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Preparation and Phytochemical Analysis of Herbal Finished Face Mask

Asst. Prof. Kousalya L, Saravanapriya P. M, Benazir M
Department of Botany
Nirmala College For Women, Coimbatore,
Tamil Nadu, India

Abstract- As the coronavirus (Covid-19) pandemic spreads, technological applications and initiatives are multiplying in an attempt to control the situation, treat patients in an effective way and facilitate the efforts of overworked healthcare workers, while developing new, effective vaccines. Ever since the pandemic hit, students, entrepreneurs and innovators have been coming up with unique protective equipment to help humankind fight the Coronavirus. Masks should be used as part of a comprehensive strategy of measures to suppress transmission and save lives; the use of a mask alone is not sufficient to provide an adequate level of protection against COVID-19. A large amount of chemical materials are used in the process of textile manufacture. The chemicals and viruses are constantly inhaled by the people. The mask made from herbal extracts like orange, lemon, clove and cinnamon in the fibre that provides antibacterial and anti-viral properties. The herbal masks prepared from the extract of Citrus sinensis, Citrus limon, Syzygium aromaticum and Cinnamonum verum. The face masks prepared from the Citrus sinensis, Citrus limon, Syzygium aromaticum and Cinnamonum verum are anti-viral in nature so using these masks will lessen the spread of corona than the normal masks. Also these herbal masks will be a good choice because of its non-allergic herbal activity. These masks may protect the skin from the chemicals.

Keywords:- Citrus sinensis, Citrus limon, Syzygium aromaticum and Cinnamonum verum, herbal finished face masks and phytochemical analysis.

I. INTRODUCTION

Airborne diseases tend to spread more easily than other types of diseases, and are thus harder to control. As a rapid response to such outbreaks, much emphasis has been placed on personal protective equipment (PPE), especially face masks, to prevent infectious diseases from airborne pathogens. Wearing face masks in public reduces disease transmission and creates a sense of community solidarity in collectively fighting the pandemic.

However, excessive use of single-use polymer-based face masks can pose a significant challenge to the environment and is increasingly evident in the ongoing COVID-19 pandemic (Smolinski, et al 2003).

On the contrary, face masks with inherent antimicrobial properties can help in real-time deactivation of microorganisms enabling multiple-use and reduces secondary infections. Given the advantages, several efforts are made incorporating natural and synthetic antimicrobial agents (AMA) to produce face mask with enhanced safety.

The current and future market potential and environmental impacts of face mask. Among the AMA tested, metal and metal-oxide based materials are more popular and relatively matured technology.

However, the repeated use of such a face mask may pose a danger to the user and environment due to leaching/detachment of nanoparticles. So careful

consideration is required to select AMA and their incorporation methods to reduce their leaching and environmental impacts. Also, systematic studies are required to establish short-term and long-term benefits (Luliano et al., 2018).

Organic antibacterial agents work by the mechanism of killing or inhibiting the growth of harmful bacteria. It damages the cell wall, causes disruption of cytoplasmic membranes of bacterial cells by physical action, and causes subsequent release of the cytoplasmic contents, inhibits enzyme action and synthesis of nucleic acid (Nabil, 2015).

When textiles are finished with the extractions obtained from various herbs, they are referred as eco-friendly textiles. The term "eco-friendly clothing" can be termed as a clothing made of natural fibres such as silk, wool and cotton which has been organically dyed with vegetables dyes and finished with herbal extracts or any fabric with small amounts of water, energy and chemicals that does not harm the environment [2].

When the process of finishing is done with the herbal extractions, no chemicals are used in its finishing process except for some solvents such as ethanol or methanol to isolate the secondary plant components, which has no toxic effect on human living cells. So, herbal extracts are different from chemicals as they carry some components of medicinal value [1].

Great importance is given to microbial finish because of its relation as protective clothing in the health care and medical textiles. Antimicrobial herbal finish has the ability to inhibit or kill the growth of microorganisms and controls the negative effect such as malodour, staining and deterioration of the textile substrate, and protecting the wearer from harmful effects of the pathogens [3].

When textiles are finished with the extractions obtained from various herbs, they are referred to as natural finishes. Bioactive compounds which are extracted from plants having antimicrobial properties have been found in plants that are rich in a wide variety of secondary metabolites, such as tannins, terpenoids, alkaloids, anthraquinones, glycosides, phlobatannin, lectins and polypeptieds, Pyrrolizidine alkaloid, saponins, coumarins, steroids, volatile oils and flavonoids, in addition to having antioxidant, wound healing and analgesic properties [5]; [6]; [7].

The plant extracts have been used in the textile industry for several decades. Various studies have been conducted throughout the world on the effects of active biological components present in medicinal plants.

The WHO has declared medicinal plants as the best source for obtaining various drugs [8] and that 80% of the world's population depend on traditional medicine [6].

The advantage of use products obtained from herbs is that they are non-toxic and less expensive than synthetic medications. Many plants and plants-derived products have been shown to possess potent antibacterial activity [10]. Bioactive agents from herbal sources having antimicrobial activity finds importance in the textile industry as it is safe, non-toxic, skin and environment friendly [9]. Many natural products which show antibacterial properties, extracts from roots, stem, leaves, flowers and seeds of diverse species of plants exhibit antibacterial properties [11].

For instance, the use of respiratory protective devices (RPDs) has gained massive impetus during COVID-19. This intervention is highly beneficial in pandemic situations to reduce exposure to infectious respiratory aerosols and droplets and slow down the spread of the disease (Garnish, et al., 2020). Realising the fact, most of the countries have enforced or advised its citizens to wear face masks in public places (Deng, et al., 2020).

However, there are several concerns associated with the use of conventional face masks such as the survivability of microorganisms on the face mask surface, re-aerosolizing of settled particles, safe management and disposal of used face masks, and fomite transmission [15]. Some of these concerns have led to the development of facemasks with inherent antimicrobial properties to impart surface contact killing/deactivation property in addition to particle filtration.

Antimicrobial face masks pave the way for reusability and considerably reduce the surging demand for single-use face masks, especially during outbreaks in highly populated, developing, and middle-income countries. The present study presents a comparative study on herbal face mask with a particular emphasis on antimicrobial face masks as an emerging weapon

in containing the spread of infectious diseases. The herbal face masks and their methods of incorporation, filtration efficacy, and current and future market potential are needed. The present scenario of COVID-19 and post COVID-19 due to the recurring nature of infectious diseases, to acquaint the readers with the relevant aspects of face mask in general and antimicrobial face masks in particular. The present study include the AMA that are tested on the face masks and other promising materials studied for similar applications.The following herbal plants are Citrus limon, Citrus sinensis , Cinnamonum verum and Syzygium aromaticum .

Citrus limon (Citrus × limon) is a hybrid of the plant genus Citrus, As well as the common name of the popular edible fruit of this Small tree. Citrus limon is an important medicinal plant originated in tropical and subtropical Southeast Asia. Very rich in Vitamin C, so it has potassium and calcium antiscorbutic characteristics. It is very much desirable to reinforce body Defenses and prevent numerous illnesses, as acne, Rheumatism, arthrosis, gout, cholesterol, arteriosclerosis, uric Acid, eczema, inflammation, infections, fever, fatigue, colds And flu. The most important Citrus limon flavone is hesperidin, which is found in the fruit in a glycosylated form as Hesperidin. The cell infection by SARS-CoV-2, and to modulate the Systemic immuno pathological phases of the disease (Majeed et al., 2018).

Sweet Citrus sinensis fruits represent the largest Citrus cultivar group, Grown around the world, accounting for about 70% of the Total annual production of Citrus species. Citrus sinensis juice Made from sweet Citrus sinensis fruits, also taken by patient 3, is the most popular juice beverage around the world as an excellent Source of vitamin C, a powerful natural antioxidant that builds the body immune system. It is also shown to possess anti-inflammatory, antioxidant, antiallergic and anti-asthmatic effects. Recently, Bellavite and Donzelli reported that sweet Citrus sinensis juice is well known for its vitamin C and hesperidin (flavonoid) content. Which seem to be active antiviral candidates against COVID-19 (Munoz et al., 2009).

Cinnamonum verum is a small and evergreen tree, most well-known for its bark, which offers the world with the normally recognized Spice, Cinnamonum verum. Numerous pharmacological investigations have confirmed that the ability of this plant is to exhibit Hepatoprotective, cardio-protective, anti bacterial, antioxidant, Antifungal, antidiabetic, anticancer, anti-inflammatory, and Neuroprotective activities supporting the traditional uses. The spicy taste and fragrance of the Cinnamonum verum is mainly due to the compound cinnamaldehyde which could be Protective against COVID-19.

Eugenol, the major component of Cinnamonum verum essential oil (45 to 90%), possessed the most potent anti-influenza activity in both liquid and vapour phases. Docking scores revealed that this compound has a binding affinity toward COVID-19. Rutin exhibited a good characteristic of Binding with COVID-19 Mpro and TLRs, indicating it as a Novel therapeutic option via virus-based and host-based antiCoV strategies (Pushpa et al., 2005).

Efficient inhibition of 3CLpro, the main protease of COVID19 Patient 2 inhaled water vapor in which water Syzygium aromaticum flower buds were boiled. Syzygium aromaticum essential oil is also studied for its analgesic, antiseptic, antistress, immune system booster, antitumor, and antiviral effects. Their flower buds are widely used in traditional medicine to treat cholera, digestive disorder, cough, teeth troubles, headaches, earaches, nausea, hypertension, respiratory problems and great air freshener [16].

Herbal clothing is also known to help fight against many common diseases such as diabetes, ideal to health. Herbal textiles are ecofriendly, and also residues they produce can be further used for making the other green products. Solid and liquid wastes from herbal dyeing are amenable to recycling producing the organic manure (San yo et al., 2017). In the present study, comparative account on herbal finished face mask prepared from various plant extracts such as Citrus sinensis, Citrus limon, Syzygium aromaticum, Cinnamonum verum um verum and their antimicrobial activity were tested.

The present study was carried out by following objectives;

- To prepare the herbal finished face mask by using Dip Coating Method.
- To compare the preliminary phytochemicals present in the various extracts of medicinal plants.
- To study sensory evaluation of prepared herbal face masks examined by volunteers.

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II. MATERIALS AND METHODS

1. Collection of Plant Material:
The source of plant materials were collected from the supermarket in Coimbatore. The Citrus sinensis and Citrus Limon peels, Syzygium aromaticum bud and Cinnamonum verum bark were powdered and used for the present study.

2. Preparation of Plants Extraction Methods:
2.1 Preparation of Citrus sinensis Peel Extract ([15], 1970): The preparation of Citrus sinensis peel extract is done by heating in water. After removing dirt particles on the Citrus sinensis by washing with water, the peel was removed using knife or simply by hand. It should have the white layer present beneath the outer rind of peel to avoid breakage on folding. When the peel was folded and pressed, an extract comes out of the outer rind of peel. 50 g of raw materials of Citrus sinensis peels (Citrus sinensis) are taken and chopped then heated in the vessel full of water and let it boil for one hour then stir the extraction continuously still the extract is taken.

2.2 Preparation of Citrus Limon Extract ([15], 1970: The preparation of Citrus Limon peel extract is done by heating in water. After removing dirt particles on the Citrus Limon by washing with water, the peel was removed using knife or simply by hand. It should have the white layer present beneath the outer rind of peel to avoid breakage on folding. When the peel was folded and pressed, an extract comes out of the outer rind of peel. 50 g of raw materials of Citrus limon peels (Citrus limon) are taken and chopped then heated in the vessel full of water and let it boil for one hour then stir the extraction continuously still the extract is taken.

2.3 Preparation of Syzygium aromaticum Extract ([15], 1970): The preparation of Syzygium aromaticum bud extract is done by heating in water. After removing dirt particles on the Syzygium aromaticum s by washing with water, the powdered Syzygium aromaticum is taken. It should be dried and powdered and then extracted. 50 g of raw materials of Syzygium aromaticum are taken and then heated in the vessel full of water and let it boil for one hour then stir the extraction continuously still the extract is taken.

2.4 Preparation of Cinnamonum verum Extract ([15], 1970): The preparation of Cinnamonum verum bark extract is done by heating in water. After removing dirt particles on the bark by washing with water, the powdered C. verum is taken. It should be dried and powdered and then extracted. 50 g of raw materials of C. verum are taken and then heated in the vessel full of water and let it boil for one hour then stir the extraction continuously still the extract is taken.

Remove the desired portion of the plant Chop or tear the blossoms, leaves, etc. apart to expose more surface area Combine in a large kettle. Now add enough water to cover the plant material.

Then Simmer on range until the plant material looks faded and dye has transferred to the water (about 1 hour). Strain out left-over plant material and discard. The remaining liquid is your dye.

3. Pre-Preparation of the Cotton Fabric:
Simmer the cotton material in a solution of dish soap. This removes any oil, wax, or dirt that might interfere with the dye adhering to the fibers. Rinse well. Dried cloth is used for the further process.

3.1 Dip coating method (Petra Guenthner Johnson, 1988): Place the cotton material in the prepared dye-bath. Bring dye-bath to a boil for 5 minutes Then Simmer for 2 hours, stirring occasionally. Let cotton material soak overnight. After that take cotton material out of dye-bath drain off excess dye rinse thoroughly and then allow drying or ironing for use.

4. Phyto Chemical Analysis [19] [20]:
In present study, extract of the selected plants were subjected to the preliminary phytochemical tests were performed by using standard methods.

4.1 Test for Alkaloids: To the test solution add 1% (w/v) HCl and any of Mayer's reagents, Wagner's reagent or Dragendroff reagent (6 drops). A creamish or brownish red or orange precipitate indicates the presence of alkaloids.

4.2 Test for Flavonoids: 5ml of dilute ammonia solution were added to a portion of the plant extract followed by addition of concentrated H2SO4. A yellow coloration observed in each extract indicated the presence of flavonoids. The yellow coloration disappeared on standing.

4.3 Test for Saponin: About 20ml of distilled water was mixed with 20 g of sample in a test tube and

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boiled in a water bath and it was mixed vigorously. The frothing was mixed with few drops of olive oil and mixed vigorously and the foam appearance showed the presence of saponins. Then observed for the formation of emulsion.

4.4 Test for Phenols: 1ml of extract was distilled to 5ml with and to this few drops of 1% aqueous solution of lead acetate was added. Yellow precipitate formation indicates the presence of phenols.

4.5 Test For Terpenoid: A 2ml of test solution is added with 2ml of chloroform. To this 3ml of con.H2SO4 was added carefully along the walls of the test tube to form a layer. A reddish brown coloration confirmed the presence of terpenoids.

4.6 Test for Tannins: About 0.5 g samples were boiled in 20ml of water in a test tube and then filtered. A few drops of 0.1% ferric chloride was added and observed for brownish green or a blue-black coloration.

4.7 Test for Steroids: 2ml of acetic anhydride was added to the test solution along with 2ml of conc.H2SO4. The colour changed from violet to blue or green in some samples. This indicates the presence of steroids.

4.8 Test for Glycosides: 2ml of 50% H2SO4 is added to 2ml of extract in a test tube. Then the mixture is heated in a boiling water bath for 5min. 10 ml of Fehlings solution was added and boiled. A brick red precipitate indicates the presence of glycosides.

4.9 Test for Amino Acid and Protein: Take 2-3 ml of sample solution in a test tube. Add 3-4 ammonia drops of ninhydrin solution and heat. Appearance of violet or purple colour indicates the presence of protein.

5. Sensory Evaluation [21]:

A group of 12 volunteers were selected as consumer panel list from family and friends. Panel list agreed to wear the sample mask and questions were asked about the quality of herbal mask.

The herbal masks are prepared according to the above methodology and the samples were given to 12 members. The panel list evaluated the mask according to the colour, odour, flavour and overall acceptability. A numeric basis of "1" represents "dislike extremely" to "10" represents "liked extremely" were noted.

III. DISCUSSION

Under the ongoing COVID-19 pandemic (caused by the SARS coV-2 coronavirus), recommendations and common practices regarding face mask use by the general public have varied greatly and are in rapid flux.

Public mask use is far more prevalent in many Asian countries, which have longer experience with novel coronavirus epidemics; public mask use may have been effective at limiting community spread during the 2003 SARS epidemic (Lau et al., 2004) and widespread mask use is a prominent feature of the relatively successful COVID response in Taiwan (Wang et al., 2020).

Masks have also been suggested as a method for limiting community transmission by asymptomatic or at least clinically carriers [18], who may be a major driver of transmission of COVID-19 (Li, et al., 2020). Herbal clothing is prepared from organic cotton fabric impregnated with special herbs and oils for health benefits.

Since ancient times, herbal clothing is believed to cure diabetes, skin infections, psoriasis, hyper tensions, asthma, arthritis, rheumatism, high blood pressure, eczema and cancer [4].

In present study, four plants were selected for the preparation of herbal face mask such as The Citrus sinensis peels, Citrus Limon peel, Cinnamonum verum and Syzygium aromaticum. The taxonomic characters of these selected plant species are as follows.

IV. RESULTS

The Citrus sinensis tree, reaching 25 ft (7.5 m) or, with great age, up to 50 ft (15 m), has a rounded crown of slender branches. The twigs are twisted and angled when young and may bear slender, semi-flexible, bluntish spines in the leaf axils.

There may be faint or conspicuous wings on the petioles of the aromatic, evergreen, alternate, elliptic to ovate, sometimes faintly toothed "leaves"– technically solitary leaflets of compound leaves [17] (PLATE- I A).

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Fig 1. Plate – I Habit of Selected Plants. A-Citrus Sinensis, B-Citrus Limon, C-Syzygium Aromaticum, D-Cinnamonum Verum

The true Citrus Limon tree reaches 10 to 20 ft in height and usually has sharp thorns on the twigs. The alternate leaves, reddish when young, become dark-green above, light-green below; are oblong. The fruit is oval with a nipple-like protuberance. The peel is usually light-yellow though some Citrus limon are variegated with longitudinal stripes of green; it is aromatic, dotted with oil glands; pulp is pale-yellow, in 8 to 10 segments, juicy, acid [17] (PLATE- I B).

The Syzygium aromaticum tree is a small, tropical evergreen, up to 20 feet tall, with oblong leaves, 5 to 10 inches long and 2 to 4 inches wide. It is native in the Philippines and nearby islands, but has been introduced into all tropical countries. The Syzygium aromaticum s are the dried flower buds, which grow in clusters at the ends of branches and are harvested and dried before they open (Magness, et al. 1971) (PLATE- I C).

The Cinnamonum verum tree is evergreen, grows to around 10 m (30 ft). Its branches are strong and Bark is smooth and yellowish in colour. It has leathery leaves, 11 to 16 cm (4.5 to 6.25 ilong, with pointed tips. The leaves are dark green on top and light green at the bottom.

The inconspicuous yellow flowers with a disagreeable odour, which are tubular with 6 lobes, grow in panicles (clusters) that are as long as the leaves (PLATE- I D).

Textiles are indispensable part of human life. Now a days textiles finishes not only enhances the feel and drape of fabrics but can also provide extra ordinary hygienic properties like making it antimicrobial in nature. Natural fibres such as cotton, wool etc., is susceptible to microbial growth and even dust mites because they retain oxygen, water, and nutrients.

Hence antimicrobial finishes should be applied to textiles to destroy or suppress the growth of micro bial agents and organisms, and also to protect the textiles from strength, color loss, unpleasant odor and quality deterioration. So the herbal masks were prepared by dip coating method and the natural finishing has become a part of human life since the time in memorial. India has a rich cultural heritage and the tradition of using finishes obtain from natural sources there is an increasing realization in the textile industry as well as among the textile consumers to develop and demand ecofriendly methods of finishing textiles (Sam, et al., 2006).

The present investigation aims at developing an ecofriendly and natural antimicrobial finish from herbal plants of India.

Chemical bonded between plant molecule and cotton cellulose molecules with cross-linking agent acting as a bridge that is bi or poly functional, allows it to chemically react with the hydroxyl group in plant and cellulosic structure. It is logical that, physio-mechanical together with chemical attachment of plant extract to cellulosic fibre and finishing agent, affect the antibacterial activity. Test on fabrics for the resistance to attack by micro-organism and also by the assessment of anti-bacterial finishes on textile material. In present study, cotton fabric was finished with herbal extraction of Citrus sinensis, Citrus Limon, Syzygium aromaticum, Cinnamonum verum um verum without using any source of chemicals.

The selection of plant in the present study was based on the anti-viral activity of the herbs especially against COVID19 (Hudson, et al., 2014).

The anti-influenza virus activity of some essential oil vapors such as that of Citrus bergamia (Bergamot), Eucalyptus globulus (Eucalyptus), Pelargonium graveolens (Geranium), Cinnamonum verum zeylanicum leaf oil (Cinnamonum verum) and Cymbopogon flexuosus has been reported. Air sterilization without human health damage using

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essential oils could be a good way to prevent COVID-19.

The herbal finishing was carried out by using the Dip Coating method. It is a facile and economical technique widely used in many industrial fields to deposit onto any substrate, including metallic, ceramic, polymer films, and fibrous materials, etc.

The process could be defined as depositing aqueous-based liquid phase coating solutions onto the surface of any substrate. Generally, target materials are dissolved in solutions which directly coated on the surface of substrate, and then the sedimentary wet coating has been evaporated to obtain dry film [12]; [13] (PLATE II).

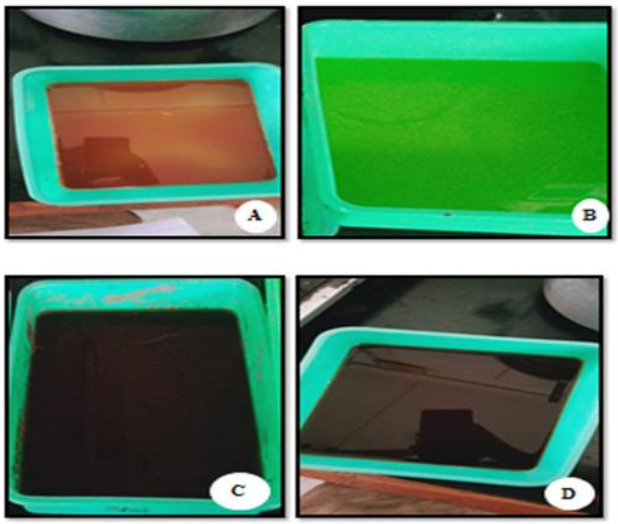

Fig 2. Plate- II Extraction of Selected Plants Species.
A-Extraction of Citrus Sinensis, B-Extraction of Citrus Limon, C-Extraction of Syzygium Aromaticum
D-Extraction of Cinnamonum Verum.

Herbal finished masks enhance fragrance which adds refreshing feel throughout the day. Aromatherapy has been used for thousands of years in Egypt and India to treat various diseases, and the antimicrobial and the anti-viral activity of essential oils have been confirmed by numerous studies. The colour of the herbal finished face mask was enhanced in the present study after treating with various extracts. (PLATE II A-D)

The colour of face mask prepared from Citrus sinensis peel, Citrus limon peel, Cinnamonum verum and Syzygium aromaticum changes from white to pale orange, yellow, brown and pale brown respectively (Plate- III A-D).

The preliminary phytochemical analysis of the extracts prepared for herbal finished face masks were tested. The existence of alkaloids, flavonoids, saponin, phenols, terpenoids, tannins, steroid, glycosides and protein was tested using standard methods.

Fig 3. Plate- III Herbal Face Mask Prepared From Various Plant Extract.
A-Extraction of Citrus Sinensis, B-Extraction of Citrus Limon, C-Extraction of Syzygium Aromaticum, D-Extraction of Cinnamonum Verum.

Among the various extract tested, Syzygium aromaticum exhibits the presence of alkaloid, flavonoid, Saponin and tannins in high content (PLATE IV C, Table-I) whereas glycoside and amino acid in low content. Cinnamonum verum shows the presence of Saponin and terpenoids in moderately whereas phenols, tannins, steroids, tannins, glycoside in minimal amount (PLATE IV D, Table-I).

Fig 4. Plate- IV Phytochemical Analysis Of Various Plant Extract.
A-Phytochemical Analysis of Citrus Sinensis,
B-Phytochemical Analysis of Citrus Limon,
C-Phytochemical Analysis of Syziygium Aromaticum,
D-Phytochemical Analysis of Cinnamonum Verum.

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Also Citrus sinensis extract exhibits the presence of alkaloids, terpenoids and amino acid whereas the content of flavonoid, phenol and glycoside in minimal level (PLATE IV A, Table-I).

Citrus limon shows the presence of terpenoids and tannins in moderately whereas flavonoid, saponins, phenol and amino acid in low level. The test results were given the plate (PLATE IV B, Table-I).

Table 1. Preliminary Phytochemical Analysis of Selected Plant Extract

S.No	Phytochemcal Test	Syzygium Aromaticum	Cinnamonum Verum	Citrus Sinensis	Citrus Limon
1.	Alkaloids	++	-	++	-
2.	Flavonoids	+++	-	+	+
3.	Saponin	+++	++	-	+
4.	Phenols	-	+	+	+
5.	Terpenoid	+	++	+++	++
6.	Tannins	++	+	-	++
7.	Steroids	-	+	-	-
8.	Glycosides	+	+	+	-
9.	Amino Acid And Protein	+	-	++	+

*+++ indicates presence in high amount;
* ++ indicates in moderate amount;
+ indicates minimal amount;
*- indicates absence

Among the various extracts tested, Syzygium aromaticum extract exhibits higher content of phyto chemicals (Table-I).

The major pharmacological activities of Syzygium aromaticum are anti-microbial, anti-inflammatory, anesthetic, analgesic, anti-oxidant and anti-cancer activity of Syzygium aromaticum may be due to the presence of such phytochemicals groups mentioned in the present study.

Sensory characters are one of the components that determine the textile product. The fabric quality perception cannot prescient from sensory, hedonic, and comfort characteristics.

Therefore sensory analyses largely used in agro food field can have increasing and interesting application applied sector as a valid instrument in quality control, new product research and territorial marketing applications.

Today more over in the view point of a sustainable development we aim at an economic growth that not become natural environment but also feeds on territorial culture by the characteristics and exploitation of typical local people.

The interaction between agricultural resources and textile entrepreneurial world. The sensory evaluation of the present study on the various herbal face masks were tabulated in Table – II. It is considered to determine the quality characters like colour, odour, flavour and the degree of compliance with consumer habits.

Sensory characters like colour, odour and flavour in Citrus sinensis, Citrus Limon, Syzygium aromaticum and Cinnamonum verum. The evaluation reveals the colour quality was found to be Syzygium aromaticum (9) when compared with Citrus sinensis, Citrus Limon and Cinnamonum verum.

The odour and flavour of Cinnamonum verum was found to be higher (8) then in Citrus sinensis and Citrus Limon. The overall acceptability was found to be high in Syzygium aromaticum. However Syzygium aromaticum has acceptability of 8.6 out of 10 which also consider as a better choice for most of volunteers.

Table 2. Sensory Evaluation of Various Herbal Finished Face Masks.

S.No	Herbal Mask	Colour (10)	Odour (10)	Flavour (10)	Overall Acceptability (10)
1.	Citrus Sinensis	7	6	6	6.3
2.	Citrus Limon	8	7	7	7.3
3.	Syzygium Aromaticum	9	8	9	8.6
4.	Cinnamonum Verum	9	8	8	8.3

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V. CONCLUSION

In now a day world the use herbal masks are very much important and protects from corona virus and other viral and bacterial infections. This herbal mask will be very much useful to the public during this pandemic time.

Using these herbal masks will be a good protective and will help in lessen the spreading of corona virus. A good material of fabric is taken for preparation of herbal masks and thus the side effects will be lessened than using the normal masks, normal masks which contain chemical activities may harm the outer skin so using the herbal masks will be very much useful.

Also chemical less herbal masks are very much good for the skin and it will be good to use and prevents corona than the normal masks and it was prepared in a very hygienic and clean method. Using these herbal masks can give a good vibe because of its good odour and the fabric is also very comfortable to use.

The masks results in positive and have a thought of developing the research in future for commercial purpose.

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REFERENCE

[1] Mucha H., D. Hoter and M. Swerev. (2002). Antimicrobial Finishes and Modifications. Melliand International, 8, 148-151.

[2] Edward Menezes and Mrinal Choudhari. (2011). Pretreatment of Textiles prior to Dyeing. Edited by Prof. Peter Hauser. Textile Dyeing, 222-240.

[3] Chitra Chowdhary and Prof. Meena Gupta. (2013). Textile Chemical Processing. Cresent Publishing Corporation, pp. 235-249. (Book).

[4] Machado T.B., Pinto A.V., Pinto M.C.F.R., Leal I.C.R., Silva M.G., Amaral A.C.F., Kuster R.M., and Netto DosSantos K.R. (2003). In vitro activity of Brazilian Medicinal Plants, Naturally Occurring Napthoquinones and their Analogues, against Methicillin-Resistant Staphylococcus aureus. International Journal of Antimicrobiology. 21(2). 279-284.

[5] Cowan M.M. (1999). Plant Products as Antimicrobial Agents. Clin.Microbiol. Rev. (12)4. Pp.564-82.

[6] Sasidharan S., Y. Chen, D. Saravanan, K. M. Sundram, and L. Yoga Latha. (2010). Extraction, Isolation and Characterization of Bioactive Compounds from Plants' Extracts. Afr J Tradit Complement Altern Med. 2011; 8(1): 1–10.

[7] Diana Santos Morais, Rui Miranda Guedes, and Maria Ascensao Lopes. (2016). Antimicrobial Approaches for Textiles: From Research to Market. Materials (Basel). 9(6): pp.498.

[8] Banu A., Sathyanarayana B.C., Chattannavar. (2012). G. Efficacy of fresh Aloe Vera Gel against Multi-Drug Resistant Bacteria in Infected Leg Ulcers. Australasian Medical Journal, 5(6), 305-309.

[9] Shalini G and Anitha D. (2016). A Review: Antimicrobial Property of Textiles. International Journal of Science and Research. Volume 5(10), pp.766-768.

[10] Mohammad Reza Akhoondinasab, Motahhare Akhoondinasab, Mohsen Saberi. (2013). Comparison of Healing Effect of Aloe Vera Extract and Silver Sulfadiazine in Burn Injuries in Experimental Rat Model. Aloe vera in Burns. pp.30.

[11] Thilagavathi G., Bala K., and Kannaian T. (2007). Micro encapsulation of Herbal Extracts for Microbial Resistance in Health Care Textiles. IJFTR 2: 351- 354.

[12] EA, Gaulding Diroll BT, Goodwin ED, Vrtis ZJ, Kagan CR, Murray CB (2015) Deposition of wafer-scale single-component and binary Nano crystal super lattice thin films via dip-coating. Adv Mater 27(18): 2846–2851

[13] Dey M, Doumenc F, Guerrier B (2016) Numerical simulation of dip-coating in the evaporative regime. Eur Phys J E 39(2):19

[14] Buchanan, Rita. (1999) A Weaver's Garden: Growing Plants for Natural Dyes and Fibers. Dover Edward. Lesch, Alma. Vegetable Dyeing. Watson-Guptill Publications. (1970)

[15] S. Rengasamy, E. Fisher and R. E. Shaffer, (2010) Evaluation of the Survivability of MS2 viral aerosols deposited on altering face piece respirator samples incorporating antimicrobial Technologies, Am. J. Infect. Control, 38,

[16] Bhowmik D, Kumar KPS, Yadav A, Srivastava S, Paswan S, Dutta AS. (2012) Recent trends in 2012 Indian Traditional herbs Syzygium Aromaticum

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and its health Benefits. J Pharmacogn Phytochem; 1(1): 13-23.

[17] Morton, J. (1987) Orange. P. 134–142. In: Fruits of warm climates. Julia F. Morton, Miam C. R. Zheng, S. Li, C. Ye, X. Li, C. Zhang and X. Yu, (2016) Particulate respirators functionalized with silver nanoparticles showed excellent real-time antimicrobial effects against pathogens, Environ. Sci Technol, 50, 7144 —7151i, FL.

[18] Chan K. H., Yuen K.-Y. COVID-19 epidemic: disentangling the re-emerging controversy about medical facemasks from an epidemio logical perspective. International Journal of Epidemiology. 2020 doi: 10.1093/ije/dyaa044.

[19] Harborne, J. B. (1973). Phytochemical methods: A guide to modern techniques of plant analysis. Chapman and Hall Ltd, London; Pp. 279.

[20] Trease GE, Evans MD (1989). A text book of Pharmacognosy, 13th Edn. Baillier, Tindal and Caussel, London. Pp. 144 -148.

[21] Liang, Y.Y., Lin, X., Liang, M., Brunicardi, F.C., ten Dijke, P., Chen, Z., Choi, K.W., Feng, X.H. (2003). J. Biol. Chem. 278(29).

[22] Chow, TT. (2010). A review on photovoltaic/ thermal hybrid solar technology. Applied Energy, 87, 365–379.