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Physico-chemical testing of developed functional jelly by using turmeric, basil leaf and aloe vera

Análisis fisicoquímico de una gelatina funcional elaborada con cúrcuma, hoja de albahaca y aloe vera

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ABSTRACT

In the study, functional jelly was formulated according to the need of the consumer and have many beneficial properties. It is seen in real time this value added jelly will have a positive effect on people's health. Because jelly was prepared by various natural ayurvedic ingredient i.e aloe vera, basil powder, turmeric and eucalyptus oil those contain high nutritional, functional and medicinal properties. According to the USDA jelly contain nutrients are calories, fat, carbohydrates, protein, vitamin, mineral, and fibers etc. This jelly has been adapted to today's times and it can be eaten by all group of people from kids to old age. Before making the final jelly, three samples were prepared which were respectively T1, T2, T3. According to the analysis of physiochemical properties of aloe vera jelly and identify the protein content is (0.03gm), fat (0gm) total soluble solid (16.04%) total solid (14.46%) ash content (0.33%), moisture content (73.25%), PH (3.5). In the coming times, apart from aloe vera jelly it can be seen in the forms of candy, marmalades etc that mostly like kids. And it will meet the health and body needs of the people based on their own merits.

Keywords: Functional food, health benefits, jelly formulation, physio-chemical testing.

RESUMEN

En el siguiente estudio se utilizó gelatina funcional elaborada de acuerdo con las necesidades del consumidor y con ingredientes de múltiples beneficios. Actualmente, se cree que este tipo de gelatina con valor añadido tiene un efecto positivo en la salud de las personas, debido a los variados ingredientes ayurvédicos

naturales que se utilizan: aloe vera, albahaca en polvo, cúrcuma y aceite de eucalipto. Estos ingredientes contienen altas propiedades a nivel nutricional, funcional y medicinal. Según el Departamento de Agricultura de los Estados Unidos, la gelatina normalmente está compuesta de calorías, grasas, carbohidratos, proteínas, vitaminas, minerales, fibra, etc., en cambio, está gelatina ha sido adaptada a los tiempos modernos y puede ser consumida por todas las personas, desde niños hasta adultos mayores. Antes de elaborar la gelatina final, tres muestras fueron preparadas: T1, T2 y T3 respectivamente. De acuerdo con el análisis fisicoquímico de la gelatina elaborada con aloe vera, los resultados fueron los siguientes: proteína (0,03 g); grasa (0 g); total de sólidos disueltos (16, 04%); sólidos totales (14, 46%); contenido de cenizas (0, 33%); porcentaje de humedad (73, 25%), PH (3,5). En el futuro, no solo se utilizará aloe vera para la gelatina, sino que también podrá estar en forma de dulces, mermeladas, etc., gustándole más a los niños, además de satisfacer las necesidades físicas y contribuir a la salud de la población según sus propias necesidades.

Palabras clave: alimentos funcionales, beneficios para la salud, formulación de gelatina, pruebas fisicoquímicas.

INTRODUCTION

In this time fast food eating has become a fashion which is very deficit for all age group of people. The more affected group is children as they don't know the disadvantage of these food and they intake in sustain manner. In the view of current situation, the most people are consuming market food and that effect in our health and we will prepare a functional jelly by using of aloevera pulp, basil, turmeric, eucalyptus oil and it was act as immunity booster food and that prevent the body from various disease. Aloe vera, basil, turmeric, and eucalyptus oil have contained various types of physio-chemical and functional properties and those help to protect our body from dangerous disease. It was loaded with lots of health benefits like wound healing, anti-inflammatory, gastro protective, anti-microbial etc. It was cultivated for agricultural and medicinal uses. Aloe vera is a succulent plant species o the genus *Aloe*. An evergreen perennial, it originates from the Arabian Peninsula, but grows wild in tropical, semi-tropical, and arid climates around the world. It is cultivated for agricultural and medicinal uses. The species is also used for decorative purposes and grows successfully indoors as a potted plant.

It is found in many consumer products including beverages, skin lotion, cosmetics, ointments or in the form of gel for minor burns and sunburns. There is little clinical evidence for the effectiveness or safety of Aloe vera extract as a cosmetic or medicine.

Aloe vera contains 75 potentially active constituents: vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acids and amino acids. It contains vitamins A (beta-carotene), C and E, which are antioxidants. It also contains vitamin B12, folic acid, and choline. Antioxidant neutralizes free radicals. It contains 8 enzymes: aliiase, alkaline phosphatase, amylase, bradykinase, carboxypeptidase, catalase, cellulase, lipase, and peroxidase.

Basil (also *Ocimum basilicum*), also called great basil, is a culinary herb of the family Lamiaceae (mints).Basil is native to tropical regions from central Africa to Southeast Asia. It is a tender plant, and is used in cuisines worldwide. Basil is a flavorful, leafy green herb. It's a member of the mint family, and many different varieties exist. Popular as a food seasoning, this aromatic herb is also used in teas and supplements which may provide a range of health benefits. Basil is generally safe when consumed in small amounts, but a few precautions are warranted. Basil leaves are high in vitamin K, which helps blood clot. High intakes could interfere with blood-thinning drugs, such as warfarin. If you're taking a blood thinner, aim to consume consistent amounts of vitamin K daily so that your doctor can regulate your medication.

Turmeric is flowering plant, *Curcuma longa* of the ginger family, Zingiberaceae, the roots of which are used in cooking. The plant is a perennial, rhizomatous, herbaceous plant native to the Indian subcontinent and Southeast Asia. Turmeric powder is about 60–70% carbohydrates, 6–13% water, 6–8% protein, 5–10% fat, 3–7% dietary minerals, 3–7% essential oils, 2–7% dietary fiber, and 1–6% curcuminoids. Phytochemical components of turmeric include diarylheptanoids, a class including numerous curcuminoids, such as curcumin, demethoxycurcumin, and bisdemethoxycurcumin. Curcumin constitutes up to 3.14% of assayed commercial samples of turmeric powder (the average was 1.51%); curry powder contains much less (an average of 0.29%).

Turmeric is used in a hot drink called "turmeric latte" or "golden milk" that is made with milk, frequently coconut milk. The turmeric milk drink known as haldi doodh (haldi means turmeric in Hindi) is a traditional indian recipe. Some 34 essential oils are present in turmeric, among which turmerone, germacrone, atlantone, and zingiberene are major constituents.

Eucalyptus oil is the generic name for distilled oil from the leaf of Eucalyptus, a genus of the plant family Myrtaceae native. Eucalyptus oil can be used for treating cough associated with the common cold and to relieve symptoms of localized muscle pain. Eucalyptus oil is also used in personal hygiene products in dental care. Cineole-based eucalyptus oil is used as an insect repellent and biopesticide. formation of a jelly with the addition of aloe vera, basil leave, turmeric, and eucalyptus oil that was help as an immunity booster food and beneficial for skin on different age groups. And that was prevent the body on this pandemic situation of covid-19. The present study aim was [1] To develop functional jelly by using turmeric, basil leaf and eucalyptus oil blended with aloe vera. [2] To evaluate the physio-chemical testing of developed functional jelly by using turmeric, basil leaf and aloe vera.

MATERIAL AND METHODS

Procurement of experimental material: The functional jelly was developed in four popular ingredients namely blended aloe vera pulp, turmeric powder, basil powder, and eucalyptus oil used in this study were collected from our village and local grocery shop in sultanpur from February in year 2021.The present research work was

done in major laboratories to fulfill all the objective related to the study. The experiment was carried out in research laboratory of department of food and nutrition, school for home science, BBAU, Lucknow.

Experimental setup and description

Study 1: characterization of aloe vera for jelly suitability

Collected undamaged few aloe vera leaves were sorted for uniform shape, size, color, free from disease and bruises. Selected leave was cleaned to remove dust from the surface, washed and peeled manually using knife. The flesh was separated from the peel using a kitchen knife and then homogenized using a pulp extractor. The pulp obtained was passed through a muslin cloth and subjected to physico-chemical analysis.

Study 2: jelly formulation and physico-chemical analysis

Based on the results obtain from the characterization, aloe vera, basil, turmeric and eucalyptus oils were selected depended on the most important characteristics which need for jelly. Functional jelly was prepared as showed in Fig. 1. jelly was prepared by different stages and it achieve whole attributes. The prepared mango jam was subjected to physico-chemical and sensory analysis determination accordingly.

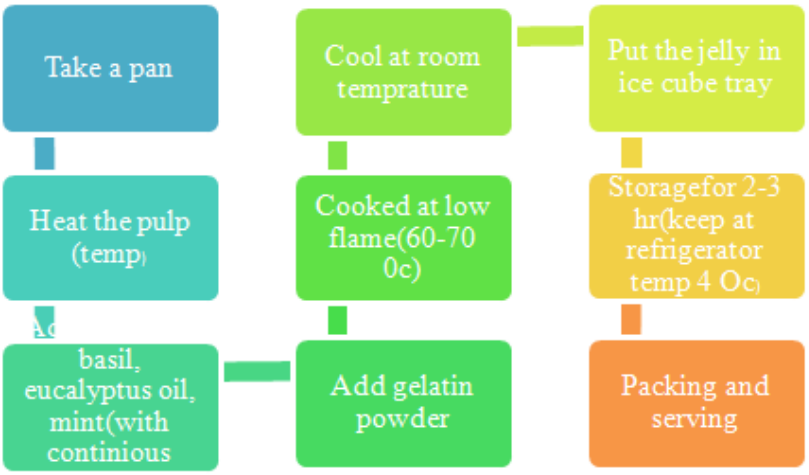

Fig. no. 1

Experimental design

This part of experiment was conducted in different step. Firstly, we will do different physiochemical testing of most acceptable sample(T2) of jelly like total soluble solid, total solid, ash content, moisture content a PH of the functional jelly. Which was prepared by different natural and ayurvedic ingredient blended aloe vera pulp, basil powder, turmeric powder and few drops of eucalyptus oil (Table 1).

Table 1. Amount of ingredients requirement for jelly formulations

Sample	Aloe vera pulp(gm)	Extracted basil powder (gm)	Extracted turmeric powder (gm)	Eucalyptus oil(drops)	Gelatin powder (teaspoon)
T1	100	4	5	2	2Tsp
T2	100	3	2	1	3Tsp
T3	100	2	4	2	1Tsp

Analytical method

Determination of pulp percentage

The pulp percentage was determined according to method of aloe vera samples from each variety were weighed and all the edible pulp was separated with kitchen knife. The extracted pulp was then filtered through muslin cloth and the percentage of pulp recovery was calculated against the weight of the pulp.

Determination of TSS

The TSS was determined according to AOAC, 932.12 method using a hand refractometer (RX 5000, Atago, Tokyo, Japan). One gm of a functional jelly was placed on prism of calibrated hand refractometer. The readings were taken, and results expressed in Brix.

Determination of moisture content

Moisture content of the samples were determined according to AOAC, 934.06 by hot air oven method by using the gravimetric method.

Determination of ash content

The ash content of the samples was determined by the method described by AOAC, 942.05 method. The produced ash was weighed and percentage was calculated depend on the sample weight taken.

Determination of PH

The PH value of each sample was determined by using digital PH meter (model: ph,815) According to AOAC, method 981.12 the PH 4.0 to 7.0 buffer solution was used to calibrate the PH meter.

RESULT AND DISCUSSION

Physico-chemical properties of functional jelly and screening for jelly suitability

The physico-chemical properties of the jelly were studied and the results were presented in Table 2. The results obtained from the fresh jelly were compared to show the varietal differences among the two samples.

Table 2. Table of testing sample

Number of test	Name of test	Result of test (%)
1	Total soluble solid (Tss)	17.85
2	Total solid	14.46
3	Protein content	0.03
4	Fat content	0.00
5	Ash content	0.33
6	Moisture content	73.25
7	PH	3.50
8	Extract pulp	78.50

Pulp percentage

The Maximum aloe vera pulp percentage (78.14%) was found in aloe vera leafs. And 21.86% waste peel material are found also. (Fig. 2).

Protein content

The protein estimation was done by kjeldahl method. And o.o3% of protein found in functional jelly per 100 gm.

Total soluble solid (Tss)

The total soluble solid was determined when sample was filled in hand refractometer. The reading is displayed in the screen after processing. The value is found 17.85 in Brix form. (Fig. 2).

Total moisture content

Total moisture content is determined by hot air oven or dehydrator method. Firstly, we will weight the sample then the sample is put on the hot air oven and moisture are evaporated and take out the sample and weight it. The difference between sample before and after dehydration that is its moisture content. In this functional jelly contain 73.25% moisture content founded by using gravimetric method. (Fig. 2).

Ash content

Ash content represents the total inorganic matter in a sample, high ash content indicates the jelly is a rich source of minerals. Ash content of functional jelly was in range of 0.29 to 0.55%. and ash content found in jelly was 0.33%. (Fig. 2).

pH

The PH measuring of sample by using digital PH meter. Digital PH meter are easy way to evaluate the exact pH of the sample. When the sample eject in contact of PH meter and it reading immediately and display the PH of sample. The PH of functional jelly was evaluated in 3.5. (Fig. 2).

Fat content

Functional jelly contains 0 gm fat in per 100 gm. Soxhlet method use to estimate the fat content of functional jelly. (Fig. 2).

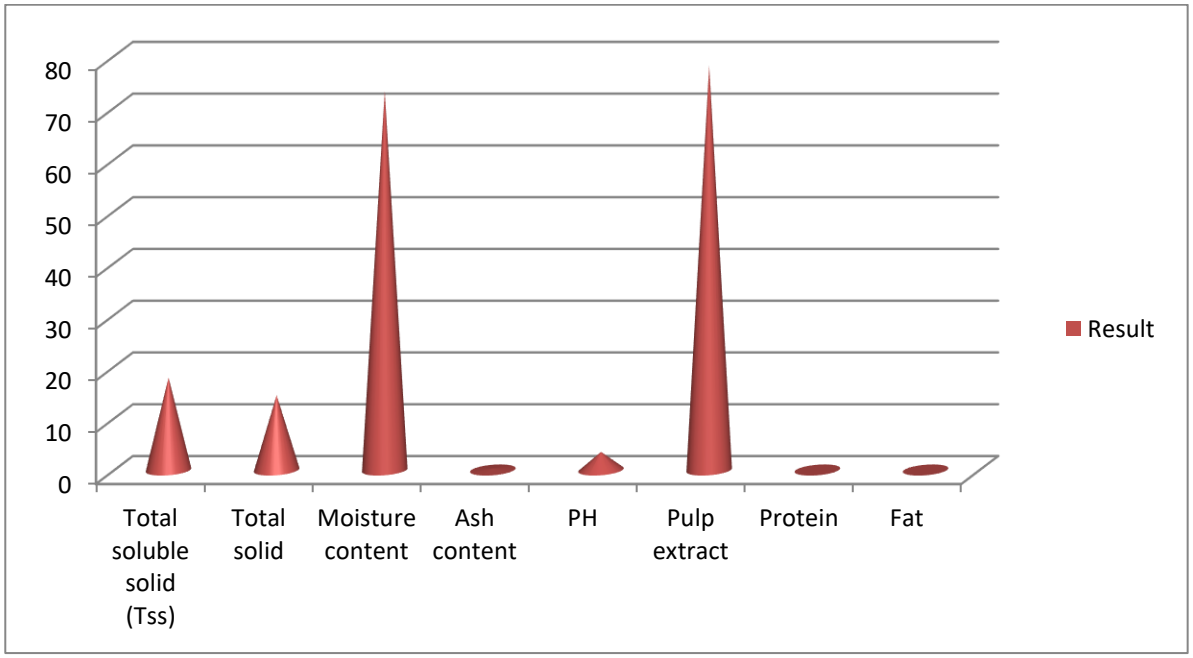

Fig. 2 (Graphical representation result of different test of functional jelly)

DISCUSSION

It was clear in the study that functional jelly is rich in nutrient, antioxidant and antimicrobial properties. It was consumption as an immunity booster food and it can prevent the body from various hazardous disease. It has been found in physiochemical testing of function jelly that was very helpful for old age and children. And it also very effective in covid-19 pandemic.

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