



PLANTAIN LEAF JELLY

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ABSTRACT:

The present study is aimed at formulating jelly using plantain leaf extract. Plantain leaves are parts of a banana tree and are considered to be nutritional and healthy as banana fruits. They are easily available in various parts of India and are used in multiple ways. Plantain (*Plantago* sp.) is a large genus of plants with over 200 different species. Plantain leaves are a popular ingredient in many parts of the world. It may also have potential uses for human health. They are a potential source of rutin, a plant flavonoid that has anti-diabetic, anti-inflammatory and antioxidative effects. This essential flavonoid is present in plantain leaves and may benefit diabetics by managing their glucose levels and preventing any risk of related complications. Plantain leaves also help break down the maltose, a type of sugar, in the body whose increased amount indicates diabetes. The plantain leaf extract is full of tannins, aucubin, which is an iridoid glycoside, and mucilage. It is also full of vitamins and minerals that are especially good for the heart. The vitamins and minerals present in it reduce inflammation and potassium content in it helps regulate blood pressure and maintain a healthy heart function. It maintains the cell and body fluid that controls the heart rate thus reducing the risk of heart problems and controls cholesterol level. Because of its numerous therapeutic effects, its Surplus availability and lack of awareness among people about its consumption there is reduced usage of plantain leaves. Hence the formulation of plantain leaf infused jelly may act as a suitable vehicle to reach many consumers.

KEYWORDS: Plantain leaf jelly, plantain leaf extract, anti-diabetic, anti-inflammatory, controls cholesterol level.

INTRODUCTION:

Plantain leaves, derived from the banana tree, are highly nutritious and integral to South Indian culture. Here, the food that is offered to God is served on the plantain leaves which enhances the taste of food. With over 200 species, plantain leaves are rich in phytonutrients, vitamins, and minerals, particularly vitamin C, known for its antioxidant properties. These leaves, characterized by their tubular shape, are not only used for serving food but also hold potential medicinal benefits, aiding digestion and reducing inflammation due to their high polyphenol content. Easily accessible and cost-effective, plantain leaves offer a natural and healthy addition to various cuisines worldwide. Plantain leaves are packed with phenols and flavonoids, boasting natural antimicrobial and antioxidant qualities. (Sahaa RK, Acharyaa S, Shovon SS, Royb P. June 2013).

Dating back to the 1500s, they've been used to combat ailments like colds, fevers, and flu. Their antibacterial and anti-inflammatory properties make them effective in wound care. Rich in tannins, aucubin, and mucilage, plantain leaf extract also offers expectorant benefits. Furthermore, it's a treasure trove of vitamins and minerals, particularly beneficial for heart health. The potassium content helps regulate blood pressure and maintain cardiac function, while antioxidants combat free radicals, reducing the risk of chronic diseases like cancer and heart disease. Chlorophyll and carotenoids contribute to their green pigmentation, providing additional antioxidant and anti-inflammatory benefits. Additionally, plantain leaves contain vitamin B6, vital for metabolism and red blood cell health. Despite their therapeutic potential, plantain leaves are underutilized due to limited awareness. Recent studies suggest that they may aid in regulating blood sugar levels and hold promise in managing diabetes, particularly attributed to compounds like rutin. (Isamraf, July 2000).

Honey, rich in antioxidants and carbohydrates, is gaining attention for its potential in managing high blood sugar levels in type 2 diabetes. Its antioxidant properties protect cells from damage and may regulate blood sugar levels. Studies indicate that components like fructose in honey can improve hyperglycemia and aid wound healing, particularly in diabetic foot ulcers. Animal and human studies suggest honey's antidiabetic effects, including reduced HbA1c levels and improved lipid profiles. Although more research is needed, honey consumption shows promise in managing diabetes and reducing the risk of complications. (Sadaf Ali & Muneeb U. Rehman December 2020).

Moreover, honey's antioxidant abilities make it a potential candidate for protecting against cardiovascular diseases (CVDs). It may help improve lipid metabolism, regulate blood pressure, and reduce heart damage after a heart attack. While further investigation is required, honey's medicinal properties highlight its potential as a cardioprotective agent. (Hilal Ahmad Wani December 2022).

China grass, also known as agar-agar, is a jelly-like substance derived from red algae, primarily *Tengusa* and *Oganori* species. Discovered in Japan in the 17th century, agar-agar is composed of agarose and agaropectin, both polysaccharides made up of galactose units. It serves as a vegan substitute for gelatin and is rich in nutrients like folate, calcium, iron, vitamins E and K. With its high fiber content, agar-agar aids in weight loss by promoting satiety. It also helps lower cholesterol levels by absorbing bile. Additionally, agar-agar possesses antioxidant properties that combat free radicals, reducing the risk of chronic diseases like cancer and heart disease. Due to its vegan origin, agar-agar is gaining popularity in the Indian subcontinent, especially among the vegetarian population. It offers digestive benefits by absorbing toxins and promoting gastrointestinal health. (Zeng y, April 2018).

This project aims to formulate a plantain leaf jelly using agar-agar, lemon and honey. Plantain leaf is a commonly available and affordable product. But its health benefits are unknown to major population due to lack of awareness. It is a rich source of potassium and fiber which makes the product functional food. It maintains the cell and body fluid that controls the heart rate thus reducing the risk of heart problems. It controls cholesterol level. A polyphenolic compound present in plantain leaf is found to exhibit cholesterol lowering activity and eliminates cholesterol as fecal bile acids. They are excellent sources of fiber, containing both soluble and insoluble fiber. The fiber present in it is good for diabetics thus maintaining normal blood sugar. The anti-inflammatory property present in the plantain leaves helps to control chronic conditions like diabetes and heart disease. It can be consumed by all age groups.

MATERIALS

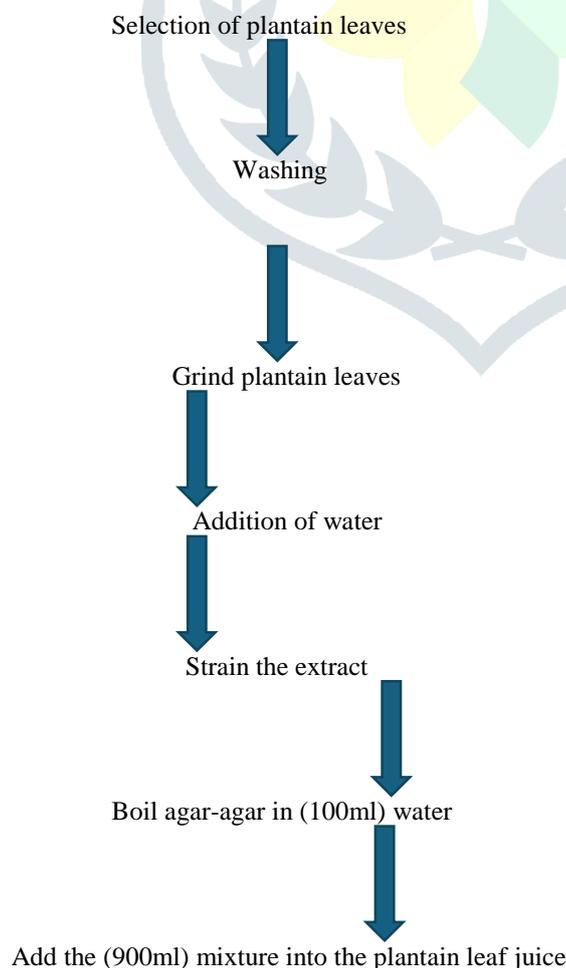
Raw materials

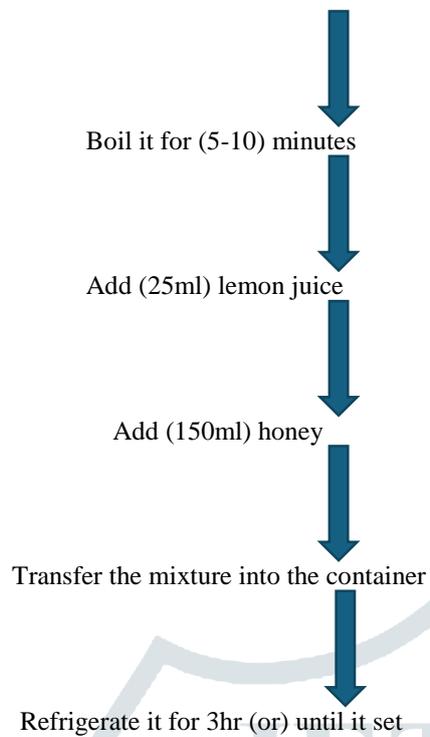
1. Plantain leaf juice
2. Lemon juice
3. Agar-agar
4. Honey

METHODOLOGY:

- I started the process by grinding the plantain leaves with water to get the juice of the leaves.
- In a pan I boiled 100ml of water along with 10g of agar-agar until it dissolved completely in the water and added 900ml of plantain leaf juice in the agar-agar mixture, now the mixture is boiled for (5-10 minutes).
- In the next step I added 25ml of lemon juice and 150ml of honey.
- The mixture is transferred and refrigerated for 3hr.

PROCESS FLOW CHART FOR PLANTAIN LEAF JELLY





SENSORY ANALYSIS

Sensory analysis of prepared plantain leaf jelly sample was done using a 9-point hedonic scale rating.

RESULT AND DISCUSSION

Proximate composition of raw materials

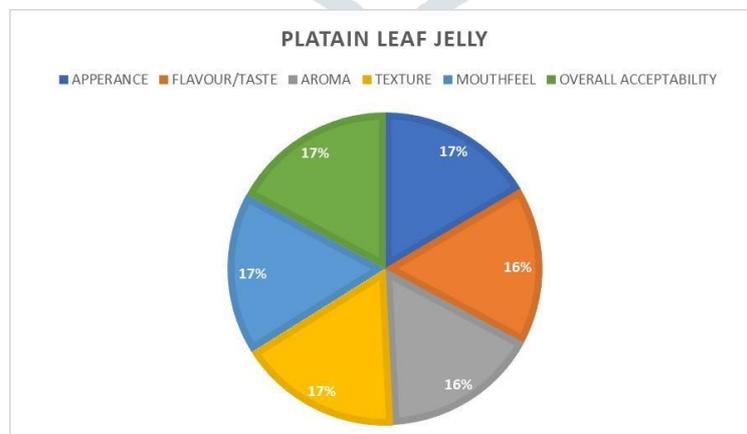
The proximate composition of raw materials such as plantain leaf juice (1000ml), agar-agar (10g), lemon juice (25ml), honey (150ml).

Physical characteristics of plantain leaf jelly

No marked difference was observed in the size, shape and weight of jelly. The size and weight of jelly were found in the range of 1.7cm, and 4.5-5g, respectively. All the samples were cuboid and recorded light green color in plantain leaf jelly.

SENSORY EVALUATION

The developed jelly was standardized using a sensory evaluation technique with the help of using 9-point hedonic scale. The developed jelly along with standard sample was served to the 50 consumers for sensory evaluation. The study has demonstrated that the appearance (30 like extremely), taste (30 like extremely), aroma (32 like extremely), texture (37 like extremely), mouthfeel (36 like extremely), overall acceptance (37 like extremely) most palatable product. It is evaluated by 9-point hedonic scale. There are many studies based on the health benefits of plantain leaf extract benefiting diabetic and cardiovascular disease.



Scorecard for sensory evaluation of plantain leaf jelly.

CONCLUSION

This product offers a preferable taste and is easily available, with raw materials that are accessible. It serves as a suitable confectionery for diabetes and heart patients, catering to various age groups. Its inclusion as a candy in food industries could initiate a trend towards healthier options.

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