



# Toddy – A traditional Indian beverage: Extraction and Supply chain management in Chittoor District, Andhra Pradesh

Raghavendra. T<sup>1\*</sup>, Lokesh.AC<sup>2</sup>, Thashneem Thaqseen Bhanu<sup>3</sup>

<sup>1,2,3</sup>FHMCT, Ramaiah University of Applied Sciences Bangalore, India

Corresponding author: [raghavendra.fb.hc@msruas.ac.in](mailto:raghavendra.fb.hc@msruas.ac.in)

**Abstract.** Drinking toddy is not just a traditional practice, it is also considered to have many health benefits when consumed in moderate quantity. A notable advantage is that when consumed early in the morning, toddy doesn't induce intoxicating effects. An incision is made in the coconut flower bud and the sap is collected in clay pots which are attached to the tree. Skilled toddy sappers climb twice daily (morning & evening); thus, toddy is extracted from coconut sap. Toddy is sweet in taste when extracted, it turns sour as the day progresses. Fermentation takes place resulting in a sour taste and increased alcohol content. Therefore, as soon as it is collected the toddy is consumed immediately and a part of it is transported to the local toddy outlets considering its shelf life. This study attempts to explore the traditional method of toddy tapping, supply chain management and consumption patterns in Chittoor district, in the state of Andhra Pradesh. This study adopts qualitative research which comprises field observational study and secondary data collection through a literature review on toddy extraction and supply chain management in Chittoor District, Andhra Pradesh. The supply chain management of toddy begins from the farm, that is extraction of toddy and continues with the initial sales which occur on-site and are later transported to toddy shops where it is available throughout the day. If remaining the unsold toddy is discarded at the end of the day as the shelf life is limited. Though toddy is a naturally occurring alcoholic beverage, it is still unexplored. Further research is required to understand the drink which can be a natural alternative to other fermented beverages. This exploration of toddy as a natural alcoholic beverage might uplift the local community and the lives of toddy sappers and toddy sellers who make a living out of this

**Keywords:** Traditional beverage; supply chain management; toddy tappers; local community

## 1 Introduction

Toddy is a naturally sweet and mild alcoholic beverage produced out of coconut palm sap and considered as wine [1]. Chittoor district is one of the four districts in the Rayalaseema region of India and in this place, toddy is collected by professional toddy tappers who climb palm trees twice a day – early in the morning and evening, the tappers make a cut in a coconut spathe and attach clay vessels for the sap to drip into the clay pots [2, 3].

Consumption of toddy was a traditional practice that has been taking place since our ancestral times, and the consumption of fresh palm wine was a recommended practice in our country [4]. Once the sap is collected, it will be delivered to a toddy shop as the shelf life of this drink is very short and once toddy gets more fermented, it will turn into vinegar [5]. Fresh, unfermented Toddy version is called Neera, it is sweeter and contains no alcohol. The longer it is stored and the more it ferments, thus increasing its sourness and alcoholic percentage. One can tell that Toddy got fermented by seeing the milky white colour when compared to the fresh one [6].

Toddy is the product from the inflorescence of the coconut tree; when it's fermented, it is called palm wine, and this later distilled gives the product known as arrack [3]. Toddy is also referred by the Britishers as 'Coconut Vodka'. The coconut tree belongs to Arecaceae / the palm family and is a recognized species in the Cocos genus, and the term coconut not only refers to the fruit but it includes the seed and palm too [7]. The coconut tree is referred to as "Kalpavriksha" and is treated with religious beliefs. This toddy is called as Kallu in Chittoor; also known as Kalparasa [8].

The consumption of palm wine has better health benefits when compared to other "green" beverages, as toddy is available naturally and a method to preserve and increase in the shelf life of toddy could impact the market on a larger scale [9]. Toddy has economical and health benefits and can act as a driving source of motivation to many labourers or daily wage employees whose occupation mainly depends on coconut farming [10]. Toddy has potential to become a substitute for manufactured alcoholic beverages while also acting as a beacon for tourism [11]. The sap of coconut can be used in so many variations for multiple things and with a method to increase the shelf life of the products obtained from the coconut tree, it could create new opportunities and open newer sectors in the market which can also boost the economy and increase the export value of the country while also making us more self-sustainable. palm sugar can be a substitute for regular sugarcane sugar while also acting as a raw material for many other substances, palm can replace sugarcane-based sugar as the sugar and other by-products obtained from palm trees proved to have more nutritive values and lesser harmful effects compared to sugar produced from sugarcane [12]. There is major potential in the rural tourism sector that can be extremely valuable to the economy of the country while also increasing the revenue aspect of residents of the rural areas [13, 14].

## 2. Aim and Objectives

Toddy is a naturally available alcoholic beverage that has very minimal exposure. The drink supposedly has various health benefits that are yet to be discovered fully and can prove to be a natural substitute for fermented alcoholic beverages. While creating an exposure about the beverage, it is also possible for the locals of the region to gain profit or make a living out of this naturally available beverage.

Therefore, the aim is to study the traditional method of toddy extraction with the equipment used in the process, and to analyze the supply chain management of toddy in Chittoor, Andhra Pradesh.

## 3. Objectives:

- To identify the traditional method of toddy extraction and equipment used.
- To examine the supply chain management of toddy.
- To explore the consumption pattern in Chittoor District, AP.



## 5.2 Equipment Used in Toddy Extraction

Figure 1 represents the interview conducted with the tappers, and as per the interview, the toddy extraction takes place between 10 to 15 minutes and early in the morning. Tappers climb around 30-40 trees per day. All the tappers in Chittoor tap toddy in the same traditional way; they extract toddy from a palm tree (coconut). The other type of toddy tapped is extracted from the date tree. They tap twice a day – once in the morning around 8 am and the second time in the evening around 4 pm. The local name of the beverage is kallu, and the tapping occupation has been carried on from generation to generation. Toddy is available in all the seasons throughout the year [8]. The equipment required a gutam, knife, wire, rope, pot and a can. Gutam is the instrument used to tap the sap and it is made of wood material. A sharp knife is used to cut the tip of the sap; this is highly sharp, that bent shape gives the shape of the sap to cut [15]. A plastic wire is used to tie the sap tight, which helps in the collection of toddy at the tip. A rope is used as an aid to climb the coconut tree with a grip. The tapper uses it around the legs and climbs the tree. A pot made out of clay is used to collect toddy from the sap, it is hung to the tip of the sap on the tree. Lastly, the cans are used for toddy extracting. One sap gives around 25 liters of toddy, and the type of clientele expected are the residents and tourists.

## 5.3 Procedure in Extracting the Toddy

Stage 1: The trees with fertile sap are identified, that is, if the sap is bent and soft, it indicates that it is ready to yield toddy. During this period of 10 days, the sap is tied with wire, making sure the toddy is collected at the tip and it is continuously tapped with gutam for 10 days with rhythm. This is the preparation stage – toddy is not extracted yet.

Stage 2: After 10 days of tapping, the liquid gets collected at the tip of the sap. The tapper cuts the tip with a knife, then adds the pot to the sap. The toddy gets collected in the pot.

Stage 3: On the day of extraction, the tapper climbs the tree with the help of a rope. The tapper empties the toddy in the pot into the can. Similarly, he collects toddy from every tree in the land. Then it is strained to serve [16, 17]

## 5.4 Post Extractions of Toddy

The toddy is then brought down, strained to remove impurities. Then it served in jugs at Rs.50 per 350 ml of toddy. The tappers earn around Rs. 1500/day, with an expense of Rs. 500/day. The rest today is then transported to nearby Kallu shops. The land owners will get a fixed amount for renting their land for tappers [18].

## 5.5 Challenges Faced

The challenges faced during tapping are slippery tree trunks during rain, damaged pots, the limited shelf life of toddy (24 hours), zero sales due to no customers visiting, bees and wasp's attack.

### 5.6 License Required

The licenses required for tapping include: The society license that shows they belong to the tapper community, and the land owner approval agreement. Based on these two criteria, the tapper gets a license to tap the toddy which is valid for 5 years, there is no fee or renewal fee for this license in Andhra Pradesh.

### 5.7 Supply Chain Management of Toddy

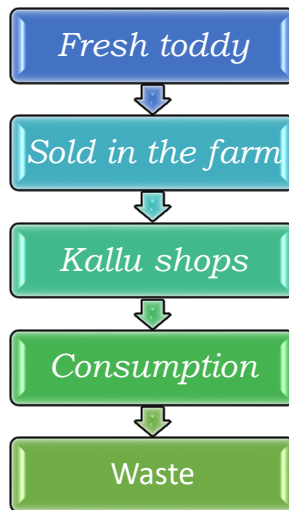


Figure 2 Supply Chain Management of Toddy

Toddy is tapped in a farm where the coconut trees are grown, the distribution of toddy to the consumer also starts from this place. The toddy is sold in the farm for around 30 minutes after extraction. In the next stage, the remaining toddy is transported to shops for sale; here in the shops, toddy is available throughout the day. The price may be high because of transportation, storage, etc.

At the end of the day, the leftover toddy will be discarded as the shelf life of the toddy is lesser.



Although each person had their ideology and reasons for the consumption of toddy, the most commonly received reactions that were similar among most of the consumers are: Detoxifying agent, natural beverage and mild buzz factor. The consumers were mostly satisfied with all aspects of toddy; i.e., method of consumption, shop environment, etc., but like most other food and beverage products, adulteration is mildly observed even in toddy. While most of them prefer to drink the natural and unadulterated beverage, some prefer drinking toddy with added chemicals as it is more alcoholic and gives a stronger buzz.

As for the suggestions and recommendations offered by the consumers on how to improve the existing system, most of them were completely satisfied with the availability and the method of consumption, some aspects could be improved for a more hygienic and approachable method of consumption.

On an average, almost 98% of the consumers said that they would suggest and recommend toddy as a replacement for other alcoholic beverages.

### 5.8 Toddy taste profile after extraction

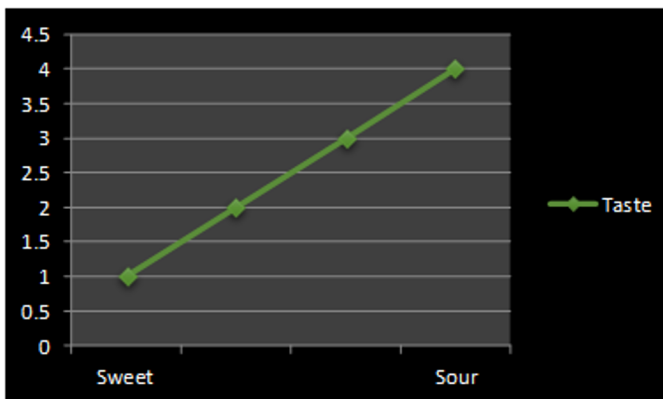


Figure 4 Taste Profile of Toddy

As longer the toddy is kept in an open surrounding, the taste profile changes from sweet to sour with an increase in alcohol content.

### 6. Conclusion:

This research would be a valuable contribution to enhance toddy consumption by giving an awareness of its health benefits when consumed in limited quantities. The shelf life of toddy is limited to 14-25 hours maximum and the storage technologies have not yet been adopted by the toddy sellers. The further process with leftover toddy has to be implemented by using the latest technology. The serving standards have to be developed – serving in jugs is not hygienic and adulteration of toddy at shops is the biggest challenge faced by the consumers. Some of the Research observations to overcome the above problems are Jugs must be replaced with glasses,

cups, to increase the shelf life, it must be maintained at proper temperature to cut down fermentation, new technologies like cooler must be installed to store and export toddy, the leftover toddy must be sent to jaggery/ sugar factory to produce palm sugar and palm jaggery. The toddy can be served with suitable accompaniments to attract consumers and enhance the toddy experience, the shop owners must stop adulteration and sell it in its natural way to preserve its originality. The Toddy supply chain management has to be made more efficient to make it available at every corner of the country. It can be concluded that this research will fill the gap of preserving the toddy flavour in the Food and Beverage Industry for appropriate purposes. Toddy is a promising source of vinegar for keeping up with ancient traditions. Based on results, it was suggested that toddy is consumed, accepted and liked by the residents in Andhra Pradesh.

**The authors have no competing interests to declare that are relevant to the content of this article**

## Reference

1. Bhavana, P., Lomte, D.: The Potential of Kallu (Toddy or Palm Wine) and Its Accompaniments to Attract Tourists in Rural Parts of Kerala. In: Proceedings of the ATITHI Conference on Tourism and Hospitality Innovation, pp. 1–8. Swarnjali Publications (2018)
2. Chopra, R., Chopra, G., Chopra, I.: Alcoholic Beverages in India: Part I. *The Indian Medical Gazette* **77**(4), 224 (1942)
3. Aparna, V., Chauhan, A.K., Singh, S.: Palm-Based Beverages Around the World: A Review. *Curr. Nutr. Food Sci.* **20**(1), 16–27 (2024)
4. Awantika, J., et al.: Nimba Neera—The Gift of Nature. *SAJP* **4**(1), 48–50 (2015)
5. Ekanayake, S.: Ethnic Fermented Foods and Beverages of Sri Lanka. In: *Ethnic Fermented Foods and Alcoholic Beverages of Asia*, pp. 139–150 (2016).
6. Jose, N., Deshmukh, G.P., Ravindra, M.R.: Neera—A Potential Natural Health Drink. *Biomed. J. Sci. Tech. Res.* **11**, 877–880 (2018)
7. Samarajeewa, U.: Industries Based on Alcoholic Fermentation in Sri Lanka (1986)
8. Devi, M., Ghatani, K.: The Use of Coconut in Rituals and Food Preparations in India: A Review. *J. Ethn. Foods* **9**(1), 37 (2022)
9. Chinnamma, M., et al.: Coconut Neera—A Vital Health Beverage from Coconut Palms: Harvesting, Processing and Quality Analysis. *Beverages* **5**(1), 22 (2019)
10. Krishnan, P., Raman, J.H.J.: Toddy Business among the Indian Labour in Colonial Malaya, 1900–1957. *Int. J. Humanit. Soc. Sci.* **8**(1), 1–44 (2018)
11. Ramanah, G., et al.: Authenticity Testing of Coconut Toddy Samples (Palm Wine) Using Sulfated Ash Content. *Food Sci. Technol.* **6**(1), 20–27 (2018)
12. Francisco-Ortega, J., Zona, S.: Sweet Sap from Palms: A Source of Beverages, Alcohol, Vinegar, Syrup, and Sugar. *Vieraea* **41**(Jan), 91–113 (2013)

13. Sharpley, R.: Rural Tourism and the Challenge of Tourism Diversification: The Case of Cyprus. *Tour. Manag.* **23**(3), 233–244 (2002)
14. Fons, M.V.S., Fierro, J.A.M., Patiño, M.G.Y.: Rural Tourism: A Sustainable Alternative. *Appl. Energy* **88**(2), 551–557 (2011)
15. Bandyopadhyay, M., et al.: Date-Sugar-Palm Based Folklore of Bengal. *Ethnobot. Med. Plants* **2**, 689–695 (2012)
16. Leong, P.: The Nutritive Value of Coconut Toddy. *Br. J. Nutr.* **7**(3), 253–259 (1953)
17. Sivakumar, S., et al.: The Feasible Screening of Genuine Fresh Palmyrah Toddy and Sugar or Rice Toddy Using Near-Infrared Spectroscopy. *Heliyon* **10**(10) (2024)
18. Punchihewa, P., Arancon, R.: Coconut: Post-Harvest Operations. *Asian Pac. Coconut Community*, 1–37 (1999)

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

