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Research Article

Formulation and Evaluation of Nutritional Juice

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ABSTRACT

A rising global health concern, obesity is linked to a number of metabolic diseases, including as type 2 diabetes, heart disease, and some types of cancer. Natural and functional foods with therapeutic potential for weight management are gaining popularity. The tropical fruit Pithecellobium dulce, often called Manila tamarind, is high in flavonoids, dietary fiber, antioxidants, and other bioactive substances. This study investigates the possible anti-obesity effects of a nutritional juice made from Pithecellobium dulce as well as its formulation and assessment. High concentrations of polyphenols and saponins, which are known to encourage lipid metabolism and lessen fat storage, were found in the preliminary phytochemical investigation. In vitro tests and animal model studies showed that subjects who consistently drank the juice had improved lipid profiles, increased antioxidant activity, and significantly decreased body weight growth. According to these results, Pithecellobium dulce juice shows promise as a natural supplement for the treatment of obesity and its associated problems. It is advised to conduct additional clinical research to confirm its effectiveness in human beings.

INTRODUCTION

In the recent years, there is an increasing interest in researchers for the production of biologically active compounds from natural sources. Bioactive compounds are important due to prevention/treatment of diseases like many types of cancers and other human diseases. These protective abilities of bioactive materials are mostly attributed to plant polyphenols and their antioxidant, antimicrobial, antiviral and anti-carcinogenic effects. Also, plant polyphenols are preferred as protective ingredients in pharmaceutical, food and cosmetic industries as food additives, preservatives and dietary supplements instead of synthetic chemicals. Worldwide about 1.9million adults are overweight and 600million of them are clinically obese4. Only drug named Orlistat is currently approved by USFDA for long term obesity treatment. But it has

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unwanted side effects like, dyspepsia, nephrotoxicity, flatulence, respiratory infection oily stools, abdominal pain, menstrual and psychiatric disorders5. Natural products recognized from conventional medicinal plants encompass constantly existing a thrilling chance for the expansion of newer remedial agents. A big amount of Indigenous plants have been claimed to have anti-obesity effect in the Indian system of medicine. Many medicinal plants like Camellia sinensis, Allium sativum, Nelumbo nucifera, Argyreia nervosa and Sida rhomboidea, were reported to have anti-obesity effect in different animal models. Therefore, basically our project is based on the purpose of finding every biological and physiochemical properties of the leave plant and its impact on the human body against diseases or disorders. According to some local sources and also after digging some research works some of the benefits of leave's properties are:

- Have antioxidants.
- Can heal wounds and burns
- Helps in keeping diabetes check
- Protects our cardiovascular system.
- Supports maintaining normal blood sugar levels.
- Fights cancer cells
- used in cosmetics for skin and hair. Etc.

The active compound of the plant includes flavonoid, sterols, tannin and triterpenoid and health promoting properties like protein, carbohydrates, steroids and disease preventing properties Some preliminary studies have shown that p. dulce leaves contain flavonoids glycosides that is beta D glucoside of a alpha spinosterol, octocosanol, kaempaferol 3-rhamnoside and kaemaferol which might exert an antiobesity effect.(6]

1.2About the sample:-

Pithecellobium dulce

Pithecellobium dulce (benth) belonging to the family of a leguiminosae .it is a small to medium sized evergreen,spiny legume tree the crown is a broad spreading with a irregular branches.)all plant part of p. dulce elaborates a vast array of biologically active compounds and have been demonstrated to exhibit antibacterial, antidiabetic, locomotor, antivenom, free radical scavenging, protease inhibitor, anti-inflammatory, antimycobacterial, abortifacient, spermicidal, anticonvulsant,antiulcer,antidiarrheal,antifungal, antitubercular, antitumor, antioxidative and antiobesity properties

1.2.1Biologicalsource

Pithecellobium ducle:

Botanical name-pithecellobium dulce

Family- leguiminosae

Part used- leaves

1.2.2Common name:

Hindi- vilayati imali, jungali jalebi,

Marathi- engraji chinch

Tamil-kodukkapuli

English-manila tamarind,money pod, madras thorn.

Nowdays, obesity is one of the serious health concern in the world and has been connected with the increased morbidity, mortality rate and reduced life span .] it has become and eventual outcome after certaim age of the human due to their lifestyle and food habits. Obesity increases the risk of many diseases such as hyperlipidemia, diabetic atherosclerosis, liver damage and cancer Moreover obesity inceases financial burden on the individual and eventually on the government alsothe major concern with the western food is either it consist of to much of enerdized material or higher fat compounds.this induces the free radical generation with increased possibility of cardiac related complication

1.3Superb health benefits of the jungle jalebi-

1.3.1Promote weight loss-

Drinking a glass of lemon juice, infused with the jungle jalebi pod extracts works wouder in shedding those extra kilos and maintaining a healthy body weight

1.3.2.Cures gut problem-

Jangle jalebi pods are a storehouse of powerful antioxidants such as flavonoids and quercetin these functions effectively in scavenging the harmful free radicals and toxins in the stomach and intestines, thereby curing diarrhea and dysentery

1.3.3. Manage diabetic symptoms-

The juice of jungali jalebi pod extract is known to exhibit anti hypoglycemic attributes.

1.3.4.Fortifies bones and muscles-

p.dulce pods are bestowed with extensive amount of calcium and phosphorous two minerals vital for maintaining strong bones.

1.3.5.Boosts immune function

The expansive qualities of vitamin c , a beneficial antioxidant,confer augmented immunity in those consuming a glass of jungle jalebi juice.

1.3.6. Promote oral health

The tiny pods of p. dulce are packed with calcium, magnesium, phosphorous, the trio of bone fortifying minerals, that vastly strengthen teeth enamel.

1.3.7. Relieves anxiety and depression

p.dulce leaves are loaded with tannin, flavonoid, alkaloid antioxidant. these enhance memory, cognition, brain power, besides ameliorating symptoms of anxiety, depression and influencing positive moods.

Aim: To Prepare and Evaluate the Herbal juice.

Objectives:

- To Promote weight loss
- Cures gut problem
- To Manage diabetic symptoms
- Boost immune function
- To Promote oral health
- To Relieves anxiety and depression

Plan of Work:

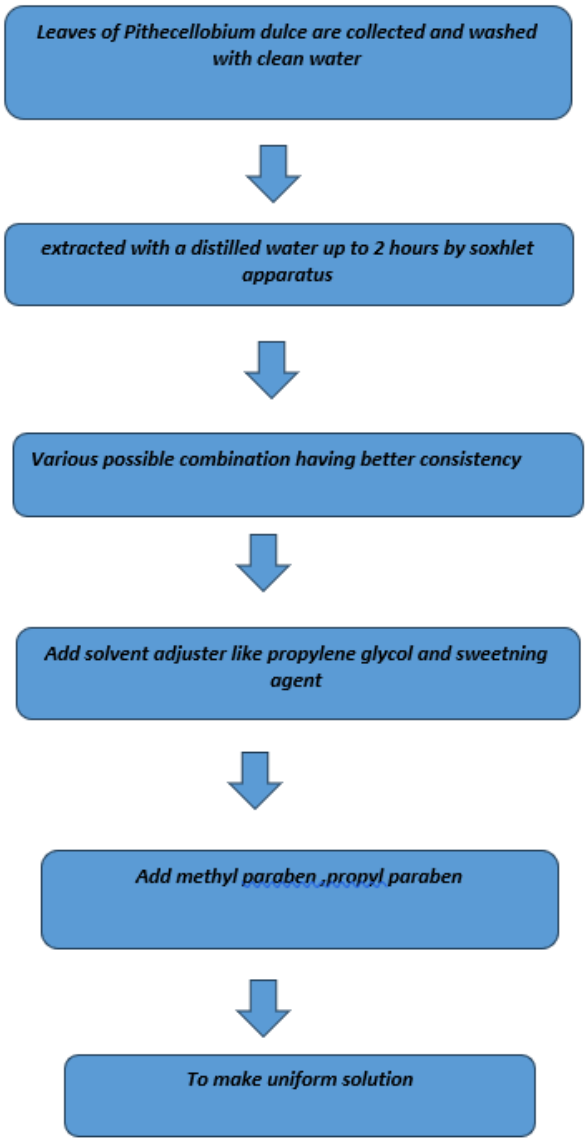
- Selection of drug and excipients.
- Pre formulation study of drug
- Formulation of juice
- Evaluation of juice
- Colour
- Odour
- pH
- Anti-obesity activity
- Viscosity test
- Result and conclusion

2.Formulation-

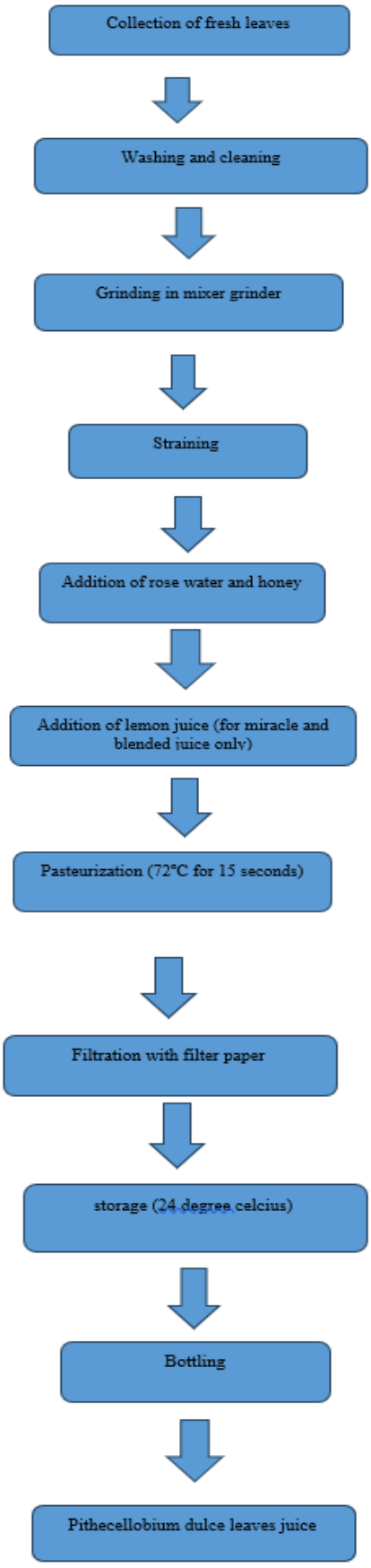
The herbal juice was formulation as per general method of formulation in which extracted Pithecellobium dulce leaves With water by heating upto 6 hours at 70 degree celcius.then add lemon juice,honey and rose water blended with turmeric colouring agent. Then add methyl paraben, propyl paraben.dilute with distilled water also add propylene glycol.to make uniform mixture.and stored in refrigerater.

3.Methods of preparation of juice –

Method – 1:



Method -2:


Collection of fresh leaves
Washing and cleaning
Grinding in mixer grinder
Straining
Addition of rose water and honey
Addition of lemon juice (for miracle and blended juice only)
Pasteurization (72°C for 15 seconds)
Filtration with filter paper
storage (24 degree celcius)
Bottling
Pithecellobium dulce leaves juice

Drug profile:

1.API-

Pithecellobium Dulce Leaves

It is also known as jangle jalebi has vitamin c, which is an excellent antioxidant which helps our body to fight against many harmful free radicals. Dulce contains vital vitamins like ascorbic acid, thiamine, riboflavin and some essential amino acids.

2.Lemon Juice

Lemon contains a high amount of vitamin c, soluble fiber, that give them number of health benefits. Lemon may aid weight loss and reduce risk of heart disease, anemia, kidney stones, digestive issues, and cancer

3.Turmeric

Turmeric is promoted as a dietary supplement for a variety of conditions, including arthritis, digestive disorder,respiratory tract,joints,and digestive system.

4.Honey

In addition to its use as a natural sweetener, honey is used as an anti-inflammatory, antioxidant and antibacterial agent

5.Rose Water

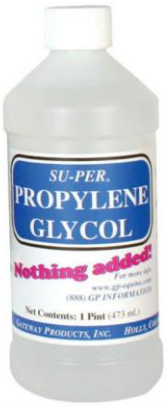
Soothes skin irritation

Reduce skin redness

Contain antioxidant

Enhance mood

Relieves headaches



***6.*Propylyne Glycol**

It acts as a preservative,flavour enhancer and solvent in food products,PG helps keep foods moist by preventing moisture loss and evaporation

4.Materials & Equipment's:

Materials:

Sr.no	Material	Role / Function
1	API	Base of Nutrient rich
2	Lemon juice	Flavour enhance, Vitamin c
3	Honey	Natural Sweetner, Preservative
4	turmeric	Anti-inflammatory, Anti-oxidant
5	Rose water	Flavour and aroma enhancer
6	Propalyen glycol	Preservative stabilizer

Equipment:

Sr.no.	Equipment
1	Hot air oven
2	Mortal pestle
3	Brookfield viscometer
4	pH meter
5	Test tube
6	Petri dish

5. Formula-

Ingredients	Quantity given(100ml)	Quantity taken (50ml)
API	48.9	24.8

Turmeric	3.2	1.9
Honey	9.2	6.9
Rose water	5.2	2.1
Lemon Juice	16.9	4.9
Distilled water	10.2	6.1
Propylene glycol	6.1	3.3

METHODOLOGY:

p.dulce natural juice blends of different formulas were prepared and kept refrigerated for 9 days in glass bottles. Physicochemical analysis and sensory evaluation were determined for the prepared juice blends. Also, marginal changes in pH, total soluble solids, viscosity and vitamin C content were measured. The antioxidant activity of fresh juice blends was also evaluated by using in vitro assays of ferric ion reduction power assay, DPPH' and ABTS'+ scavenging capacities. The effect of juice storage for 3, 6 and 9 days on pH, acidity and vitamin C content was assayed

6.Evaluation test:

Sr.no.	Evaluation test
1.	Organoleptic test
2	Moisture content
3	Ash value
4	pH
5	Viscosity

1. Sensory test-

Sensory evaluation of juice samples was Carried out through evaluating taste,odor,color,mouthfeel,Appearance and overall acceptability as described by Hussein.And Shedeed. All blank formulations (i.e., formulations without active ingredient) and drug-loaded formulation were tested for physical appearance, color, texture, phase s

separation, and homogeneity. These characteristics were evaluated by visual observation. Homogeneity and texture were tested by pressing a small quantity of the formulated cream and gels between the thumb and index finger. The consistency of the formulations and the presence of coarse particles were used to evaluate the texture and homogeneity of the formulations. Immediate skin feel (including stiffness, grittiness, and greasiness) was also evaluated.

Taste-

pithecellobium dulce,also known as manila tamarind or madras thorn, is a legume tree native to Mexico and central America.it is popular food crop in tropical regions, known for its sweet and tangy taste as well as its high nutritional value.

Odour

the odour of p.dulce leaves juice is aromatic and pleasant.

Colour: Color parameters (L*, a* and b*) of juice samples were determined using a spectro-colorimeter .[21]

d. Appearance

juice of p. dulce leaves shown good appearance

2. Physiochemical tests

The fresh p. dulce leaves and-processed p. dulce juices were analyzed for moisture ,ash, vitamin C,

pH, clarity, viscosity, solubility, antioxidant activity, antimicrobial activity etc. [22,23].

a. Moisture content

Five grams of juice was taken in porcelain crucibles and oven dried at 80°C until the weight become constant. Percent moisture content was calculated according to the following formula-[24]

% moisture=IW –FW/IW ×100

Where,

IW= Initial weight of p. dulce samples

FW= Final weight of oven dried sample

5 - 4.10 / 5 ×100

Moisture content = 18 %

b. Ash Content

Two grams of sample was taken in dry, clean porcelain crucibles and burned using an electric heater. Then the crucibles were placed into a muffle furnace at constant temperature of 550°C for 4 hours. The sample was then cooled in a desiccator and weighed. Ash percent was calculated as follows:

Ash value=Weight of ash content\Initial weight of P. dulce

Where, AW =Weight of ash and

IW= Initial weight of P. dulce (1.10)

1.10 /2 × 100

Ash value = 55 %

pH

The pH of the p.dulce juice was measured by using pH meter at an ambient temperature.The pH test were performed by immersing probe of digital pH metre into sample to confirm neutral PH.[31] About 2.5 g of all formulations were taken in dry beaker and 50 ml of water was added. Beaker containing ointments was heated on water bath at 60–70°C. The pH of ointments determined using a pH meter (pH Tutor, Eutech Instruments). The determinations were carried out in triplicate and the averages of three readings were not found.

Viscosity

Brookfield Synchro-Lectric Viscometer (Model RVT) with Helipath Stand was used for rheological studies. The sample (50 g) was placed in a beaker and was allowed to equilibrate for 5 min before measuring the dial reading using a T-D

spindle at 10, 20, 30, 50, 60, and 100 rpm. At each speed, the corresponding dial reading on the viscometer was noted. The spindle speed was successively lowered and the corresponding dial reading was noted. The measurements were carried in triplicate at ambient temperature. Direct multiplication of the dial readings with factors given in the Brookfield Viscometer catalog gave the viscosity in centipoises (CPS)

7.DISCUSSION-

The lethal dose of *P. dulce* provided a healthy and non-toxic extract of up to 5 gm / kg. In earlier studies includes, anti-inflammatory, antibacterial, antioxidant, antidiabetic, antimicrobial, cardiac, antidiarrheal, antiulcer, and antifungal activities have been observed in all sections27. A variety of herbal extracts were used fortheir anti-obesity practices in traditional medicine. There is still no proof of anti-obesity ability in various *P.dulce* extracts. The research was therefore designed to prove that *P. dulce* has an anti-obesity impact in extremely fatty obesity induced by diet in rats. *P. dulce* dosage based on organ and fat pad weights decreased which could result in adiposis mobilization and lipid catabolism. Plants such as *P. dulce* are not shocking to see that they include a high amount of quercetin, hormones, saponins, lipids, phospholipids, glycosides, polysaccharides, kaempferol, dulcitol, and afezilin41,42. The *P. dulce* in this experiment has worked on fatty liver, and anti-obesity interventions have been shown.

8.RESULT-

The overall acceptability of blended juice of formula indicated the possibility to manufacture good and nutritional juices at commercial scale. The high antioxidant activity of fresh juice blends indicated that they could be used as a source of antioxidants and as functional drinks. These juice blends are recommended to people suffering from obesity, blood pressure, cancer, Alzheimer's and heart diseases, as they play a key role in preventing these diseases.

Sr.no.	Evaluation test	Result
1	Colour	Yellowish brown
2	Odour	Aromatic
3	Taste	sweet
4	pH	6-7
5	Viscosity	Good

9.CONCLUSION:

The present study provides scientific evidence and support for the use of peel of Pithecellobium dulce in traditional medicine to treat obesity. p, dulce leaves juice lead to the development of nutritious and delicious juice blend. The juice had good sensory characteristics and good acceptance during storage. They contain also essential vitamins and minerals as well as bioactive compounds that are known to have many health benefits. Although studies are fragmented and need to be expanded, particularly in the clinical area, juices may play a role in diseases related to chronic inflammation, cancer, heart and bone

diseases, problems related to cognition and aging, and possibly insulin resistance.

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