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ORIGINAL PAPER



Neera – Processing and Preservation Technology

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SUMMARY

Coconut Neera is the natural sap of the mature coconut palms rich with all essential nutrients, minerals and vitamins for human health. Harvesting of Neera from the spadix of the palms without disturbing the physiology of the tree has a lot of potential at the industrial scale. However, the development of alcohol in the extracted sap during tapping by auto-fermentation has given a misnomer for Neera as “sweet toddy”. Hence, the commercial popularity of Neera as a health drink has diminished at a global level. Though several traditional techniques like the usage of calcium hydroxide (lime) and the application of the chiller device during harvesting Neera from spadix have been practiced for collecting non-fermented Neera, none of the techniques were found acceptable at the commercial level. The results of the present study demonstrate the harvesting and processing procedure standardized for the collection and storage of non-fermented Neera from palms by repeated field trials. This literature gives the detailed processing techniques of Neera.

INTRODUCTION

Neera is the sap extracted from the spathe or the immature flower spike of coconut trees. Neera is a delicious, natural, non-alcoholic beverage and high in nutritional value. It is sweet, light golden in color, and translucent. Neera is fast becoming a popular drink. It is good for digestion, facilitates clear urination and prevents jaundice. The nutrient-rich “sap” has low Glycemic Index (GI of only 35) and hence diabetic-friendly since very low amount of the sugar is absorbed into the blood. It is an abundant source of minerals, 17 amino acids, vitamin C, broad-spectrum B vitamins, and has nearly neutral pH. While most brown sugar is boiled at temperatures

up to 221 degrees F with the end product containing 93% sucrose, sap crystals contain only 0.5% glucose, 1.5% fructose, 16% sucrose and 82% inulin - a pre-biotic that promotes digestive health. It can be used as an ideal sweetener. Neera fetches much better returns compared to copra.

Processing and Preservation Technology

The technology for processing and preservation of coconut neera is available with various institutes like, CDB Institute of Technology under Coconut Development Board, Govt. of India, SCMS Institute of Science and Technology, Defence Food Research Laboratory, Kerala Agricultural University and Central Plantation Crops Research Institute (CPCRI). The Process ensures hygienic collection of sap using anti ferment agents approved by FSSAI. The fresh coconut sap collected in such a manner could be transported in ambient conditions to the factory site. The coconut sap is processed into a non-alcoholic nutritious drink through centrifugal filtration and pasteurization at the desired temperature and packed into consumer packs. The Neera processing methods are explained in Figure.1.

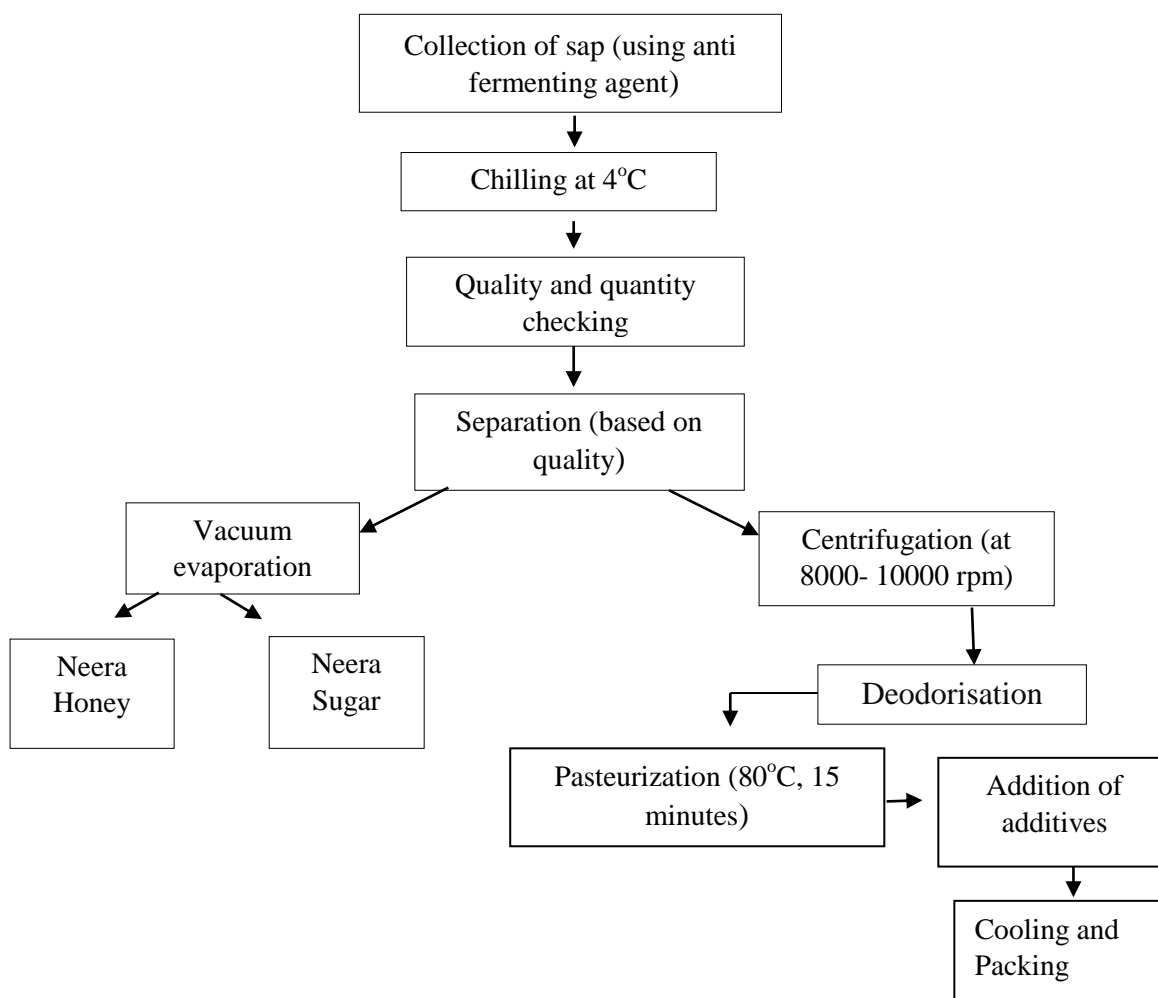


Figure.1. Neera Processing technology

NEERA FERMENTATION

Coconut neera is highly susceptible to natural fermentation by *Saccharomyces cerevisiae*. Fermented neera is known as toddy which is an alcoholic beverage and produces off flavour and taste. In order to stop the fermentation, it is required to control the microbial growth in fresh neera. Among the different preservation methods microwave heat treatment has advantages of volumetric heating and higher penetration depth.

If the fermentation process continues further it produces coconut vinegar as a result of acetic fermentation. Thus, leads to the formation of 4-7% acetic in the fermented product.

As fermentation rate increases an unpleasant aroma and taste will be produced. This ultimately affects the quality and that leads to the preservation issues. High fermentable nature of neera leads to unpleasant aroma and taste, which poses preservation issues

Anti-Fermentation Solution- During the harvesting of Neera, CA lowers the pH of raw Neera to acidic level. In the acidic condition, KMS exhibits the property of suppressing the growth of bacteria and fungi in the harvested Neera, thereby preventing auto-fermentation. Since both CA and KMS are accepted food preservatives, it will be fully secure and will not make any biosafety issues during usage. Other methods of preservation from fermentation include Microwave treatment, Physio chemical treatment and hygienic ways of Neera collection.

By-products of Neera

a) Coconut Jaggery: It is solid or semi-solid crystalline mass obtained by boiling and evaporating Neera in small batches with final product having pH in the range of 6.5-7.0. The production requires minimal heat treatment without the aid of any additives or enzymes. Caramelization turns the heated Neera from milky white to transparent brown.

b) Neera Syrup: It is produced when fresh Neera is heated and concentrated into syrup and is used as a health and wellness drink in connection with Ayurveda and other systems of medicine.

c) Palm Wine (Toddy): It is an alcoholic beverage produced from the sap of palm which is mildly intoxicating and sweet, obtained by fermentation of natural yeasts yielding an aromatic wine having 4% alcohol content. As the day progresses, it may yield a sourer, stronger and acidic product due to fermentation. Spices are added to obtain distinct taste to product

d) Palm Honey: It is a thick liquid syrup similar to honey, having a sweetness of 780 Brix and a pH of 6.0-6.5, which is used as sweetener in ice creams and other confectionaries. Palm honey also find applications in pharmaceutical formulations and is good for patients suffering from anaemia as it is rich source of iron.

e) Palm Sugar: The coconut sap sugar is obtained by moderately heating the freshly harvested Neera at 115°C to remove water which is considered as one of the best natural sweetener since it has no added chemicals. It is widely used as sweetener in South- East Asian regions since thousands of years which is a perfect and healthier substitute for artificial sweeteners. It is rich in minerals, vitamins and has twice the iron, four times the magnesium and over ten times the zinc than brown sugar which is obtained from sugar cane.

f) Palm Vinegar

Coconut vinegar can also be produced from the inflorescence sap other than from matured coconut water. Fresh sap is poured in a wide large plastic container with clean – netted cover to allow aeration and prevent entry of dirt and foreign objects. After about ten days fermentation in well ventilated room, the sap can be harvested as vinegar. Vinegar has extensive use as preservative in pickle industry and flavouring agent in food processing sector. The palm vinegar has good export potential as compared to the synthetic vinegar.

CONCLUSION

Coconut neera enjoys a wide market potential in countries like USA, Europe and African countries. The targeted consumers for coconut neera within the country are health and nutrition sector, supermarkets and huge shopping malls, luxury hotels, clubs, tourism industry, railways, airways etc. Neera is also having variety of by-products which has good market potential.