EJPMR, 2026, 13(7), 374-379 **Review Article** **Impact Factor: 8.158**

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

ISSN (O): 2394-3211
ISSN (P): 3051-2573
Coden USA: EJPMAG

CHEMICAL CONSTITUENTS FROM MEDICINAL PLANTS USED AS EMETICS AND ANTIEMETICS- A REVIEW

Lattupally Varalakshmi[1]*, Musham Tharun[2], Pasula Nikhil[3], Paga Pavani[4], Nalaganti Shiva Kumar[5], Munigonda Nithin Kumar[6]

[1,2,3,4,5,6]Holy Mary Institute of Technology & Science (College of Pharmacy) Bogaram(V), Keesara (M), Medchal (Dist) 501 301, Telangana, India.

***Corresponding Author: Lattupally Varalakshmi**

Holy Mary Institute of Technology & Science (College of Pharmacy) Bogaram(V), Keesara (M), Medchal (Dist) 501301, Telangana, India. **DOI:** https://doi.org/10.5281/zenodo.21157100

How to cite this Article: Lattupally Varalakshmi[1]*, Musham Tharun[2], Pasula Nikhil[3], Paga Pavani[4], Nalaganti Shiva Kumar[5], Munigonda Nithin Kumar[6]. (2026). Chemical Constituents From Medicinal Plants Used As Emetics and Antiemetics- A Review. European Journal of Pharmaceutical and Medical Research, 13(7), 374–379.

Article Received on 05/05/2026 **Article Revised on 25/06/2026** **Article Published on 03/07/2026**

ABSTRACT

Medicinal plants have important chemical constituents show better biological activity. secondary metabolites obtain from medicinal plants such as flavonoids, alkaloids, polyphenols, terpenoids, glycosides and essential oils are exhibit their biological effects. effective and safe use of medicinal plants depends on understanding their phytochemistry, biological actions. Many people trust on medicinal plants since olden days because of effectiveness, less cost, easy availability, less side effects. The aim of our review is to provide chemical constituents from medicinal plants used as emetics and antiemetics

KEYWORDS: Medicinal Plants, chemical constituents, Emetics, Antiemetics.

INTRODUCTION

Medicinal plants play a key role as a source of drugs, many drugs currently derived from traditional herbal medicine. In many countries around the world, medicinal plants are oldest form of medication used for thousand years in traditional medicine. Medicinal plants have different phytochemicals such as alkaloids, flavonoids, glycosides, terpenoids are responsible to treat various diseases and they show potential health benefits.[1]

Emetics cause vomiting, it is a evacuation process or elimination of gastric content. Vomiting is useful for removal of harmful substances from stomach and vomiting is a physical event, eliminates the gastric content from the mouth. vomiting center (postrema) is located in medulla oblongata of brainstem, chemoreceptor trigger zone (CTZ) and nucleus tractus soliterius (NTS) causes vomiting are present in the area of postrema of of medulla oblongata is located in brainstem.[2]

Anti emetics antagonize the actions of emetics and are used to stop Vomiting, they block signals that trigger vomitings.[3]

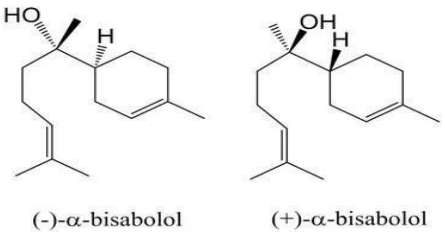
Many medicinal plants are used effectively as emetics and antiemetics. The aim of this paper is to provide chemical constituents obtain from medicinal plants are responsible for emetics and antiemetics.

MATERIALS AND METHODS

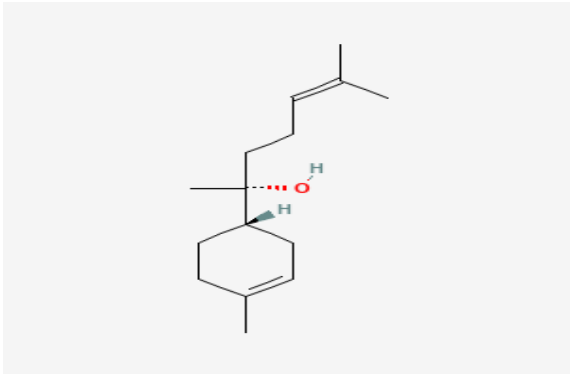
Medicinal plants used since olden days to treat various ailments, and are very effective as emetics also anti emetics, this review gives information on chemical constituents obtained from medicinal plants are used to treat as emetics and also antiemetics. Chemical constituents include α-Bisabolol, α-bisabolol oxide A and α-bisabolol oxide from Chamomile[4,5], Linalool and linalyl from Lavandula[6.7,8], Anethole, estragole and fenchone from Fennel[9,10], Gingerol (specifically 6-gingerol), Shogaols (specifically 6-shogaol), Zingerone, and Paradols from Ginger[11.12,13], Menthol and Carvone from Peppermint[14,15], Carvone and Limonene From Caraway oil[16,17,18], chemical constituents are used as emetics are emetine and cephaeline from Ipecacuanha (Psychotria ipecacuanha[19,20,21], are lobeline from Indian tobacco.[22,23] protopine from Mexican Poppy[24,25], Sanguinarine from Sanguinaria Canadensis.[26,27]

RESULTS AND DISCUSSION

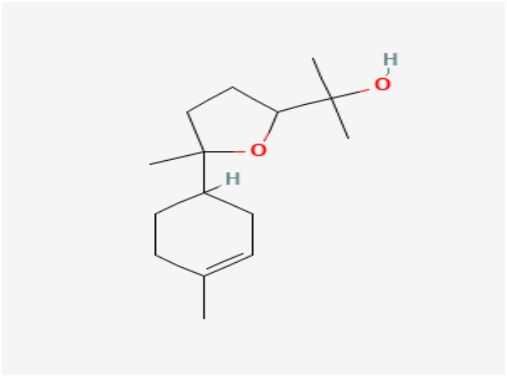
Chemical Constituents: A-Bisabolol, A-Bisabolol Oxide A and A-Bisabolol Oxide B (sesquiterpene alcohols and oxanes)
Plant name: Matricaria Chamomilla L. (Mc) and Chamaemelum Nobile (L.)
Family: Asteraceae



(-)-α-bisabolol (+)-α-bisabolol



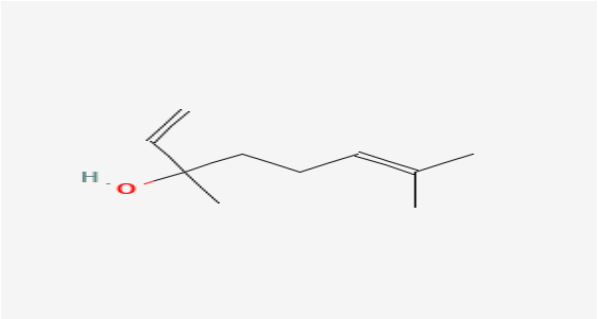
Bisabolol



α-bisabolol oxide B

α-Bisabolol oxides (A and B) show antiemetic activity mainly by protecting the gastric mucosa and calming the gastrointestinal tract. They enhance cytoprotective factor like prostaglandins and nitric oxide and help maintain mucosal blood flow, which prevents irritation and ulceration of the stomach lining that can trigger nausea and vomiting.

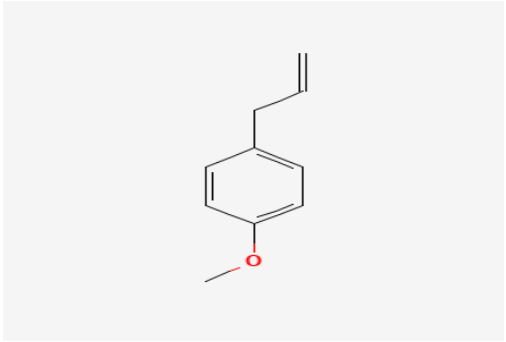
Chemical Constituents: Linalool And Linalyl (Monoterpenoids)
Plant name: *Lavandula*
Family: Lamiaceae



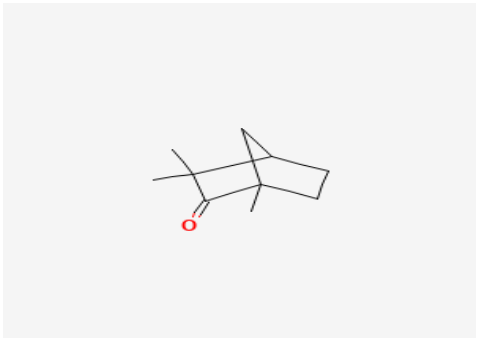
Linalool

Lavender functions as an antiemetic by utilizing linalool to calm the central nervous system and inhibit the brain's vomiting reflex. Its antispasmodic properties relax the stomach muscles, while its scent reduces the stress and anxiety that often trigger nausea.

Chemical Constituents: Anethole, Estragole, and Fenchone (phenylpropanoids)
Plant name: Fennel (Foeniculum Vulgare)
Family: Umbelliferae or Apiaceae



Estragole



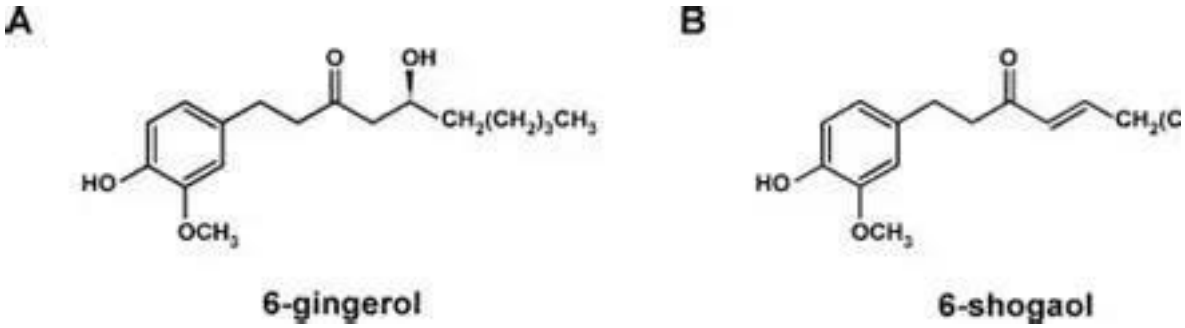
Fenchone

Estragole show antiemetic because it calms the gut and reduce the signals that trigger the vomiting reflex. It is a phenylpropanoid from fennel has a carminative action, helping to relieve gas, bloating and intestinal discomfort. When distension and cramping in the stomach and intestines decrease, there is less stimulation of vagal afferent fibres that carry "nausea" signals to the vomiting centre in the brainstem. Estragole also shows a mild spasmolytic effect on smooth muscles of the gastrointestinal tract, so abnormal contractions and hypermotility are reduced, which further lowers the tendency to vomit.

Chemical Constituents: Gingerol (Specifically 6-Gingerol), Shogaols (Specifically 6-Shogaol), Zingerone, And Paradols(polyphenols)

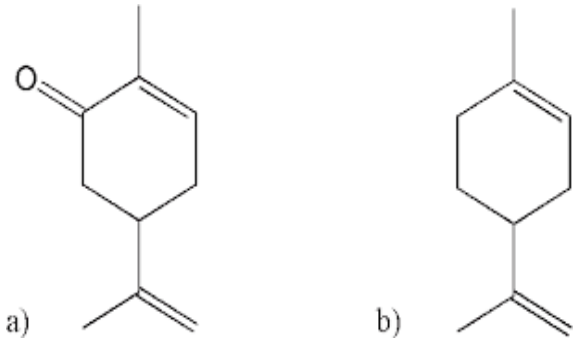
Plant Name: *Zingiber Officinale*

Family: Zingiberaceae



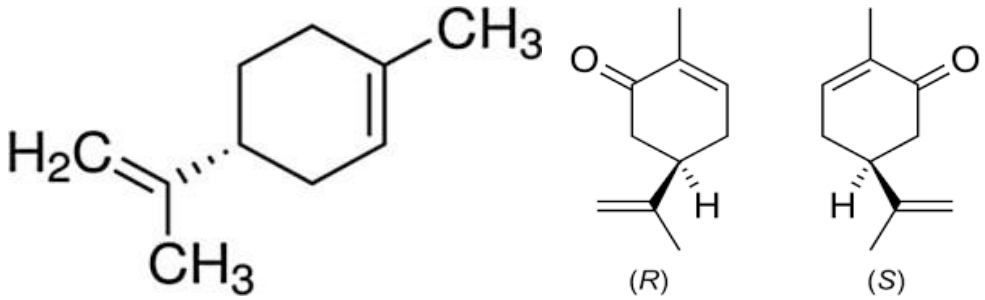
Ginger has been shown to reduce nausea intensity within 20–40 minutes and is clinically effective in conditions such as morning sickness, travel sickness, post-operative nausea, and functional digestive disorders— offering a powerful yet safe natural alternative to synthetic anti-emetic drugs. These compounds collectively influence gut motility, reduce inflammation and modulate visceral nerve signaling, which could improve symptoms in gastroparesis and also other functional GI disorders.

Chemical constituents: menthol, carvone
Plant Name: *Mentha spicata*
Family: Lamiaceae (Mint Family)



Peppermint also relaxes stomach and intestinal muscles, preventing the spasms that often trigger vomiting, while its cooling effect soothes irritation in the gastric lining. By reducing gas, bloating, and abdominal pressure, it decreases the mechanical triggers that cause nausea. Peppermint's anti inflammatory and mild digestive-enhancing actions further help stabilize the stomach, making it especially effective for nausea caused by indigestion, motion sickness, stress, and gastric irritation

Chemical Constituents: Carvone and Limonene(terpenoids)
Plant Name: Carum carvi
Family: Apiaceae (Umbelliferae)

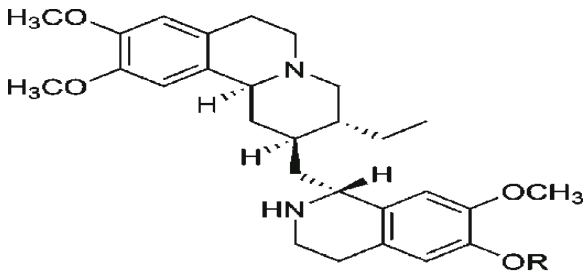


Limonene (d-Limonene) **Carvone (d-Carvone)**

Caraway oil works as an effective natural anti-emetic due to its key active constituents—carvone, limonene, and various flavonoids—which together help calm

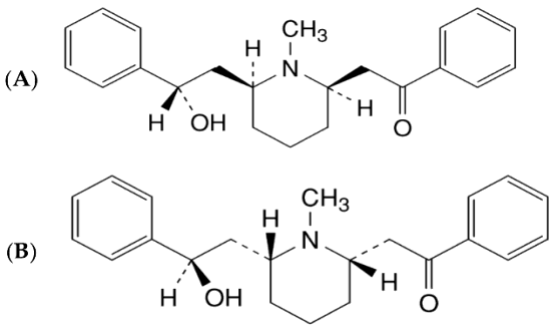
the stomach and reduce nausea and vomiting. Carvone gently modulates vagal sensory nerves, lowering the intensity of nausea signals sent to the brain, while its strong anti-spasmodic action relaxes stomach muscles and prevents the painful contractions that often trigger vomiting. Caraway's well-known carminative effect reduces gas, bloating, and abdominal pressure, which are common mechanical causes of nausea

Chemical constituents: Emetine and Cephaeline (isoquinoline alkaloids)
Plant Name: Ipecacuanha (Psychotria ipecacuanha)
Family: Rubiaceae



Cephaeline (R = H)
Emetine (R = CH_3)

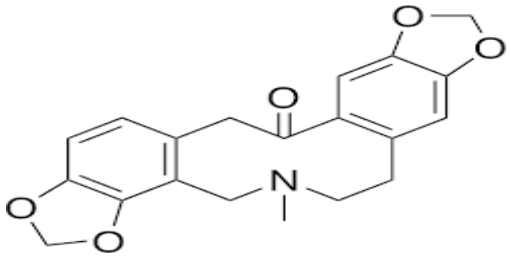
Emetine directly crosses the blood-brain barrier to stimulate the area postrema (the brain's vomiting center) and the medullary CTZ. This signals the autonomic nervous system to initiate the nausea and vomiting.
Chemical constituents: lobeline (Piperidine alkaloid)
Plant name: Indian Tobacco (Lobelia Inflata L)
Family: Lobeliaceae



Lobeline.

Indian Tobacco (Lobelia inflata) functions as an emetic primarily through its active alkaloid, lobeline, which triggers vomiting via dual pathways. Peripherally, lobeline acts as a gastrointestinal irritant, stimulating sensory nerves in the stomach lining that signal the brain to purge contents. Centrally, it serves as a nicotinic acetylcholine receptor agonist, directly exciting the chemoreceptor trigger zone (CTZ) in the medulla oblongata. This combined stimulation of the vomiting center induces rapid emesis. However, due to its narrow therapeutic window and risk of respiratory paralysis, it is considered highly toxic and rarely used in modern clinical practice.

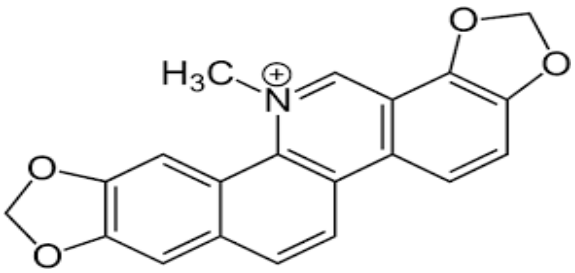
Chemical constituents: Protopine (isoquinoline alkaloid)
Plant name: Mexican Poppy
Family: Papaveracceae



Protopine.

Protopine acts centrally by stimulating the Chemoreceptor Trigger Zone (CTZ) in the brain to trigger vomiting without irritating the stomach. The Mexican Poppy (*Argemone mexicana*) is historically used as an emetic due to its high concentration of toxic alkaloids like sanguinarine and berberine. These compounds induce vomiting by severely irritating the gastrointestinal lining and stimulating the brain's chemoreceptor trigger zone (CTZ). In traditional medicine, a decoction made from the seeds or root was administered to force the expulsion of toxins or phlegm from the body.

Chemicalconstituents: Sanguinarine (benzophenanthridine alkaloid)
Plant: Name (sanguinaria canadensis)
Family: Papaveraceae



Sanguinarine.

Sanguinarine causes vomiting (emesis) primarily through a combination of direct cellular damage and disruption of critical bodily functions. When ingested, this strong toxin directly irritates and damages the cells lining the stomach and intestines. A major mechanism involves the inhibition of the essential na+/k+-atpase pump located in cell membranes, which disrupts normal cell balance and function. This damage also extends to tiny blood vessels, causing them to widen and leak fluid. The body senses this intense iiritation and distress, sending signals that

activate the brain's "vomiting center" (specifically the chemoreceptor trigger zone). This triggers the immediate reflex to vomit, effectively forcing the irritating substance out of the system.

SUMMARY AND CONCLUSION

Medicinal plants play key role in treating many diseases because these plants have different chemical constituents used as antiemetics such as α-Bisabolol, α-bisabolol oxide A and α-bisabolol oxide from chamomile, Linalool and linalyl from lavender, Anethole, estragole and fenchone from fennel, Gingerol (specifically 6-gingerol), Shogaols (specifically 6-shogaol), Zingerone, and Paradols from ginger, Menthol[16] and Carvone from peppermint, Carvone and Limonene From caraway oil, chemical constituents are used as emetics are lobeline from Indian tobacco, emetine and cephaeline from ipecacuanha (Psychotria ipecacuanha), protopine from Mexican Poppy, Sanguinarine from Sanguinaria canadensis. The results shows that the plant Based emetics and antiemetics are safe and suitable for routine use particularly in primary Heath care.

REFERENCE

1. Mariangela., Medicinal Plants., National Library of Medicine., Jul. 2, 2021; 10(7).
2. Ashok Rathod, Amol Rathod, Kundan Tiwari., emetics and antiemetics: a review., research journal of pharmaceutical dosage forms and technology., 2019; 11(1): 15-18.
3. Amit Kumar* 1 and Anoop Kumar 2., ANTIEMETICS: A REVIEW., IJPSR, 2013; 4(1): 113-123.
4. Mehdi Sharifi-Rad a, Jolanta Nazaruk b, Letizia Polito c, Maria Flaviana Bezerra Morais-Braga d, JanaínaEsmeraldo Rocha d, HenriqueDouglasMelo Coutinho d, Bahare Salehi e f, Giu lia Tabanelli g, Chiara Montanari g, María delMarContreras h, Zubaida Yousaf i, WilliamN. Se tzer j, DeepaR. Verma k, Miquel Martorell l, Antoni Sureda m, Javad Sharifi-Rad., Matricaria genus as a source of antimicrobial agents: From farm to pharmacy and food applications., Microbiological Research., October 2018; 215: 76-88.
5. S.B. Bezerra, L.K.A.M. Leal, […], and A.R. Campos., Bisabolol - Induced Gastroprotection Against Acute Gastric Lesions: Role of Prostaglandins, Nitric Oxide, and K+ATP Channels., Journal of Medicinal Food., 12: 6.
6. Abdullah Al Fahmi 1, Khadija Akter 1, Imam Hossen Rakib 1, Sakib Hossain 1, Ali G Alkhathami 3, Md Sakib Al Hasan 1, Rakib Hossan 1, Iffat Ara 1, Md Mizanur Rahaman 4,✉, Muhammad Torequl Islam., Linalool exerts antiemetic effects via dopaminergic and serotonergic pathways: Evidence from chick model and molecular docking., Naunyn Schmiedebergs Arch Pharmacol, Oct. 20, 2025; 399(3): 4401–4411.
7. Wang X, Xun S, Guo Q, Wang Y, Jia Y, Wang W, Wang Y, Li T, TangT, Zou J , Wang M, Yang M, Wang F, Zhang X, Wang C., Study of the Mechanism of Antiemetic Effect of Lavandula angustifolia Mill. Essential Oil Based on Ca2+/CaMKII/ERK1/2 Pathway., dovepress., 26 July 2022; 16: 2407—2422.
8. Jane Buckle PhD, RN., Chapter 12 - Care of the Elderly., Clinical Aromatherapy (Third Edition)Essential Oils in Healthcare., 2015; 240-251.
9. Manzoor A. Rathera,□ ,Bilal A. Dara, Shahnawaz N. Sofia, Bilal A. Bhata,□ ,Mushtaq A. Qurishib., Foeniculum vulgare: A comprehensive review of its traditional use, phytochemistry, pharmacology, andsafety,. Arabian Journal of Chemistry., 9(2): S1574-S1583.
10. Charles C Horn., The medical implications of gastrointestinal vagal afferent pathways in nausea and vomiting., Curr Pharm Des., 2014; 20(16): 2703-12.
11 Wolfgang Marx 1 2, Karin Ried 2, Alexandra L McCarthy 3, Luis Vitetta 4, Avni Sali 2, Daniel McKavanagh 5, Liz Isenring ., Ginger-Mechanism of action in chemotherapy-induced nausea and vomiting: A review., ., National library of medicine., Crit Rev Food Sci Nutr., Jan. 2, 2017; 57(1): 141-146.
12 Min-Jung Ko 1, Hwa-Hyun Nam 1, Myong-Soo Chung., Conversion of 6-gingerol to 6-shogaol in ginger (Zingiber officinale) pulp and peel during subcritical water extraction., Food Chemistry, 2019; 149-155: 270.
13 Iñaki Lete1, José Allué 2Chemical Constituents: Menthol (primary monoterpenes)., The Effectiveness of Ginger in the Prevention of Nausea and Vomiting during Pregnancy and Chemotherapy., Integr Med Insights, Mar. 31, 2016; 11: 11–17.
14 Aisyah Putri Subiningtyas, Nurul Purborini, Sri Hananto Ponco Nugroho, Margono., Aromatherapy using peppermint to alleviate nausea and vomiting post-adenoidectomy., The International Conference of Advancements in Nursing Care (ADNURS), 2025; 2(2).
15. Bruno P Chumpitazi1, Gregory Kearns2, Robert J Shulman1,3., Review article: The physiologic effects and safety of Peppermint Oil and its efficacy in irritable bowel syndrome and other functional disorders., Aliment Pharmacol Ther., Jan. 26, 2018; 47(6): 738–752.
16. Xue Sun, Fangfang Nie, Jizhuo Sun, Yuanhe Wang., Medicinal Plants for Chemotherapy-Induced Nausea and Vomiting: A Systematic Review of Antiemetic, Chemosensitizing, and Immunomodulatory Mechanisms., Research gate., July 2025; 21(1): 1187-1218.
17. Mohaddese Mahboubi., Caraway as Important Medicinal Plants in Management of Diseases., Nat Prod Bioprospect, Oct. 29, 2018; 9(1): 1–11.
18. A Keshavarz 1, M Minaiyan 1,*, A Ghannadi 2, P Mahzouni 3., Effects of Carum carvi L. (Caraway) extract and essential oil on TNBS-induced colitis in

rats., Res Pharm Sci., Jan-Mar. 2013; 8(1): 1–8.
19. AtishKumar Sahoo a, Jagnehswar Dandapat b, UmeshChandra Dash a, Satish Kanhar a, Features and outcomes of drugs for combination therapy as multi-targets strategy to combat Alzheimer'sdisease., Journal of Ethnopharmacology., 6 April 2018; 215: 42-73.
20. Takanori Sato 1, Yoshiyuki Hirai, Shaoyi Su, Wei Zimo, Nanae Yasuura, Tadashi Inui, Makoto Funahashi., Involvement of the area postrema and the nucleus tractus solitarius in the emetogenic action of emetine in rats., Journal of Oral Biosciences, December 2020; 62(4): 310-314.
21. María Catalina Rosales López, Rodrigo Munoz Arrieta, Ana Abdelnour-Esquivel., Emetine and cephaeline content in plants of Psychotria ipecacuanha in Costa Rica., 2020; 49(2): 18-22.
22. Linda P Dwoskin 1, Peter A Crooks., A novel mechanism of action and potential use for lobeline as a treatment for psychostimulant abuse., Biochem Pharmacol, Jan 15, 2002; 63(2): 89-98.
23. AtishKumar Sahooa, Jagnehswar Dandapatb, UmeshChandra Dasha, Satish Kanhara., Features and outcomes of drugs for combination therapy as multi-targets strategy to combat Alzheimer's disease., Journal of Ethnopharmacology, 6 April 2018; 215: 42-73.
24. Rekha Sharanappa, Vidyasagar G.M.*., Medicinal Plants And Microbiology Research Laboratory, Department Of Post-Graduate Studies And Research In Botany, Gulbarga University, Gulbarga-585106, Karnataka, India., Int J Pharm Pharm Sci., 6(7): 45-53.
25. body N.R. Dey1 , K.C. Das2 , Yogender Rai3., Argemone mexicana., Indian Journal of Research in Homoeopathy, January-March 2008; 2(1).
26. Andrew Croaker 1, *, Graham J. King 1, John H. Pyne 2, Shailendra Anoopkumar-Dukie 3andLei Liu 1, *., Sanguinaria canadensis: Traditional Medicine,Phytochemical Composition, Biological Activities andCurrent Uses., International Journal of Molecular Sciences Review., Int. J. Mol. Sci., 2016; 17: 1414. doi:10.3390/ijms17091414
27. Nitika Singh 1, Bechan Sharma 1,*., Toxicological Effects of Berberine and Sanguinarine., Front Mol Biosci, Mar. 19, 2018; 5: 21.