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FORMULATION AND STANDARDIZATION OF GREEN MUSKMELON JELLY

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ABSTRACT

Objective: This study aimed to compare the safety profile of oral terbinafine and fluconazole in patients with This jelly aims to provide a sustainable substitute for traditional sugar-based jellies by utilizingjaggery powder as a natural sweetener. Ripe green muskmelons are juiced and blended with the powder, then heated and set agents are added to get the desired consistency. Taste, color, texture, and aroma are some of the sensory characteristics that will be compared to traditional sugar-based jellies to determine how well-liked the green muskmelon jelly with jaggery powder is. Additionally, the nutritional profile and possible health benefits of using jaggery powder as a sweetener will be evaluated. Lastly, this research advances the development of healthier and environmentally friendly jelly options while encouraging the use of jaggery powder.

The study investigates the creation and assessment of a novel jelly that combines the distinct flavors and nutritional advantages of muskmelon (Cucumis melo) and jaggery (unrefined canesugar). The formulation method includes achieving the desired consistency, taste, and shelf stability by adjusting the amounts of jaggery, pectin, and citric acid in muskmelon puree. Measurements of physical and chemical characteristics, such as pH, total soluble solids, and viscosity, were made in addition to a trained panel's evaluation of sensory characteristics. Because of the natural components of jaggery, the finished product had a balanced sweetness and a refreshing fruity flavor with enhanced mineral content. . Antioxidant activity assays revealed a significant retention of muskmelon's bioactive compounds. The developed jelly wasalso subjected to microbiological analysis to ensure safety and extended shelf life. This research highlights the potential of integrating traditional and modern ingredients to create functional foods that cater to contemporary health trends and consumer preferences. The muskmelon jaggery jelly offers a promising alternative to conventional fruit jellies, aligning with the growing demand for nutritious and natural food products.

INTRODUCTION

Originally created using fruit juice and sugar, jelly is a well-liked and adaptable delicacy that now comes in a wide range of flavors and components. One interesting take puts a pleasant spin on the traditional recipe by utilizing green muskmelon and jaggery as the main ingredients. "Nut meg" melons are another name for muskmelon. The term comes from the Roman practiceof enhancing the fruit's flavor by dusting it with powdered musk. The word "melon" is new, coming from the Latin Melope, which means "apple-shaped melon," and the word "musk," which comes from Persian literature, means "Perfume." (Wan Shafiin et al., 2020; Wan Nur Suzani Sazleen Wan). According to Shivapriya Manchali et al. (2020), muskmelon is a rich plant source of vital minerals. It has good quantities of boron, calcium, potassium, selenium, and zinc, all of which are crucial for regular physiology and an active immune system. The smooth, slightly ribbed skin and sweet, juicy meat of this melon type mix faint citrus and floralflavors with a modest sweetness.

Green muskmelon, which is native to Southeast Asia, has become increasingly popular around the world and is now a staple in many diets and culinary customs because of its diverse flavor and health advantages. The vivid color and refreshing taste of green muskmelon blends well with the deep, caramel-like sweetness of jaggery. Vitamin A, vitamin C, potassium, and dietary fiber are just a few of the important vitamins and minerals that are abundant in this melon species. These nutrients enhance immune system strength, skin health, and digestive health, among other aspects of general health and wellbeing. In addition, its natural sweetness and low calorie content make it a healthy snack choice and an excellent tool for managing weight. Additionally, studies indicate that flavonoids and carotenoids—two phytochemicals with antioxidant qualities—are present in green muskmelon. According to The World's Healthiest Foods, these substances assist the body in eliminating free radicals, which may lower the chance of developing chronic illnesses including heart disease and some types of cancer.

For generations, jaggery—a traditional sweetener made from sugarcane or palm sap—has been a mainstay in many civilizations. Jaggery is made by heating sugarcane juice or palm sap until it solidifies. It is recognized for its inherent sweetness and unique caramel-like flavor. American Jaggery contains minerals and vitamins in addition to glucose, fructose (invert sugars), and sucrose; refined white sugar only contains sucrose (Ghosh et al. 1998).More nutrients, such as minerals like iron, potassium, and calcium as well as trace levels of vitamins B1, B2, B3, and B6, are retained in this unrefined sugar compared to refined sugar. In addition to creating various shapes and forms of jaggery, liquid, granular, and powdered formulations are currentlybeing produced to take the place of refined white sugar in baked goods, chocolates, candies, and drinks. In addition to producing jaggery in various shapes and forms, powdered, granular, and liquid formulations are being produced to take the place of refined white sugar in beverages, chocolates, confections, and baked goods (Baboo et al. 1988). Because of its high sucrose and glucose content, it is frequently used as a natural energy booster and as a treatment for digestive problems and respiratory diseases. Additionally, jaggery has a lower glycemic index than white sugar, which makes it a better sweetener for people who are watching their blood sugar levels. Jaggery has anti-allergy qualities that assist to control asthma-related issues and relieve stress. It also includes iron, which helps to prevent anemia (Singh et al. 2008). In addition to enhancing the fruit's inherent sweetness, this combination adds a subtle depth that will appeal to both conventional and daring palates. Chefs and home cooks alike have been experimenting with new flavors and sensations in recent years due to the increased interest in utilizing unusual ingredients in culinary techniques. This tendency is best illustrated by the combination of green muskmelon and jaggery in jelly, which offers a cool but satisfying dessert choice that satisfies contemporary palates while respecting long-standing culinary customs.

The amount of ingredients are used in making the product are shown in the below table1.

Table 1: Formulation of GREEN MUSKMELON JELLY

Ingredients	Sample 1	Sample 2	Sample 3
Musk melon pulp	50	55	60
Jaggery	45	40	35
Gelatin	5	5	5
Lemon juice	1 tablespoon	1table spoon	1 tablespoon
Salt	A pinch of salt	A pinch of salt	A pinch of salt

Procedure:

Pick up the green, well-ripened muskmelon.

Prepare Muskmelon: After removing the seeds, peel and chop the green muskmelon into chunks.

Boil Muskmelon and Jaggery: Add the water, chopped or grated jaggery, and chopped muskmelon to a saucepan. Bring to a boil over medium heat, stirring from time to time, until the jaggery dissolves completely and the muskmelon becomes mushy.

Blend: Let the mixture cool down a little. After that, transfer it to a food processor or blender and process until smooth. Strain the puree to get rid of any fibrous bits if desired.

Health benefits of muskmelon jelly:

Vitamins A and C are abundant in green muskmelon, such as honeydew, and are vital for healthy skin, eyesight, and immunity.

Iron, potassium, and other healthy minerals can be found in jaggery, a natural sweetener.

Green muskmelon and jaggery are both rich in antioxidants that assist the body fight oxidative stress, which lowers the risk of inflammation and chronic illnesses.

Because green muskmelon contains a lot of water, it keeps the body hydrated. Maintaining body functions and general health depend on this.

Due to its lack of processing and increased nutritional retention, jaggery is a better substitute for refined sugar.

Materials & Methods:

Green Muskmelon, Jaggery, Gelatin, Lemon Juice, Salt, Jelly Moulds or Containers. Equipments required: Saucepan, Blender or food processor, Strainer (if needed), Measuring cups and spoons, Whisk or spatula, Jelly moulds or containers.

Prepare Gelatin: Dissolve the gelatin powder in 1/4 cup water in a small bowl. After a few minutes, let it sit until it starts to get spongy. Combine Ingredients: To the muskmelon puree, add the dissolved gelatin, lemon juice, and a small amount of salt. Blend until all ingredients are properly blended.

Pour into Moulds: Transfer the mixture into preferred containers or jelly molds. Glass dishes, silicone molds, or even tiny cups can be used. Chill and Set: After the molds or containers are chilled for at least 4 hours, or until the jelly is fully set, remove from the refrigerator. If you want a harder texture, it's best to leave them overnight.

Serve: After the jelly solidifies, carefully remove it from the molds.

Physio-chemical Analysis:

Acidity Citric Acid Monohydrate:- To lay out the process for determining the acidity of the given fruit. The hydrolysis of the sample releases hydrogen ions from the solute. These hydrogen ions then react with the sodium hydroxide to raise the pH to 8.3, which is the neutralization end point indicated by the color shift from colorless to pink. The sodium hydroxide solution (0.1N) is made by dissolving 4 grams of NaOH in 1000 milliliters of distilled water and diluting with it. The phenolphthalein indicator (1%) is made by dissolving 1 g of phenolphthalein in 100 milliliters of distilled water (or) using a ready-made solution.

Procedure: Bring down the temperature of the sample to room temperature without thawing. Fill the burette with0.1 N-NaOH solution and note down the initial reading. Measure l g of sample. Take it in a clean conical flask. Dilute to 100 ml with distilled water. Add 2-3 drops phenolphthalein indicator solution. Titrate against the 0.1 N NaOH solution till the pink color persists for 30 seconds. Note down the final reading; take down the volume of 0.1 N NaOH consumed as V. Repeat the procedure for three trials. Obtain the average. Volume from three trials. Substitute the values in the formula and calculate the acidity.

Formula: (v1-v2) *c/s

V1-initial reading of burette

V2-final reading after the color changeC-critical acid equivalent (0.64)

S-weight of the sample

Brix: To determine the concentration of sugar in given sample using brix refractometer. Refractometer is the instrument works by the principle of light refraction. Light refraction is the "bending" effect that liquid has on light passing through it. As the concentration of dissolved sugars increases, the "bending" effect also increases. Using carefully aligned prisms and mirrors; the refractometer measures the refracted angle of light as it passes through the sample. This refracted angle equates to a sugar concentration in Degrees Brix ("Brix). One "Brix represents 1 gram of sugar in 100 grams of solution.

Procedure: Hand Refractometer OP. If the sample is frozen, thaw it to room temperature. Wipe the refractometer's prism with tissue paper. Adjust the refractometer's calibration according to SOP. Grind the necessary quantity of material with a mixer or mortar and pestle. Apply one ortwo droplets of sample to the prism. Close the daylight plates. Track the brix value. Clean the prism with distilled water.

Digital Packet Refractometer

If the sample is frozen, use those papers to clean the prism of tribemates and lower the temperature of the sample to the roost temperature. According to SOP, calibrate the refractometer. Using a mortar and pestle or mixer, grind the necessary amount of sample.

pH: The measurement of total hydrogen ion concentration is known as pH, and it is used to determine the pH of any given material. The hydrogen ions in the sample flow toward the glass electrode when the pH electrode is put into it, partially replacing the metal ions in the glass electrode. This ultimately generates the minuscule voltage that travels to the amplifier via the silver wire. The voltage data are converted into pH value by this amplifier. The pH will decrease as the concentration of hydrogen ions increases.

Procedure: The pH meter should be turned "ON" 20 minutes before use. Using tissue paper, wipe the electrode. According to the calibration SOP, calibrate the pH meter. Without thawing, lower the sample's temperature to room temperature. Using a mortar and pestle or blender, grind the necessary amount of sample. Fill the beaker with the contents. Next, place the electrode inside the specimen. A "Ready" notification will appear on the display after two to three minutes. Write down the pH level. Make the electrode clean. Using purified water, then dab it with a piece of tissue.

Proximate analysis:

Determining the Proximate Content

The proximate content—which comprises the water, ash, fat, protein, and crude fiber content—was measured using the AOAC method. A distinct method was employed to ascertain the overall amount of carbohydrates.

Moisture content: using a hot air oven to measure the moisture content of a food sample. A variety of techniques, including direct measurement, indirect measurement, and empirical measurement, are used to determine the water content or moisture content. When determining moisture content, a direct approach is typically employed, which involves first measuring the weight loss and then extracting moisture through listening. Finding the weight loss that occurs when a food sample is dried under particular conditions can be used to measure the moisture content.

Procedure: - Find the weight of a petri plate that is empty. Slice the samples thinly into three pieces. Then, put the samples in a petri plate, weigh them, and record the result. After that, putthe petri plate in a hot air oven set to 105°C for two hours. In a desiccator, cool the sample for five to ten minutes. Weigh the Petri plate and carry out the drying, cooling, and weighing steps once more. Take note of the variations between the constant weight and the consecutive weighing record. Method: (First weight) - (Final weight)/ (First weight) × 100 = Moisture Content%

Ash content:

Determination the amount of ash content: A particular cup, holding up to two grams of sample, was heated to 650°C for three hours in the furnace. After then, the ash was allowed to cool before being weighed. The ash content was calculated using the following formula: Ash content (%) Weight total: initial weight times 100%Weight of sample.

Fat content:

Determination the fat content:

Weighed to a maximum of two grams, the mashed kernel was then added to the timble. Timble was put inside the Soxhlet flask, and the fat content was extracted over the course of six hours. In this method, the reservoir is a fat flask with a known weight. The timble is then taken out, and the fat flask is poured with distilled petroleum ether and baked for an hour at a temperature between 103 and 105°C. After being chilled for about half an hour in a desiccator, the fat flask was weighed. Until a constant weight was reached, this process was repeated.

Fat content (%) was the formula used to calculate the fat content. Complete weight: whole number of grams sample weight.

Protein content:

Determination the amount of protein Samples of mashed maize kernels weighing two grams were introduced to the Kjeldahl flask. Ten grams of selenium and thirty milliliters of concentrated sulfuric acid (HSO4) were added. Subsequently, the flask was placed in an acidic chamber and boiled until the solution took on a distinctly green hue, destroying the sample. After letting the liquid cool, aqueduct is added to dilute it. After that, the liquid was transferred to a boiling flask and 120 milliliters of 30% NaOH solution were added to the top.

After that, distillation was continued until a distillate volume of 75 ml was obtained. After that, a milliliter of 0.5 N NaOH solution was used to titrate the distillate. The same procedures were used to complete the sample and the blank. The protein content was calculated using the formula below:

Protein content (%) = (b-a) x N x 0.014 x 5.95 x 100% Sample weight:10 .

Carbohydrate content: Using the difference approach, the total amount of carbohydrates wasdetermined by dividing 100% by the contents of water, protein, ash, and fat. Carbohydrate percentage (%) Completely (The content of water, protein, fat, and ash).

RESULTS AND DISCUSSIONS

Sensory evaluation: The sensory evaluation is a procedure that compares the three samples to the control to ascertain the taste, flavor, appearance, consistency, and general acceptability.

Table 2: Sensory evaluation

Sensory Attributes	Control	Sample 1	Sample 2	Sample 3
Color	9	8	9	8
Flavor	8	7	8	7
Consistency	9	8	9	8
Taste	8	7	9	8
Appearance	9	7	8	8
Overall acceptability	9	7	9	8

It is possible to compute the sample mean values and take into account the majority value of the sample while developing new products. Sample 2 may be chosen for additional processing based on the results of the sensory evaluation. The finished product can be identified through sensory assessment, which is followed by physiochemical analysis. in order to ascertain the nutritional value.

The taste attributes were rated very similar for two of the developed formulations. The texture of the product is slightly different and soft. Treatment 2 is finalized as it is good in taste and its texture when compared to treatment 1 and treatment 3. Treatment 1 is rejected due to its taste and appearance and Trail 3 is rejected as it is not satisfying the attributes compared to other 2 formulations.

Table 3: Proximate Analysis

The above table shows low ash content ensures purity. Optimal moisture levels maintain freshness, Minimal fat content for a lighter treat. Surprisingly the protein content supports a satisfying snack with minimum amount of carbohydrates.

Nutrition	Control	Sample
Moisture	60%	65%
Ash	2%	15%
Total solids	32%	42%
Fat	7%	9%
Protein	12%	13%
Carbohydrates	**18%**	**49%**

The table.4 shows brix with 8.9 value which is acceptable by all age groups. It is ensuring a richer flavor profile and texture. These measurements guarantee a higher quality product that stands out in taste and performance.

Table 4: Physico Chemical Analysis

Nutrition	Control	Sample
Brix	8.9	8.9
Acidity	0.19	0.19
pH	3.8	4.7

CONCLUSION

The lovely blend of natural sweetness and refreshing flavor is present in green muskmelon jelly. This jelly is a tasty and nutritious delicacy that embodies the flavor of fresh muskmelons, thanks to the addition of gelatin for texture and jaggery for sweetness. Green muskmelon and Jagger jelly promises a special mix of fruity sweetness and herbal undertones, making for a refreshing and unique flavor profile. This creative combination not only improves the classic jelly experience but also adds a delightful twist that will appeal to taste buds that are daring and looking for something new and unforgettable.

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