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FORMULATION AND EVALUATION OF HERBAL LOLLYPOP FOR MOTION SICKNESS

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1. ABSTRACT

Herbal lollipop as an innovative approach to treating motion sickness In pediatric patients, particularly those aged between 3 to 12 years. Motion sickness is caused by conflicting sensory information, which Induces dizziness, nausea, and vomiting. The emphasis of the research Is on natural ingredients mainly ginger, amla, and peppermint, which Have been identified with gastrointestinal and central nervous system Activity. Ginger is very effective in countering nausea, and its bioactive Compounds like gingerol and shogaol increase the motility of the Stomach. Amla is a great source of vitamin C and antioxidants, thusEnhancing digestive health. Peppermint contains menthol, which Exhibits antispasmodic activity and relaxes the gastrointestinal tract.

KEYWORDS: *Ginger; Amla; Peppermint; Pediatric Motion Sickness; Herbal Remedies; Antifungal Activity*

2. INTRODUCTION

Motion sickness is a frequent condition marked by feelings of discomfort that are induced by Specific kinds of movement. Motion sickness is one of the usual conditions where symptoms Such as dizziness, nausea, or vomiting are caused due to various conflicting signals being sent From one's inner ear, the eyes, and body through the brain. The root cause is mostly a Misleading communication while traveling by motor vehicle, boats, planes, trains, or riding Attractions in an amusement park. Children between 3 to 12 years are more prone to motione Sickness, but children below 2 years are do not experience symptoms.The mechanism for Motion sickness is based on a mismatch of sensory information. For instance, while reading Or looking down inside a moving car, the child's inner ear feels that the child is moving but The eyes see stillness. Such a discrepancy creates confusion in the brain, which may give rise To symptoms of motion sickness.The inner ear is quite sensitive; children with Heightened sensitivity may experience more acute symptoms.Symptoms in children can Vary and often include an upset stomach (often the first sign), dizziness (especially common In younger children), nausea and vomiting (more pronounced after age 12), cold sweats, loss Of energy, and behavioral signs such as becoming pale or squirmy.To manage motion Sickness in children, several preventive measures can be taken ensuring the child is not Hungry before travel (light snacks like oatmeal or bananas are recommended), encouraging

Them to look outside rather than at books or screens, making frequent stops during car trips For breaks, and opting for auditory entertainment instead of reading materials. Other over-the Counter drugs that could be effective but have to be used under the advice of a pediatrician. If There are symptoms of motion sickness occurring outside of movement activity, or if Symptoms continue after more than eight hours posttravel, a pediatrician has to be consulted So as to exclude other causes of such an illness.

Motion sickness, also known as kinetosis, occurs due to sensory conflicts in the vestibular system, leading to nausea, vomiting, sweating, and dizziness. It is prevalent in children aged 2-12 years. While pharmaceutical interventions are available, they may not be well-tolerated in children. Herbal lollipops provide an innovative, child-friendly solution by combining the therapeutic benefits of herbs with an enjoyable delivery format.

Motion sickness is treated by natural herbs and plants because of their chemicals that affect The central nervous system and the gastrointestinal tract. Active components included in Many of these natural therapies relax the stomach and support digestive health,

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which helps Reduce nausea and vomiting. They frequently function by calming the gastrointestinal tract's Muscles, which might lessen nausea. Other herbs can help control the body's reaction to stress Caused by motion since they have anti-inflammatory qualities. Through enhancing stomach Movement and influencing the brain's vomiting area, these herbal therapies offer a Comprehensive strategy for treating motion sickness symptoms. With a long history of Traditional use, their use as natural alternatives to conventional medications makes them Attractive options for those looking for relief from motion-related discomfort.

2.1 Motion Sickness

Motion sickness occurs when your brain receives conflicting signals from your inner ears, eyes, and other body parts about motion and spatial orientation. This mismatch causes symptoms such as:

Common Symptoms:
Nausea or vomiting
Dizziness
Cold sweats
Fatigue
Headache
Pale skin
Increased salivation

• Common Triggers
Traveling by car, boat, plane, or train
Virtual reality experiences
Reading or focusing on a screen while in motion
Amusement park rides

• Who's Most Affected
Children aged 2–12
Pregnant individuals
People prone to migraines or anxiety
Those with inner ear disorders

• Prevention Tips
Sit where motion is least (front seat of car, over wing in plane, midship on boat)
Look at the horizon or a fixed point
Keep head still and upright
Avoid reading or screen use
Get fresh air or keep windows open
Eat light meals before travel
Stay hydrated

• Treatment Options
Medications:
Over-the-counter: Meclizine (Bonine), dimenhydrinate (Dramamine), or antihistamines like diphenhydramine (Benadryl)
Prescription: Scopolamine patches or promethazine

• Natural Remedies
Ginger (tea, capsules, or candy)
Acupressure wristbands (e.g., Sea-Bands)

1. Introduction to Motion Sickness

Motion sickness, also known as kinetosis, is a common condition that occurs when there is a conflict between the sensory systems involved in balance and motion perception. It often arises during travel by car, boat, plane, or virtual reality environments.

Symptoms: Nausea, vomiting, dizziness, sweating, pallor, headache, and a general feeling of malaise.

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Triggers: Movement in vehicles (car, ship, airplane), rides, simulators, or visual disorientation (e.g., reading while riding

2. Pathophysiology of Motion Sickness

Motion sickness results from a sensory mismatch or conflict between the following systems:
Vestibular system (inner ear) – detects motion and spatial orientation.
Visual system (eyes) – perceives movement and positioning.
Proprioceptive input (muscles and joints) – senses body position.
When these systems send inconsistent signals to the brain (e.g., the inner ear detects movement, but the eyes do not), the central nervous system, particularly the vestibular nuclei in the brainstem, interprets this mismatch as an abnormal state, potentially akin to poisoning. This may trigger a vomiting reflex as a protective mechanism.
• Key structures involved:
Vestibular apparatus (labyrinth) – detects changes in motion and position.
Cerebellum – integrates sensory input and coordinates responses.
Autonomic nervous system – mediates symptoms like nausea and sweating.

3. Treatment of Motion Sickness

• Non-pharmacological Measures:
Positioning: Face forward and sit in the front seat of a car or on the deck of a ship where motion is least felt.
Fix gaze: Look at the horizon or a stable object.
Avoid visual stimuli: Don't read or look at screens.
Adequate ventilation: Fresh air reduces symptoms.
Behavioral techniques: Relaxation, desensitization (gradual exposure
• Pharmacological Treatments:
Antihistamines (block histamine receptors in the vestibular system):
Dimenhydrinate (Dramamine)
Meclizine (Bonine)
Diphenhydramine (Benadryl)
• Anticholinergics:
Scopolamine (transdermal patch) – highly effective; blocks muscarinic receptors.
Benzodiazepines (for severe anxiety-related motion sickness, with caution):
Diazepam, Lorazepam

3. AIM : Formulation And Evaluation Of Herbal Lollypop For Motion Sickness

3.1 OBJECTIVE

1. To identify and select suitable herbal ingredients with known antiemetic properties, such as ginger, peppermint, and clove.
2. To formulate a herbal lollipop using natural sweeteners and excipients that ensure stability, taste, and therapeutic efficacy.
3. To evaluate the physicochemical properties of the herbal lollipop, including weight variation, hardness, pH, and moisture content.
4. To assess the in vitro drug release profile to determine the release pattern of active herbal constituents.
5. To conduct organoleptic evaluation (taste, color, texture, and appearance) for acceptability, especially in children and adults.

4. MATERIALS AND METHODS

4.1. Materials

- Sugar
- Liquid Glucose
- Ginger (Zingiber officinale)
- Amla (Phyllanthus emblica)
- Peppermint (Mentha piperita)
- Black salt
- Citric acid

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4.MATERIALS (INGREDIENTS) USED

4.1 Ginger



Figure 1: Ginger rhizomes.

Scientific Name: Zingiber officinale Roscoe
Synonyms (Botanical): Amomum zingiber L. Zingiber majus Garsault
Family: Zingiberaceae
Biological Source: Ginger consists of the dried rhizomes of Zingiber officinale Roscoe, a perennial herb.
Chemical Constituents: Zingiberene B-Bisabolene

4.2 Amla



Figure 2: Phyllanthus emblica.

Scientific Name: Phyllanthus emblica
Synonym: Emblica officinalis Gaertn.
Family: Phyllanthaceae
Biological Source: It consists of dried or fresh fruit of Phyllanthus emblica
Chemical Constituents: Ascorbic acid Tannins Flavonoids

Use
Boosts Immunity
High in vitamin C and antioxidants.
Strengthens the immune system and helps fight infections.
Improves Digestion
Aids in relieving acidity, bloating, and constipation.
Enhances metabolism.
Controls Blood Sugar
Beneficial for diabetics as it helps regulate blood glucose levels.

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4.3 Peppermint



Figure 3: Mentha Piperita

Kingdom: Plantae
Order: Lamiales
Family: Lamiaceae
Genus: Mentha
Species: Mentha piperita

Use
Relieves Digestive Issues
Eases indigestion, gas, and bloating.
Peppermint oil capsules are commonly used for Irritable Bowel Syndrome (IBS).
Soothes Headaches & Migraines
Applying diluted peppermint oil to the temples can relieve tension headaches due to its cooling and pain-relieving properties.

4.4 Sugar



Figure 4: Sucrose

Botanical Name: Saccharum officinarum
Biological Source: It is obtained from the stems of Saccharum officinarum (sugarcane)
Family: Poaceae

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4.5 Citric Acid



Figure 5 : Lemon

Botanical Name: Citrus limon
Biological Source: Citric acid is primarily obtained from the juice of citrus fruits such as lemon
Family: Rutaceae

Use
Flavor Enhancer
Adds a sour, tangy taste to candies, soft drinks, jams, and sauces.
Preservative Prevents spoilage and extends shelf life by lowering pH and inhibiting microbial growth.

5. MATERIAL EQUIPMENT
• Weighing balance
• Beakers
• Heating mantle or hot plate
• Glass rod (for stirring)
• Candy thermometer
• Molds (lollipop molds)
• Lollipop sticks

5.1 Formula

Sr.no	Ingredients	Quantity taken(gm)
1.	Sugar	60gm
2.	Liquid glucose	20gm
3.	Ginger	5gm
4.	Amla	5gm
5.	Peppermint	2-3 drops
6.	Black salt	2gm
7.	Citric acid	1-2gm

6. PROCEDURE FOR FORMULATION

1. **Preparation of Herbal Extracts (if using raw herbs)**
   Dry and powder ginger and lemon peel.
   Extract using water/alcohol depending on the solubility (maceration or decoction for water-soluble; tincture for alcohol-soluble).
   Concentrate the extract to a syrupy consistency.

2. **Lollipop Base Preparation**
   In a stainless steel vessel, mix sucrose and glucose syrup in a 2:1 ratio with water.
   Heat the mixture while stirring until it reaches hard crack stage (150°C – 155°C).
   Add citric acid (around 0.1-0.2%) just before reaching final temperature.

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Remove from heat and allow the temperature to drop to around 110°C

- Add:
  - Herbal extracts (ginger, lemon)
  - Peppermint oil
  - Natural color and flavor
- Mix thoroughly but gently to avoid air entrapment.



3. Molding

Pour the hot mixture into pre-oiled lollipop molds with sticks.
Allow to cool and solidify at room temperature.
Demold and package in moisture-resistant wrappers.



Harbal Lollypop For Motion Sickness

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7. COMPARISONS BETWEEN HERBAL PRODUCT AND MARKETED PRODUCT

Here's a comparison between herbal lollipops for motion sickness and marketed (conventional pharmaceutical) products, highlighting their ingredients, mechanism of action, effectiveness, safety, and availability

Herbal Lollipop vs Marketed Products for Motion Sickness

Feature	Herbal Lollipop	**Marketed Product** (e.g., **Dramamine**, **Bonine**)
Main Ingredients	Ginger, peppermint, chamomile, lemon balm	Dimenhydrinate, Meclizine, Scopolamine (patch)
Mechanism of Action	Natural anti-nausea, calming GI tract and nerves	Blocks signals to brain's nausea center (antihistamine)
Onset of Action	Slower (20–40 mins)	Faster (15–30 mins)
Effectiveness (Mild/Moderate)	Good for mild to moderate motion sickness	Very effective for moderate to severe symptoms
Side Effects	Minimal (possible allergy or mild GI upset)	Drowsiness, dry mouth, dizziness
Children Safe	Yes (many are safe for 2+ years; check label)	Varies; often not recommended under 6 years
Pregnancy Safe	Yes (especially ginger-based)	Some not recommended (especially in 1st trimester)
Convenience & Taste	Pleasant, candy-like form	Pills, chewables, patches (not always pleasant)
Long-Term Use	Generally safe	Can cause tolerance or side effects over time
Cost	Moderate ($5–10 per pack)	Varies ($5–20 depending on type
Examples	Queasy Pops, Preggie Pops, Sea-Band lozenges	Dramamine, Bonine, Transderm Scop patch

7.1 Applications and Uses

Primary Use: Prevention and management of motion sickness in children and adults.
Ideal for:
Road, air, and sea travelers
People sensitive to motion or turbulence
Situations where pills are not suitable (nausea, fear of swallowing tablets)
Additional Benefits:
Digestive aid
Refreshing and breath-freshening effect (especially with mint)
Sugar-based lollipops provide energy boost during travel
Motion Sickness Management
Ideal for travelers (children, adults) to prevent nausea and dizziness during car, sea, or air travel
Pediatric Use
Appealing form for children who resist pills or syrups
On-the-Go Relief
Easy to carry, no water needed, immediate soothing action
Alternative Medicine and Wellness
Incorporates traditional herbs in a modern, convenient form

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7.2 Physical test

Test Name	Purpose	Method/Procedure
Weight Variation	To ensure uniformity of dosage	Weigh 10 lollipops individually and calculate average weight. Deviation should be within ±5–10%.
Thickness and Diameter	To ensure uniform size	Use a Vernier caliper to measure dimensions of 10 lollipops.
Hardness/Breaking Strength	To check mechanical strength	Use a tablet hardness tester or manually assess brittleness.
Surface Texture and Appearance	To evaluate visual quality	Visually inspect for cracks, discoloration, or air bubbles.
pH of Dissolved Lollipop	To check acidity/alkalinity (for oral safety)	Dissolve lollipop in distilled water (1:10 w/v) and measure pH using a digital pH meter. Should be in the range of 5–7.
Dissolution Time	To evaluate in-mouth release profile	Simulate salivary conditions (e.g., stirring in 100 ml of artificial saliva at 37°C) and record time to complete dissolution.
Stick Adhesion Test	To ensure stick is properly embedded	Apply gentle pulling force to the stick; it should remain firmly embedded.
Moisture Content (LOD)	To determine water content	Use a moisture analyzer or oven-dry method (105°C until constant weight). High moisture can cause microbial growth.

7.3 Chemical Tests

Test Name	Purpose	Method/Procedure
Drug Content Uniformity	To ensure uniform distribution of active herbal ingredients	Dissolve one lollipop in a suitable solvent, filter, and analyze using UV-Vis spectrophotometer or HPLC based on marker compounds (e.g., gingerols for ginger).
Sugar Content Estimation	To quantify sucrose/glucose	Use Fehling's test or modern HPLC methods
Stability Testing	To assess shelf life	Store samples at different conditions (25°C/60% RH & 40°C/75% RH) and evaluate monthly for 3–6 months. Mon

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8. RESULT

Formulation of herbal lollipop to treat pediatric motion sickness will involve an in-depth Exploration of motion sickness, which generally affects children from 3 years old up to 12 Years of age. It is characterized by conflicting sensory inputs that trigger such symptoms as Dizziness, nausea, and vomiting. The paper describes the possibility that natural herbs like Ginger, amla, and peppermint are used to eliminate these symptoms through their Gastrointestinal and CNS benefits. In fact, compounds in ginger may enhance gastric motility And reduce nausea, while compounds in amla have antioxidants that may eliminate oxidative Stress, and peppermint is known to have antispasmodic effects that relieve the gastrointestinal Tract. The study focuses on a holistic approach by using these herbal ingredients as Alternatives to conventional medications, making them appealing for those seeking natural Remedies for motion-related discomfort. The formulation process involves blending the herbs With sugar and liquid glucose, followed by cooking and molding into lollipops, providing an Enjoyable method to administer these beneficial ingredients. This approach not only enhances Compliance among pediatric patients but also capitalizes on the sensory appeal of lollipops.

9. CONCLUSION

The research reaches the conclusion that a promising new treatment for children motion Sickness is the herbal lollipop. It was established that ginger greatly reduces nausea, and Peppermint and amla both have unique health advantages. The findings imply that this Formulation offers a comprehensive substitute for pharmaceutical solutions while also acting As a fun treatment for kids. To confirm their efficacy in the general population and investigate Additional motion sickness uses, however, larger clinical trials must be conducted in the Future. In light of this, the study highlights the potential for herbs to enhance people's quality Of life by alleviating motion-related discomfort.

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