

Original Research Article

Sensory and Nutritional Evaluation of Value Added Products Prepared from Mahua Flower

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ABSTRACT

Keywords

Ashwagandha,
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alternata*,
management,
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biofertilizer

Mahua (*Madhuca longifolia*) occupies important place in the diet and economy of tribal people. It belongs to Sapotaceae family. In India, It is found in the states of UP, Madhya Pradesh, orissa, Jharkhand, Chattishgarh, Gujrat, Andhra Pradesh, Maharashtra, Bihar, West Bengal & Karnatka. Every part of Mahua tree is used by the tribal for their livelihood. However now a days it is losing its importance as food due to Urbanization, Lack of value addition technologies and changing food preferences. At present the most popular use of Mahua is in liquor making, due to its high sugar content. Its leaves and bark is used as medicine by tribals to cure different type of diseases. Mahua flower is big source of nutrients like, Protein, Vitamins, Carbohydrate, Minerals, Enzymes & organic acids. Lack of knowledge of value added technology related to their diversified use results in distress sell. Keeping this in view an attempt was made to popularize its diversified use for higher income as well as food security orientation. For this an on farm trial was conducted for technology assessment and refinement. The location of study was Jamtara district. The Technology is related to Ladoo and pickle was demonstrated among 20 families spread over 20 villages. For conducting OFT, three technology options were selected. TO1- Farmers Practice (sell of Raw Mahua); TO2-Value addition of Mahua flower by Making Pickle; TO3-Value addition of Mahua flower by making Ladoo. Pre treatment of Mahua flower was done before making Pickle and Ladoo. Sensory evaluation was done on five point scale and chemical analysis was done by standard method. Both pickle and ladoo was liked extremely by the farm women. However, pickle was preferred due to higher B:C ratio and shelf life. Both products contain appreciable amount of nutritional value. Food use of Mahua flower can be revived by disseminating cost effective value addition technology and has potential to be promoted for rural entrepreneurship.

Introduction

Mahua (*Madhuca longifolia*) occupies important place in the diet and economy of tribal people. The corolla of Mahua flowers are edible and form as important constituent of tribal diet. It is a multipurpose forest tree, more than 70 % of tribal population is engaged in collection, drying and selling Mahua flower. It is an important tree found

largely in Santhal Pargana area of Jharkhand. It is also found in UP, Madhya Pradesh, orissa, Chattishgarh, Gujrat, Andhra Pradesh, Maharashtra, Bihar, West Bengal & Karnatka. The tree is considered a boon for the tribals who are forest dwellers and keenly conserve this tree. The flowers of the tree which have a unique fragrance use

to produce alcohol and provide livelihood to thousands of people. There are multipurpose uses of Mahua flower and also used as a herbal medicines. It is a primary source of tribal house hold for four months of a year.

However, now days it is losing its importance as food due to urbanization, lack of value addition technologies and changing food preferences. At present the most popular use of Mahua is liquor making. Lack of knowledge of value added technologies related to their diversified use results in distress sell. It is also an effort to make people divert to hazardous use liquor to value added product. Keeping this in view an attempt was made to popularize its diversified use for higher income as well as food security orientation.

Materials and Methods

Technology assessment and refinement through conducting on farm trial was done at Jamtara district of Jharkhand. At first for conducting on farm trial, 20 villages were selected where Mahua flower is found abundant amount. The technologies related to pickle and laddoo was demonstrated among 20 families spread over 20 villages of Jamtara district.

Technology option

TO-1 Farmers Practice (Sell of Raw Mahua)

TO-2 Value addition of Mahua Flower by making pickle

TO-3 Value addition of Mahua flower by making Laddoo

Hygienic collection

The established practice of collection of Mahua flower is that once the flower falls on the ground they are swept by using broom

and collected. This results in the collection of impurities along with the flowers. In order to avoid contamination of the collection of Mahua flower netting is tied and pegged under the tree to avoid flowers falling on the ground as per usual practice and then collection of Mahua flowers often they set on the net.

Pre-processing treatment

Pre processing treatment was introduced which consists of washing, manual removal of stamens and blanching with preservatives. The pre-processed material was then dried using shade drying technique. Removal of stamen from Mahua flower by manually with hands or by Machines. Dehydration was done in shade drying on trays as well as on black sheets under shade netting.

Sensory evaluation and organoleptic acceptability was assessed by five point scale that included sensory attribution taste, appearance, colour, flavor & acceptance. To study the shelf life of laddoo, sensory evaluation was conducted by scoring taste. Attributes to be scored as 5 = Excellent, 4 = Very good, 3 = Good, 2 = Fair and 1 = Poor.

Results and Discussion

Both pickle and laddoo were liked extremely by the farm women, however pickle was preferred due to higher B:C ratio and shelf life.

Both products contain appreciable amount of nutritional value.

It was observed that colour and flavor of laddoo remain constant throughout for weeks. Then there was a slight decline in taste and aroma which may be due to oxidative change brought by nuts & Ghee

The taste and aroma of pickle scored good with good acceptability and more shelf life than laddoo.

Laddoo was good for children health point of view for combating malnutrition.

Result reveals that the developed value added products in the form of Laddoo and pickle were highly acceptable having a score of 4.32 and 4.49 respectively. The protein content of the product was more in laddoo i.e. 5.23 than the pickle i.e. 4.04. The fat content of pickle was 4.24 and of laddoo were 7.96 and calcium content was 130 and 139 mg in Pickle & Laddoo respectively. Out of the developed product, Laddoo and Pickle meet

the 1/3rd requirement of protein and intake of 100 gram of Laddoo can fulfill about 1/3rd of RDA of iron. Incorporation of sesame seed in laddoo improves the protein and mineral content.

The Table no.-2 reveals that mean score for colour of laddoo was 4.71 and the mean score of pickle was less than laddoo (4.57). The taste score of laddoo were same (4.57). The flavor score of pickle was higher (4.57) than laddoo (4.42). Appearance of laddoo (4.25) was more eyes catching than pickle (4.28). Then at last over all acceptability, shelf life & B:C ratio of pickle was more than the laddoo.

Table.1 The nutritional value of Mahua flower (100 gms)

NUTRIENT	QTY
Protein	4.4 g
Fat	0.6 g
Minerals	2.7 g
Fiber	1.7 g
Carbohydrate	72.0 g
Energy	311 Kcal
Calcium	140 mg
Phosphorus	140 mg
Iron	15.0 mg
Carotene	23 ug.
Thiamin	0.03 mg
Riboflavin	0.80 mg
Niacin	5.2 mg
Vitamin C	7 mg
Source: National Institute of Nutrition, Hydrabad	

Table.2 Organoleptic evaluation of Mahua pickle & Mahua laddoo

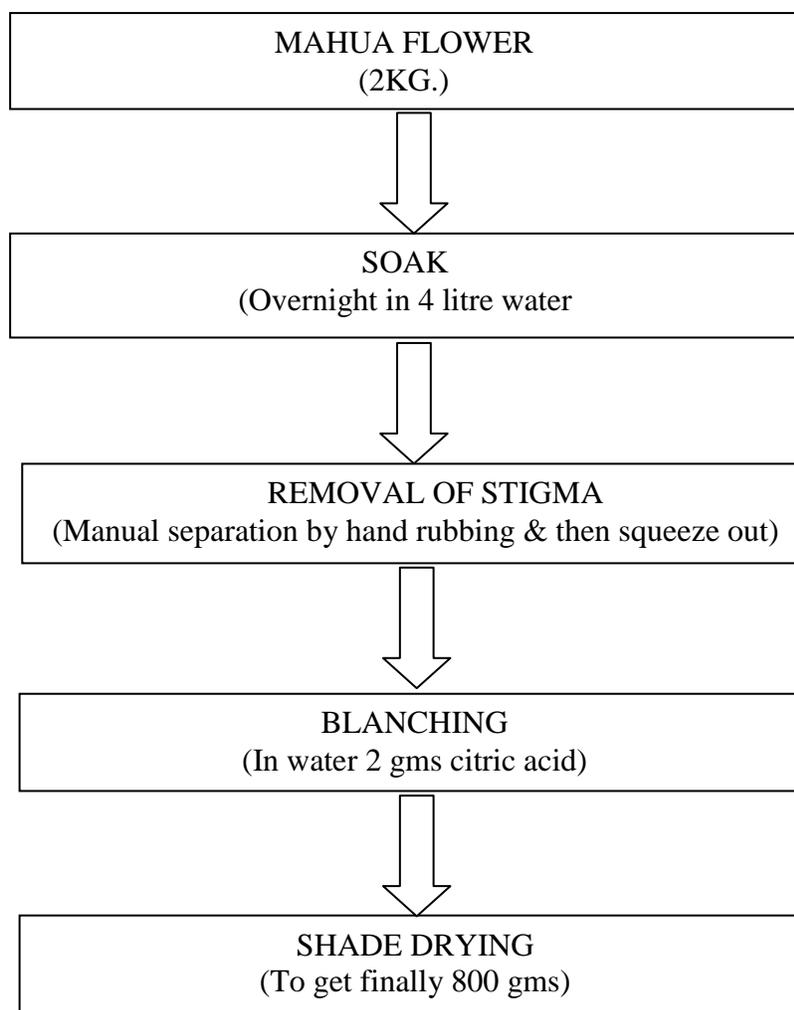
Technology Option	Shelf Life (Days)					Shelf Life	B:C
	Colour	Taste	Flavor	Appearance	Acceptability		
Farmers Practice	2.57 ±0.13	2.74 ±0.15	2.42 ±0.13	1.57 ±0.13	2.52 ±0.13	30	
TO-1	4.57 ±0.16	4.57 ±0.10	4.57 ±0.21	3.57 ±0.10	4.49 ±0.0	180	1:3.5
TO-2	4.71 ±0.13	4.57 ±0.14	4.42 ±0.18	4.28 ±0.0	4.32 ±0.0	15	1:2.6

Sensory score scale- (5 = Excellent, 4 = Very good, 3 = Good, 2 = Fair and 1 = Poor.)

Table.3 Chemical composition of mahua pickle and mahua laddoo per 100 gram

Observation Parameter	Value added product of Mahua flower		
	Dried Mahua Flower	Pickle	Ladoo
Energy (k cal)	311.00 ±1.14	375.808 ±1.56	518.581 ±2.10
Protein (g)	4.40 ±0.05	4.047 ±0.07	5.230 ±0.06
Fat (g)	0.60 ±0.4	4.240 ±0.22	7.960 ±0.15
Carbohydrate (g)	72.00 ±0.22	60.550 ±0.31	17.310 ±0.42
Calcium (mg)	140.00 ±1.83	139.000 ±1.90	130.000 ±1.76
Phosphorus (mg)	140.00 ±0.14	127.200 ±0.12	157.200 ±0.76
Iron (mg)	15.00 ±0.10	12.708 ±0.09	9.720 ±0.16
βcarotene (μg)	23.00 ±0.88	30.365 ±0.28	239.324 ±0.10

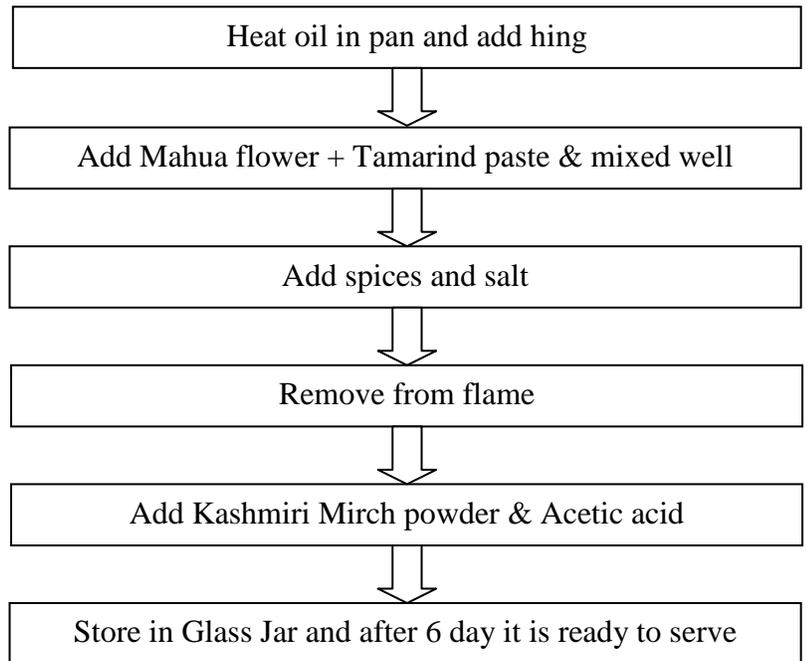
Flow chart for the pre-treatment of Mahua flower



INGREDIENTS REQUIRED FOR

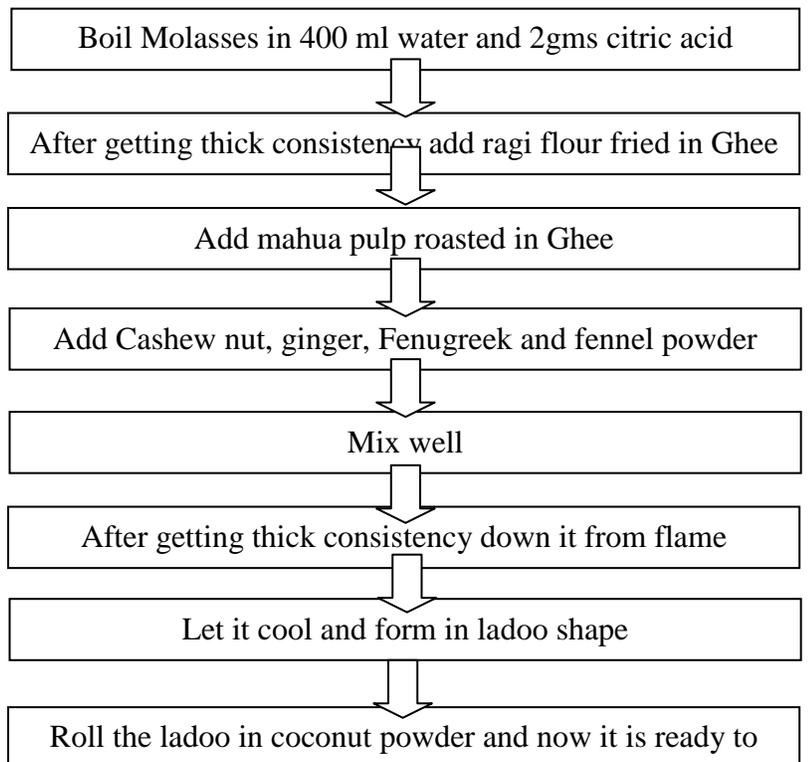
TO-2 :	Mahua Flower	1 kg
	Tamarind paste	400gms
	Chilli Powder	20gm
	Fenugreek Powder	10gm
	Cumin Powder	10gms
	Mustard Powder	20gms
	Kashmiri Mirch	10gm
	Asafetida (Hing)	4gm
	Fennel seed powder	3gm
	Salt	140gm
	Acetic acid	5ml
	Mustard Oil	250ml

FLOW DIAGRAM OF TO-2



FLOW DIAGRAM OF TO-3

TO-3 :	Mahua Pulp	1 kg
	Molasses	100gms
	Ragi flour	500gms
	Cashew Nut	100gms
	Sesame seed	40gms
	Fenugreek powder	10gm
	Dried ginger powder	20gm
	Ghee	100ml
	Coconut Powder	200gms
	Citric acid	4 gms



It can be concluded as follows:

Mahua ladoo is a product providing variety of nutrients and can be recommended for all age group as it has good biological value

The value added product obtained by standardized processing from Mahua flower will help to combat malnutrition to meet the nutritional requirement of growing children while added variety to food.

It helps to divert the tribal people from liquor to value added products while focusing on employment and income generation through commercial use of flower.

It can be processed into nutraceutical food products which mainly help in fighting with severe and most common malnutrition.

Tribal people in villages do not have sufficient money for various resources to earn their living, that is why they fully or partially dependent on the natural resources which are easily available, cheap and renewable.

The study shows that Mahua flower is having potential to satisfy needs of rural tribal people.

It can be concluded that food of Mahua flower can be revived by disseminating cost effective value addition technologies and has potential to be promoted for rural entrepreneurship.

It become the future raw material for food processing industries to manufacture numerous food products due to its high nutritive value which can add variety to human diet and also help in the development of life style of tribal people in major grown area of Mahua tree.

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