



RESEARCH ARTICLE

PREPARATION AND STANDARDIZATION OF NONI-ORANGE R.T.S. BEVERAGE

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ABSTRACT

Noni fruits are edible but they don't have nice taste and flavor. In order to enhance its organoleptic properties, in the present investigation attempts have been made to prepare and standardize Noni-RTS beverages. The Noni RTS were prepared by using Orange juice at the rate of 3, 4 and 5 per cent concentration, with keeping Noni juice concentration to 10%. The sensory evaluation of the sample was carried out and the Noni RTS prepared using 5% orange juice with Noni juice rated significantly. This blended sample has been found organoleptically superior than the other sample. Hence this product could be recommended for commercial exploitation.

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INTRODUCTION

Herbal and natural products of folk medicine have been used for centuries in every culture throughout the world (Acharya and Shrivastava, 2008). "Let food be your medicine and let medicine be your food" is world famous advice of father of medicine "Hippocrates" (Katarzyna *et al.*, 2010). Over the past few years as natural products have become increasingly popular, the field of natural herbal remedies has flourished. One such upcoming natural plant having medicinal properties is *Morinda citrifolia L.*, commonly known as Noni (Mathivanan *et al.*, 2005). Noni has been used in folk medicine for over 2000 years, it's every part i.e. root, stem, bark, leaves, flowers and fruit is utilized in various combinations for herbal remedies (Tabrah and Eveleth, 1966). It have a broad range of therapeutic effects, its juice is equally effective for diabetics and hypertension (Yanine *et al.*, 2006). Recently, the fruit juice is in high demand as food supplement or alternative herbal medicine for different kind of illnesses. With the increasing demand, both the harvesting and processing of Noni fruits got more importance for the product preparation. Noni fruits can be picked at any stage of development, depending on the intended processing method. Some producers prefer the hard white Noni fruits for processing. Most of the juice processors accept or prefer the "hard white" stage of fruit development for Noni juice

production, because the fruits ripen quickly once that stage of development is reached (Shixin *et al.*, 2010). Noni fruits are harvested by hand by picking the individual fruits from the branches. It does not bruise or damage easily and usually no special padded containers or other precautions are needed to prevent fruit significant fruit damage. The fruits are edible, but don't have a nice taste or smell. So that the variety of Noni fruit products are processed and prepared by variety of methods with addition of sugar, acids, spices and condiments, who helps to reduce the bad smell of Noni-fruit pulp. Noni juice can be more popularized in the form of RTS, beverages, squash, concentrated liquid, flavoured beverages, fortified beverages, mixed or blended juice, wine etc. Pulp can be successfully exploited in preparation of fruit leather bar, pulp concentrate, herbal prash, puree, jam, spread, mixed fruit pulp, mix-fruit prash, powder, sauce, chutney, toffee etc. The fruit powder can be reconstituted with water and later concentrated or used as base for RTS, squash, flavoured beverages, fruit drink etc. It may contain added flavouring substances, honey or sugar for taste modification. The powder can be encapsulated or used for tablet making.

With the increasing demand, both the supply and price of products is increasing. The high cost makes it out of reach of common masses. Therefore, present investigation was undertaken to utilize Noni fruit for the preparation of different value added products which can be easily available at cheaper price so that all the masses can equally enjoy the medicinal benefit of this wonderful gift of nature.

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MATERIALS AND METHODS

Raw Materials

Noni fruits were collected from college orchard. The fruits were washed, cleaned and used for the experiment. All the other ingredients were obtained from the local market of Parbhani (MS) India.

Noni Juice Extraction

Well matured Noni fruits with white-yellowish tint and full of fruits were manually harvested and kept for fermentation for specific period. The Juice gets extracted due to natural dripping under anaerobic condition at ambient temperature. The method of extraction of noni juice is summarized in Fig-1.

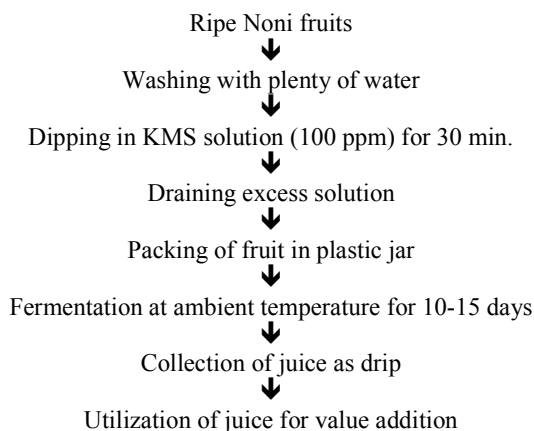


Fig.-1 Flow sheet for method of extraction of Noni juice.

Blended Beverage Formulation

Orange juice were used as blending material in preparation of blended Noni RTS beverage. Before mixing the Noni and orange juice, the beverages were standardised in order to optimise the formulation, varying only the contents of orange juice for the sensory analysis. Corrections of total soluble solids ($^{\circ}$ Brix) and pH values were done when needed. The standardised pH value was 4.0 (corrected with citric acid). Total soluble solids ($^{\circ}$ Brix) were kept constant to 10 $^{\circ}$ Bx.

Blended Beverage Preparation

The process of preparation of blended Noni-RTS beverage is summarized in Fig-2.

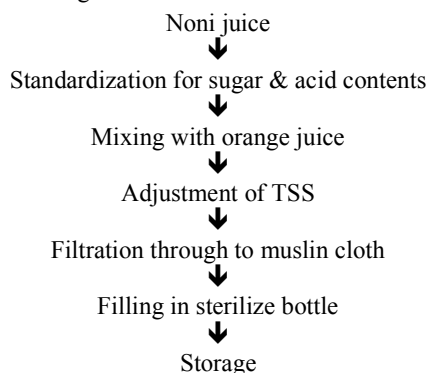


Fig. 2. Flow sheet for preparation of Noni-Orange RTS beverage

Analysis of Noni juice

Prepared noni juice was analyzed for its pH, total soluble solids, brix to acid ratio, acidity, reducing sugar, tannin, pectin, total phenol and ascorbic acid by standard methods (AOAC, 1990). The color of noni juice was measured by using Lovibond tintometer.

Sensorial Analysis

Sensory analysis of prepared product was performed by using standard method (Amerine *et al.*, 1987).

Statistical analysis

The analysis of variance of the data obtained was done by using Completely Randomized Design (CRD) for different treatments as per the methods given by Panse and Sukhatme (1967). The analysis of variance revealed at significance of $P < 0.05$ level, S.E. and C.D. at 5 % level is mentioned wherever required.

RESULTS AND DISCUSSION

The data obtained during present investigation is summarized under suitable headings as follows:

Chemical Composition of Noni Juice

The chemical composition of Noni juice, extracted from matured fruit is presented in table-1. The values show that, total soluble solids and acidity of Noni juice were 8 $^{\circ}$ Brix and 1.28% respectively.

Table-1 chemical composition of Noni Juice

Characteristics	Values
TSS ($^{\circ}$ Brix)	8
pH	4.16
$^{\circ}$ Brix : acid	6.28
Acidity (%)	1.28
Reducing sugar (%)	1.34
Total sugar (%)	3.84
Tannin (%)	1.2
Pectin (%)	0.44
Total phenol (%)	0.83
Ascorbic acid (mg/100ml)	32.43
Colour	10R+10.2Y+3B

Further the total sugar and reducing sugar were 3.84% and 1.34% where as the ascorbic acid content was 32.42 mg/100ml.

Standardization for preparation of Noni R.T.S. using Orange juice

The recipe for the preparation of 'Noni-orange RTS' was standardized by blending the Orange juice. The different combinations of treatments were standardized (Table-2). The initial concentration of Noni juice was kept constant i.e. 10% and Noni-Orange RTS was prepared by using various levels of orange juice i.e. 3%, 4% and 5%. Moreover, the acidity and TSS of juice were maintained at 1% and 15 $^{\circ}$ brix respectively.

Table 2. Standardization for preparation of Noni R.T.S. using Orange juice

Sr. No.	Treatments	Noni juice (%)	Orange juice (%)
1	T ₁	10	--
2	T ₂	10	3
3	T ₃	10	4
4	T ₄	10	5

Organoleptic evaluation of Noni -Orange RTS

The means score values of sensory evaluation of Noni Orange R.T.S. are presented in table-3.

Table-3 Organoleptic evaluation of Noni- orange R.T.S.

Sr. No	Sample code	Appearance	Color	Flavor	Taste	Consistency	Overall acceptability
1	T ₁	4.7	4.4	4.0	4.0	4.5	4.6
2	T ₂	6.3	5.8	5.6	5.7	5.7	5.9
3	T ₃	6.9	6.9	6.5	6.4	6.9	7.0
4	T ₄	7.9	7.8	7.5	7.8	7.8	8.0
	SE ±	0.14	0.13	0.16	0.13	0.15	0.12
	CD at 5%	0.41	0.37	0.45	0.36	0.42	0.33

The values revealed that the sample T₄ was found organoleptically better as compared to other samples T₁, T₂, and T₃ and rated highest for overall acceptability by panel members, indicating much liking by all the members.

CONCLUSION

Organoleptic evaluation of Noni juice showed that it has minimum consumer acceptability. However, its sensorial characteristics can be improved by blending noni juice with orange juice. In case of Noni-Orange RTS beverage, it was found that sample with 10 per cent noni juice and 5 per cent orange juice reported to be organoleptically superior compared to other sample. On the basis of present investigation, it could be concluded that Noni-blended RTS beverages with orange juice incorporation, up to the level of 5 per cent, significantly enhances the sensorial quality characteristics.

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