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EXPLORING HERBAL NUTRACEUTICALS: UNLOCKING POTENTIAL IN NAUSEA AND VOMITING PREVENTION - A COMPREHENSIVE REVIEW

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The review article provides an in-depth collection of nutraceuticals in managing nausea and vomiting, particularly in chemotherapy-induced and postoperative cases (CINV and PONV). It explores the underlying mechanisms of these symptoms, focusing on disruptions in neurotransmitters such as serotonin, histamine, and dopamine. This comprehensive review highlights a global trend towards integrating plant-based extracts into conventional medicine, reflecting a growing preference for natural treatment alternatives.The article identifies various herbs and spices with antiemetic properties, including both traditional medicinal products and patented preparations. It examines the efficacy of vegetables and herbs from diverse medicinal systems worldwide, demonstrating their potential in preventing and treating nausea and vomiting. Additionally, the review outlines various screening methods and discusses current clinical studies, providing a thorough overview of the field.The article also reviews patents and marketed products related to active plants used as antiemetics, showcasing the commercial and practical applications of these natural remedies. The findings ultimately propose strategies for the nutraceutical industry to influence the medicinal benefits of foods, vegetables, and herbs as antiemetics. These strategies aim to cater to both local consumption and broader medicinal applications, highlighting the significant role of nutraceuticals in modern healthcare. The review emphasizes the importance of continued research and development in this area to enhance the effectiveness and accessibility of natural antiemetic treatments

***Keywords**: Herbs, antiemetics, nutraceuticals, spices, motion-sickness, chemotherapy*

INTRODUCTION

The global surge in herbal medicine reflects a growing preference for alternative healthcare, with almost 80% of the world embracing plant-based extracts in conventional medications, as per WHO. Medicinal plants are integral to traditional medical systems, offering effective remedies and contributing significantly to global income[1].

Nutraceuticals, valued at over USD 117 billion, are gaining attention for promoting health and well-being. Coined by Dr. Stephen DeFelice in 1989, the term "nutraceutical" blends pharmaceutical and nutrition, encompassing supplements marketed for disease prevention or treatment[2]. Hippocrates' ancient wisdom, "Let food be your medicine and medicine be your food," underscores the crucial link between diet and well-being. This idea is gaining momentum globally as awareness grows about the health benefits of nutraceuticals. These products, lacking a precise regulatory definition, encompass anything providing health or medicinal advantages, including disease prevention and treatment[3].

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Nutraceuticals' appeal lies in their perceived safety and potential medicinal and nutritional benefits. Industries recognize the financial advantages of catering to health-conscious consumers, resulting in an upsurge of value-added goods targeting conditions like heart health and cancer. **Fig. 1** illustrates the diverse range of natural/herbal food types within the realm of nutraceuticals, including dietary fiber, probiotics, and antioxidants, providing effective protection against significant health issues.Despite claims of multiple therapeutic advantages, conclusive evidence supporting both positive and negative impacts remains insufficient[4].

Recent years have seen the emergence of pharmaceutical formulations featuring food bioactive components, supported by scientific studies demonstrating their biological activity. However, health claims often lack a robust scientific foundation, with limited and inconclusive human clinical trials.A few importantproblems with these food bioactive components' bioavailability, metabolism, dose/response, and toxicity, as well as problems with the nutraceuticals themselvesare still not fully established[6].

People are increasingly turning to nutraceuticals for their natural benefits, aiming to minimize side effects, reduce medication reliance, and incorporate them into daily diets. The objectives include minimizing motion sickness with herbs and preventing chemotherapy-induced motion sickness. However, consulting a healthcare professional is crucial, especially for those on medications or with health issues. Unlike pharmaceutical treatments, herbs offer a holistic approach to symptom relief without adverse effects.

Throughout history, herbs and spices have been recognized for their antibacterial properties, enhancing food safety by combating foodborne viruses and germs. Traditional medicine has harnessed antibacterial compounds from plants to address infectious disorders, with Ayurveda utilizing herbs and spices for various purposes. As a result, significant focus has been directed towards leveraging medicinal plants and herbs for the development of alternative drugs[7].Today, over 65% of the global population relies on traditional medicines for their healthcare needs[8].

Mechanisms of Nausea and Vomiting

Nausea, a challenging-to-define subjective sensation, involves feelings of imminent vomiting or descriptors like 'sick to the stomach' and 'queasy,' posing difficulty in measurement[9]. Assessing the severity of nausea requires consideration of different dimensions, such as maximal intensity, entity, duration, and quantity[10].In contrast, vomiting is a specific occurrence characterized by the aggressive evacuation of gastric contents in a regressive style from the stomach up to and out of the mouth.

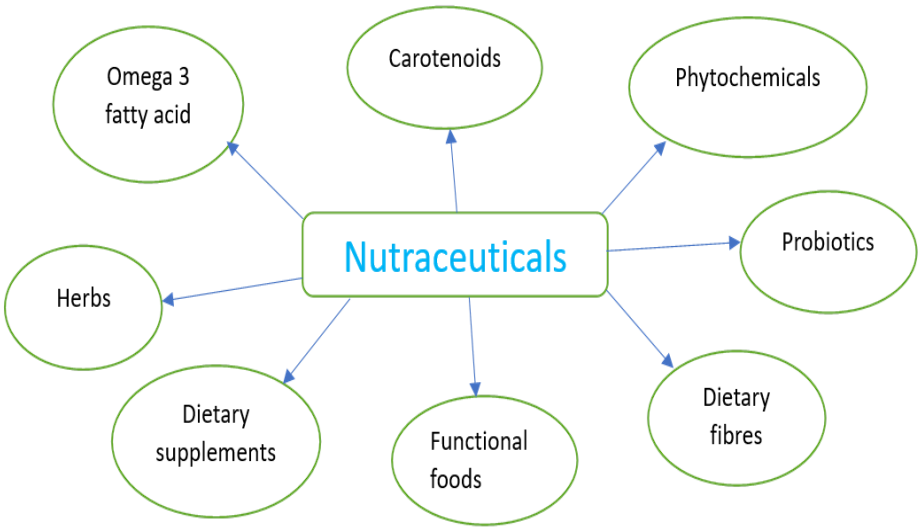

Fig. 1: Classification of substances as nutraceuticals[5].

The cause of nausea and vomiting is complex, detailed in **Fig. 2**, involving both internal bodily signals and external environmental stimuli. The emetic or vomiting center in the brain is located in the medulla oblongata. It can be stimulated by four primary areas: the gastrointestinal tract, cerebral cortex and thalamus, vestibular region, and chemoreceptor trigger zone.

The parasympathetic and sympathetic visceral afferent routes transmit signals to the nucleus tractus solitarius in the medulla from the throat, stomach, and small intestine. This pathology is prevalent in gastroparesis, where vomiting is triggered by visceral afferent input to the central nervous system (CNS) in response to stomach stretching or other signals.

The act of emesis relies on the intact abdominal vagus nerve[9].Certain pathways' non-activation, as observed in postvagotomy gastroparesis or dyspepsia-predominant gastroparesis, may lead to the absence of retching and vomiting, resulting in effortless regurgitation of undigested foods. The chemoreceptor trigger zone, located in the area postrema on the floor of the fourth ventricle, lies outside the blood–brain barrier and detects toxins that induce emesis. Nausea and vomiting can also stem from the vestibular system pathway, housing histamine-1 and muscarinic-1 receptors, with adjuvant use of receptor antagonists assisting in managing symptoms in gastroparesis patients, despite the lack of dedicated treatments for nausea and vomiting[12].

The vomiting reaction is governed by the brain's vomiting centre situated in the medulla oblongata[13]. **Fig. 3** illustrates how chemotherapeutic drugs induce nausea and vomiting by activating neurotransmitter receptors in the area postrema of the brain or stimulating vagal afferents near enterochromaffin cells in the intestine[14].Post-treatment, these drugs initiate the peripheral pathway for 24 hours[15].Free radicals generated prompt enterochromaffin cells in the gastrointestinal tract to release serotonin, activating the vomiting centre. This stimulation triggers the emetic response in the peripheral emesis pathway[16].

In a study by Maheswari D et al., sensory mismatch was identified as the cause of motion sickness. The authors attributed motion sickness to elevated levels of acetylcholine, histamine, and dopamine. Examining the potential anti-motion sickness impact of herbal extracts and their bioactive ingredients using in vitro and in vivo models, the investigation focused on the effects of herbal extracts **(Table .1)** and their bioactive components on the release of histamine, dopamine, and acetylcholine esterase in rat pheochromocytoma PC12 cells and human leukemia KU812 cells[18].

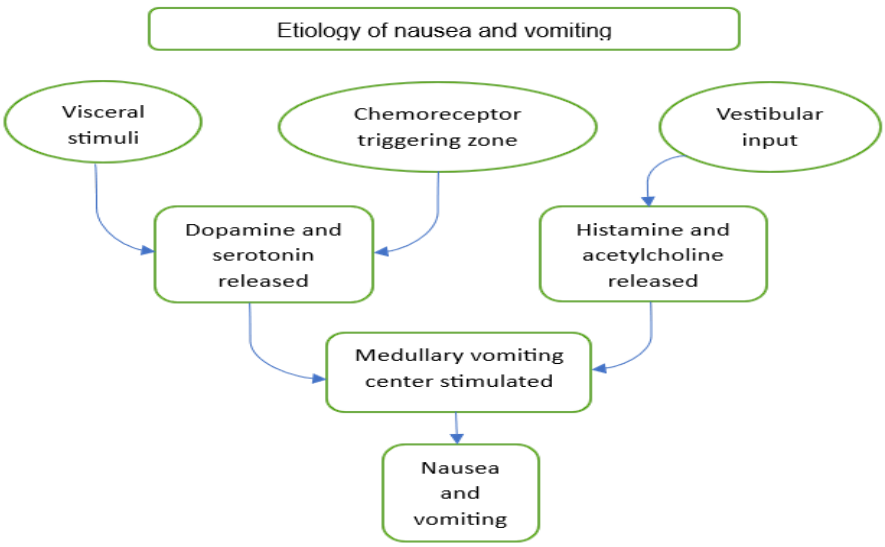

Fig. 2: Etiology of nausea and vomiting[11]**.**

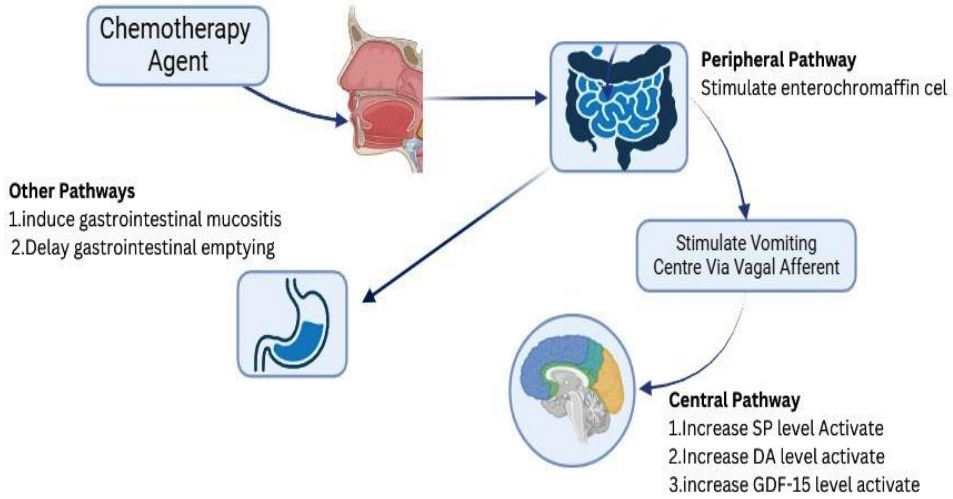

Fig. 3: Mechanism of nausea and vomiting involved on administration of chemotherapeutic agent administration[17].

Table 1: Herbal extracts/ Bioactive compound[18].

Sr. no.	Herbal Extract/ Phytoconstituent	Sr. no.	Herbal Extract/ Phytoconstituent
1	Citrus aurantifolia peel extract	11	Trigonella foenum. Graecum L. seed extract
2	Prunus domestica L. fruit extract	12	Pimpinella heyneana seed extract
3	Ocimumbasilicum L. var.basilicum seed extract	13	Hesperdin
4	Pimenta dioica L. leaf extract	14	Menthol
5	Mentha arvensis L. leaf extract	15	Riboflavin
6	Trachy spermumammi L. seeds extract	16	Thiamine
7	Syzygium Aromaticum extract	17	Ascorbic acid
8	Coriandrum sativum L. seed extract	18	Linalool
9	Cinnamaldehyde	19	Eugenol
10	Rutin hydrate	20	Alpha-pinene

Herbs and spices as sources of antiemetics used worldwide

Aframomum melegueta

Aframomum melegueta, an indigenous plant of West Africa, particularly Cameroon, is known as melegueta pepper or grains of paradise. Interestingly, in the Basketo district of southern Ethiopia, it has emerged as a significant cash crop. Locally, it holds traditional value due to its stimulant and antiemetic properties. This showcases the diverse roles and adaptations of the plant beyond its more common associations with West Africa[19].

Anethum graveolens

A. graveolens L., an aromatic annual plant, holds widespread utility as both a spice and a remedy for emesis in Africa. The seeds and leaves of the dill plant are commonly employed as a spice, condiment, and in the preparation of tea. This plant boasts a rich composition of flavonoids, terpenoids, cardiac glycosides, and tannins. Notably, the herb and seeds exhibit distinct volatile components. The herb is characterized by myristicin, α-phellandrene, limonene, and A. graveolens ether as its primary odorants. Conversely, carvone takes precedence as the predominant odorant in the seeds. Additionally, the seeds contain coumarins, flavonoids, phenolic acids, and steroids. This diverse chemical profile underscores the multifaceted uses and potential therapeutic properties of A. graveolens L[20].

Mentha longifolia

M. longifolia, also known as wild mint, belongs to the Lamiaceae family of plants and is distributed in regions such as southern Africa, Egypt, and the Arabic countries. It is frequently utilized as a spice or in the preparation of hot beverages. Notably, the dried components of the plant are recognized for their antiemetic properties. Pulegone, a key component within its essential oil, plays a pivotal role in mediating its pharmacological effects and is considered one of the primary monoterpenes present. Alongside pulegone, other significant compounds found in the essential oil include borneol, piperitenone oxide, 1,8-cineole, menthol, menthone, and isomenthone. The diverse chemical composition of M. longifolia underscores its potential therapeutic properties, particularly in addressing nausea and vomiting[21].

Monodora myristica

The tropical tree M. myristica, commonly referred to as Calabash nutmeg and belonging to the Annonaceae family, is utilized medicinally in Gabon and the Congo. Its seeds are employed to address various conditions, including emesis, voice loss, headaches, and rhinopharyngitis[19].

Murraya koenigii

he tropical Curry tree, scientifically known as Murraya koenigii, is widely utilized as a spice in various parts of Africa, particularly in countries like Nigeria and Niger. The leaves of this tree are employed to alleviate symptoms of nausea and vomiting. The distinctive flavor and aroma of the Curry tree are attributed to compounds such as cadinol, cadinene, caryophyllene, sabinene, and pinene. Additionally, it is known for its abundance in carbazole alkaloids Essential oils extracted from the leaves of M. koenigii are rich in diverse compounds, with 3-carene and caryophyllene being among the most prevalent[22].

Myristica fragrans

One common spice that is a member of the Myristicaceae family is nutmeg. In Southeast Nigeria and Asia, it is typical. It's essential oil contains the following compounds: limonene, 1,8-cineole, α-pinene, β-pinene, myrcene, safrole, terpinen, and sabinene. Despite its past usage as an antiemetic[23].

Ocimum species

The Ocimum genus is predominantly distributed in Africa and India, with over 150 species found across temperate regions worldwide. Notable for their antiemetic properties, O. gratissimum and O. basilicum are two well-recognized plants within this genus. O. basilicum, belonging to the Lamiaceae family, is a spice with diverse chemical components such as linalool, 1,8-cineole, and eugenol. Meanwhile, O. gratissimum, a valued medicinal plant in sub-Saharan Africa, is known for its aromatic and antiemetic leaves. It's essential oil comprises various compounds, including limonene, γ-

terpinene, and β-phellandrene. It's worth noting that there is considerable variability in the chemical composition across different Ocimum species[24].

Piper nigrum

Black pepper, scientifically known as Piper nigrum L., is a tropical plant species belonging to the Piperaceae family. Widely utilized as a spice and seasoning, particularly in the African Niger Delta, its dried fruits are integral to culinary applications. The antiemetic properties of black pepper can be attributed to its key components, namely volatile oil and potent chemicals. The pungency of black pepper is primarily due to the alkaloid piperine, while its distinctive aroma and flavor arise from essential oils containing α- and β-pinene, limonene, myrcene, linalool, α-phellandrene, sabinene, β-caryophyllene, and germacrene D[25].

Solanum species

Solanum species exhibit a global distribution, encompassing approximately 1500 species, with around 100 indigenous to Africa. Nigeria, in particular, hosts over 25 species employed in traditional medicine or as food sources. S. melongena L., commonly known as eggplant or aubergine, thrives throughout Africa and is recognized for its antiemetic properties. In Cameroon, the fruits of S. melongena serve as both seasonings and vegetables. Phytochemical analyses have uncovered the existence of alkaloids, flavonoids, tannins, steroids, and glycosides in the extracts of S. melongena, highlighting its diverse chemical composition[26].

Syzygium aromaticum

Clove, scientifically known as Syzygium aromaticum L. Merr. & Perry, is a plant belonging to the Myrtaceae family and is found growing in Africa. Clove has a rich history of both culinary and medicinal applications. Its oil has been traditionally employed as an expectorant and antiemetic, although clinical outcomes have been inconsistent. Additionally, clove tea has been utilized for its potential to alleviate nausea. The flower buds of clove are recognized for their antiemetic properties[27].A published patent highlights the combined use of ginger and clove, emphasizing the synergistic impact of phytoconstituents gingerol and eugenol. The patent details their role in effectively addressing chemotherapy-induced nausea and vomiting associated with cancer treatment[27].

Thegenus Thymus

The Thymus genus, along with fellow members of the Lamiaceae family, demonstrates robust antiemetic properties in Northern Africa and Asia, as detailed in **Table 2**. Notably, Thyme species like Thyme transcaspicus and Thyme vulgaris, commonly used spices in Africa, exhibit antiemetic qualities. The essential oil derived from the aerial parts of T. transcaspicus, a fragrant medicinal herb indigenous to North Africa, contains thymol, carvacrol, γ-terpinene, and p-cymene. Extracts from these components exhibit antiemetic effects through both peripheral and central mechanisms[27].

Table 2: Other Lamiaceae-Family Antiemetic.

Herbs	Part used	Dose
Melissa officinalis (lemonbalm)	Leaf	Tincture 1-3 ml
Pogostemon cablin (patchouli)	Leaf, flower	Tincture 1-3 ml
Agastache rugosa(licorice mint)	Leaf, flower	Granulation 1-3 gm
Ocimum tenuiflorum (holy basil)	Leaf, flower	Tincture 1-2 ml tid Volatile oil 2-3 gtt

*Initiate the consumption of all herbs 30–60 minutes prior to travel and maintain a regular interval of every 2–4 hours for ongoing usage throughout the journey[29].

Xylopia aethiopia

The African spice X. aethiopia, commonly known as "African Pepper" and classified under the Annonaceae family, is recognized for its antiemetic properties. The primary constituent in the plant's essential oil is trans-m-mentha-1(7),8-diene, a predominant monoterpene. Furthermore, the entire plant, including stems, roots, leaves, and bark, is rich in β-pinene, a notable component of the oil [17].

Ginger

Zingiber officinale, commonly known as ginger and a member of the Zingiberaceae family, is a globally renowned spice. This perennial creeper is characterized by long leaves, yellow-green flowers, and a robust tuberous rhizome, offering an intensely flavored storage root. With a diverse range of biological activities, ginger stands out as one of the most versatile medicinal herbs, boasting a history of more than 2,000 years of use. The key bioactive compound responsible for its medicinal properties is gingerol. Throughout millennia, Ayurvedic and Chinese medicinal practices have harnessed the healing potential of ginger, utilizing it to address various conditions such as cancer, menstrual cramps, food poisoning, osteoarthritis, epilepsy, nausea, inflammation, coughs, and colds[1].

Amla

Extending the focus to amla, recent research has delved into its potential antiemetic properties. Studies suggest that amla, or Indian gooseberry, exhibits promising antiemetic effects, particularly in mitigating nausea and vomiting. The pharmacological composition of amla, with its astringent, antihemorrhagic, and antidiarrheal properties, may contribute to its ability to alleviate symptoms associated with chemotherapy-induced and post-surgery nausea and vomiting. This research builds upon the traditional use of amla in Ayurvedic medicine, where it has long been recognized as a tonic for restoring vitality. The exploration of amla's antiemetic qualities adds a contemporary dimension to its medicinal profile, potentially offering new avenues for managing gastrointestinal distress in various clinical settings.It is one of the three fruits that go into making the traditional digestive tonic known as triphala. Amla's pharmacological properties include being astringent, antihemorrhagic, antidiarrheal, antiemetic, digestive, carminative, and laxative[30].

Peppermints

Recent research highlights the advantageous impact of mints on the gastrointestinal system. The active components present in mint oils play a pivotal role in promoting both intestinal relaxation and efficient stomach emptying, thereby enhancing the overall digestive process. The noteworthy antiemetic qualities of mints are particularly significant, as they have been found to effectively mitigate nausea and vomiting induced by both chemotherapy and post-surgery recovery. This dual benefit, addressing both digestion and nausea relief, underscores the potential of mint as a holistic support for gastrointestinal well-being in clinical contexts[31].

Cuscuta reflexa

Cuscuta reflexa, a parasitic herb in the Convolvulaceae family, is widespread globally, especially in South Asian nations. Within the Genus Cuscuta L., there are 145 species, with 14 in Pakistan. Traditionally used for conditions like alopecia, HIV, diabetes, and epilepsy, it exhibits antihistaminic, anticholinergic, and anti-inflammatory properties[32]. Phytochemical analysis reveals components like tannins, lutein, kaempferol, and polyphenols such as cuscutalin and quercetin-3-O-glucoside[33].Cuscuta reflexa, traditionally recognized for its antiemetic properties, has been incorporated into diverse herbal formulations targeting emesis. A group of researchers conducted a scientific study to investigate the antiemetic activity of C. reflexa. The study involved the administration of Juice, aqueous, and methanolic extracts of C. reflexa in pigeons. Emesis was induced in the pigeons through the use of gastrointestinal irritants, providing a controlled environment for evaluating the potential antiemetic effects of the plant extracts[34].

Spilanthes paniculata

S. paniculata, a member of the Asteraceae family, is commonly referred to as the toothache plant or Shormoni in Bengali. It has various synonyms, including Bidens acmella, Bidens

ocymifolia, Pyrethrum acmella, Spilanthesocymifolia, and Verbesinaocymifolia. In Brazil and India, the raw leaves of S. paniculata find application as flavoring agents in salads, soups, and meats. The plants antiemetic[35,] antipyretic, antiplasmodic activity[36], antilarvicidal activity against *Anopheles* mosquitoes[37],antinociceptive[35], antioxidant, and anti-inflammatory[38] has been reported.

Swertia chirata

Swertia chirata, referred to as "Anaryatikta," "Bhunimba," or "Chiratitka" in Sanskrit, is identified as an annual or biennial herb.The herb comprises several vital phytoconstituents, each possessing distinct pharmacological properties. Noteworthy components include amarogentin, acknowledged as the bitterest substance identified to date, exhibiting topoisomerase inhibiting, chemo-preventive, and antileishmanial properties. Additionally, amaroswerin contributes gastro-protective effects, while gentianine is associated with anti-inflammatory, anesthetic, antihistaminic, antipsychotic, anticonvulsant, and diuretic properties. Swerchirin, another component, is recognized for its antimalarial and pro-haematopoietic properties.In a conducted study, the antiemetic property of the methanolic[39].

Bibhitaki

Terminalia belerica, a member of the Combretaceae family, is recognized for its antiemetic and antiulcer properties. The fruit of Bibhitaki is extensively employed in rejuvenating formulations targeted at balancing Kapha, particularly addressing symptoms affecting Kapha sites such as the lungs, throat, eyes, and hair[40].They are reported to contain tannins in significant amounts (30-40%), including chebulinic acid, neochebulinic acid, corilagin, chebulagic acid, gallic acid, ellagic acid, punicalagin, terchebin, and terflavin A. Additionally, these fruits have flavonoids such as luteolin, rutins, and quercetin. Beyond that, other phytochemicals present include anthraquinones, saponins, β-D-glucogallin, 1, 3, 6-trigalloyl glucose, 1, 2, 3, 4, 6-penta-O-galloyl, as well as various carbohydrates, amino acids, and fatty acids.

Propolis

Honey bees generate a material called propolis, which is necessary for building the nest; a hive without enough of it won't function properly. Propolis is also known as bee glue because of its texture, which is sticky like glue. Worker bees utilise propolis in their hives to minimise and seal holes, caulk gaps, and seal crevices[41]. Phenolic acids or esters, flavonoids (flavones, flavanones, flavonols, dihiroflavonol, and chalcones), terpenoids, aldehydes and aromatic alcohols, fatty acids, stilbene, and b-steroids are the primary chemical groups present in propolis resin. The propolis component has a very complicated chemical makeup.and it has high concentrations of phenolic acids, benzoic acid, caffeine acid, cinnamic acid, and terpene chemicals.Numerous phenolic chemicals, particularly flavonoids, are also present in propolis.Propolis has antioxidant, antiviral, antifungal, anticancer, and anti-inflammatory qualities[42].The antiemetic activity of both the water extract and specific active compounds in the extract of Brazilian propolis has been documented[43].In another study, the research focused on exploring the antiemetic potential of stingless bee propolis to assess its efficacy in reducing the prevalence of nausea associated with the consumption of anti-tuberculosis drugs in patients diagnosed with tuberculosis[44].

Vegetables derived nutraceuticals as antiemetics

The classification of various vegetables based on their botanical families and the elucidation of the plant components contributing to their antiemetic properties are presented in **Table 3**. Integrating vegetable-derived nutraceuticals into dietary recommendations can enhance patient well-being.Further research is needed to establish optimal dosages, safety profiles, and long-term effects.Remember, nature’s bounty holds valuable solutions, and these vegetable-based nutraceuticals offer a refreshing approach to managing nausea and vomiting.

Table . 3: Vegetables as antiemetic[51].

Name of vegetables	Botanical name	Family	Part used	Constituents	Ref.
Abrus precatorius	Abrus precatorius subsp. africanus	Fabaceae	leaves, roots, and seeds	abrine,trigonelline, abruslactone A, hemiphloin,abrusoside A, abrusoside B, abrusoside C, abrusoside D, xylose, choline, hypaphorine, precatorine, glycyrrhizin, montanylalcohol,etc	45
Acalypha species	A. ornate Hochst	Euphorbiaceae	leaves	Flavonoids, terpenoids, (5-HT3 , 5-HT4 , and/or NK1 receptors antagonism)	46
Adenantherapavonina	Asia, A. pavonina	Leguminosae	Leaves extracts, seeds	triterpenes, flavonoids, and fatty acids	47
Afzeliaafricana	A. africana belongs	Fabaceae	Leaves	-	48
Polygonum lapathifolium	P. lapathifolium	Polygonaceae	Flower extracts	Alkaloids, phytosterols, diterpenes, triterpenes, amino acids, protein, flavonoids and phenolic compounds	49
Solanum aethiopicum	S. aethiopicum L.	Solanaceae	Fruits, seeds, leaves, shoots	alkaloids, saponins, flavonoids, tannins, and ascorbic acid	50

Grewia asiatica L

Belonging to the Malvaceae family and commonly known as phalsa and dhaman, Grewia asiatica is a diminutive tree, reaching a height of at least 4 meters. This plant is renowned for its perceived antiemetic properties. The fruit of Grewia asiatica is characterized by its mordant, stomachic, laxative, and aphrodisiac qualities. Unripe fruits find application in the treatment of various ailments, including fever, diarrhea, cardiac and respiratory issues, blood disorders, and inflammation. Originally discovered in Varanasi, India, Grewia asiatica is also native to Pakistan and has expanded its presence to other parts of the world[52] . Notably, this plant exhibits a diverse range of medicinal activities, including antiviral, antibacterial, antifungal, antioxidant, anticancer, antidiabetic, anti-inflammatory, antipyretic, analgesic, antihyperlipidemic, hepatoprotective, gelling-polymeric, radioprotective, immunomodulator, and nootropic properties.

Cinnamon

Cinnamon, encompassing both Cinnamomum zeylanicum and Cinnamon cassia, is a perennial tree regarded as the enduring icon of tropical medicine, affiliated with the Lauraceae family. Widely utilized globally, cinnamon stands as a pivotal spice in daily culinary practices[53].Within its rich composition of polyphenols, notable components include vanillic, caffeic, gallic, protocatechuic, p-coumaric, and ferulic acids[54].Ayurvedic literature underscores cinnamon's robust antiemetic, anti-diarrheal, anti-flatulent, and stimulant properties[55]. This versatile spice predominantly thrives in regions such as China, Madagascar, Sri Lanka, and the

Seychelles, with additional smaller-scale cultivation in Vietnam and India[56].

Punica granatum

The pomegranate, scientifically known as Punica granatum and belonging to the Punicaceae family, stands as an ancient and exceptionally distinctive fruit.Rich in polyphenols, the pomegranate includes compounds such as gallic acid, ellagic acid, and ellagic tannins. The fruit is widely employed as a traditional remedy for gastric ulcers, dysentery, diarrhea, as well as microbial and respiratory infections. Within the Ayurvedic system of medicine, pomegranate is harnessed as an anti-parasitic agent, showcasing its effectiveness in addressing parasitic concerns. In the Unani system of medicine, it finds application as an anti-diabetic agent, emphasizing its role in managing diabetes-related conditions. Additionally, pomegranate is acknowledged as an effective remedy for the prevention and treatment of various conditions, including cancer, cardiovascular disorders, dental issues, erectile dysfunction, and protection against ultraviolet radiation. Recent studies have assessed the antiemetic activity of the crude methanol extract derived from the peel of Punica granatum L. using a chick emesis model[57].

Forsythiae Fructus

The dried fruit of Forsythia suspensa (Thunb.) Vahl, belonging to the Oleaceae family, is utilized for various purposes. A traditional Chinese herb renowned for its heat-clearing and detoxifying properties, Forsythiae Fructus is commonly employed in Chinese folk medicine to address vomiting induced by various factors. Furthermore, its antiemetic efficacy has been validated in studies such as the copper-sulfate-pentahydrate-induced emesis model of frogs conducted by Kinoshita et al. (1996)[43]. This research laid the groundwork for exploring the potential of Forsythiae Fructus in mitigating chemotherapy-induced emesis. In a rat model with cisplatin-induced pica, pretreatment with Forsythiae Fructus extract demonstrated a significant reduction in plasma 5-HT levels and downregulation of ileum 5-HT3R expression. These findings indicate a potential antiemetic effect primarily associated with the inhibition of the 5-HT/5-HT3R pathway[58].

Panax ginseng C.A. Mey

The term "Panax," originating from the Greek word "Panakos," signifies a panacea, a belief attributed to it by the Chinese, who regard it as a universal remedy effective against a wide array of ailments. Ginseng has a rich history of use aimed at enhancing the body's resilience to stress, promoting vitality, overall well-being, immune function, libido, and athletic performance. Preclinical studies suggest that it exhibits a range of beneficial effects, including adaptogenic, anti-inflammatory, antineurological, hypoglycemic, antineoplastic, immunomodulatory, cardiovascular, central nervous system, endocrine, and ergogenic properties. Additionally, in traditional medicine, ginseng is employed for alleviating emesis[66].

Scutellariabaicalensis

Scutellariabaicalensis, commonly referred to as Baikal skullcap, is a perennial herb belonging to the Lamiaceae family. It is characterized by its fleshy roots, branched stems, papery leaves, and distinctive purple-red to blue flowers. The plant produces black-brown ovoid nutlets as part of its reproductive structure.They are utilized to treat dysentery, diarrhea, allergic and inflammatory diseases, allergic rhinitis, and to help reduce cholesterol levels and blood pressure. Additionally, they are employed in managing conditions such as atherosclerosis, hypertension, cholecystitis, hepatitis, cataracts, diabetes complications, acute bronchitis, asthma, colds, cancer, bacterial and viral infections of the respiratory and gastrointestinal tracts, hepatitis, jaundice, tumors, and leukemia. The antiemetic properties of the hot water–soluble extract derived from the roots of Scutellariabaicalensis has been investigated in rats experiencing cisplatin-induced alterations[60].

Grape seeds

Vitis vinifera L. seeds, once overlooked as a byproduct of the grape industry, have emerged as a valuable resource with promising applications. Recent investigations have unveiled their potential as a potent antidote against chemotherapy-induced nausea and

vomiting (CINV), a common challenge in cancer treatment. In a study the efficacy of grape-seed proanthocyanin, an antioxidant compound, was explored in a cisplatin-induced emesis model utilizing pigeons as subjects. The findings were remarkable: administration of grape-seed proanthocyanin significantly mitigated vomiting episodes, reduced retching frequency, and curbed weight loss in comparison to cisplatin treatment alone[61].

Rhus verniciflua

Rhusverniciflua extract, long revered in traditional herbal medicine for its gastrointestinal benefits, is now gaining recognition for its potential in combating chemotherapy-induced nausea and vomiting (CINV). Recent research has shed light on its antiemetic properties, particularly in a rat model induced with cisplatin-induced pica[62].The mechanism underlying this effect appears to involve the modulation of serotonin receptors and transporters in the small intestine. Specifically, Rhus verniciflua extract is believed to block 5-HT3 receptors and decrease the expression of serotonin transporter (SERT), thus exerting a regulatory influence on gastrointestinal function.

Ganoderma lucidum

A revered tonic in traditional Chinese medicine is renowned for its immune-boosting and potential anti-cancer properties. Recent research, particularly in rat and mouse models induced with cisplatin-induced pica, has unveiled its promising role as an antiemetic against in CINV[63].Additionally, studies have also revealed that Ganoderma lucidum polysaccharides exhibited a superior inhibitory effect on cisplatin-induced pica behavior in mice compared to the antiemetic medication granisetron[64].

Morinda lucida

Morinda lucida, commonly known as "Oruwo" in Yoruba, is a tropical rainforest tree found in southwestern Nigeria, renowned for its medicinal properties. Its leaves are rich in vitamin K, facilitating bone strength and acting as an anticoagulant, while studies suggest its efficacy against trypanosomes, potentially aiding in treating sleeping sickness. Additionally, Morinda lucida exhibits aortic vasorelaxant properties, offering cardiovascular benefits, alongside reported anticancer effects attributed to both its leaf and stem bark constituents. Further research indicates hepatoprotective qualities, cytotoxic and genotoxic activities relevant to cancer treatment, and anti-spermatogenic effects that could influence fertility. Moreover, its hypoglycemic and antidiabetic activities have implications for managing blood sugar levels. Notably, in a chick emesis model, the ethanolic leaf extract displayed antiemetic properties, suggesting potential for alleviating vomiting and nausea[65].

Coriandrum sativum

Coriandrum sativum, or coriander, possesses a plethora of therapeutic properties. Studies have shown its central nervous system protective effects like anxiolytic, antidepressant, and sedative-hypnotic activities, along with antimicrobial properties against bacteria, fungi, and helminths. It also exhibits cardioprotective, anti-inflammatory, analgesic, antidiabetic, anticancer, and hepatoprotective effects, among others. Additionally, it has been found to have antiemetic and analgesic properties in animal models[66].*Top of Form*

Traditional Marketed Medicinal products used worldwide as antiemetic-

Rikkunshito

Rikkunshito, a Kampo medicine renowned for its antiemetic effects, comprises eight herbal medicines and is extensively used to address various gastrointestinal disorders in Japan[67]. Animal experiments have revealed that Rikkunshito acts as an antagonist to the 5-HT3 receptor. Additionally, it demonstrates antagonistic effects on the 5-hydroxytryptamine receptor 2B (5-HT2B) and 5-hydroxytryptamine receptor 2C (5-HT2C) receptors. This antagonistic action helps prevent the cisplatin-induced reduction in ghrelin levels, leading to the restoration of food intake[68].

Tianxiang

For years, TXC has been a reliable remedy for both preventing and treating motion sickness. It is made up of fourteen traditional Chinese herbs: Paeonia lactiflora Pall (Baishao), Eugenia caryophyllataThunb

(Dingxiang), Coptis chinensis Franch. (Huanglian), Gardenia jasminoides Ellis (Zhizi), Perilla frutescens (L.) Britton (Zisu), Cinnamomum cassia (L.) J. Presl (Guizhi), Pinelliaternata (Thunb.) Makino (Banxia), Citrus reticulata Blanco (Chenpi), Eugenia caryophyllata Benth (Guang Huoxiang), Atractylodesmacrocephala Koidz (Baizhu), and Poria cocos (Schw.) Wolf (Fuling)[69].

Xiao-Ban-Xia-Tang

Reformulated from an ancient antiemetic remedy found in the Golden Chamber prescription by Zhang Zhongjing during the Han dynasty, this traditional Chinese formula features a combination of Pinelliaternata (Thunb.) Makino and Zingiber officinale Roscoe, showcasing the enduring wisdom of historical herbal formulations for alleviating nausea. Numerous clinical studies conducted in China have substantiated the efficacy of this formulation in effectively managing chemotherapy-induced nausea and vomiting (CINV)[70].The clinical outcomes revealed a synergistic effect when combining XBXD with the 5-HT_3R antagonist for prophylaxis against CINV[71]. This combination not only demonstrated enhanced antiemetic efficacy against delayed vomiting but also showcased a reduction in adverse reactions associated with the 5-HT3R antagonist.

Goreisan-Kampo

Goreisan, a traditional Japanese herbal remedy, comprises five herbal components: Takusha (Alismatisrhizoma), Bukuryo (hoelen), Sojutsu (Atractylodislanceaerhizoma), Keihi (cinnamon bark), and Chorei(Polyporus). Rooted in historical use, it has traditionally served as a hydrostatic modulator, addressing conditions such as edema, diarrhea, headache, nausea, and dizziness.Some reports suggest that Goreisan may play a role in regulating intestinal function, indicating its potential for addressing gastrointestinal issues[72]. Additionally, an antiemetic effect has been observed, suggesting that it may help in alleviating nausea and vomiting.The effectiveness of Goreisan in preventing postoperative nausea and vomiting (PONV) is has been studied in a group of high-risk patients undergoing gynecological surgery[73].

Hezhong granules

Hezhong (HZ) granules, consisting of eight carefully purified herbs, has been explored for their potential to prevent chemotherapy-induced nausea and vomiting (CINV) in patients with advanced colorectal cancer. The granules include herbs such as Pinellia ternata (Thunb.) Makino, Zingiber officinale Roscoe, Scutellaria baicalensis Georgi, Coptis chinensis Franch., Evodia rutaecarpa (Juss.) Benth, Panax ginseng C. A. Mey, Poria cocos (Schw.) Wolf, and Cinnamomum verum J. Presl. Recent clinical trials have shown promising results in managing CINV in this patient population[74].

He-wei granules

The protective effects of He-Wei granules (HWKL) against chemotherapy-induced nausea and vomiting (CINV) were investigated using a cisplatin-induced (5 mg/kg) pica model. HWKL, which is composed of seven herbs—Pinellia ternata (Thunb.) Breit, Zingiber officinale Rosc, Panax ginseng C. A. Mey, Scutellaria baicalensis Georgi, Coptis chinensis Franch, Glycyrrhiza uralensis Fisch, and Ziziphus jujuba Mill—has been shown to reduce CINV by inhibiting the activity of 5-hydroxytryptamine (5-HT) and substance P (SP)[75].

Huangqin decoction

Huangqin Decoction, composed of Scutellaria Baicalensis Radix, Glycyrrhizae Radix, Radix Paeoniae Alba, and Jujubae Fructus, is commonly used to manage various gastrointestinal symptoms, including diarrhea, nausea, and vomiting. In patients with metastatic colorectal cancer (CRC) undergoing treatment with irinotecan, 5-fluorouracil (5-Fu), and leucovorin (LV), Huangqin Decoction has been found to significantly reduce gastrointestinal toxicity, particularly alleviating nausea and diarrhea[76].

Liujunzi decoction

Liujunzi Decoction, which includes CodonopsisPilosula, Poria Cocos, Atractylodes Macrocephala, Pinellia Ternata, Citri ReticulataePericarpium, and Glycyrrhiza Radix, has demonstrated several benefits in animal studies.It has been shown to alleviate chemotherapy-induced nausea and vomiting

(CINV) in patients undergoing cisplatin and paclitaxel regimens. It achieves this by antagonizing the 5-HT3 receptor, as well as the 5-hydroxytryptamine receptors 2B and 2C[76].

Banxia Xiexin decoction

Banxia Xiexin Decoction, composed of Pinellia ternata (Banxia), Ginger (Shengjiang), Scutellaria baicalensis (Huangqin), Glycyrrhiza uralensis (Gancao), Coptis chinensis (Huanglian), and Poria cocos (Fuling), works together to address vomiting and nausea by regulating stomach function, resolving phlegm, and balancing digestive health. Studies have examined the effects of combining chemotherapy with Banxia Xiexin Decoction in treating duodenal cancer and found it to be effective in controlling nausea and vomiting in patients with duodenal cancer[77].

Wuzhuyu Decoction

It consists of four herbs: Euodiae Fructus, ZingiberisRhizoma, Ginseng Radix, and Jujubae Fructus. It has been reported to effectively control migraine-induced headaches, nausea, vomiting, and gastrointestinal disorders[78].

Patent Preparations with Antiemetic Properties

Patent preparations, often backed by rigorous research and development, represent cutting-edge advancements in medical science. These specialty formulations minimise adverse effects while effectively reversing nausea and vomiting by focusing on particular pathways involved in these symptoms. From novel drug delivery systems to plant-based extracts, patent preparations offer hope for patients grappling with these distressing symptoms. **Table 4** presents a data on patent preparations developed to treat nausea and vomiting.

Table 4: Patent Preparations with Antiemetic Properties.

Sr.no	Title	Findings	Patent Number	Reference
1	Ginger and clove composition, preparation method of ginger and clove composition and use of ginger and clove composition for preparing toxicity-reducing efficacy-improving medicine in cancer radiotherapy and chemotherapy	Patent highlights the combined use of ginger and clove, emphasizing the synergistic impact of phytoconstituents gingerol and eugenol. The patent details their role in effectively addressing chemotherapy-induced nausea and vomiting associated with cancer treatment.	CN102145158A	[28]
2	Novel herbal compositions and process for preparation thereof	A novel formulation combining supercritical extracts of turmeric, ashwagandha, tinospora cordifolia, ginger rhizome, and neem leaf with therapeutic powders in encapsulated vegetarian gelcaps supports healthy cell growth and alleviates chemotherapy-induced nausea and vomiting, with additional COX-2 inhibition from turmeric and ginger.	US20060193928A1	[79]

Table 4: Continued.

3	Fast-acting plant-based medicinal compounds and nutritional supplements	A nutritional supplement incorporating a sesame oil-formulated cannabis extract, rich in THC, offers appetite stimulation and anti-emetic properties, particularly beneficial for managing AIDS-related anorexia and chemotherapy-induced nausea and vomiting.	AU2022201021B2	[80]
4	The mixture and its preparation and use of Cannabinoids compound	Cannabidiol salt in ratio 1:1exhibited effects of appetite stimulation and anti-vomiting properties.	CN105517989B	[81]
5	Tetrahydrocannabivarin (THCV) for use in the treatment of nausea and vomiting	The invention centres' on employing THCV for alleviating nausea and vomiting, preferably utilizing separated or purified THCV from cannabis plant extracts, particularly targeting medication-induced side effects like those from chemotherapeutic agents.	US9675579B2	[82]
6	Use of gingerols for cancer patients suffering from nausea and emesis induced by chemotherapy	A ginger rhizome extract formulation in an oil base, containing specified gingerol and shogaol percentages, administered orally every three to four hours, to treat nausea effectively.	US8435575B2	[84]
7	Carsickness relieving tea	Combination of natural botanicals such as tea leaves, ginger, smoked plum, olive, mint, licorice, and haw to alleviate symptoms of motion sickness.	CN103798436B	[83]
8	Pharmaceutical composition for preventing miscarriage and stopping vomiting and preparation method and application thereof	A patch comprising of costustoot, fructus amomi, ginger processed pinellia, dried orange peel, adenophora tetraphylla, poria cocos, bighead atractylodes rhizome, perilla leaves, coptis chinensis, wrinkled gianthyssop herb, bamboo shavings, and loquat leaves.	CN112076297A	[85]
9	Ginger/white pepper composition for relieving vomiting due to cancer chemotherapy and enhancing effect of cancer chemotherapy and preparation method thereof	The natural drug composition includes concentrated water extracts of ginger and white pepper, with gingerol and piperine, respectively, at varying ratios ranging from 2-6 parts ginger to 3-5 parts white pepper, and 4-8 parts gingerol to 2-9 parts piperine.	CN102526668A	[86]

Table 4: Continued.

10	Ginger and dark plum fruit composition and preparation method thereof, and application of ginger and dark plum fruit composition in preparation of attenuation and synergy medicaments for radiotherapy and chemotherapy of cancers	The natural medicinal composition includes ginger and dark plum fruit extracts, along with gingerol and dark plum fruit ethanol extract. It effectively alleviates side effects of cancer treatments like emesis while also possessing tumor-inhibiting effects.	CN102091315B	[87]
12	Traditional Chinese medicine paste for reducing vomiting reaction after chemotherapy and preparation method of traditional Chinese medicine paste	Paste includes red-rooted salvia root, radix curcumae, lignum dalbergi aeodoriferae, costus root, semen coicis, hairy vein agrimony, pericarpium citrireticulatae, pinellia ternata, poria cocos, medicated leaven, agilawood, honey-fried liquorice root, refined honey, and 50% alcohol as auxiliaries	CN103893695A	[88]
13	Anti-dizziness and vomit-stopping candy	The candy formulation incorporates nine vomit-suppressing ingredients, divided into an outer layer with pleasing-tasting additives including dark plums, dried orange peel, lemons, and fragrant oranges, and an inner layer with less palatable additives such as fresh ginger, purple perilla, agasta cherugosus, poria cocos, cloves, and liquorice roots.	CN110801506A	[89]
14	Traditional Chinese medicine composition for treatin g vomit and application thereof	The traditional Chinese medicine composition is formulated with variable parts by weight, including floscaryophylli, calyx kaki, rhizome zingiberisrecens, cassia twig, cortex magnoliae officinalis, rhizome pinelliae preparata, and herba pogostemonis	CN103768485A	[90]
15	Lotus seed natural medicine combination, preparing method and anti-emesis application	The natural medicine combination consists of lotus seed extract and fresh ginger extract (gingerol), processed into powdery form, then transformed into granules, and finally formulated into tablets and/or capsules.	CN104138419A	[91]

Table 4: Continued.

16	Enhanced gingerols for patients suffering from nausea and emesis	Method using supercritical, critical, or near-critical fluids with or without polar cosolvents to enhance gingerols. Capsules contain an extract with 6-gingerol, 8-gingerol, 10-gingerol, and 6-shogaol in a ratio to the starting mass of ginger rhizome of 90-100%.	WO2022104232A1	[92]
17	Fructus cannabis medicine pair for resisting cancer, stopping vomiting, reducing toxicity and improving efficacy and preparation method thereof	The fructus cannabis medicine pair combines fructus cannabis fruit extract with ginger extract.	CN103919819A	[93]
18	Vomit-stopping mouthwash	Mouthwash, incorporating the revitalizing properties of motherwort, peppermint, liquorice, honeysuckle, and leaf extracts, effectively freshens breath, eliminates bacteria, and alleviates nausea."	CN107496246A	[94]
19	Formula of herbal tea for treating vomiting	The invention offers a herbal tea blend, comprising bamboo shavings, galangal, radix sophoraeflavescentis, pueraria flower, schisandra chinensis, myristica fragrans, dark plum, mulberry, amomum kravanh, lalang grass rhizome, ginger, codonopsispilosula, pinellia ternate, radix paeoniae alba, liquorice, rehmannia root tablet, floscaryophylli, rhizome znemarrhenae, and polygala tenuifolia, in specific weight ratios. This tea effectively treats nervous vomiting.	CN103520679A	[95]

Table 4: Continued.

20	Chinese eaglewood extracts with function of arresting vomiting and application thereof	The invention offers Chinese eaglewood extracts, rich in anti-vomiting sesquiterpenoids like karanone and dihydrokaranone, blended with essential oils such as neroli, ginger, perilla frutescens, ginseng, costustoot, and fructus aurantii.	CN108002997A	[96]
21	Zingiber and caulis bambusae in taenian medicinal pair with vomit-stopping and anticancer effects and preparation method thereof	The inventor combines zingiber and caulis bambusae extracts to effectively inhibit cancer and postoperative nausea and vomiting, offering safety and efficacy.	CN113694172A	[97]

Antiemetics Screening Methods

1- In vivo emesis models

Antiemetics' efficacy is evaluated in a variety of animal models. These consist of the following: house musk shrew, pigeon, cat, pig, dog, rat, chick, frog, ferret, mink, and monkey. In the past, ranid frog and leopard models were employed, but the experimentation period required a lot of time—90 minutes. Akita et al. have devised a novel technique that substitutes young chicks for frogs. This approach saves more time because it only requires counting the retches for observation. Young chicks are used because they are easier to handle, easier to count the retching action, and the experiment takes less time (30 min). This paradigm is helpful for assessing the role of the brain in the antiemetic effects of botanicals because it replicates acute emesis as observed in humans. The assay procedure for antiemetic effects using young chicks has been established as standard practise. In addition, young chicks are less expensive and easier to raise than other animal emesis models like pigeons[98].

2-In vitro emesis model (Dictyostelium Chemotaxis model)

While antiemetics have been evaluated using animal models for centuries, researchers are now looking for non-animal alternatives due to ethical issues and regulatory changes. The Dictyosteliumdiscoideum chemotaxis model is one such model that is easy to use, rapid, and affordable. It functions as a precursor to antiemetic drugs by monitoring Dictyostelium cell activity. Emetic substances typically prevent these cells from moving. Several substances, including as capsaicin, stomach irritants, three bitter-tasting substances, and a phosphodiesterase IV inhibitor, have been tested in this model. Upcoming antiemetic research is anticipated to use more of these in vitro bioassay models[99].

Navigating Nausea and Vomiting: Latest Clinical Insights

Nausea and vomiting are the many common side effects of many treatments. The goal of current research is to create new drugs that can both prevent and treat vomiting. More knowledge about the circuitry and cellular mechanisms behind nausea and vomiting has surfaced, especially with relation to the interplay of the enteric, central, and autonomic nervous systems. For the best therapy, receptor-selective antiemetics that target particular emetic pathways are essential. Following **Table 5** shows the various Nutraceuticals conducted studies on various trial groups with different outcomes and findings for preventing nausea and vomiting.

Table 5 : Clinical studies details of current scenario in nausea and vomiting.

Name of compound	Dosage form/extract	Trial groups	Finding/ outcomes	Reference
Ginger	Ginger powder capsule of -250mg x 4 day -500mg x 3 day -125mg x 4 day -350mg x 3 day -325mg x 3 day -500mg x 2 day -Ginger biscuit.	Given in pregnancy and CINV. Comparator. -placebo -10mg vitaminB6 -placebo -25mg vitaminB6 -12.5mgvitaminB6 -50mg dimenhydrinate -65 women's, 30 given with placebo and 35 with ginger biscuit in pregnancy.	-Ginger was significantly more effective than placebo -Both ginger and vitaminB6 significantly effective -Ginger as effective as dimenhydrinate -Reduction in vomiting episode in ginger group	100 101 102 103 104 105 106
Propolis	Control water extract of 300 mg/kg.	5-6 young chicks group.	50.9% inhibition of copper sulphate induced emesis in young chicks	107
Grewia asiatica L	50mg/kg,100mg/kg grewia asiatica.	4 groups of 4 days old chicks.	39.42% inhibition of g2 and 59.69% of g3	108
Lemon	Lemon essential oil as inhalant.	100 pregnant women's divided in intervention and control groups.	There is significant difference found between treatment and control .	109
Peppermint oil	Nasal inhaler of peppermint oil. -inhalation Aromatherapy with 10% and 30% Peppermint Essential Oils.	In 123 cardiac patients. -120 patients undergoing abdominal surgery were randomly divided into three groups of 10% peppermint, 30% peppermint, and control	Control nausea and vomiting after cardiac surgery. -peppermint essential oils are equally effective on the severity of nausea.	110 111

Table 5: Continued.

Chamomile	Oral capsules	In 105 pregnant women's, comparing the effect with ginger.	Oral chamomile capsules reduce nausea and vomiting symptoms during pregnancy.	[112]
Cinnamon	Crude aqueous bark extract.	15 days old male chicks.	79.22% inhibition of copper sulphate induced emesis.	[113]
Cuscuta reflexa	Cuscuta reflexa aqueous extract.	In pigeons.	Inhibition of 5-HT3 receptor, emesis induced due to cisplatin.	[34]
Ginseng	Korean red ginseng extract	Cisplatin induced nausea and vomiting in ferrets.	KRGE via oral route significantly reduced the cisplatin-induced nausea and vomiting in ferrets.	[114]
Lemon	Lemon inhalation aromatherapy	100 pregnant women with nausea and vomiting randomly divided into intervention and control groups	A statistically significant difference between lemon inhalation group and placebo group	[115]
Cardamom	Cardamom powder capsule 500mg	Randomized clinical trial was performed on 120 pregnant women	The frequency and duration of nausea and the frequency of vomiting significantly decreased in the cardamom powder group	[116]
Pomegranate and spearmint	Pomegranate syrup and spearmint syrup	A total of 24 and 31 patients were analysed in the syrup and vitamin B6 groups.	Effectiveness of pomegranate and spearmint syrup in reducing nausea was confirmed in the syrup group versus the control group with significant differences.	[117]

Conclusion

Nutraceuticals are gaining traction for treating various ailments, with herbs, vegetables, and spices showing promise against nausea and vomiting. This review explores their potential integration into daily diets, highlighting their efficacy based on clinical studies and screening models. It emphasizes their role as complementary medicines, especially for chemotherapy-induced nausea, pregnancy-related symptoms, and motion sickness. Additionally, patented formulations claiming effectiveness in symptom control are discussed.

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إستكشاف المغذيات العشبية: إطلاق العنان للإمكانات للوقاية من الغثيان والقيء – بحث مرجعى

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يتناول هذا البحث المرجعى تحليلًا متعمقًا لمجموعة المغذيات وتأثيرها على الغثيان والقيء، خاصة في الحالات الناجمة عن العلاج الكيميائي وبعد العملية الجراحية (CINV وPONV). ويتناول الآليات الأساسية لهذه الأعراض، مع التركيز على الاضطرابات في الناقلات العصبية مثل السيروتونين والهستامين والدوبامين. و تسلط هذه الدراسة المرجعية الشاملة الضوء على الاتجاه العالمي نحو دمج المستخلصات النباتية في الطب التقليدي، مما يعكس التفضيل المتزايد لبدائل العلاج الطبيعي. و تناولت المقالة العديد من الأعشاب والتوابل ذات الخصائص المضادة للقيء، بما في ذلك المنتجات الطبية التقليدية والمستحضرات الحاصلة على براءة اختراع. وهو يدرس فعالية الخضروات والأعشاب من الأنظمة الطبية المتنوعة في جميع أنحاء العالم، التى لها مقدرة على منع وعلاج الغثيان والقيء. بالإضافة إلى ذلك، تحدد الدراسة طرق الفحص المختلفة وتناقش الدراسات السريرية الحالية، مما يوفر نظرة عامة شاملة على هذا المجال. كما تستعرض المقالة براءات الاختراع والمنتجات المسوقة المتعلقة بالنباتات النشطة المستخدمة كمضادات للقيء، وتعرض التطبيقات التجارية والعملية لهذه العلاجات الطبيعية. و تقترح النتائج في النهاية استراتيجيات لصناعة المغذيات للتأثير على الفوائد الطبية للأطعمة والخضروات والأعشاب كمضادات للقيء. وتهدف هذه الاستراتيجيات إلى تلبية احتياجات الاستهلاك المحلي والتطبيقات الطبية الأوسع، مع تسليط الضوء على الدور الهام للمغذيات في الرعاية الصحية الحديثة. تؤكد الدراسة على أهمية البحث والتطوير المستمر في هذا المجال لتعزيز فعالية العلاجات الطبيعية المضادة للقيء وإمكانية الوصول إليها.