Vol 7 (2), July 2016; 19-23

Antimicrobial Pattern Associated With Handmade Goat Milk Soap

Zainab Ashraf[1], Atifa Jamil[1], Saba Umar[1] & Sayyada Ghufrana Nadeem[1]

[1]Department of Microbiology, Jinnah University for Women

ABSTRACT

Bacteria are bubiquitous in environment. During daily activities of person is exposed to various pathogens which can cause disease and these pathogens can be transmitted from person to person, hands and body gets frequently contaminated with pathogens. Soaps can remove these pathogens very easily by washing our face and hands. Soaps those are commercially available are highly loaded with synthetic chemicals that can cause cancers and other fatal disease. Antimicrobial handmade soaps by using natural product such as herbs and milk play an important role in removing pathogens .huge studies have been carried out to detect antibacterial activity of handmade soap. In this study we have used Goat milk to make antibacterial soap. Goat milk soap has variety of benefits it has been used for therapeutic purposes for centuries. Goat milk is effective for treating acne and skin infections it has antimicrobial properties that delays growth of pathogenic organisms, it contains variety of nutrients and vitamins such as Vitamin D, C, B1, B12and E. Fourteen test organism those were isolated from clinical specimen were used in this study. Goat milk soap was tested against pathogenic organism include *Escherichia coli*, *Staphylococcus aureus*, *Bacillus subtilis*, *Pseudomonas aeruginosa*, *Candida albicans*, *Klebsiella pneumonia*, *Salmonella typhi*, *Shiegella dysentry*, *Micrococcus*, *Staphylococcus epidermidis*, *Proteus vulgaris*, *Enterococcus*, *Micrococcus luteus*, *Streptococcus*. (Kirby_Bauer Test) method was used to detect antimicrobial activity of goat milk soap. Complete inhibition of growth of *S.aureus*, *B.subtilis*, *C.albicans*, *Micrococcus*, *Enterococcus*, *S.epidermidis* was reported. Also clear zone has been noted against other pathogens. Result from this study indicated that "Goat milk" soap has great antimicrobial activity against these pathogenic organisms and Fungus.

Keywords: *Goat milk, antibacterial soap, pathogenic organism, antimicrobial activity*

INTRODUCTION

Microbes are diverse and ubiquitous in different environment, for example, soil, water, sewage, stagnant water and even in human body. Microscopic organisms' those invade human body are pathogenic and are sickness bringing on and have more noteworthy significance with reference to wellbeing (Johnson *et al.*, 2002). Cleanser and chemicals plays basic role in emptying and dispensing with microorganisms. Typical solid skin has capability of hydrogen (pH) scope of 5.4-5.9 and a normal bacterial flora. Utilization of cleanser with high pH causes an expansion in skin pH, which thus causes an increase in dehydrative impact, peevishness and modification in bacterial flora (Tarun *et al.*, 2014).

Triclosan is an acknowledged antimicrobial fixing on account of its security and antimicrobial adequacy. Triclosan is a one of a kind og antimicrobial appropriate for use in the medicinal services industry in which gentleness is a need to secure the social insurance laborer amid rehashed use and antimicrobial movement is a need to ensure general wellbeing. Triclosan has exhibited quick, constant, expansive range antimicrobial activity and utility in clinical medicinal services settings. This audit highlights the utility and adequacy of a 1% triclosan definition for use in high-chance, high-recurrence hand washing (Jones *et al.*, 2000).

Moreover Triclosan regularly added to cleansers and other healthy skin items. It can be consumed through skin and has been identified in pee, bosom milk, and serum. Triclosan is a growth promoter specialist it doesn't bring about malignancy all alone however its expansion succeptiblity to pick up disease and tumor arrangement after long introduction (Nhanes, 2009).

The commitment of goat milk to the financial and healthful prosperity of mankind is unquestionable in various nations, particularly in the Mediterranean, Middle East, Eastern Europe and South American nations. Goat milk has assumed a critical part in wellbeing and sustenance of youthful and elderly. Goat milk has likewise been known for its advantageous and helpful consequences for the general population who have dairy animal's milk sensitivity. These nourishing, wellbeing and restorative advantages illuminate the possibilities and estimations of goat milk and its claim to fame items. The compound attributes of goat milk can be utilized to make a wide assortment of items, including liquid drink items (low fat, invigorated, or seasoned) and UHT (ultra high temperature) milk, fermented items, for example, cheddar, buttermilk or yogurt, solidified items, for example, dessert or solidified yogurt, spread, dense/dried items, desserts and confections. Furthermore, other items, for example, hair, healthy skin and cosmetics produced using goat milk as of late have picked up a further consideration. By and by, great items must be delivered from high quality goat milk. The quality milk ought to can possibly endure innovative treatment and be changed into an item that fulfills the desires of shoppers, as far as nourishing, hygienic and tactile characteristics (Ribeiro, 2009).

The study leads us towards the new ways of developing the hygienic practices by using antibacterial soaps of natural substances that don't have any side affect relating to our health. Now, we can delete the chemically manufactured soaps and cleansers from our life that causes the irritability and different skin disorder.

MATERIALS AND METHODS

Manufacturing of Goat Milk: Goat milk that has been used for research was purchased from local milk supplier. Recipe of goat milk soap is mentioned below. One ml of NaOH was dissolved in 5 ml of distilled water followed by

RESULTS

Table I. The zone of inhibitions by the activity of Goat Milk Soap against specimens

Organisms	Zone Diameter	Interpretation
Staphylococcus aureus	40 mm	Sensitive
Staph epidermidis	36 mm	Sensitive
Pseudomonas aeruginosa	41 mm	Sensitive
Escherichia coli	41 mm	Sensitive
Bacillus subtilis	56 mm	Sensitive
Salmonella typhi	40 mm	Sensitive
Proteus vulgaris	37mm	Sensitive
Candida albicans	40 mm	Sensitive
Klebsiella pneumonia	38 mm	Sensitive
Micrococcus luteus	45 mm	Sensitive
Enterococcus spp	35mm	Sensitive

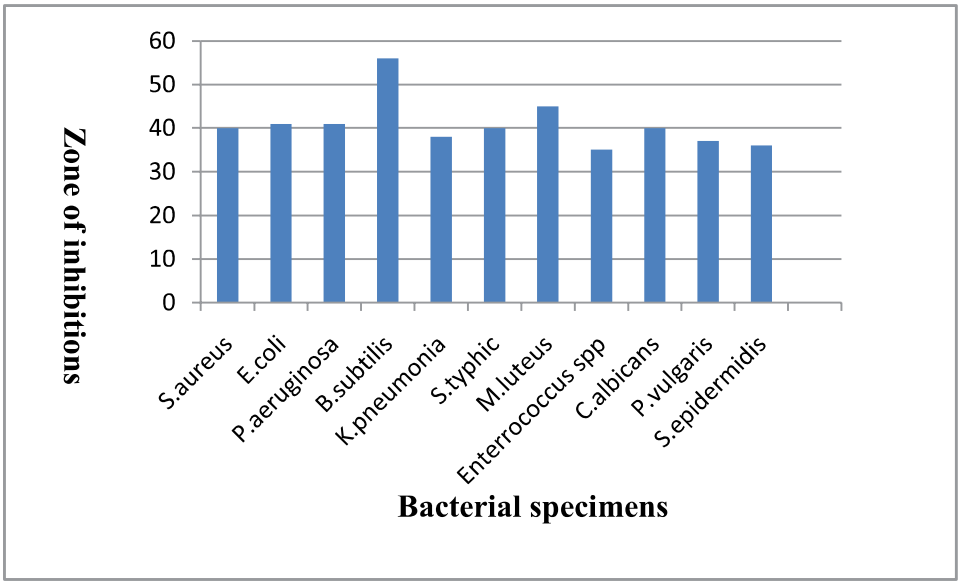

Figure 1. Comparission of Goat Milk Activity among Species

Figure 2: *S.epidermidis (zone 36mm)*

Figure 3: *Staphylococcus aureus (zone 40 mm)*

Figure 4: *Bacillus subtilis* (zone 56 mm)

Figure 5: *Candida albicans* (zone 40 mm)

Figure 6: *Escherichia coli* (zone 41 mm)

Figure 7: *Proteus spp* (zone 37 mm)

Antimicrobial Activity of Goat Milk Soap against clinical specimens

the addition of 5ml coconut oil and goat milk soap Then 5 ml of olive oil was added to the solution. The solution was stirred immediately until a thick paste of soap resulted. The soap samples were left to settle at room temperature.

Antibacterial Assay (Kirby-Bauer Test): Appropriately each (MH) Muller-Hinton agar plate was labeled for each organism to be tested.

Test organism was aseptically inoculated with in the medium then well was made with the help of borer. Then goat milk soap extract was poured in this well and incubated for 18-24 hours at temperature range of 35°C. After 24 hours, the zone sizes were measured to the nearest mm using a ruler. An absence of antibacterial activity would produce a halo of 7mm diameter, the size of the glass fiber discs (Barry, *et al.*, 1979).

DISCUSSION

Microorganisms are the obscured enemies to the mankind that cause very profound damage in human body as than other living organism. The agents which have the capability to inhibit the microbial flora or capture the multiplication are called the antimicrobial agents or drugs. There are a lot of antimicrobial agents or drugs. There are lots of antimicrobial drugs of which some are discovered and some are hidden in the nature (Mishra and Dubey, 1994). The physiological and biochemical facts of the unique qualities of goat milk are just barely known and little exploited, especially not the high levels in goat milk of short and medium chain fatty acids, which have recognized medical values for many disorders and diseases of people (Haenlein, 2004). Present study has been carried to detect antimicrobial activity of handmade Goat Milk soap against different pathogenic organisms that has been reason of variety of skin diseases. The antimicrobial activity of handmade soap was tested against *Staphylococcus aureus*, by using Kirby-Bauer technique. A clear zone of inhibition 40 measuring mm was obtained against *S.aureus*. We also checked antibacterial activity of our handmade soap against *Pseudomonas aeruginosa*, *Escherichia coli* and *Klebsiella pneumonia*, clear inhibitory zones of 41mm and 38 mm respectively were seen. This shows great antimicrobial activity of soap against these pathogens. However we also checked affectivity of goat milk soap against most common skin pathogens such as *Candida albicans*, *S. epidermidis*, *Micrococcus luteus* and *Enterococcus spp.* Majority of skin infections are caused by thesemicroorganisms. Goat milk showed zone of 40 mm against *C.albicans*, whereas zone of 36 mm was measured against *S.epidermidis* and 35 mm against *Enterococcus spp.* Goat milk soap showed great activity against M. luteus a clear zone of inhibition i.e 45mm was measured against it. Antimicrobial activity of Goat milk soap was also checked against *B. subtilis*, *Salmonella typhi* and *P. vulgaris*, clear zones of inhibition that is 56 mm, 40 mm and 39 mm respectively were measured. Results showed that Goat milk has great antimicrobial activity.

CONCLUSION

In conclusion, it can be state that the soaps made from Goat milk had shown strong antimicrobial activity and can be serve as a very good source for the invention of new therapeutic agents to kill pathogenic skin organisms .The goat milk is the form of soaps were found to be effective antimicrobial soap against skin pathogens. Keeping in view it antimicrobial effect Goat milk can be used for variety of purposes such as making cosmetics, detergents and other skin care product it is not only working as antimicrobial agents but it also provide nourishment and healthy and fear complexion to skin. This study paves the way for further attention and research to identify the active compounds responsible for the biological activity of milk. Further studies should be undertaken to elucidate the exact mechanism of action by which active compound in milk exert their antimicrobial effect.

REFERENCES

Barry AL, Coyle MB, Thornsberry C, Gerlach EH and Hawkinson RW. 1979. Methods of measuring zones of inhibition with the Bauer-Kirby disk susceptibility test. *Journal of clinical Microbiology*, 10(6): 885-889.

Haenlein, GFW. 2004. Goat milk in human nutrition. *Small Ruminant Research*, 51(2):155-163.

Johnson SA, Goddard PA, Iliffe C, Timmins B, Richard AH, Robson G, Handley PS (2002). *Comparative susceptibility of resident and transient hand bacteria to Para-chloro-meta-xylenol and tricloson. J.Appl. Microbiol.*, 93:336-344

Jones RD, Jampani HB, Newman JL and Lee AS. 2000. Triclosan: a review of effectiveness and safety in health care settings. *American journal of infection control*, 28(2):184-196.

Mishra AK and Dubey NK. 1994. Evaluation of some essential oils for their toxicity against fungi causing deterioration of stored food commodities. *Applied and environmental microbiology*, 60(4): 1101-1105.

Nhanes IV. 2009. Fourth national report on human exposure to environmental chemicals. *Department of Health and Human Services Centers for Disease Control and Prevention. Atlanta, Georgia.*

Ribeiro AC and Ribeiro SDA. 2010. Specialty products made from goat milk. *Small Ruminant Research*, 89(2): 225-233.

Tarun J, Susan J, Suria VJS and Criton S. 2014. Evaluation of pH of bathing soaps and shampoos for skin and hair care. *Indian journal of dermatology*, 59(5): 442.