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## Improvement of Traditional Balinese "Ong" Tea-Making Process to Extend Shelf Life To Support Ecotourism in Banjar Lantangidung, Gianyar, Bali

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### A B S T R A C T

"Ong" tea contains vitamins B1, B2, B6, B12, folic acid, and vitamin C, in addition to several essential amino acids, organic acids, minerals, vitamins, amino acids, and active polyphenol compounds, and various important enzymes that have many benefits for the body. "Ong" tea is a probiotic drink from the tea fermentation process. The bacteria in SCOBY (Symbiotic Consortium of Bacteria and Yeast) are *Acetobacter xylinum* bacteria. The purpose of implementing the activities proposed in the training to improve the process of making "Ong" tea through PKM (Community Service Program) activities is to ensure that the people of Br. Lantangidung, Batuan, Sukawati have the skills and insight to manage local natural resources and have an entrepreneurial spirit to open up business opportunities related to the conditions of the Batuan Village area. Improving product quality, expanding marketing reach, and using more hygienic and modern packaging techniques are also important. Thus, it is hoped that Balinese "ong" tea can become a superior product to improve the community's economy and support ecotourism development in Banjar Lantangidung.

#### Contribution to Sustainable Development Goals (SDGs):

SDG 1: No Poverty

SDG 3: Good Health and Well-Being

SDG 8: Decent Work and Economic Growth

SDG 9: Industry, Innovation, and Infrastructure

SDG 12: Responsible Consumption and Production

SDG 15: Life on Land

## 1. INTRODUCTION

Tea, a standard agricultural product in the community, is used as a base ingredient for popular drinks. In addition to its distinctive taste, people use tea as a refreshing drink and believe in the benefits of tea that can improve health [1]. Bali is one of the tourist destinations. Many people want to visit or travel to Bali [2]. In the history of Bali, or according to local Balinese people, especially in the Gianyar area, there is a traditional tea-based drink product, a type of Kombucha drink called "Teh Ong." Currently, interest in natural products is increasing along with the

increasing public understanding of their health and aging conditions [3].

Food is a determinant of digestive tract health and is closely related to the body's immune system. If the digestive system is healthy, the immune system will be more muscular, and vice versa [4]. Functional food products that support local wisdom are currently popular for consumption and development by the community, namely probiotic drinks. "Ong" tea is one of the typical Balinese probiotic drink products that is starting to have few producers and enthusiasts. This product can attract tourists visiting Bali because its distinctive taste resembles kombucha tea.



“Ong” tea or Kombucha is a traditional drink from northeastern China during the Tsin Dynasty, around 220 BC [5]. This drink is made from fermented tea containing compounds that are beneficial for health [6], including organic acids, minerals, vitamins, amino acids, and active polyphenol compounds [7]. In addition, “Ong” tea also contains vitamins B1, B2, B6, B12, folic acid, and vitamin C, as well as several essential amino acids and various vital enzymes that benefit the body [8]. Several studies have shown that the biological activity of kombucha is antioxidant [9], antimicrobial [10], antidiabetic [11], anticancer [12], and anti-inflammatory [13].

“Ong” Kombucha Tea is a type of probiotic drink produced from the tea fermentation process [14]. The microorganisms used in the fermentation process are symbioses of bacteria and fungi. The bacteria found in SCOBY (Symbiotic Consortium of Bacteria and Yeast) are *Acetobacter xylinum* bacteria [15]. The fungi that live side by side with these bacteria are fungi from the genus *Saccharomyces*, *Zygosaccharomyces*, *Pichia*, and *Brettanomyces* [16]. Fermentation is a process that changes organic substrates to react with the appropriate starter. Starters in the fermentation process are usually assisted by microorganisms such as yeast, mold, and bacteria [17]. The demand for kombucha is increasing as a functional drink due to its superior nutritional content. The global kombucha market is growing rapidly, with a compound annual growth rate of 23% in 2014–2018 and is expected to maintain its rapid growth in the coming years.

Making kombucha requires attention to several things because it involves the fermentation process. This process requires a starter as a kombucha culture. Using a starter of more than 30% can increase the acidity level, and adding sugar composition affects the results of kombucha. According to Ref. [18], using sugar at a concentration of 20% and a kombucha starter of 10-20% can provide the best results in the kombucha fermentation process. The higher the concentration of kombucha starter, the higher the pH value will be, so that the best concentration is not more than 30% and is combined with a sugar concentration of 10% [19]. Based on the results of this research, the manufacture of “Ong” tea traditionally occurs in several places in Gianyar Regency, especially in Batuan Village, which is starting to have few producers, and people who consume it are worried that it will become extinct, so it is very necessary to introduce it with process improvements with controlled fermentation technology so that this product is of good quality, the shelf life becomes longer by implementing good packaging techniques, and the manufacturer can guarantee product safety when consumed.

Br. Lantangidung is also now known as a tourist area, so it has the potential to be a food product market. This situation allows the community to process their agricultural products, one of which is “Ong” tea, which can be marketed as a typical souvenir from Batuan Village. Batuan Village is located in Sukawati District, Gianyar Regency, Bali Province. Of the 410 ha area, land use is divided into several parts, including rice fields: 135 ha, settlements: 60 ha, dry fields: 113 ha, cemeteries: 1.67 ha, and others: 100.33 ha [20]. The market potential and needs for processed tea products, especially “Ong” tea for health, require efforts and efforts to master the processing technology so that it can become a new business and can increase community income through various activities.

## 2. MATERIALS AND METHODS

### 2.1. *Stages or Steps Method in implementing the offered Solution*

#### a. Socialization and Location Exploration

The method used in the socialization is through direct interviews and approaches and coordination with the management and members of PKK Merta Nadi, Br. Lantangidung, Sukawati, selection of meeting and training locations.

#### b. Training

Practice of making “Ong” Tea products, packaging and labeling of the products produced and there are Pre-Test and Post-test activities. The process of making “Ong” Tea is that “Ong” Tea is boiled and filled with sugar. The tea is then poured into a scoby (kombucha starter), and tightly closed for at least 14 days. During this fermentation process, kombucha must not be exposed to air, aka oxygen-tight, and must not be contaminated. During those 14 days, its properties came out, such as acetic acid, glucuronic acid, and other substances, which are the characteristics of the typical “Ong” Tea drink.

#### c. Application of technology

The technologies applied to improve the processing process in this program include substrate sterilization, starters, starter enrichment, packaging, and labelling techniques carried out in the form of efficient, appropriate technology training to process tea into a good quality Balinese “Ong” tea drink. For the training to be carried out, the PKM team will provide donations of equipment and materials to partners to support the manufacture of products to be implemented.

#### d. Mentoring and evaluation

Mentoring in the form of monitoring and evaluation is carried out three times, namely assessment of the preparations that both the PKM Team and Partners have carried out for the smooth running of activities, evaluation of the implementation of activities for the program's sustainability, and evaluation of output. Products can be sold and profits can be gained by increasing partner turnover. This activity aims to maintain continuity and achievement of the output targets to be achieved from this Community Partnership Program activity. The service team continues to motivate partners so that they remain enthusiastic and maintain the cohesiveness of the PKK Merta Nadi partners, Banjar Lantangidung. The results of this monitoring and mentoring are then evaluated and reviewed to be able to make overall improvements to this PKM activity.

## 3. RESULT AND DISCUSSION

### 3.1. *Results*

As an initial stage, an approach and coordination were carried out with PKK partners Merta Nadi, Banjar Lantangidung, Batuan, Sukawati, and Banjar Adat Kelihan to finalize the training activity plan that had been agreed upon during the exploration. At the meeting, it was agreed that 10 representatives of PKK Merta Nadi, Banjar Lantangidung, would participate in the traditional “ong” tea-making training. The exploration by the PKM Team

with the Head of PKK Merta Nadi, Banjar Lantangidung, can be seen in Figure 1.



**Figure 1.** Exploration by the PKM Team with PKK Chairperson Merta Nadi, Banjar Lantangidung

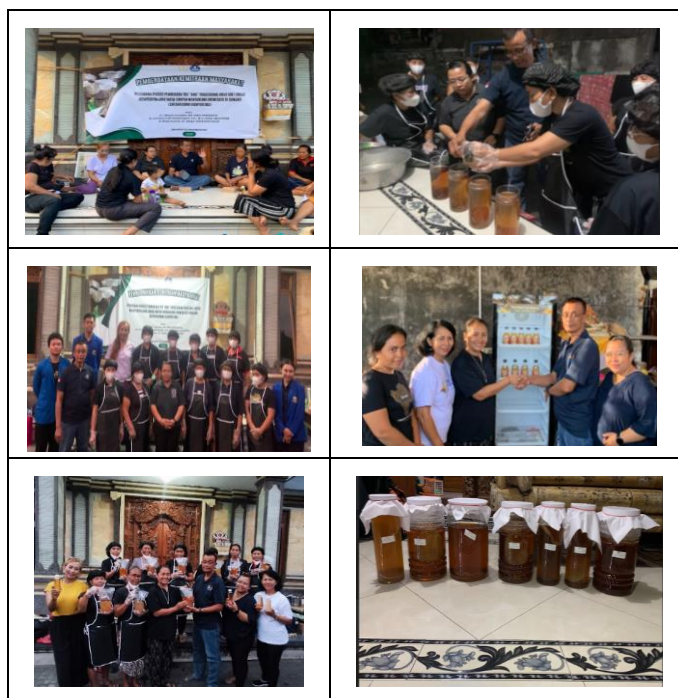
Knowledge counselling with all training participants attended by representatives of PKK Merta Nadi members, Banjar Lantangidung, with activities carried out including:

1. The opening ceremony of the activity will be held by the Head of the PKM Team, who will provide a welcoming speech and direction for the smooth running of this activity.
2. Greetings and explanations from the Head of PKK Merta Nadi, Banjar Lantangidung, about the planned training activities that will be carried out so that all participants and instructors who will accompany during the activity can have the same perception and the activity runs smoothly.
3. Handover of training and production equipment that will be donated to PKK Merta Nadi partners, Banjar Lantangidung, to support manufacturing products in the training that can be produced after the training activity.
4. Preparing and discussing the planned activity schedule with PKK Merta Nadi partners, Banjar Lantangidung, who will be training participants so that they can organize their activity time and the activity can take place according to plan and in terms of time efficiency and adjust to the activities of the participants.
5. Discussion and Q&A on the problems partners face so that this activity can be planned well to determine the steps to solve the issues.
6. Distribution of learning modules so that training participants can learn and follow the training more smoothly. The implementation of activities can be seen in Figure 2.

### 3.2. *Benefits of Technology and Innovation Products*

1. Extension: The cooling process helps extend the shelf life of "ong" tea to several months without using chemical preservatives.
2. Quality improvement: The resulting "ong" tea has better quality, namely a brighter color, more fragrant aroma, and richer taste.
3. Cultural preservation: This innovation helps preserve the cultural heritage of traditional "ong" tea making while increasing its economic value.

4. Ecotourism development: Quality "ong" tea products can be one of the tourist attractions in Banjar Lantangidung and increase the local community's income.

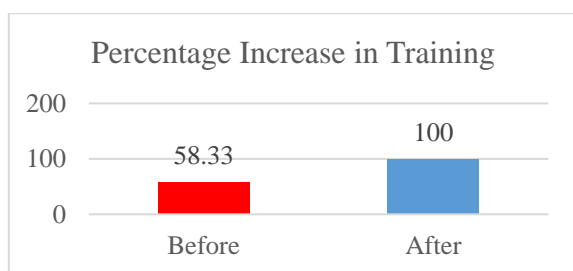


**Figure 2.** Implementation of training and practice activities for making traditional "ong" tea

Implementing the training program on producing "Ong" tea has significantly improved the community's understanding and skills (Figure 3). Before the training, many participants had limited knowledge of the fermentation process, the role of probiotics, and the proper hygienic techniques required for high-quality production. However, after participating in the structured sessions, which included hands-on practice, demonstrations, and detailed guidance on modern packaging and marketing strategies, there was a marked increase in their ability to create "Ong" tea with consistency and enhanced quality.

Community members now possess a deeper insight into the use of SCOBY (Symbiotic Consortium of Bacteria and Yeast), understanding the functions of *Acetobacter xylinum* bacteria in fermentation, as well as the health benefits provided by the rich vitamins, amino acids, and polyphenols found in "Ong" tea. Furthermore, the training also equipped them with entrepreneurial skills, enabling them to develop better branding, improve product presentation, and expand market reach.

This comprehensive knowledge enhancement empowers the local people of Br. Lantangidung, Batuan, Sukawati, to harness their natural resources effectively, increase their economic potential, and support local ecotourism development, positioning Balinese "Ong" tea as a signature product with sustainable business opportunities.



**Figure 3.** Percentage results of the evaluation of the training on making traditional "ong" tea products

### 3.3. *Relevance and Community Participation*

1. Partners with full discipline and responsibility, comply with all agreements, and carry out all series of activities until all activity plans end.
2. Partners have contributed to this activity by providing a training venue and preparing coconut raw materials that will be used in the training.
3. After the end of this PKM activity, partners are expected to be able to pass on their skills to other community members to utilize the potential of existing coconuts.
4. After the PKM activity ends, partners are expected to be able to practice and continue the business well, and the business they pioneered can grow.

### 3.4. *Usefulness and Productivity*

PKM which focuses on improving the process of making traditional "ong" tea, is expected to have a significant impact on the people of Banjar Lantangidung, Gianyar, Bali. By extending the shelf life of "ong" tea, the productivity of local tea farmers will increase. This will have an impact on increasing community income and economic welfare. Furthermore, "ong" tea products with better quality and longer shelf life can be a special attraction for tourists. Thus, this PKM not only supports the sustainability of traditional "ong" tea production as a cultural heritage but also contributes to the development of ecotourism in the area. Increasing tourist visits will have a positive impact on the local economy, from the tourism sector to other supporting sectors.

The PKM has a significant impact on increasing the productivity of the Banjar Lantangidung community, Gianyar. By implementing more modern processing techniques, the shelf life of "ong" tea has been significantly extended. This not only increases the selling value of the product but also opens up wider market opportunities. Furthermore, the success of this PKM has also encouraged the development of ecotourism in the region. "Ong" tea, which is one of Bali's cultural icons, is now increasingly attracting tourists to visit and learn the manufacturing process directly. Thus, this PKM not only provides economic benefits to the community but also contributes to the preservation of culture and the environment in Banjar Lantangidung. The Traditional Balinese "Ong" Tea product that has been packaged and is ready to be marketed can be seen in Figure 4.



**Figure 4.** Traditional Balinese "Ong" Tea product that has been packaged and is ready to be marketed.

### 3.5. *Next Stage Plan*

After successfully improving the process of making traditional Balinese "ong" tea in the initial stage, the next stage plan will focus more on improving product quality and expanding marketing reach. This activity will involve further training for the "ong" tea producer group in Banjar Lantangidung on more hygienic and modern drying and packaging techniques. In addition, an in-depth study will be conducted on the market potential of "ong" tea both at the local and national levels, involving tourism and culinary industry players. The results of this study will be used to develop an effective marketing strategy, including creating attractive product branding and developing environmentally friendly packaging. Thus, it is hoped that Balinese "ong" tea can become a superior product that can improve the community's economy and support the development of ecotourism in Banjar Lantangidung.

## 4. CONCLUSION

After successfully improving the process of making traditional Balinese "ong" tea in the initial stage, the next stage plan will focus more on improving product quality and expanding marketing reach. This activity will involve further training for the "ong" tea producer group in Banjar Lantangidung on more hygienic and modern drying and packaging techniques. In addition, an in-depth study will be conducted on the market potential of "ong" tea both at the local and national levels, involving tourism and culinary industry players. The results of this study will be used to develop an effective marketing strategy, including creating attractive product branding and developing environmentally friendly packaging. Thus, it is hoped that Balinese "ong" tea can become a superior product that can improve the community's economy and support the development of ecotourism in Banjar Lantangidung.

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