ejpmr, 2017,4(11), 233-237

SJIF Impact Factor 4.161

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Review Article

ISSN 2394-3211

EJPMR

SYNTHESIS AND BIOLOGICAL APPLICATIONS OF MEDICATED HAND-WASH

Kalyani P. and Prof. Dr. Prakash K.*

Elaeocarpus Scientific Laboratory Pvt. Ltd., Hyderabad.

***Corresponding Author: Prof. Dr. Prakash K.**

Elaeocarpus Scientific Laboratory Pvt. Ltd., Hyderabad.

Article Received on 25/08/2017 **Article Revised on 15/09/2017** **Article Accepted on 06/10/2017**

ABSTRACT

The topic of this science project is to find out which hand wash liquid washes away more germs. This topic was chosen as one should not be sick and it can be prevent illness by something as simple as washing hands with soap and water. This has to be shared with everyone. This liquid hand wash is made by saponification of oils with caustic soda. When suitable oils are used. Caustic soda produces liquid that will give a rich lather in low concentrations. Besides providing better rinsing than cake or powdered soaps, liquid hand wash is more economical. It is usually made in large batches and sold in bulk,and does not have to go through crutching, drying, milling, grinding, wrapping and packaging operations all of which increase the cost of production. The present research paper relates to synthesis and biological applications of liquid hand wash.

KEYWORDS: Hand wash, chlorhexidine, saponification, Curcumin.

INTROUDUCTION

Healthcare workers' hands are for the most part common vehicle for the transmission of healthcare-associated pathogens from patient to patient and within the healthcare environment. Hand hygiene is the most important measure for preventing the extend of antimicrobial resistance and reducing healthcare-associated infections (HCAIs). But healthcare worker disobedience with optimal practices remains low in most settings. The research is needed to evaluate the relative efficacy of each strategy component and to identify the most successful interventions, particularly in settings with limited resources. The main objective of the First Global Patient Safety Challenge, launched by the World Health Organization (WHO), is to achieve an improvement in hand hygiene practices worldwide with the ultimate goal of promoting a strong patient safety culture. This paper also reports the considerations and solutions resulting from the implementation of the multimodal strategy proposed in the WHO Guidelines on Hand Hygiene in Health Care.

We used all different kinds of detergents, ranging from liquid hand soap to foaming hand soap to bar soap. Having clean hands helps one not get sick. This topic is useful in the real world because there are lots of germs out there, and it is to be shown to other people which soap is better to take off the germs. People sneezing, coughing, telephones, doorknobs, and hand rails are the sources of infections. We have to test which soap will take off more germs. Mud is taken and put in a different kind of soap in each mud container and tested out which soap will be the best. This gives an idea of which type of soap will have the least mold or growth in each container. The best way to wash away more germs is with liquidsoap, rubbing hands together, and washing them with clean water.

Alcohol-based hand sanitizer is preferable to hand washing with soap and water in most situations in the healthcare setting.[1] It is generally more effective at killing microorganisms and better tolerated than soap and water.[2] Hand washing should still be carried out if contamination can be seen or following the use of the toilet.[3] Hand sanitizer that contains at least 60 percent alcohol or contains a "persistent antiseptic" should be used.[4,5] Alcohol rubs kill many different kinds of bacteria, including antibiotic resistant bacteria and TB bacteria. 90% alcohol rubs are highly flammable, but kill many kinds of viruses, including enveloped viruses such as the flu virus, the common cold virus, and HIV, though is notably ineffective against the rabies virus.[6,7,8] 90% alcohol rubs are more effective against viruses than most other form of hand washing.[9] Isopropyl alcohol will kill 99.99 percent or more of all non-spore forming bacteria in less than 30 seconds, both in the laboratory and on human skin.[4,10]

As more American and Indian consumers become aware of the danger of pathogen transmission in food, they become concerned that food workers are not washing their hands after using the toilet or touching contaminated items. Since consumers have no way of knowing if food workers have washed their hands, they are demanding that food service personal wear plastic gloves. People assume that if food workers wear plastic

gloves when handling food, food products are safe to consume. This logic is based on the presumption that gloves prevent transmission of microorganisms on hands and fingertips to food. However, this is not the case, because microorganisms found on hands and fingertips contaminate both exterior and interior glove surfaces when gloves are put on, unless hands and fingertips have been washed thoroughly. Plastic gloves used in foodservice operations may also have pinholes or other defects that allow microorganisms from hands and fingertips to escape through the glove surfaces. The results demonstrate that hand washing with non-antibacterial hand wash is much more effective in removing bacteria from hands than hand washing with water only. Although hand washing with water alone reduced the presence of bacteria on hands substantially. The study supports the policy of many current hand hygiene campaigns promoting the use of soap.[11] [12] The strong association between hand hygiene method and bacterial contamination of hands found in our study suggests that the prevalence of faecal indicator bacteria may also be used to monitor changes in hygiene behaviour in the general population.

A number of objectives must be met when formulating hand wash compositions. While it is important that these compositions contain a good cleansing surfactant system (generally containing at least one anionic surfactant and preferably at least an additional amphoteric surfactant), such compositions should ideally also contain a component beneficial to the skin, e.g., component which will counteract the "dry" feeling associated with a good cleansing surfactant. We are on the lookout for such a good moisturizing ingredients. Examples of moisturizing ingredients used in the art include guar, proteins, silicones, esters etc. It should be noted that many of these moisturizers leave the hand feeling moisturized but do not also provide a "clean" feeling. For handwash such "clean" feeling is very important.

BRIEF DESCRIPTION OF THE PROJECT

The present research relates to handwash compositions, particularly those comprising mixture of anionic and amphoteric surfactants containing a specific skin benefit agent (e.g., cationic wheat protein) which provides unexpectedly good moisturizing feel relative to other proteins while simultaneously maintaining a clean feeling. Use of such protein in an antibacterial handwash in particular is believed to be novel to the art. Hence we have concentrated to manufacture such a hand wash.

We have chosen the following surfactant

Caustic soda, slurry, sodium chloride, sodium lauryl sulphate, sodium lauryl ether sulphate, Sodium tri poly phoshate, EDTA.

Antibacterial Agent

Suitable antibacterial agents which may be used in the subject invention (i.e., in one embodiment of the invention) include:

Triclosan, Chlorhexidine gluconate.

Chlorhexidine gluconate is an antiseptic that fights bacteria. Chlorhexidine topical (for the skin) is used to clean the skin to prevent infection that may be caused by surgery, injection, or skin injury. Medical hand-washing liquid is for a minimum of 15 seconds, using generous amounts of soap and water or gel to lather and rub each part of the hands. Hands should be rubbed together with digits interlocking. If there is debris under fingernails, a bristle brush may be used to remove it. Since germs may remain in the water on the hands, it is important to rinse well and wipe dry with a clean towel. After drying, the paper towel should be used to turn off the water (and open any exit door if necessary). This avoids re-contaminating the hands from those surfaces. To 'scrub' one's hands for a surgical operation, it is necessary to have a tap that can be turned on and off without touching it with the hands, some chlorhexidine gluconate or iodine wash. For control of staphylococcal infections in hospitals, it has been found that the greatest benefit from hand-cleansing came from the first 20% of washing, and that very little additional benefit was gained when hand cleansing frequency was increased beyond 35%. Washing with our hand wash results is more than triple the rate of bacterial infectious disease transmitted to food as compared to washing with antibacterial soap.

SYNTHESIS

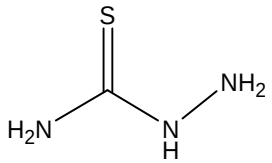
The focus of this experiment is to produce Hand wash liquid through soaponification and test their various properties by analyzing the products under different conditions. The purpose of this experiment was to synthesize hand wash through soaponification along with the analysis of their different properties which all were concurrent with their expected results. Overall this hand wash liquid is prepared thus fuflling the main focus of the experiment.

In the present work hand wash liquid is formulated using sodium hydroxide neutralized polymer and NaCl. Liquid detergents formulated using sodium hydroxide neutralized carbohydrate polymers and slurry have shown good results in terms of performance like reduction in surface tension of water, foam volume, percent detergency. Neutralization using sodium hydroxide has brought excellent appearance, feel and color to t he samples of liquid hand wash. The liquidsoap prepared by mixing the suspended water extract to the sodium lauryl sulphate (SLS). Extracts of lemon grass was added for fragrance. The solution was mixed well, made homogenous under room temperature and further utilized for the screening of the activity. To this was added NaOH and reflux one hour and cool to room temperature. To this was added above introducing ingradients and mix well and kept at room temperature for 12 hrs. The commercial liquidsoap contains curcumin, aloe and lemon.

The various compounds were formulated using starch, STPP, SLS, sodium carbonate, Causticsoda, sodium chloride, Triclosan, Chlorhexidine (CHX; 1,6-di(4'-chlorophenyl-diguanido)hexane) and curcumin, used in cleaning of hands successfully and various liquid detergents were formulated using different resin. The effect of sodium hydroxide neutralization of green polymer and acid slurry have shown better results in terms of performance like color, feel, appearance and reduction in surface tension of water, foam volume, percent in liquid hand wash.

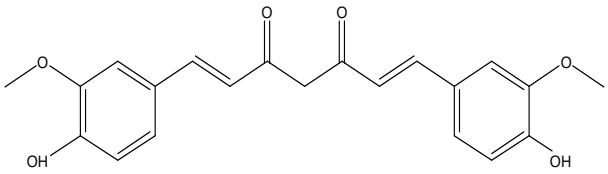
Thiosemi carbazones and Oximes of Curcumin, Quercetin and Isatin added. These are effective in anti-bacterial, *anti-microbial* and anti-cancer properties.

Cancer is a undoubtedly one of the main health concerns facing our society and one of the primary target regarding medicinal chemistry. One of the most promising areas in which thiosemicarbazone compounds are being developed is their use against cancer. Their anti-tumour activity is extremely differentiated and it is very much dependent on the typology of tumour cells. **Large number of thiosemicarbazones has been evaluated for their antitumor activity, because of their useful chemotherapeutic properties.**

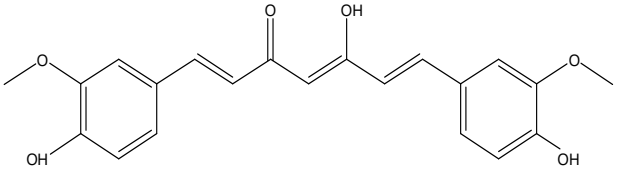


Thiosemicarbazide

A large number **of** oximes have been evaluated for their anti-malarial and anti-tumor activities, because of their useful chemotherapeutic properties. In cancer treatment it has been shown that the metal chelates are more potent than the chelating agents. Metal complex containing nitrogen and oxygen donor ligands is found to be effective catalysts for oxidation, reduction, hydrolysis and other organic transformation. The phytochemical, curcumin is one of the major dietary flavonoid, belonging to a group of flavonol. Curcumin is a simple symmetrical β-diketone and incorporates several functional groups. The two aromatic rings containing phenolic groups are connected by two α, β-unsaturated carbonyl groups.



Curcumin



Enol form

Structure of curcumin

These carbonyl groups form a diketone which exists in keto- and enol- tautomeric forms where energetically more stable enol form. Curcumin exists in the keto form in acidic and neutral pH media and in the enol form in alkaline pH medium. Flavonoids have a long history of use in traditional medicines in many cultures. Research in recent years has focused on several possible helpful effects of curcumin, including its potential role in preventing cancer. Recent studies suggest that curcumin can slow the growth of cancercells, because they have anti-tumor and anti-oxidant properties. Quercetin is a flavonol occurring in fruit and vegetable in food component with proven valuable impact on health. Quercetin is one of the most potent antioxidants among polyphenols. Quercetin has also been demonstrated to display the anticarcinogenic, antibacterial, antiviral, and antiinflammatory effects.[13] The anti carcinogenic properties of quercetin result from its significant impact on an increase in the apoptosis of the mutated cells, inhibition of cancerous cell growth, and inhibition of the DNA synthesis, decrease and modification of cellular signal transduction pathways. In food, quercetin occurs mainly in a bounded form with phenolic acids, sugar and alcohols etc.[14] Because of Oximes and thiosemi carbazones of Curcumin, Quercetin and Isatin added.

Liquid colors, such as liquid dye mix easily with shower gel base. Fragrance oils are synthetic man-made aromatic ingredients that are used to scent soap and other products are added. Some fragrance oils also contain natural essential oils. The typical usage rate is about 2-2.5% of the liquid hand soap base. Essential oils are considered a natural way to fragrance soap and are concentrated hydrophobic liquids containing volatile aroma compounds from plants are also added. Essential oils are extracted from plant materials (flowers, bark, seeds, peel, roots, leaves, etc.) by expression, steam distillation or solvent extraction. The typical usage rate is about 2-2.5% of the liquid hand soap base.

Kalyani and Prakash's (Elaeocarpus Scientific Laboratory Pvt.Ltd.) Organic hand washliquid and Detergents are developed to be mild yet still effective at keeping one's hands sanitised.

Sodium lauryl sulphate (SLS), a foaming agent used in many personal care products. As well as hand wash, one will find it in shampoo, shower gel, toothpaste; potentially in pretty much anything that foams. Keeping hands clean through improved hand hygiene is one of the most important steps we can take to avoid getting sick and spreading germs to others. Many diseases and

conditions are spread by not washing hands with liquid soap and clean, running water. If clean, running water is not accessible, as is common in many parts of the world, use these liquid soap and available water. Washing hands with these liquid soap and water is the best way to reduce the number of germs on them in most situations. This hand wash liquid is essential to personal and public health. They safely remove germs, soils and other contaminants and help us to stay healthy and make our surroundings more pleasant.

Physico Chemical Properties of Medicated Hand Wash Test Result

Sl. No.	Test Parameters	Unit of Measurement	Result
1	Total fatty matter	%	0.08
2	Matter insoluble in alcohol	%	1.99
3	Free caustic alkali	%	0.01
4	Synthetic detergent	%	0.50
5	pH	----	11.28
6	Viscosity	CPS	360
7	Foam	mm	1300

APPLICATIONS

It protects against everyday germs including those that can cause

(i) Skin infections
(ii) Respiratory infections
(iii) Gastroenteritis (such as Salmonella and Escherichia Coli)
(iv) Ttransference of germs from our hands
(v) Anti-Cancer properties.

Protection formula that keeps we are healthy and protected from more illness causing germs. The anti-cancer drugs as single or a combination of Genestiene analagues and their copmplexes, Resveratrol analogues and their complexes and curcumin analagues and their complexes are added.

Long-lasting protection

Hand contact to contaminated surfaces is proven to be the main way that humans catch germs. The US Center for Disease Control and Prevention recognizes hand washing as one of the most important means of preventing germs from spreading. Scientific research has underlined the fact that using antimicrobial and anti-bacterial like our hand wash products reduces or even eliminates microorganisms which can cause skin infections, intestinal illnesses or other commonly transmitted diseases. Many studies have highlighted the beneficial effects of hand hygiene products containing Triclosan when used in domestic, industrial and medical environments. In addition to its bactericidal activity, Triclosan provides a long-lasting anti-bacterial activity on treated skin already at concentrations of 0.1 to 0.3%.

CONCLUSION

This liquidsoap and detergents serves a standard when it comes to providing protection from germs. A wide array of products have been synthesized and mindfully formulated to provide our's the best germ protection. It is a hygiene product designed to protect our family from harmful germs that can cause illness. This hand wash serve for 100% better germ protection than majority of the leading germ protection liquids. Our Classic Clean variant with revitalizing lemongrass oil fragrance gives our hands a clean and fresh feeling. Our research work involves a wide variety of viral, bacterial, fungal pathogens focused on antimicrobial intervention strategies and anti-cancer properties. Wound care and first aid can help kill germs and prevent infection by applying these medicated antiseptic hand wash, we can protect our family's health from harmful germs.

REFERENCES

1. Bolon, MK. "Hand Hygiene: An Update.". Infectious disease clinics of North America, September 2016; 30(3): 591–607. PMID 27515139. doi:10.1016/j.idc.2016.04.007.
2. Boyce, JM; Pittet, D; Healthcare Infection Control Practices Advisory, Committee; HICPAC/SHEA/APIC/IDSA Hand Hygiene Task, Force. "Guideline for Hand Hygiene in Health-Care Settings. Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Society for Healthcare Epidemiology of America/Association for Professionals in Infection Control/Infectious Diseases Society of America." MMWR. Recommendations and reports: Morbidity and mortality weekly report. Recommendations and reports, 25 October 2002; 51(RR-16): 1–45. quiz CE1–4. PMID 12418624.
3. The selection and use of essential medicines: Twentieth report of the WHO Expert Committee 2015 (including 19th WHO Model List of Essential Medicines and 5th WHO Model List of Essential Medicines for Children). (PDF). WHO. p. 323. ISBN 9789240694941. Archived (PDF) from the original on 20 December 2016, Retrieved 8 December 2016, 4.
4. Witt Huberts, J; Greenland, K; Schmidt, WP; Curtis, V. "Exploring the potential of antimicrobial hand hygiene products in reducing the infectious burden in low-income countries: An integrative review." American journal of infection control, 1 July 2016; 44 (7): 764 71. PMID 27061254. doi:10.1016/j.ajic.2016.01.045.
5. Meadows, E; Le Saux, N. "A systematic review of the effectiveness of antimicrobial rinse-free hand sanitizers for prevention of illness-related absenteeism in elementary school children.". BMC Public Health, 1 November 2004; 4: 50. PMC 534108. PMID 15518593. doi:10.1186/1471-2458-4-50.

6. Sandora TJ, Shih MC, Goldmann DA. "Reducing absenteeism from gastrointestinal and respiratory illness in elementary school students: a randomized, controlled trial of an infection-control intervention". Pediatrics, June 2008; 121: e1555–62. PMID 18519460. doi:10.1542/peds.2007-2597.
7. Infection Control Campaign brochure Archived January 2, 2009, at the Wayback Machine.
8. "Hand Hygiene" (PDF). Retrieved 2011-08-31.[dead link].
9. Rotter M. "Hand washing and hand disinfection". Hospital epidemiology and infection control, 1999; 87.
10. Hibbard, John S. "Analyses Comparing the Antimicrobial Activity and Safety of Current Antiseptic Agents". J. Infusion Nursing. Infusion Nurses Society, May–June 2005; 28 (3): 194–207. PMID 15912075. doi:10.1097/00129804-200505000-00008.
11. Curtis V, Sidibe M, Scott BE, lyer P, Sara J. The Handwash Handbook: A Guide for Developing a Hygiene Promotion Program to Increase Handwashing with Soap. The World Bank Group; Washington, DC, USA, 2005; 67–68.
12. Scott BE, Schmidt WP, Aunger R, Garbrah-Aidoo N, Animashaun R. Marketing hygiene behaviours: The impact of different communication channels on reported handwashing behaviour of women in Ghanas. Health Educ. Res, 2008; 23: 392–401.
13. Walle T. Absorption and metabolism of flavonoids. Free Rad Biol Med, 2004; 36: 829-837.
14. Williams RJ, Spencer PE, Rice-Evans C. Flavonoids: antioxidants or signaling molecules? Free Rad Biol Med, 2004; 36: 838-849.