish and somewhat like a cantaloupe in flavor; in some types quite musky. Attached lightly to the wall by soft, white, fibrous tissue, are usually numerous small, black, ovoid, corrugated, peppery seeds about 3/16 in (5 mm) long, each coated with a transparent, gelatinous aril.

Chemical constituent¹⁸: Enzyme: papaya is rich in enzyme called papain. It also contains Carotinoids namely β -carotene, cryptoxanthin and zeaxanthin in the fruits, alkaloids from the leaves are carpaine, carpinine. Monoterpenoids includes 4-terpineol, linalool and linalool oxides. Whereas Flavonoids marks their presence via quercetin, myricetin and kaempferol in the shoot. The fruits also contain potassium, calcium, magnesium, copper, zinc, iron

Use¹⁸: Papaya has been used for digestion problems. This product should not be used for intestinal parasite infections because it may be ineffective. The effects of *Carica papaya* Linn on exogenous ulcer and histamine-induced acid secretion were studied in rats. The latex of the unripened fruit of *C. papaya* was effective in protecting the exogenous ulcer. It significantly lessened the acid secretion induced by intravenous infusion of histamine in chronic gastric fistulated rats. Crystalline papain was also effective in protecting the exogenous ulcer and in decreasing the histamine-induced acid secretion in rats. The conclusion is that papain is the active principle in *C. papaya* that exerts the ulcer-protective effect.

Papaya is cultivated for its ripe fruits, favored by tropical people, as breakfast fruit, and as an ingredient in jellies, preserves, or cooked in various ways; juice makes a popular beverage; young leaves, shoots, and fruits cooked as a vegetable. Latex used to remove freckles. Bark used for making rope. Leaves used as a soap substitute, are supposed to remove stains. Flowers are eaten in Java. Papain, the proteolytic enzyme, has a wealth of industrial uses. It has milk-clotting (rennet) and protein digesting properties. Active over a wide pH range, papain is useful in medicine, combatting dyspepsia and other digestive disorders. In liquid preparations it has been used for reducing enlarged tonsils. Nearly 80% of American beer is treated with papain, which digests the precipitable protein fragments and then the beer remains clear on cooling. Papain is also used for degumming natural silk. But most of the papain imported in the U.S. is used for meat-tenderizers and chewing gums. Also used to extract the oil from tuna liver. Cosmetically it is used in some dentifrices, shampoos, and face-lifting preparations. Used to clean silks and wools before dyeing, and to remove hair from hides during tanning (Duke, 1984b). It is also used in the manufacture of rubber from Hevea (Morton, 1977). Recently, the FDA has cleared chymopapain for intradiscal injection in patients with documented herniated lumbar intervertebral discs whose signs and symptoms have not responded to conservative therapy over an adequate period of time (FDA Drug Bull. 12(3): 17-18). Fruit and seed extracts have pronounced bactericidal activity against *Staphylococcus aureus*, *Bacillus cereus*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Shigella flexneri* (Emeruwa, 1982).

Pharmacological review:²⁰ The effects of *Carica papaya* Linn on exogenous ulcer and histamine-induced acid secretion were studied in rats. The latex of the unripened fruit of *C. papaya* was effective in

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The studies were made in 31 patient with gastric and duodenal peptic ulcer aged from 60 to 82 years. It has been ascertained that exacerbation of the condition is accompanied by decline in the lysis of azoalbumin (low-molecular proteins), by a decrease in the blood serum concentration of alpha 2-macroglobulin in the presence of an increased lysis of azocol (colagenolytic activity of the blood) and the blood serum content of aldehyde- and ketone derivatives. Administration of wobenzym and erbisol against the background of a differentiated basic therapy makes for improvement of the condition of the blood proteinase-inhibitory system, with the protein oxidative modification processes being on the decrease.

EMBILICA OFFICINALIS

Synonyms : Indian goosber, Arab. Amlaj.; Assam. Amluki.; Ayurvedic: Amalaki; Beng. Amia, Amlaki, Amla, Arnloki.



Family : Euphorbiaceae

Distribution²¹: The Deccan, the sea-coast districts and Kashmir [Nadkarni and Nadkarni]. It is common all over tropical and sub-tropical India and also found in Burma [Dey], it is abundant in deciduous forests of Madhya Pradesh]. Grows in tropical and subtropical parts of Ceylon, Malay Peninsula and China. In Ceylon, it is very common in exposed places of patana land in the moist regions up to 4000 feet altitude.

Morphology²¹: Tree; leaves alternate, bifarious, pinnate, flower -bearing; leaflets numerous, alternate, linear-obtuse, entire; petioles striated, round; calyx 6-parted; flowers in the male very

numerous in the axils of the lower leaflets, and round the common petiole below the leaflets; in the female few, solitary, sessile, mixed with some males in the most exterior floriferous axils; stigmas 3; drupe globular, fleshy, smooth, 6-striated; nut obovate-triangular, 3-celled; seeds 2 in each cell; flowers small, greenish yellow. Flowers during October.

Chemical constituent²¹: The fruit is a very rich source of vitamin C according to most if not nearly all references, this is probably not the case. It was proposed that superior effect of the mistaken "vitamin C" component is actually the more stable and potent anti-oxidant effect of the tannins that appeared to be the vitamin. A repeated laboratory test showed that every 100g of fresh fruit provides 470 - 680mg of vitamin C. The vitamin value of amla increased further when the juice was extracted from the fruit. The dehydrated berry provided 2428 - 3470mg of vitamin C per 100g. Its mineral and vitamin contents include calcium, phosphorous, iron, carotene, thiamine, riboflavin, and niacin. The seeds of the Indian gooseberry contains a fixed oil, phosphatides, and an essential oil. The fruits, bark, and the leaves of this tree are rich in tannin. The fruits, leaves and bark are rich in tannins. The root contains ellagic acid and lupeol and bark contains leucodelphinidin. The seeds yield a fixed oil (16%) which is brownish-yellow in colour. It has the following fatty acids: linolenic (8.8%), linoleic (44.0%), oleic (28.4%), stearic (2.15%), palmitic (3.0%) and myristic (1.0%). The ethanol soluble fraction contains free sugars, D-glucose, D-fructose, D-myo-inositol. The acidic water soluble fraction contains a pectin with D-galacturonic acid, D-arabinosyl, D-rhamnosyl, D-xylosyl, D-glucosyl, D-mannosyl and D-galactosyl residues. The low molecular weight hydrolyzable tannins (<1,000), namely Emblica nin A and Emblica nin B, along with pedunculagin and punigluconin are the key ingredients in Emblica. Figure shows structure of pedunculagin, one of the ellagitannins of emblica. Each of the ring structures is a phenol, gallic acid di-o-galloyl-glucose (Fruit), 3-6-di-o-galloyl-glucose (Shoot), Alanine (Fruit), Amlaic acid (Leaf), Arginine (Fruit), Ascorbic-acid (Fruit), Ascorbic-acid (Plant), Ash (Fruit), Aspartic-acid (Fruit), Astragaline (Leaf), β -carotene (Fruit), β -sitosterol (Bark, Seed Oil, Tissue Culture, Shoot), Boron (Fruit), Calcium (Fruit), Carbohydrates (Fruit), Chebulagic acid (Fruit), Chebulagic acid (Shoot), Chebulaginic acid (Fruit), Chebulic acid (Fruit), Chibulinic acid Chebulagic acid (Shoot), Chebulaginic acid (Fruit), Chebulic acid (Fruit), Chibulinic acid (Fruit), Chibulinic acid (Shoot), Chloride (Fruit), Copper (Fruit), Corilagic acid (Fruit), Corilagin (Fruit,

Shoot), Cystine (Fruit), D-fructose (Fruit), D-glucose (Fruit), Ellagic acid (Fruit, Shoot, Root, Pericarp and Leaf), Emblicol (Fruit, Pericarp), Ethyl gallate (Fruit), Fat (Fruit and Seed), Fibre (Fruit), Gallic acid (Fruit, Shoot, Pericarp), Gallic acid ethyl ester (Fruit, Tissue Culture), Gallo-tannin (Leaf), Gibberellin-a-1 (Fruit), Gibberellin-a-3 (Fruit), Gibberellin-a-4 (Fruit), Gibberellin-a-7 (Fruit), Gibberellin-a-9 (Fruit), Glucogallin (Fruit), Glucogallin (Shoot), Glucose (Fruit), Glutamic acid (Fruit), Glycine (Fruit), Histidine (Fruit), Iron (Fruit), Isoleucine (Fruit), Kaempferol (Leaf), Kaempferol-3-o-glucoside (Leaf), Leucine (Fruit), Leucodelphinidin (Bark), Linoleic acid (Seed, Seed Oil), Linolenic acid (Seed, Seed Oil), Lupenone (Plant), Lupeol (Bark, Root, Shoot), Lysine (Fruit), Magnesium (Fruit), Manganese (Fruit), Methionine (Fruit), Myo-inositol (Fruit), Myristic acid (Fruit, Seed Oil), Niacin (Fruit), Nitrogen (Fruit), Oleic acid (Seed, Seed Oil), Palmitic acid (Seed, Seed Oil), Pectin (Fruit), Phenylalanine (Fruit), Phosphorus (Fruit), Phyllantidine (Fruit, Tissue Culture, Leaf), Phyllantine (Fruit, Leaf, Tissue Culture), Phyllemblic acid (Fruit, Pericarp), Phyllemblic acid (Fruit), Phyllemblic acid (Fruit), Polysaccharide (Fruit), Potassium (Fruit), Proline (Fruit), Protein (Fruit), Quercetin (Tissue Culture), Riboflavin (Fruit), Rutin (Fruit, Leaf), Selenium (Fruit), Serine (Fruit), Silica (Fruit), Sodium (Fruit), Starch (Fruit), Stearic acid (Seed, Seed Oil), Sucrose (Fruit), Sulfur (Fruit), Tannin (Bark, Fruit, Twig, Leaf), Terchebin (Fruit), Thiamin (Fruit), Threonine (Fruit), Trigalloyl glucose (Fruit), Tryptophan

Uses²¹: Indian gooseberry has been used as a valuable ingredient of various medicines in India and Middle East from time immemorial. Aperient The green fruits are made into pickles and preserves to stimulate the appetite. Antibacterial, antifungal, antiviral Medical studies conducted on Amla fruit suggest that it has antiviral properties and also functions as an antibacterial and anti-fungal agent. Antioxidant The use of amla as an antioxidant has been examined by a number of authors. Experiments conducted at the Niwa Institute of Immunology in Japan have shown Amla to be a potent scavenger of free radicals. The studies showed that Amla preparations contained high levels of the free-radical scavenger, superoxide dismutase (SOD), in the experimental subjects. Aphrodisiac Amla is believed to increase ojas, and is considered to be one of the strongest rejuvenative herbs in Ayurvedic medicine. It is the primary ingredient used in one of the renowned Ayurvedic herbal formulae, called Chayavanprasha which has great respect as a tonic.

Photoaging of the skin is a complex biologic process affecting various layers of the skin with major changes seen in the connective tissue within the dermis. Emblica was shown to reduce UV-induced erythema and had excellent free-radical quenching ability, chelating ability to iron and copper as well as MMP-1 and MMP-3 inhibitory activity. The fruit is occasionally pickled or preserved in sugar. When dry it is said to be gently laxative, according to some sources the fresh fruit is also laxative. The fresh ripe fruits are used extensively in India as a laxative, one or two fruits being sufficient for a dose. They have been exported to Europe, preserved in sugar, and are valued as a pleasant laxative for children and made into a confection consisting of the pulp of the de-seeded fruit. Fruits along with those of Terminalia bellirica and T. chebula are the constituents of "Triphala" which are used as a laxative.

Pharmacological review:²² An ethanol extract of 'Amla' *Emblica officinalis* Gaertn. was examined for its antisecretory and antiulcer activities employing different experimental models in rats, including pylorus ligation Shay rats, indomethacin, hypothermic restraint stress-induced gastric ulcer and necrotizing agents (80% ethanol, 0.2 M NaOH and 25% NaCl). Oral administration of Amla extract at doses 250 mg/kg and 500 mg/kg significantly inhibited the development of gastric lesions in all test models used. It also caused significant decrease of the pyloric-ligation induced basal gastric secretion, titratable acidity and gastric mucosal injury. Besides, Amla extract offered protection against ethanol-induced depletion of stomach wall mucus and reduction in nonprotein sulfhydryl concentration. Histopathological analyses are in good agreement with pharmacological and biochemical findings. The results indicate that Amla extract possesses antisecretory, antiulcer, and cytoprotective properties.

ALOE VERA

Synonyms: Aloe, Musabber, kumara



Family : Liliaceae

Distribution²³: The natural range of Aloe vera is unclear, as the species has been widely cultivated throughout the world. Naturalised stands of the species occur in the southern half of the Arabian peninsula, through North Africa (Morocco, Mauritania, Egypt) as well as Sudan and neighbouring countries, along with the Canary, Cape Verde, and Madeira Islands. This distribution is somewhat similar to the one of *Euphorbia balsamifera*, *Pistacia atlantica*, and a few others, suggesting that a dry sclerophyll forest once covered large areas, but has been dramatically reduced due to desertification in the Sahara, leaving these few patches isolated. Several closely related species (or sometimes identical) can be found on the two extreme sides of the Sahara: Dragon trees and *Aeonium* being some of the most representative examples.

The species was introduced to China and various parts of southern Europe in the 17th century. The species is widely naturalised elsewhere, occurring in temperate and tropical regions of Australia, Barbados, Belize, Nigeria, Paraguay and the US. It has been suggested that the actual species' distribution is the result of human cultivation and that the taxonomy could be doubtful too.

Morphology²³: Aloe vera is a stemless or very short-stemmed succulent plant growing to 60–100 cm (24–39 in) tall, spreading by offsets. The leaves are thick and fleshy, green to grey-green, with some varieties showing white flecks on the upper and lower stem surfaces. The margin of the leaf is serrated and has small white teeth. The flowers are produced in summer on a spike up to 90 cm (35 in) tall, each flower pendulous, with a yellow tubular corolla 2–3 cm (0.8–1.2 in) long. Like other Aloe species, Aloe vera forms arbuscular mycorrhiza, a symbiosis that allows the plant better access to mineral nutrients in soil.

Chemical constituent²⁴: Scientists have discovered over 150 nutritional ingredients in Aloe vera. There seems to be no single magic ingredient. They all work together in a synergistic way to create healing and health giving benefits. The ten main areas of chemical constituents of Aloe vera include: amino acids, anthraquinones, enzymes, minerals, vitamins, lignins, monosaccharide, polysaccharides, salicylic acid, saponins, and sterols.³³

The amino acids in Aloe vera are the building blocks of protein and influence our brain

function. Humans require 22 amino acids and the body will make all of them except for eight essential amino acids which our body gets from the food/drinks that we take in. Every one of the essential amino acids are available in Aloe vera and they include isoleucine, leucine, lysine, methionine, phenylalanine, threonine, valine, and tryptophan. Some of the other non-essential amino acids found in Aloe vera include alanine, arginine, asparagine, cysteine, glutamic acid, glycine, histidine, proline, serine, tyrosine, glutamine, and aspartic acid.

Located in the sap of the leaves you will find twelve anthraquinones, a phenolic compound that has stimulating effects on the bowels and antibiotic properties. The most important anthraquinones are aloin and emodin. They are anti-bacterial, anti-viral, and analgesic. The anthraquinones in Aloe vera breakup residue, pus and lifeless cells, bring blood to the region and flush out material from the wound and ulcer.

“The main enzymes found in Aloe vera include Amylase (breaks down sugars and starches), Bradykinase (stimulates immune system, analgesic, anti-inflammatory), Catalase (prevents accumulation of water in the body), Cellulase (aids digestion - cellulose), Lipase (aids digestion - fats), Oxidase, Alkaline Phosphatase, Proteolytiase (hydrolyses proteins into their constituent elements), Creatine Phosphokinase (aids metabolism), and Carboxypeptidase. Because of the healing properties of Aloe vera and its synergistic action, the body receives what it needs to work properly. Aloe vera, an anti-oxidant rich plant, contains vitamins such as A, C, and E plus the minerals, zinc, and selenium. Anti-oxidants help boost the immune system and combat free radicals in the body. It also contains Vitamins B1, B2, B3, B5, B6, and B12 along with choline, calcium (teeth and bone formation, muscle contractions and heart health), magnesium (strengthens teeth and bones, maintains healthy muscles and nervous system, activates enzymes), zinc (speeds up wound healing, mental quickness assists with healthy teeth, bones, skin, immune system, and digestive aid), manganese (activates enzymes, builds healthy bones, nerves and tissues), chromium (assists with protein metabolism and balancing of blood sugars), selenium which influences our brain performance. Additional minerals found in Aloe vera include copper (important for red blood cells, skin and hair pigment), iron (involved in oxygen transportation and making of hemoglobin in red blood cells), potassium (helps with fluid balance), phosphorus (helps build bones and teeth, assists with metabolism and body pH), and sodium (regulates body liquids, helps with nerve and muscle

performance, and helps deliver nutrients into body cells). Aloe vera also contains the trace minerals of rhodium and iridium used in cancer and tumor research experiments. One polysaccharide, acemannan, is known for its ability to restore and boost the immune system by stimulating the production of macrophages and improving the activity of T-Lymphocytes by up to 50 %. Acemannan produces immune agents such as interferon and interleukin which help to destroy viruses, bacteria, and tumor cells. Acemannan improves cellular metabolism by normalizing cellular function and regulating the flow of nutrients and wastes in and out of the cells. It knows how to destroy parasites and fungus. In some AIDS patients, it even protected the immune system from the toxic side effects of AZT. Carrington Laboratories in the United States have separated the acemannan from Aloe vera. Many sources stated that Aloe vera has mucopolysaccharides, nitrogen containing polysaccharides, found in animals and bacteria. A regulation and testing board for Aloe vera products known as the International Aloe Science Council concludes that some people are misinformed and confused on terminology. The Aloe has polysaccharides but not mucopolysaccharides. Aloe vera contains salicylic acid which is an aspirin-like compound with anti-inflammatory, analgesic, and anti-bacterial properties. It has anti-pyretic properties for reducing fevers. Other constituents of Aloe vera would include prostaglandins, tannins, magnesium lactate, resins, mannins, proteins such as lectins, monosulfonic acid and gibberlin. Another constituent of Aloe vera includes saponins. These are soapy substances from the gel that is capable of cleansing and having antiseptic properties. The saponins perform strongly as anti-microbial against bacteria, viruses, fungi, and yeasts.⁵¹ The plant sterols or phyto-steroids in Aloe vera include Cholesterol, Campesterol, Lupeol, and B Sitosterol.⁵² The plant steroids have fatty acids in them that have antiseptic, analgesic, and anti-inflammatory properties.

Uses²³: Aloe vera juice is used for consumption and relief of digestive issues such as heartburn and irritable bowel syndrome, although it bears significant potential to be toxic when taken orally. It is common practice for cosmetic companies to add sap or other derivatives. Other uses for extracts of aloe vera include the dilution of semen for the artificial fertilization of sheep, use as fresh food preservative, and use in water conservation in small farms. The supposed therapeutic uses of aloe vera are not exclusive to the species and may be found to a

lesser or greater degree in the gels of all aloes, and indeed are shared with large numbers of plants belonging to the family Asphodelaceae. Bulbine frutescens, for example, is used widely for the treatment of burns and a host of skin afflictions.

WITHANIA SOMNIFERA

Synonyms: Ashwagandha, Indian ginseng, Winter cherry, Ajagandha, Kanaje Hindi, Amukkara in Tamil .



Family : Solanaceae

Distribution : Withania Somnifera grows abundantly in India (especially Madhya Pradesh), Pakistan, Bangla Desh, Sri Lanka and parts of northern Africa.

Morphology:²⁵

- Height: usually 30-60 cm but can grow up to 170 cm.
- Shape: upright and stout shrub with central stem.
- Branches: star-shaped branching; branches are covered in fine hairs.
- Leaves: alternate and ovate, up to 10 cm long and up to 5 cm wide.
- Flowers: yellow petals on the inside but with a green outer-covering layer.
- Fruit: red berries in papery protective covering (calyx).
- Roots: long, fleshy tubers.

Chemical constituent²⁵: The main constituents of ashwagandha are alkaloids and steroidal lactones. Among the various alkaloids, withanine is the main constituent. The other alkaloids are somniferine, somnine, somniferinine, withananine, pseudo-withanine, tropine, pseudo-tropine, cuscohygrine, anferine and anhydrine. Two acyl steryl glucoside

viz. sitoindoside VII and sitoindoside VIII have been isolated from root. The leaves contain steroidal lactones, which are commonly called withanolides. The withanolides have C28 steroidal nucleus with C9 side chain, having six membered lactone ring.

Use²⁶: Ashwagandha is considered to be one of the best rejuvenating agents in Ayurveda. Its roots, seeds and leaves are used in Ayurvedic and Unani medicines. Ashwagandha root drug finds an important place in treatment of rheumatic pain, inflammation of joints, nervous disorders and epilepsy. Dried roots are used as tonic for hiccup, cold, cough, female disorders, as a sedative, in care of senile debility, ulcers, etc. Leaves are applied for carbuncles, inflammation and swellings. Leaf juice is useful in conjunctivitis. Bark decoction is taken for asthma and applied locally to bed sores. Ashwagandha and its extracts are used in preparation of herbal tea, powders, tablets and syrups.

Ashwagandha has anti-inflammatory, anti-tumor, anti-stress, antioxidant, mind-boosting, immune-enhancing, and rejuvenating properties. Ashwagandha root has also been noted to have sex-enhancing properties. Ashwagandha is mentioned in the ancient Kama Sutra as an herb to be used for heightening sexual experience. Ashwagandha has the ability to restore sexual health and improve overall vitality while promoting a calm state of mind. A 2002 laboratory study indicates ashwagandha stimulates the growth of axons and dendrites. A 2001 study in rodents showed ashwagandha had memory boosting ability. A 2000 study with rodents showed ashwagandha to have anti-anxiety and anti-depression effects.

The plant has been used as an aphrodisiac, liver tonic, anti-inflammatory agent, and more recently to treat asthma, ulcers, insomnia, and senile dementia. Clinical trials and animal research support the use of ashwagandha for anxiety, cognitive and neurological disorders, inflammation, in providing progressive, long lasting results for various health concerns like aging, anemia and slow growth, arthritis, fatigue, waning memory, sports fitness and stress-disorders. Pharmacological studies and research so far have indicated that Ashwagandha has anti-tumour, anti-stress, antioxidant boosting, haemopoietic and rejuvenating properties. It is also an exceptional nerve tonic and nourishes the nerves and improves nerve function to maintain calm during stressful conditions. It also nourishes crucial mind and body connection and psychological immune response.

MUSA PARADISCA

Synonym : Banana, Kela.



Family: Musaceae

Distribution²⁷: Original home of banana is believed to be India and Malaya. The fruit as well as its plant is considered to be a very auspicious in all the religious and social ceremonies in India. In the mythological ages in Europe it was called the 'apple of paradise'. The Greek and Arabian writers referred to it as a wonderful fruit of India. The Malayan soldiers probably took them to Madagascar about the fifth century AD and from there it spread to east coast and mainland of Africa. Later, it was introduced in Western countries and other parts of the world. In India, there are three important banana producing areas South India, Western India and Eastern India from Bihar to Assam.

Morphology²⁸: *Musa paradisiaca* is a tall herb, Stoloniferous, cylindrical plant reaching 25 ft. Oblong, green leaves 8 ft long, and 2 ft broad, Pendulous inflorescence reaching 4 ft long. Male flowers and bracts sub-persistent. Cylindrical fruits are berries in several clusters, golden yellow or yellowish green in colour when ripe pulpy.

Chemical constituent²⁹: Plant contains glycoside sitoindoside IV, 14-methyl-9Beta, 19-cyclo-5-ergost-24(28)-en-3Beta-ol(I). Flowers contain diglycosides of delphinidin and cyanidin. Unripe fruit contains starch. Fruit contains sugars, proteins albumin and globulin. Flesh of mature fruit contains tannin, also contain serotonin and norepinephrine in addition to dopamine and an unidentified catecholamine. Peel contains tannin

Uses²⁷ - The roots and stems are astringent and anthelmintic. Juice of the sheaths and stem is useful in otalgia and haemoptysis. Ripe fruits are demulcent, nutritive and mildly laxative. Fruit nutritious, and constipative if ripened totally, used in bleeding disorders, unripe fruit is used in diabetes with other medicines, flower is used in menorrhagia, stem juice

is given in epilepsy and other neurological disorders. Root is used in tumors.

RHEUM EMODI



Synonyms : Variyattu, Rhubarb, Tursak, amla-vetasa, Rhubarb de Perse, Rheuchini, aml parni, Rhabarber, revand-chini, Reval-chini, archu, Nattu ireval-chinni, Chinese Rhubarb, Ladakirevanda-chini, Turkey rhubarb, Indian rhubarb, Da huang, Himalayan rhubarb, Bangla Revanchini.

Family : Polygonaceae

Distribution³⁰ : Rhubarb occurs in commerce under various names: Russian, Turkey, East Indian and Chinese; but the geographical source of all species is the same, the commercial names of the drug indicating only the route by which it formerly reached the European market. Previous to 1842, Canton being the only port of the Chinese Empire holding direct communication with Europe, Rhubarb mostly came by overland routes: the Russian Rhubarb used to be brought by the Chinese to the Russian frontier town of Kiachta; the Turkey Rhubarb received its name because it came to us by way of Asiatic Turkey, through the Levant; East Indian came by way of Singapore and other East Indian ports, and Chinese Rhubarb was shipped from Canton. At the present day practically all is conveyed to Europe via Shanghai.

Morphology³⁰: The drug coming to market is called as either Flats or Round. Round drug is barrel shaped, cylindrical and conical with 8-10 cm length and 4 cm thickness. Flats are 7-10 cm in length and 3-6 cm in thickness towards middle portion. The surface is covered with yellow powder and pale brown to red in colour. The pieces also shows holes, through which they are threaded.

Chemical constituent:³⁰

- Elements derived from anthraquinone, like reidin C, chrysophanol, sennosides A-E, emodin, chrysophanein, glucoemodin; glucorhein, and other O-glycosides, physcion, rhein, and more. Chinese Rhubarb includes epicatechin gallate and d-catechin, as well as galloyl, coumaroyl, cinnamoyl fructoses and glucosides; tannins.
- Stilbene glycosides can be found in other species, together with stilbene derivatives;
- Other: volatile oil, which includes calcium oxalate, fatty acids, rutin, ferulic and cinnamic acids; diisobutyl phthalate, and so on.

Uses: The plant is widely applied due to its ability to reduce constipations, boost one's metabolism, stimulate blood circulation, cure stomach diseases, and rid the bowel of helminthes.

It's additionally applied to treat diarrhea, dysentery, liver diseases and jaundice.

Rhubarb Root has a purgative action for use in the treatment of constipation, but also has an astringent effect following this. It therefore has a truly cleansing action upon the gut, removing debris and then astringing with antiseptic properties as well.

Rhubarb is widely known for its ability to purify the bowel, fighting the problems like constipation, accompanied with fevers, infections, as well as stomach ulcers. It is referred to as an effective remedy for diarrhea, as well. The plant is also known to fight bacterial infections.

You should also remember that taking rhubarb root you may have deep-yellow or red-colored urine.

Plant's action depends on the quantity you take. Applied in small doses, it produces a positive effect on the liver, but used in large quantities, it produces a purgative effect.

In Ayurvedic medicine the plant has several applications. It is used to fight stomach diseases, stimulate the digestive system and treat liver disorders. The plant is applied in mild cases of diarrhea; however, it's not used for constipation, especially in case where one needs a permanent purgative effect. The stimulative capacity of the herb is applied for treating atonic dyspepsia.

Due to its mild effect on the system, the plant is in popular use among aged people and children. When bowel muscles are weak, the plant may serve a good remedy if used in combination with Grey Powder. The dose is 10 grains on average.

In some cases the root may be chewed. Rhubarb has a wide range of application in complex herbal remedies. Colon irritation, characteristic for the

period of teeth eruption in children, duodenal catarrh, jaundice, and skin inflammations are also cases of plant application.

To keep the bowel muscles functional, the remedy is applied together with psyllium or licorice for aged people (to eliminate the possibility of spasms fennel or ginger is added in a proportion of 4:1 (rhubarb:ginger)). The plant is also applied to stimulate metabolism, blood and bile circulation. If mixed with epsom salt, acts more effective.

In Chinese medicine the plant is considered potent of eliminating constipation, treating infections, induced by microorganisms, reduce tumors, stimulates bile movement, reduces blood pressure and bad cholesterol amount in blood, as well as eliminates inflammations.

Chinese herbalists consider rhubarb one of the most effective medical remedies. The plant is potent of reducing fevers, which are associated with constipation. It is known to increase blood circulation which is essential in case of bruises and sharp pain. Both local and oral application is suitable, with the former being an anti-inflammatory means.

Rhubarb is applied for cases of dysentery accompanied with bloody feces. Additionally the plant is used for bloody vomiting. Applied orally and locally to treat infections. Serves as a remedy for helminthes(esp. flukes). Used externally to eliminate skin diseases like blisters and boils, accompanied with inflammations; in this case the remedy is mixed with honey or water, and aided by similar herbal medicines.

Conclusion

The present study was aimed at the medicinal plants for the treatment of Gastric Ulcer. Some of them are already reported as anti ulcer drug, but for some still no work has been done and these are only used traditionally. It is high time efforts should be made to use the vast ethno-pharmacological knowledge our traditional practitioners have to develop safer herbal preparations, for the people which will be less toxic and cheaper than the Modern day Medicaments.

In view of increasing popularity of alternative system of medicine, it is necessary to conduct research to support the therapeutic claim and also to ensure that the plants are given importance according to their therapeutic value, in modern herbal medicines. Safety is not a matter of concern for these plants as it has been proved over the years by their traditional use. The point where more study is needed is to develop Standard Procedures for Standardization of Herbs.

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