International Journal of Innovative Research in Technology, Basic and Applied Sciences
ISSN Hard Print: 2465-7301, ISSN Online: 2467-8171 Vol. 2, No. 1 September, 2015

CHEMICAL PROPERTIES OF ICE CREAM MADE FROM CISSUM POPULNEA (CISSUS GUM)

[1]Ogori A. F, [2]Tanko. S, [3]Joeguluba .J & [4]Apeh M. O
[1,2,3] Federal College of Education
School of Vocational Education P.M.B 39 Niger State
[4] Department of Chemistry
Federal College of Education. F.C.E Zuba
Abuja. Nigeria

Abstract
The use of cissum populnea in the production of ice cream and comparing it with a standard control for its chemical properties were investigated. The chemical results showed that moisture content 18.5 %for sample B, protein 4.4% for sample C, fat value for sample C and D were 6.28% and 614% respectively. Values compared favorably with standard control. Ash value and carbohydrate content were slightly similar with the control sample .This indicates that cissum populnea can take the place of additives in the production of ice cream, and this may be due to its food value compared to other additives ,especially cholesterol in egg as well as it binding nutrient bioavailability.

Keywords*: Cissum gum, ice cream , physiochemical ,ingredient.*

Background to the Study

The history of ice cream would not be legendary without the mention of the Italians marcopolo, the renowned Italian explorer who had spent 17 years in china in the latter part of the 13th century. Unsubstantiated claims that he had discovered some sort of recipe for a milk-based iced product during his time there. It was not, however until the 17th century that the more familiar appearance of the ice cream we recognize today began to emerge.

According to Gordom (2005), ice cream is a frozen desert usually made from dairy products such as milk and cream often combine with fruits on other ingredients and flavours. Most varieties are super although some are made with other sweeteners. In some cases artificial flavorings and colourings are used in addition to, or instead of the natural ingredients. The mixture of chosen ingredient is stirred slowly while cooling in order to incorporate air and to prevent large crystals from forming. Ice cream is comprised of a mixture of air water, milk fat or non diary fats, milk solids not fat (MSNF) sweeteners, stabilizers, emulsifier and flavours.

Ice cream has a high concentration of MSNF, which is 34-36% milk protein when obtained from traditional source thus giving ice cream a protein content of 2.5-40% by weight. The milk protein contained in ice cream is of excellent biological value, because they contain all the essential amino acids. Milk proteins are important source of tryptophan and are especially rich in lysine. The fat content, milk fat consists mainly of triacylglycerides of fatty acids, 98.8% on a weight basis. Glycosides are compounds in which one, two or three fatty and molecules are linked by ester bonds with the trihydric alcohol glycerol mono,di-and triacylglycerides contain one or two and three fatty acids, respectively milk fat is highly complex, containing almost 400 fatty acids. Carbohydrate include starch, dextrin, cellulose, super, pectin's, gums and related substance. Carbohydrate serves as a source of heat and energy in the body. They are broken down to simple sugar under the action of specific enzymes secreted into the digestive tract and the principal end product is glucose.. The mineral content of ice cream are among the richest sources of calcium. The mineral content of ice cream derives almost entirely from the MSNF and is therefore found in proportion to the content of MSNF which can range from about 6 to 14% although it is normally more like 9-11%.

Like milk, ice cream is an important source of several vitamins, the content depending primarily on how much milk solid is contained and the weight of a serving. The high palatability of ice cream is an important factor in choice of it is food. Chewing is not required with most flavours, and smooth velvety texture soothes the palates, it's coldness makes it especially desirable during hot weather. Digestibility is generally high. The exception can be with the lactose malabsorbing individuals. Thus ice cream is an ideal food for times when other foods do not appeal. Not other food contributes so much as ice cream.

Proximate composition analysis of Cissum Populnea showed that it is very rich in carbohydrate (43.7 to 48.1g/100g). The mineral composition of Cissum Polulnea indicate that it is a very good source of mineral with high level of potassium (>1000mg/100g). Other elements present in appreciable quantities are calcium (821 to 905mg/100g). Magnesium (295 - 394 mg/100g) and phosphorus (203 to 251

mg/100g) Soladeya et al (2012). Ice cream is loved not just by kids and teens but most adults too. Ice cream is very popular especially during summer when it is super hot. Because of its high demand, the art of making ice cream at the comfort of our homes is now fast becoming a trend and that is made possible because of our modern technology. That is why ice creams are now available in different flavours and styles for anyone who can create their own flavours at home. Ice cream has been a source of joy to other kids they feel loved when ever ice cream is brought to them by their parents. Some people use ice cream to establish a relationship it gives room for people to be close and forget their sad movements.

Banquate and Debray (1974), Haung (2008) said that some people are allergic to egg due to the high content of cholesterol forming substances in egg . The research focus on ice cream from cissum populneas (cissum gum) as wet ingredient .

Materials

Collection of material batches of plant cissus populnea were between may and June 2014 from a nearby village called Salka. The plant was not popularly known by people. Materials like emulsifier and the vanilla flavor were purchased here in Kontagora market such as, icing sugar, skimmed milk and salt and emulsifier.

Sample Preparation

Sample A1 (control) in a medium pan, heat up the milk, sugar and salt. 6% egg yolks mixture, 70% skimmed milk, 9 % icing sugar, 9% vanilla flavor, 6% liquid emulsifier and a pinch of salt to taste. Beat the 6% eggs for about 20-25 minutes until it brings out foam. Pack the foam in a separate pan do the same until all egg mixture were collected. After collecting the foam from the egg liquid, then add 9% of icing sugar, emulsifier, vanilla, pinch of salt and then heat milk before sugar mixture together. Mix for about 5 minutes until desired texture is obtained then allow it to settle down and freeze.

Sample A extract your cissum populnea gum using hot water extraction and add 12% cissum populnea into a separate medium pan. Beat to reduce the thickness, add 9 % icing sugar into the cissum gum stir for about five minutes, then add 70% skimmed milk, 9%vanilla and a pinch of salt to taste. Mix all ingredients for about 5-10 minutes then allow settling and freeze.

Sample B. In medium pan heat up together for 5 minutes 6% egg mixture, 9 % cissum gum, 70 % skimmed milk, 3 %vanilla,3 % emulsifier a pinch of salt to taste and 9 %icing sugar. Beat eggs for 15-20 minutes until it foams. Pack the foam in a separate pan do so all through until you collected all. Beat cissum gum for 5 minutes to reduce the thickness then add the two mixtures together, egg and the cissum gum

mixture. Mix the two mixtures and add your icing sugar and then heat with milk, sugar and salt together again on stirring for 2 minutes before adding your icing sugar vanilla flavor, pinch of salt and emulsifier, stir to desire texture. Allow to settle and freeze.

Sample C in a medium pan heat up the skimmed milk, sugar and salt. Beat 5% egg yolk mixture, 10 % cissum gum. Then add your 9 % of icing sugar, 70 % of skimmed milk, 3 % vanilla flavor, 3 % of emulsifier and pinch of salt to taste. Mix up tougher for 5 minutes allow the mix to settle down then freeze.

Sample D. Liguid Extract of cissum populnea gum using hot water. Measure at least 15 % of cissum gum in a separate medium pan, beat your cissum populnea gum to reduce its thickness, measure 9% of icing sugar mix with the cissum populnea stir for about 5 minutes, then add 70%milk, 6% vanilla flavor and salt to taste. Mix up together until desire texture is obtained.

Sample E .Extract your cissum populnea gum using hot water, add 9 % of cissum populnea gum and beat it to reduce its thickness. And 9 % of icing sugar mix for about 5-10 minute, then add 70 % of milk, 6 % of vanilla flavor, 6 % of emulsifier and pinch of salt to taste mix together until desire texture is obtained.

Methodology

The approximate value was obtained through analysis at federal university of technology Minna, department of food science laboratory. Methods for moisture content, crude protein, fibre, fat content, ash and carbohydrate values were obtained by (AOAC 2000) methods. The overrun were calculated from difference in terms of raised level of ice cream after freezing from the first day.
Thus total over run = Rise level in day 1 –Rise level in day 2

Results

Table 1. Overrun of prepared ice cream mix samples

Samples	Day 1	Day 2	Total Overrun
Control	2CM	0.5CM	1.25CM
A	1.3CM	0.2CM	0.75CM
B	2.2CM	0.3CM	1.25CM
C	1.9CM	0.4CM	1.15CM
D	2.4CM	0.5CM	1.45CM
E	2.CM	0.3CM	1.2CM

keys

A[1] Control = 70%Milk ,9 % egg mixture ,9 % icing sugar 9% emulsifier 9 % vanilla pinch of salt to taste.

A =12%Cissus populnea ,9% icing sugar 70% skimmed milk 9% vanilla flavor and pinch of salt to taste.

B=6%Egg liguid, 9% cissum populnea 70%skimmed milk 3%vanillas ,3%emulsifier ,pinch of salt to taste and 9%icing sugar.

C =5%Egg liguid 10% cissum populnea 70%skimmed milk 3% vanilla, 3 % emulsifier pinch of salt to taste and 9% icing sugar .

D =15% gum of Cissum populnea 9 % icing sugar 70%skimmed milk 6% vanilla flavor and pinch f salt to taste.

E = 9%Icing sugar 9% cissusm populnea 6% emulsifier ,70%skimmed milk 3% vanilla flavour3 and pinch of salt to taste.

Chemical Composition of Cissum Populnea Ice Cream Blend
Table 2

	Control	A	B	C	D	E
Moisture content	b 18.61	F 13.77	a 18.77	d 14.65	e 14.33	c 15.18
Protein	a 15.0	e 2.82	d 3.72	d 3.72	b 4.43	c 4.00
Fat	14.11[a]	e 5.03	d 5.08	b 6.28	c 6.14	g 3.38
Ash	f 2.08	c 2.63	a 3.18	e 2.26	b 2.87	d 2.39
Carbohydrate	b 73.68	e 69.15	e 69.15	c 73.61	a 74.27	d 71.15

Mean values carrying similar superscripts are not significantly different at 0,05 significant level.

A[1] Control = 70%Milk ,9 % egg mixture ,9 % icing sugar 9% emulsifier 9 % vanilla pinch of salt to taste.

A =12%Cissus populnea ,9% icing sugar 70% skimmed milk 9% vanilla flavor and pinch of salt to taste.

B=6%Egg liguid, 9% cissum populnea 70%skimmed milk 3%vanillas ,3%emulsifier ,pinch of salt to taste and 9%icing sugar.

C =5%Egg liguid 10% cissum populnea 70%skimmed milk 3% vanilla, 3 % emulsifier pinch of salt to taste and 9% icing sugar .

D =15% gum of Cissum populnea 9 % icing sugar 70%skimmed milk 6% vanilla flavor and pinch f salt to taste.

E = 9%Icing sugar 9% cissusm populnea 6% emulsifier ,70%skimmed milk 3% vanilla flavour3 and pinch of salt to taste

Discussion

Table one above showed the overrun of cissus populnea ice cream blends. Sample D (1.45cm) have the highest value overrun followed by sample B .Sample E and A had the least values compared to the control of 1.25 mean value. The advantage here of sample D could be due to latent emulsifying ability of cissum populnea .The low value in sample B and E maybe because of chemical interaction not allowing the complete interaction to have resulted in swell ability of the mixtures Edeoga et al (2005) or could be the quantity of the measurement of the samples. Table two above showed the chemical composition of cissum populnea ice cream blends. The moisture content of sample B were higher at 18.77% and sample A had 13.79% mean moisture content lower among other samples this is an indication that cissum populnea does not bind water properly like hence had a lot of loosely bounded water hence could have storage problem. However the moisture content of D which 14.33% agrees with Braum's vanilla ice cream of 14%moisture content.

Control has the highest value of protein of 15% compare to other samples, it is higher because it contains all the necessary ice cream ingredients .4.43% and 4.00% of sample D and E have good protein value. The disparity maybe due to it chelating strength on the mixture against it phobic tendencies for water. The whey's low vanilla ice cream has protein contents of 4.0% which agrees with protain composition of cissum populnea ice cream blend of 4.0% in sample D and E

Breyer's vanilla ice cream fat content is 4.0% which agreed with all the samples but dis agree with the control of been lower in value mean percentage. The prepared sample from admixture of cissum gum could be potentially good for obese and people having fads with cholesterol diets.

The cissum populnea ice cream blend showed ash content in each of the samples having higher ash values compared to the control. This is an indication that ice cream made from cissum gum could be good roughage and could help indigestion in children. These values also indicate mineralization of the product The carbohydrate value of sample D and C showed favorably against the control sample. Addition of cissum gum indicates dense energy food in ice cream made from cissum populnea better diet for growing infants since protein, vitamins and mineral could be metabolized easily.

Conclusion

Based on the findings of this study it can be concluded that the use of cissum populnea in the production of ice cream can add to it chemical richness. The use of cissum populnea in the production of ice cream is of great importance chemically because it could cause reduction in expense, time wastage, and improve economics of scale in ice creams production, as well as machining and advance nutritional education may be achieved.

References

AOAC (2000), "Official Method of Analysis17th Edition." Washington D.C : Association of Official Method of Analysis

Bouquet, A. & Dbray, M. (1974), "Plants Medicates de La cote Divoire. Travaux e Documents No32, Orstom, Pairs, France.

Edeoga, H.O. Okwu, D.E & Mbaebie, B. O. (2005), "Photochemical Constituent of some Nigeria Medical Plants Africa J". Biotechnology, 4:685-688.

Gordom, M.W. (2005), "Perspectives in Nutrition. 5th Edition.".NY: Publisher.

Huang, T. H. (2008), "Early uses of Soybeans I Chinese History." Chee-beny Sidey mintz University of Illinois Press

Soladaye, M.O. & Chukwuma, E. C. (2012), "Qualitative Photochemical Profile of the leaves of Cissus Populnea Guill & per." (Vitaceae) an Important Medical Plant in Central Nigeria. Arch. Appl. Sci. Res, 4 (1): 200-206.