Original Research Article

Study on Preparation Procedure and Standardization of Recipe of Tikhur Burfi blended with Cashew Nut Kernel

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A B S T R A C T

An investigation was conducted at Shaheed Gundadhoor College of Agriculture and Research Station, Kumhrawand, Jagdalpur, Bastar, Chhattisgarh in Horticultural laboratory under AICRP on Tuber Crops. The experiment was undertaken during 2016 and 2017. The experiment was laid out in Completely Randomized Design in which 11 treatments tested in three replications for identification of best recipe for preparation of blended tikhur *Burfi*. Tikhur *Burfi* was prepared in Horticulture laboratory for evaluation of best recipe among 11 different treatments. The different recipe combination of tikhur starch, cashew nut kernel sugar and water in 11 treatments were taken to standardize the recipe. The results clearly indicated that the highest score was also awarded to recipe T_{10} for sweetness. Highest score of 8.31 was awarded by panel of 11 judges after organoleptic taste of tikur *Burfi* to treatment T_{10}=50 parts tikhur powder by weight+50 parts cashew nut kernel. The hedonic scale rating of treatment T_{10} was awarded liked very much (LVM) and liked slightly (LS) after 2 days interval of storage by Judges. The highest score was awarded to treatment T_{10} for its, flavour, fibrousness sweetness, texture and moisture content and similarly T_9 also recorded. Highest score was also awarded to treatment T_{10} for overall acceptability just after preparation and after 14 days storage by panel of judges. On the basis of above findings it can be concluded that the treatment or recipe combination T_{10}=50 parts tikhur powder by weight+ 50 parts cashew nut kernel was best for the preparation of blended tikhur *Burfi*.

Introduction

Tikhur (*Curcuma angustifolia*; family Zingiberaceae) is a rhizomatous herb also known as white turmeric or East Indian Arrowroot. Its cultivation has now been undertaken by the farmers of Bastar on a large area. Tikhur is also found in central province, Bihar, Maharashtra and Southern part of India. In undivided Madhya Pradesh, it is widely distributed in Bastar, Balaghat, Chhindwara, Surguja, Bilaspur, Raipur and Mandla districts (Kirtikar and Basu, 1918). Two types of tikhur are found in the Bastar division; one with

creamy white flowers and another having light pink coloured flowers (Singh *et al.,* 1999). Tikhur rhizomes are used as appetizer reducing burning sensations and stomach pains, removal of stone from kidney, useful for ulcer patient (Sharma, 2003) and rhizome pulp is used for treatment of headache as well as it gives cooling effect (Nag *et al.*, 2006). The starch of tikhur is used for the preparation of many sweet meals and herbal dishes like *Halwa, Barfi, Jalebi* etc. It is used specially during fast (*Vrata, Upwas*). Farmers also prepare herbal drink "*Sarbat*" through tikhur starch during summer due to its cooling effect (Singh and Palta, 2004). Better post harvest management and diversification for production of value added products is one of the dependable methods to make tikhur crop lucrative to both farmers and entrepreneurs. In future the tikhur *Burfi* may be best value added herbal sweets of tikhur in all over India and it may be famous sweets of Bastar. Looking to the importance of the crop for people of the Chhattisgarh an investigation on the preparation procedure and standardization of recipe for Tikhur *Barfi* and to find out the best recipe for preparation of value added product tikhur *Burfi* from starch of tikhur was undertaken.

Experimental methods

The investigation was conducted at IGKV, Shaheed Gundadhoor College of Agriculture and Research Station, Kumhrawand, Jagdalpur, Bastar, Chhattisgarh in Horticultural laboratory. The experiment was undertaken during 2016 and 2017. The experiment was laid out in Completely Random Design in which 11 treatments tested in three replications for identification of best recipe for preparation of tikhur Burfi. Best starch quality genotype IGDMT-10-1 of tikhur was selected as an experimental material and starch of above genotype used for preparation of tikhur Burfi. *Tikhur Burfi* was prepared in

Horticulture laboratory for evaluation of best recipe among 16 different treatments. The different recipe combination of tikhur starch, sugar and water in 11 treatments were taken to standardize the recipe. Tikhur starch powder and cashew nut powder were weighed as per treatment and quantities of sugar and water was added as per standardized method of tikhur burfi preparation. The level of burner was always kept on medium flame and continuously stirred through spoon. After 3-4 minutes of starch, cashew kernel, sugar and water started coagulation. During this period total soluble solids were measured by Digital Refractometer. Then after 5-6 minutes the solution was totally coagulated and put in plate for setting down to give shape of burfi. After setting and cooling of coagulated material, prepared the pieces through knife to give shape of *tikhur burfi* and it was now ready for taking different observations and Organopeptic Test.The tikhur Barfi were evaluated in three replications by a panel of 11 judges consisting of staff and students of SG College of Agriculture and Research Station, Kumhrawand, Jagdalpur, Chhattisgarh for organoleptic test. Scoring was done for various characters based on 10 marks headonic scale rating (Amerine *et al*., 1965). The values given by each of the 11 judges were then averaged for statistical analysis.

Experimental findings and analysis

The findings of the present study as well as relevant discussion have been presented under following heads: Estimation of total soluble solids (TSS), final weight of prepared product (Burfi), storability of Burfi and weight loss during storage of tikhur Barfi (2016-17 and 2017-18): The tikhur Barfi prepared through different recipes was subjected to analysis for determination of total soluble solids (%), final weight of prepared product (g), storability of tikhur Barfi (days) and weight loss during storage (%) and standardization of recipe for

preparation of tikhur Barfi. The results obtained are presented in the Table 1.

Final weight of prepared product (kg)

Final weight of prepared product was recorded highest in treatment T_0 (1.871kg) followed by T_1 (1.827kg). The lowest weight of prepared product was recorded in treatment T_{10} (1.435kg) in the year 2016-17. Final weight of prepared product was recorded maximum in treatment T_0 (1823.8kg) followed by T_1 (1782.6 g) whereas, lowest was observed in treatment T_{10} (1411.9 g) during the year 2017-18. As the *tikhur* content decreased and cashew nut content increased in the final product, the moisture content decreased in the final product highest moisture content with addition of tikhur powder was due to higher level of starch, which facilitated the retention of more moisture inside the dough during *burfi* preparation.

Storability of tikhur Burfi (days)

Maximum storability of tikhur *Burfi* was observed in treatment T_{10} and T_9, during 2016-17 and 2017-18 *i.e.* 10 days and 9.4 days respectively, which were significantly superior to other treatments. The minimum storability was observed in treatment T_0 during the year 2016-17 and 2017-18 *i.e.* 4 days and 4.5 days respectively.

Weight loss during storage (%)

Maximum weight loss per cent of tikhur *Burfi* was observed in treatment T_0 during 2016-17 and 2017-18 *i.e.* 18.96 and 18.88% respectively, which were significantly superior to other treatments. The minimum weight loss per cent was observed in treatment T_{10} during the year 2016-17.and 2017-18 (5.17 and 5.31%) respectively.

Table.1

	2016-17				2017-18		
Treatments	Final product weight	Storability (days)	Weight loss during storage (%)	Treatments	Final product weight	Storability	Weight loss during storage
T_0	1.871	4	18.96	T_0	1823.8	4.5	18.88
T_1	1.827	5	18.64	T_1	1782.61	5.8	18.72
T_2	1.783	6	5.88	T_2	1741.4	6.2	6.62
T_3	1.740	6	13.04	T_3	1700.2	6.5	12.78
T_4	1.696	7	13.23	T_4	1659	7.2	13.12
T_5	1.653	7	12.50	T_5	1617.8	7.4	12.42
T_6	1.609	8	10.60	T_6	1576	7.8	11.31
T_7	1.566	8	9.78	T_7	1535.4	7.6	9.82
T_8	1.522	9	13.33	T_8	1494.2	8.2	13.15
T_9	1.479	10	7.40	T_9	1458.5	9.3	7.52
T_{10}	1.435	10	5.17	T_{10}	1411.9	9.4	5.31

Table.2 Effect of different levels of tikhur and cashew nut kernels on organoleptic score of tikhur burfi(2016-17)

Treatment	Appearances	Flavor	Fibrousness	Sweetness	Texture	Moisture	Overall Acceptability
T_0-100 parts *Tikhur* powder by weight +0 parts Cashew nut kernel	8.30	7.82	7.67	7.57	8.47	5.32	7.53
T_1-95 parts *Tikhur* powder by weight +5 parts Cashew nut kernel	5.17	4.88	3.83	5.26	4.23	3.92	4.55
T_2-90 parts *Tikhur* powder by weight +10 parts Cashew nut kernel	4.43	4.92	4.28	5.23	4.92	3.90	4.61
T_3-85 parts *Tikhur* powder by weight +15 parts Cashew nut kernel	6.02	4.90	5.47	6.28	5.28	4.92	5.48
T_4-80 parts *Tikhur* powder by weight +20 parts Cashew nut kernel	5.88	5.94	5.57	6.62	6.02	6.02	6.01
T_5-75 parts *Tikhur* powder by weight +25 parts Cashew nut kernel	6.10	5.91	6.28	7.28	6.59	6.38	6.42
T_6-70 parts *Tikhur* powder by weight +30 parts Cashew nut kernel	6.23	7.04	6.92	7.58	6.92	6.32	6.84
T_7-65 parts *Tikhur* powder by weight +35 parts Cashew nut kernel	6.98	7.08	6.98	7.54	7.52	6.94	7.17
T_8-60 parts *Tikhur* powder by weight +40 parts Cashew nut kernel	7.48	7.02	8.12	8.24	8.02	6.92	7.63
T_9-55 parts *Tikhur* powder by weight +45 parts Cashew nut kernel	8.62	7.98	8.24	8.56	8.32	8.08	8.30
T_{10}-50parts *Tikhur* powder by weight +50 parts Cashew nut kernel	8.19	8.02	8.57	9.28	8.68	8.62	8.56
SEm	0.19	0.17	0.03	0.12	0.04	0.04	0.04
CD	0.55	0.50	0.09	0.04	0.11	0.11	0.12
CV	4.80	4.55	0.81	0.99	0.94	1.03	1.03

Table.3 Effect of different levels of tikhur and cashew nut kernel on organoleptic score of tikhur burfi (2017-18)

Treatment	Appearances	Flavor	Fibrousness	Sweetness	Texture	Moisture	Overall Acceptability
T_0-100 parts *Tikhur* powder by weight +0 parts Cashew nut kernel	8.60	8.00	7.67	7.67	8.67	5.5	7.68
T_1-95 parts *Tikhur* powder by weight +5 parts Cashew nut kernel	5.27	5.00	3.67	5.33	4.33	4.0	4.60
T_2-90 parts *Tikhur* powder by weight +10 parts Cashew nut kernel	4.73	5.03	4.31	5.33	5.00	4.0	4.73
T_3-85 parts *Tikhur* powder by weight +15 parts Cashew nut kernel	6.13	5.00	5.67	6.33	5.33	5.0	5.58
T_4-80 parts *Tikhur* powder by weight +20 parts Cashew nut kernel	5.93	6.00	5.67	6.67	6.00	6.0	6.05
T_5-75 parts *Tikhur* powder by weight +25 parts Cashew nut kernel	6.40	6.00	6.33	7.33	6.67	6.5	6.54
T_6-70 parts *Tikhur* powder by weight +30 parts Cashew nut kernel	6.33	7.00	7.00	7.67	7.00	6.5	6.92
T_7-65 parts *Tikhur* powder by weight +35 parts Cashew nut kernel	7.13	7.00	7.00	7.67	7.67	7.0	7.25
T_8-60 parts *Tikhur* powder by weight +40 parts Cashew nut kernel	7.93	7.00	8.33	8.33	8.33	7.0	7.82
T_9-55 parts *Tikhur* powder by weight +45 parts Cashew nut kernel	8.93	8.00	8.31	8.67	8.67	8.0	8.43
T_{10}-50parts *Tikhur* powder by weight +50 parts Cashew nut kernel	8.40	8.00	8.67	9.33	9.00	8.5	8.65
SEm	0.28	0.19	0.01	0.03	0.03	0.02	0.06
CD	0.82	0.55	0.04	0.10	0.09	0.06	0.16
CV	7.04	4.96	0.33	0.78	0.74	0.61	1..41

Organoleptic score of tikhur *Burfi*

The mean score of different sensory characteristics of *blended burfi* is presented in Table 2. Organoleptic scores were judged by panel of 11 judges and during 2016-17. Scores for Appearance, Flavor, Fibrousness, Sweetness, Texture, Moisture and Overall acceptability in different treatment combinations were in the range of 5.17-8.62, 4.88-8.02, 3.83-8.57, 5.23-9.28, 4.23-8.68, 3.90-8.62 and 4.55-8.56, respectively.

The highest score of (8.62) was awarded to treatment T_9 for its appearance whereas, lowest was (4.43) under T_2.

In case of flavor, the highest organoleptic score of (8.02) was observed under treatment T_{10} for its flavour and lowest (4.88) for T_1.

The treatment T_{10} had the highest organoleptic score (8.57) for its fibrousness and lowest was (3.83) for treatment T_1.

For sweetness of tikhur burfi in treatment T_{10} recorded the highest score of (9.28) and lowest (5.23) under treatment T_2.

Highest score of (8.68) was awarded to treatment T_{10} for its texture and lowest score was (4.23) to treatment T_1.

Highest score of (8.62) was awarded to treatment T_8 for its moisture content and lowest score was (3.90) to treatment T_2.

The overall acceptability recorded the highest score of (8.56) under T_{10} the recipe *i.e.* T_{10}-50 parts *Tikhur* powder by weight +50 parts Cashew nut kernel while lowest score (4.55) was recorded under the treatment T_1 -95 parts *Tikhur* powder by weight +5 parts Cashew The mean score of different sensory characteristics of blended burfi during 2017-18 is presented in Table 3.

Organoleptic scores were judged by panel of 11 judges and given in Table 3. Scores for Appearance, Flavor, Fibrousness, Sweetness, Texture, Moisture and Overall acceptability in different treatment combinations were in the range of 4.73-8.93, 5.00-8.00, 3.67-8.67, 5.33-9.33, 4.33-9.00, 4-8.50 and 4.60-8.65, respectively.

The highest score of (8.93) was awarded to treatment T_9 for its appearance whereas, lowest was (4.73) under T_2.

In case of flavor, the highest organoleptic score of (8.00) was observed under treatment T_{10} for its flavour and lowest (5.00) for T_1. The treatment T_{10} had the highest organoleptic score (8.67) for its fibrousness and lowest was (3.67) for treatment T_1.

For sweetness of tikhur burfi, treatment T_{10} recorded the highest score of (9.33) and lowest (5.33) under treatment T_2. Highest score of (9.00) was awarded to treatment T_{10} for its texture and lowest score was (4.33) to treatment T_1. Highest score of (8.50) was awarded to treatment T_8 for its moisture content and lowest score was (4.00) to treatment T_2.

The overall acceptability recorded the highest score of (8.65) under T_{10} recipe *i.e.* 50parts *Tikhur* powder by weight +50 parts Cashew nut kernel while lowest score (4.60) was recorded under the treatment T_1.-95 parts *Tikhur* powder by weight +5 parts Cashew nut kernel The former treatment (T_{10}) was liked very much through hedonic scale rating as compared to other treatment recipes.

Summary and conclusion is as follows:

Final weight of prepared product was recorded highest in treatment T0 and lowest was in T10. Weight loss during storage was maximum in treatment T_0 and minimum in

treatment T_{10}. Under organoleptic test of tikhur *Burfi* the highest or organoleptic score was awarded to recipe T_{10} for its flavour fibrousness sweetness, texture and moisture. The hedonic scale rating of treatment T10 was awarded liked very much (LE) by panel of 11 Judges. The treatment T_{10} or recipe combination T_{10}= 50 parts of tikhur starch by weight+ 50 parts cashew nut kernel has been standardized for preparation of tikhur *Burfi*. Treatment T_{10} awarded highest organoleptic score by panel of 11 Judges and liked extremely by judges through over all organoleptic rating.

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