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To study the effect of crushed dried mahua (*Madhuca longifolia*) flowers on physico-chemical properties of burfi

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Abstract

Burfi is one of the most popular milk product of Indian origin, which is conventionally prepared by using khoa. The research work on effect of different combination of crushed dried Mahua flowers on proximate composition of cow milk burfi was conducted during the year 2021-2022. Milk was standardized to 4 percent fat and the burfi was prepared by addition of crushed dried Mahua flowers in the proportion of (T₁) 100:0, (T₂) 90:10, (T₃) 85:15, (T₄) 80:20 and (T₅) 75:25 khoa to crushed dried Mahua flowers. The data were statistically analysed for five treatments and five replications in Completely Randomized Design (CRD). The chemical composition of burfi i.e., protein, fat, Ash and moisture of Burfi were decreased with increase in level of crushed dried Mahua flowers. While total solids, solids not fat and acidity percent were increased with the increase in level of crushed dried Mahua flowers. The Burfi prepared with addition of 20 parts of crushed dried Mahua flowers contained 13.01 percent fat, 14.64 percent protein, 84.21 percent T.S., 70.38 percent SNF, 15.79 percent moisture, 0.34 percent acidity and 2.64 percent ash. Thus, it is inferred that a good quality cow milk burfi with utilizing crushed dried Mahua flowers can be prepared by 80% khoa + 20% crushed dried Mahua flowers and 30 percent sugar.

Keywords: Mahua flowers, burfi, milk, khoa, chemical properties, fat, protein, total solids, acidity, ash

Introduction

Milk has been recognized as a complete food by nutritionists all over the world. It has all the ingredients and nutrients necessary for growth and maintenance of a healthy human body. Indian scripture have been described milk as the elixir of life or Amrita. Milk is the traditional diet has varied greatly in different region of the world. Milk is regarded as a complete food in a human diet. Milk is provided all the nutrients essential for the nourishment of the human body.

Burfi has been flavoured as one of the most popular khoa based sweet all over India. The unique of khoa in terms of its flavour, body and texture to blend with a wide range of food adjunct had permitted development of an impressive array of Burfi varieties. Khare *et al.* (2018) [7] reported that the Mahua tree is having lots of nutritional value in it. It produces fruit which is valued for its seed which yield high quantity of fat commercially known as Mahua butter or mowrah butter, many edible and medicinal applications and it is also used as a biodiesel (Singh *et al.* 1991) [12].

Material and Methods

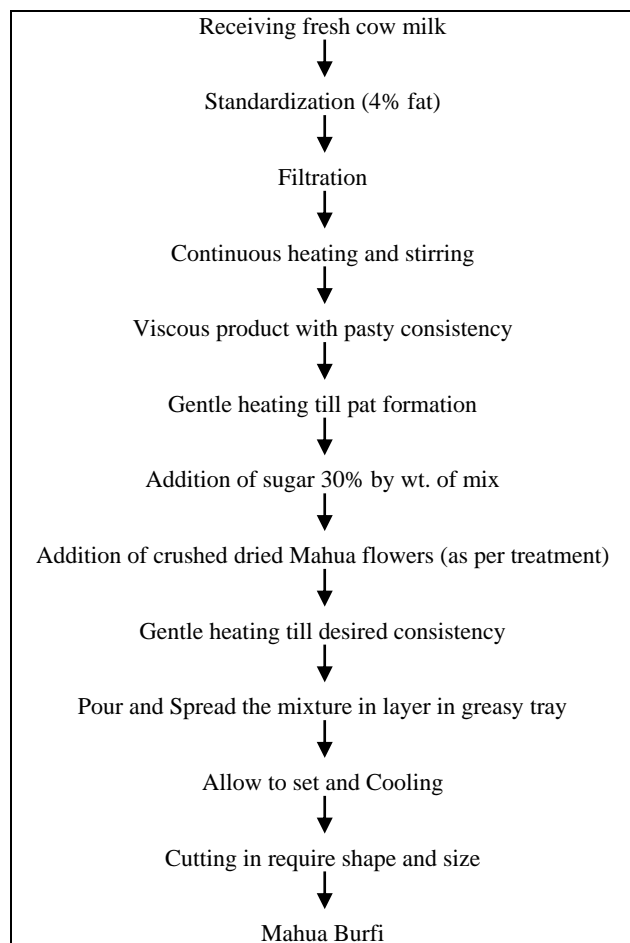
Milk sample of cow was obtained from the Section of Animal Husbandry and Dairy Science, College of Agriculture, Nagpur. The milk was standardized at 4 percent fat by using Pearson's square formula. Good quality of Dried Mahua flowers obtained from local market of Nagpur will be used for preparation of Mahua flowers Burfi.

Treatments details

Burfi was prepared by using four levels of crushed dried Mahua flowers and control treatment i.e., without crushed dried Mahua flowers. The level of sugar at 30% was common in all treatment. The treatment combinations used for the study were T₁ 0% crushed dried Mahua flowers +100% of khoa by weight, T₂ 10% crushed dried Mahua flowers + 90% of khoa by weight, T₃ 15% crushed dried Mahua flowers +85% of khoa by weight, T₄ 20% crushed dried

Mahua flowers + 80% of khoa by weight and T₅ 25% crushed dried Mahua flowers + 75% of khoa by weight.

Preparation of Burfi



Statistical Analysis

The experiment was laid out in CRD with 5 treatments in 5 replications. The data obtained were analyzed statistically according to method described by Snedechor and Cochran (1994) [16]

Results and Discussion

Table 1: Chemical composition of crushed dried Mahua flowers burfi

Treatments	Parameters					
	Fat	Protein	Total Solids	Moisture	Acidity	Ash
T ₁	15.93	15.89	82.23	17.76	0.30	3.51
T ₂	14.81	15.54	82.56	17.35	0.32	3.21
T ₃	14.24	15.01	83.36	16.60	0.34	2.91
T ₄	13.47	14.50	83.99	15.94	0.37	2.80
T ₅	12.74	14.09	84.51	15.22	0.39	2.51
S.E(m)	0.21	0.16	0.13	0.14	0.01	0.04
C.D	0.61	0.47	0.39	0.41	0.03	0.14
Result	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.

Effect of crushed dried Mahua flowers on chemical properties of Burfi

Fat

The data presented in Table 1 indicates that the average fat content in the Burfi was significantly affected due to addition of crushed dried Mahua flowers. Fat content in Burfi was

highest in T₁ (15.93). Fat was decreased as the preparation of crushed dried Mahua flowers in Burfi increased. This is might be due to low fat content in Mahua flowers. This investigation are agree with results obtained by Dhande and Suchita Bhosale (2017) [3] observed the fat content in Burfi was decreased as the proportion of ash gourd pulp in the Burfi was increased, Deshmukh (2020) [2] reported that the fat content was highest 18.92 percent in T₀ (0%) and lowest 15.15 percent in T₃ orange Burfi and Mohod *et al.* (2020) [8] reported that the fat content in treatment (T₁) was highest (29.05%) among all the treatments. The lowest fat content (21.73%) was observed in Burfi prepared with addition of 25 parts of finger millet flour (T₅). Fat content in Burfi was decreased as the proportion of finger millet flour in the Burfi increased.

Protein

The data presented in Table 1 indicates that the Protein content of Burfi by the different levels of crushed dried Mahua flowers Burfi ranges from 15.89 to 14.09 percent. The control plain Burfi T₁ had highest protein content (15.89%). While Burfi prepared with 25 percent crushed dried Mahua flowers had lowest (14.09) percent protein content i.e., T₅. The findings are closed agreement with Tanuja *et al.* (2017) [14] revealed that by addition of apple pomace in Burfi resulted in the percent protein of Burfi was found to be decreased (16.62 to 14.81) with increasing level of apple pomace in the Burfi, Gadekar *et al.* (2018) [4] prepared wood apple Burfi and observed that protein content was highest 13.50 (T₁) and lowest 10.42 (T₅) in Burfi prepared with wood apple and Ramteke *et al.* (2018) [11] reported the protein content of Burfi prepared in the proportion of 100:0 (T₁), 95:05 (T₂), 90:10 (T₃), 85:15 (T₄) and 80:20 (T₅) khoa to potato flour were 18.79, 18.12, 17.50, 16.86 and 16.23 percent respectively as level of potato flour increased protein content in Burfi decreased.

Total solids

The data presented in Table 1 indicates that the Total solids content in Burfi was affected by addition of different levels of crushed dried Mahua flowers in the proportion. Highest level of total solids was noticed in control Burfi T₅ (84.51%) and the lowest level of total solids was in T₁ (82.23%). Results obtained are agreement with Patil (2015) [10] the total solids content increased from 82.23 percent (T₀) to (T₃) 84.24 percent with increase in level of dried date in Burfi. The increase in total solids was there as dried date contains more total solids than khoa, Kapare (2017) [5] reported that total solids content of the finger millet Burfi was in range of 83.16 to 84.20 percent and Mohod *et al.* (2020) [8] observed that the significantly highest total solids were in T₅ (82.02%). It is indicated that as the finger millet flour level increased, total solids content in Burfi also increased.

Moisture

The data presented in Table 1 indicates that the highest moisture was noticed in treatment T₁ (17.76%) and lowest moisture was in T₅ (16.85%). The moisture content in Burfi decreases with the increase of different levels of crushed dried Mahua flowers. These findings are agreement with Patil *et al.* (2015) [10] observed the fat content of dried date Burfi with different proportions of 10:90 (T₁), 15:85 (T₂) and 20:80 (T₃) dried date to khoa as 17.39, 16.59 and 15.76 percent respectively, Kapare (2017) [5] reported moisture content in

finger millet Burfi under various treatments (T₀), (T₁), (T₂), (T₃) and (T₄) were 16.84, 16.62, 16.35, 16.09 and 15.87 percent, Suchita bhosale *et al.* (2018) [13] analyzed that the moisture content in the Burfi was highest in treatment T₁ (17.77 percent) and lowest in T₄ (16.50 percent). The moisture content in Burfi was significantly increased with different levels of bottle gourd pulp and Mohod *et al.* (2020) [8] reported that the moisture content (20.08%) of Burfi prepared without addition of finger millet flour (T₁) was significantly highest than rest of the treatments. As finger millet flour level increased, moisture content in Burfi decreased. This might be due to lowest moisture content of finger millet flour.

Ash

The data presented in Table 1 indicates that the ash content was highest in treatment T₁ (3.51%) and lowest in treatment T₅ (3.21%). It indicates that as the level of crushed dried Mahua flowers increases in Burfi ash content decreases. This was because of less percent of ash in Mahua flowers. These findings are agreement with Kapila Kamble *et al.* (2010) [6] while studied on preparation of pine apple pulp Burfi observed 3.02 to 2.50 percent ash, Wasnik *et al.* (2013) [15] they reported that ash content of santra Burfi was decreases, Suchita Bhosale *et al.* (2018) [13] analyzed the ash content of bottle gourd Burfi as 2.80 to 2.39 percent and Ramteke *et al.* (2018) [11] reported that as the increase in the levels of potato

flour in preparation of Burfi there was decrease in levels of ash content in Burfi form (3.13 to 3.03%).

Acidity

The data presented in Table 1 indicates that the Acidity content in Burfi was affected by addition of different levels of crushed dried Mahua flowers in the proportion. Highest level of Acidity was noticed in control Burfi T₅ (0.39%) and the lowest level of total solids was in T₁ (0.30%). Results obtained are agreement with Bankar (2013) reported that the acidity of pineapple Burfi was significantly increased with the increasing the level of pineapple pulp in the Burfi i.e., T₀ (0.29) control sample, T₁ (0.42), T₂ (5% pineapple pulp), T₃ (0.44) (10% pineapple pulp), T₄ (0.48) (15% pineapple pulp), Navale *et al.* (2014) [9] reported that the control sample T₁ having acidity (0.31) and it increases with the increasing the wood apple pulp in the Burfi and acidity goes upto (0.62) T₅ with 15% wood apple pulp, Patil *et al.* (2015) [10] was reported the titrable acidity of date burfi increased with increase in level of date and Gadekar *et al.* (2018) [4] observed that Burfi samples from treatments T₂, T₃ and T₄ naturally had more acidity due to addition of wood apple pulp having quite high acidity (0.72 to 1.25). It also showed increasing trend as the level of pulp increased.

Overall acceptability

Table 2: Score for overall acceptability of Burfi prepared with different levels of crushed dried Mahua flowers on the basis of 9-point Hedonic scale.

Treatment	Replications					Mean
	R-I	R-II	R-III	R-IV	R-V	
T ₁	7	8	7	7	7	7.2
T ₂	6	7	7	6	6	6.4
T ₃	7	7	6	6	7	6.6
T ₄	8	8	8	8	7	7.8
T ₅	6	6	6	6	5	5.8
S.E= 0.21						
C.D= 0.65						
Result= Sig.						

The data from Table 2. showed that, that, the burfi prepared with 20 parts of crushed dried Mahua flowers (T₄) was highest i.e.,7.8 amongst all the treatments followed by T₁ (0 parts), T₃ (15 parts), T₂ (10 parts) and T₅ (25 parts), respectively.

Conclusions

It may concluded that the superior quality Burfi can be prepared by addition of 20 parts of crushed dried Mahua flowers with 80 parts of khoa and 30% sugar which is common for all treatments. In respect of physico-chemical composition of Burfi fat, protein, ash, moisture percentage significantly decreased with increased levels of crushed dried Mahua flowers while total solids and acidity was increased with the increased level of crushed dried Mahua flowers. Mahua preparations are useful for removing intestinal worms, in respiratory infections and in cases of debility and emaciation. The crushed dried Mahua flowers could be successfully utilized for preparation of Burfi.

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