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COMPARITIVE REVIEW ON ANTI-ULCER ACTIVITY OF SOME MEDICINAL PLANT EXTRACTS

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SEARCH

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Peptic ulcer, Plant extracts, Antiulcer, Gastro protective

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ABSTRACT: Peptic ulcer is an excavation of mucosa and may extend to the submucosal layer. The bacterium Helicobacter pylori is regarded as the most common cause of infection. Long-term use of NSAIDs (non-steroidal anti-inflammatory disease drugs) like Aspirin, Diclofenac, and Naproxen and stress were also regarded as causes of ulceration. Ancient technology of synthesizing and utilizing plantbased medicine is known from time immemorial. Chronic and complicated diseases have been cured with plant-based products. Considering their importance in manufacturing new medicines, their efficacy and safety have become a major concern. This literature review reviews some investigated plants that have shown promising results in mitigating peptic ulcers at different doses. Preliminary phytochemical screening of these herbs has shown the presence of important secondary metabolites like flavonoids, alkaloids, terpenoids, tannins which are responsible for the anti-ulcer activity. Acute toxicity studies have proved the safety of the selected plant extracts. This article reviews the overall active constituents, anti-ulcer, gastro protective activity of some medicinal plants investigated between 2015-2022.

INTRODUCTION: Peptic ulcers are generally caused due to an imbalance between destructive and defensive factors in the stomach. The destructive factors include HCl, pepsin, ethanol, NSAIDs, stress, smoking, and H-pylori infection. The defensive factors include mucus-bicarbonate barrier, mucin secretion, prostaglandins, and anti-oxidant enzymes ¹.

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Treatment for ulcers includes either antagonizing the destructive factors or stimulating the defensive factors 2 . The present pharmacological treatment includes histamine type 2 receptor antagonists such as ranitidine, cimetidine, or proton pump inhibitors like omeprazole 3 .

Side effects and relapse of ulcers are major concerns for these medicines. A wide range of plants contains phytochemicals like flavonoids, terpenoids, tannins, alkaloids that help in the treatment of ulcers as they have antioxidant activity and antibiotic activity with less or no side effects. This article gives information about some medicinal plants which were proved to have antiulcer activity.

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TABLES 1: EXTRACTION WITH NON-AQUEOUS SOLVENTS

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	Terminalia	Combretaceae	Leaves	Methanol	*	Female	Ethanol-acid	Akter S et
flavonoids, wistar								
coumarins rats						rats		

TABLES 2: EXTRACTION WITH AQUEOUS SOLVENT						
Botanical	Family	Parts	Chemical constituents	Animals used	Screening method	Reference
Name		used				
Azadirachta	Meliaceae	Leaves	Flavonoids, saponin,	Male Wistar	Pyloric ligation, aspirin,	Bhajoni PS
indica			alkaloids, tannins	rats	cold restraint stress-	et al., 2016
					induced	25
Balanites	Zygophyllaceae	Stem,	Flavonoids, polyphenols	Wistar rats	Ethanol, indomethacin,	Ugwah MO

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	al., 2019
	26
acid-induced	A
	e Araújo
<i>pinnatum</i> rats, swiss indomethacin-induced E	R <i>et al.,</i> 2021 ²⁷
	yede HO
papaya saponins rats et a	al., 2015
Citrus Rutaceae Fruit Flavonoids, polyphenols, Male wistar Ethanol-induced Se	elmi S <i>et</i>
	, 201 73
1	nang AP
	al., 2017
	29
tannins, saponins restraint stress induced, absolute ethanol	
	rvé EE <i>et</i>
	, 2018 30
<i>barteri</i> flavonoids, saponins, rats ligation, cold restraint al. alkaloids, sterols stress, Hcl/ethanol	, 2018
induced	
	maanah
1 ' '	angeneh M <i>et al.</i> ,
	2019^{31}
	ori MA et
	2017 32
	gheri SM
ovata fibers rats et a	al., 2018
Terminalia Combretaceae leaves Flavonoids, tannins, Male wistar Absolute ethanol, Sil	va LP <i>et</i>
	, 2015 ³⁴
induced	,
	agão TP
	al., 2018
triterpenoids, steroids Indomethacin induced	35
1 '	medi S et
	, 2015 ³⁶

TABLES 3: EXTRACTION WITH VARIOUS SOLVENTS

Botanical	Family	Parts	Solvent used	Chemical constituents	Animals	Screening	Reference
Name		used			used	method	
Averrhoa	Oxalidaceae	Leaves	Petroleum ether,	Tannins, flavonoids,	Wistar	Ethanol,	Pal A et
carambola			Chloroform,	phenols, terpenoids,	albino rats	pylorus	al., 2019 37
			Ethanol, Distilled	sterols, fats, fixed oils		ligation	
			water			induced	
Citrus	Rutaceae	Leaves	Ethanol, distilled	Alkaloids, phenols,	Wistar	Ethanol,	Sapkota B
maxima			water	flavonoids,	albino rats	water	et al., 2021
				terpenoids.Tannins		immersion	38
						stress-	
						induced	
Ficus	Moraceae	Stem,	Ethanol, acetone	Alkaloids, glycosides,	Adult	Ethanol-	Panchawat
religiosa		bark		steroids, flavonoids,	wistar	induced	S et al.,
				tannins, phenols	albino rats		2020 ³⁹
Melia	Meliaceae	Leaves	Alcohol, aqueous	Alkaloids, glycosides,	Wistar	Aspirin,	Kayande N
azedarach				flavonoids, saponins,	albino rats	Pyrolic	et al., 2018
				steroids, triterpenoids		ligation	40
Moringa	Moringaceae	Flowers,	Petroleum ether,	Alkaloids, glycosides,	Male	Acetic acid-	Patel VK,
oleifera		seeds	acetone, methanol	flavonoids, tannins,	albino	induced	Lariya NK
				saponins, steroids	wistar rats		<i>et al.</i> , 2019

DISCUSSION: This literature review consists of 40 medicinal plants belonging to different families having antiulcer activity. The most common plant parts used for the extract preparation were the leaves (52.5%), followed by the stem, bark (12.5%), seed (10%), flower (7.5%), roots (5.6%). The least used plant parts were fruits, rhizomes, aerial plants, and peels (2.5%). The most often preferred solvent for extract preparation was aqueous followed by methanol, ethanol, hydroalcoholic and petroleum ether.

The phytochemical screening of these extracts has shown the presence of alkaloids, flavonoids, tannins, terpenoids majorly, which are responsible for the anti-ulcer activity. *In-vivo* studies were also performed for all these plant extracts and satisfactory results were shown. Various screening methods were used for inducing ulcers in animals, of all, ethanol and pyloric ligation methods were mostly preferred. The authors declare no conflict of interest.

CONCLUSION: This review article concludes that the above-mentioned medicinal plants have shown significant antiulcer activity in animal models. Based on the above observations, the enlisted medicinal plants can also be considered for treatment or as adjunctive drugs to manage peptic ulcer disease.

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CONFLICTS OF INTEREST: Nil

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