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THERAPEUTIC POTENTIAL OF HERBAL REMEDIES USED IN MANAGEMENT OF REFLUX ESOPHAGITIS

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Abstract-
Reflux esophagitis is most common disease which is affecting population globally lowering the quality of life. When it comes to treating this disease there are multiple factors responsible for causation hence it requires longer time for relief of symptoms. Evaluation of these causes is very essential commonest causes are food –diet-sleep pattern, mental stress, obesity, genetic history and many more. Hence it is seen that management becomes difficult hence patient might shift from one treatment modality to another to get relief which has negative effects which need to be overcome. There are numerous plants and herbs which are commonly used as home remedies for this disorder. They are usually beneficial in relieving symptoms. The current review focuses on plants having medicinal value and clinically demonstrated to have efficacy in management of reflux esophagitis

Key words- well being, quality of life, herbal remedies , reflux esophagitis
Abbreviations- Lower Esophageal sphincter (LES), Percentage(%)

Introduction-

Though there are a number of potential contributing factors , the main cause of gastroesophageal reflux disease is a dysfunction of the lower esophageal sphincter (LES). Various pathological as well as physiological factors also contribute to GERD[1]The symptoms of gastroesophageal reflux disease (GERD) are caused by the reflux of stomach contents into the esophagus, as defined by the Montreal definition.[2]Chest pain, regurgitation, and heartburn are a few of the typical GERD indications and symptoms. GERD can also cause some other symptoms, like laryngitis, asthma, erosion of tooth , and chronic cough. Moreover, GERD greatly raises the risk of developing esophageal squamous epithelium

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inflammation, cancer, mental illnesses, head and neck problems, respiratory issues, and cardiovascular diseases.[3]Age over fifty, low socioeconomic status, tobacco use, excessive alcohol consumption, connective tissue disorders, pregnancy, post lunch supination, and different drug classes from conventional system of medicine are additional risk factors that have been independently linked to the onset of GERD symptoms.[4,5,6]In India, the prevalence of GERD varies between 7.6% and 30%; in most population research, mostly due to the usage of spices and non-vegetarian meals .[7]

Pathogensesis-
Heartburn and regurgitation are common signs of gastro-oesophageal reflux disease, but it has also been linked to extra-oesophageal manifestations such laryngitis, asthma, and persistent cough.Multiple factors contribute to the pathophysiology of gastro-oesophageal reflux disease, including temporary relaxations of the lower oesophageal sphincter and various anomalies of the lower oesophageal sphincter pressure.The aetiology of gastro-oesophageal reflux disease is further complicated by delayed stomach emptying, impaired mucosal defence mechanisms, reduced oesophageal clearance, and hiatal hernia.[8]

CONVENTIONAL THERAPY FOR GERD
Surgical and endoscopic procedures, as well as medication therapy, are common forms of treatment for GERD. For treating GERD, proton-pump inhibitors (PPIs) are the first line of treatment. Nevertheless, even using PPIs, up to 50% of patients stated that their reflux symptoms persisted.
Modifications to diet and lifestyle can be useful add-ons for managing GERD. Clinical guidelines recommended that individuals with symptomatic GERD benefit from weight loss, quitting smoking, avoiding trigger foods and late meals, and elevating their head of the bed while they sleep.[9]
HERBAL PLANTS USED IN MANAGEMENT OF GERD

Active Ingredients in Plants and herbs alleviate the symptoms of GERD.
Herbal remedies and plants are commonly utilized to alleviate reflux symptoms in patients. The incredibly low toxicity of these remedies makes them especially appealing. They have also been reasonably well studied and are safe, especially for reflux-affected infants. Demulcents are thought to be beneficial because they lessen inflammation and protect the gastric mucosa.

1. Vanilla Plantifolia
Vanilla is produced from Vanilla Plantifolia plant, a member of Orchidaceae family. The original habitat is Mexico used widely in different cuisines all over the word since it has peculiar pleasant aroma which makes it expensive. Vanilla serves as aphrodisiac properties.[10] Vanilla beans (fruit) have volatile components. Vanilla includes significant elements that can be utilized to cure a variety of ailments. The most popular flavoring is vanilla, which finds use in a variety of industries including food, beverage, medicine, and fragrance.[11] This study suggests that vanilla planifolia has a wide range of antibacterial activity. The results of the different screening tests also show that the plant's stem and leaves have a discernible inhibitory effect on the pathogens under investigation. It is interesting to note that this plant's leaf extract was discovered to be highly effective against Pseudomonas aeruginosa, one of the bacteria that is highly resistant to manmade medications. Therefore, this plant may serve as a source for the development of novel antibacterial compounds[12].
Rich in antioxidants, anti-inflammatory agents and bioactive compounds, vanilla exhibits diverse health benefits according to Ayurvedic principles. From its potential to alleviate stress and anxiety to its anti-microbial and anti-cancer properties, vanilla emerges as a versatile herb with

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2. Zingiber Officinalis-

Ginger, a commonly used herb belonging to the family *Zingiber officinale,* is used as a spice and a nutritional supplement around the globe. Ginger has long been used in traditional Chinese and Indian medicine to treat gastrointestinal disorders like fever, indigestion, nausea, vomiting, and flatulence.[14] Studies have shown that a wide range of physiologically active volatile and non-volatile phytochemicals are present in ginger. These include phenolics (gingerols, 6-shogaol, 6-paradol, and zingerone) and monoterpenes (limonene, citral). An oil component called limonene has antiviral, anti-inflammatory, antioxidant, and gastroprotective properties. It also heals cancer and gastric reflux.[15,16]

Ginger promoted increased lower esophageal sphincter relaxation and reduced esophageal contraction velocity and provided an antiflatulant effect[17]. Ginger was found to be more effective than a placebo in reducing dyspepsia symptoms, such as epigastric pain, in a thorough analysis of randomized controlled trials from twelve research papers including 1278 participants.[18] Bhargava and his colleagues found that anorexia-cachexia syndrome patients (n = 14) with advanced cancer showed a substantial reduction in upper gastrointestinal symptoms, such as reflux, ulcer-like symptoms, dysmotility, and nausea, when ginger (1650 mg daily) was taken. Moreover, an electrogastrogram (EGG) in nine of the fifteen patients revealed enhanced gastric myoelectrical activity in the stomach, which may be related to motility.[19]

3.Aloe vera-

A xerophytic shrub, Aloe barbadensis miller, popularly known as Aloe vera, acts as an antioxidant, anti-inflammatory, immunoregulatory, wound healing, anti-cancer, and many more.
It contains approximately 75 distinct medicinal molecules which include alkaline phosphatase, amylase, bradykinase, catalase, nataloins, barbaloins, auxins, gibberellins, phosphoric acid , vitamins, niacin, riboflavin, B12, folic acid minerals, anthraquinone. The alkaline components are believed to be beneficial in reducing excess stomach acid, alleviating gastritis symptoms, and maintaining a normal gastric pH of 1-2 to 4-5. [20] Aloctin A, a glycoprotein in Aloe species, when intravenously given, was shown to lower gastric juice, acid, and pepsin output and suppress acute gastric lesions in a study conducted on rats[21]In another study, A. vera treatment improved interleukin-10 levels, reduced tumor necrosis factor (TNF-α) levels, and decreased leukocyte adherence to postcapillary venules in rats with stomach ulcers.. Furthermore, histological investigation showed decreased stomach inflammation and ulcer size, increased epithelial cell proliferation, and gastric gland development. [22]According to Polish epidemiological research, A. vera was often used to treat gastric hyperacidity and duodenal and stomach ulcers among smokers[23] The activity of lectins found in A. vera has been believed to be responsible for reducing gastric acid secretion; they prevent parietal cells from absorbing aminopyrin, which lowers gastric acid production[24]. Clinical data and an ethnobotanical history supporting its safety have led to the classification of aloe vera as generally recognized as safe. Additionally, studies have shown that A. vera formulations, which are widely readily available and cost-effective, have therapeutic effects against a number of other conditions that often coexist with GERD, including peptic ulcers, irritable bowel

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syndrome, ulcerative colitis and more[25,26,27].

4. Chamomile-

German chamomile (Chamomilla recutita) and Roman chamomile are the two common types of chamomile, which is grown all over the world and belongs to the Asteraceae/Compositae family. A number of conditions, including hypersensitivity, inflammation, muscle spasms, irregular periods, insomnia, wound healing, gastrointestinal problems, joint pain, hemorrhoids, and many more, can be treated with chamomile medication. There are 120 secondary metabolites in chamomile, comprising 36 flavonoids and 28 terpenoids[28,29]. German chamomile flowers yield an essential oil that comprises α-bisabolol and its oxide azulenes, which include derivatives of acetylene and chamazulene. The main constituents of Roman chamomile essential oil are angelic and tiglic acid esters, with trace amounts of chamazulene, farnesene, and α-pinene. Furthermore, up to 0.6% is composed of sesquiterpene lactones of the germacranolide class, such as nobilin and 3-epinobilin. Major bioactive components include flavonoids (apigenin, luteolin, patuletin, and quercetin), coumarins (herniarin and mucilumbelliferone), terpenoids, mucilage, α-bisabolol, bisabolol oxides A and B, chamazulene, azulenesse, farnesene, spiro-ether quiterpene lactones, and hydroxycoumarins [30,31]. Chamomile has long been used as a remedy for a variety of gastrointestinal conditions, such as ulcers, "spasm" or colic, upset stomach, gas, flatulence, and digestive difficulties. In particular, chamomile eases the contractions of the muscles that move food through the intestines, soothes the stomach, and relieves flatulence. Previous studies have shown that a commercial product (STW5, Iberogast) can prevent the formation of stomach ulcers. Extracts of bitter candy tuft, liquorice root, Angelica root, chamomile flower, caraway fruit, peppermint leaf, milk thistle fruit, and larger celandine herb were included in this concoction.

In addition to a decrease in stomach acid production, an increase in protective mucus secretion, a rise in prostaglandin E (2) release, and a decrease in leukotriene production, the administration of STW5 extracts led to a dose-dependent reduction in ulcer formation. The outcomes showed that STW5 was just as successful as a commercial antacid at lowering stomach acidity.It was also more effective in preventing subsequent hyperacidity.[33]According to preclinical research, chamomile can inhibit Helicobacter pylori, the bacterium that causes stomach ulcers.34 It has been demonstrated that chamomile helps reduce smooth muscle spasms, which are connected to a number of inflammatory gastrointestinal disorders. Because chamomile flower extract has anti-inflammatory, antispasmodic, and wound-healing qualities, it is used internally to treat gastrointestinal complaints.[35]Numerous components of the chamomile flower have anti-inflammatory properties. According to the research conducted, a mixture of myrrh, coffee charcoal, and chamomile flower extract was proved to be efficacious, well-tolerated, and safe for administering to individuals experiencing symptoms of severe diarrhea. Notable positive results were observed in patients with irritable bowel syndrome (IBS) and inflammatory bowel disease (IBD), which includes ulcerative colitis and Crohn's disease.[36]Chamomile, a traditional herbal remedy, is still utilized due to its phytochemicals. While it may improve heart health, immunity, and even offer some cancer protection, extensive research is still required. Improved clinical research and studies can validate and develop the potential benefits of chamomile, making it a promising herbal medicine for the future[37].

5. Licorice-

Known for its sweetness, Licorice (Glycyrrhiza glabra) also has anti-ulcer, anti-inflammatory, and cytoprotective benefits.[38] Glycyrrhizic acid, a molecule responsible for its "sweetening" behavior, hydrolyzes to produce 18-beta-glycyrrhetinic acid, which possesses anti-inflammatory, cytoprotective,

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and antiulcer properties. Indeed, licorice-based products that lack glycyrrhetinic acid or its prodrug similarly lack any biological action.[39] The presence of glycyrrhetinic acid-containing licorice derivatives has a positive impact on the gastrointestinal mucosa as they extend the duration of these prostaglandins.[40] Studies demonstrated the anitulcer efficacy of licorice products at dosages of 400–500 mg/day of glycyrrhetinic acid and 750–1000 mg/day of its prodrug.[41,42] Deglycyrrhizinated licorice(DGL) reduced aspirin-induced gastric bleeding in human studies; it is highly recommended as an antiulcer in individuals on prolonged ulcerogenic medicines such as aspirin, nonsteroidal anti-inflammatory agents, and corticosteroids.[43] Researchers administered DGL (760 mg, three times a day) or a placebo to 33 individuals suffering from gastric ulcers for a month.The DGL group experienced a 78% reduction in ulcer size, while the placebo group only saw a 34% reduction. 44% of the DGL group made a full recovery.[44]For a duration of two weeks, 380 mg of licorice taken twice daily was added to a traditional triple regimen based on clarithromycin to evaluate its effectiveness in eliminating H. pylori in 120 patients suffering from either nonulcer dyspepsia (NUD) or peptic ulcer disease (PUD). Following six weeks of treatment, licorice showed an 83.3% therapeutic response whereas the control group showed 62.5%. It has been shown that G. glabra flavonoids suppress H. pylori, including those that are resistant to antibiotics. [45]

6. Basil-

Basil is popular as the "Queen of Herbs and Elixir of Life" because of its medicinal and spiritual value. A study revealed that 60% of GERD patients experienced heightened symptoms during stressful events.[46] Regular Basil intake has the dual benefit of safeguarding and purifying the cells and organs of the body, while also alleviating harmful stress by inducing relaxation and tranquility in the mind. [47] Mechanisms contributing to its anti-ulcer efficacy include a decrease in harmful components like lipid peroxidation and acid-pepsin production, as well as an increase in gastric defense aspects like mucin secretion, cellular mucus, and mucosal cell lifespan.[48,49]It is now clear that the fixed oil of basil seeds, Ocimum sanctum L. (Labiatae), effectively prevented ulcers in rats and guinea pigs that were brought on by stress, aspirin, indomethacin, alcohol, histamine, reserpine, and serotonin. In these animal trials, researchers used oil doses of 1.0, 2.0, and 3.0 mL/kg and found a significant decrease in antiulcer effects. Aspirin-induced stomach ulcers and a significant decrease in gastric output were also observed in rats with pylorus ligation. Basil seed oil's histamine antagonistic, lipoxygenase-inhibiting, and antisecretory qualities may be related to its antiulcer efficacy.[50] People who use tulsi have reported reduced stress, anxiety, and depression. Tulsi has been shown in a 6-week, randomised, double-blind, placebo-controlled experiment to significantly reduce overall stress.[51]

Conclusion-

Herbs are used for management of GERD symptoms since ancient times. A herbal approach in conjunction with medications can help manage underlying causes of GERD while also managing symptoms, allowing many patients to reduce or eliminate long-term use of medicines from conventional therapy. Cholagogues and anticholinergics may help alleviate symptoms and improve general health, particularly when paired with lifestyle adjustments. Demulcents and inflammation modulators can help reduce acute symptoms and repair damaged tissues of the gut. Herbal medications along with lifestyle modifications can help to lessen the symptoms and frequency of GERD episodes while also increasing overall well-being and quality of life. At the same time, herbal remedies should be used only after consultation with a physician. These techniques require further research to discover appropriate dosages and specific drugs.

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