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Sensory evaluation of frozen dessert prepared by different level of *Asparagus adscendens* R and *Dactylorhiza hatagirea* powder

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Abstract
Frozen desert prepared by incorporating medicinal herbs showed sensory properties. *Asparagus adscendens* R. and *Dactylorhiza hatagirea* are popular medicinal plant has containing improvement flavour and test, colour and appearance, body and texture, melting quality of milk frozen product. The present study is carried out to find the flavour and test, colour and appearance, body and texture, melting quality measured by sensory methods of dairy frozen desserts. The result found that best overall acceptability of frozen desserts were inclusion 0%, 2%, 3% and 4% herbs used respectively in frozen desserts. Frozen desserts was found best treatment T_5 followed by control and other experimental treatment. Frozen dessert prepared by this method is subjected to sensory properties of herbal milk frozen dessert.

Keywords: Herbal, frozen dessert, Sensory, *Asparagus adscendens* R. and *Dactylorhiza hatagirea*.

1. Introduction
The word Kulfi derives its origin from the Hindustani kulaf, which means a "lock" or “container” that has to be unlocked. Kulfi finds mention in "aini-akbari’’ a 16th centurchronicle, documenting court life (Aneja *et al.*, 2002). Kulfi has nutritional significance but possess no therapeutic properties. The growing interest of consumers towards therapeutic products (Tandon and Shukla 1995) [9]. Reported that traditional medicine *Dactylorhiza hatagirea* has been prescribed for dressing and treating of glottal inflammations and intestine disorders, tuberculosis, diarrhea, Parkinson, cancer, fever, and especially used to strengthen the sexual activity, erectile dysfunction therapy, physical strength enhancement and increase vigorousness (Thakur and Dixit, 2007) [10]. The powdered dried root of *Asparagus adscendens* is used in Ayurveda for dysepesia. Oral administration of powdered dried root of *Asparagus adscendens* has been found to promote gastric emptying in healthy volunteers. Its action is reported to be comparable with that of the synthetic dopamine antagonist metoclopromide. In Ayurveda, *Asparagus adscendens* has also been mentioned for the treatment of ulcerative disorder of stomach and parinamasula. In the worldwide as well as in the developing countries, the most human died due to infectious bacterial diseases (Nathan, 2004) [4]. Therefore, it might be interesting to develop a new kulfi with the addition of bioactive agents from plants to extend its shelf-life. This product should have been positively perceived by the consumer. The present investigation is an alternate to manufacture acceptable quality of Herbal kulfi using different levels of herbs with the following objectives: Asses the sensory attribute of herbal frozen desert (kulfi).

2. Materials and Methods
Toned milk was collected (Brand- amul milk) from Mahewa, Allahabad. Sugar was collected from the local market of Allahabad. Herbs *Asparagus adscendens* R (Green asparagus) and *Dactylorhiza hatagirea* (Salep orchid) were Obtain from Deoband, Saharanpur. Stabilizer was obtained from scientific corporation, Allahabad.

3. Treatment

T_0 Kulfi mix was standardized to 10% fat, milk solids not fat 12%, sugar 15%, 0.3 % of stabilizer, the formulated kulfi total solids contains 37%.

T_1 Kulfi mix was standardized to 10% fat, milk solids not fat 12%, 0.3% of stabilizer, the rate of addition of sugar 15% with 2% Asparagus powder. Cream and Skim milk powder were added as a source of Fat & MSNF as required so that the formulation contains 37 % total solids.

T_2 Kulfi mix was standardized to 10% fat, milk solids not fat 12%, 0.3% stabilizer, 15 % sugar with 3% Asparagus powder. Cream and Skim milk powder were added as a source of Fat& MSNF as required so that the formulation contains 37 % total solids.

T_3 Kulfi mix was standardized to 10% fat, milk solids not fat 12%, 0.3% of stabilizer, the rate of addition of sugar 15% with 4% Asparagus powder. Cream and Skim milk powder were added as a source of Fat& MSNF as required so that the formulation contains 37 % total solids.

T_4 Kulfi mix was standardized to 10% fat, milk solids not fat 14%, 0.3% of stabilizer, the rate of addition of sugar 15% with 2% Salep orchid powder. Cream and Skim milk powder was added as a source of MSNF and fat as required so that the formulation contains 39 % total solids.

T_5 Kulfi mix was standardized to 10% fat, milk solids not fat 14%, 0.3% stabilizer, 15 % sugar with 3% Salep orchid powder. Cream and Skim milk powder was added as a source of MSNF and fat as required so that the formulation contains 39 % total solids.

T_6 Kulfi mix was standardized to 10% fat, milk solids not fat 14%, 0.3% of stabilizer, the rate of addition of sugar 15% with 4% Salep orchid powder. Cream and Skim milk powder was added as a source of MSNF and fat as required so that the formulation contains 39 % total solids.

4. Detail procedure adopted for manufacturing herbal frozen desert (kulfi)

The control Kulfi was prepared by following the standard procedure of with slight modification Here, 1 Kg of Toned milk with 3% fat and 8.5% msnf was placed in a steel pan with a wooden plunger and heated by placing pan in a container containing water (double jacketed vat arrangement) over direct fire. The milk was condensed to (2:1) ratio. Kulfi mix was standardized by adding calculated amount of liquid ingredients and dry ingredient like sugar, stabilizer, cream, SMP to obtain total solids of 39% in the final mix. The mix was held at 68 ºC for 30 minutes to fulfill the PFA requirement of pasteurization. During holding 0.3 percent Stabilizer was added. Then the mix was cooled immediately to 5 ºC. The mix was subsequently frozen in a batch freezer and subsequently be transferred into Kulfi moulds and hardened at -20^0c overnight.

5. For experimental herbal frozen desert (kulfi) mix

Here, 1 Kg of Toned milk with 3.0% fat and 8.5% MSNF was placed in a steel pan with a wooden plunger and heated by placing pan in a container containing water (double jacketed vat arrangement) over direct fire. The milk was condensed to (2:1) ratio calculated amount of liquid ingredients and dry ingredient like, sugar, stabilizer, SMP and Cream, was added as per the requirement in treatments T_1, T2, and T_3. Then mix was held at 68 ºC for 30 minutes to fulfill the PFA requirement of pasteurization and cooled to 42ºC and Salep Orchid powder was added in different variation. Then the mix was cooled to 5 ºC. The mix was subsequently frozen in a batch freezer and subsequently transferred into Kulfi moulds and hardened at -20^0C overnight.

6. Sensory Evaluation

Organoleptic Evolution-The kulfi samples of different treatments was analyzed for Organoleptic Quality (flavour & test, body & texture, colour & appearance and melting resistance, overall acceptability). Attributes will be rated on nine point Hedonic scale (Nelson and Trout, 1964) [5].

Judging panel: Five experienced staff members of the Dairy Technology Department will be served as a judging team and will be evaluated the samples of control and experimental kulfi. Numerical scores will be allocated for flavor, body and texture, melting quality and color of the kulfi. The numerical score will be used as an indication of the quality. The Judges will be also identifying qualities and they will consider to unsatisfactory or satisfactory.

Statistical Analysis: The data on organoleptic evaluation was analyzed statistically. The percentages, standard error, analysis of variance and their statistical significance was ascertained using a computer program me package (Cheema and Sidhu 2004) [2].

7. Results and Discussion

The results shown above indicate that the herbal powder based frozen desert (kulfi) has good sensory score, which was confirmed by method used for the sensory evaluation. The herbal frozen desert (kulfi) prepared by different concentration of green Asparagus powder and Salep orchid powder in 2%, 3% and 4% respectively.

Table A: Table for sensory score of herbal frozen desert

Parameters Of sensory Evaluation	Average of sensory parameters score							
	T_0	T_1	T_2	T_3	T_4	T_5	T_6	CD Value
colour and appearance	8.36	7.86	7.92	7.86	8.26	8.50	8.28	0.33
Body and texture	7.88	7.64	8.04	7.58	8.00	8.60	7.82	0.62
flavour and taste	8.1	7.3	7.58	7.82	8.36	8.58	8.27	0.50
Melting resistance	7.80	8.50	8.10	7.80	8.50	8.10	7.80	0.38
Overall acceptability	8.035	7.825	7.91	7.765	8.28	8.445	8.0425	0.01

Colour and appearance: The highest colour and appearance score of herbal frozen desert prepared by selected medicinal herbs sowed result (table A) was found T_5 followed by T_0, T_1, T_2, T_3, T_4 and T_6. Statistically analysis of colour and appearance score was found significant at 5% level degree of freedom.

Body and texture: The highest body and texture score of herbal frozen desert prepared by selected medicinal herbs sowed result (table A) was found T_5 followed by T_0, T_1, T_2, T_3, T_4 and T_6. Statistically analysis of body and texture score was found significant at 5% level degree of freedom.

Flavour and taste: The highest flavour and taste score of herbal frozen desert prepared by selected medicinal herbs sowed result (table A) was found T_5 followed by T_0, T_1, T_2, T_3, T_4 and T_6. Statistically analysis of flavour and taste score was found significant at 5% level degree of freedom.

Melting resistance: The highest melting resistance score of herbal frozen desert prepared by selected medicinal herbs sowed result (table A) was found T_1 and T_4 followed by T_0, T_2, T_3, T_5 and T_6. Statistically analysis of melting resistance score was found significant at 5% level degree of freedom.

Overall acceptability: The highest overall acceptability score of herbal frozen desert prepared by selected medicinal herbs sowed result (table A) was found T_5 followed by T_0, T_1, T_2, T_3, T_4 and T_6. Statistically analysis of overall acceptability score was found significant at 5% level degree of freedom.

The control and experimental samples prepared in the laboratory were superior in sensory quality viz. colour, flavour and test, body and texture (Singh *et al.,* 2012) [8]. The results also showed that the mean values of organoleptic traits have no effect of on colour and appearance at any level of substitution. However, there was a significant effect of vegetable and herbal oil on body and texture, flavour and overall acceptability as the level of substitution increased beyond 70 per cent due to the oily taste noticed by the judges (Murthy *et al.,* 2009) [3]. Three types of dry *Kulfi* (frozen dessert) blends were prepared from partially de-oiled groundnut meal (PDGM), stabilizers and salts (B_1); PDGM, whole milk powder, stabilizers and salts (B_2); and PDGM, skim milk powder, stabilizers and salts (B_3). The kulfis, designated as K_1, K_2 and K_3, made from B_1, B_2 and B_3, respectively were compared with the control kulfi (Kc) for their average chemical composition, physico-chemical properties and microbiological quality. Comparative appraisal of the sensory scores showed significantly higher scores of Kc than K_1, K_2 and K_3 for colour and appearance, flavour and overall acceptability but K_1 had the highest body and texture scores (Ramachandran *et al.,* 2009). Herbal ice cream is having number of medicinal properties viz anti-septic, anti-microbial, anti-viral, antidiabetic, antioxidants and etc. The *Asparagus adscendens* R. and *Dactylorhiza hatagirea* are as popular medicine plant to fight many human diseases due to present several antioxidant compounds (glutathione, thioredoxin, lipoic acid, ellagitannin-enriched polyphenol and streptozotocin) (Ali *et al.,* 2014) [1]. In the present study herbal frozen desert showed the ability to sensory attribute which may improve flavour and test, colour and appearance, body and texture, melting quality analyzed sensory score by 5 member of institution in 9 hedonic scale.

8. Conclusion

The Sensory attribute of herbal frozen desert (kulfi) prepared by different level of selected medicinal herbs can be determined accurately, conveniently, and rapidly using sensory mathods. The results of the present study revealed that the inclusion of herbs powder in the milk frozen desert T_5 best and high overall score fallowed by other treatment. *Asparagus adscendens* R. and *Dactylorhiza hatagirea* ware found best herbs for flavour and test, colour and appearance, body and texture, melting quality imprudent in milk frozen dessert.

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