

Preparation of Wine from Indian Gooseberry Fortified with Aloe Vera

Ashutosh Patel¹, Dhanya Joseph²

¹M.Sc. Food Technology, Department of Food Technology, PIAS, Parul University Vadodara, Gujarat, India

²Assistant Professor, Department of Food Technology, PIAS, Parul University, Vadodara, Gujarat, India

ABSTRACT

Wine is a functional fermented food that has a variety of health advantages. Yeast fermentation, which involves converting sugar to alcohol, is how commercial wine is made. Across the entire year, wine can serve as a nutrient source for seasonal fruits and vegetables. Ayurveda uses the herb *Emblica Officinalis*, which has existed since ancient times, to cure a variety of illnesses. Here, the foundation is an Indian gooseberry, which is recognized for its great medicinal and nutritional value. A study was done on how various amounts of Jaggery were used to make Amla wine. The purpose of the study is to analysis three varieties of Indian gooseberry wine and assesses the sensory, microbiological, and other chemical analyses of the final product. The fruit was chosen, cleaned, and inspected. The titles S1, S2, and S3 of the three varieties of Indian gooseberry wine correspond to the proportionate increases in the quantities of Indian gooseberry and Jaggery utilized. After the testing was over, it was discovered that the S2 findings were superior to those of other wines. The investigation is clear that the control sample is less accepted than fortified wine.

KEYWORDS: *Gooseberry, Fermentation, Wine, Jaggery concentration*

1. INTRODUCTION

An alcoholic brew is a drink that contains ethanol. These are distributed into three broad classes for taxation and instruction of creation namely beers, wines, and spirits distilled brews similar to whisky, rum, gin, vodka, etc. [1].

Wine is one of the oldest, fermented, traditional, convenient alcoholic potables of humanity [2]. Wine is a product attained from partial or complete alcoholic turmoil of grapes or non-grape fruits. It's the oldest known fermented product, according to the Rigveda, and is one of the most commercially flourishing biotechnological processes throughout the world. Wine is classified into two types of wines, fortified wine and sparkling wine (with an alternate turmoil process), which are relatively distinct and are veritably popular. Among the fortified wines, vermouth is a wine fortified with alcohol and blended with spices and sauces, which can be sweet or dry.[3]

The Indian gooseberry (*Emblica Officinalis* Gaertn.) (EO), or Aonla or Amla, is one of the most important, yet underutilized, traditional fruits of Indian origin,

having great eventuality for civilization on borderline or desolate land. In India, the fruit has been known for its medicinal and remedial parcels since ancient times, and it's now considered a wonder fruit for a health-conscious population. It has been grown and known in India for further than 3500 times and belongs to the family Euphorbiaceae and subfamily Phyllanthoidae[4]. Indian gooseberry trees thrive throughout the tropical and subtropical parts of India, found growing either wild or cultivated. India ranks first in the world in area and production of EO; however, the fruit is also grown in Sri Lanka (MacMillan, 1943), Cuba, Puerto Rico (Williams and Williams, 1951), Hawaii, Florida (Barrett, 1956; Sturrock, 1959), Iran, Iraq (Hooper and Field, 1937), Pakistan, China, Malaysia, Bhutan, Thailand, Vietnam, Philippines (Benthal, 1946), Trinidad, Panama, and Japan (Webster, 1957).

India, the homeland of Aonla, cultivation was 1st started in Varanasi (earlier known as Banaras) district of Uttar Pradesh with the initiative of Maharaja of

How to cite this paper: Ashutosh Patel | Dhanya Joseph "Preparation of Wine from Indian Gooseberry Fortified with Aloe Vera" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-7 | Issue-1, February 2023, pp.1222-1226, URL: www.ijtsrd.com/papers/ijtsrd53843.pdf



Copyright © 2023 by author (s) and International Journal of Trend in Scientific Research and Development Journal. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0) (<http://creativecommons.org/licenses/by/4.0>)



Kashi.. The production of Aonla is mainly concentrated in Uttar Pradesh, Madhya Pradesh, Tamilnadu, Gujarat, and Chhattisgarh and to a smaller extent in Assam, Jammu and Kashmir (Previous state territory), Bihar, Maharashtra, and Rajasthan. Uttar Pradesh (35.79%) is the leading state in Aonla production followed by Madhya Pradesh (28.14%), Tamilnadu (14.24 %), Gujarat (7.63 %) and Chhattisgarh (4.03%)[5].

Indian gooseberry fruit is largely nutritional, with a wide range of medicinal uses. It's a rich source of vitamin C and contains 500–1500 mg of ascorbic acid per 100 g of pulp. This is much more than the vitamin C content of guavas, oranges, tangerines, or other failed fruits[6]. Raghu reported that fruit juice contains nearly 20 times as much important vitamin C as orange juice. Still, the claim that EO fruits are a "good source of vitamin C" is questionable (Raghu et al., 2007). Its other ingredients are phenols and tannins, which contain gallic acid and ellagic acid, which help with the oxidation of vitamin C. EO fruits aren't consumed in their fresh form because of their high acidity and bitter taste. For this reason, it isn't consumed as a table fruit, but it has other important uses[7].

Phyllanthus Emblica plays a positive role in the treatment of degenerative conditions such as cancer, diabetes, liver disease, ulcers, anemia, and heart problems and is a key ingredient in hepatoprotective formulations [8]. Indian gooseberry is one of the richest sources of vitamin C and low-molecular-weight hydrolyzable tannins, which makes Amla a good antioxidant. The tannins of amla, like emblicanin-A (37%), emblicanin-B (33%), punigluconin, and pedunculagin, are reported to defend against oxygen radical-initiated hemolysis of rat peripheral blood erythrocytes. The mechanism behind the antioxidant activity is due to the recycling of the sugar moiety and the conversion of the polyphenol into medium- and high-molecular-weight tannins. The powerful antioxidant ellagic acid, present in Amla, can inhibit mutations in genes and repair chromosomal abnormalities [9]. Last but not least, taking Indian gooseberry supplements might help prevent blood clots from forming, which could lead to a heart attack or stroke if they block an artery. Even yet, more study must be done before Indian gooseberry can be hailed as a successful supplement for heart health, despite some human trials having been done (Banu & al, 2004) [10].

The name aloe is from the Greek *alsos* and denotes to the bitter juice from the leaves of these plants. It is most likely derived from the previous Arabic word *alloeh* or the Hebrew word *allal*, equally meaning

bitter. It has an enormous traditional role in native system of medicine like ayurveda, siddha, Unani and homoeopathy [11]. *Aloe barbadensis* miller a semi tropical plant is one of the 250 kinds of Aloe. It goes to Asphodelaceae (Liliaceae) family, and is a shrubby, perennial, xerophytic, pea- green color plant. The Aloe vera plant is a member of lily plant well-known as *Aloe barbadensis* which is full of juice and closes similar to a cactus. As a result of its cactus like feel, Aloe is often erroneously called a "Desert Cacti". On the other hand, only two species are grown at present commercially, with *Aloe barbadensis* Miller and *Aloe arborescens* being the most widespread. Most frequently used for its medicinal belongings, Aloe Vera or the Sanskrit name "Ghee kunwar" [12].

Aloe vera leaves contain a variety of chemicals, such as anthraquinones (such as aloe-emodin), anthrones and their glycosides (such as aloin A and B), chromones, carbohydrates, proteins, glycoproteins, amino acids, organic acids, lipids, sugars, vitamins, and minerals. There are more than 200 chemicals found in *Aloe barbadensis*, of which about 75 have biological activities [13].

Therapeutic properties of Aloe Vera range from external burn treatments to helping get rid of constipation by feeding. Aloe Vera is the most useful natural plant used both externally and internally. Furthermore there are several benefits that are derived from this ideal plant. The health benefits of Aloe Vera have been transmitted all over the world [14].

Aloe Vera consists of two elements that are frequently employed. The bitter exudate is commonly used as a bittering agent in alcoholic beverages and as a laxative. It is utilized as a natural medicine for its cathartic action. The dried latex, which has a high barb loin content and is a strong laxative, should only be used for one week at a time and should not be taken while menstruating, breastfeeding, or nursing. The portion of the Aloe Vera plant which is most recognized is the inner gel, often known as "pure gel" [15]. Since Aloe Vera serves as an astringent, lubricant, humidifier, and cleaner, it is widely used in dermatology. It softens the skin, minimizes wrinkles, and cures skin irritation, psoriasis, eczema, mycosis, red spots, acne, and herpes. It also protects the skin from pollution. Moreover, it is ideal for repairing sunburns, sensitive skin, and eliminating and rejuvenating old skin and cells.

Juice of Aloe Vera stimulates digestive health and is a great solution for drinking too much alcohol. It also inhibits liver damage in addition to the foregoing. With very few adverse effects, Aloe Vera juice contains 12 vital elements that reduce inflammation.

Aloe Vera juice also enhances joint and muscular flexibility. Aloe helps to boost the immune system, which in turn shields the body from viral and tumour-related disorders.

2. Material and Methodology

2.1. Raw Material

Indian Gooseberry, Chemical-free Jaggery, Aloe Vera Powder, porcelain jars, muslin cloth were purchased from the local market. The fruit was selected and sanitized in 1% sodium hypochlorite. Also, the porcelain jars and muslin cloth were washed and made free from moisture.

2.2. Preparation of Wine

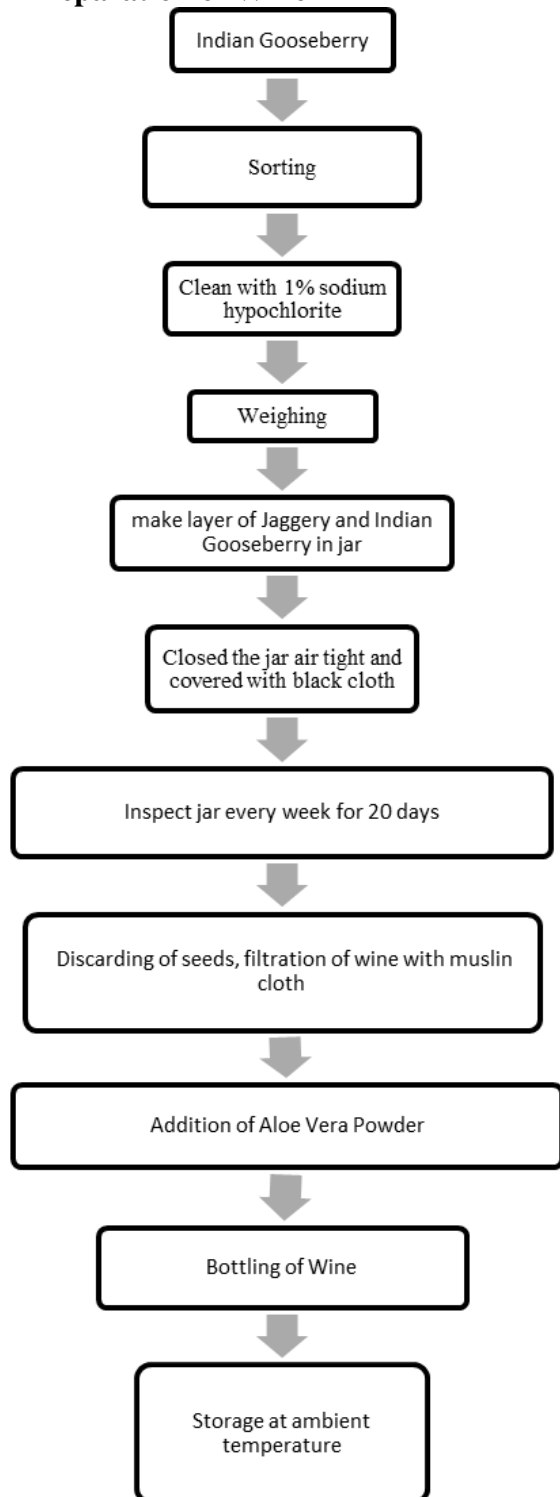


Figure 2.2.1 Flowchart for preparation of Wine

2.3. Formulation of Wine:

Table 2.3.1: Formulations of Wine

Sr. No	Ingredients	S1	S2	S3
1.	Indian Gooseberry	975gm	750gm	900gm
2.	Jaggery	525gm	750gm	600gm
3.	Aloe Vera Powder	2gm	5gm	8gm

2.4. Analysis of chemical properties:

The chemical characteristics such as PH, alcohol (ethanol) %, sulphur dioxide, Titrable acidity, residual sugar, dissolved oxygen, dissolved nitrogen, turbidity NTU were analysed by different methods.

PH:

The PH of the samples was assessed using IS 7585: Wines-Method of Analysis: Bureau of Indian Standards.

Alcohol (ethanol):

The alcohol (ethanol) % was assessed using IS: 3752 (2005): Alcoholic drinks- Methods of test [FAD 14: Drinks and Carbonated Beverages].

Sulphur dioxide:

The sulphur dioxide was assessed using FSSAI Manual- Beverages, Sugar and Sugar Products & Confectionary Products 2015, Method- 7.5.

Titration Acidity:

The Titrable acidity of the samples was assessed using IS 7585: Wines-Method of Analysis: Bureau of Indian Standards.

Residual Sugar:

The residual sugar of the sample was assessed using Hydrometer.

Dissolved Oxygen:

The dissolved oxygen of the sample was assessed by DO Meter.

The amount of oxygen that diffuses into a probe through a permeable (or semi-permeable) membrane is measured by dissolved oxygen probes (sensor). An electrical signal is generated after a chemical reduction event occurs because oxygen is present inside the sensor. This signal is found by the DO probe and is then shown on a metre.

Dissolved Nitrogen:

The dissolved nitrogen of the sample was determined by Kjehdal Method.

Turbidity:

The turbidity of sample was assessed by using Turbidity meter.

2.5. Sensory Evaluation of Wine

For all three trials, the wine sensory evaluation was recorded. Five semi-trained panellists from the

Department of Food Technology of Parul University, Vadodara, conducted sensory evaluations using a 9-point hedonic scale ranging from 1 (extremely dislike/ most undesirable) to 9 (extremely like/most desirable). A test proforma was also supplied to the panellists at the time of evaluation. It is given here, 9 = like extremely, 8 = like very much, 7 = like

moderately, 6 = like slightly, 5 = neither like nor dislike, 4 = dislike slightly, 3 = dislike moderately, 2 = dislike very much, 1 = dislike extremely, for various parameters, including appearance, texture, taste, consistency and overall acceptability. All panellists were Asst.professors and P.G. students between the ages of 23 and 40.

3. Results and Discussion

3.1. Sensory evaluation of wine

The mean scores for sensory of S1, S2, and S3 samples are shown in Figure. Sample S2 containing 5gm Aloe Vera powder had the highest scores for appearance, texture, taste, consistency and overall acceptability. The increase in the quantity of Aloe Vera powder seems to have contributed to improvements in appearance, texture, taste and consistency. The addition of Aloe Vera powder play important role in higher overall acceptability of the finished product.

Samples S1 and S3 had an acceptable but slightly below-average flavor. These samples received lower ratings for look and flavour than Sample S2, which contained 5g of Aloe Vera powder. The physical characteristics and chemical makeup of Sample S2, which was found to be acceptable over the other two samples, were then compared to those of the control sample.

Graphical representation of sensory evaluation

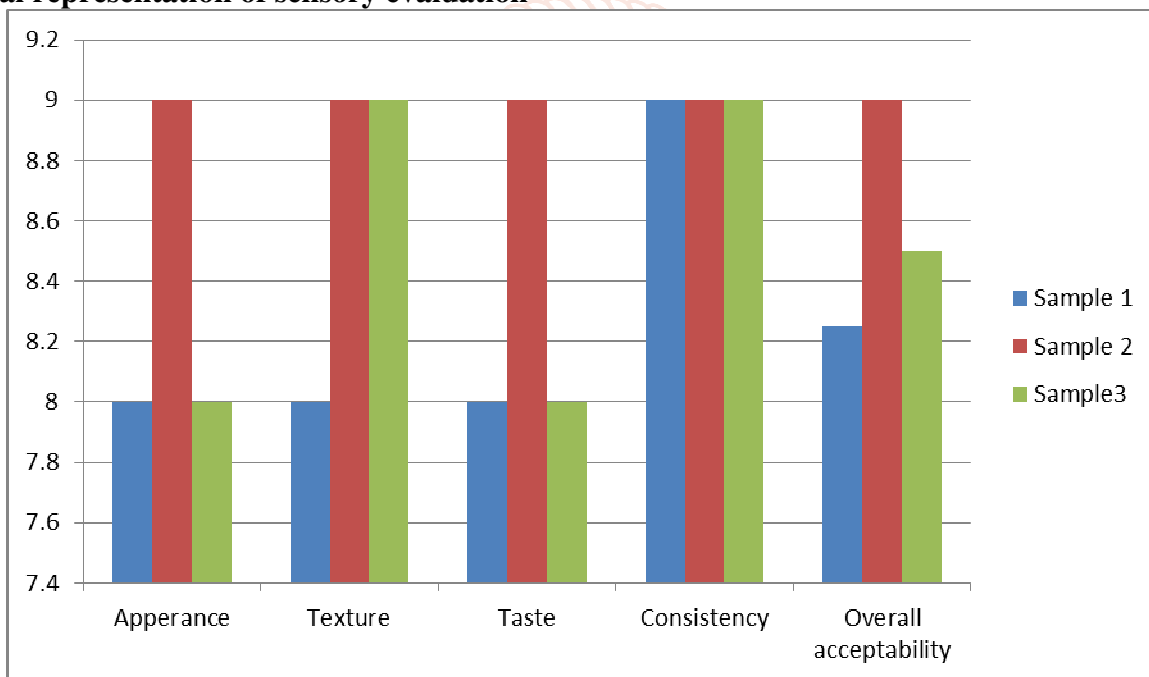


Figure 3.1.1 Sensory Evaluation Parameters

3.2. Chemical Analysis of wine

The chemical characteristics such as PH, alcohol (ethanol) %, sulphur dioxide, Titrable acidity, residual sugar, dissolved oxygen, dissolved nitrogen, turbidity NTU were analysed by different methods.

Table 3.2.1 Chemical Analysis of Wine

Sr. No.	TEST NAME	RESULTS
1	PH	3.70 at 25.0 degree Celsius
2	Alcohol(Ethanol) %	5.0
3	Sulphur Dioxide, mg/kg	53.18
4	Titration Acidity, %	0.57
5	Residual Sugar, mg/100ml	23.24
6	Dissolved Oxygen, mg/l	10.31
7	Dissolved Nitrogen, %	BLQ
8	Turbidity, NTU	246

4. Conclusion

These results indicate that wine made from Indian Gooseberry using Jaggery with fortification of Aloe Vera powder have more health benefit than the other fruits wines available in the market. The improvement of food is a crucial strategy for preventing certain nutritional deficiencies. Additionally, to reducing the risk of heart disease, inflammation, anaemia, toxins, urinary stone, it can also work as an immune system booster and reduce.

Compliances with ethical standards

Acknowledgments

We are grateful to all those with whom we have had the pleasure to work during this research project. Each and every member of my Research Project work has provided us with extensive personal and professional guidance and taught us a great deal about both scientific research and life in general.

Disclosure of conflict of interest

The authors declare that there is no conflict of interest.

Reference

- [1] Kosseva Maria, Joshi V.K., Panesar P.S. 2017. Science and Technology of Fruit Wine Production (pp.410-470).
- [2] Blandino A, Al-Aseeri ME, Pandiella SS, Cantero D and Webb C (2003). Cereal-based fermented foods and beverages. Food Research International 36(6) 527-543.
- [3] Das A, Raychaudhuri U and Chakraborty R (2012). Cereal based functional food of Indian subcontinent: a review. Journal of Food Science and Technology 49(6) 665-672.
- [4] Platt BS (1955). Some traditional alcoholic beverages and their importance in indigenous African communities. Proceedings of the Nutrition Society 14(02) 115-124.
- [5] Kosseva Maria, Joshi V.K., Panesar P.S. 2017. Science and Technology of Fruit Wine Production (pp.410-470).
- [6] Pareek, S., Shikov, A. N., Pozharitskaya, O. N., Makarov, V. G., González-Aguilar, G. A., Ramalho, S. A., & Narain, N. (2017). Indian gooseberry (*Emblica officinalis* Gaertn.). *Fruit and Vegetable Phytochemicals: Chemistry and Human Health, 2nd Edition*, 1077-1106.
- [7] Goswami, K. P., & Singh, S. (2022). Spatio-temporal analysis of Aonla (Indian Gooseberry) cultivation in Pratapgarh district, Uttar Pradesh. *National Geographical Journal of India*, 67(2), 134-144.
- [8] Chauhan OP, Srivastava S, Pandey P, Rai GK. 2005. A study on the development of aonla blended sauce. Beverage Food World, 32:31–32.
- [9] Raghu V, Patel K, Srinivasan K. 2007. Comparison of ascorbic acid content of *Emblica officinalis* fruits determined by different analytical methods. J Food Compos Anal, 20:529–533
- [10] Pandey, Govind, Some important anti -cancer herbs: A review, International Research Journal of Pharmacy. 2011;2(7):45 -52
- [11] Ghosal S, Tripathi VK, Chauhan S, Active constituents of *Emblica officinalis*, Part I, the chemistry and antioxidant effects of two new hydrolysable tannins, emblicanin A and B, Indian Journal of Chemistry. 1996; 35, 941 -8.
- [12] Pareek, S., Shikov, A. N., Pozharitskaya, O. N., Makarov, V. G., González-Aguilar, G. A., Ramalho, S. A., & Narain, N. (2017). Indian gooseberry (*Emblica officinalis* Gaertn.). *Fruit and Vegetable Phytochemicals: Chemistry and Human Health, 2nd Edition*, 1077-1106.
- [13] Baby J, Justin SR. Pharmacognostic and phytochemical properties of Aloe vera linn –an overview. International journal of pharmaceutical sciences review and research 2010; 4:106.
- [14] Manvitha, K., & Bidya, B. (2014). Aloe vera: a wonder plant its history, cultivation and medicinal uses. *Journal of Pharmacognosy and Phytochemistry*, 2(5), 85-88.
- [15] Roy Upton, Pavel Axentiev MS, Diana Swisher MA. Aloe vera Leaf. American Herbal Pharmacopoeia®. 2012; 1-52. Available from: <http://www.e-bookspdf.org>
- [16] Saeed MA, Ahmad I, Yaqub U, Akbar S, Waheed A, Saleem M, Nasir-ud-Din. Aloe Vera: A Plant of Vital Significance. Science vision 2004; 9:1-13.
- [17] Hosseini N, Fakhraee R. Medial uses of Aloe vera.