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Production & Quality assessment of herbal ice lolly with tulsi paste– A healthy and delicious dairy dish

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Abstract
Herbal ice cream is a delicious product with some medicinal properties like some therapeutic, disease controlling, antiseptic, antimicrobial, antidiabetic, antioxidant etc. in this study holy basil or tulsi (*Ocimum sanctum*) and other easily available Indian spices like ginger and cardamom were used for the production of simple bench scale. Tulsi has many therapeutic values, one of them is to prevent cold and cough, also, ginger and cardamom also help to prevent a sore throat and flu and bronchitis problem. Generally, children are very fond of ice cream or ice lolly but elders prevent them to take this due to the fear of cold and cough, but this herbal ice lolly has all the good values of tulsi along with ginger and cardamom which helps to build immunity against the flu. The product is made with a different concentration of tulsi like 2%, 4%, 8%, 10% in w/v method and the final product contains 10% tulsi paste, 1% ginger paste and 0.3% of cardamom dust. With all its good medicated values it is very delicious, so above all this herbal ice lolly is a perfect fusion of health and taste.

Keywords: Herbal, Ice Lolly, Tulsi, Cardamom, Ginger, Quality Assessment

1. Introduction
Ice cream is a frozen dairy product made by suitable blending and processing of cream and other milk products, together with sugar and flavor, with or without stabilizer or color and with the incorporation of air during the freezing process (De Sukumar,1980). Ice cream is very delicious frozen dessert and ice lolly is an attractive form of it which is specially liked by the children. Every year the selling of ice cream in India is increasing by 12-15%, but generally, the ice creams are consumed due to its test and attractiveness, they don't have any therapeutic value.
Nowadays people are health conscious, they like value added product as a part of their everyday meal or as well as the foods they eat for pleasure. This project is a trial of making a confectionery product like ice lolly with the well-medicated values of tulsi, ginger and cardamom.
Tulsi is a herb whose scientific name is Ocimum sanctum. In India, it is famous for its religious means and use for the worship of God Vishnu. Beside that tulsi extract or paste are used for the treatment of a sore throat, cough and tonsil problems. Ginger and cardamom are also well-known spices generally use in Indian dishes, as well as in the winter Indian people enjoy tea with ginger and cardamom because this to spices is effective against cold, flu, asthma or bronchitis.
In this project different amount of tulsi paste is used as 2%, 4%, 8% and 10% along with ginger and according to the taste and then by a proper sensory and quality analysis finally the product having 10% tulsi paste with 1% ginger and 0.3% cardamom was get a good acceptance.

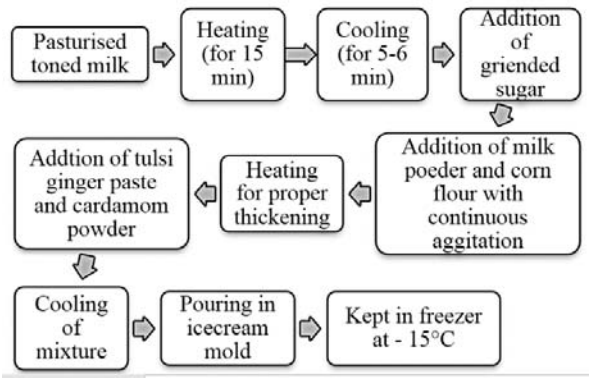
2. Material and Method
The ice lolly is prepared in a simple bench scale method. All the materials were collected from the local market.

The materials which were use given below-

- Toned milk (Amul)
- Sugar
- Milk powder(Amul spray)
- Corn flour
- Tulsi paste
- Ginger paste
- Cardamom paste

Pic 1: materials used for herbal ice lolly [ref. GNIT Food Processing Lab]

Herbal ice lolly preparation method follows the standard method of processing of ice cream. Ice creams with different concentration of herbs were produced in bench scale. The procedure of production was same of each product.
The process flow of the final product is given below-



Products with different concentration of tulsi paste were made with the aforesaid ingredients. Five types of sample were made for trial –

- 2% tulsi ice lolly
- 4% tulsi ice lolly
- 8% tulsi ice lolly
- 10% tulsi & cardamom ice lolly
- 10% tulsi, ginger & cardamom ice lolly

Pic 2: Storage of herbal ice lolly [ref: GNIT quality control lab]

All the products were made with proper handling and care. After the final processing, the product was kept in batch scale freezer overnight at -15 °C without any interruption in temperature control or in the power supply. Then the ice lolly samples were gone for a sensory evaluation and quality analysis like detection of moisture content, ash content, sugar content and total solid content.

3. Detail procedure for the quality analysis

➢ **Detection of moisture content-**

At first, the weight of Petri dish is taken.5 gm of the sample is taken and kept on the Petri dish. Then the Petri dish was kept in the hot air oven at 105 ^{0}C. After Sometimes, the Petri dish is taken out from the hot air oven weighed. This process is continued until the weight become constant.

➢ **Detection of ash content**

At first weight of the crucible is taken. Then 5 gm of the sample is taken and kept in the crucible. Then it is kept in muffle furnace for 5 hours at 550 ^{0}C.Then it is taken out and weighted.

➢ **Procedure to measure sugar content (total sugar = reducing sugar + non-reducing sugar)**

1) Fehling A: Dissolve 34.6 gm of crystallized copper sulfate of highest purity in water and make up the volume up to 500ml.

2) Fehling B: Dissolve 173 gm of re-crystallized Rochelle salt (Na-K-tartrate) and 50 gm of sodium hydroxide in water to make up to 500 ml.
Fehling solution is prepared by mixing both Fehling A& Fehling B.
3) Solution of pure dextrose is needed to standardize the Fehling's solution.

Standardization of Fehling's reagent: 5ml of each solution of Fehling A & B is mixed. Then 30 ml of water is added to this mixture in a porcelain basin. Then this mixture is titrated with standard dextrose solution while heating. This process is continued until the solution with red precipitate becomes colorless.

Estimation of reducing sugar: The sample (ice cream) solution is taken in the burette. The standardized Fehling's solution is taken in a porcelain basin and boiled gently for 2 minutes. Then the sample solution is added from the burette. 3-5 drops of methylene blue are added as an indicator.

Estimation of non-reducing sugar:- 25 ml of sample is taken in a 250 ml volumetric flask and 12.5 ml water and 5 ml conc. HCl is added to it. Then the content is heated in a

water bath at 70-80 ^{0}C for 10 minutes. Then the content is cooled and neutralized with 40% NaOH. The final volume is made up to 250 ml. Then it is titrated by the previous method.

4. Results and Discussions

In this project, 5 types of the ice lolly mix were made for the sensory and quality evaluation.

The ice lolly mix was prepared with increasing percentage of tulsi paste from 2% to 10%. All this percentage were measure with w/v method according to the volume of milk. Same was done with ginger paste and cardamom powder to make the ginger cardamom tulsi ice lolly.

Pic 3: Tulsi, ginger & cardamom ice lolly [ref: GNIT food processing lab]

Composition of different ice lolly mix is given below-

Table A: Composition of Different Ice Lolly Mix

Type of mix	Milk (ml)	Corn flour (gm)	Milk powder (gm)	Sugar (gm)	Tulsi (gm)	Cardamom (gm)	Ginger (gm)
2% tulsi	500	50	50	100	10	-	
4% tulsi	500	50	50	100	20	-	
8% tulsi	500	45	50	100	40	-	
10% tulsi+ cardamom	500	73.5	47	47	50	5	-
10%tulsi+ginger+cardamom	500	73.5	47	47	50	3	5

Quality analysis of every product was done according to the standard method mentioned above. Calculation procedure of moisture and ash content are described below

- **For moisture content**

Weight of blank petri dish= x gm (say)
Weight of sample= y gm (say)
Total weight initially=x+y= a gm (say)
After complete drying the constant total weight finally=b gm (say)
Therefore, moisture%= {(a-b)/a}×100

- **For ash content**

Weight of silica crucible = x gm (say)
Sample wt = y gm (say)
Final wt of crucible+ ash= a gm (say)
Ash content = {(a-x)/y}×100%

- **Total solid content**

Total solid content (%) = (100-% of moisture content)
The values of quality analysis are given in table B & C

Table B: Values of Moisture Content, Ash Content & Total Solid

Type of sample	Moisture content	Ash content	Total solid
2% tulsi	61.35%	1.30%	38.60%
4% tulsi	60.85%	1.20%	39.15%
8% tulsi	60.30%	1.20%	39.70%
10%Tulsi+cardamom	61.8%	1.2%	38.2%
10%Tulsi+cardamom+ginger	58.8%	1%	41.2%

Table C: Values of Reducing Sugar, Non-Reducing Sugar & Total Sugar Contents (double diluted samples)

Type of sample	Reducing sugar content	Non-reducing sugar content	Total sugar content
2% Tulsi	5.02%	18.9%	23.92%
4% Tulsi	5.27%	17.08%	22.35%
8% Tulsi	3.43%	17.61%	21.05%
10% tulsi + cardamom	7.87%	7.28%	15.15%
10% tulsi+ ginger+ cardamom	7.29%	6.95%	14.24%

All the ice lolly sample were analyzed for sensory evaluation- flavor& test, body & texture, color & appearance and melting resistance, overall acceptability.

All this test was done by trained people. The professors of food technology department was served as judging team. The scores were given in 10 point scale, they are indication of quality & taste As per the score 10% tulsi, ginger & cardamom got the highest number, so it is considered as the final product with good quality and acceptance.

The score of the final product in sensory evaluation is given in bar diagram 1

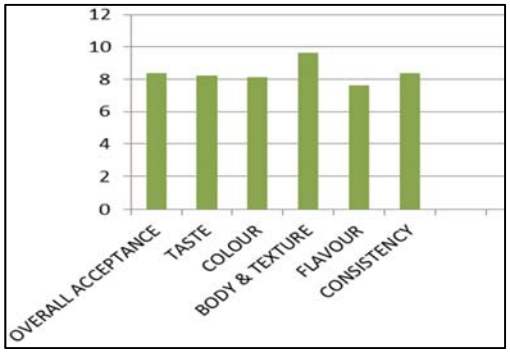


Diagram 1: Sensory evaluation score of tulsi (10%), ginger and cardamom ice lolly (at 10 point scale)[marks given by trained panel]

5. Conclusion

As per ISI the standard values of ice cream is as follows- Moisture – 55-64%0.8-2.1% ash, Sugar12-15%,Total solid 35-37% (SukumarDey,2010)[7] The herbal product maintain all these standard so it can be said that the product is good standard according to global standard.

The product promotes the beneficial values tulsi, ginger and cardamom ie help to prevent cold and cough, sore throat or flu. So this product will be a good choice of those people who often feared to get a cough after consuming ice cream and also for children who are fond of ice lollies.

6. Acknowledgement

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