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A REVIEW ON ANTIULCER ACTIVITY OF SOME MEDICINAL PLANTS

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ABSTRACT

Peptic ulcers represent the most prevalent disorder of the gastrointestinal tract, primarily arising from an imbalance between protective and aggressive gastric factors. These ulcers are particularly common in industrialized and developed nations, largely due to stressful living conditions. Contributing factors such as smoking, alcohol intake, stress, the use of non-steroidal anti-inflammatory drugs (NSAIDs), and poor nutritional habits may exacerbate the occurrence of peptic ulcers. Typical symptoms include abdominal pain and discomfort, with duodenal ulcers often presenting a pain-relief pattern associated with food intake, while gastric ulcers typically exhibit a pain-on-food pattern. Currently, the prevalence of acidity and ulcers is significant, leading to considerable suffering, with ulcers posing serious concerns due to their high rates of recurrence and mortality. The mortality rate for peptic ulcers is approximately 30%, with morbidity reaching up to 50%. Although numerous allopathic medications exist for treating peptic ulcers, they often come with adverse effects, prompting researchers to explore alternative treatment options. This exploration has resulted in the identification and utilization of herbal plants known for their anti-ulcer properties. A growing number of individuals are now turning to these medicinal plants, as they are generally considered safe, cost-effective, and devoid of adverse effects.

INTRODUCTION:

Ulcers are defined as open sores on the skin or mucous membranes, marked by the shedding of inflamed, dead tissue. These lesions can occur on the skin or mucous membranes, resulting in a superficial loss of tissue. While ulcers are frequently found on the skin of the lower extremities and within the gastrointestinal tract, they can develop in nearly any location. Various types of ulcers exist, including mouth ulcers, oesophageal ulcers, peptic ulcers, and genital ulcers, with peptic ulcers being particularly prevalent. Peptic ulcers involve the erosion of the stomach or duodenal lining. The two primary forms of peptic ulcers are gastric ulcers and duodenal ulcers, named for their respective Locations. It is possible for an individual to have both types simultaneously. Gastric ulcers, which occur in the stomach, are often associated with pain that may worsen with eating, especially in older adults. Symptoms can also include nausea, vomiting, and weight loss. Interestingly, gastric ulcers can develop even when acid production is normal or reduced. On the other hand, duodenal ulcers, located at the start of the small intestine, are characterized by intense burning pain in the upper abdomen that can disrupt sleep. This pain typically arises when the stomach is empty and is alleviated by eating. Duodenal ulcers are more common among younger males and can manifest on

both the front and back walls of the duodenum. In severe cases, peptic ulcers can pose life-threatening risks, presenting symptoms such as bloody stools, intense abdominal pain, cramps, and vomiting blood (B. Debjit *et al* .,).

AMPELOPSIS CANTONIENSIS

Plant name -*Ampelopsis cantoniensis*, **Family:** Vitaceae, **Part of plant:** Leaves, **Local name:** Che day, **Standard drug:** Omeprazole, **Solvent used:** Ethanol, **Method of extraction:** Spray drying technique, **Type of induction:** HPLC, **Results:** The analytical method proved to be selective, linear, accurate, sensitive .A. cantoniensis pray dried extract (ACP)was obtained using colloidal silicon dioxide as adjuvant and was shown to possess 25.94% ampelopsisn.it shown significant antiulcer activity in a model of an indomethacin-induced gastric lesion in rats and also produced a gastro protective effect (Duc Minh Nguyen *et al.,).*

OSYRIS QUADRIPARTITE

Plant name: *Osyris quadripartite*, **Family:** Santalaceae, **Part of plant:** No specific part mentioned, **Local name:** Wild tea plant, **Standard drug:** Omeprazole, **Solvent used:** Distilled Water, **Method of extraction:** Maceration technique, **Type of induction:** Ethanol induced ulcer method, **Result:** Osyris quadripartite was extracted and investigated for the anti-ulcer activity in the ethanol-induced ulcer disease method. The extracts were tested in three doses and compared to the standard drug, omeprazole. The extract at a higher dose exhibited more significant activity when compared to that at a lower dose and also the standard drug (Dinesh Babe J *et al.*,).

BETA VULGARIS

Plant name: *Beta vulgaris*, **Family:** Chenopodiaceae, **Part of plant:** Roots, **Local name:** Beetroot, **Standard drug:** Omeprazole, **Solvent used:** Methanol, **Method of extraction:** Maceration, **Type of induction:** Cold induced stress induced ulcer, **Results:** The methanolic extract of roots of Beta vulgaris was subjected for phytochemical investigation and LD50 studies. It was found that methanolic extract contained flavonoids, saponins, sterols, and alkaloids. The extract was tested for their lethal effect up to the dose level of 2000 mg/kg. None of them have produced abnormal behaviour or mortality in rats (Manoj Jagannath Jagtap *et al*.,).

CALPURNIA AURAE

Plant name: *Calpurnia aurea,* **Family:** Fabaceae, **Part of plant:** Leaves, **Local name:** Benth, **Standard drug:** Omeprazole**, Solvent used:** Ethanol**,** Methanol, **Method of extraction:** Maceration, **Type of induction:** Acetic acid induced ulcer method, **Results:** The study demonstrated that the hydromethanolic extract and solvent fractions were shown to have excellent antiulcer activity. The observed antiulcer potential could have been attributed to the existence of diverse bioactive molecules in the plant (Yared Andargie *et al.,*).

CAPPARIS ZEYLANICA

Plant name: *Capparis Zeylanica,* **Family:** Capparaceae, **Part of plant:** Leaves, **Standard drug:** Sucralfate, **Solvent used:** Ethanol, **Method of extraction:** Hot perforation method **Type of induction:** Chemical induced ulcer, **Results:** Morphological studies showed less conspicuous petechial marks and hemorrhages in stomach tissues after treatment with test drugs. Histopathological study revealed that C. zeylanica extract reduced stomach damages and eradicated H. pylori infections (Abhishek Tripathi *et al.,*).

CISSUS VERTICILLATA

Plant name: *Cissus Verticillata,* **Family:** Vitaceae, **Part of plant:** Leaves, **Local name:** Princess vine, **Standard drug:** Ranitidine, **Solvent used:** Methanol, **Method of extraction:** Soxhlet extraction, **Type of induction:** Aspirin induced gastric ulcer and alocohol induced ulcer, **Results:** The Methonolic extract high dose showed highly significant antiulcer activity followed by low dose also showing highly significant when compared to control (no gastric Protection). The group treated with Ranitidine (highly significant) showed marked reduction in gastric volume, gastric acidity, and ulcer index (Mohammed Vazir *et al .,*).

CUCUMIS SATIVUS

Plant name: *cucumis sativus,* **Family:** Cucurbitaceae, Part **of plant:** Fruit Pulp**,** seeds, **Local name:** cucumber, **Standard drug:** Ranitidine, **Solvent used:** Ethanol, **Type of induction:** Aspirin induced ulcer model, **Results:** In traditional Unani medicine, the herb cucumber (Cucumis sativusL.) is widely used to treat a wide range of ailments and ulcer is one of them. In various pharmacological preclinical evaluations of *Cucumis sativus* has proven its antiulcer activity also (Soumi Chattopadhyay *et al.,*).

DAUCUS CAROTA

Plant name: *Daucus Carota*, **Family:** Apiaceae, **Part of plant:** Fruit, **Local name:** Carrot
Standard drug: Pantaprazole, **Solvent used:** Water, **Method of extraction:** steam boiling
Type of induction: Acetic acid induced gastric ulcer, **Results:** The antioxidant profile of carrot together with the gastric antisecretory properties of some of the active constituents of carrot preparation and probable gastric cytoprotection offered by vitamin A or beta-carotene may be responsible for its antiulcer effect. Overall, both ulcer preventive effects and ulcer healing properties of the pantoprazole were significantly enhanced in animals who received the co-administration of carrot fruit (Syed Mohammed Basheeruddin Asdaq *et al.*,).

AZADIRACHTA INDICA

Plant name: *Azadirachta Indica*, **Family:** Meliaceae, **Part of plant:** Leaves, **Local name:** Neem, **Standard drug:** Ranitidine, **Solvent used:** Distilled water, **Method of extraction:** soxhlet extraction, **Type of induction:** Acetic acid induced gastric ulcer, **Results:** AE showed a dose-dependent and significant ($p < 0.05$) decrease in the UI and an increase in the PI in all models employed compared to the control group. AE caused a dose-dependent decline in the gastric content volume, free acidity, and total acidity (Pranjit Santonu Bhajoniet *et al.*,).

CUSCUTA REFLEXA

Plant name: *Cuscuta Reflexa*, **Family:** Convolvulaceae, **Part of plant:** Stem, **Local name:** Giant dodder, **Standard drug:** Ranitidine, **Solvent used:** Distilled water, **Method of extraction:** Soxhlet extraction, **Type of induction:** Pyloric ligation, **Results:** Oral administration of alcoholic and aqueous extracts of Cuscuta reflexa exhibited dose dependent significant protection in the pylorus ligation induced peptic ulcerated animals (Dev Prakash *et al*.,).

CYPERUS CONGLOMERATUS

Plant name: *Cyperus conglomeratus*, **Family:** Cyperaceae, **Part of plant:** Above ground parts, **Local name:** Thanda, **Standard drug:** Ranitidine, **Solvent used:** Methanol, **Method of extraction:** Alcoholic extraction, **Type of induction:** Ethanol induced gastric ulcer, **Results:** It could be concluded that C. conglomeratus extract provides significant gastro protective activity in ethanol-induced gastric ulcer and ought to be included in nutraceuticals in the future for ulcer treatment (Abdelsamed Elshamy *et al.*,).

LAGENARIA SICERARIA

Plant name: *Lagenaria Siceraria*, **Family:** Cucurbitaceae, **Part of plant:** Fruit, **Local name:** Bottle gourd, **Standard drug:** Ranitidine, **Solvent used:** Methanol, **Method of extraction:** Evaporation, **Type of induction:** Ethanol and aspirin induced ulcer, **Results:** The extract (100 mg/kg & 200 mg/kg) showed significant ($P < 0.005$) reduction in gastric volume, free acidity and ulcer index as compared to control. This present study indicates that *Lagenaria siceraria* fruit extract have potential anti-ulcer activity in these models (Vivek Srivastava *et al.*,).

MORINGA OLEIFERA

Plant name: *Moringa Oleifera*, **Family:** Moringaceae, **Part of plant:** Leaves, **Local name:** Drum Stick , **Standard drug:** ethanol and water, **Solvent used:** Methanol, **Method of extraction:** Methanolic extract, **Type of induction:** Aspirin induced peptic ulcer, **Results:** Metabolic extract of *Moringa oleifera* leaves shows a significant ($p<0.01$) anti-ulcer activity in a dose dependent manner as well as significant ($p<0.01$) reduction in the ulcer index when compared to control group, the anti-ulcer activity results was relatively comparable to the positive control (Hamisu Abdul *et al.*,).

PERSEA AMERICANA

Plant name: *Persea Americana*, **Family:** Lauraceae , **Part of plant:** Seed, **Local name:** Avacado tree, **Standard drug:** Omeprazole & Ranitidine, **Solvent used:** Distilled water **Method of extraction:** Decoction, **Type of induction:** Alcohol induced peptic ulcer, **Results:** Oral administrations of extracts 100 mg/kg one day before inducing ulcer protected 50% of exposed animals compared with 37.5% by omeprazole (20mg/kg) and 25% by ranitidine (50mg/kg); while, a 7-days treatment of induced ulcers healed 72.92% of animals, compared with 88.9% by the reference drugs. The extract contained alkaloids, phenolic compounds, flavonoids, sterols/triterpenes, and reducing acids. The findings back the observations made by other researchers and support the use of avocado seeds (Franklin Bwironde Makelele *et al.*,).

PSIDIUM GUAJAVA

Plant name: *psidium guajava*, **Family:** Myrtaceae, **Part of plant:** Leaves, **Local name:** Guava, **Standard drug:** Ranitidine, **Solvent used:** Acetone and hexane, **Method of extraction:** Solvent extraction, **Type of induction:** Pylorus ligation induced gastric

ulcer, **Results:** The present study was performed in pylorus ligation induced gastric ulcer model in albino rats in which the ability of hydroalcoholic extracts of *Psidium guajava* was tested at a dose level of 400 mg/kg body weight orally and compared with Ranitidine (10 mg/kg) as standard. From the results it is concluded hydro alcohol leaf extracts of *Psidium guajava* 400 mg/kg dose level showed significant anti-ulcer activity when compared to that of standard drug (M. Divyapraba *et al.*,).

RUMEX NEPALENSIS

Plant name: *Rumex nepalensis,* **Family:** Polygonaceae, **Part of plant:** Roots, **Local name:** Nepal dock, **Standard drug:** Cimetidine, **Solvent used:** methanol, **Method of extraction:** Maceration, **Type of induction:** Acetic acid induced ulcer, **Results:** From this study, it is concluded that hydromethanolic crude extract and solvent fractions of *R. nepalensis* root showed promising anti-ulcer activity. This upholds its folkloric use. Thus, it is considered as a possible source to develop a new anti-ulcer agent (Woretaw Sisay Zewdu *et al.*,)**.**

SAPONARIA OFFICINALIS

Plant name: *Saponaria Officinalis*, **Family:** Caryophillaceae, **Local name:** Soapwort, **Standard drug:** Omeprazole, **Solvent used:** Ethanol, **Method of extraction:** maceration, **Type of induction:** in vitro method, **Results:** The ethanol extract of *Saponaria officinalis* at a concentration of 100µg, showed maximum percentage of inhibition of 67.17±1.96% as compared to omeprazole 71.47±0.52%, demonstrated the highest percentage of inhibition of the H+/K+ - ATPase. The results of this study suggest that *Saponaria officinalis* ethanol extract contains substances that can block enzymes and neutralize acids, making it a potential alternative treatment for digestive issues (Ms. Sowmya B A *et al.*,).

CORCHORUS TRILOCULARIS

Plant name: *Corchorus trilocularis*, **Family:** Tiliaceae, **Part of plant:** Entire plant, **Local name:** Mrenda, **Standard drug:** Lansoprazole, **Solvent used:** Chloroform, ethanol, **Method of extraction:** Soxhlet extraction, **Type of induction:** Aspirin induced gastric ulceration, **Results:** In aspirin induced gastric ulceration in rats, the 70% ethanolic extract of *Corchorus trilocularis* Linn showed 18.70% and 46.99% protection from ulcers at 250mg/ kg and 500mg/kg doses respectively. The acid secretory parameters like total acidity and volume of gastric secretions were also decreased. Thus the current study showed that *Corchorus trilocularis* Linn could be used as a potential anti-ulcer agent that could be beneficial for geri- atrics and patients under frequent medication suffering with ulcers (Shaista Omer *et al.*,).

WEDELIA TRILOBATA

Plant name: *Wedelia trilobata***, Family:** Asteraceae, **Part of plant:** Whole plant, **Local name:** Sphagnecola trilobata, **Standard drug:** Ranitidine, **Solvent used:** Ethanol, **Method of extraction:** Soxhlet apparatus, **Type of induction:** Pylorus ligation induced ulcer method, **Results:** Qualitative phytochemical analysis showed phenolic compounds, flavonoids, glycosides, carbohydrates, and tannins. In vivo antiulcer activity in rats were studied using 100 and 200 mg/kg, p.o doses of *Wedelia trilobata*. The percentage of protection were significantly found to be increased, with EEWT at dose of 100mg/kg and 200 mg/kg (S.Ruby *et al.*,).

CORDIA AFRICANA

Plant name: *Cordia Africana,* **Family:** Boraginaceae**, Part of plant:** Seeds, **Local name:** East African cordia, **Standard drug:** Ranitidine, **Solvent used:** Methanol, **Type of induction:** Pylorus ligation method, **Results :** The result of this study showed that the hydromethanolic crude extract of *Cordia Africana* has strong anti-secretory and ulcer protective activities against ulcers produced by pylorus ligation (Yazachew Engida Yismaw *et al.*,).

NYMPHEA ALBA

Plant name: *Nymphaea Alba,* **Family:** Nymphaeaceae, **Part of plant:** Flower, **Local name:** Nymphaea Alba Linn, white lotus, **Standard drug:** Omeprazole, **Solvent used:** Chloroform

Method of extraction: Hot percolation method, **Type of induction:** Pylorus ligation, **Results:** This present study indicates that *Nymphaea alba* flower extract have potential Anti-ulcer activity in the both models. These results may further suggest that Ethanolic extract was found to possess Antiulcerogenic as well as ulcer healing properties, which might be due to its Anti-secretary activity (Ashish K *et al.*,).

MUSSAENDA PHILIPPICA

Plant name: *Mussaenda philippica*, **Family:** Rubiaceae, **Part of plant:** Leaves, **Standard drug:** Ranitidin**e, Solvent used:** Distilled water, **Method of extraction:** Aqueous extraction, **Type of induction:** Pylorus ligated induced method, **Results:** In conclusion the aqueous extract of *Mussaenda philippica* leaves possess potential antiulcer activity in experimental rat models (Rasmita Jena *et al.*,).

ARTEMISIA CAMPESTRIS

Plant name: *Artemisia campestris*, **Family:** Asteraceae, **Part of plant:** aerial part, **Local name:** Field wormwood, **Standard drug:** Omeprazole, **Solvent used:** Distilled water, **Method of extraction:** Aqueous and hydroethanolic extract, **Type of induction:** Ethanol induced gastric ulcer, **Results:** These results were confirmed by a decrease in mucosal thickness and MDA level in the group treated with the plant compared to the control ulcer group. The acute toxicity study revealed no abnormal sign or death to the mice treated with 4 g/kg and 8 g/kg of both extracts. This funding reveals a safe antiulcer activity of Moroccan Artemisia campestris L. subsp. Glutinosa (Mohamed Marghich *et al* .

HUGONIA MYSTAX

Plant name: *Hugonia mystax*, **Family:** Linaceae, **Part of plant:** Leaves, **Local name:** Climbing flax, **Standard drug:** Lansoprozole, **Solvent used:** Ethanol, **Method of extraction:** Soxhlet apparatus, **Type of induction:** Indomethacin induced ulcer, **Results:**. *Hugonia mystax* ethanol extraction possess antiulcer properties in different gastric ulcer models. The antiulcer activity of the HMEE may be attributed to the polyphenolic compounds that are present in it (Devendra S *et al.*,).

HELITROPIUM CRISPUM

Plant name: *Heliotropium crispum*, **Family:** Boraginaceae, **Part of plant:** Roots, **Local name:** Indian turnsole, **Standard drug:** Omeprazole, **Solvent used:** Chloroform, **Type of induction:** Ethanol induced gastric ulcer, **Results:** *Heliotropium crispum*, showed a significant decrease in ulcer index and % inhibition except the n-hexane fraction, whose results were insignificant compared to the disease control group. Thus, it was concluded that H. crispum shows an antiulcer effect by decreasing gastric juice volume and acidity (Syeda Farheen Fatima *et al.*,)

HANNOA KLAINEANA

Plant name : ***Hannoa klaineana*, **Family: Simaroubaceae, **Part of plant:** Leaves, **Local name :** Takardar giwa, **Standard drug:** Omeprazole, **Solvent used:** Methanol, **Method of extraction:** Maceration, **Type of**

induction : Ethanol induced ulcer model, **Results:** This study suggested that methanol extract of the leaves of *Hannoa klaineana* is safe for oral administration and exhibited strong anti-ulcer effect, thus validating the traditional use of the plant leaves in ulcer treatment (Ibrahim Abubakar *et al.,*).

CONCLUSION

Within the present observe, some medicinal plants as shown in review for examples *Ampelopsis cantoniensis, Osyris quadripartite, Beta vulgaris, Calpurnia aurea, Capparis Zeylanica, Cissus Verticillata, Cucumis sativus, Daucus Carota, Azadirachta Indica, Cuscuta Reflexa, Cyperus conglomeratus, Lagenaria Siceraria, Moringa Oleifera, : Persea Americana, psidium guajava, Rumex nepalensis, Saponaria Officinalis, Corchorus Trilocularis, Wedelia trilobata, Cordia Africana, Nymphaea Alba, Mussaenda philippica, Artemisia campestris, Hugonia mystax, Heliotropium crispum, Hannoa klaineana* had been proved to possess valuable anti-ulcer properties as they comprise a huge range of secondary metabolites.

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