

Some of The Medicinal Plants With Anti-Ulcer Activity- A Review

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Abstract :

The aim of this review is to know more about the anti - ulcer property of the medicinal plants. An ulcer is an erosion in the lining of the stomach and duodenum. There are two types of ulcers -gastric and duodenal ulcer. Together ,they are called peptic ulcer. There are many herbs and plant products that have been found to play a role in protecting or helping to heal stomach and peptic ulcers. In recent years,gastric ulcer has also been associated with infection of gastrointestinal mucosal tissue by *Helicobacter pylori* . Herbal plants are considered as safe for peptic ulcer treatment with less side effect. This article reviews the features of some of the plants like *Ocimum sanctum L.*,*Morus alba L.*,*Musa acuminata*, *Mangifera indica L.*, *Zingiber officinalis Roscoe* are reported to possess antiulcer and ulcer healing properties.

Keywords:Erosion,*helicobacter pylori*,duodenum,gastrointestinal mucosal tissue.

INTRODUCTION :

Peptic ulcer is a gastro intestinal disorder due to an imbalance between the aggressive factors like acid, pepsin, *Helicobacter pylori* and defensive factors like bicarbonate secretion, prostaglandins, gastric mucus, innate resistance of the mucosal cell factors (1). Normally peptic ulcer develops when aggressive factors overcome the defensive factors (2). Peptic ulcer can be categorized on the basis of location and on the severity of disease. Basically, word “peptic” is derived from Greek term “peptikos” whose meaning is related to digestion . Various reports indicates that old age group patients are more prone to gastric ulcer. Younger individuals have higher risk of duodenal ulcers .A number of drugs including proton pump inhibitors and H2 receptor antagonists are available for the treatment of peptic ulcer, but clinical evaluation of these drugs has shown incidence of relapses, side effects, and drug interactions. But therapeutic uses of plant are safe, economical & effective as their ease of availability(3) .Different plants are rich source of medicines. Currently, increasing health concern urged the researchers to revitalize the natural products and to alleviate the diseases without harming the body. This study has presented the review of commonly used anti-ulcer plants which are used for the treatment or prevention of peptic ulcers. Plants such as *Ocimum sanctum L.*,*Morus alba L.*,*Musa acuminata*, *Mangifera indica L.*, *Zingiber officinalis Roscoe* are reviewed here.

Ocimum sanctum Linn

Ocimum sanctum belong to family *Lamiaceae* are very important for their therapeutic potential. *Ocimum sanctum* has two varieties i.e. black (Krishna Tulsi) and green (Rama Tulsi), their chemical constituents are similar(4). *Ocimum sanctum* is widely distributed covering the entire Indian sub continent.Tulsi is an important symbol of the Hindu religious tradition.Different parts of plant are used in Ayurveda

and Siddha Systems of Medicine for prevention and cure of many illnesses. Tulsi is a popular home remedy for many ailments such as wound, bronchitis, liver diseases, catarrhal fever, otalgia, lumbago, hiccough, ophthalmia, gastric disorders, genitourinary disorders, skin diseases, various forms of poisoning and psychosomatic stress disorders(5,6). It has also aromatic, stomachic, carminative, demulcent, diaphoretic, diuretic, expectorant, alexiteric, vermifuge and febrifuge properties(7).

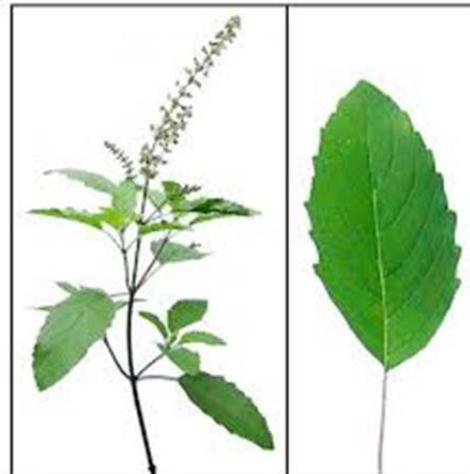


Figure -1 : *Ocimum sanctum Linn*

Anti-ulcer activity :

The fixed oil significantly possessed antiulcer activity due to its lipoxygenase inhibitory, histamine antagonistic and antisecretory effects(8). Reported pharmacological activities of the plant are anti-bacterial, anti-inflammatory,anti hypertensive,cardioprotective,central nervous system depressant,anti oxidant, chemopreventive, immunomodulatory, analgesic, antipyretic, anti-fertility, anti-arthritis, anti-stress, anti-cataract, anticoagulant, hepatoprotective, radioprotective (9).

Morus alba Linn:

Morus alba Linn. is commonly known as White mulberry and belongs to the family *Moraceae*. White mulberry is cultivated throughout the world, wherever silkworms are raised. The leaves of white mulberry are the main food source for the silkworms. The plant is known by various names in different languages as: Sanskrit: Tutam; Hindi: Tut; English: Mullberry; Malayalam: Malbari; Tamil: Musukette. This widely grown plant has been in use by tribals of this country for ailments such as asthma, cough, bronchitis, edema, insomnia, wound healing, diabetes, influenza, eye infections and nosebleeds(10). Traditionally, the mulberry fruit has been used as a medicinal agent to nourish the blood, benefit the kidneys and treat weakness, fatigue, anemia and premature graying of hair. It is also used to treat urinary incontinence, tinnitus, dizziness and constipation in the elderly patient(11). It also reported reduction of blood glucose levels by regeneration of β cells (12).

Figure -2: *Morus alba Linn***Anti-ulcer activity :**

The plant leaf extracts reported antiulcer activity in experimentally-induced gastric ulcers in rats (13). The white mulberry has a long history of medicinal use in Chinese medicine; Almost all the parts of the plant are used as Medicine(14). The mulberry leaves are richest source of phytochemicals, which are beneficial for the health and can be used as vegetable. The leaves of mulberry contains higher amount of quercetin which is responsible for reduction of oxidation process in vivo and in vitro.

***Musa acuminata*:**

Musa acuminata is a plant that belongs to the family *Liliaceae* with lilies and orchids. *Musa acuminata* is one of two species (along with *M. balbisiana*) that are wild progenitors of the complex hybrids that make up modern bananas and plantain. Important ingredients in banana fruit: fructose and glucose, potassium (350 mg), carotene (provitamin A), vitamins B-complex, pectin, malic acid. Banana is rich in potassium, a key mineral that helps normalize blood pressure, heart function, work cells, nerves and muscles. Many previous studies have shown that a diet rich in potassium, magnesium and dietary fiber reduces the risk of heart attack. In one of the studies showed that a

mixture of banana and milk significantly reduces gastric acid secretion . It is also used in curing of intestinal lesions in colitis, inflammation, pains and snakebite (15) as well exhibited antiulcerogenic (16), hypoglycemic (17), hypolipidemic activities (18)

Figure-3: *Musa acuminata***Anti-ulcer activity:**

Ripe bananas contain compounds that act in two ways: by activating the epithelial cells lining the stomach to produce a thick protective layer of mucus, which is stomach acid barrier and eliminate the bacteria from the stomach (especially *Helicobacter pylori*) for which it is known to cause ulcer. Plant

parts like peels, stalks, fruits, roots and leaves of banana plants have been consumed orally or tropically for the medication of diarrhea and dysentery. However, the antiulcerative activity in banana is due to the presence of natural flavonoids and this activity may vary in different varieties of banana due to the different levels of these natural active components (19,20).

Mangifera indica Linn:

Mangifera indica L. is commonly known as Mango. It belongs to the family *Anacardiaceae*. Various parts of plant are used as a dentrifrice, antiseptic, astringent, diaphoretic, stomachic, vermifuge, tonic, laxative and diuretic and to treat diarrhea, dysentery, anaemia, asthma, bronchitis, cough, hypertension, insomnia, rheumatism, toothache, leucorrhoea, haemorrhage and piles. All parts are used to treat abscesses, broken horn, rabid dog or jackal bite, tumour, snakebite, stings, datura poisoning, heat stroke, miscarriage, anthrax, blisters, wounds in the mouth, tympanitis, colic, diarrhea, glossitis, indigestion, bacillosis, bloody dysentery, liver disorders, excessive urination, tetanus and asthma.

Figure -4: *Mangifera indica Linn*

Anti-ulcer activity:

The petroleum ether and ethanol plant leaf extracts reported antiulcer activity (21).The effects of *mangiferin* on gastric mucosal damage were assessed by determination of changes in mean gastric lesion area or ulcer score in mice and on gastric secretory volume and total acidity in 4-h pylorus-ligated rats. These findings provide evidence that *mangiferin* affords gastroprotection against gastric injury induced by ethanol and indomethacin most possibly through the antisecretory and antioxidant mechanisms of action.(22).

Zingiber officinalis Roscoe:

Zingiber officinalis Roscoe is commonly known as Ginger which is consumed as a flavoring agent, spice belongs to the family *Zingiberaceae*. Reported pharmacological activities of the plant are antioxidant, anti migraine, antiemetic, anti inflammatory, anti-microbial, anti thrombotic, anti analgesic, anti proliferative, anti osteoarthritic, hepato protective (23). Powdered rhizome of ginger root has been used as a traditional remedy for gastrointestinal complaints including in treating peptic ulceration despite the fact that ginger promotes gastric secretions(24).



Figure -5: *Zingiber officinalis Roscoe*

Anti-ulcer activity:

Several anti-ulcer compounds have been isolated from ginger, including 6-gingesulphonic acid(25), 6- shogaol and ar-curcumene(26). Most notable is 6- gingesulphonic acid, which showed weaker pungency and more potent anti-ulcer activity than 6- gingerol and 6-shogaol(27-29).The antiulcer activity of ginger may also be due to the potent thromboxane synthetase inhibition(30).High doses of ginger probably act as a gastric irritant.

CONCLUSION:

This article reviews drugs derived from plants which are used for the treatment of peptic ulcer and it is evident that plant extracts have significant antiulcer activity in animal models. This article presents a review on medicinal plants with potential anti-ulcer activity. *Ocimum sanctum L.*,*Morus alba L.*,*Musa acuminata*, *Mangifera indica L.*, *Zingiber officinalis Roscoe* etc., are popular all over the world as medicinal plants for the treatment of ulcer.

REFERENCE:

1. Dashputre NL, Naikwade NS. Evaluation of Anti-Ulcer Activity of Methanolic Extract of *Abutilon indicum* Linn Leaves in Experimental Rats. International Journal of Pharmaceutical Sciences and Drug Research 2011; 3(2):97100.
2. Izzo A, Borrelli F. The Plant Kingdom as a Source of Antiulcer Remedies. Phytother Res 2000; 14:581–591.
3. Kumar V., Andola H.C., Lohani H. and Chauhan N. (2011). Pharmacological Review on *Ocimum sanctum* Linnaeus: A Queen of herbs. J of Pharm Res, 4:366-368.
4. Mondal S., Bijay R. Miranda R. B., and Sushil C. M. (2009). The Science behind Sacredness of Tulsi (*Ocimum sanctum* LINN.). Ind J of Physiol Pharmacol. 53: 291–306.
5. Das SK, Vasudevan DM. Tulsi: The Indian holy power plant. Natural Product Radiance. 5:2006,279-83.
6. Prajapati ND, Purohit SS, Sharma AK, Kumar T. A Hand Book of Medicinal Plant, 1st Ed. Agrobios, India: 2003, p. 367.
7. Gupta SK, Prakash J, Srivastava S. Validation of traditional claim of Tulsi, *Ocimum sanctum* Linn. as a medicinal plant. Indian J Exp Biol 40:2002,765-773.
8. Singh S, Majumdar DK. Evaluation of the gastric antiulcer activity of fixed oil- *Ocimum sanctum* (Holy basil). J Ethnopharmacol 65:1999,13-19.
9. Govind P, Madhuri S. Pharmacological activities of *Ocimum Sanctum* (tulsi): a review. International Journal of Pharmaceutical Sciences Review and Research 2010; 5(1).
10. Anonymous. The Wealth of India, A Dictionary of Indian Raw materials. Vol. 7. New Delhi: Council of Scientific and Industrial Research; 1952. p. 429-37.
11. Nadkarni AK. Indian Materia Medica. Vol. 1. Mumbai: Popular Prakashan; 1976. p.1292-94.
12. Jamshid M, Prakash RN. The histopathologic effects of *Morus alba* leaf extract on the pancreas of diabetic rats. Turk J Biol 2012; 36:211-216.
13. Ali HM, Ahmed KA, Abdulla MA, Ismail S, Noor SM. Evaluation of the anti-ulcer activities of *Morus alba* extracts in experimentally-induced gastric ulcer in rats. Biomed Res 2009; 20(1):35–39.
14. Mhaskar KS, Latter EB, Caius JS, Kirtikar and Basu. Indian Medicinal Plants. Vol. 3. Sri Satguru Publications; 2000. p. 3185.
15. D. A. Lewis, W. N. Fields and G. P. Shaw. Journal of Ethnopharmacology. 65, 283 (1999).
16. J. A. Ojewole and C. O. Adewunmi. Methods and Findings in Experimental and Clinical Pharmacology. 25, 453 (2003).
17. K. Krishnan and N. R. Vijayalakshmi. Indian Journal of Medical Research. 122, 540 (2005).
18. D. S. Jang, E. J. Park, M. E. Hawthorne, J. S. Vigo, J. G. Graham, F. Cabieses, B. D. Santarsiero, A. D. Mesecar, H. H. Fong, R. G. Mehta, J. M. Pezzuto and A. D. Kinghorn. Journal of Agricultural and Food Chemistry. 50, 6330 (2002).
19. S. Vijaykumar, G. Presannakumar and N. R. Vijayalakshmi. Fitoterapia. 79, 279 (2008). 18. D. A. Lewis and G. P. Shaw. The Journal of Nutritional Biochemistry. 12, 95 (2001).
20. D. L. Jain, A. M. Baheti, S. R. Parakh, S. P. Ingale and P. L. Ingale. Pharmacognosy Magazine. 3, 116 (2007).
21. Lakshmi BVS, Mrityunjaya BP, Neelapu N, Muvvala S. Antiulcer Activity and HPTLC Analysis of *Mangifera indica* L. Leaves. International Journal of Pharmaceutical and Phytopharmacological Research 2012; 1(4):146-155.
22. Carvalho AC, Guedes MM, De Souza AL, Trevisan MT, Lima AF, Santos FA, et al. Gastroprotective effect of mangiferin: A xanthoneoid from *Mangifera indica*, against gastric injury induced by ethanol and indomethacin in rodents. Planta Med. 2007;73:1372–6.
23. Ghosh AK, Mullick HI, Banerjee J, Banerjee S. *Zingiber officinale*: a natural gold. International Journal of Pharma and Bio Sciences 2011; 2(1).
24. Backon J. Ginger: Inhibition of thromboxane synthetase and stimulation of prostacyclin: Relevance for medicine and psychiatry. Med Hypoth 1986;20:271-8.
25. Yoshikawa M, Hatakeyama S, Taniguchi K, Matsuda H, Yamahara J. 6-Gingesulfonic acid, a new antiulcer principle and Gingerglycolipids A, B and C, Three new monoacylgalactosyl glycerols, from *Zingiberis Rhizoma* originating in Taiwan. Chem Pharmaceut Bull 1992;40 :2239-40.

26. Yamahara J, Hatakeyama S, Taniguchi K, Kawamura M, Yoshikawa M. Stomachic principles in ginger II pungent and antiulcer effects of low polar constituents isolated from ginger, the dried rhizome of *Zingiber officinale* Rosc. cultivated in Taiwan. The absolute stereostructure of a new Diarylheptanoid *Yakugaku Zasshi*. *J Pharmaceu Soc Jap* 1992;112:645-55.
27. Yamahara J, Mochizuki M, Rong HQ, Matsuda H, Fujimura H. The antiulcer effect in rats of ginger constituents. *J Ethnopharmacol* 1988;23:299-304.
- 28.. al-Yahya M A, Rafatullah S, Mossa J S, Ageel A M, Parmar N S, Tariq M. Gastroprotective activity of ginger (*Zingiber officinale* Rosc.) in albino rats. *Am J Chin med* 1989;17: 51-6.
29. Yoshikawa M, Yamaguchi S, Kunimi K, Matsuda H, Okuno Y, Tamahara J, Murakami N. Stomachic principles in gin- ger III. An antiulcer principle, 6-gingesulfonic acid and three monoacyldigalactosylglycerols, ginger glycolipids A, B and C, from *Zingiberis Rhizoma* originating in Taiwan. *Chem Pharmaceu Bull* 1994;6:1226-30.
30. Srivastava KC. Aqueous extracts of onion, garlic and gin- ger inhibit platelet aggregation and alter arachidonic acid metabolism. *Biomed Biochem Acta* 1984;43:335-46.