Studies on preparation of khajoor (Phoenix dactylifera) burfi incorporated with honey

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Abstract
The present study was investigated to optimize the level of honey in khajoor (Phoenix dactylifera) burfi on the basis of organoleptic evaluation. The khajoor burfi formulated by using khoa and khajoor in proportion of 80:20 with incorporation of 2, 4 and 6 per cent honey and subjected to organoleptic evaluation and nutritional composition. The khajoor burfi incorporated with 4% honey scored highest in sensory attributes. Hence on the basis of score of overall acceptability the 4% honey incorporated burfi was liked by panel members. The nutritional composition of all treatments showed that the fat and carbohydrate content of burfi was reduced with increased level of honey. The fat, protein, total sugar and reducing sugar of selected treatments were found to be 16.42, 14.80, 42.43 and 32.52 per cent respectively. Further it can be concluded that honey can be utilized in burfi up to 4 per cent.

Keywords: khajoor, Honey Burfi, Sensory evaluation, Chemical Composition, Mineral composition.

Introduction
The present study was conducted to optimize the level of honey in khajoor (Phoenix dactylifera) burfi. The khajoor burfi incorporated with 4% honey scored highest in sensory attributes. Hence on the basis of score of overall acceptability the 4% honey incorporated burfi was liked by panel members. The nutritional composition of all treatments showed that the fat and carbohydrate content of burfi was reduced with increased level of honey. The fat, protein, total sugar and reducing sugar of selected treatments were found to be 16.42, 14.80, 42.43 and 32.52 per cent respectively. Further it can be concluded that honey can be utilized in burfi up to 4 per cent.

Keywords: khajoor, Honey Burfi, Sensory evaluation, Chemical Composition, Mineral composition.
Honey is a natural sweetener, having medicinal properties. This makes the use of honey less harmful than sugar. If we replace sugar with honey in the sweets and deserts, it will certainly help to overcome various health problems and would provide the sweetmeat with therapeutic value. It is used as laxative, blood purifier, a preventive against cold, cough and fever, curative for sores, eye ailments and ulcers on tongue, sore throat and burns (Srivastava, 1996) [16]. Burfi is one of the highly nutritious khoa based indigenous milk products prepared from cow or buffalo milk, as it contains a considerable amount of milk solids. Sugar is added in different proportions and other ingredients were incorporated according to the demand of consumers. Several varieties of Burfi were sold in the market, depending upon the additives present, and viz., Mawa Burfi, Pista Burfi, Chocolate Burfi, Coconut Burfi and Rava Burfi. Good quality Burfi is characterized by moderately sweet taste, soft and slightly greasy body and smooth texture with very fine grains (Pal, 2000).

Materials and Methods
Materials
The raw materials utilized during present investigation like khajoor, khoa, honey and ghee were procured from local market of Parbhani, Maharashtra.

Equipment’s and machineries
Equipment’s like weighting balance, Mixer, Hand refractometer, thermometer, hot air oven, muffle furnace and other utensils required were used from the Department of Food Science and Technology, VNMKV, Parbhani.

Chemicals and Glasswares
The chemicals and glasswares required for analysis purpose were taken from the Department of Food Science and Technology, VNMKV, Parbhani.

Packaging material
Packaging material i.e. PET bottles, HDPE, LDPE were purchased from local market of Parbhani.

Methods
Formulation of for preparation of khajoor Burfi
Standardization of recipe for Khajoor Burfi
The formulation of Khajoor burfi was done in laboratory by using khoa, khajoor and honey. For preparation of khajoor burfi the level of honey were standardized. The product was standardized based on sensory score.

Table 1: Formulation of khajoor burfi with different levels of honey

<table>
<thead>
<tr>
<th>Sample Code</th>
<th>Khao (g)</th>
<th>Khajoor (g)</th>
<th>Honey (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B0</td>
<td>100</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>B1</td>
<td>80</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>B2</td>
<td>80</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>B3</td>
<td>80</td>
<td>20</td>
<td>6</td>
</tr>
</tbody>
</table>

Preparation of khajoor Paste
To prepare khajoor paste the seeds were removed from khajoor manually. The seedless Khajoor were then crushed in mixer cum grinder to obtain khajoor paste.

Preparation of khajoor Burfi with honey
The khoa was prepared using method given by Patil et al., (2015) [13]; Mete et al., (2017) [9] Buffalo milk was filtered by passing through muslin cloth and was standardized at 6% fat and 9% SNF. The milk was concentrated by evaporating in open pan on gentle fire with continuous stirring-cum-scraping until pasty consistency obtained. The calculated amount of khajoor paste as per treatment and honey were added. The mixture was then further heated with continuous stirring with wooden ladle up to desirable solid mass stage attained. The product was then transferred into greasy tray and was allowed to cool. The final product was cut into rectangular pieces of desirable sizes.

Fig 1: Flow sheet for the preparation of khajoor burfi incorporated with honey

Proximate composition of burfi
Chemical constituents like moisture, protein, fat, and ash content of khajoor burfi were determined by AOAC, (2003) [1]. Reducing and non-reducing sugar were determined as per methods given by (Ranganna 1995) [15].

Sensory evaluation of khajoor burfi
The honey incorpprated Khajoor burfi were evaluated for sensory characteristics like colour and appearance, flavour, texture, taste and overall acceptability using 9 point hedonic rating by 10 semi-trained panel members comprised of academic staff members of the Department of Food Science and Technology, College of Food Technology, VNMKV, Parbhani.

Statistical analysis
The obtained data in the present investigation was statistically analysed. The analysis of variance of the data obtained was done by using Completely Randomized Design (CRD). The analysis of variance revealed at significant of P<0.05 level, S.E. and C.D. at 5% level were mentioned whenever required.
Results and discussion

Sensory evaluation of *khajoor* burfi incorporated with different levels of honey for replacement of sugar.

The study was undertaken to evaluate the effect of incorporation of honey as a sweetening agent in place of sugar in *khajoor* burfi. The *khajoor* Burfi was prepared by adding various levels of honey replacing sugar as per the formulation depicted in Table 1 and the sensory score obtained for the present study is depicted in Table 9.

**Color and appearance**

Color and appearance of *khajoor* burfi was significantly affected by addition of honey at different level. The addition of honey at 4% level in *khajoor* burfi showed (8.02) as compared to control (7.00). However, higher addition of honey up to 6% was not found desirable as showed decreased drastically.

<table>
<thead>
<tr>
<th>Samples Code</th>
<th>Color/ Appearance</th>
<th>Taste</th>
<th>Flavor</th>
<th>Texture</th>
<th>Overall acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>B0</td>
<td>7.00</td>
<td>7.5</td>
<td>7.5</td>
<td>7.50</td>
<td>7.50</td>
</tr>
<tr>
<td>B1</td>
<td>7.52</td>
<td>8.12</td>
<td>8.18</td>
<td>8.06</td>
<td>7.98</td>
</tr>
<tr>
<td>B2</td>
<td>8.02</td>
<td>8.58</td>
<td>8.44</td>
<td>8.46</td>
<td>8.5</td>
</tr>
<tr>
<td>B3</td>
<td>7.6</td>
<td>8.06</td>
<td>7.42</td>
<td>7.94</td>
<td>7.94</td>
</tr>
<tr>
<td>S.E±</td>
<td>0.0349</td>
<td>0.0341</td>
<td>0.0349</td>
<td>0.0302</td>
<td>0.0402</td>
</tr>
<tr>
<td>CD at 5%</td>
<td>0.105</td>
<td>0.1025</td>
<td>0.1049</td>
<td>0.0909</td>
<td>0.121</td>
</tr>
</tbody>
</table>

*Each value represents the average of three determinations
B0= control, B1= 4 % honey, B2= 2 % honey, B3= 6 % honey.

**Chemical composition of *Khajoor* burfi added with honey**

After standardizing the *khajoor* level in burfi i.e. at 20% as per the finalized product based on sensory panel member was selected for addition of honey in place of sugar. Different levels to prepare a *khajoor* burfi with honey. The *Khajoor* burfi incorporated with different levels of honey were selected for further studies and different physicochemical properties viz., moisture, fat, protein, carbohydrate, total solids, and ash content were determined and the results are summarized in Table 3. The data revealed that addition of honey in burfi resulted in increase in various parameters, the percent moisture, carbohydrate, ash, total sugar and reducing sugar found to be increased marginally with increase the level of honey in the burfi.

**Table 3: Chemical composition of honey incorporated burfi**

<table>
<thead>
<tr>
<th>Chemical parameters (%)</th>
<th>Samples</th>
<th>B0</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>SE±</th>
<th>CD at 5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>21.33</td>
<td>26.24</td>
<td>26.35</td>
<td>26.87</td>
<td>0.0058</td>
<td>0.0174</td>
<td></td>
</tr>
<tr>
<td>Fat</td>
<td>15.19</td>
<td>16.45</td>
<td>16.42</td>
<td>16.39</td>
<td>0.0061</td>
<td>0.0184</td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td>12.37</td>
<td>14.80</td>
<td>14.76</td>
<td>14.71</td>
<td>0.0104</td>
<td>0.0278</td>
<td></td>
</tr>
<tr>
<td>Ash</td>
<td>3.04</td>
<td>3.10</td>
<td>3.14</td>
<td>3.19</td>
<td>0.0122</td>
<td>0.0369</td>
<td></td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>47.55</td>
<td>38.89</td>
<td>38.81</td>
<td>38.32</td>
<td>0.0061</td>
<td>0.0184</td>
<td></td>
</tr>
<tr>
<td>Total sugar</td>
<td>47.03</td>
<td>42.43</td>
<td>43.87</td>
<td>45.31</td>
<td>0.0024</td>
<td>0.0071</td>
<td></td>
</tr>
<tr>
<td>Reducing Sugar</td>
<td>31.20</td>
<td>32.52</td>
<td>33.88</td>
<td>35.24</td>
<td>0.0349</td>
<td>0.1049</td>
<td></td>
</tr>
<tr>
<td>Crude Fibre</td>
<td>0.52</td>
<td>0.52</td>
<td>0.52</td>
<td>0.52</td>
<td>0.0105</td>
<td>0.0317</td>
<td></td>
</tr>
</tbody>
</table>

*Each value represents the average of three determinations

Data also revealed that the moisture content of burfi was varied significantly from 21.33 to 26.87 percent compared to control sample of burfi. The increase in moisture content of honey based *khajoor* burfi may be due to hygroscopic nature of honey, which acts a conditioning agent and keeps moisture impact above in burfi. The results are in agreement with finding with Ramanna *et al.*, (1983) [14] and Pal and Gupta (1985) [15]. It also showed the increase in ash from 3.04 to 3.19 per cent and reducing sugar from 31.20 to 35.24 per cent. It also
showed that honey added burfi decrease in fat and protein content. The decrease in these constituents may be due to corresponding lower percent of replacement of 30% sugar from recipe. As in khajoor burfi 30% sugar was added in all incorporation levels. The results are in good agreement with Jose et al., (2014) [4].

Mineral composition of khajoor burfi incorporated with honey
The data showed that the honey blended burfi sample was found to be rich in mineral content. The table further revealed that the manganese and iron content of burfi sample found to be significantly increased with increased level of honey in burfi. The mineral content of control sample was found to be less in mineral value as compare to other treatment samples. The khoa main ingredient was quite high in calcium content and it improves the nutritional value of khoa based products.

Table 4: Mineral composition of prepared khajoor burfi blended with honey

<table>
<thead>
<tr>
<th>Parameters (mg/100g)</th>
<th>Sample</th>
<th>B0</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>SE</th>
<th>CD at 5 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium</td>
<td></td>
<td>14.26</td>
<td>14.26</td>
<td>14.26</td>
<td>14.26</td>
<td>0.0075</td>
<td>0.0224</td>
</tr>
<tr>
<td>Calcium</td>
<td></td>
<td>971</td>
<td>971</td>
<td>971</td>
<td>971</td>
<td>0.8819</td>
<td>0.0265</td>
</tr>
<tr>
<td>Manganese</td>
<td></td>
<td>0.03</td>
<td>0.058</td>
<td>0.126</td>
<td>0.194</td>
<td>0.0096</td>
<td>0.0289</td>
</tr>
<tr>
<td>Iron</td>
<td></td>
<td>0.16</td>
<td>0.128</td>
<td>0.169</td>
<td>0.254</td>
<td>0.0117</td>
<td>0.0352</td>
</tr>
<tr>
<td>Magnesium</td>
<td></td>
<td>12.8</td>
<td>12.8</td>
<td>12.8</td>
<td>12.8</td>
<td>1.0774</td>
<td>0.3232</td>
</tr>
<tr>
<td>Copper</td>
<td></td>
<td>0.048</td>
<td>0.048</td>
<td>0.048</td>
<td>0.048</td>
<td>0.0011</td>
<td>0.0052</td>
</tr>
</tbody>
</table>

*Each value represents the average of three determinations

It is very clearly observed that manganese was increased from 0.05mg/100g to 0.194mg/100g. The increase in manganese content was about 3.88%. It is also interesting to note that iron content which an essential element for maintenance of hemoglobin in females was found to be increased significantly over control. Iron content was increases from 0.16mg/100g to 0.254mg/100g which about to be 1.58% as compare to control. The similar results were reported by Kumar and Shrinivasan (1982) [6] and Eman (2015) [2]. Schmidt (1988) [3].

Conclusion
It may concluded that the superior quality of khajoor burfi incorporated with honey can be prepared by addition of 20 part of khajoor and 80 of Khoa and 4% of honey as the overall acceptance for treatment combination B2 was highest in all the parameters. The dates possess diverse medicinal uses including antihyperlipidemic, anticancer, gastroprotective, hepatoprotective and nephroprotective activities and thereby serving as an important healthy food in the human diet. The observed pharmacological properties may be attributed to the presence of a high concentration of minerals in date.

References
3. Hashempoor M. Date Treasure; Agricultural Education Publication, Tehran, Iran, 1999; 668.