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Review Article

Herbal drugs: Boon for Peptic ulcer patients

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ABSTRACT

Antibiotic, antiviral, antifungal and antiparasitic medicines are used to treat the diseases caused by pathogenic microorganisms. These microbes effects humans, animals and plants and produces diseases. As per the recent report of World Health Organization (WHO), the cases of Antimicrobial resistance (AMR) is continuously rising, which causes ineffective treatment and prevention of infections caused by bacteria, viruses, fungi and parasites. AMR occurs when these microbes gets resistance and the medications gets ineffective against these microbes, which makes treatment of common infections difficult and consequently increases the risk of severe illness, spread of disease and death. Because the medicines becomes purposeless, infections continue to exist in the body and increases the likeliness of spread to others. WHO recommends reduced use of synthetic antibiotics and raised use of herbal antimicrobial drugs. These are the ways by which the AMR can be controlled or abolished. Herbal drugs can be used for this purpose because these are considered to be effective with no or less side effects. In the present article we discussed about peptic ulcer, causative agent of peptic ulcer and the medicinal plants which can be used to treat this disease. Twenty medicinal plants were listed which contains both antibacterial and antiulcer activity. Due to these properties of these medicinal plants, these can be used for the treatment of peptic ulcer because of dual benefits firstly, antibacterial which kills or retards the growth of *Helicobacter pylori* and secondly, antiulcer which heals the ulcer.

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1. Introduction

Quadruple therapy is the method used to treat Peptic ulcers which comprises of four types of synthetic drugs in modern medicine i.e.

1. H₂ antagonists to inhibit gastric acid secretion e.g. Cimetidine, Ranitidine, Famotidine etc.
2. Antacids to neutralize gastric acid e.g. Calcium carbonate, Magnesium hydroxide, Aluminum hydroxide and/or Sodium bicarbonate.
3. Proton pump inhibitors like Omeprazole, Pantoprazole and Lansoprazole as ulcer protective agents.
4. Antibacterial drugs like Amoxicillin, Clarithromycin, Metronidazole, Tinidazole, Tetracycline and Levofloxacin. These are chemically synthesized

drugs and the treatment continued for many days, hence they causes lot of side effects and also produces AMR. The use of herbal drugs to treat the disease can reduce AMR because they are effective and have very less or no side effects.¹

2. Antimicrobial Resistance (AMR)

Disease producing microorganisms are called pathogenic microorganisms causes infection and responsible for producing many diseases in human, animals and plants. To treat those diseases by retarding the growth of microorganisms or destroying them, antimicrobial drugs are used like antibacterial, antifungal, antiviral and antiparasitic drugs. Over use (long term use and use of drug in wrong dose) of the antimicrobial drugs, results in developing resistance of microbes towards these

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drugs which makes medications ineffective. This is called antimicrobial resistance (AMR). WHO states that AMR is a global problem. To fight against AMR recommends to use the synthetic antimicrobial drugs whenever necessary in a right dose and if possible for a short period and secondly instead of synthetic antimicrobial drugs, herbal antimicrobial drugs should be used.² By following these two ways, AMR can be controlled or eliminated.

3. Peptic Ulcer Disease

Peptic ulcer disease is painful sores form in the lining of the stomach, duodenum (beginning of small intestine) or bowels. Ulcers can sometimes cause bleeding or a hole in the stomach or bowel. The common symptom is burning when the stomach is empty but it can happen any time and can lasts from few minutes to many hours. The other symptoms are stomach upset, blood in stool or vomit, loss of appetite or weight loss. The common causes of peptic ulcer is infection due to bacteria known as *Helicobacter pylori* (*H.pylori*) and Non-steroidal anti-inflammatory drugs (NSAID) use like Aspirin or Ibuprofen. Acid-pepsin secretions when exposed to the regions of the upper gastrointestinal tract (GIT) may leads to peptic ulcer.² It affects stomach or duodenum. The two most common types of peptic ulcer are Gastric ulcer (Ulcer of stomach) and duodenal ulcer (Ulcer of duodenum). Reports says that duodenal ulcer is 2-4 times more usual than gastric ulcer.³ Ulcers of the stomach are common in persons of older age, which is characterized by stomach pain. Nausea, vomiting and weight loss are the other symptoms of gastric ulcer. It may occur in patients with normal or diminished acid production or even in absence of acid also.⁴ The beginning of the small intestine is called duodenum where the duodenal ulcers are found which is characterized by burning sensation in upper abdomen with severe pain. Sometimes the severity of pain awakes patients from sleep. In empty stomach usually the pain occurs and after eating it stops. Males are mostly effected by duodenal ulcer and it is more common in younger individuals.⁵

Fig. 1: Shows peptic ulcer & itscauses

4. Global and National Status of Peptic Ulcer

There are many GIT diseases but peptic ulcer is the major one in the world. About 10% of the total world population is effected by peptic ulcer disease.⁶ In two types of peptic ulcer, duodenal ulcer is more common and in 20 peptic ulcer patients 19 are suffering from duodenal ulcer. As per estimation, annually 15000 deaths occurs due to peptic ulcer. A estimation also states that every year the incidence of peptic ulcer hemorrhage and peptic ulcer perforation was 19.4-57 per 100,000 individuals and 3.8-14 per 100,000 individuals respectively. On an average the rate at which peptic ulcer hemorrhage reoccurs in seven days and long term peptic ulcer perforation were 13.9% and 12.2% respectively.⁷ WHO latest data published in 2017 says that 57,658 or 0.66% deaths was due to peptic ulcer disease of total deaths in India. Age adjusted death rate in India is 5.79 per 100,000 of population which keeps our country in 53 rank in the world⁸ Antacids and antiulcer drugs shares 6.2 billion rupees or 4.3% of the total market share in Indian Pharmaceutical industry.⁹

The probable factors responsible for the occurrence of peptic ulcer are Aggressive and protective and due to the imbalance between these two factors in the stomach the disease occurs.¹⁰ *Helicobacter pylori*, hydrochloric acid, pepsins, Non-steroidal anti-inflammatory drugs, bile acids, ischemia, hypoxia, smoking and alcohol comes under aggressive factors and bicarbonate, mucus layer, mucosal blood flows, prostaglandins and growth factors comes under protective factors.¹¹

5. Helicobacter Pylori

Helicobacter pylori is a common human pathogenic bacteria which can transmit from one person to another person. It infects the upper GIT and causes gastroduodenal inflammation of progressive acute and chronic type. The other manifestations of *H.pylori* infection are Gastritis, gastric atrophy, duodenal ulcer disease, gastric ulcer disease, primary gastric B-cell lymphoma, gastric adenocarcinoma, iron deficiency anaemia, and vitamin B₁₂ deficiency. Risk factors which contributes to the infection are overall sanitary conditions and contact with infected humans. The mode of transmission is contaminated water in rural areas whereas in urban areas infection depends on the level of household hygiene.¹² *H. pylori* bacteria found in almost 50% of the population of the world. The relation between peptic ulcer disease and *H. pylori* infection was unknown earlier but has been found over the last few decades and scientific studies says that *H. pylori* infection is responsible for 90% of duodenal ulcers and up to 70% of gastric ulcers. If untreated or going for treatment late, it creates complications in about 20 to 25% of the patients.¹³

Natural products became the most attractive source of new drug because of easy availability, relatively less

Table 1: List of twenty medicinal plants having reported antibacterial and antiulcer activity

S.No.	Common name	Botanical name	Family	Plant part (Antibacterial)	Plant part (Antiulcer)	
1	Indian Gum Arabic tree, Babool	Acacia Arabica	Leguminosae	Bark	Seedless pods, gum	14,15
2	Bengal quince, golden apple, Japanese bitter orange, stone apple, wood apple, Bael, Belli	Aegle marmelos L.	Rutaceae	Leaves, bark & fruits	Leaves	16,17
3	Garlic, Lissan	Allium sativum	Amaryllidaceae	Bulbs	Bulbs	18-20
4	Aloe vera, Gwar Patha, Kuwar Patha	Aloe barbadensis M.	Asphodelaceae (Liliaceae)	Leaves	Leaves	21,22
5	Neem	Azadirachta indica	Meliaceae	Leaves	Leaves	23,24
6	Indian Barberry, Tree Turmeric, Chitra, Daruharidra	Berberis aristata	Berberidaceae	Stem	Roots & woods	25,26
7	Beet root	Beta vulgaris L.	Amaranthaceae	Pomace	Roots	27,28
8	Papaya, Papita, Melon tree	Carica papaya	Caricaceae	Leaves	Seeds	19,29
9	Peepal, Peepdi	Ficus religiosa	Moraceae	Latex	Leaves	30,31
10	Gurhal, China rose, Jasod	Hibiscus rosa sinensis	Malvaceae	Flowers	Leaves	32,33
11	Mango, Aam	Mangifera indica	Anacardiaceae	Stem bark	Leaves	34,35
12	Sensitive plant, touch me not, Lajjamdi	Mimosa pudica	Fabaceae	Whole plant	Leaves	36,37
13	Drumstick tree, Horseradish tree, Senjana, Seeng	Moringa oleifera	Moringaceae	Leaves, bark, seed and flesh	Leaves	38,39
14	Holi basil, Tulsi	Ocimum sanctum	Lamiaceae	Leaves	Leaves	21,40,41
15	Gale of the wind, Stone breaker, Seed under leaf, Bhuaamla	Phyllanthus niruri	Phyllanthaceae	Leaves	Leaves	42,43
16	Black nightshade, Mokoi	Solanum nigrum	Solanaceae	Whole plant	Leaves	44,45
17	Tamarind, Imli, Amli	Tamarindus indica	Caesalpiniaceae	Stem, bark and leaves	Seeds	46,47
18	Myrobalan, Chebulic myrobalan, Harra, Harad, Harde	Terminalia chebula	Combretaceae	Leaves	Fruits	48,49
19	False daisy, trailing eclipta, Bhringraj, Kesharaj, Bhingdo	Eclipta alba	Asteraceae	Aerial parts	Whole plant	50,51
20	Field mint, Wild mint, Corn mint, Podina, Fudina	Mentha arvensis	Lamiaceae	Leaves	Whole plant	52,53

expensive, no or less side effects makes it safe to use even at higher doses for the treatment and prevention of many diseases. These are the broad reasons why herbal drugs are getting popularity over synthetic drugs and continuously expanding throughout the world.⁵⁴ According to WHO, for older diseases and for newer ones variety of drugs can be obtained from medicinal plants. It would be the best source. Therefore, these must be properly investigated to better understand their pharmacognostic properties, pharmacological properties, microbiological properties, safety and efficacy.⁵⁵

In India, number of antibacterial drugs and antiulcer drugs are available and known for their properties individually. In this review article we tried to prepare a list of twenty medicinal plants which are potent antibacterial and antiulcer based on scientific studies.

6. Antibacterial activity of some Medicinal Plants

In present scenario, the incidence of antimicrobial resistance is on continuously rising threatening all to return to the pre-antibiotic era. There many bacterial infections now a days which are untreatable by the current available treatment methods.⁵⁶ Its time to think and act to solve this global

problem This review aims to focus on preparing a list of twenty medicinal plants used in traditional medicines having antibacterial activity.

7. Antiulcer activity of some Medicinal Plants

75–80% of the world total population uses herbal/traditional medicines especially in developing countries for their primary health care. The reasons behind this are better cultural acceptability of these drugs, easily available and lesser side effects.⁵⁷ Studies revealed that no any acute toxicity showed by these medicinal plants. Preliminary photochemical screening of these medicinal plants identified the presence of secondary metabolites like flavonoids and tannins which are responsible for the antiulcer activity.⁵⁸ Present study focused to prepare a list of medicinal plants which are considered as gastroprotective and healing agents on ulcers.

8. Conclusion

According to WHO, Antibiotic resistance is a global health problem and our country is also facing the same. Individuals of any age group can get effected by antibiotic resistance. Misuse of antibiotics is the reason behind raising cases of antibiotic resistance in humans and animals. Because of ineffectiveness of antibiotics, now a days its become very difficult to treat bacterial infections like pneumonia, tuberculosis, gonorrhoea and salmonellosis. Antibiotic resistance results in increase of hospital stay, medical expenses and death rate. To reduce AMR, treatment with herbal drugs is today's necessity and many medicinal plants are reported till date which possess both antibacterial and antiulcer activities and that were proved scientifically. The bacteria *H.pylori* is the causative agent of peptic ulcer disease. No or less literatures are available which shows effect of herbal drugs both on *Helicobacter pylori* and healing of ulcer, hence research is needed in this field to know the effect of these medicinal plants both on *H.pylori* & healing of ulcer i.e. antibacterial and antiulcer activity in single drug. If it shows positive effect then to reduce AMR these will be a nice herbal drug option to treat Peptic ulcer without any side effect.

9. Source of Funding

None.

10. Conflict of Interest

None.

References

- Mahato TK. Exploring antibacterial & antiulcer activity of aegle marmelos linn. : A review. *Int J Pharm Chem Anal.* 2020;7(3):107–12.
- Available from: <https://www.who.int/health-topics/antimicrobial-resistance>.
- Barazandeh F, Yazdanbod A, Pourfarzi F, Sepanlou SG, Derakhshan MH. Epidemiology of peptic ulcer disease: endoscopic results of a systematic investigation in Iran. *Middle East J Dig Dis.* 2012;4(2):90.
- Khomenko T, Szabo S, Deng X, Ishikawa H, Anderson GJ, McLaren GD. Role of iron in the pathogenesis of cysteamine-induced duodenal ulceration in rats. *Am J Physiol Gastrointest Liver Physiol.* 2009;296(6):G1277–86. doi:10.1152/ajpgi.90257.2008.
- Vyawahare NS, Deshmukh VV, Godkari MR, Kagathara VG. Plants with anti-ulcer activity. *Pharmacogn.* 2009;3:108–15.
- Brooks FP. The pathophysiology of peptic ulcer disease. *Dig Dis Sci.* 1985;30(S11):15S–29S. doi:10.1007/bf01309381.
- Zapata-Colindres JC, Zepeda-Gómez S, Montañón-Loza A, Ballesteros EV, Villalobos JJ, Valdovinos-Andraca F. The Association of *Helicobacter pylori* Infection and Nonsteroidal Anti-Inflammatory Drugs in Peptic Ulcer Disease. *Can J Gastroenterol.* 2006;20(4):277–80. doi:10.1155/2006/175217.
- Lau JY, Sung J, Hill C, Henderson C, Howden CW, Metz DC. Systematic Review of the Epidemiology of Complicated Peptic Ulcer Disease: Incidence, Recurrence, Risk Factors and Mortality. *Digestion.* 2011;84(2):102–13. doi:10.1159/000323958.
- Vimala G, Shoba FG. A Review on Antiulcer Activity of Few Indian Medicinal Plants. *Int J Microbiol.* 2014;2014:1–14. doi:10.1155/2014/519590.
- Hoogerwerf WA, Pasricha PJ. Agents Used for Control of Gastric Acidity and Treatment of Peptic Ulcers and Gastro Esophageal Reflux Disease. 10th ed. New York, USA: McGraw-Hill; 2011.
- Lima ZP, Severi JA, Pellizzon CH, Brito A, Solis PN, Cáceres A, et al. Can the aqueous decoction of mango flowers be used as an antiulcer agent? *J Ethnopharmacol.* 2006;106(1):29–37. doi:10.1016/j.jep.2005.11.032.
- Thirumurthi S, Graham DY. *Helicobacter pylori* infection in India from a western perspective. *Indian J Med Res.* 2012;136(4):549–62.
- Kate V, Mohsina S, Muthusami A, Shankar G, Sureshkumar S. *Helicobacter pylori* eradication in complicated peptic ulcer: Beneficial in most? *Int J Adv Med Health Res.* 2016;3(2):58. doi:10.4103/2349-4220.195947.
- Lawrence R, Gupta EJ. Antibacterial Activity of Acacia arabica (Bark) Extract against selected Multi Drug Resistant Pathogenic Bacteria. *Int J Curr Microbiol Appl Sci.* 2015;p. 213–22.
- Roqaiya M, Begum W, Jahufer R. Acacia arabica (Babool) - A Review on Ethnobotanical and Unani Traditional Uses as well as Phytochemical and Pharmacological Properties. *Int J Pharma Phytopharmacol Res.* 2015;4(6):315–21.
- Poonkothai M, Saravanan M. Antibacterial activity of Aegle marmelos against leaf, bark and fruit extracts. *Anc Sci Life.* 2008;27(3):15–8.
- Ilavarasan J, Monideen S, Vijayalakshmi M. Antiulcer activity of aegle marmelos linn. *Anc Sci Life.* 2002;XXI:256–9.
- Viswanathan V, Phadatar AG, Mukne A. Antimycobacterial and Antibacterial Activity of Allium sativum Bulbs. *Indian J Pharm Sci.* 2014;76(3):251–6.
- Lonkala S, Reddy ARN. Antibacterial Activity of Carica papaya Leaves and Allium sativum Cloves Alone and in Combination against Multiple Strains. *Pharmacognosy J.* 2019;11(3):600–2. doi:10.5530/pj.2019.11.95.
- Tope SA, Sunday OF, Gabriel AT. Mechanisms of Antiulcerogenic Effect of Garlic (*Allium sativum*) in Albino Rats. *Eur J Med Plants.* 2014;4(5):571–8.
- Karumari RJ. Antibacterial Activity of Leaf Extracts of Aloe Vera, Ocimum Sanctum and Sesbania Grandiflora against the Gram Positive Bacteria. *Asian J Biomed Pharm Sci.* 2014;4(35):60–3. doi:10.15272/ajbps.v4i35.564.
- Gopinathan S, Rameela N. Anti-ulcer activity of aloe vera juice and aloe vera and amla fruit combined juice in ethanol induced ulcerated rats. *Int J Pharm Pharm Sci.* 2014;6(6):190–7.
- Muhammad A, Lawan IM, Abubakar A, Dangora II. Antimicrobial Activity of Azadirachta indica (Neem) Leave Extract Against Some Clinical Isolates. *Dutse J Pure Appl Sci.* 2019;5(1b):97–104.
- Bhajoni PS, Meshram GG, Lahkar M. Evaluation of the Antiulcer Activity of the Leaves of *Azadirachta indica*.

- An Experimental Study. *Integr Med Int.* 2016;3(1-2):10-6. doi:10.1159/000442750.
25. Saravanakumar T, Ventatasubramanian P, Vasanthi NS, Manonmani E. Antibacterial potential of Daruharidra (*Berberis aristata* DC) against the pathogens causing eye infection. *Int J Green Pharm.* 2014;8:153-7.
 26. Vimala G, Shoba FG. A Review on Antiulcer Activity of Few Indian Medicinal Plants. *Int J Microbiol.* 2014;2014:519590.
 27. Velicanski A, Cvetković DD, Sinisa M, Vulić J, Djilas SM. Antibacterial activity of *Beta vulgaris* L. pomace extract. *Acta Periodica Technol.* 2011;42:263-9.
 28. Jagtap MJ, Deore AB. Antiulcer Activity of Methanolic Extract of Roots of *Beta vulgaris*, *Chenopodiaceae*. *Int J Pharm Sci Drug Res.* 2018;10(6):454-9. doi:10.25004/ijpsdr.2018.100605.
 29. Chinnala KM, Elsani MM, Pulla S. Evaluation of antiulcer activity of carica papaya seeds in experimental gastric ulcers in rats. *Int J Adv Biomed Pharm Res.* 2014;3(1):19-23.
 30. Srividya S, Velayudhan A. Sustainability and Health. *Int J Indian Psychol.* 2016;3(3):107-10. doi:10.25215/0303.103.
 31. Gregory M, Divya B, Mary RA, Viji MMH, Kalaichelvan VK, Palanivel V. Anti-ulcer activity of *Ficus religiosa* leaf ethanolic extract. *Asian Pac J Trop Biomed.* 2013;3(7):554-6. doi:10.1016/s2221-1691(13)60112-4.
 32. Ruban P, Gajalakshmi K. In vitro antibacterial activity of *Hibiscus rosa-sinensis* flower extract against human pathogens. *Asian Pac J Trop Biomed.* 2012;2(5):399-403. doi:10.1016/s2221-1691(12)60064-1.
 33. Srivastava S, Jaiswal J, Gautam H, Sharma S, Rao CV. Anti-ulcer activity of methanolic extract of *hibiscus rosa sinensis* leaves. *Int J Pharm Pharm Sci.* 2013;5(3):829-30.
 34. Mushore J, Matuvhunya M. Antibacterial properties of *Mangifera indica* on *Staphylococcus aureus*. *Afr J Clin Exp Microbiol.* 2013;14(2):62-74. doi:10.4314/ajcem.v14i2.4.
 35. Neelapu N, Muvvala S, Patil MB, Lakshmi BVS. Anti-ulcer activity and HPTLC analysis of *Mangifera indica* L. Leaves. *Int J Pharm Phytopharmacol Res.* 2012;1(4):146-55.
 36. Balsaraf SV, Chole RH. Antibacterial efficacy of *Mimosa pudica* (Lajavanti) against *streptococcus mutans*. *J Indian Assoc Public Health Dent.* 2014;12(4):317-9. doi:10.4103/2319-5932.147677.
 37. Vinothapooshan G, Sundar K. Anti-ulcer activity of *Mimosa pudica* leaves against gastric ulcer in rats. *Res J Pharm Biol Chem Sci.* 2010;1(4):606-14.
 38. Priya V, Abiramasundari P, Devi S, Jeyanthi GP. Antibacterial activity of the leaves, bark, seed and flesh of *moringa oleifera*. *Int J Pharm Sci Res.* 2011;2(8):2045-9.
 39. Hamid AK, Shariq B, Jiyauddin K, Kaleemullah M, Samer AD, Sakina R, et al. Anti-ulcer activity of *moringa oleifera* leave's extract in swiss albino mice against aspirin induced peptic ulcer. *World J Pharm Res.* 2015;4(5):406-21.
 40. Mittal R, Kumar R, Chahal HS. Antimicrobial activity of *Ocimum sanctum* leaves extracts and oil. *J Drug Deliv Ther.* 2018;8(6):201-4. doi:10.22270/jddt.v8i6.2166.
 41. Kaniganti S, Das MC, Bannaravuri R. Antiulcer activity of aqueous and ethanolic extracts of *Ocimum sanctum* leaves in albino rats. *Int J Basic Clin Pharmacol.* 2016;5(4):1353-8. doi:10.18203/2319-2003.ijbcp20162435.
 42. Pasha F, Irfan S. A Study on Antimicrobial Properties of *Phyllanthus niruri* and *Ocimum sanctum*. *Biomed Pharmacol J.* 2011;4(2):297-9. doi:10.13005/bpj/298.
 43. Mostofa R, Ahmed S, Begum M, Rahman S, Begum T, Ahmed S, et al. Evaluation of anti-inflammatory and gastric anti-ulcer activity of *Phyllanthus niruri* L. (*Euphorbiaceae*) leaves in experimental rats. *BMC Complement Alternat Med.* 2017;17(1):267. doi:10.1186/s12906-017-1771-7.
 44. Kasa P, Aluru S, Kishori B. Invitro antibacterial activity in the extracts of *Solanum Nigrum*. *Indian Streams Res J.* 2012;2(7):1-4.
 45. Totade S. Evaluation of Gastric Anti - Ulcer Activity of Hydroalcoholic Extract of *Solanum nigrum*: An Animal Study. *Res J Pharm Biol Chem Sci.* 2016;7(3):1221-4.
 46. Doughari JH. Antimicrobial Activity of *Tamarindus indica* Linn. *Trop J Pharm Res.* 2007;5(2):597-603. doi:10.4314/tjpr.v5i2.14637.
 47. Kumar S, Suman, Sharma S, Kalra P. Antiulcer effect of the methanolic extract of *Tamarindus indica* seeds in different experimental models. *J Pharm Bioallied Sci.* 2011;3(2):236-41. doi:10.4103/0975-7406.80778.
 48. Mostafa GM, Rahman M, Karim MM. Antimicrobial activity of *Terminalia chebula*. *Int J Med Aromatic Plants.* 2011;1(2):175-9.
 49. Sharma P, Prakash T, Kotresha D, Ansari A, Sahrm UR, Kumar B, et al. Antiulcerogenic activity of *Terminalia chebula* fruit in experimentally induced ulcer in rats. *Pharm Biol.* 2011;49(3):262-8. doi:10.3109/13880209.2010.503709.
 50. Pandey MK, Singh GN, Sharma RK, Lata S. Antibacterial activity of *Eclipta alba* (L.) Hassk. *J Appl Pharm Sci.* 2011;01(07):104-7.
 51. Banerjee A, Shrivastava N, Kothari A, Padh H, Nivsarkar M. Antiulcer activity of methanol extract of *Eclipta alba*. *Indian J Pharm Sci.* 2005;67(2):165-8.
 52. Sugandhi B, Bai GM. Antimicrobial Activity of *Mentha arvensis* L. (*Lamiaceae*). *J Adv Lab Res Biol.* 2011;2(1):8-11.
 53. Londonkar RL. Studies on activity of various extracts of *Mentha arvensis* Linn against drug induced gastric ulcer in mammals. *World J Gastrointest Oncol.* 2009;1(1):82. doi:10.4251/wjgo.v1.i1.82.
 54. Iyer S, Doktycz MJ. Research Highlights: Shear-activated nanotherapeutics. *Nanomedicine.* 2012;7(11):1653-5. doi:10.2217/nnm.12.148.
 55. Borrelli F, Izzo AA. The plant kingdom as a source of anti-ulcer remedies. *Phytother Res.* 2000;14(8):581-91. doi:10.1002/1099-1573(200012)14:8<581::aid-pt776>3.0.co;2-s.
 56. Kaur M, Rai J, Randhawa GK. Recent advances in antibacterial drugs. *Int J Appl Basic Med Res.* 2013;3(1):3. doi:10.4103/2229-516x.112229.
 57. Kumar R. A review on medicinal plants for peptic ulcer. Scholar Research Library. *Der Pharmacia Lettre.* 2011;3(3):414-20.
 58. Govind P, Saurabh J. Antiulcer Activity of *Nerium indicum* in Rats. *Res J Pharmacol.* 2010;4(3):66-8. doi:10.3923/rjpharm.2010.66.68.

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