

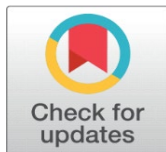
A REVIEW STUDY ON EVALUATION OF ALCOHOL BASED HERBAL HAND SANITIZER

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ABSTRACT

The necessity of good hand hygiene, particularly in light of public health emergencies, has caused a spike in the demand for hand sanitizers worldwide in recent years. Interest in alcohol-based herbal hand sanitizers is rising as natural and herbal goods become more and more popular. In contrast to traditional alcohol-based sanitizers, the goal of this review is to thoroughly evaluate the efficacy, safety, safety & possible advantages of herbal alcohol-based hand sanitizers. The review emphasises how crucial it is to formulate and concentrate alcohol in herbal hand sanitizers correctly in order to get the highest level or germ-killing effectiveness. It also investigates how adding plant extracts, essential oil, other some natural components may work in concert to alcohol's antibacterial qualities. The safety of these formulations is examined from all angles, with thorough analysis of factors such as skin irritation, allergic reaction, long term usage impacts. They provide information about the efficacy, safety, environmental effects of alcohol based herbal hand sanitizers. They also seek to compile the body of knowledge currently available on the subject. An alcohol-based herbal hand sanitizer was made using tulsi (*osimum tenuiflorum*), aloe vera (*aloe barbadensis* Miller), neem bark (*Azadirachta indica*), ashwagandha root (*Withania somnifera*), and orange peel (*citrus sinensis*).

Keywords: Tulsi, Alcohol, Essential Oil, Aloe vera, Neem Bark

1. INTRODUCTION

The skin is the area of the body that is most exposed to light, pollutants in the environment, and some kind of pathogen defence. Eczema (atopic dermatitis), warts, acne, psoriasis, rashes, allergic reactions, and other skin conditions are the most prevalent ones. to shield the skin from dangerous microbes as well as to stop the spread of many pores and skin infections. Cleaning your hands is undoubtedly a crucial precaution. [Aburayan et al. \(2020\)](#)

During corona virus disease pandemic of 2019 (COVID-19), the World Health organization has discussed the significance of hand cleanliness in preventing the virus transmission. Alcohol based hand sanitizer is provided in hand hygiene facilities. However, consuming of alcohol or using alcohol-based hand sanitizers frequently increases the risk of skin infection by making skin dry and blistering. In order to create a safe and effective alcohol-based hand sanitizer, a natural bioactive component obtained from the available agricultural crop was selected. [Afsar & Khanam \(2016\)](#)

In the modern times as, the world is undergoing through enormous changes in every sector and achieving new highest of success. But with great development, human race is also obligated to face the challenges. [Barrett & Bahl \(2015\)](#)

The majority of individuals aren't even aware of how important it is to use herbal handwash and sanitizer. Since the main way that many infections are transferred is through the hands. Infection can be avoided by washing and drying hands properly. As a result, it has been demonstrated that herbal handwash and sanitizer are extremely effective against a variety of bacteria, viruses, and germs and are necessary in the current environment. Herbal hand sanitizer and handwash are far more affordable, eco-friendly, biodegradable, and very effective than chemically made versions. Because of its contents' efficacy on human skin and suitability for all skin types, herbal handwash is far superior to regular soap. Handwash made mostly of herbs shields us against numerous everyday encounters. [Gaspar et al. \(2018\)](#)

Natural substances with antibacterial qualities are frequently found in herbal handwashes and hand sanitizers. Aloe vera, neem, tea tree oil, lavender, and eucalyptus are a few typical natural constituents. These ingredients are useful against a variety of pathogens since it is believed that they have antibacterial, antiviral, and antifungal qualities. [Greenaway et al. \(2018\)](#)

Individual beliefs, skin sensitivity, and personal preferences are often factors in the decision between herbal and conventional hand hygiene solutions. Whatever the kind of product being used, it's always a good idea to adhere to the rules for good hand hygiene practices established by health organisations such as the World Health Organisation (WHO). Hand washing often for at least 20 seconds with soap and water is still a very powerful way to stop the spread of diseases. In situations where access to soap and water is limited, hand sanitizers might be employed as an additional precaution. [Korting et al. \(1990\)](#)

In addition to receiving treatment for this fatal illness, people must make every effort to avoid coming into touch with others who have already contracted the sickness, according to clear WHO guidelines. In order to eliminate the possibility of infection, they also need to sanitise themselves and wear masks if they come into touch. The use of disinfectants has been essential in preventing the spread of this potentially fatal illness. [Malik & Zarnigar \(2013\)](#)

They have demonstrated remarkable efficacy and safety in combating the SARS-CoV-2 virus. When opposed to utilising soap and water for hand cleaning, they are far more convenient.

2. IMPORTANT FEATURE

Alcohol: - Effective hand sanitizers usually use alcohol (ethanol or isopropyl alcohol) as their active ingredient. Alcohol concentration is important; for best results, it is usually advised to have at least 60% alcohol.

Herbal Ingredients: - Variations exist in the antibacterial qualities of herbal components. Research ought to assess the effectiveness of the particular herbal extracts or oils in the sanitizer against bacteria and viruses.

Antimicrobial Efficacy: - Evaluate the herbal hand sanitizer's overall efficacy against a variety of pathogens, such as viruses and bacteria. Standard techniques may be used in studies to evaluate the antibacterial activity.

Skin Compatibility: -Analyse how herbal components affect the condition of your skin. In order to promote frequent use, a good herbal hand sanitizer should be mild on the skin and effective against germs.

User acceptance: - Examine research that evaluate the acceptability and user experience of herbal hand sanitizers, taking into account aspects such as overall satisfaction, texture, and aroma.

Respect for Regulatory Standards: Verify that the herbal hand sanitizer adheres to the rules and regulations established by health authorities. This can entail following labelling and formulation specifications.

Effect on the Environment: Evaluate the environmental impact of herbal hand sanitizers by taking eco-friendliness and biodegradability into account.

Analogous to Traditional Sanitizers: Examine the possibility of developing bacteria resistance after extended use. Examine whether using the herbal hand sanitizer consistently would cause it to lose its efficacy over time.

3. ANTI-MICROBIAL ACTIVITY OF SANITIZER

In order to evaluate the antibacterial efficacy of manufactured hand sanitizers, gram-positive and gram-negative bacteria as well as opportunistic pathogenic yeast (*C. albicans*) were collected and added to the American Type Culture Collection (ATCC). Among the bacteria were *E. Coli*, *P. aeruginosa*, *K. pneumoniae*, *S. aureus*, *M. luteus*, and *S. epidermidis*. isolates of bacteria. The *C. albicans* yeast was supplied by the ATCC. Mueller-Hinton broth is said to have been utilised to create the bacterial and yeast suspensions, commonly known as inoculums, according to each microbe was grown on Mueller-Hinton agar medium and kept at 37 °C for the whole night in the incubator. [Mounika et al. \(2017\)](#)

Antimicrobial Zone of inhibition Test: - The antibacterial activity of the hand sanitizer gels was evaluated using the zone of inhibition test against a variety of gram-positive and gram-negative bacterial strains as well as a yeast strain. Three easily accessible hand sanitizers were also assessed as experimental controls.

The final inoculum concentration of 1 10⁶ CFU/mL was distributed uniformly. After a brief drying period, each hand sanitizer gel was put to a sterile microbiological disc, which was subsequently placed on the Mueller–Hinton agar plate. Every plate was incubated for a full night at 37 °C. The millimetres (mm) that surrounded the circumference of each disc that was free of growth were measured. The three replicates' mean and standard deviation represent the results.

Effectiveness of Alcohol: Because of its strong antibacterial qualities, alcohol is the main active component of the majority of hand sanitizers. The efficacy of various alcohol concentrations in herbal sanitizers and their capacity to eradicate a wide range of infections have to be thoroughly examined in the review.

Herbal Ingredients: Plant extracts with antibacterial or skin-soothing qualities are frequently used in herbal compositions. Reviewers ought to evaluate whether or not these herbal ingredients improve the overall effectiveness of hand sanitizers and whether or not they promote skin health.

Safety and Skin Compatibility: It's important to assess the safety of herbal sanitizers containing alcohol, particularly in light of allergic responses and skin irritation.

Residual Activity: One crucial consideration is the antibacterial activity's continued presence following hand sanitizer use. Talk about research that evaluate the herbal sanitizers with alcohol content and their residual action, especially when compared to traditional sanitizers.

Comparative Studies: Evaluate the efficacy of herbal hand sanitizers with alcohol content in comparison to other varieties, such as non-herbal and alcohol-based hand sanitizers. This will reveal whether the plant-based ingredients have any real benefits.

Comparative Studies: Evaluate the efficacy of herbal hand sanitizers with alcohol content in comparison to other varieties, such as non-herbal and alcohol-based hand sanitizers. This will reveal whether the plant-based ingredients have any real benefits.

Difficulties and Restrictions: Express recognition of any difficulties or restrictions noted in the studies that were reviewed. This could include discrepancies in formulations, uneven study methodology, or problems with the standardisation of herbal extracts.

4. DIFFERENCE BETWEEN ALCOHOLIC BASED AND NON-ALCOHOLIC HAND SANITIZERS

Effectiveness: Alcohol-based hand sanitizers are very successful at eliminating a wide range of microorganisms, including bacteria and viruses. This is especially true of those that have at least 60% alcohol by volume.

Rapid Evaporation: Hands feel clean and dry once they swiftly evaporate.

Strongly Suggested: Because of their shown effectiveness, health agencies including the World Health Organisation and the Centres for Disease Control and Prevention (CDC) advise using alcohol-based hand sanitizers.

Drying Effect: Regular use of sanitizers with high alcohol concentrations may cause skin to become parched. Alcohol-based sanitizers should be used and stored carefully due to their flammability.

Softer on the Skin: Sanitizers without alcohol tend to be kinder to the skin and might be a better option for people with sensitive skin.

Non-Flammable: Since they often don't catch fire, there is less risk involved in using and storing them.

Persistent Action: A few non-alcohol sanitizers make the assertion that their skin protection lasts longer.

5. NON-ALCOHOL BASED SANITIZERS

Softer on the Skin: Sanitizers without alcohol tend to be kinder to the skin and might be a better option for people with sensitive skin.

Non-Flammable: Since they often don't catch fire, there is less risk involved in using and storing them.

Persistent Action: A few non-alcohol sanitizers make the assertion that their skin protection lasts longer.

Effectiveness: Compared to their alcohol-based equivalents, non-alcohol-based hand sanitizers may be less effective against some types of bacteria.

6. CONCLUSION

Sanitising hands reduces the risk of contracting any disease that can spread through hand-to-hand contact. Alcohol-based herbal hand sanitizers could be particularly helpful during pandemics, such as the novel corona virus. Currently, different herbal plants are used to prepare different herbal formulations. Since using chemical hand sanitizers carries some risk, herbal formulations have shown to be very important due to the increase in pathogen resistance to the formulations used as fungicides or bactericides. [Oghenemaro et al. \(2018\)](#)

The development of novel herbal formulations has increased due to the growing need for potent and more efficient hand sanitizers. The many herbal ingredients—such as tulsi, neem bark, aloe vera gel, and ashwagandha root—that are used to make herbal hand sanitizer are very important since they have all been shown to exhibit antibacterial action against specific pathogenic strains that are hazardous to people. The evaluation process led to the conclusion that the produced hand sanitizer had a decent appearance. [Rahmasari et al. \(2020\)](#)

Finally, it can be said that the method for standardising herbal sanitizers containing medicinal plants such as orange peels, neem, aloe vera, tulsi, and ashwagandha roots should be applied to standardise all herbal sanitizers. This method includes physical and chemical evaluation and comparison with the preparation created in-house as reference standards. It could have been necessary to purchase or isolate a pure reference standard of the stated active component in order to establish an analytical technique. It will be feasible to quantitatively ascertain the active ingredient in the herbal sanitizers in part by using these reference standards. [Shapiro & Saliou \(2001\)](#)

CONFLICT OF INTERESTS

None.

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