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Review Paper

Preparation And Evaluation the Extract from Herbal Source for Pathological Condition- Migraine

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ABSTRACT

Abnormal or unhealthy states that impact the body's organs, tissues, or systems are referred to as pathological conditions. Numerous variables, including genetic mutations, infections, environmental factors, and autonomic disorders, can cause these conditions. Numerous illnesses exist, including neurological, immunological, and cardiovascular disorders. A neurological condition is migraine. It is characterized by repeated episodes of moderate to severe intensity, usually one-sided, throbbing headaches that are frequently accompanied by light, sound, and nausea sensitivity. There are several types of migraine, including chronic, episodic, migraine with aura, and migraine without aura. In addition to the chemicals sumatriptan and riztriptan, there are also peppermint oil, ginger, lavender oil, and turmeric. Herbal remedies are applied. Herbs are readily accessible. This review briefly discusses the use of herbal remedies to alleviate migraines. Additionally, it offers different methods for extracting and analysing the herbal remedies used to treat migraines.

INTRODUCTION

The term "pathological conditions" refers to any illness, sickness, or anomaly that interferes with the natural operation of the body's systems, tissues, or organs. Numerous factors, including as genetic abnormalities, infections, injuries, environmental influences, and degenerative processes, can lead to these disorders. A person's quality of life may be impacted by symptoms and problems resulting from pathological alterations that alter the structure and function of cells and tissues. Autoimmune disorders, in which the immune system unintentionally targets healthy tissues, and cardiovascular ailments, which interfere with

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blood flow.[1] The particular ailment and its underlying causes determine the diagnosis and course of treatment, with therapies intended to control symptoms, address malfunction, or slow the progression of the disease.

Infectious diseases: brought on by pathogens such parasites, fungus, viruses, or bacteria.

Malaria, HIV/AIDS, and tuberculosis are a few examples.

Genetic Disorders: These include Down syndrome, sickle cell anaemia, and cystic fibrosis and are caused by inherited mutations or genetic abnormalities.

Autoimmune diseases: These arise when healthy tissues are mistakenly attacked by the immune system. This group includes diseases like multiple sclerosis, lupus, and rheumatoid arthritis.

Degenerative Diseases: Those that cause cells, tissues, or organs to gradually deteriorate over time. Parkinson's illness, osteoarthritis, and Alzheimer's disease are a few example

Neoplastic Diseases: These include aberrant cell growths that can be either benign or malignant (cancerous). One of the most common neoplastic diseases is cancer, including lung and breast cancer.

Brain Anatomy:

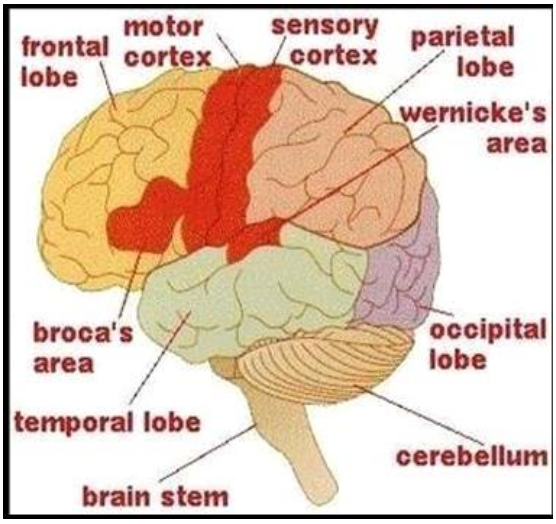

Figure 1

The central nervous system is composed of the brain and spinal cord. Everything that defines who we are, including our personality, memories, thoughts, senses, and movements, is controlled by the central nervous system. Additionally, it regulates more automatic processes including blood pressure, respiration, and heartbeat. The greatest part of the brain is the cerebrum. It is separated into two hemispheres, or halves. After that, these are separated into four smaller lobes. These lobes each have distinct roles to play:

The front of the brain contains the frontal lobes. Personality, reasoning, problem- solving, focus, and attention are all influenced by the frontal lobes. A tiny area in the frontal lobe, typically on the left side, known as Broca's area, is crucial for speech and language function. The motor cortex, which governs movement of the body, is located behind the frontal lobes. The left motor cortex governs movement on the right side of the body, while the right motor cortex governs movement on the left side, since each hemisphere of the brain governs the opposite side of the body. The temporal lobes are crucial for comprehending spoken language and sounds, as well as memory and emotion. Wernicke's area is a tiny region in the temporal lobe that is involved in language comprehension. The parietal lobes are in charge of receiving and interpreting sensory information from the body, such as touch, temperature, pain,

and pressure. They also contribute to reasoning and mathematical abilities. The rear of the brain contains the occipital lobes. They play a crucial role in the reception and interpretation of visual information. Additionally, there are a few deep structures known as the diencephalon that have significant roles: Information traveling through the brain is "relayed stationed" by the thalamus. It transmit in coming data for interpretation to other parts of the brain. The hypothalamus regulates a few of the brain's autonomic, or automatic, proesses. It regulates hunger and digestion, sleep, body temperature, and hormone systems The thyroid hormone, growth hormone, and sex hormone system are among the hormone systems that the pituitary gland regulates. The cerebellum, which means "little brain" in Latin, is situated in the rear of the brain. It is located in what is known as the posterior fossa. Muscle tone, balance, and coordination are all regulated by the cerebellum.

Information is transferred between the brain and the rest of the body via the brain stem. It consists of the medulla, pons, and midbrain. The midbrain performs a variety of tasks. It processes sensory data like vision and hearing and is important in sleep and waking cycles. The cerebellum and pons are directly related. It facilitates the synchronization of facial and ocular movements.

The cerebellum and pons are directly related. It facilitates the synchronization of facial and ocular movements. The medulla regulates breathing, swallowing, and heart rhythm. Grey matter, so called because it appears gray, makes up the brain's outer. The cerebral cortex, the outermost layer of the brain, is formed of the gray matter, which is composed of the cell bodies of the neurons, or nerve cells. The cortex is where most seizures originate. The white matter, which is composed of myelinated, or insulated, fibers, lies beneath the gray matter. Numerous neurological conditions, including multiple sclerosis (MS), are linked to white matter inflammation and autoimmune processes. The vertebral basilar system, which is composed of the vertebral and basilar arteries on the back of the neck, and the carotid arteries, which are the two large arteries on the sides of the neck, deliver blood to the brain. Strokes, some autoimmune disorders, and injuries can all have an impact on these arteries.

Brain-Related Disorders: Also referred to as neurological disorders, brain-related disorders include a broad spectrum of illnesses that impact the chemistry, structure, or function of the brain. These conditions may affect behaviour, motor abilities, thought processes, or general brain activity. The following are a few prevalent brain-related conditions:

Stroke: This condition is brought on by an interruption in blood flow to a portion of brain.

Epilepsy: A condition marked by frequent seizures brought on by aberrant brain electrical activity. The type and severity of seizures might vary.

Multiple Sclerosis (MS): This autoimmune the brain, which damages surrounding tissue and impairs function. It may result in cognitive decline, speech problems, and paralysis.

Alzheimer's Disease: A degenerative brain condition that causes cognitive decline, disorientation, and memory loss. In elderly persons, it is the most frequent cause of dementia.

Parkinson's disease is a neurological condition that mostly impairs movement and manifests as stiffness, tremors, and issues with balance and coordination. Condition causes communication issues between the brain and the rest of the body by attacking the myelin sheath that surrounds nerve fibers.

Traumatic Brain Injury (TBI): Occurs when the brain sustains an abrupt injury, frequently as a result of falls or accidents. Based on the extent and region of the brain impacted, it may result in cognitive, emotional, and physical issues.

Brain tumours: Unusual cell growths in the brain that may be cancerous or benign. By applying

pressure to specific parts of the brain, they can disrupt brain activity and result in symptoms including headaches, seizures, and behavioural abnormalities.

Migraine: A neurological disorder marked by severe, frequent headaches that are frequently accompanied by other symptoms like light and sound sensitivity, nausea, and vision abnormalities.

Huntington's Disease: This genetic condition results in the progressive degeneration of brain nerve cells, which impairs cognition, movement, and mental health. 10.Lou Gehrig's disease, also known as Amyotrophic Lateral Sclerosis (ALS), is a progressive neurodegenerative illness that damages brain and spinal cord nerve cells, resulting in muscle weakening and ultimately loss of voluntary muscle control.

Schizophrenia Disorder: This mental illness comprises delusions, hallucinations, disorganized speech, lack of feeling, and disruptions in thoughts, perceptions, emotions, and social interaction.

Anxiety: Excessive concern, fear, or apprehension regarding commonplace situations characterizes anxiety, a mental health illness. Stress, trauma, genetics, or chemical imbalances in the brain can all set it off.

Depression: Depression is a mood condition characterized by enduring depressive, gloomy, and disinterested feelings. It may be brought on by long-term stress, life events, brain chemistry, or genetic factors depend on the underlying cause and severity, each of these conditions may call for a different medical strategy, such as medication, therapy, or surgery.

What Is A Headache

One of the most prevalent neurological disorders, headaches are frequently associated with abnormalities in the cerebral cortex, which processes sensory data like temperature, touch, and pain. Headache-related symptoms are also influenced by the brainstem, which controls autonomic processes including breathing and heartbeat.Additionally, variations in carotid artery blood flow can affect how the brain functions generally, which can lead to headaches. These links demonstrate how various brain areas and their roles can affect how headaches are experienced. [5]

Headache

Headache Types

A headache is a throbbing, continuous, acute, or dull discomfort in your head or face that is frequently characterized as pressure. The kind, intensity, location, and frequency of headaches can vary substantially. The majority of people will get headaches frequently during their lifetimes, making it a highly common ailment. Although the majority of headaches are not harmful, some may indicate more serious diseases. Over 150 different kinds of headaches exist.

They can be divided into primary and secondary groups.

Primary headaches are caused by the malfunction or hyperactivity of your head's pain- sensitive components. They are neither brought on by or an indication of an underlying illness. Primary headaches may be more common in some people due to genetic predispositions.

Primary headache types include:

Tension-type headaches, which are the most prevalent kind.

1. Headaches from migraine.
2. Headaches in cluster.
3. NDPH, or new daily persistent headaches.
4. Alcohol, especially red wine, is one lifestyle element or circumstance that might cause a main headache.
5. Some foods, like nitrate-containing processed meats (food-triggered headaches).
6. Nicotine consumption (headache).
7. Sleep disturbances or insufficient sleep.
8. Bad posture.

9. Exercise and other forms of physical activity (exertion headaches).
10. Missed meals due to a headache from hunger.
11. Seizing, blowing your nose, coughing, straining (as during a bowel movement), or sobbing or laughing uncontrollably (cough headaches).
12. Although primary headaches are usually not harmful, they can cause severe discomfort and interfere with daily activities.
13. Secondary headaches are caused by an underlying medical problem. They are seen as an indication or symptom of a disease.

The following are examples of secondary headaches that are not always harmful and go away if the underlying condition is treated:

1. Headaches from dehydration.
2. Headaches from sinuses.
3. Headaches from medication misuse.

The following categories of secondary headaches may indicate a dangerous or even fatal illness:

- Spinal headache: spinal headache are severe headaches that commonly follow a spinal tap and happen when spinal fluid seeps out of the membrane enclosing your spinal cord. The majority of spinal headaches are treatable at home, but if left untreated for an extended period of time, they can result in seizures and subdural hematomas, among other potentially fatal consequences.
- Headaches from thunderclaps: An excruciatingly severe headache that strikes suddenly, akin to a thunderclap, is known as a thunderclap headache. This kind of headache lasts for at least five minutes and peaks in intensity in about one minute. Even though thunderclap headaches are occasionally benign, it's crucial to get medical help right once. They may indicate a brain haemorrhage or a head injury. abrupt and significant increase in blood pressure. Reversible cerebral vasoconstriction syndrome.[10]

Migraine Pathological Condition

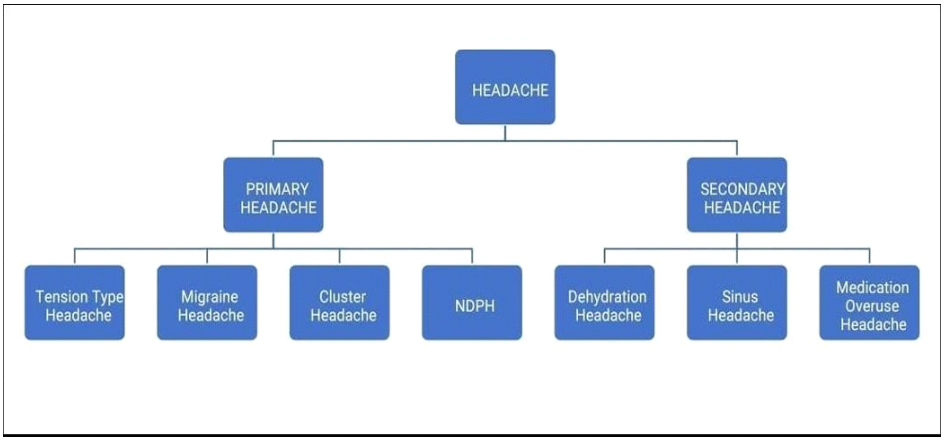

Figure 2

What Is A Migraine?

One kind of headache is a migraine. Symptoms could include light and sound sensitivity, nausea, or vomiting. Most people only have a throbbing pain on one side of their head. A neurological disorder, or pathological condition affecting the nerve system, is what migraine is classified as. In addition to recurrent headaches, it frequently manifests as light and sound sensitivity, nausea, and vision abnormalities (aura). Although the precise ethology of migraines is unknown, it is believed to be related to aberrant brain activity, which includes alterations in blood flow and chemical releases.[3]

Numerous things, including stress, hormone fluctuations, particular diets, and environmental triggers, can cause migraines. Normal brain and

nerve function is disrupted in neurological illnesses, such as migraines.

Reasons:

Abnormal brain activity is the source of a migraine headache. Numerous factors can cause this behaviour to occur. However, the precise sequence of events is still unknown. The majority of medical professionals think the attack starts in the brain and includes chemicals and nerve connections. Blood flow in the brain and adjacent tissues is impacted by the alterations. The onset of migraine headaches often occurs between the ages of 10 and 45. They can occasionally start earlier or later. There may be a family history of migraines. Women experience migraines more frequently than men do.Some pregnant women experience fewer migraines than others.Any of the following factors can cause migraine attacks: Caffeine withdrawal Modifications in hormone levels brought on by a woman on birth control tablets or during her menstrual cycle.Alterations in sleep patterns, including inadequate sleep, alcohol consumption, physical stress from exercise, loud noises or bright lights, missing meals, odours or fragrances, smoking or being around smoke, stress, and anxiety

The following categories apply to migraines:

1. An aura-free migraine: Recurrent headache bouts that last four to seventy-two hours are part of this category. Usually unilateral, the pain is pulsing, moderate to severe in intensity, exacerbated by movement, and linked to light sensitivity (photophobia), sound sensitivity (phonophobia), and nausea.
2. Aura-accompanied migraine: This subtype is characterized by frequent, completely reversible attacks that last for several minutes. Usually, one or more unilateral symptoms, such as visual, sensory, speech and language, motor, brainstem, or retinal abnormalities, are present first, followed by headache and other migraine symptoms.
3. A chronic migraine is characterized by a headache that lasts for more than three months and occurs at least 15 days each month, with migraine symptoms present on at least 8 of those days.
4. A probable migraine is a symptomatic migraine episode that does not fit the criteria for another form of headache and does not have one of the characteristics needed to meet the criteria for one of the aforementioned.

Symptoms: Migraines come in two primary varieties:

Classic migraine, or migraine with aura

Common migraine, or migraine without aura77

A collection of neurological (or nervous system) symptoms is called an aura. These symptoms are thought to be an early indicator of an impending migraine. The most common symptoms involve vision impairment, which might include any or all of the following:

- Zigzag lines, or flashing lights.
- Blurred vision.
- Eye pain
- Coloured patches or temporary blind areas
- Tunnel vision (only able to see items close to the centre of the field of view)

Stars

Other symptoms of the neurological system include weakness, numbness, tingling, dizziness, nausea, difficulty concentrating, yawning, and difficulty finding the proper words. With migraine headaches, several of these symptoms are far less frequent. Your doctor will probably prescribe tests to determine the cause if you experience any of these symptoms. Although it might happen just a few minutes to 24 hours before to the headache, an aura usually happens 10 to 15 minutes beforehand. An aura is not usually followed by a headache. The headaches typically last four to seventy-two hours, start out as a dull ache that gets worse a matter of minutes to hours, and are throbbing, pounding, or pulsating. They also frequently affect one side of

the head, causing discomfort behind the eye or in the back of the head and neck.

The following are other headache symptoms that could manifest:

Increased frequency of urination, exhaustion, appetite loss, nausea, vomiting, light or sound sensitivity, and sweating. Even after the migraine has passed, symptoms could still be present. We refer to this as a migraine hangover.

A few symptoms include

Neck pain, Needing extra sleep, Feeling cognitively drowsy, as if your thoughts are not clear or sharp.

Treatment:

Migraine treatment involves a combination of strategies aimed at alleviating symptoms and preventing future episodes. Acute treatments focus on relieving pain during an attack and may include over-the-counter analgesics such as ibuprofen and aspirin or prescription medications like triptans (e.g., sumatriptan, rizatriptan). Preventive therapies are recommended for individuals with frequent or severe migraines and may involve the use of beta-blockers, antiepileptic drugs, or antidepressants. In addition to pharmacological approaches, non-pharmacological methods such as cognitive-behavioral therapy, acupuncture, and lifestyle modifications—such as maintaining regular sleep patterns, stress management, and dietary adjustments—can be effective. Herbal remedies, including peppermint oil, ginger, lavender oil, and turmeric, have also been explored as complementary treatments. Advanced options, such as Botox injections or CGRP inhibitors, are available for chronic migraine sufferers. A personalized treatment plan developed in consultation with a healthcare professional is essential for optimal management of migraines.[15]

Managing An Attack

Drinking fluids to stay hydrated is often beneficial, whether or not medications are used. At the first indication of a migraine attack, additional medications are taken. When your migraine is mild, over-the-counter (OTC) pain relievers like aspirin, ibuprofen, naproxen, or acetaminophen are frequently beneficial.[14]

Synthetic medications for migraine treatment:

Substances that are selective 5-HT agonists include sumatriptin, riztriptan, narotritan, and zolmitriptan.

1. Alkaloids of ergot
2. Dihydroergotamine (DHE)
3. Ergotamine
4. Other
5. Amitriptine.
6. Propranolol.
7. Valproic acid.

Herbal medications for migraine therapy.

1. Turmeric
2. Peppermint
3. Coriander
4. Lavender
5. Ginger

Benefits of using herbal remedies instead of allopathic ones

Herbal preparations are manufactured with only natural and organic materials; they don't contain artificial additives or surfactants, and they don't have any negative side effects; they're also environmentally friendly and biodegradable.

- If chemical treatment is discontinued, there may be a potential that the issue will recur and that prolonged use may result in resistance.
- Herbal medications are less expensive than synthetic ones.

The drawbacks of herbal remedies

- The absence of uniformity
- The possibility of adverse effects
- Contamination risk.

Turmeric

Figure 3

Synonym : Indian saffron, curcuma, turmeric, and haldi are synonyms. Zingiberaceae family

The plant Curcuma longa Linn. (C. domestica), a member of the Zingiberaceae family, is the biological source of turmeric. Its rhizomes can be either fresh or dried. It has a zingiberene content of at least 1.5%.

Chemical Components: About 5% of turmeric is made up of resin, volatile oil, zingiberaceous starch grains, and curcuminoids, which are chemicals that give turmeric its yellow color. 50–60% of curcuminoids are curcumin, which is their main constituent. Curcuma species are chemically composed of curcumin, starch, and volatile oil. Some species are said to be yellow because of curcumin and other related curcuminoids including demethoxy curcumin and bis demethoxy curcumin. Mono and sesquiterpenes like α and β pinene, α-phellandrene, camphor, camphene, DL-α-termerone zingiberene, and α, ß curcumenes make up the 1–6.5 percent volatile ol content. Because of their high starch content, species like C. angustifolia and C. caulina are used in place of arrow root. Several pharmacopoeias recognize turmeric and curcumin as legitimate substances. In addition to its conventional uses, curcumin has demonstrated anti-inflammatory properties. It has been determined that C is an antiarthritic agent.

aromatica. Cervical cancer has been treated with C. wenyjuin (C. aromatica) in China. The British Standard (BS) and the International Standards Organization (ISO 5562-1983) have defined curcumins. 6147: 1983. HPLC and colorimetry are both used to estimate it. For different constituents, G.L.C. and T.L.C. approaches have been reported. Curcumin was mentioned in the WHO/FAO expert committee report on food additives. Mild HIV-I and HIV-2 protease inhibitory action has been demonstrated by curcuminoids that were separated from turmeric's ethyl acetate extract.[2]

Peppermint

Figure 4

Colpermin, Mentha oil, and oil of mentha piperita are synonyms. Origin in Biology: The fresh flowering tops of the plants known as Mentha piperita Linn., which are members of the Labiatae family, are steam-distilled to produce the oil. It is corrected if required. Mentha oil includes at least 4.5% and up to 10% w/w of esters, which are calculated as menthyl acetate; at least 44% of free alcohols, which are calculated as menthol; and at least 15% and up to 32% of ketone, which is calculated as menthone.

Chemical Constituents: Depending on the variation (such as American, Japanese, or Indian), peppermint oil mostly comprises menthol, up to 70% in free form, as well as esters. Japanese peppermint oil has 70–90% menthol, compared to 80 percent in American peppermint oil.

Menthone, menthofuran, jasmone, menthyl isovalerate, menthyl acetate, and a number of other terpene derivatives are additional significant components of peppermint oil. Ilimonene, isopulegone, cineole, pinene, camphene, and others are among the various terpenes. Pleasant flavor is caused by esters and jasmone.

Applications: Mentha or peppermint oil is used as a flavouring, stimulant, and carminative. It also possesses minor antibacterial qualities. It is found in various pharmacological dosage forms, toothpaste, tooth powders, and shaving creams. Additionally, chewing gum, candies, jellies, fragrances, and essences are made with it. Procter & Gamble Ltd., Bhavna Chemicals,

S. H. Kelkar and Co., and a number of other companies make menthol in India. Approximately 500 tons of menthol are produced in India each year.[2]

Coriander

Figure 5

Cilantro leaves and coriander fruits are synonyms. The Umbelliferae family

Biological Source: These are the ripe, totally dried fruits of the Coriandrum sativum Linn. plant, which belongs to the Umbelliferae family. At least 0.3% of the volatile oil should be present in the fruits.

Chemical components: From 0.31 percent volatile oil, coriander is grown. The remaining ingredients in the medication include proteins (20%) and fixed oil (13%). 90% of the drug's volatile oil is made up of D-linalool (coriandrol) and coriandryl acetate, with trace amounts of L-borneol, geraniol, and pinene. Vitamin A concentration is high in coriander leaves. S-7 percent ash is produced by the fruit. The volatile oil composition of crude drugs changes significantly during routine storage. Uses for Coriandrol . The fruits and their volatile oil are used as flavouring agents, stimulants, carminatives, and aromatics. To avoid gripping, coriander oil is used in conjunction with purgatives. It is a component of cascara elixir and orange tumpound spirit.[2]

Lavender

Figure 6

Comman Lavendor is a synonym. Labiatae is the family. Its biological source is the volatile oil that is extracted through steam distillation from the fresh blooming tops of the Labiatae family plant Lavandula officinak Chaix (L. Vera D.C.). Common lavender and real lavender are other names for this plant. It is thought to be the best variety of lavender and is native to mountainous or hilly areas of Europe. Another type called Lavendera stoechas is also utilized to separate oil. It is referred to as French lavender in commerce.

Chemical components: According to Chemical Constituents, the oil includes roughly 30–40% esters, which are measured as linalyl acetate and linalool, 0.878. cineol, pinene, and geraniol.

Uses: utilized in cosmetics and fragrances as a flavoring agent, carminative, and aromatic.[2]

Ginger

Figure 7

Drug Profile

Sunthi, Zingiber, and Zingiberis are synonyms. Zingiberaceae family The biological source of ginger is the dried, scraped, or unscrapped rhizomes of Zingiber officinale Roscoe, a member of the Zingiberaceae family. On a dried basis, it contains at least 0.8% of all gingerols. Ginger's chemical components include acrid resinous matter (5–10%), inorganic material (6%), fat (10%), fiber (5%), starch (40–60%), and volatile oil (1–4%). Ginger oil is made up of oxygenated mono and sesquiterpene hydrocarbons, phenyl propanoids, and monoterpene hydrocarbons

All varieties of ginger oil from various nations have the same amount of sesquiterpene hydrocarbons, which include α-curcumene, β-bisabolene, αfarnesene, β-sesquiphellandrene, and α-zingiberene. The primary characteristics of ginger are its flavor and aroma. Phenolic ketones of oleo-resin provide the flavor, pungency, and pharmacological action, and volatile oil's aromatic components provide the aroma. The delicate and lemony scent is caused by a variety of volatile oil constituents, including isometric terpenic aldehydes like citral and geranial. A small number of sesquiterpene oil hydrocarbons are thought to have a spicy note. Gingerols such as shogaols, zingerone, paradols, gingediols, and hexahydrocurcumin, as well as their omethyl ethers, are examples of phenolic ketones found in oleo resin.

Applications: Ginger is used as a stimulant, carminative, aromatic, stomachic, and flavoring agent. Ginger powder has been shown to help with motion sickness, and ginger oil is used in mouthwash, liquors, and ginger drinks. Ginger's adsorbent, aromatic, and carminative qualities have been proposed to increase stomach motility and adsorb toxins in the gastrointestinal tract. These might most likely block the symptoms of nausea and G.I. responses. The methanolic extract of Z. officinale exhibits molluscicidal properties and is effective in controlling schistosomiasis, a parasitic infection. A ginger product that is generally regarded as safe (GRAS) has been approved by the US Food and Drug Administration.[2]

Extraction: Separating and standardizing gingerol from ginger

- Herbal extract preparation: After being picked and allowed to dry in the shade for two to three days, the purchased plants were ground into a powder using a mixer grinder.
- 100ml a of ethanol was used to soak 10g of each medication.
- Using a mechanical stirrer, continuously stirred for 6–8 hours at 970 rpm
- Cold maceration in a refrigerator for roughly 72 hours.

The macerated product was subsequently filtered, and the filtrate was kept for further use.[7]

Figure 8

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