

# Wine Making Technology Along With Types

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**Abstract---** *Wine is an alcoholic beverage made from fermented grape juice. The distinction between wine and beer, in terms of variations, is that beer is produced from distilled grapes, which are then aged. Wine is made from fruit and beer is made from grains, therefore, very simply. Wine making is the processing of wine, beginning with the collection of the grapes, the fermentation into alcohol and the finished beverage being bottled. Wine-making tradition extends through centuries. The wine and winemaking disciplines are classified as oenology. Also a wine-maker can be called a vintner. Grape growing is viticulture, and many types of grapes are found. The article presents a review of the potential of wine production from different fruits, wine classification and wine industry's current status. This paper covered various classes of wine, such as grape wine, fruit wine, berry wine, vegetable wine, herb wine, raisin wine etc. Latest reports on the development of wine from various tropical and subtropical fruits such as strawberry, banana and apple cider.*

**Keywords---** *Apple wine, Banana wine, Fruit wine, Mango wine.*

## I. INTRODUCTION

India is one of the world's biggest fruits growers. Fruits are among mankind's most essential products, as they are not only healthy but also invaluable for health maintenance. New and refined fruits not only enhance the quality of our food, but also provide essential ingredients such as vitamins, minerals, carbohydrates, etc. Postharvest depletion of fresh fruit is one of Tropical Countries including India's serious problems. Around 35 to 40 percent of horticultural production goes waste due to improper post-harvest handling and insufficient processing facilities. India inflicts post-harvest fruits and vegetable losses in excess of Rs 2 lakh crore each year largely due to the lack of food processing units, modern cold storage facilities and a callous attitude towards tackling the serious issue of post-harvest losses. In India, the fruit and vegetable processing industry uses less than 2% of overall fruit and vegetable production to turn into goods, compared to 40 to 50% in advanced countries. Fermentation is a viable technique in the development of new products, especially flavor and nutritional components, with modified physicochemical and sensory qualities. Fermentations of alcohol, acetate, and lactic acid are important for production quality.

Of these, alcoholic fermentation is commonly used in the production for beverages where alcohol is a significant constituent. From time immemorial, humanity learned about fermented beverages. An alcoholic drink is a liquor containing ethanol. These are divided into three general classes for taxation and production regulation, namely distilled beers, wines, and spirits such as whisky, rum, gin, vodka etc. Ale is developed by starch fermentation mixing yeast and malted cereal starch, in particular barley corn, rye, wheat or multi-grain combination and typically flavored with hops. This comprises 4 to 8 per cent alcohol and varies from 28 to 73 kcal per 100 mL. Distilled alcoholic beverages are created by fermenting berries, fruits or vegetables to distilled ethanol. These are produced from juice of sugarcane, molasses,

fermented maize and potato mash, and fermented barley and rye malt. Alcohol content varies from 40 to 60 percent of concentrated alcoholic beverages.

## **II. LITERATURE REVIEW**

Fruit wines are un-distilled alcoholic beverages typically made from grapes or other fruits such as peaches, prunes or apricots, bananas, elderberries or black current etc. which are healthier, more delicious and moderate stimulants. Such fruits experience a process of rotting and fermentation. They usually have a 5 to 13 per cent alcohol content. Fruity wines are often named after the fruits. No other product, excluding water and milk, has gained such universal acceptance and respect as wine has throughout the ages. Wine is a product with a taste that can be processed and shipped under the current conditions. As an aged and un-distilled product based on berries, wine provides most of the nutrients in the initial juice of the plant. The nutritional value of wine is increased during fermentation due to the release of amino acids and other nutrients from the yeast. Fruit wines contain between 8 and 11 per cent alcohol and between 2 and 3 per cent sugar with an energy value of between 70 and 90 kcal per 100 mL.

### **Types of wines**

A standard wine includes ethyl alcohol, carbohydrates, fats, low alcohols, tannins, aldehydes, esters, amino acids, nutrients, proteins, anthocyanin's, small constituents such as aromatic compounds, etc. Its substance is perhaps the most ancient fermented beverage and has been listed in the Bible as well as in other Asian records. The wines are graded as natural wines (9-14% alcohol) and dessert and appetizer wines (15-21% alcohol), based on the different attributes such as cultivar, level of fruit maturation, chemical composition of pulp, use of additives to the must, vinification techniques and aging of wine, alcohol and sugar content. Organic wines include dry wine, sweet table wine, fine wine, champagne, Muscat and burgundy wines, whereas white wine, cherries, vermouth and port wines are called dessert and appetizer wines.

Red and white wines are the most common styles of wines accompanied by rosé and sparkling wines. There are other wine specialties around the world, such as the Portuguese Port Wine, a very rich flavor that the chefs often use in their signature dishes. Most styles of wines, which are easy to remember, can be classified into several categories. These wines may be categorized as grape wine, fruit wine, berry wine, vegetable wine, plant wine, raisin wine etc. depending on the product creation.

### **Red wine**

Red wine is made from red grapes, which in fact are colored closer to black. There are lots of different kinds of red wines. In the realm of wines, this is known to be the most popular, blending delicious red grapes with a wide range of aromas, from wood to eucalypti, chocolate or even mint hints. Some black grape juice is greenish-white; the red color arises from the anthocyan pigments found in the grape tissue[1].

### **White wine**

White wine isn't exactly white; it's often colored in purple, gold or silver, based on whether it contains the grape skin or just the fruit. White wine can be made through the alcoholic processing of the non-colored pulp of green or gold colored grapes or from picked red grape juice produced in Europe and many other areas such as Australia, California, New

Zealand and South Africa and so on. In the final product, it is processed to retain a yellow translucent hue. White wines often taste lighter, crisper and more refreshing than a red wine, making them popular in warmer months of the year[2].

### **Pink wine**

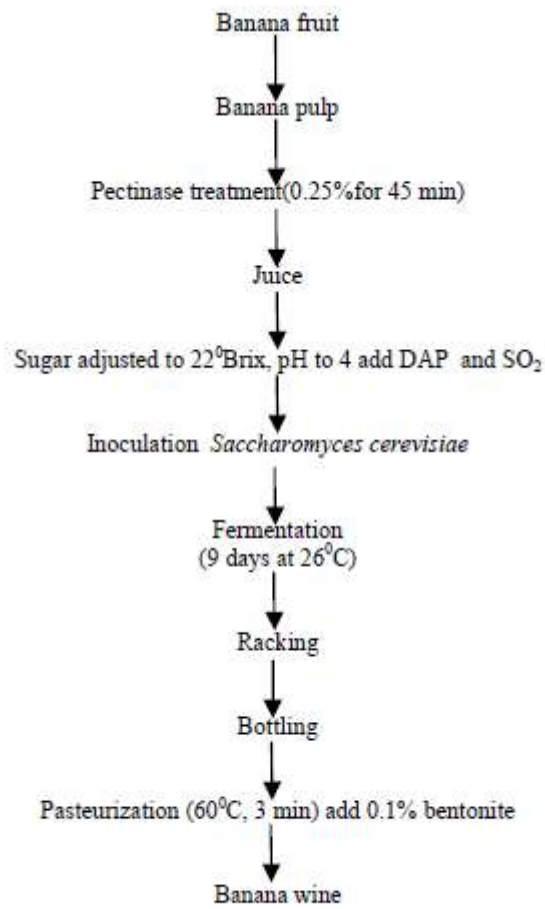
Rosa wine with a light pink hue, grape skin removed shortly after the fermentation process begins. Such wines are produced from a combination of "black" and "white" grapes, utilizing white wine processing techniques. Classifying wines by sugar and alcohol means separating them into dining rooms and fittings[3].

### **Mango wine**

Mango, India's pride fruit, is a significant tropical fruit crop which occupies about 60 percent of India's total cultivated area. Twenty-five separate mango cultivars are available in India, and valued for their medium to bright yellow color, sweet and tasty taste, strong nutritional value (large levels of amino acids, a good source of vitamin A and B6, low in saturated fat, cholesterol, and sodium), as well as its inexpensive market price. It has a deep luscious, spicy fragrance and wonderful taste where sugar and acidity combined delightfully. Mango contains a high sugar content (16-18 per cent w / v) and many organic acids, as well as antioxidants such as carotene (as vitamin A, 4,800 IU). The main sugars in ripened mango are sucrose, glucose and fructose. Citric acid, malic acid, oxalic acid, succinic acid and other organic acids are in the unripe fruit. For comparison, malic acid is the predominant organic compound for mature fruits. The mango wine has similar characteristics to grape wine, according to their reports, but they do not have details on the technique of vinification and the chemical composition of wine produced from mango. One of the preparation and preserving approaches for mango is to brew the high-carbohydrate juice into wines[4].

### **Banana wines**

Banana is the fourth most important crop after rice, wheat and maize and is valued at around US\$ 5 billion annually in international banana trade. The traditional extraction of banana juice and its subsequent fermentation to produce beer (tonto) is an important social and economic activity among many East African tribes. Bananas contain high carbohydrate nutrient sources, minerals especially potassium, and vitamins such as B1, B2, B3, B12, C and E. It can be refined and dried into rice, beans, and dried fruit. Bananas are pounded into porridges and also for the production of beer. The fiber is used to make ropes, sackcloth and mats. The banana peel is turned into sheets of paper and ink. Banana fruits are heat prone and highly perishable. Banana wine consumption offers a rich source of minerals, which improves fruit growing as a valuable by-product because bananas are abundant throughout the year. Banana is a good source of sugars and fibers making it an outstanding source of nutrition. It may alleviate fatigue, anemia, and blood pressure, risk of stroke, heartburns, ulcers, pain, constipation and diarrhea when ingested. This offers eyesight protection, strong bones and kidney dysfunctions, morning sickness, scratching and inflammation, strengthens nervous functioning and is said to help people quit smoking[5].



**Figure 1. Process flow chart for banana wine making**

### **Apple cider and wine**

Apple fruit is used for the preparation of mild alcoholic drinks that are more nutritious than distilled liquors. The apple flavor is more closely related to beer than any other alcoholic drink. Cider is a low alcoholic beverage made through apple juice fermentation, and is known to have been generated for over 2000 years. Cider is known throughout the world by various names such as cidre (France), sidre (Italy), sidra (Spain), and apfel wein (Germany and Switzerland). Cider can be dry or soft. Cider is classified into soft cider (1-5 percent) or hard cider (6-7 percent) based on the alcohol content[6].

### **Wine making technology**

Wine making mainly involves three types of processes, including pre-fermentation, fermentation, and post-fermentation. Pre-fermentation involves, in the case of wines made from grapes, crushing the fruit and releasing juice. In the case of white wine, alcohol is removed from the skin whereas the skins are not segregated from the liquid in the red wine. Juice clarification for white wine is usually achieved through sedimentary or centrifugation. Fermentation involves a reaction to alcohol and carbon dioxide converting the sugars in the juice. During the fermentation period, yeasts use sugars. A stuck fermentation occurs when yeasts do not use the available sugar to the full and the fermentation rate slows down and/or stops. Clarification can be gained by racking, filtration and/or centrifugation. Fermentation takes place under anaerobic conditions and can be boosted with di-ammonium phosphate (DAP) to supplement the nitrogen needed for

yeast growth in non-traditional winemaking approaches. Post-fermentation practices are performed after fermentation has reached the desired stage or is complete.

Wine is scraped off the yeast lees here, typically in containers made of stainless steel or in barrels of wood. The wine may be washed, distilled, fined and/or mixed in cold during the storage time. Different fining agents such as enzymes, bentonite, diatomaceous earth, egg albumen, etc. can be purchased commercially and added to help with wine clarification. During maturation and at an appropriate stage, wine undergoes continuous changes; the wine is filtered and bottled.

This research discloses about several factors affect the quality of various components in pomace, such as variety, harvesting at a particular stage, period of maceration, yeast strains or crops used for winemaking, conditions for winemaking, pressure used to extract wine from pomace and pomace drying temperatures etc. Focused and appropriate efforts are needed to increase the acceptance of cookies with more wine grape pomace powder as more antioxidants with cookies will be obtained by consumers[7]. This paper shows that the wine made from the variety Banginapalli had better aroma composition and good taste than that of the variety Alphonso[8]. The study contributes to the analysis of wine consumer behavior by defining qualities that are essential to the large segment of Indian millennial consumers for wine marketing. The results would help the marketers spot their wines better on the Indian market. The study will also help with product development, branding and pricing decisions[9]. The paper seeks to examine Italian wine's current situation and prospects in major Asian export markets-China, Japan, India, Singapore, and South Korea. Such countries show the highest wine consumption growth rates and are expected to become increasingly important for Italian wine producers[10].

### III. CONCLUSION

New and refined fruits not only improve the quality of our food but also provide essential ingredients such as vitamins, minerals, carbohydrates etc. Fruit wines are undistilled alcoholic beverages typically made from grapes or other fruits such as peaches, prunes or apricots, bananas, elder berry or black current etc. which are healthier, more delicious and moderate stimulants. Being a fermented and undistilled fruit-based product, wine includes most of the nutrients found in the original fruit juice. The nutritional value of wine is enhanced during fermentation due to the extraction of amino acids and other nutrients from the yeast.

### REFERANCES

- [1] I. Moreno-Indias et al., "Red wine polyphenols modulate fecal microbiota and reduce markers of the metabolic syndrome in obese patients," *Food Funct.*, 2016.
- [2] P. Comuzzo, F. Battistutta, M. Vendrame, M. S. Páez, G. Luisi, and R. Zironi, "Antioxidant properties of different products and additives in white wine," *Food Chem.*, 2015.
- [3] N. Velikova, S. Charters, T. Bouzdine-Chameeva, J. Fountain, C. Ritchie, and T. H. Dodd, "Seriously pink: a cross-cultural examination of the perceived image of rosé wine," *Int. J. Wine Bus. Res.*, 2015.
- [4] S. Varakumar, Y. S. Kumar, and O. V. S. Reddy, "Carotenoid composition of mango (*mangifera indica* l.) wine and its antioxidant activity," *J. Food Biochem.*, 2011.
- [5] D. Mohapatra, S. Mishra, and N. Sutar, "Banana and its by-product utilisation: An overview," *Journal of Scientific and Industrial Research*. 2010.

- [6] A. C. L. G. Mota, R. D. de Castro, J. de Araújo Oliveira, and E. de Oliveira Lima, "Antifungal Activity of Apple Cider Vinegar on Candida Species Involved in Denture Stomatitis," *J. Prosthodont.*, 2015.
- [7] S. Maner, A. K. Sharma, and K. Banerjee, "Wheat Flour Replacement by Wine Grape Pomace Powder Positively Affects Physical, Functional and Sensory Properties of Cookies," *Proc. Natl. Acad. Sci. India Sect. B - Biol. Sci.*, 2017.
- [8] L. V. A. Reddy, Y. S. Kumar, and O. V. S. Reddy, "Analysis of volatile aroma constituents of wine produced from Indian mango (*Mangifera indica* L.) by GC-MS," *Indian J. Microbiol.*, 2010.
- [9] R. Mehta and N. Bhanja, "Consumer preferences for wine attributes in an emerging market," *Int. J. Retail Distrib. Manag.*, 2018.
- [10] A. M. Corsi, N. Marinelli, and V. A. Sottini, "Italian wines and Asia: Policy scenarios and competitive dynamics," *Br. Food J.*, 2013.