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Standardization of Gummies Incorporated with Rose Petal

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Abstract:- In the past few years, there has been a significant rise in the demand for edible flowers. Recently, there has been an increasing curiosity surrounding the positive impacts on health that certain secondary metabolites and other compounds present in flowers can have. These include carotenoids, phenolic compounds, vitamins C and E, saponins, and phytosterols. The rose flower is commonly used in the food, medicinal, and cosmetic industries. It is known for its rich nutritional content, including high levels of vitamin C, carotenoids, phenolic compounds, minerals, and essential oils. Rose value added products are packed with antioxidants and have a range of beneficial properties. Gelatin or agar-agar, sweeteners, flavorings, and colorings are combined to create gummy candy, a distinctive treat. Its malleable nature allows it to be shaped into a multitude of forms, making it a highly adaptable confectionery item with endless possibilities. The gummies were made with rose petal extract, palm sugar and gelatin. The objective of the study is to standardize rose petal gummies. The developed product is made with three varaition. Variation were made with two main ingrdient rose petal extract and palm sugar. Sensory analysis was done with 50 untrained panel members.Propotion of variation I (8:2), variation II (7:3), variation III (6:4). Variation I (8:2) has good organoleptic quality among the other and was accepted by the untrained panel members.

Keywords:- *Antioxidant Activity, Nutritional Content, Rosaceae Family, Phytochemical, Therapeutic Effects.*

I. INTRODUCTION

Flowers have always held significance in human life, whether it be through their direct or indirect influence. Serving as the sexual reproductive organs of plants, flowers have played a vital role in various aspects of human culture since ancient times. They have been utilized for ornamental purposes, decorations, medicinal uses (in fresh, distillate, decoction, and powdered forms), as sources of nutrients and foods (used fresh as garnishes, dried, in cocktails, canned with sugar), during religious ceremonies, in prayers to deities, in culinary creations, for essential oils, and in beauty products. Flowers have truly been a versatile and essential element in human life throughout history (Reddy *et al.*, 2015). In the past few years, there has been a significant rise in the demand for edible flowers. This surge in popularity can be linked to various factors, such as the widespread dissemination of information regarding their health benefits and bioactive properties (Fernandes *et al.*, 2019 and Lu *et al.*, *2016*). Recently, there has been an increasing curiosity surrounding the positive impacts on health that certain secondary metabolites and other compounds present in flowers can have. These include carotenoids, phenolic compounds, vitamins C and E, saponins, and phytosterols (Barros *et al.*, 2021).

For centuries, medical professionals have recognized the healing qualities of specific flowers. Flowers are unparalleled adornments to the natural world. The importance of flowers is assessed based on their potential health benefits, particularly in terms of how color, scent, and taste components impact antioxidant activity, the ability to eliminate reactive oxygen radicals, and potential cancer-fighting properties. Edible flowers are a great source of vitamins, proteins, essential oils, and antioxidants, particularly when eaten in their natural state or with minimal processing (Fernandes *et al.*, 2019). The rose is a stunning marvel of nature, often referred to as the "Queen of Flowers" for its exquisite beauty. Within the world of floriculture, the rose holds significant commercial importance as both cut roses and loose flowers, as well as in various value-added products. Its desirability remains high across the globe, with a year-round demand. The rose is classified within the Rosaceae family. Roses exhibit a variety of qualities that make them ideal for use as cut flowers, including their abundance of petals, gradual blooming process, long-lasting nature, and stunning array of colors. In addition, roses are known for their resilience, able to withstand the challenges posed by harsh weather conditions. (Ayci *et al.*, 2005). The rose flower is commonly used in the food, medicinal, and cosmetic industries. It is known for its rich nutritional content, including high levels of vitamin C, carotenoids, phenolic compounds, minerals, and essential oils. Rose petals have been enjoyed in various forms such as cakes, teas, and flavor extracts for centuries (Mabellini *et al.*, 2011).

Researchers have been dedicating more attention to studying the nutritional properties, pharmacological benefits, chemical composition, and methods of preparing edible species due to the rising demand for natural and healthy foods. Advanced techniques for extracting bioactive compounds from flowers are also being utilized to uncover their components, enabling the creation of functional ingredients for the food industry (Jacqueline *et al.*, 2020).

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Throughout history, flowers have been used not only for their medicinal properties but also for culinary purposes. In ancient Rome, various species of Roses were incorporated into the cooking of purees and omelets (Mlcek and Rop, 2011). The Mediterranean region is known as a significant hub for the cultivation and production of various types of Rosa damascene, specifically for the extraction of rose water and hibiscus. These botanical ingredients are essential for making rose jam (Zhao *et al., 2019*). Ancient Romans grew roses, violets, and borage for cooking, such as incorporating rose flowers into purees and omelets in ancient Rome, and using squash blossoms in Italian dishes (Melillo 1994). Rose value added products are packed with antioxidants and have a range of beneficial properties. They can act as an astringent to tighten and tone the skin, a tonic to invigorate the body, a mild laxative to aid digestion, and an antibacterial agent to fight off harmful bacteria. Additionally, they are used in the treatment of various ailments such as sore throat, enlarged tonsils, cardiac issues, eye diseases, and gallstones. Furthermore, these products have been found to have anti-HIV, antibacterial, and hypnotic effects (Agrawal and Kaur 2017).

Gelatin or agar-agar, sweeteners, flavorings, and colorings are combined to create gummy candy, a distinctive treat. Its malleable nature allows it to be shaped into a multitude of forms, making it a highly adaptable confectionery item with endless possibilities (Elizabeth La Bau 2012). In this study Gummies are incorporated with rose petal extract, the theraapeutic effects of rose conribute to the antifungal, antibacterial, anti-inflammatory, digestion, antioxidant etc. Which in turn makes the gummies more healthier when compared to gummies made with sucrose, dextrose and corn syrup.

➢ *Objective*

- To identify the phytochemical composition of rose petals
- To standardize rose petal gummies
- To evaluate the snesory attribute to rose petal gummies
- To analyse the Nutritive value of the Rose petal gummies

II. MATERIALS AND METHODS

A. Selection and Collection of Leaves

Rose petals are the soft and fragrant floral parts of the rose plant. They are made up of thin layers of petals, which can come in a variety of colors from light pink to dark red, depending on the type of rose. These petals contain different bioactive compounds that give them their scent and may offer health benefits. Rose petals are packed with antioxidants, such as flavonoids, phenolics, and vitamin C, which play a crucial role in fighting off oxidative stress, reducing inflammation, and shielding the body against chronic conditions like heart disease and cancer. Even though rose petals are not a primary source of macronutrients such as protein or carbohydrates, they do offer essential vitamins and minerals like vitamin C, vitamin A, and various B vitamins. Additionally, they contain dietary fiber, although in smaller quantities.

B. Processing of Fresh and Dried Petal

After a thorough examination, the specimen was closely analyzed for any indications of infection, spores, harm, color change, or deformity. Only the petals that were deemed intact were chosen, crushed, and sifted to extract the essence. The process of natural shade drying was employed as a practical method of preserving the aromatic properties of medicinal herbs while minimizing the loss of volatile components. As a result, the petals underwent shadow drying for approximately 5-6 days before being gathered, pulverized into a fine powder, and stored securely in an airtight vessel.

C. Development of Gummies Incorporated with Rose Petal Extract

Combine Rose petal extract and water in a saucepan. Add sugar and stir well. Heat the mixture over gentle heat, stirring continuously until the sugar is completely dissolved. In a tiny bowl, gently sprinkle the gelatin powder over a quarter cup of warm water. Allow it to rest for approximately 5 minutes to bloom. After the sugar has melted into the rose petal extract, introduce the bloomed gelatin to the saucepan. Stir consistently until the gelatin fully dissolves and the mixture achieves a smooth consistency. This process may require a few minutes. To enhance the flavor, squeeze in a touch of fresh lime juice. Mix thoroughly to blend the ingredients together. To make rose petal gummies, pour the mixture into bear shaped silicone molds. Place the molds in the refrigerator and allow the mixture to set for 2-3 hours, or until it becomes firm. Once the mixture has set, remove the gummies from the molds. Store the rose petal gummies in an airtight container in the refrigerator. These delicious treats should stay fresh for several days, although they are so tasty that they may not last that long.

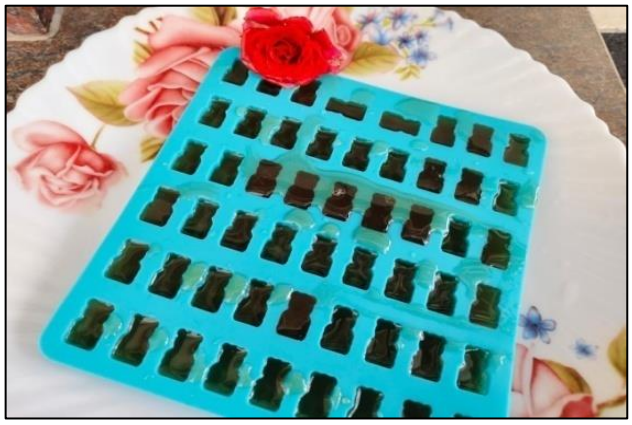

Fig 1: Rose Petal Gummies in Silicone Mold

D. Qualitative Phytochemical Analysis

Analysis was conducted to determine the presence of different phytochemicals in both fresh and dried Rose petals. Alkaloids, saponin, tannin, terpenoids, quinones, flavonoids, phenol, and steroids were examined using established methods and various solvents. The qualitative screening process for phytochemicals is outlined as follows:

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Table 1: Qualitative Phytochemical Analysis in Various Solvent Extract

Phytochemicals	Procedure	Observation
Alkaloids (Wagnertest)	2ml extract, 2 to 3dropsofFecl	Greenish to black color indicates the presence of alkaloids
Flavonoids (Alkalinereagenttest)	2mlextract+Few drops of NaOHsolution	Intense yellowcolor which become colorless onadditionof dilHcl
Phenol (Ferricchloridetest)	2mlextract+5%Fecl	Deep blue or green color Indicates presence of phenol
Saponins (Foamingtest)	2mlextract+6mldistilled H_2Oandshakevigorously	Staple foam indicates the presence of saponins
Tannins (Braymerstest)	2ml extract +AlcoholicFecl3	Blue or green colour indicates the presence of tannins
Terpenoids	1mlchloroform+2mlextract+fewdrops C.H_2SO_4	Reddish brown precipitate indicates presence of terpenoids
Quinone	2mlextract+con HCL	Yellow precipitate indicates The presence of quinone
Steroids (Salkowski test)	2mlextract +chloroform +H_2SO_4	Development of reddish Brown colour indicates the presence of steroids

E. Standardization of Rose Petal Gummies

Table 2: Standardization

Ingredient	Variation I	Variation II	Variation III
Rose petal extract	80	70	60
Palm sugar	20	30	40

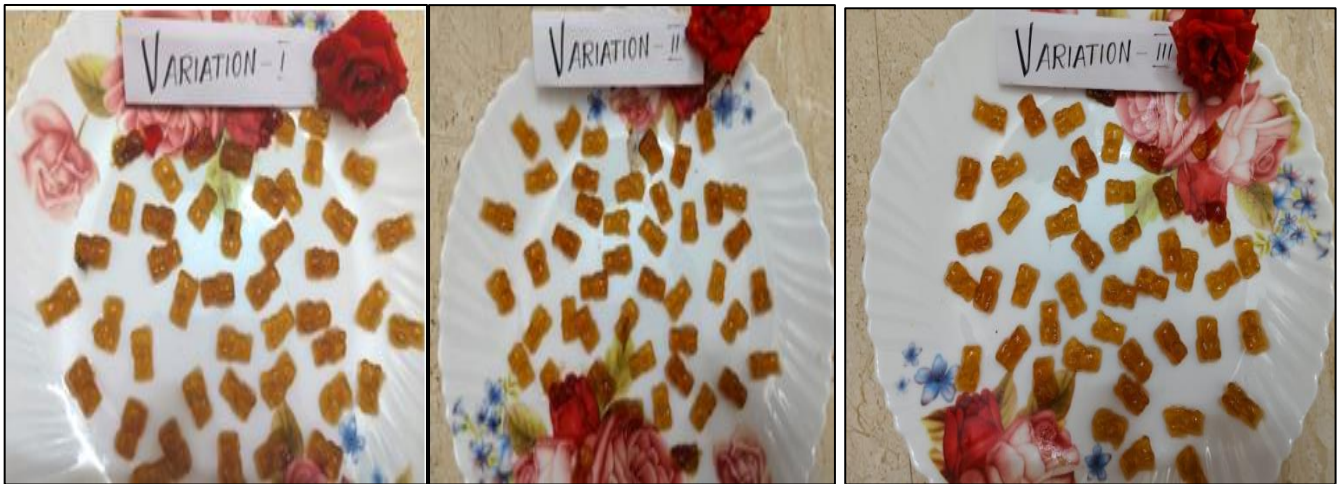
➢ *Sensory Analysis*

Sensory analysis of rose petal gummies wassubjected to organoleptic evaluation for its quality attributes like appearance, colour, texture, taste, Flavour and Overall acceptability using 5 point hedonic scale. Total of 50 untrained panel members were used in this study. The variation which was most acceptable among the recipes was selected.

Table 3: Sensory Arttributes of Rose Petal Gummies

Criteria	Variation I	Variation II	Variation III
COLOUR	4.16 ± 0.7	4.2 ± 0.6	4.2 ± 0.6
APPEARANCE	4.2± 0.6	4.16 ± 0.7	4.12 ± 0.5
FLAVOUR	4.2 ± 0.7	4 ± 0.7	4.16 ± 0.6
TEXTURE	4.0 ± 0.6	4.12 ± 0.7	4.36 ± 0.4
TASTE	4.4 ± 0.6	4.32 ± 0.8	4.32 ± 0.5
OVERALL AACEPTABILITY	**4.32 ± 0.6**	**4.28 ± 0.6**	**4.12 ± 0.5**

Table 3 shows the sensory attributes of Rose petal incorpoated gummy recipe. From the rseult it was found that organoleptic evaluation scores of sample, S1 is (4.32 ± 0.6), S2 (4.28 ± 0.6), S3 (4.12 ± 0.5). Hence S1 has higher level of accpetability



Variation I Varaitaion II Variation III

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III. RESULTS AND DISCUSSION

Table 4: Qualitative Phytochemical Analysis of Fresh and Dried Rose Petal in Various Solvents

Phytochemicals	Aqueous		Ethanol		Methanol		Acetone		Petroleum Ether		Chloroform	
	Fresh	Dried	Fresh	Dried	Fresh	Dried	Fresh	Dried	Fresh	Dried	Fresh	Dried
Alkaloids	-	-	+	+	+	+	+	-	-	+	-	-
Flavonoids	+	+	+	+	+	+	+	+	-	+	-	+
Phenols	+	+	+	+	+	+	+	+	-	-	+	+
Saponins	-	+	+	-	+	+	+	+	+	+	+	-
Tannins	+	+	+	+	+	+	+	+	-	+	-	+
Terpenoids	-	-	-	+	-	+	-	-	-	-	+	+
Quinones	-	-	-	+	-	-	-	+	+	+	-	-
Steroids	+	+	+	+	+	+	+	-	+	+	+	+

Table – 4 depicts the qualitative phytochemical analysis of fresh and dried Rose Petals with various solvent extract. Aqueous extract of fresh Rose petals reveals that it contains flavonoids, phenols, tannins and steroids while in dried Rose petals contains phytochemicals such as flavonoids, phenols, saponins, tannins and steroids except alkaloids, terpenoids and quinones.

Ethanol extract of fresh Petals contains all phytochemicals except terpenoids & quinones while in dried Petals contains all phytochemicals except saponins.

Methanol extract of fresh petals contain all phytochemicals except terpenoids & quinones while in dried petals contains all phytochemicals except quinones

Acetone extract of fresh petals contains all phytochemicals except terpenoids and quinones while in dried petals contains phytochemicals such as flavonoids, phenols, saponins, tannins & quinones.

Petroleum ether of fresh petals contain saponins, quinones and steroids while in dried petals contains most of the phytochemicals except phenols & terpenoids.

Chloroform extract of fresh petals contains phenol, saponins, terpenoids and steroids while in dried petals contains all phytochemicals except saponin and quinones.

Majority of the tested phytochemical were present in all solvent extract of the dried petals.

- *Nutrient Analysis*

Table 5: The Nutritive value is calculated for the selected variation, that is VARIATION I

Criteria	Amount Per Serving (100g)
Energy	118 kcal
Carbs	24.17 g
Protein	1.84 g
Fibre	3.5 g
Total sugar	16 g
Vitamin C	0.2 mg
Iron	3.7 mg
Calcium	120 mg

Table 5 depicts nutritive composition of fresh rose petal. The first variation (Variation I) has the highest nutrient as Carbohydrate (24.17g), Protein (1.84g), Fibre (3.5g), Total Sugar (16 g) Vitamin C (0.2 mg), Iron (3.7 mg), Calcium (120mg). The variation was standardised

IV. CONCLUSION

It may be concluded from the study that all three standardized variations of Rose petal gummies has quantity of proximate nutrients. The carbs, protein, fibre, vitamin C, iron, calcium were found to be high in the developed rose petal incorporated gummies. Rose petal are rich in antioxidant activity are high in dried petals compared to fresh. Using Rose petal in food industry & pharmacology can address the growing demand for nutraceuticals can funtional foods. Products made from dried samples would have higher nutritional profile than those made.

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