



Investigations into the Mixture and Impact of Herb Hand Sanitizer

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ABSTRACT :

Hand sanitizers are often liquid gels or foams that are meant to rid your hands of different germs, viruses, and other microbes. Wash your hands with soap and water the majority of the time. Producing polyherbal hand sanitizers is mostly done for hygienic or cleaning purposes. An alternative to washing your hands with soap and water is to use hand sanitizer. This idea can be applied to lessen, prevent, and control acquired illnesses. The transmission of bacteria and other microbes from one area of the body to another can be stopped by using hand sanitizers. One of the most crucial procedures in the preparation of homes and other day care centers, as well as in the creation and serving of meals, is hand cleanliness.

Keywords: introduction to hand hygiene, herbal extracts, antibacterial agents, and herbal hand sanitizers

Introduction :

The coronavirus disease (Covid-19) pandemic has raised serious concerns about worldwide public health, which has resulted in the widespread use of hand sanitizers that transmit infection. Thus, the best way to stop the spread of nosocomial illnesses and infectious germs is to practice good hand hygiene.

In addition to hand washing with soap and water, hand sanitizer serves as a disinfectant.

There are numerous formulations to choose from, such as gels, foams, and solutions. The goddess of healing, Hygeia, is the source of the word hygiene.

These days, maintaining good cleanliness is linked to preventing illness and fostering wellness. Everyone agrees that hygiene is important, and evidence supports this belief.

One important way that infections spread is through physical contact between humans and between people and items. Consequently, maintaining good hand hygiene is crucial to preventing illness.

A million lives could be saved annually by practicing basic hand washing, according to estimates, and "hand hygiene" has been the focus of numerous global public health efforts with differing degrees of success.

COVID-19, also known as the "severe acute respiratory syndrome coronavirus 2" pandemic, was proclaimed by the World Health Organization in the beginning of 2020. They are among the crucial procedures for lessening the strain on infections since they are utilized to break the cycle of illnesses.

Defining :

The most recent definition of hand sanitizer by the FDA states that it can be used in addition to or instead of washing your hands with soap and water.

Applying hand sanitizer—also called hand rub or hand antiseptic—to the hands is a way to get rid of common hand pathogens.

Typically, hand sanitizers come in liquid, gel, or foam form.

There are several preparation options available, such as liquid solution, gel, and foam.

Hand Sanitizer Types :

Most hand sanitizers fall into one of two categories:

- A) Hand sanitizer without alcohol
- B) Hand sanitizer with alcohol content

Hand sanitizer advantages:

take less time than cleaning your hands.

Take swift action to eradicate bacteria on your hands.

are easier to reach than sinks.

lower the amount of bacteria on hands.

Don't encourage resistance to antibiotics.

are less abrasive on the skin than water and soap.

Some even help to improve skin condition.

Hand sanitizer made of herbs

Herbal Hand Sanitizer: Tulsi and other herbs are included in this antimicrobial sanitizer additional herbal essential oil, a potent organic antibacterial agent, as a herbal component.

India's top 5 brands of herbal hand sanitizer

BRAND HAND SANITIZERS

1. 1Hand Sanitizer Herbal Strategi NatureClean
2. 2TreeWear Natural Hand Sanitizer without Alcohol
3. 3Alcohol-free Palm Safe Hand Sanitizer Foam
4. 4Herbal Sanitizer Gel Puro
5. 5Clean Mint Herbo Hand Sanitizer

Important Constituents of Herbal Hand Sanitizer:

Barbadosse aloe vera

Ocimum Sanctum Leaf, or tulsi

Azadirachta, or neem

Citrus medica, or lemon

Jasmine flower (jasminum)

Prepared in Prassana* Q.s. (*Prassana is Rectified spirit; over 70% w/w of alcohol) IPA

The Reason Behind Our Use of the Above Herbs' Liquid Extract:

- Lemon: Antibacterial saponin chemicals substances that harm the membranes of bacterium cells. In addition, lemon juice has vitamin C, which functions as an antioxidant, destroys bacteria, mold, and germs, and is a healthy substitute for scent.
- Jasmine: The outcomes demonstrated that the extracts from jasmine had an impact in preventing the growth of the bacteria. It is renowned for having calming, relaxing, and revitalizing qualities. It gives the skin moisture, vitality, and stimulation.
- Neem: Known for its antiviral, antifungal, antibacterial, and antimalarial qualities, neem is a recognized medical plant. Neem's vitamins and fatty acids help to preserve and enhance skin suppleness.
- Aloe: It offers total defense against any viral assault thanks to its strong antibacterial, antifungal, and antiviral qualities.
- Tulsi: Current studies have demonstrated that Tulsi possesses antimicrobial, antiviral, and antifungal properties, including the ability to combat numerous microorganisms that cause illnesses in humans.

You may use Sparsh Herbal Hand Sanitizer on your skin, all surfaces, cellphones, and other devices because it is non-sticky.

ACTION:

1. To make powder, 12.5 g of tulsi and 12.5 g of neem leaves were coarsely ground and dried in an oven at 50°C.
2. Mix this powder with enough water.
3. Bring this powdered leaf mixture to a boil for 8 to 10 minutes.
4. Include the freshly cut aloe leaf gel.
5. Continue to boil water for 5 minutes.
6. Strain the mixture, removing the filtered material.
7. Transfer 19 ml of 66.5% to another flask. In a flask, there are 3.5 ethyl and isopropyl alcohol.
8. Next, add 4 ml of rose water and 2 ml of glycerol to it.
9. Next, thoroughly combine the filtrate with the solution mentioned above.
10. Finally, carefully store the sanitizer liquid in the sanitized bottle.

Assessment of Gel Hand Sanitizers:

Organoleptic Examination

In order to assess the texture, color, and odor of the gels in semisolid conditions, the prepared samples were visually examined.

PH Assessment

A digital pH meter (Mettler Toledo pH meter, USA) was used to measure the prepared gels' pH. The three replicates' mean \pm standard deviation (SD) is represented by the pH readings.

Spreadability of Gel:

The spreadability of the ready-made hand sanitizers was assessed using the following methodology: On pre-marked, translucent glass measuring two centimeters in diameter, 0.5 grams of the prepared gel was applied. After that, another clear glass was put on top, and the contents were distributed for five minutes by adding a 500 g weight. With this technique, the gels' slip and drag properties were used to calculate the spreadability. The excess gel around the edges was scraped off. It was established what the spreading area of the formulation's diameter was.

The following formula was used to determine the gel's spreadability. S is $M \times L / T$.

where Spreadability (S) is the

Length is adjusted by the glass, and weight is fixed in the pan connected to the upper slide. Length altered by the slide of glass T-Seconds required to fully separate the slide amongst themselves.

Test of Agar Well Diffusion:

The agar well diffusion test was used as a preliminary screening to evaluate each product's antibacterial activity.

This required the application of an inoculum equal to 0.5 McFarland.

After inoculating a Mueller Hinton agar plate with a swab, the test inoculum was let to stand at room temperature for fifteen minutes.

The test material was then introduced to each of the four wells that were made on the plates using a 6 mm cork borer in the following concentrations: 100%, 50%, and 25%.

The zones of inhibition were then evaluated following a 24-hour incubation period at 37°C.

Exercise caution:

- Avoid getting sanitizer in your nose or eyes.
- Use hand sanitizer in a place with enough ventilation.
- Keep out of children's reach.
- Because hand sanitizer is flammable, keep it away from heat sources and flames.

Negative aspects

In some cases, hand washing with soap and water is preferable to using hand sanitizer. These situations include the removal of parasites like *Cryptosporidium*, bacteria like *Clostridium difficile*, and some viruses like norovirus, depending on the amount of alcohol in the sanitizer (95% alcohol was found to be most effective in eliminating most viruses).

Furthermore, it is recommended to wash your hands after using the restroom, if they are contaminated with fluids or other obvious contaminants, or if the residue from using alcohol sanitizer is causing you discomfort.

Additionally, according to the CDC (Centers for Disease Control & Prevention), hand sanitizers are ineffective at getting rid of pollutants like pesticides.

Efficiency :

Hand sanitizer, also known as hand antiseptic or hand rub, is an agent that is applied to the hands to help get rid of common pathogens, or organisms that cause sickness. Typically, hand sanitizers are liquid, gel, or foam-based.

It is advised to use them when hand cleaning with soap and water is not possible or when frequent hand washing damages the skin's natural barrier, leading to skin fissures or scaling.

Hand sanitizer is used as a basic infection control measure in a wide range of locations, from supermarkets to cruise ships, from day care centers and schools to hospitals and medical facilities, despite its varying effectiveness.

Hand sanitizer's efficacy is contingent upon several aspects, such as how the product is (e.g., amount used, length of exposure, frequency of use) and if the product's active ingredient is vulnerable to the particular infectious pathogens that are on the user's hands.

Hand sanitizers can assist prevent the spread of illness despite their variable efficacy, particularly in situations when hand washing compliance is low.

For instance, including an alcohol-free hand sanitizer into classroom hand hygiene programs has been linked to a decrease in infectious illness-related absenteeism among primary school students.

How Is Hand Sanitizer Used?

When using hand sanitizer, there are two things to consider.

It must be massaged into your skin until your hands are completely dry.

You should first wash your hands with soap and water if they are oily or unclean.

In light of that, consider the following advice when using hand sanitizer.

1. Give one hand's palm a shot of sanitizer or apply it there.
2. Give your hands a good, thorough rub. Make sure to completely envelop all of your fingers and hands.
3. Rub your hands for another 30 to 60 seconds, or until they are completely dry. The majority of bacteria can be killed by hand sanitizer only after at least 60 seconds, and occasionally even longer.

Which bacteria does hand sanitizer kill?

The amount of bacteria on your hands can be rapidly decreased by using an alcohol-based hand sanitizer that satisfies the alcohol volume criterion, according to the CDC.

Additionally, it can aid with eliminating a variety of germs or substances that cause disease from your hands, including SARS-CoV-2, a novel coronavirus.

Even the greatest alcohol-based hand sanitizers, nevertheless, have their limitations and can't completely eradicate all germs.

The CDC claims that hand sanitizers are ineffective at eliminating potentially dangerous substances. Moreover, it is ineffective in eliminating the following bacteria:

The norovirus

The causative agent of cryptosporidiosis, *Cryptosporidium*

The common name for *Clostridium difficile* is *C. diff*. Furthermore, if your hands are obviously oily or filthy, a hand sanitizer could not operate as intended. This could come after handling food, gardening, yard labor, or participating in sports.

Choose hand washing over hand sanitizer if your hands appear grimy or slimy.

In summary:

Numerous research have concluded that herbs are highly beneficial substances that have long-lasting benefits and can be used in hand sanitizers. Since hands are the most common way for germs to transfer to patients, practicing good hand hygiene helps stop the spread of antibiotic resistance and infections linked to medical care. After testing, the herbal sanitizer we developed proved to be successful in reducing the growth of bacteria. This demonstrates how well hand sanitizer works to stop the spread of bacteria.

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