



TO STUDY THE FORMULATION OF HAND SANITIZER WITH ALOEVERA

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ABSTRACT

The initial point of contact for bacteria and diseases is hands. A crucial idea and practise in the prevention, management, and reduction of diseases is hand cleanliness. The COVID pandemic has raised the need for hand sanitizer, which reduces hand dryness. We created a herbal sanitizer utilising extract from readily available herbal plants and other substances after taking the necessity into consideration. This study focuses on the potency, awareness-raising, and upbeat effects of herbal hand sanitizers made with Psidium guajava and aloe vera leaf extract. The majority of study has been on maintaining hygiene by preventing germs from entering the body through hands. When the influence of time interval was also examined, it was discovered that using hand sanitizer for longer periods of time resulted in less bacterial development. Aloe Vera is a healthy component with moisturising and antioxidant qualities. Aloe Vera hand sanitizer calms skin while cleansing. Natural herbal hand sanitizers are affordable, effective, and environmentally friendly.

Keywords: Hand sanitizer, Hygiene, Pathogens, Psidiumguajava, Aloe vera.

INTRODUCTION

Hand sanitizers have been shown to be beneficial in limiting the spread of microbe-borne illnesses and viruses like COVID-19, which left affected individuals dealing with mild respiratory illnesses. Due to their antibacterial and hygienic qualities, hand sanitizers are currently one of the main tactics to combat COVID-19 and decrease community transmission of illnesses. Many businesses produce less expensive hand sanitizers using readily available natural ingredients like aloe vera gel and guava essential oils, among others, together with glycerine and isopropyl alcohol. One of the various strategies used to stop the spread of the virus is consistent and routine hand washing. One of the most prevalent and devastating side effects of viral infections, particularly in the elderly, is secondary bacterial or fungal infection.^[1] During the current epidemic, hand sanitizer use is becoming more and more common in an effort to stop the spread of the virus and to follow government-set health guidelines. Because of its effectiveness and portability, hand sanitizer is used when access to water and soap for hand washing is not possible.^[2] Additionally, the production of ABHS, which significantly cut the length of the world's supply chain for alcohol, has raised demand for alcohol. Due to the COVID-19 pandemic's demand for alcohol, the WHO proposed two formulas for reduced volume manufacture of ABHS. As opposed to the second formulation, which contains 75% (v/v) isopropyl alcohol, 0.125% (v/v) hydrogen peroxide, and 1.45% (v/v) glycerol, the first formulation has 80% (v/v) ethanol, 0.125% (v/v), and 1.45% (v/v) glycerol. In order to reduce the risk in the

supply chain for alcohol, it was imperative to create an alternative alcohol-free hand sanitizer (AFHS) with equivalent antibacterial efficacy. In this study, several essential oils (Eos), aloe vera, vitamin E, glycerin, and AFHS formulations made from natural constituents were assessed. These Ingredients are also extensively accessible due to their market availability.^[3] [Vitamin E and glycerine were utilised because they can both moisturise the skin and slow down rancidity, which is the oxidation or hydrolysis of fats and oils. The AFHS gels' main active ingredients include Eos, which has a variety of antibacterial Activities. According to reports, Eos' antibacterial effectiveness is caused by their hydrophobic nature, which makes it easier for active ingredients to be distributed throughout the mitochondria and lipid of bacterial cell membranes, weakening the integrity of the cytoplasmic membrane. For instance, it has been proven that a blend of cinnamon and clove oil is beneficial against a number of bacterial, yeast, and fungal species, including *S. aureus*, *Aspergillum flatus*, and *Debaryomyces Hansen*. There are various benefits to making hand sanitizer in the form of gel. versus liquid (spray) or foam hand sanitizers of other types. Nosocomial infections are primarily brought on by health care workers' hands in both acute and long-term care institutions. This loop can be broken by adhering to efficient hand washing and hand sanitization routines.^[4] Ethanol is a major component of many aerosol sprays and consumer products that are designed to contact the skin like hand sanitizer.^[5] The most prevalent skin conditions include eczema (atopic dermatitis), warts, acne, rashes, psoriasis, allergies, etc. since the skin is the part of the body that is most exposed to skin pathogens. to shield the skin from dangerous microbes and stop the spread of numerous skin infections. Absolutely, hand washing is a crucial safety measure. As a result, it raises the issue of hand washing with antiseptics. Many of the chemical antiseptics are currently offered in the market as chlorhexidine products, alcohol-based sanitizers, etc. These soaps or treatments decrease the spread of contagious diseases in the healthcare setting more effectively, but they also have some drawbacks or negative consequences. Their repeated usage can result in pathogen resistance as well as skin irritation.^[6] It can instantly kill germs without using water. It can be used anytime and anywhere, for example, after holding money, before eating, after from the toilet, and after taking out the trash.^[7] Aloe vera is being used in this situation because it has strong antibacterial, antifungal, and antiviral qualities. Aloe Vera's natural anthraquinones have been shown to inhibit *Mycobacterium TB* and *Bacillus subtilis* in vitro, which has been linked to the plant's antibacterial properties. *Salmonella paratyphi*, *Streptococcus pyogenes*, and *Staphylococcus aureus* have all been proven to be bacteriostatic in aloe juice.^[8] Since ancient times, it has been used for its therapeutic benefits. It was utilised by the Egyptians to cure illnesses and mend war wounds. The Greeks used it to treat colon and stomach issues as well as leg ulcers, blisters, and burns. Discorides' *De Materia Medica*, Pliny the Elder's *Natural History*, the *Juliana Anicia Codex*, and the *Ebers Papyrus* from the sixteenth century BC all provide early accounts of the usage of aloe vera.^[9] Herbal hand sanitizer formulations and preparations have been shown to be efficient against pathogens, and results have also been compared and proven to be effective with hand sanitizer formulations based on alcohol. As far as the environment is concerned, these herbal preparations have been deemed safe for human health.^[10]

Surgical Spirit

Surgical spirit combats fungi, viruses, and germs. Because alcohol has the ability to penetrate bacterial cell walls, break cell membranes, and enter the interior of bacteria, it can ultimately affect an organism's cellular metabolism. Consequently, surgical spirit is employed as an antiseptic liquid.

Glycerine

Because it functions as a humectant—a chemical that enables the skin to retain moisture—glycerine is excellent for the skin. It can hydrate the skin more, reduce dryness, and revitalise the top layer of the skin. Additionally, glycerine is antibacterial, which means it can shield the skin from dangerous microbes.

Aloe Vera

Aloe Vera gel is anti-inflammatory and has cooling effects. As a result, it is one of the most organic treatments for burned or sunburned skin. Applying this gel helps the skin retain moisture and creates a protective layer for the skin. It is abundant in minerals and antioxidants, both of which speed up the healing process.

Guava leaf

Guava leaves' active components, such as isoflavonoids, gallic acid, ascorbic acid, and carotenoids, have an antibacterial effect and help treat skin infections and inflammations.

Clove Oil

The use of clove oil reduces skin sagginess and delays the development of wrinkles and fine lines. Most cosmetics contain this potent anti-aging substance. It exfoliates dead skin cells and promotes blood flow, both of which contribute to skin that appears young and beautiful.

Dettol

The powerful antiseptic disinfectant Dettol Liquid Antiseptic Kills Bacteria and Offers Protection Against Bacteria that Can Cause Infection and Illness. It can be used for antiseptic skin cleansing as well as gentle antiseptic wound cleaning and disinfection.

CONCLUSION

One of the alternatives for maintaining good hand hygiene is hand sanitizer gel. The COVID-19 pandemic has made the use of AFHS gels for the prevention and control of bacterial or fungal co-infections increasingly important, especially when the supply chain for alcohol is at risk. Aloe vera, glycerin, vitamin E, and a number of EOs were used in the formulation of the AFHS gels in this investigation as the active antimicrobial components. Based on the findings, it can be said that the created formulations have superb organoleptic qualities, pH levels that are similar to skin pH, and adequate viscosity and spreadability profiles. The antimicrobial test revealed that several EO-based formulations had differential antibacterial effects on a variety of gramme-positive and gramme-negative bacteria as well as Candida. The findings showed that clove oil had powerful antibacterial effects against a variety of microorganisms.

ACKNOWLEDGEMENT

The Sri Sai College of Pharmacy in Badhani, Pathankot, and its personnel provided the essential installations and invaluable support for the writers, for which they are grateful.

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