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MICROBIAL EVALUATION OF BURFI PREPARED FROM HONEY AS A SWEETENING AGENT

G. D. Deshmukh* , G. K. Londe* , A. P. Naik, D. D. Thorat** N. S. Gaikwad*** .**
Department of Animal Husbandry and Dairy Science,
Marathwada Agricultural University, Parbhani-431 402. India.
**** Department of Dairy Science. Toshniwal ACS college Sengaon, Dist:Hingoli (MS)***
***** Department of Microbiology. Toshniwal ACS college Sengaon, Dist:Hingoli (MS)***

ABSTRACT:

The present investigation was carried out to evaluate the microbial quality of burfi prepared from Honey as a Sweetening agent. In microbial effect, during storage the increasing trend Standard Plate count was observed. The maximum Standard Plate count was observed on 6th day of storage. Initially the yeast and mould count in honey burfi was 0.34 x 10^{-3} cfu. The sample was spoiled after 6 days of storage with 1.00 x 10^{-3} cfu at 30 $\pm$ 1^{o}C storage. Whereas, no colonies of coliformia observed on selective media.

KEYWORDS: *Honey, Burfi, Khoa, SPC, Yeast Mould, coliforms*

INTRODUCTION

Milk and milk products occupy a very prominent place in the food sector and economy of India. In India about 50-55 per cent of the India's total milk production is converted into a variety of traditional milk products by the unorganized sector (*Halwais*) employing various unit operations such as coagulation (heat and /or acid), desiccation and fermentation (Banerjee, 1997).

Burfi, a *khoa* based sweet, is comparatively more popular than other milk sweets. *Burfi* is popular milk based confection in India and likely to attain global status.

According to Indian standards Institution (1970), the important steps in the preparation of *burfi* are: desiccation of milk into *khoa* of different consistencies, incorporation of sugar either in crystalline form or as syrup, admixture of other ingredients and subsequent desiccation to get a desired body and texture (soft, semi hard and hard) characteristics of the variety.

Varies investigations shows that in different parts of India presence of different types of microbes, the bacterial pathogens like *Staphylococcus, Streptococcus, E.Coli, Salmonella, Pseudomonas* . Fungal pathogens like *Aspergillus flavus and A.fumigatus* were found in diffirent product of Milk.
(Devashree 2015)

The Honey is natural sweetner, having medicinal qualities. This makes the use of honey less harmful than sugar. It helps to overcome various health problems and provide the sweetmeat with therapeutic value. The present study is, therefore, an attempt to develop a technology for production of *burfi* using honey as a sweetening agent.

MATERIAL AND METHODS

The present investigation was carried out in the Department of Animal Husbandry and Dairy Science, College of Agriculture Latur, Marathwada Agricultural University Parbhani. Buffalo milk was procured from the local market. Milk was standardized to 6.0 per cent fat and 9.0 per cent SNF. Honey used as a Sweetening agent for preparation of *Burfi* was manufactured by DABUR INDIA LTD.

TREATMENT DETAILS : A preliminary trial was conducted to decide the levels of honey on the basis of *khoa*. It is decided that honey is acceptable at the level of 10-20 per cent on the basis of *khoa*. For further

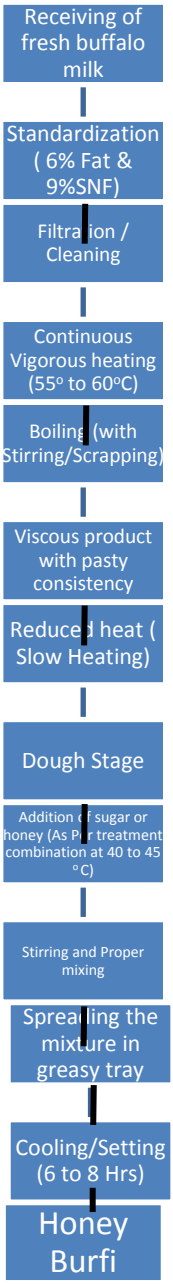
study, *burfi* was prepared by using there-levels of honey on the basis of *khoa*. The details of treatments were as follows.

T_0 *Khoa* + recommended level of sugar (25 %)
T_1 *Khoa* + honey @ 10 % of *khoa*
T_2 *Khoa* + honey @ 15 % of *khoa*
T_3 *Khoa* + honey @ 20 % of *khoa*

Preparation of Burfi using honey as a sweetening agent.

The standardized buffalo milk was concentrated to a dough stage by evaporating in a iron Karahi on a gentle fire. At this stage the honey was added and mixed properly. The product was taken out and spread into a stainless steel tray and was allow to cool and cut into desirable size. A schematic diagram for preparation of burfi using honey as a sweetening agent is given in fig 1.

Fig. 1 : Manufacture of honey *burfi* (flow chart)



Microbiological analysis

Preparation of dilution blanks

Phosphate buffer solution is generally used for preparing dilution blanks to be used in the microbiological analysis of honey *burfi*. The method of preparing dilution blanks was as described in Manual of Dairy Bacteriology (ICAR, 1982).

Phosphate buffer (stock solution) is prepared by dissolving 34 g of potassium di-hydrogen phosphate in 500 ml water, and then adjusting the pH to 7.2 with 1 N NaOH solution and making upto one litre by adding distilled water. 1.25 ml of this stock solution was pipetted out and transferred into a 1 litre volumetric flask and the volume was made upto 1000 ml by adding glass distilled water. This is test solution. 99 ml of this test solution was poured into rectangular glass bottles for preparing 1:10 dilution. For 1:100, 1:1000 and 1:10000 dilutions 9 ml of test tubes. The bottles and test tubes containing dilution blanks were then sterilized at 15 psi for 15 min in an autoclave.

Preparation of dilutions

11.0 g of honey *burfi* was weighed in sterile aluminium dish, in the balance using a sterile spatula. The contents of the aluminium dish was then transferred to a sterile glass mortar. Then about 20 ml of sterile buffer solution (at 45^{o}C) from 99 ml dilution blank was added and smooth paste was made using the pestle which was then transferred into a sterile 250 ml conical flask. Another 20 ml of the buffer was poured into the mortar, rinsed thoroughly and transferred into the flask. Rest of the buffer solution in 99 ml dilution blank was poured into the mortar, rinsed and transferred into the flask. The content of the flask was mixed well. This gives a dilution of 1:10 from this initial dilution further dilutions were prepared by transferring 1 ml into 9 ml blanks.

Standard plate count

Plate count agar (Hi-Media) was used to enumerate the SPC in the honey *burfi* sample.

To rehydrate this medium 23.5 g of the dry medium was suspended in 1000 ml distilled water. The mixture was then boiled to dissolve the medium completely. It was then filled in conical flask and the mouth of the conical flasks was closed with cotton plugs. The conical flasks were then sterilized by autoclaving at 15 psi pressure (121^{o}C) for 15 min.

One ml of the diluted sample (suitable dilution) was transferred in each of the duplicate petri dishes. 10-15 ml of the melted agar (at 45 ^{o} C) was added to each petri dish and 1 drop of 10 % tartaric acid (sterile) was added to them. The contents of the petri dishes were mixed by rotating the plates in horizontal position placing them on a table. The media was allowed to solidify and then inverted and incubated at 37^{o}C for 48 hrs.

Yeast and mould count

Potato Dextrose Agar (Hi Media) was used to enumerate yeast and mould counts in the honey *burfi* samples.

To rehydrate this medium 39 g of PDA powder was suspended in 1000 ml distilled water and then boiled to dissolve the medium completely. It was then filled in conical flasks and the mouth of the flasks was closed with cotton plugs. The flasks were then sterilized by autoclaving at 15 psi pressure (121^{o}C). The pH of the media was adjusted to 3.5 at the time of plating by using 10% sterile tartaric acid solution.

One ml of the diluted sample (suitable dilution) was added to each of the duplicate sterile petri dishes. 10-15 ml of the melted potato dextrose agar (at 45^{o}C) was added to each petri dish and 1 drop of 10 % tartaric acid (sterile) was added to them. The contents of the Petri dishes were mixed by rotating the plates in horizontal position placing them on a table. The media was allowed to solidify and then inverted and incubated at 22^{o}C $\pm$ 2^{o}C for 3 to 5 days.

Coliform count

Violet Red Bile Agar (Hi-media) was used to enumerate the coliform counts in honey *burfi* samples.

To rehydrate this medium 41.5 g of V.R.B.A. powder was suspended in 1000 ml distilled water. The mixture was brought to boil to dissolve completely. The media was then cooled to 45 ^{o}C and poured into conical flasks (150 ml). This media was not autoclaved.

To each of the duplicate sterile Petri dishes were added 1 ml of 1:10 dilution of the sample. To each of these Petri dishes, 10-15 ml of melted (45 ^{o}C). Violet Red Bile Agar was added and the contents of the petridishes were mixed well by rotating the plates by placing them horizontally on a table. The media was then allowed to solidify and then a second layer of agar was made by adding 5-10 ml of melted agar. The media was allowed to solidify and then incubated after inverting the plates at 37 ^{o} C + 0.5 ^{o} C for 2 days.

RESULT AND DISCUSSION

Sample of honey burfi prepared by standardized method described in fig. 1. The product was prepared by using 15% honey on the basis of khoa. Hence microbiological study was conducted for this product with reference to special standard plate count, yeast and mould count and coliform count during storage at 30±1^{0}C in cardboard box.

Standard plate count

The observations given in table 4.12 with reference to standard plate count of honey *burfi* stored at 30 $\pm$ 1^{o}C was also illustrated in fig. 4.2. Initially the SPC count was 0.73 x 10^{-4} cfu. During storage the increasing trends in SPC was observed. The maximum SPC count was observed on 6th day of storage (8.33 x 10^{-4}). The anova table indicates that the interval of storage for SPC was significant. (T > 0.01)

Table : Standard Plate Count of honey *burfi* at various time interval (cfu x 10^{-4}) per g

Days	Replication					Mean
	I	II	III	IV	V	
D_0	0.72	0.67	0.71	0.79	0.77	0.73
D_2	2.39	2.56	2.86	3.17	2.65	2.72
D_4	5.68	6.12	5.80	5.67	6.01	5.85
D_6	8.11	8.44	8.07	8.82	8.23	8.33

ANOVA

SV	d.f.	SS	MSS	Cal 'F'	't'. value	
Replication	4	0.316	0.079			
Treatment	3	169.36	56.42	11.39.3	3.49	**
Error	12	0.588	0.049			
Total	19					

SE = 0.09 CD at 5 % 0.30 Result = Significant

** P < 0.01.

Yeast and Mould count

The observations related to yeast and mould count of honey *burfi* samples stored at 30 $\pm$ 1^{o}C are illustrated in fig. 4.3. Initially the yeast and mould cont in honey *burfi* was 0.34 x 10^{-3} cfu (T_0). The sample was spoiled after 6 days of storage with 1.00 x 10^{-3} cfu at 30 $\pm$ 1^{o}C storage (Table 4.13). ANOVA for the data for Y x M count indicates that the interval of storage (Table 13) show highly significant (T > 0.01) effect.

Table . Yeast and mould count of honey *burfi* at various time interval (cfu x 10^{-3}) per g

Days	Replications					Mean
	I	II	III	IV	V	
D_0	0.10	0.22	0.35	0.47	0.60	0.34
D_2	0.15	0.37	0.55	0.78	0.95	0.56
D_4	0.32	0.56	0.86	1.05	1.61	0.90
D_6	0.45	0.72	0.98	1.25	1.60	1.03

ANOVA

SV	d.f.	SS	MSS	Cal 'F'	't' value	
Replication	4	2.08	0.52			
Treatment	3	1.35	0.45	22.95	3.49	**
Error	12	0.24	0.02			
Total	19					

SE = 0.06 CD at 5 % 0.19 Result = Significant

** P < 0.01.

Coliform

Coliform in any dairy product indicate the hygenic condition maintained during production and packaging. In the present study coliform are found to be absent in honey *burfi*.

CONCLUSIONS

The present investigation was conducted to evaluate the microbiological quality of burfi prepared by using Honey as a Sweetening agent. In these during storage the increasing trend in SPC was observed. The maximum SPC count was observed on 6^{th} day of storage. Initially the yeast and mould count in honey *burfi* was 0.34 x 10^{-3} cfu. The sample was spoiled after 6 days of storage with 1.00 x 10^{-3} cfu at 30 $\pm$ 1^{o}C storage. Whereas, the coliforms are absent during storage.

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