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Development of Processed Products from Noni (*Morinda citrifolia* L.)

by

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Summary and Conclusion

The project was aimed to prepare food products like jam, jelly, ketchup, pickle and squash using noni fruit, assess the acceptability of these products through sensory evaluation using a panel of judges and to standardize the most accepted product. Five trials were conducted and the summary of the findings of each trial are given below.

- Trial I : Trial I depicted that a much more healthier version of commonly used products like jam, jelly, ketchup, pickle and squash using noni fruit can be prepared and the results of sensory evaluation of trial I indicated that the recipes should be improvised for consumer acceptance.
- Trial II: The sensory evaluation of trial II products revealed that majority of the people preferred and have rated noni products as 'good' and 'very good' in comparison with the commercial products. Specific jams like noni pineapple jam and noni strawberry jam could be prepared. The use of natural colors especially for jelly and squash by varying the ingredients will provide wider choices for health conscious people. Incorporation of spices like ginger and garlic in pickle will add variety to noni pickle, making it tastier and a healthier accompaniment.
- Trial III: In the third trial innovations like noni pineapple jam, noni guava jelly, noni tomato ketchup with increased concentration of noni

than the previous trials, noni ginger garlic pickle and noni ginger lime squash were prepared. The sensory evaluation of trial III products revealed that noni mixed fruit jam, noni tomato ketchup (20% Noni concentration), noni ginger garlic pickle and noni ginger lime squash were the most preferred.

- Trial IV: In Trial IV, the products were prepared in smaller portions (10 samples). Every detail about the preparation (like taken for the whole preparation, ingredients utilized, output obtained etc) was noted down.
- Trial. V: Trial V was a repetition of trial IV so that a standard recipe could be developed. Noni mixed fruit jam, noni ginger garlic pickle and noni ginger lime squash were standardized but noni jelly and noni tomato ketchup couldn't be standardized. The pectin content of noni fruit varied from batch to batch and hence the pectin content had to be determined during every preparation so that jelly will be set properly. In the case of noni tomato ketchup, due to variation in the pulp content of both noni and tomatoes, the time duration for the preparation of noni tomato ketchup varied. The amount of ketchup obtained also reduced due to decreased pulp extraction. With the help of consistometer, the initial consistency of the fruit pulps could be assessed along with the end point.
- The recipes of the products are given below. Among them the recipes of noni mixed fruit jam, noni ginger garlic pickle and noni ginger lime squash are standardized recipes.

Recipes

a. Noni Mixed Fruit Jam

Ingredients required:

Noni fruit	185g
Fruit pulp	1.2kg
	(Apple, papaya, guava, banana - 300g each)
Parry's sugar	1.2kg
Sodium benzoate (SB)	2.5g
Red bust color	2.5g
Citric acid	7.5g
Tiger brand essence	3ml

Preparation method

Wash all the fruits and shred them except noni fruit. Cut noni fruit into small pieces and add 280 ml of water and allow it cook for 20 minutes. Extract the pulp of the noni fruit by passing it through the small pulper. Grind all the other fruits in the mixer grinder. Mix sugar and all fruit pulp together well and cook it over a medium flame till the end point is reached. The end point of the jam is the sheet formation on the ladle if held in a slanting position. Add the color, essence, citric acid and sodium benzoate (SB) and immediately remove it from the flame. Transfer the prepared jam immediately to sterilized bottles and fill it up to the top. After 5 minutes of cooling, close it well.

Pre preparation time - 90 minutes
Cooking time - 40 minutes
Serves - 10 bottles of 200g each

b. Noni Jelly

Ingredients required

Noni Fruit (unripe) 1.66 kg
Clean sugar (Parry's) 1.5 kg
Water 4.74 l

Method of Preparation

Wash and cut noni into ½ inch thick pieces. All the said amount of water and heat it on a medium flame for about 40 minutes and filter it. To 3l of this filtrate, sugar was added and boiled till done (sheeting was visible). After a few minutes the jelly was removed from the fire and was poured into the mould and was allowed to cool.

Pre preparation time - 40 minutes
Cooking time - 60 minutes
Serves - 10 bottles of 200g each

c. Noni Tomato ketchup

Ingredients required

Noni fruit 630 g
Tomato 3 kg
Onion 625 g
Sugar 320 g
Salt 100 g
Sakthi Garam masala 40 g
Sakthi Chilli powder 40 g
Everest Kashmiri lal powder 40 g
Garlic 30 g
Acetic acid 115 ml

Method of Preparation

Fresh ripened fruits were selected, washed and were cut into small pieces. To the cut fruits, chopped tomatoes, ground onion and garlic were added. The mixture was allowed to boil till the tomatoes became very tender. Then it was extracted. In the mean time, a spice bag was prepared. Chilli powder, *Kashmiri* lal chilli powder and garam masala were tied like a bag using muslin cloth. The spice bag was placed in the extract and it was allowed to boil for about twenty minutes on medium flame so that the essence of the spices was taken up by the extract. About one third of sugar and salt was added before the spice bag was lowered into the extract. After 20 minutes the spice bag was taken out and squeezed well. Then the remaining two third of the sugar was added and was cooked till the mixture thickened. Once removed from the flame, acetic acid was added and mixed well. The ketchup should be immediately transferred to sterilized glass bottles.

Pre preparation time	-	60 minutes
Cooking time	-	40 minutes
Serves	-	10 bottles of 200ml each

d. Noni Ginger -Garlic Pickle

Ingredients required

Half ripen noni fruit	550 g
Idhyam gingerly oil	690 ml
Everest Kashmiri lal chilli powder	100 g
Sakhti chilli powder	50 g
Tamarind	80 g
Sakhti Turmeric powder	50 g
Garlic	30 g
Ginger	30 g
Salt	75 g
Mustard seeds	14 g
Roasted fenugreek powder	8 g
Roasted mustard powder	16 g
TTK asafoetida powder	3 g
Potassium meta bisulphite	2 pinch

Method of Preparation

Soak the tamarind in hot water for 20 minutes and remove the seeds. Then grind into a thick pulp. Wash the noni fruits well. Cut the fruits and immediately grind it into a fine paste. In order to prevent oxidation add turmeric powder, salt and tamarind paste little by little to the ground paste. Peel the skin of ginger and garlic and grind it into a fine paste. Heat the oil in a kadai. Once it is hot, add the mustard seeds and when it splutters add asafoetida powder and after a few seconds add the ground ginger garlic paste. Once it turns slight golden in color, add the ground noni fruit paste and cook it well. At first all the oil will be absorbed then after a while oil will spill out. Once the oil starts to come out, add mustard seed powder and fenugreek powder and mix it for a few minutes. Then remove from flame. After two minutes, add two pinches of potassium meta bi sulphite powder and mix it well. Transfer the pickle into sterilized bottles.

Pre preparation time	-	60 minutes
Cooking time	-	25 minutes
Serves	-	10 bottles of 200g each

e. Noni Ginger lime squash

Ingredients required

Noni fruit	2.8 kg
Ginger extract	180 ml
Lemon juice	1.170 l
Water	4.2 l
Potassium meta bi sulphite	2.5 g
For sugar syrup	

Clean Sugar (Parrys) 4 kg
Water 2 l

Method of Preparation

In a big vessel add sugar and water and heat it. Once the sugar dissolves remove it from the flame and cool it thoroughly. Wash the noni fruits and cut them into small pieces. To this add 4.2 litres of water and allow it to cook well for 40 minutes. Immediately extract the pulp from the cooked fruit by passing it through the pulper. Now mix the pulp obtained into the sugar syrup. Add ginger extract, lime juice and potassium meta bi sulphite to the sugar syrup and mix well. Transfer the squash into sterilized bottles.

Pre preparation time - 200 minutes
Cooking time - 40 minutes
Serves - 10 bottles of 700ml each

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