

## DEVELOPMENT OF ANTIBACTERIAL EFFICACY OF PUMPKIN SEED OIL (CUCURBITA PEPO) ON COTTON FABRIC

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### ABSTRACT

Textiles are classified according to their component fibers into silk, wool, linen, cotton, and such synthetic fibers. Mechanical, electrical, thermal will offer ability function to Technical textiles, thus using different fibers technical textiles are evolved. Cotton is known for its versatility, performance and natural comfort and it is made up of physical and chemical properties. Pumpkin seeds, also known as pepitas, are edible and nutrient-rich. The Glycolic acid (hydroacetic acid or hydroxyacetic acid); chemical formula  $C_2H_4O_3$  (also written as  $HOCH_2CO_2H$ ), is the smallest  $\alpha$ -hydroxy acid (AHA). This colorless, odorless, and hygroscopic crystalline solid is highly soluble in water that is used in various skin care products. The glycolic acid and pumpkin seeds are used as Face masks which tightens skin and are best suited for acne prone skin. The study is carried out with cotton fabric finished with glycolic acid and cucurbita pepo and applied to acne prone skin and tests are carried out. The masks are given to people with acne and pimples for definite days.

**KEYWORDS:** Textile, Medical Textile, Cotton, Cucurbita pepo, Glycolic acid.

### I. INTRODUCTION

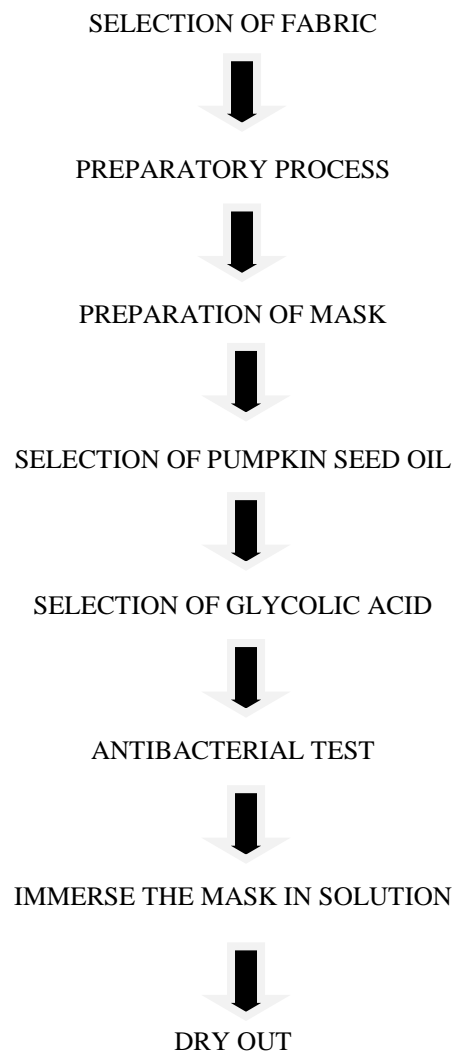
Textile has various forms such as fibers, yarn, cloth, and other materials. Textile refers to any material made of interlacing or Interlooping fibers/Yarns and the textile is done by the processing called weaving, knitting, spreading, crocheting, or bonding which are used in production of further goods (garments, etc.). Woven fabric is a textile formed by weaving and also it made by interlacing two or more threads at right angles to one another. It is created on a loom and comprised of many threads woven on a warp and a weft direction and there is no stretchability. Much varieties of materials are produced by weaving. Cotton is a naturally grown fibre, it is a soft, fluffy staple fiber that grows in a boll, or protective case. which belongs to the family of Mallow. The filament cotton fibres are used to make cloth, the staple fibres can be used in the paper industry and also the oils can be produced with the help of cotton seeds. Cotton fabrics can be extremely durable and resistant to abrasion. Nonwoven cotton, made by fusing in hospital and other medical uses. Medical textiles is in the part of Technical textile, also known as healthcare Textiles. This term medical textile refers to all textiles which are used for first aid, clinical, surgical and hygienic too. Medical Textiles plays a vital role in the textile market. Pumpkin are perhaps the oldest domesticated plants on earth, the scientific name for pumpkin is Cucurbita pepo and its thick shell contains the seeds and pulp. Pumpkin had a good source of vitamin C/B and also it provides various health benefits. The pumpkin seeds are called as pepitas, flat dark green seeds. They are a good source of magnesium, seeds are nutty in flavor and chewy texture. Roasted and salted pumpkin seeds are a great snack food and make for a very popular ingredient in the cuisines of many countries such as Greece, Turkey, the Balkan countries, Spain, Italy and Mexico. The pumpkin seed oil is dark green is color, it contains a high amount of fatty acid and also it is called out as “superhero ingredient” in skincare products. The benefits in skincare includes treating acne, moisturizing and redness release etc. It helps to improve the freshness and clean skin. Glycolic acid is a type of alpa-hydroxy acid (AHA) that is derived from sugarcane. Glycolic acid is a naturally occurring substance, that when used in skincare products. “glycolic acids helps to separate the connections between keratinocytes [skin cells] in the outer layers of skin without rough, mechanical exfoliation techniques and promote exfoliation,” Dr.krant.

**Objectives:**

- To analyze the compounds present in the selected oil according to its properties.
- Treating woven face mask with pumpkin seed oil 'cucurbita'.
- To determine the sample using Anti-bacterial activity.

**II. METHODOLOGY**

The antibacterial efficacy of pumpkin seed oil is going to treat with cotton fabric. The methodology process of this study is given below

**Experimental Procedure-****Fig-1****a) SELECTION OF FABRIC:**

Now we are going to select cotton fabric because it is amazingly versatile. It is a natural fiber and a woven fabric made of cotton yarns or yarns produced from a blend of cotton. Cotton fabrics had some properties namely hygienic,

breathable, washing and resistant to wear but it has less elasticity. So here, we are going to select cotton for making face mask.

**b) PRE- TREATMENT:**

Cotton fabrics were sterilized in boiling water. The cotton fabrics were immersed in the boiling water with 90°C for 15 minutes. Then the fabrics were removed from the water and allow it to dry.

**c) PREPARATION OF MASK:**

Face mask are an easy and inexpensive way to perk up your skin and pumper yourself. After the pre-treatment of fabric, next was the preparation of facemask so fold the fabric in half. Measure and cut out a 7 ½ inch by 9 ½ inch circle to create two identically sized layers. Stitch those circular raw edges and cut out the areas of nose, eyes and lips.

**d) SELECTION OF SEED OIL:**

Next about the selection of oil, Pumpkin seed oil is a storehouse of potent antioxidants that battle free radicals throughout our body. It has lots of vitamin E, which protects our skin cells from oxidative damages by its excellent antioxidant properties, which gives us young and beautiful appearance. The oil comes packed with vitamins, minerals and essential fatty acids, which also contribute to its anti-aging capacities. Pumpkin seed oil gives a good result in skincare such as acne, rashes, removal of darkness etc. Under the auspices of these properties the pumpkin seed oil is selected.

**e) SELECTION OF ACID:**

Glycolic acid is a specialized product in cosmetics. It has the smallest molecules in the group, it is a wonderful skincare ingredient and making it the most effective for treating skin issues like noticeable sun damage, dark spots or acne marks, deeper lines and wrinkles. Chemical peels use a high percentage of this acid and can be very effective if done safely and properly so, with the help of this properties it will selected.

**f) ANTIBACTERIAL TEST:**

The Anti-bacterial test is based on the natural source which can be control bacteria's like

- **Escherichia coli**
- **Staphylococcus aureus**
- **Pseudomonas aeruginosa.**
- **Propionibacterium acnes**

After completing this processes then going to the antibacterial test of the above properties. Escherichia coli is commonly known as E. coli, it is a consists of diverse group of bacterias normally live in the intestines of people and animals. Staphylococcus aureus is a gram-positive, round-shaped bacterium that is a member of the Firm cutes, and is frequently found in the nose, respiratory tract, and on the skin. S. aureus is not always pathogenic, it is a common cause of skin infections such as a skin abscess, respiratory infections such as sinusitis, and food poisoning and next about the Pseudomonas aeruginosa, it is a common Gram-negative, rod-shaped bacterium that can cause disease in plants and animals, including humans. A species of considerable medical importance, P. aeruginosa is a multidrug resistant pathogen recognised for its ubiquity, its intrinsically advanced antibiotic resistance mechanisms, and its association with serious illnesses – especially hospital-acquired infections such as ventilator-associated pneumonia and various sepsis syndromes. Treatment of P. aeruginosa infections can be difficult due to its natural resistance to antibiotics. When more advanced antibiotic drug regimens are needed adverse effects may result. And finally about the propionibacterium acnes was the most abundant bacterium on human skin, particularly in sebaceous areas. P.acnes is suggested to be an opportunistic pathogen involved in the development of diverse medical conditions but is also a proven contaminant of human clinical samples and surgical wounds.

**g) IMMERSER THE MASK IN SOLUTION:**

Solution of pumpkin seed oil and glycolic acid is prepared with 40% of each. Pretreated cotton mask is immersed into the prepared solution for 24 hours. For better fixation into the material it should be stirred well for 30 minutes of the process.

**h) DRY OUT:**

After 24 hours the dipped cotton mask is taken out and kept to dry under the shade.

**III. MODEL AND ANALYSIS****Fig-2****IV. RESULT AND DISCUSSION**

In the present study of pumpkin seed oil and glycolic acid are collected. Then the oil and acids were examined for its anti-bacterial activity using the disc method.

The Anti-bacterial activity for the given sample was carried out by disc diffusion method 1x1 of cotton gauze was immersed or soaked in 20% of pumpkin seed oil and 20% of glycolic acid and assayed against test pathogens. Hence, the result shows that the activity of oil extracted from pumpkin seed oil and glycolic acid coated fabric react with Propionibacterium acnes anti-bacterial activity.

**V. CONCLUSION**

The development of facemask by using pumpkin seed oil and glycolic acid in medical textile was carried out. The oil and acid was collected, identified and authenticated.

Facemask was developed by dip and dry method using oil and acid on medical textile. An antibacterial assessment of the facemask was done by measuring the zone of Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa and propionibacterium acnes but the final result shows with P.acnes bacteria.

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