JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

"Formulation and Evaluation of Herbal hand Sanitizer (Liquid and Gel) using *psidium guajava* leaves Extract"

Miss. Shaila Kiran Domane[1*], Mr. Audumbar Baburao Kutre[1], Miss. Snehal Sanjay Upadhye[1], Mr. Vivekanand Ekanath Teli[1], Mr. Kalmesh Pralhad Chougule[1], Miss. Pallavi Tanawade[2]

[1]Student, [2]Assistant Professor

Yashwant Redekar College of Pharmacy (B. Pharm & D. Pharm), Nesari, Kolhapur

Maharashtra 416504.

ABSTRACT

The creation and assessment of a herbal hand sanitizer using Psidium guava leaf extract is the goal. Its efficiency highlights the positive impact of herbal hand sanitizer. The majority of study has been on maintaining cleanliness by preventing germs from entering the body through the hands. After discussing the advantages of lowering the microorganisms, the objective of the current investigation is established. Natural herbal hand sanitizers are affordable, effective, and environmentally and biodegradably friendly. In comparison to gram-negative bacteria, guava leaf extract shown greater antibacterial efficacy against gram-positive and gram-negative bacteria. In food production, food service, households, and other daycare preparations, good hand hygiene is essential and one of the most crucial tasks. Hand sanitizer helps prevent negative consequences like dermatitis, itchiness, and irritation. Therefore, with hygiene as the primary consideration, an effort has been undertaken to create a herbal hand wash utilising an extract of a widely accessible plant, such as guava. The formulation's physical characteristics were assessed.

KEYWORDS: Hand sanitizers, Hygiene, Psidium guava leaves, Herbal Extract, Extraction, Antimicrobial Agents.

INTRODUCTION

Tropical temperatures are ideal for the evergreen guava tree (Psidium guajava), which belongs to the Myrtaceae family. And subtropical regions, favouring arid climate. Folk medicine employs psidium guajava. That aids in managing and treating a number of disorders. Several plant components have been employed in various. To treat ailments including malaria, gastroenteritis, vomiting, and diarrhoea using conventional medicine Ulcers, coughs, sore throats, dysentery, toothaches, and irritated gums. Guava trees are a Little evergreen trees Guava leaves range in size from two to six inches long and one to two inches broad. The leaves have prominent coriaceous veins and a dull green appearance.

The Method of Guava Contains:

1. Chemical and reagent
2. Preparation of water extract
3. Preparation of Ethanol extract
4. Phytochemical tests

A bioactive substance found in guava leaves has anti-infective, blood sugar-regulating, and weight-loss properties. Staphylococcus aureus can cause a variety of infections, from minor illnesses to fatal ones, when it spreads to different body parts like the skin, hair, and nose. Additionally, some studies have shown that ethanol- or ethyl-alcohol-based hand sanitizers have a greater impact than soap and water in suppressing microbial development. According to a study on the efficacy of hand sanitizers, workers who used alcohol-based hand sanitizers at least five times every workday had a roughly two-third lower risk of getting sick than those who continued to merely wash their hands. The influenza virus was also reduced as a result of frequent hand sanitizer use. When clean, flowing water is not readily available, hand sanitizers can be used as a substitute for hand washing as the first line of defence in the fight against disease. Hand washing is effective.

Brand Name of Herbal Hand Sanitizer:

1) Himalaya hand sanitizer
2) Nycil hand sanitizer
3) Dabur hand sanitizer
4) Herbodaya hand sanitizer
5) Suthol hand sanitizer
6) Strategi hand sanitizer
7) Jagat hand sanitizer
8) Slexi hand sanitizer

Morphology: The shape of the leaf blade ranges from elliptic to oblong; it measures 5–15 cm long by 3–7 cm wide; the lower face is coarsely pubescent and veined; the upper face is glabrous. The 3 cm in diameter, coloured flowers are either borne singly or in groups of two to three in the axils of newly emerging lateral shoots.

Nutritional value

1) Guava leaves are rich in vitamin C, vitamin B, antioxidants, and tannins in addition to having several anti-inflammatory qualities.
2) Guava leaves offer anti-inflammatory and antimicrobial qualities that eliminate bacteria and Battles infections, and those who use guava leaves at home can help manage toothaches.

Scientific Name: Psidium Guajava

Reginal Language	Common name
1.Hindi	Amrud
2.Sanskrit	Amrutam
3.Marathi	Peru
4.English	Guava
5.Telagu	Guava
6.Oriya	Piguli
7.Latin	Psidium Guajava
8.French	Goyava

BOTANICAL CLASSIFICATION:

1.Kingdom	Plantae
2.Divison	Magnoliophyta
3.Class	Magnoliopsida
4.Subclass	Rosidae
5.Superorder	Rosanae
6.Order	Myrtales
7.Family	Myrtaceae
8.Genus	Psidium L. Guavas
9.Species	Psidium Guajava L.

Distribution of Guava tree:

The FDA's current good manufacturing practise regulations are referred to as CGMP. When a medicine is being manufactured, processed, packaged, or held, CGMP procedures must be followed to ensure that it complies with regulatory standards. Acting in a way that is distinct, strong, and satisfies the standards for quality and purity Portrayed for processing.

Objectives:

Concerned with all facets of manufacturing and quality control; ensure that goods are consistently created and inspected to the required quality.

In the production of cosmetics, overall management and Monitoring Make sure the consumer obtains products that meet the requirements Quality.

BACTERIAL STRAINS:

1. Escherichia coli (gram–ve) ATCC 10531

2. Pseudomonas aeruginosa(gram–ve) ATCC 25619

3. Staphylococcus aureus (gram +ve) ATCC 6538

4. Bacillus subtilis (gram +ve) ATCC 663

FUNGI STRAINS:

1. Saccharomyces cerevisiae (yeast) ATCC 2601

2. Candida albicans (yeast) ATCC 1023

Application of Guava leaves:

1) First, to make marine-fish gelatin beads for use in the food, pharmaceutical, and medical industries as well as other applications.

2) Giri et al. recommended guava leaves as an additional source of food for the fish species. Due to the immune-stimulating impact, Labeorohita.

3) Guava leaves provide tannin and other essential oils that prevent bacteria from growing and treat illnesses. Diarrhoea.

4) The anti-inflammatory and antibacterial qualities of guava leaves help combat .germs People who consume guava leaves at home can help manage toothaches and infections.

Adverse effect:

1. It is simple to prevent the negative effects of hand sanitizers or hand washing soaps by determining the trigger and taking the necessary precautions using one or a combination of the following techniques: choosing products with less irritating ingredients, and applying post-use moisturiser to skin Hygiene and avoiding practises that could worsen or cause skin irritation.
2. Tropical nations and regions with higher relative humidity have longer skin moisture retention rates. Compared to cold, dry settings, humidity
3. This element necessitates different emollient requirements depending on the relevant climatic conditions Climates and environmental conditions based on place. Several people, including the Dry skin is particularly common in older people and healthcare workers who frequently wear occlusive gloves.
4. As a result, it is advisable for these High-risk people should use moisturisers with To increase skin moisture and strengthen the skin barrier, use humectants, fats, or oils.

MATERIAL AND METHODOLOGY:

PLANT MATERIAL COLLECTION AND AUTHENTICATION

In November 2021, leaves and barks of fully ripe and healthy guavas (P. guajava) were randomly taken from low land areas of Nesari. The Dr. Babasaheb Ambedkar Technology University and the pharmaceutical laboratory both performed sample authentication.

1.PREPARATION OF EXTRACTION.

Fresh guava leaves weighing 50g were collected, washed under running water to eliminate dust, and dried for five days at room temperature in the shade. They were processed through an electric miller into a fine powder. The dried powder was obtained using Employing a 95% ethanol maceration process for three to four days. 250 cc of ethanol and 50 g of powder 500ml flasks were added, combined, and shaken. Flask was then covered with aluminium foil to It was shaken on a platform shaker for three days at room temperature to prevent evaporation. The resultant extract was concentrated for 30 minutes using a magnetic stirrer. The filtrate was then collected after the extract had been filtered using Whatman filter paper. They were When used for both qualitative and quantitative purposes at 4

PREPARATION OF SOLVENT:

Menstruum is another name for the solvent used to extract medicinal and herbal plants. The type of plant, the plant component being extracted, the makeup of the bioactive compound, and the solvent's bioavailability all influence the choice of solvent. A nonpolar solvent like water, Polar chemical extraction uses ethanol and methanol. Using a non-polar solvent, like a Non-polar compound extraction uses hexane and dichloromethane.

PROPERTIES OF SOLVENT EXTRACTION:

1. Water: The most polar solvent, it is utilised to extract a variety of polar compounds.

Advantage: It is extremely polar, inexpensive, non-toxic, and dissolves a variety of compounds.

Disadvantage: It may cause hydrolysis, it encourages the growth of germs and mould, and it generates a lot of heat. need to concentrate the extract.

2. Alcohol Additionally polar and water soluble, it has the ability to extract polar secondary metabolites.

Advantage: At concentration, it is a self-preservative, and only a little heat is needed for Extract concentration

Disadvantage: It is volatile and combustible, and it does not dissolve wax, gums, or fats.

FACTORS CONSIDERED IN SELECTING SOLVENT OF EXTRACTION

- Selectivity: The ability of a chosen solvent extractthe active constituent and leave the inert material.
- Safety: The ideal solvent of extraction should be non-toxic and non-flammable.
- Cost: It should be cheap as possible
- Reactivity: Suitable solvent should not react with the extract.
- Recovery: The solvent of extraction should be quickly recovered and separated from the extract.
- Viscosity: Should be low viscosity to allow ease of penetration.

Extraction of Guava leaves:

The first phase and crucial factor in the preparation of medicinal herbs for Obtaining effective research results. Before doing so, bioactive constituents must be extracted and their quality and quantity evaluated. The planned biological test should go ahead. The major stages included in acquiring quality bioactive molecules are the selection of an Appropriate solvent, extraction method, phytochemical screening procedure, fractionation Method and techniques for identification Solvents commonly used in the extraction of herbal plants (medicinal plants) are polar solvents. (Example: water, alcohol). Intermediate polar compounds (for example, -acetone, dichloromethane) and Nonpolar (-n-hexane, ether, chloroform, for example) In general, extraction procedures include maceration, digestion, decoction, infusion, percolation, Soxhlet extraction, superficial extraction, ultrasound-assisted, and microwave-assisted Extractions. The application allows for the fractionation and purification of purification and fractionation of phytochemical compounds. Other chromatographic methods include thin-layer chromatography and paper chromatography.

Process of Extraction:

To prepare herbal plants (Medicinal plants) for direct consumption, they are extracted and processed. As herbal or conventional medicine, or as a preparation for an experiment. The process of making herbal For experimental reasons, medicinal plants must be collected properly and on time. Plant, authentication, followed by sufficient drying, grinding, extraction, and fractionation And the separation of bioactive substances. Separating active ingredients from herbal plants is done by extraction.

Plate 1: photos of *Psidium guajava* leaves. i.e. (a) *Psidium guajava* leaves ;(b) Dried leaves; (c) Dried leaves at oven; (d) Grinding leaves.

Maceration: A container is filled with finely powdered drug material, such as leaves, stem bark, or root bark, and the mechanism is then poured on top, covering the drug material thoroughly. After that, the container is sealed and preserved for a minimum of three days. The Content is periodically swirled, and if stored inside a container, it should be periodically shaken to guarantee total extraction. The micelle is removed from the horse by at the conclusion of extraction Decoction or Filtering oven is where the micelle is evaporated away from the menstruum. or on the water bath's surface.

Drug Excipients Compatibility Study:

When developing a formulation for a drug product that uses many excipients, a study of drug excipient compatibility is a crucial step. The preformulation stage of the investigation is important. A drug product includes a combination of several forms of active pharmaceutical ingredients (API), in addition to these. Excipients. The physical-chemical interaction between API and excipients must be studied. In general, a binary mix combination in a ratio of 1:1 is used for excipient compatibility studies. Evaluated. Occasionally, in order to assess the degree of interaction and complexity, numerous Excipient compositions in API presence were evaluated.

Importance of excipients and its compatibility:

The drug excipients compatibility study could be used to choose the best excipients. It advocates avoiding the anticipated last-minute complexity throughout the formulation development process. Excipients improve the drug product's fundamental quality. Such as the precise amount that is necessary, stability, solubility, effectiveness, acceptability, and quality absorption. A drug's safety and effectiveness in vivo. Drug excipient must comply with regulatory regulations. Compatibility studies are necessary to forecast likely medication manufacturing degradation processes.

Stability Studies: One of the crucial criteria for the creation of new medications and formulations is the stability studies of pharmaceutical goods. All dosage forms of pharmaceutical products are developed with the shelf-life prediction playing a vital role. Used to specify label instructions and identify the specific storage state. Stability Pharmaceutical product studies guarantee the upkeep of product quality. Security and Effectiveness during the course of the shelf life is regarded as a need for acceptance and approval. Of every medicinal item. Pharmaceutical product stability studies might be summarised as The amount of time that pharmaceutical products maintain their physical, chemical, and microbiological properties Pharmacokinetic traits and qualities from the time of manufacture through the end of the shelf life Manufacture. The product's shelf life can be determined.

Standard Operating Procedure (SOPs):

Preparation of SOPs for different instruments and equipment.

DIGITAL WEIGHING BALANCE:

1. Turn the balance on.
2. Hold off until the scale's reading is zero.
3. Set a Petri dish on the balancing plate.
4. Write down the Petrik plate's weight or tear it off.
5. Place the necessary amount of sample on a Petri dish.

Autoclave:

Principle of Autoclave:

A basic principle of chemistry is that when the pressure of a gas increases, the temperature of the Gas increase proportionally. For example, when free-flowing steam at a temperature of 100°C is Placed under a pressure of 1 atmosphere above sea level pressure – that is, about 15 pounds of Pressure per

Importance: All forms of life, including bacterial spores, are thought to be most reliably destroyed by moist heat in the form of compressed steam. The autoclave is a machine that uses this technique. French and German microbiologists created the first The autoclave as a necessary element in their labs.

HOT AIR OVEN:

Turn on the mains supply and wait until it reaches the desired temperature. Once the temperature has reached the desired temperature, turn on the hot air oven. When the temperature reaches the desired degree and is stable, maintain the plates and rack inside the incubator.bSustained for 30 minutes.

MAGNATIC STIRRER:

A magnetic stirrer, also known as a magnetic mixer, is a laboratory apparatus that uses a rotating magnetic field to stir a liquid by causing a stir bar (also known as a flea) to spin very quickly. A set of stationary electromagnets or a rotating magnet can both produce the rotating field. Beneath the liquid-filled vessel In chemistry and biology, it is utilised in place of other kinds of Such as stirring rods and motorised stirrers.

UV CABINET

1. Switch “ON” the main power supply.

2. Open the cabinet door, by pulling the white knob located on the front side of the cabinet.

3. Place the TLC plate or any material inside it and close the cabinet door.

4. Three switches are provided on the top right corner of the instrument.

5. Switch 1-for UV light at long wavelength (365 nm).

6. Switch 2-for UV light at short wavelength (254 nm).

7. Switch 3-for daylight.

8. Select the required light and switch to "ON".

9. Observe the plate for visualization of spot from the observation compartment (window)

located on the top of cabinet.

10. Switch 'OFF' the lamp or the instrument when not required.

Phytochemical test:

The phytochemical analysis of the chemical components of guava extracts is qualitatively understudied. The findings showed that the four distinct extracts contained active substances. The methanol and ethanol extracts, as shown in the table, suggest that saponins are not present, but there are tannins, phenols, flavonoids, terpenoids, and glycosides.

Test	Observation	Inference
1.Test for alkaloids a) DragendorffsTest : 1ml of extract was taken and placed into a test tube. Then 1ml of potassium bismuth iodide solution (Dragendroffs reagent) was added and shaken	Orange- red ppt is formed	Alkaloid is present.
b)Wagner'sTest : 1ml of extract +1ml of potassium iodide (Wagner's reagent) was added and shaken.	Reddish- brown ppt is formed	Alkaloid is present.
c)Mayer'sTest : 1ml of extract +1ml of potassium mercuric iodide solution (Mayer'sreagent) was added and shaken.	Whitish or cream ppt is formed.	Alkaloid is present
d)Hager'sTest : 1ml of solution of an extract thus 1ml of saturated ferric solution(Hager's Reagent) was added and shaken	Yellow colour ppt is formed	Alkaloid is present
2) Test for glycosides: a) Bontrager's test (modified): 1 gm of crude extract + 5ml of dilute HCL + 5ml of ferric chloride (5%) solution was added, then shaken and placed over water bath + Boil for 10min coted and filtered, then extracted with benzene +	The pink color formed	Glycoside is present

Finally equal volume of ammonia solution was added to benzene layer.		
b) killer killianii test :2ml of extract with water + 0.5ml is lead acetate is added shaken and filtered + then get evaporated and dissolved the residue in glacial acetic acid + few drops of ferric chloride added the mixture was placed in test tube in contains 2ml of H2SO4.	Blush green is formed	Glycoside is present
3)Test for steroids and triterpenoids:1ml extract + 2ml chloroform added shaken filtered few drops of conc.H2So4 added, filtered and shaken and allow to stand.	Golden yellow ppt is formed	Glycoside is present
4)Test for flavonoids: a)Shinodas test: 2ml extract + Few drops of conc.HCL+0.5mg of Rimandoium tumings and shaken.	The pink colour is formed	Glycoside is present

Thin Layer Chromatography: This method uses an adsorption process as well to isolate a chemical from a mixture. The interaction of the chemicals in a mixture with the stationary phase is the basis for separation. It can be used for the separation of low-molecular-weight molecules. The Typically, stationary phase is a slurry made by dissolving 100g of silica gel in distilled water. Meanwhile, Sephadex is appropriate in some circumstances. The silica gel solution is then poured. Resulting in a 1.5mm thick glass plate with dimensions of 20 cm by 20 cm. Then, it is retained. For one hour to solidify at 105°C. 10mL of the extract is then injected onto the plate's lowest portion. Endorsed as it grows.

Following a cautious insertion into the mobile phase-containing separation chamber, the plate is then left to stand for 30 minutes. Based on their solubility, the mixture's constituent chemicals will ascend to different locations on the plate. By measuring the retardation factor, which is the ratio of the distance travelled by the compound to the solvent, and comparing it to that of a known compound, each chemical separated is identified. The spotted compounds are scraped using a spatula in various locations before being re-extracted using a variety of solvents. Less time is required, clear spots are produced, and the solvent is stable to acid, among other benefits.

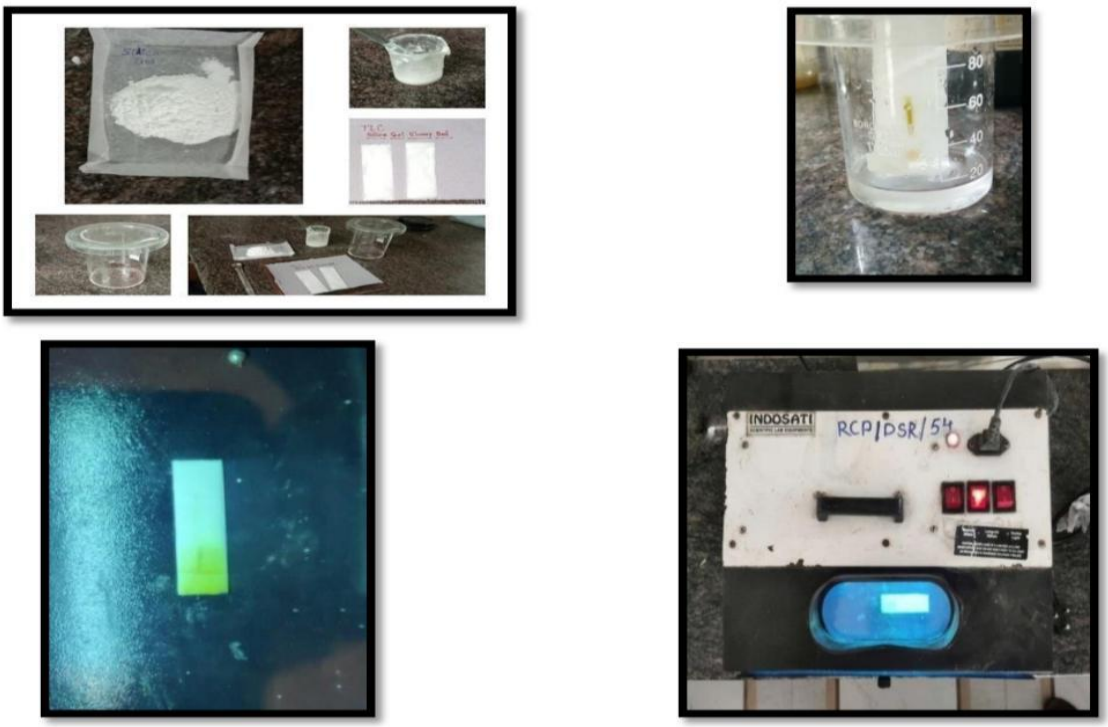

Fig 11 . Thin-layer chromatography (TLC)

METHOD OF PREPARATION: (Hand Sanitizer Liquid)

Sr. No	Ingredient	Quantity
1	Carbopol	0.18ml
2	Alcohol	18.6ml
3	Glycerine	0.69ml
4	Methyl Paraben	0.5gm
5	Guava Leaves Extract	0.5gm
6	Triethanolamine	0.07ml
7	Deionized Water	9.3ml
8	Perfume	0.15ml

Procedure for formulation of Hand Sanitizer:

1. Carbopol was added to deionized water with constant stirring.

2. After uniform mixing, Triethanolamine was added with slow stirring to avoid formation of possible air bubbles in the product.

3. Kept aside for 24 hrs.

4. The extract of guava leaves and Carbopol were added to denaturing alcohol with glycerin, Polysorbate 20, were mixed with aqueous.

5. Finally, methylparaben was added as a preservative and perfume was added. 6.Mixed with slow stirring to obtain uniform product.

Sr. No	Ingredient	Quantity taken
1	Guava leaf extract	0.28gm
2	HPMC (Hydroxy propyl methyl cellulose)	0.69gm
3	Glycerine	3.46gm
4	Methyl paraben	0.23gm
5	Propylene glycol	1.73gm
6	Distilled water	8.65ml
7	Perfume	0.86ml

Procedure for formulation of Hand Sanitizer Gel:

1. 10 ml distilled water was heated at temperature of 80℃.

2. Then HPMC was swelling on hot water for 5min then added methyl paraben after then added ethanol extract of guava leaves. Then stirred homogenously.

3. The gel mass has been formed then added glycerine and propylene glycol.

4. Finally added distilled water, while stirred homogenous.

COMPARISSION SANITIZER LIQUID AND SANITIZER GEL:

1) Compared to gel hand sanitizer, which could take up to 30 seconds to completely remove viral or bacterial content, liquid hand sanitizer can function more quickly, at a rate of about 15 seconds.

2) Gel might take longer to dry. Gel is easier to handle and distribute for some individuals. than sanitising liquid.

3) The third form of hand sanitizer is gel, which has a thicker, almost jelly-like consistency. On the other hand, liquid hand sanitizer has a viscosity more akin to water.

4) Because liquid hand sanitizer has a higher concentration than gel hand sanitizer, it is more effective. Alcohol concentration Hand sanitizers typically have moisturisers added by manufacturers to lessen the skin-drying effects of alcohol.

5) utilised properly, Both liquid and gel sanitizers effectively eliminate germs, although the liquid is more effective.Sanitizer works more quickly.

6) The prolonged use of gel may reduce its effectiveness in everyday use because Some folks could apply it and remove it right away before it has a chance to work.

EVALUATION TEST:

Antimicrobial test:

Protocol: The nutrient agar media was used. E. coli microorganism culture was used. Incubation

time was set up for 24hrs.

Method: Agar bore well diffusion method.

Following the addition of an E. coli suspension, 40 cc of sterile nutritional agar media were placed into each sterilised plate. The plates were gently stirred to ensure that the agar and text organism were thoroughly mixed before being left on the flat firm surface.surface, then let it harden. 1 cup, 10 ml in diameter, was inserted into each plate and filled with bore in cork Carefully using a sterilised dissecting needle, the disc of the agar bore was removed.avoid breaking the cups. Equal amounts of cream formulation with the same strength are placed on each plate. was put in the cup and kept there for 24 hours at a temperature of 37°C + 2°C. the whole Zone of inhibition was estimated during the surgery, which was done in an aseptic environment.

Evaluation Parameters:

Organoleptic Properties: - Tests like Colour, Odour and clarity were carried out.

Physical properties: - pH: The pH was determined by using pH paper/meter. The pH measurement of the formulated gel was measured using a digital pH- meter. The pH Measurements represent the mean +- standard deviation of three replicates.

1)Guava leaves extract

2)Hand Sanitizer Liquid

3) Hand Sanitizer Gel

1. Five healthy volunteers underwent an irritancy test. The time after applying the herbal hand sanitizer to the palm was recorded. Itching, redness, dryness, and irritability were assessed.
2. ive healthy people were chosen as the evaporation rate. They rubbed the herbal hand sanitizer on their palms before applying it to their hands. Evaporation happened, and that moment was recorded. The rate of evaporation was below one minute.
3. Antibacterial Test:The antibacterial activity of herbal hand sanitizer using different solvents against strains of aerobic and anaerobic micro-organisms was evaluated by standard cup plate method. For this standard cup plate method, the nutrient agar medium was used as a culture media.

Antibacterial Activity

Sr. No	Ingredients	Quantity taken
1	Agar	2gm
2	Beef extract	1gm
3	Peptone	1gm
4	NaCl	0.50gm
5	Distilled water	100ml

Preparation of Nutrient Agar:

1. Suspend 2 gm of nutrient agar powder in 100 ml of distilled water.

2. Heat this mixture while stirring to fully dissolve all components.

3. Autoclave the dissolved mixture at 121 degrees Celsius for 15 minutes.

4. Once the nutrient agar has been autoclaved, allow it to cool but not solidify.

5. Pour nutrient agar into each plate and leave plates on the sterile surface until the agar has solidified and is placed into a refrigerator.

6. The Petri plate was incubated for 24 hrs at 37˚C. Then next to this, the agar culture media was poured on the Petri plate uniformly in aseptic condition.

7. After spreading, the agar medium was covered with another Petri plate and kept aside for 24 hrs in refrigerator to solidify the agar medium.

8. On two particular plates, which contains microorganism strains i.e. E. coli and Bacillus subtilis were uniformly spread in aseptic condition and these two plates were incubated for 24 hrs at 370

9. The zone of inhibition of antibiotic Gentamycin appeared. In image A, the zone of inhibition of E. coli appeared and in image B the zone of inhibition of Bacillus subtilis was seen.

10. Result of antibacterial test of herbal hand sanitizer against standard of pure antibiotic Gentamycin was measured in mm by scale.

RESULTS AND DISCUSSION:

According to the study's findings, only methanol and ethanol, two of the crude solvent extracts made from Psidium guajava leaves, exhibited inhibitory efficacy against bacteria. Staphylococcus aureus and Bacillus cereus are the only Gram-positive bacteria that are susceptible to the While neither of the Gram-negative bacteria displayed any inhibition, two extracts. For opportunistic bacteria, the human skin provides food and favourable conditions for growth. And other infections, which resist the majority of cleaning methods and support their presence in Ecosystem. A straightforward and inexpensive method of reducing hospital acquired infections is hand cleanliness. Specifically originating from environmental surfaces are infections. Commercially produced sanitizers come in a variety of forms, including those with and without alcohol as the active ingredient.The effects of bacterial growth and lead biocidal activity vary depending on the sanitizer. As a result of the COVID 19 outbreak, hand sanitizer is currently in high demand. Not just in doctors, but also in regular males. Using an alcohol-based sanitizer on a daily basis Leads to skin irritation and dryness in sensitive people as well. Thus, we concentrated on ppolyherba Sanitizer. In the current investigation, we chose seven plants and made an alcohol-based sanitizer, Hydrogen peroxide, camphor, and glycerol. Sanitizers come in a variety of varieties. Commercially available market, including alcohol- and non-alcohol-based hand sanitizers. The effects of lead and bacterial growth vary depending on the sanitizer. In the current investigation, we chose seven plants and made a sanitizer with camphor, alcohol, glycerol, and hydrogen peroxide. Each ingredient plays a specific part in preventing the development of germs and fungus. The antibacterial properties of hand sanitizer were the subject of our study. It was discovered to be effective in comparison to other widely used commercial sanitizers. An alternate topical antibacterial agent is the specially developed guava hand sanitizer gel. There Qualities coming

from a natural phytochemical it produces that is similar to the Brands of commercial hand sanitizer. The well-known tropical fruit tree Psidium guajava is planted in tropical regions. It is determined that Beneficial for diabetes, hypertension, gastroenteritis, and diarrhoea.

Result Table:

Sr. No	Parameters	Results
1	Organoleptic properties A) Colour B) Odour C) Clarity	Green Characteristic Opaque
2	Ph	4 to 6
3	Irritancy Test	No irritancy
4	Evaporation Test	Less than 1 minute
5	Anti-bacterial Test A) Escherichia coli B) Bacillus subtilis	Std 44 44 45 45

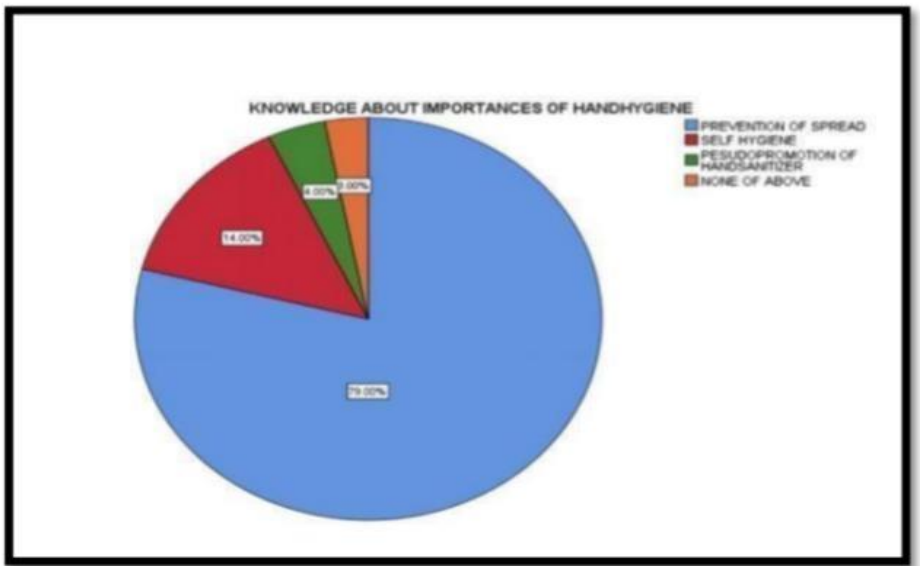

Figure 1: Graph shows the result of knowledge about the importance of hand hygiene. 79% of Respondents said that it helps prevent spread, 14% said that it is for self-hygiene, 4% respondents Said that it is only for advertisement (pseudo-pro-motion) of hand sanitizer and the remaining 3% Choose the options none of the above.

CONCLUSION:

The goal of the study was to ascertain the rate at which the development of Staphylococcus aureus was reduced after using the specially prepared guava hand sanitizer. The guava leaf extract-derived hand sanitizer gel had the same level of activity as the reference standard when it was measured. of the inhibitory zone. Additionally, there was no discernible change when compared to hand sanitizer. The study's commercial brands B and C. Ethyl alcohol and water as solvents are compared The mean zones of inhibition did not significantly alter when isopropyl alcohol was used. This shows that antibacterial hand sanitizer is efficient against Staphylococcus aureus. The emergence of a zone of inhibition formed by formulated materials indicates the reduction of germs. Staphylococcus aureus is a manifestation of the antibacterial action of guava hand sanitizer gel.the active component of the plant, such as tannins and other phytochemicals that may antimicrobial action The mechanism entails bacterial cell walls and membranes rupturing. When bacteria are treated with plant extracts, the intracellular matrix is disrupted irregularly. In between the persons, poor hand hygiene might also be a concern. No matter the location, prevention and control of infectious activities are intended to stop the spread of infection and create a secure atmosphere for everyone. Due to the development of antibiotic-Effective infection control strategies, such hand sanitising, are crucial in the face of resistant microbes. preventive action. Hands are cleaned with hand sanitizer gels. It is determined from the outcome that the appearance and uniformity of the gel formulation are good.

REFERENCES:

1. Firdous shaikh ,Priyanka Bhosale, Snehal More. Formulation and evaluation of herbal hand Sanitizer using psidium guajava leave extract. Int.J.Pharma.Sci.Rev.Res,62(2),May- June 2020. Article no-07
2. M.D. Mahfuzul Hoque, M.L. Bari, Y. Inatsu, Vijay K.Juneja, and S. Kawamoto. Antibacterial Activity of guava (Abstract).Published on -27 Nov 2007https://doi.org/10.1089/fpd.2007.0040
3. Dereje AtomsaOncho, MeseretChimdessaEgigu, OlyadErba. Qualitative Phytochemical Analysis. Published on – April 2021. DOI:10.1186/s40816-021-00268-2
4. Research article| open access Volume 2013 |Article ID 746165|https://doi.org/10.1155/2013/7461165Academic Editor: Todd R.Callaway. Published on 20 Oct 2013
5. S. Kim and D. Y. C. Fung, “Antibacterial effect of crude water-soluble arrowroot(Puerariae Radix) tea extracts on foodborne pathogens in a liquid medium,” Letters in Applied Microbiology, vol. 39, no. 4, pp. 319–325, 2004.Letters in Applied Microbiology 2004, 39,319-325. Received 28 April 2004 and accepted 1 June 2004 Doi:10.1111/j.1472765x.2004.01582.x
6. https://www.ncbi.n|m.nih.gov|pmc|articlesApplications of the guava tree.
7. https://doi.org/10.20546/ijcmas.2019.802.226.
8. Nusrat Jahan Methela, Omar Faruk, Mohammad Shafiqul Islam. Morphology ofof guava leaves.
9. Article received 25.09.18https://doi.org/10.18801/jbar.200119.203Published on 14 April 2019.
10. Nandkishor S. Wani, Ashish k. Bhalerao, Vikram P. Ranaware. Formulation and evaluation of Herbal hand sanitizer, ISSN:0974-4304.Formulation and evaluation of herbal hand sanitizer
11. Mansoor Shazia, integral university. Formulation of herbal hand sanitizer from indian herbs Article08July2021https://www.researchgate.net/publication/353072469
12. SuciRahmawati on 14 February 2020. Universitas Bengkulu. Author profiles for this publication At:https://www.researchgate.net/publication/339252959
13. M. Kavya Shree, Leslie Rani S, Brundha M.P. knowledge about the importance of hand hygiene.Revised:24.08.2020.Published:20.10.2020.DOI:http://dx.doi.org/10.31782/IJCRR.2020.
14. Kampf, G.; Todt, D.; Pfaender, S.; Steinmann, E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. J. Hosp. Infect. 2020, 104,246–251.

15. JongkwonSeo, Soojung Lee, Marcus L Elam, Sarah A Johnson, Jonghoon Kang, Bahram H Arjmandi. First published: 12 February2014.best extraction solvent for use with guava leaves (Iridium guajava L.)https://doi.org/10.1002/fsn.91
16. Kimberly Rogers, Fredrick McLaughlin, Dwayne Daniels, and Anand Yadav.Academic Editor: Todd R. Callaway. Published Oct 2013.Antimicrobial Activities of Leaf Extracts of Guava (Psidium guajava L.)https://doi.org/10.1155/2013/746165Richard N. Le, Amy L. Hicks, and Janice Dodge. Published Online:1 Dec 2005. AutoclaveTesting. DOI-10.1177/153567600501000407
17. . Sneha Aashigari, Ramya Goud G., Sneha S., Vykuntam U. and Naga Raju Potnuri. STABILITY STUDIES OF PHARMACEUTICAL PRODUCTS.Article Received on 25 Oct.2018 DOI:10.20959/wjpr20191-13872
18. Ingle KP, Deshmukh AG, Padole DA, Dudhare MS, Moharil MP, Khelurkar VC. Phytochemicals: Extraction methods, identification, and detection of bioactive compounds from plant extracts. J PharmacognPhytochem. 2017;6:32–6
19. Biswas, B., Rogers, K., McLaughlin, F., Daniels, D., & Yadav, A. (2013). Antimicrobial activities of leaf extracts of guava (Psidium guajava L.) on two gram-negative andgram-positivebacteria. International Journal of Microbiology,2013.
20. Balakrishna Acharya, Saradindu Ghosh, Giriraj Yadav, Kavita Sharma, Sirsendu Ghosh, Sushil Joshi, "Formulation, Evolution and Antibacterial Efficiency of Water-based Herbal Hand Sanitizer Gel"; ResearchGate, July-2018.