

DEVELOPMENT OF ANTIBACTERIAL FINISH ON COTTON FABRIC

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ABSTRACT

In this investigation use of lemongrass oil on texture was done by means of two techniques: splash strategy applied through showering technique and cushioning ravage technique. Lemongrass oil were arranged utilizing M: L: R and applied on texture utilizing shower method. The maintenance of fragrance on the examples treated with the two strategies was evaluated when washing and the one giving better outcomes was exposed to additional testing for example antibacterial adequacy. The antibacterial evaluation of the control and treated texture was finished. The outcomes uncovered that textures treated with lemongrass oil cushioning ravage technique were more successful in scent maintenance when contrasted with the textures treated with shower strategy. The lemongrass oil treated with cushioning mutilate texture showed 80% bacterial decrease.

Keywords: Cotton fabric, Lemongrass oil, antibacterial finish, spray method, padding method.

1. INTRODUCTION

Clothing serves many purposes: it can serve as protection from the elements, rough surfaces, rash-causing plants, insect bites, splinters, thorns and prickles by providing a barrier between the skin and the environment. Clothes can insulate against cold or hot conditions, and they can provide a hygienic barrier, keeping infectious and toxic materials away from the body. Clothing also provides protection from ultraviolet radiation.

Cotton is a soft, fluffy staple fiber that grows in a boll, or protective case, around the seeds of the cotton plants of the genus *Gossypium* in the mallow family Malvaceae. The fiber is almost pure cellulose. Under natural conditions, the cotton bolls will increase the dispersal of the seeds.

The plant is a shrub native to tropical and subtropical regions around the world, including the Americas, Africa, Egypt and India. The greatest diversity of wild cotton species is found in Mexico, followed by Australia and Africa. Cotton was independently domesticated in the Old and New Worlds.

The fiber is most often spun into yarn or thread and used to make a soft, breathable textile. The use of cotton for fabric is known to date to prehistoric times; fragments of cotton fabric dated to the fifth

millennium BC have been found in the Indus Valley Civilization, as well as fabric remnants dated back to 6000 BC in Peru. Although cultivated since antiquity, it was the invention of the cotton gin that lowered the cost of production that led to its widespread use, and it is the most widely used natural fiber cloth in clothing today.

Lemongrass is a plant. The leaves and the oil are used to make medicine. Lemongrass is used for treating digestive tract spasms, stomachache, high blood pressure, convulsions, pain, vomiting, cough, achy joints, fever, the common cold, and exhaustion. It is also used to kill germs and as a mild astringent. Some people apply lemongrass and its essential oil directly to the skin for headache, Stomachache, abdominal pain, and muscle pain. By inhalation, the essential oil of lemongrass is used as aromatherapy for muscle pain. In food and beverages, lemongrass is used as a flavoring. For example, lemongrass leaves are commonly used as “lemon” flavoring in herbal teas. In manufacturing, lemongrass is used as a fragrance in soaps and cosmetics. Lemongrass is also used in making vitamin A and natural citral.

Microbial growth on a textile fabric causes loss of strength and elongation, discoloration, and changes in appearance. The antibacterial finishing agents extracted from nettle plant leaf have been used to impart finish to the cotton fabric by using the Pad-Dry-Cure application method.

An antibacterial is an agent that kills microorganisms or stops their growth. Antibacterial medicines can be grouped according to the microorganisms they act primarily against. For example, antibiotics are used against bacteria, and antifungals are used against fungi. They can also be classified according to their function. Agents that kill microbes are microbicides, while those that merely inhibit their growth are called bacteriostatic agents. The use of antibacterial medicines to treat infection is known as antibacterial chemotherapy, while the use of antibacterial medicines to prevent infection is known as antibacterial prophylaxis.

The main classes of antibacterial agents are disinfectants (non-selective agents, such as bleach), which kill a wide range of microbes on non-living surfaces to prevent the spread of illness, antiseptics (which are applied to living tissue and help reduce infection during surgery), and antibiotics (which destroy microorganisms within the body). The term "antibiotic" originally described only those formulations derived from living microorganisms but is now also applied to synthetic agents, such as sulfonamides or fluoroquinolones. Though the term used to be restricted to antibacterials (and is often used as a synonym for them by medical professionals and in medical literature), its context has broadened to include all antibacterial. Antibacterial agents can be further subdivided into bactericidal agents, which kill bacteria, and bacteriostatic agents, which slow down or stall bacterial growth. In response, further advancements in antibacterial technologies have resulted in solutions that can go beyond simply inhibiting microbial growth. Instead, certain types of porous media have been developed

to kill microbes on contact.

1.1 OBJECTIVES

- To select cotton fabric for the study.
- To select lemongrass oil for antibacterial finish.
- To extract the lemongrass oil and finish the cotton material using spray method and padding mangle method.
- To evaluate the antibacterial finished fabrics by qualitative analysis and sensorial evaluation.

2. METHODOLOGY

Fragrance used: Fragrance oil: Lemongrass oil

Solvents: Acetic acid

Fabric: Cotton fabric was used for the study

Finish application was done by two methods

- Spray method
- Padding mangle method with silicon softener

Finish application by spray method

10% lemongrass oil was applied by dissolving in 50% water to make it soluble finally by sprayed on to the fabric by means spray gun using a pressure of 4 kg/cm² with the distance of 40 cm followed by air drying.

INGREDIENTS	RATIO	RATIO USED
Water	50%	60 ml
Fragrance oil	10%	12 ml

Finish application by padding method with acetic acid

Acetic acid and the solution prepared earlier for spray method were mixed to a mixture. This solution needs to be mixed very well. Water was added and mixing was done to ensure a good dispersion. PH was adjusted to 5.5 with acetic acid. After this the fabric was dipped into the solution and was passed through padding mangle for one dip and one nip. Sample was dried and cured.

INGREDIENTS	RATIO	RATIO USED
Solution	9 times	1180 ml
MLR	1:10	1180 ml
Temperature	<40° c	<40° c
pH value	5 – 5.5	5 – 5.5
Time	1 dip/ 1 nip	1 dip/ 1 nip

3. RESULT AND DISCUSSION

3.1. ANTIBACTERIAL EVALUATION:

Results:

The result of antibacterial activity of poly herbal finished fabric care shown in plates

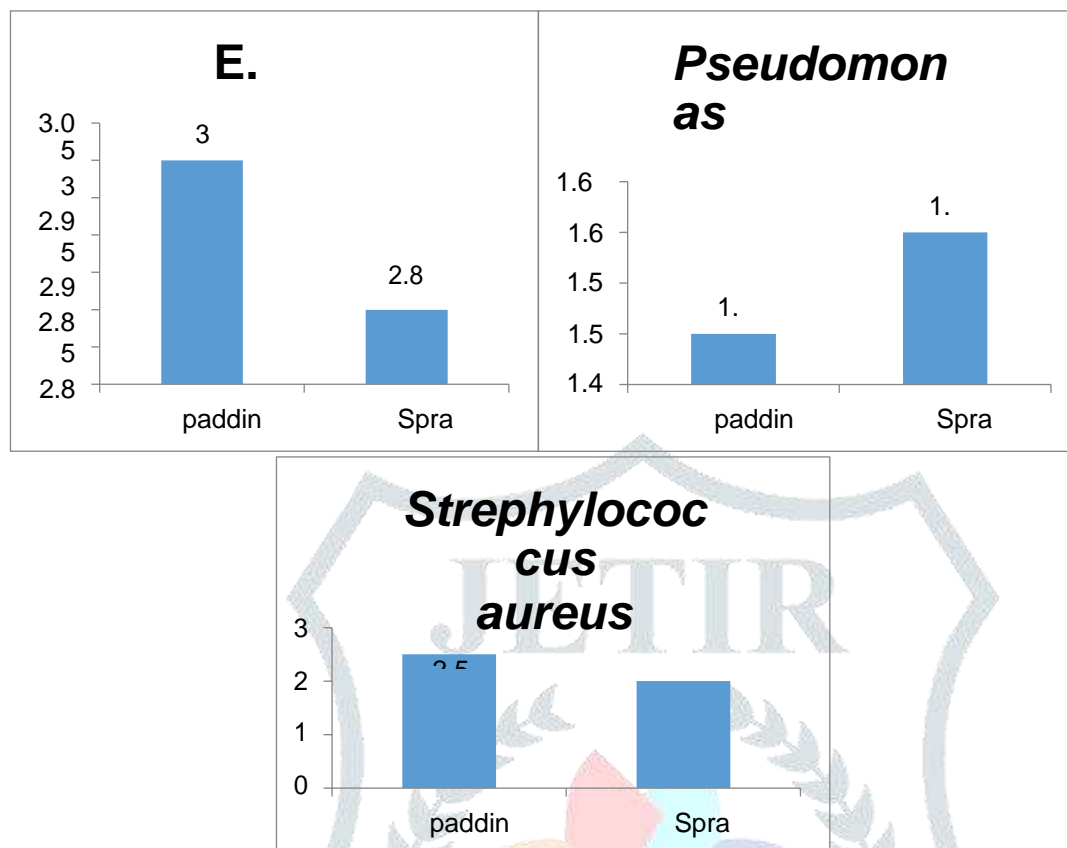


name of the sample	e. coli zone of inhibition	pseudomonas aeruginosa zone of inhibition	streptococcus aureus zone of inhibition
padding	3.0 cm	1.5 cm	2.5 cm
Spray	2.8 cm	1.6 cm	2.0 cm

Plate: 8:e.coli

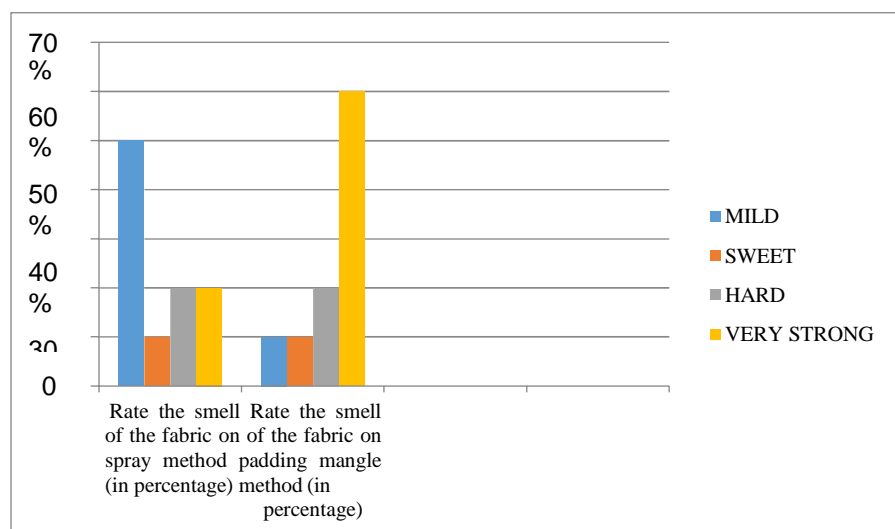
Plate: 9: Pseudomonas

Plate: 10: s.aureus



3.2. SENSORIAL EVALUATION: rate the following property of the given sample:

S.NO	QUESTIONS	MILD	SWEET	HARD	VERY STRONG
1	Rate the smell of the fabric on spray method (in percentage)	50%	10%	20%	20%
2	Rate the smell of the fabric on padding mangle method (in percentage)	10%	10%	20%	60%



Thus, the feel is mild and good in spray method than the padding method.

4. SUMMARY AND CONCLUSION

In this study application of lemongrass oil on fabric was done via two methods: spray method applied through spraying method and padding mangle method. Lemongrass oil were prepared using M: L: R and applied on fabric using spray technique. The retention of aroma on the samples treated with both techniques was assessed before and after washing and the one giving better results was subjected to further testing i.e. antibacterial efficacy. The antibacterial assessment of the control and treated fabric was done. The results revealed that fabrics treated with lemongrass oil padding mangle method were more effective as compared to the fabrics treated with spray method. The lemongrass oil treated with padding mangle fabric showed 80% bacterial reduction.

4.2 Recommendation for the future scope of the study

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