IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 8, June 2025
Impact Factor: 7.67

Formulation and Evaluation of Watermelon Wax

Supriya Mhamane[1], Ganesh Gajeli[2], Divya Birajdar[3], Vaishnavi Karjkhede[4]
M. Pharm (Pharmaceutical Quality Assurance)[1,3,4]
Professor, M. Pharm, PhD.[2]
D. S. T. S. Mandal's College of Pharmacy, Solapur.
Punyashlok Ahilyadevi Holkar Solapur University, Solapur. Solapur, Maharashtra, India
supriyamhamane99@gmail.com

Abstract: *Citrullus lanatus, which is also known as watermelon, is a member of the Cucurbitaceae family. Hydration, antioxidant qualities, anti-inflammatory effects, cardiovascular health, anti-cancer characteristics, digestive health, and skin health are some of the health advantages of watermelon. Wax is used to soften the skin and remove undesirable hair. Wax is made from honey, paraffin wax, beeswax, and aloe vera. The most widely used wax is honey. However, it takes more time, money, and effort to prepare; that's why watermelon wax is ready. Tests were conducted for organoleptic evaluation, pH, viscosity, spreadability, solubility, irritancy, washability, and hair removal. The results of all the tests came within the range. That's why we can prefer the use of watermelon wax*

Keywords: Watermelon, wax, evaporation, hair remova

I. INTRODUCTION

Watermelon is primarily water, so it can be a good choice for daily water intake. Its water content also means that it has a low-calorie density, meaning that it has very few calories for its total weight. Eating foods with low calorie densities, like watermelon, may help you manage your weight by keeping you feeling fuller for longer. Normal organ function, body temperature regulation, nutrient delivery to cells, and alertness are just a few of the bodily processes that depend on adequate hydration. [1]

Vitamins A and C, potassium, and magnesium are among the many nutrients found in watermelon. It has a comparatively low-calorie count.

One cup (152 grams) of raw, chopped watermelon contains the following nutrients:

46 calories per day
11.5 grams of carbohydrate
0.6 grams of fibre
9.4 mg of sugar
The amount of protein: 0.9 grams
0.2 grams of fat
5% of the daily value (DV) of vitamin A
14% of the DV for vitamin C
Potassium: 4% of the DV
4% of the DV is magnesium [2,3]

Citrulline, an amino acid that may enhance exercise performance, is also abundant in watermelon. Additionally, watermelon and other foods contain antioxidants including vitamin C, carotenoids, lycopene, and cucurbitacin E, all of which are good for your health. These substances aid in the fight against free radicals, which are unstable chemicals that can harm your cells if they build up in your body. Diabetes, heart disease, and cancer can develop as a result of this damage over time [4]

Honey, aloe vera, beeswax, and paraffin wax are the products that are available in the market; honey wax is the most commonly used. The aforementioned products require more time and money to prepare, so watermelon wax was prepared by taking the watery content of the rind part of watermelon and was evaluated. Waxing is an epilation method

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 5, Issue 8, June 2025 Impact Factor: 7.67

that involves applying warm or cold wax onto hair bearing skin and quickly stripping off the hardened wax and embedded hairs [5,6]

II. MATERIALS AND METHOD

Materials: Watermelon.

Apparatus and equipment: Knife, grater, mixer grinder, strainer, filter paper, refrigerator, water bath, pH meter, Brookfield viscometer, glass slides, weighing balance, stopwatch, scale and wax strips.

Method: It involves following steps-

1. Size reduction and separation: Using a knife, cut the watermelon fruit into small pieces. Then, use a grater to minimize the size of the rind. Pulp should be ground in a mixer grinder. Then used the sieve to separate the water from the pulp and rind. [7]
2. Evaporation: After a significant amount of water has evaporated from the juice to create a semisolid mass, filter the juice and place it back on the water bath to continue evaporating. [8]
3. Evaluation: Evaluation of the organoleptic properties (colour, texture, odour, and appearance), chemical tests, pH, viscosity, spreadability, solubility, irritancy, washability and hair removal. [9,10]

Evaluation of the organoleptic properties:

Organoleptic evaluation refers to the use of sense organs in the study of drugs. It refers to analytical techniques including colour, taste, size, form, fragrance, and unique characteristics like texture, touch, and so forth. Evidently, the plant or extract is so distinctive at first glance that it tends to recognise itself. Assessing watermelon's sensory qualities through sight, smell, taste, and touch is known as organoleptic evaluation. In this process, the sample is usually prepared, presented to a panel of tasters, and their subjective opinions regarding characteristics such as colour, texture, sweetness, and overall flavour are then gathered.

Procedure:

1. Sample Preparation:

Picked watermelons that are ripe. Watermelons should be cleaned and peeled.

Slice the meat into cubes or tiny, bite-sized pieces. The samples are prepared aseptically in hygienic containers.

2. Panel Selection and Training: Depending on the evaluation's goal, assembled a panel of tasters who may or may not be trained. Given the panelists background knowledge about the qualities to be evaluated.
3. Presentation and Testing: Sent the samples to the panel so they can assess each one in a controlled setting (a quiet room, for example). To help the panelists cleared their palates in between samples, supplied them with plain water. The samples at the right temperature (e.g., room temperature or chilled) kept for the best sensory experience.
4. Sensory Assessment:

Color: Assessed the brilliance and homogeneity of the watermelon flesh.

Odor: Assessed the smell of watermelon.

Texture: Taken note of the sample's overall mouthfeel, hardness, and crispness.

5. Data Collection: Documented the panel's subjective evaluations using a rating scale. Compiled the information on each quality and general approval.
6. Data Analysis: Analyzed the data collected from the panel to discover trends and significant changes in sensory qualities.
7. Reporting and Interpretation: Summarized the findings and reported the sensory profile of the watermelon.

Chemical Tests:

A number of chemical assays are used in phytochemical screening to identify and describe chemicals produced from plants. These tests might be quantitative (finding the amount) or qualitative (finding presence or absence). To detect the presence of particular phytochemicals, such as alkaloids, flavonoids, tannins, saponins, and phenols, common

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 8, June 2025
Impact Factor: 7.67

techniques include extracting plant material, carrying out particular chemical reactions, and monitoring colour changes or precipitate formation.

Chemical Qualitative Tests:

Alkaloids:

Mayer's Reagent Test: Mixed the extract with a few drops of potassium mercuric iodide, also known as Mayer's reagent. A yellowish-white precipitate suggests the presence of alkaloids.

Wagner's Test: Used the iodine-potassium iodide solution, often known as Wagner's reagent, to conduct the test. Alkaloids are indicated by a brown-red precipitate.

Flavonoids:

Shinoda Test: Mixed an alcoholic extract with strong HCl and a tiny bit of magnesium ribbon. Flavonoids were indicated by a pink or red.

Ferric Chloride Test: To test for ferric chloride, mixed the extract with a few drops of a neutral ferric chloride solution. Flavonoids were indicated by a shift in colour, such as from yellow to green.

Tannins:

Ferric Chloride Test: Added a few drops of ferric chloride solution to the extract; a bluish-green or black colour indicates the presence of tannins.

Lead Acetate Test: Added a few drops of lead sub-acetate solution to the extract; a gelatinous precipitate indicates tannins.

Saponins:

Foam Test: Diluted the extract with water and shake vigorously; a stable foam formation indicates saponins.

Lead Acetate Test: Added lead acetate solution to the extract; a white precipitate indicates saponins.

Carbohydrates:

Molisch's Test: The Molisch's test, which measures carbohydrates, involves adding concentrated sulphuric acid to the extract after adding Molisch's reagent (alpha-naphthol solution). Carbohydrates were indicated by a violet ring at the interface.

Acetic anhydride and concentrated sulphuric acid were added to the extract in order to test for terpenoids (such as the Libermann-Burchard test). Terpenoids are indicated by a reddish-brown.

pH:

1. Calibration: Turned on the pH meter and let it warm up. After rinsing it with distilled water, dried the pH electrode. Adjusted the meter to match the known pH value after dipping the electrode into a buffer solution with a pH of 7.0. To do a two-point calibration, rinsed the electrode once again and submerged it in a second buffer solution (such as pH 4.0 or pH 10.0). To match the second buffer's known pH value, adjusted the meter's slope control.

2. Measurement: Used distilled water to thoroughly rinse the electrode, then dried.

Placed the electrode in the sample solution to be measured. Allowed the reading to stabilize, which may take a minute or two. Noted the pH reading that appears on the meter.

3. Cleaning and Storage: Used distilled water to rinse and dry the electrode.

Some electrodes may need to be kept wet, so checked the meter's handbook for advice on how to maintain them properly.

Viscosity:

Procedure:

1. Get the Sample Ready: Sure, that the sample is at a known and constant temperature. Semi-solid was prepared in accordance with the applicable test technique.

2. Select Spindle and Speed: Selected the suitable spindle based on the estimated viscosity of the sample. Taking the viscosity range into account, chosen the right speed.

Used a smaller spindle and slower speed for samples with high viscosity, or changed the spindle and speed until the torque percentage reading falls within the suggested range (20–80 on the dial, for example).

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 8, June 2025
Impact Factor: 7.67

3. Submerge the Spindle: Transferred the sample into an appropriate container or beaker. To reduce air bubbles, tilt the beaker as pour. Spindle were submerged to the proper level, typically indicated on the spindle before submerging it in the sample. Tilted the spindle slightly when submerging to avoid air trapping.
4. Initiate and Observe: Turned on the viscometer motor. Await the stabilization of the reading, which normally takes 30 to 45 seconds. Ensured the spindle were centered in the sample.
5. Note and Compute: Noted the digital or dial reading (e.g., viscosity or torque percentage in centipoise). Used the relevant factor for the selected spindle and speed to convert the reading to viscosity units (such as centipoise or mPa.s).
Spreadability:
1. Set up: Sandwiched the sample (i.e. wax) between two glass plates.
2. Uniform Film: To produce a uniform film of the sample, applied a certain weight or pressure to the top plate for a predetermined amount of time.
3. Measurement: After removing the top plate, measured the diameter of the sample's spread or the amount of time it takes for the top plate to travel a certain distance when subjected to a given force.
4. Calculation: Used a formula that considers the diameter, weight and time to determine the spreadability.
Solubility:
1. Prepared the solute and solvent: Get the solvent (such as water, alcohol, or chloroform) and the solute (wax). Because contaminants might impair solubility, be sure the solvent is dry and clean.
2. Filled the solvent with the solute: Put a tiny quantity of the solute such as a few drops of liquid or the tip of a spatula into a sterile test tube that also contains the solvent.
It may be necessary to create the gas and measured its solubility.
3. Watch the mixture: Kept an eye out for any changes, such as the solute dissolving and turning into a transparent solution or staying as a solid or droplet.
The solute is deemed soluble if it dissolves. The solute is deemed insoluble if it doesn't dissolve.
4. Repeat if required: Added more solute until it is still undissolved if the first quantity is not enough to reach saturation. This aids in figuring out how much solute can dissolve in the solvent at a specific temperature.
5. Note the outcomes: Noted if the solute dissolves or does not dissolve in the specified solvent. Noted the solute's concentration in the saturated solution for quantitative assays.
Irritancy: Small amount of wax is applied on specific part of skin and for 5 minutes irritancy is observed.
Washability: Small amount of wax is applied on specific part of skin and washed off after 5 minutes.
Hair removal: Warm the wax to a comfortable temperature. Put a thin coating on the skin. Use a paper or cloth strip to remove. Apply a calming lotion or oil afterward.

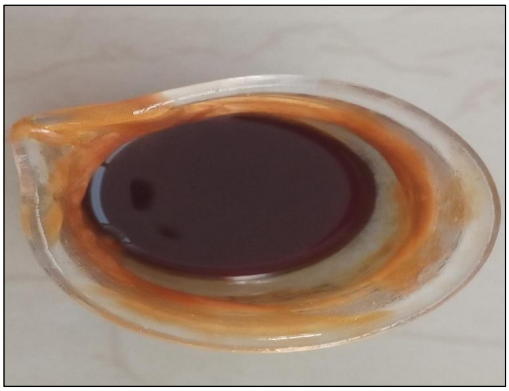

Figure 1: Watermelon wax

DOI: 10.48175/IJARSCT-28158

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 8, June 2025
Impact Factor: 7.67

III. RESULTS

Table 1: Organoleptic evaluation

Sr. No.	Parameter	Observation
1	Appearance	Semisolid
2	Color	Brown
3	Odor	Sweet
4	Texture	Fine and smooth

Table 2: Chemical tests:

Test	Observation
Alkaloid, Carbohydrate, Reducing sugar, Cardiac glycosides, Proteins and amino acids, Flavonoids, Phenolic compounds, Tannins, Phytosterols, Resins, Fixed oil and fats	Present
Saponin, Triterpenoids, Anthraquinone, Carboxylic acids, Gums and mucilage	Absent

Table 3: Evaluation

Parameters		
	Watermelon wax	Marketed Honey wax
pH	5.96	3.93
Viscosity	813.33	1233.33
Spreadability	5 gm.cm/sec	4 gm.cm/sec
Solubility	Insoluble in water, chloroform and alcohol	Insoluble in water
Particle size	5.53	4.3
Irritancy	No irritancy	No irritancy
Washability	Easy to wash	Difficult to wash
Hair removal	Good	
Permeation and diffusion study	Good	

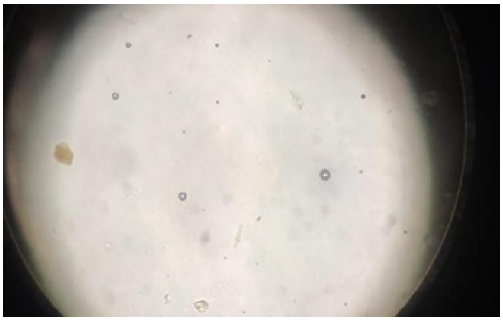

Figure 2: Particle size of watermelon wax

DOI: 10.48175/IJARSCT-28158

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 8, June 2025
Impact Factor: 7.67

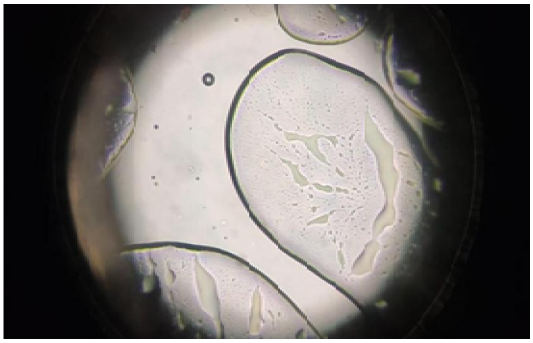

Figure 3: Particle size of marketed honey wax

Table 4: Permeation and diffusion study

Sr. No.	Time	Watermelon wax	Marketed honey wax
1	0	0	0
2	1	0.089808917	0.091920885
3	2	0.213739763	0.184847469
4	3	0.340400364	0.346161582
5	4	0.475250227	0.495407308
6	5	0.618289354	0.697955079

Graph 1: Permeation and diffusion study

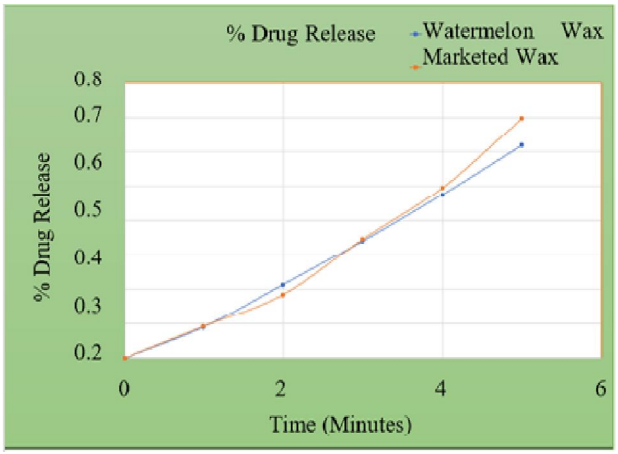

Table 5: Cost for 600gm wax

Wax	Watermelon wax	Marketed honey wax
Cost	Rs. 60	Rs. 110

Outcomes:

1. Agriculture: There is a sizable market for watermelon growers, who can also profit from the worst watermelon, higher revenue, and unseasonal benefits. They will also receive a fixed income.
2. Animal husbandry: Preserving honey and wax.

DOI: 10.48175/IJARSCT-28158

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 5, Issue 8, June 2025 Impact Factor: 7.67

3. The juice center's best trash will be used to generate revenue and lessen the effort required to dispose of waste.
4. Economic: Compared to honey wax, it is more cost-effective.
5. Wax production company: Watermelon is readily available, and it requires less energy, time, effort, people, and money than honey wax.
6. Control methods are simple.

IV. DISCUSSION

Watermelon wax is a semisolid, fine, brown wax with a sweet, jaggedy scent. Wax has a slightly acidic pH, is less viscous, and is more absorbent and spreadable. There was no oedema or irritation when this wax was put to the skin, and because it dissolves in water, washing it is simple. Just like honey wax, watermelon wax uses a strip to remove hairs from the skin.

V. CONCLUSION

The watermelon's rind was used to make watermelon wax by simply concentrating its aqueous content. Organoleptic characteristics, pH, viscosity, spreadability, solubility, particle size, irritancy, washability, hair removal, and permeation and diffusion studies were all assessed for watermelon wax, and the results were significantly better than those of commercially available honey wax.

ACKNOWLEDGMENT

“Ambition is the path to success. Persistence is the vehicle you arrive in”
Today at the end of my research work, I heartily remember God, my family, my teachers and my friends.
It gives me profound pleasure to express my deep sense of gratitude to my esteemed guide Dr. G. B. Gajeli, who had inevitably support me in all complications and difficulties incurred during completion of my research work. He has been an incredible mentor and role model for me, and I am so grateful for his enlightening knowledge. His simplicity, meticulous guidance and provision of fearless work environment cherished in all works of my life.
With my profound gratitude, I would like to express my respect to Dr. M. S. Kalshetti, I/C Principal, D.S.T.S. Mandal’s College of Pharmacy, Solapur for his support, advice and for providing all the facilities needed to complete my dissertation work and post-graduation.
I am thankful to Mr. M. V. Potdar and Miss Rupali Upase, for his timely assistant in the lab.
I express my deepest thanks to M. Pharm. Team and special thanks to M. Pharm friends for constant support, willing help, and co-operation during my post-graduation.
I would like to express my love and gratitude to my father Mr. Shivanand Vitthal Mhamane, my mother Mrs. Drakshayani Shivanand Mhamane, and my brother Swapnil Shivanand Mhamane from my heart for their blessing without which I would not have been achieved this task.
Ms. Supriya Shivanand Mhamane

REFERENCES

[1]. Supriya Mhamane, Revati Kadam. Herbal face pack formulation from Citrullus lanatus. Indian J Pharm Drug Studies. 2024; 3(2):73-76.
[2]. Ismael, R. N., Mustafa, Y. F., Al-Qazaz, H. K. Citrullus lanatus, a Potential Source of Medicinal Products: A Review. Journal of Medicinal and Chemical Sciences, 2022; 5(4): 607-618.
[3]. Manivannan A, Lee ES, Han K, Lee HE, Kim DS. Versatile Nutraceutical Potentials of Watermelon. Molecules. 2020 Nov 11;25(22):5258.
[4]. Purnamawati S, Indrastuti N, Danarti R, Saefudin T. The Role of Moisturizers in Addressing Various Kinds of Dermatitis: A Review. Clin Med Res. 2017 Dec;15(3- 4):75-87.
[5]. Kim Chin, RD, The Top Health Benefits of Watermelon, Nutrition — Written by Kerri-Ann Jennings, MS, RD and Fatima Hallal, APD — Updated on January 25, 2024.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 8, June 2025
Impact Factor: 7.67

[6]. Prof. Farhan J Ahmad et. al., HAIR REMOVAL PRODUCTS, Pharmaceutical Sciences Cosmetics, 2017, 1-22.
[7]. https://www.researchgate.net/publication/357413844_MEANS_OF_MECHANIZATION_AND_TECHNOLOGIES_FOR_MELONS_PROCESSING_Monograph
[8]. Whiski, Evaporation Process, Food Science, science direct, Second edition, 2014.
[9]. Yashraj Narake et.al., FORMULATION AND EVALUATION HAIR REMOVAL CREAM, International Journal of Novel Research and Development, 2024, Volume 9, Issue 7.
[10]. Mehul Jain, IPQC & FPQC tests for creams, Slideshare scibd, 18 Nov 2021.

BIOGRAPHY

I am the student of Second Year M. Pharmacy. I have huge interest in doing research. Research means finding new from existing, so I am trying to explore and get solution to the limitations in my previous findings. I completed and published 5 research works in Final Year B. Pharmacy in the journal Indian Journal of Pharmacy and Drug Studies. I reviewed more than 10 research articles for various journals like Acta pharmaceuticals, Biosciences Biotechnology Research Asia. I participated in Aavishkar poster presentation competion in 2023 upto zonal level, 2024 upto university level and 2025 upto state level.