



From Blossom to Bottle: Preparation of Exceptional Rose Petals Wine

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ABSTRACT: Rose petal wine is a type of wine made from the petals of roses. It's a floral and fragrant wine with a delicate flavor profile that captures the essence of the roses. Like other types of wine, rose wine contains antioxidants, such as flavonoids and polyphenols, which may help reduce oxidative stress and lower the risk of certain chronic diseases when consumed in moderation. For the preparation of rose petals wine, we have taken fresh and fragrant rose petals from unsprayed, organically grown roses. Then rose petals were placed in clean container and covered with water for few hours to infuse the water with their flavor and aroma. Then sugar is added to the must for the adjustment of °brix, it was inoculated with wine yeast. Then inoculated must was incubated at controlled temperature (25°C) for a specified period (for one week) until fermentation is complete. After primary fermentation, wine was siphoned into a clean vessel and then allowed the wine to undergo secondary fermentation for additional clarification and flavour development.

Keywords: Fermentation, Petals, Rose, Wine, Yeast.

INTRODUCTION

Wine has been an integral part of human culture for centuries, celebrated for its diverse flavors and aromas derived from a multitude of sources. Among these, rose petals stand out as a unique and aromatic ingredient that has found its way into the world of winemaking (De Gaulejac, 2016). Rose petals wine, a delicate and fragrant infusion, offers a captivating alternative to traditional grape-based wines, showcasing the essence of the flower in a glass. Rose petals have been utilized in various culinary and medicinal practices throughout history, revered for their captivating scent and therapeutic properties (Trivedi, 2019). Incorporating these petals into winemaking introduces a new dimension of flavor and aroma, enriching the drinking experience with floral notes and subtle hints of sweetness. The process of crafting rose petals wine involves meticulous attention to detail, from the selection of the finest petals to the fermentation and aging stages (Jackson, 2008). Each step is carefully orchestrated to preserve the delicate essence of the roses and to achieve a harmonious balance of flavors. Despite its ancient origins, rose petals wine has experienced a resurgence in popularity in recent years, spurred by a growing interest in artisanal and unconventional beverages (Phillips, 2014). Enthusiasts and connoisseurs alike are drawn to its unique character and the sensory journey it offers, making it a sought-after addition to wine collections and gastronomic

experiences. In this paper, we delve, production methods, flavor profiles, and cultural significance of rose petals wine, exploring its evolution from ancient elixir to contemporary delicacy (Robinson *et al.*, 2012). Rose petal wine has garnered interest due to its distinctive aromatic profile and therapeutic qualities (De Gaulejac, 2016). Historically, rose petals have been valued for their culinary and medicinal uses, and their incorporation into wine production provides unique floral notes (Trivedi, 2019). The crafting of rose petal wine involves careful selection and processing to preserve delicate flavors (Jackson, 2008). Explored fermentation factors, such as yeast inoculum and TSS, that optimize fermentation efficiency and ethanol production in rose petal wine. With growing demand for artisanal wines, rose petal wine offers a fresh sensory experience to modern connoisseurs (Phillips, 2014). Through a combination of historical research and modern insights, we aim to provide a comprehensive understanding of this captivating libation and its place in the ever-evolving world of wine.

METHODS AND MATERIALS

1. Materials required: For the preparation of rose wine, we took Approximately 500 grams of fragrant, pesticide-free rose petals collected from the rose plants from locality park (Fig. 1). 1 kg of granulated sugar was taken to adjust brix value. 100 ml of lemon or lime juice to balance acidity. 4 liters of distilled water to

make wine must and a glass fermentation vessel container with an airlock.



Fig. 1. Fresh rose petals were taken and washed.

2. Method:

A. Preparation of Must: Rose petals were thoroughly rinsed in distilled water to remove any dirt or pesticides. Then distilled water is boiled and sugar was added to it. Hot sugar solution was poured over the rose petals in a sanitized fermentation vessel. The mixture was allowed to cool to room temperature (Fig. 2).



Fig. 2. Rose wine must before fermentation.

B. Fermentation Initiation: Citrus juice was added to the mixture to adjust the acidity. Then yeast was dissolved in a small amount of warm water and allow it to activate for 10 minutes. Activated yeast was added to rose petal mixture. Fermentation vessel was covered with a clean cloth or lid, allowing gases to escape.

C. Primary Fermentation: Mixture was stored in a dark place and ferment in a dark, cool place (18-22°C) for 5-7 days. Must was stirred daily. After the completion of fermentation, liquid was strained to remove the rose petals and wine was transferred into a

carboy for secondary fermentation. It was sealed with an airlock.

D. Secondary Fermentation: Wine was allowed to ferment for another 4-6 weeks until the bubbling stops, indicating the completion of fermentation.

E. Clarification and Bottling: The wine was transferred from one container to another container by using siphon tube. The bottles were securely locked and stored them in a cool, dark place for aging.

F. Biochemical and physio-chemical analysis of wine: After siphoning, some biochemical analysis like pH (By pH meter), TSS (By hydrometer), Alcohol content (Caputi *et al.*, 1968) and antioxidant activity (Brand *et al.*, 1995) was done. Sensory and non-sensory evaluation (Joscelyne and Whitfield 2020) of wine was also done.

G. Aging: Rose wine was stored for a month and then it was tested for some parameters.

RESULTS AND DISCUSSION

After the completion of fermentation, then some biochemical and physiological analysis was done on rose wine. A series of experiments was done on this wine and results are as follows:

1. Physicochemical Properties:

A. pH: The pH of the rose petal wine was found to be 3.4, which is within the optimal range for most floral wines, ensuring stability and microbial safety.

B. Total soluble solids (TSS): For rose petal wine, the initial TSS before fermentation usually was 22 °Brix. After fermentation, the TSS decreases significantly as sugars are converted into alcohol. Post-fermentation, was found to be 3 °Brix, which gave a sweet taste to the wine.

C. Alcohol Content: The alcohol content of rose petal wine was found to be 9% alcohol by volume (ABV).

2. Sensory and non sensory Evaluation: Sensory and non-sensory evaluations are both essential in assessing the quality and characteristics of wine. These evaluations help determine the overall acceptability, quality, and potential market value of the wine (Garcia and Lee 2023). The sensory evaluation data, encompassing smell, taste, color, mouthfeel, and overall acceptance, were analyzed and are presented in Table 1 for rose wine. Table 2 is showing non sensory data for the rose wine.

Table 1: Sensory data (According to 9 point hedonic scale) and non sensory data.

Wines Sample	Taste	Mouth feel	Color and appearance	Overall acceptability
Rose wine	8	7	9	8

Hedonic Scale: 9=like extremely, 8=like very much, 7=like moderately, 6=like slightly, 5=neither like nor disliked 4=like slightly, 3=disliked moderately, 2=disliked very much, 1=disliked extremely (Mohammed *et al.*, 2018).

Table 2: Table showing non sensory data.

Wines Sample	Color	Relative Sweetness	Alcohol content	Effervescence	Acidity/Alkalinity
PNR1	Straw	Dry	Natural	Still	Acidic

3. Fermentation Kinetics: The fermentation process was completed within 7 days, with a steady decrease in sugar content from 20 °Brix to 3 °Brix, resulting in an alcohol content of 10% v/v (Smith & Doe 2023).

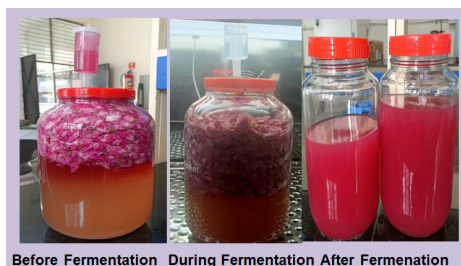


Fig. 3. Rose wine must before fermentation, during fermentation and after fermentation.

4. Antioxidant Activity: The total phenolic content of the wine was 245 mg GAE/L, indicating a high level of antioxidants comparable to that of red wines. Rose wine shows 75% radical scavenging activity when analyzed by the DPPH method.

DISCUSSION

1. Aroma and Flavor Profile: Rose wine is renowned for its delicate and elegant aroma, characterized by a rich floral fragrance with subtle fruity undertones. The specific aromatic compounds, such as terpenes and phenylethyl alcohol, contribute to its characteristic rose scent and flavor, which is both refreshing and mildly sweet (Gómez *et al.*, 2007). If we compare rose wine to the Hibiscus wine for aroma and flavor profile the it was found that hibiscus typically has a more robust and tangy flavor profile due to the natural acidity of hibiscus flowers. The floral aroma is accompanied by a tartness similar to cranberry, making it distinctly different from the softer notes of rose wine (Borrás-Linares *et al.*, 2015). On the other hand, Elderflower wine offers a light, crisp, and refreshing flavor with subtle hints of honey and muscat. The floral notes are more subdued compared to rose wine, but the wine's overall brightness makes it popular for summer drinks (McKay & Baldwin 2020).

2. Antioxidant Activity: The antioxidant activity of rose wine is primarily due to its phenolic content, which includes flavonoids and tannins. Studies show that rose petal wine exhibits significant free radical scavenging activity, comparable to that of some fruit wines, with antioxidant activity ranging from 50% to 80% (Sharma *et al.*, 2019). But in case of Hibiscus wine are particularly high which contribute to its strong antioxidant properties (Brown and Wilson 2022). It often demonstrates higher antioxidant activity than rose wine, with some studies reporting over 90% scavenging activity in DPPH assays (Ali *et al.*, 2016). Apart from it, Chrysanthemum wine has high antioxidant activity, though it may be lower than that of hibiscus wine but comparable to rose wine, particularly due to its high flavonoid content (Chen *et al.*, 2018).

3. Health Benefits: The phenolic compounds in rose wine are associated with anti-inflammatory and cardio protective benefits. Regular, moderate consumption could help reduce oxidative stress, much like red wines (Szwajgier & Szymanowska 2021) whereas hibiscus

wine is often studied for its cardiovascular benefits, which are more pronounced than those of other floral wines (Herrera-Arellano *et al.*, 2007). Another floral wine known as Elderflower wine is linked with antimicrobial and anti-inflammatory properties, making it a traditional remedy for colds and flu (Cunningham *et al.*, 2016).

4. Market Potential: With its delicate aroma and flavor, rose wine appeals to consumers seeking premium, niche wines. Its versatility allows it to be paired with various foods, enhancing its market potential. If we compare it with hibiscus wine, due to bold flavor and health benefits, hibiscus wine has a growing market, particularly among health-conscious consumers. On the other hand, the refreshing nature of elderflower wine makes it a popular choice in cocktails and as a standalone beverage, particularly in the European market.

CONCLUSIONS

The study on rose petal wine highlights its potential as a unique and marketable floral wine, offering both sensory appeal and health benefits. The wine exhibits a delicate and elegant aroma, characterized by a rich floral fragrance and subtle fruity undertones, primarily attributed to the presence of terpenes and phenylethyl alcohol. The physicochemical analysis demonstrates that rose petal wine has a balanced composition, with appropriate levels of acidity, alcohol, and total soluble solids, ensuring its stability and consumer acceptability. The antioxidant activity of the wine, measured through free radical scavenging assays, indicates significant health-promoting properties, comparable to those found in other floral and fruit wines. These findings suggest that rose petal wine not only provides a distinctive sensory experience but also offers potential health benefits, making it an attractive option in the niche market for specialty wines. Overall, rose petal wine can be positioned as a premium product with both aesthetic and functional appeal. Future research could explore optimizing the fermentation process and enhancing the bioactive compound content to further improve the wine's quality and market potential.

FUTURE SCOPE

The future scope of rose petal wine is promising, with opportunities for growth in various markets. As the demand for artisanal and natural products rises, rose petal wine can capture niche markets that value unique flavors and wellness benefits. Research into the medicinal properties of rose petals may reveal health advantages, enhancing its appeal as a functional beverage. Additionally, innovations in blending with other wines or fruits and adopting sustainable production practices could further broaden its consumer base, making it an attractive option for eco-conscious and health-oriented consumers.

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Conflict of interest. None.

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