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Production of Homemade Wine Using Different Plant Substrates

Research Article

Shashikanth Vale, Sumanth Deekonda, Sravani P, Sahiti Mannar TB and Sushma Patkar*

Bhavan's Vivekananda College of Sciences, Humanities and Commerce, Sainikpuri, Hyderabad, India

***Corresponding author:** Sushma Patkar, Bhavan's Vivekananda College of Sciences, Humanities and Commerce, Sainikpuri, Hyderabad, India, Phone: 040-2711611, Fax 040-27112717; E-mail: sushma.ghosh@gmail.com

evershineshashi@gmail.com

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Abstract

Home wine making is an educative and enjoyable hobby. Wine can be made from any non toxic part of plant. In the present study, wine was prepared from tomato, guava, bitter guard and ginger. Ethanol, Ascorbic acid and glucose content were measured in respective wine samples and were compared with commercially available wine. Tomato (9.8 µg/ml) and Guava (14.8 µg/ml) wines had the lower ethanol content when compared to bitter gourd (59 µg/ml), ginger (64 µg/ml) and commercial wine (34.5 µg/ml). Glucose content was found to be lower in tomato wine (18 mg/ml) than commercial (29 mg/ml), however guava (42 mg/ml), bitter gourd (49 mg/ml), and ginger wine (45 mg/ml) had higher glucose content than commercial wine. Ginger (19.53 µg/ml) and tomato (15.19 µg/ml) wines had high ascorbic acid concentration as compared to guava (10.86 µg/ml) and bitter gourd (13.88 µg/ml), however the ascorbic acid content was highest in commercial wine (32.6µg/ml). Homemade tomato and guava wine were found to have lower ethanol content and tomato wine had lower glucose content than commercial wine.

Keywords: Homemade wine; Plant substrates and Ethanol

Introduction

Wine is an alcoholic drink prepared by fermentation. Home winemaking can be both educative and enjoyable. Traditional homemade wine recepies use grapes as base ingredient as it contains the correct mix of sugar, moisture and nutrients required for fermentation. Wine can be made from almost any non-toxic plant or plant part if additional ingredients are supplied in correct proportion. Wine has been prepared by using fruits like apple or berries [1], Tomato [2], Jamun [3], plum [4] or from mixed fruit juices like pineapple and orange [5] or fruit juices with betel leaf [6] or using Indian Gooseberry [7] and spices like Ginger [7]. Research indicates that if taken in moderate doses, wine intake affects cholesterol levels favorably, decreasing the tendency of blood to clot and assists in dissolving clots thereby protecting from cardiovascular disease. Wine contains quercetin a potent anti carcinogen, and many flavnoids and polyphenolic antioxidants. Studies have indicated moderate intake of wine delays dementia and prevents arthiritis [8]. The objective of the present study is to prepare wine using fruits like Tomato, Bitter guard, Guava and rhizome like ginger, estimate the ethanol, glucose content and ascorbic acid concentration and compare these parameters with commercial wine. The mentioned plant substrates were taken owing to their easy availability, health benefits, antioxidant, nutritional and medicinal properties.

Methodology

Ripe tomato, guava, bitter gourd and ginger (1Kg each) were purchased from the local market, washed thoroughly in tap water and were cut in small pieces. Tomato pieces were ground in a mixer and the pulp was strained through a muslin cloth, whereas juice from guava, bitter gourd and ginger was extracted with water and was filtered. The extracts were dispensed in conical flasks, autoclaved, inoculated with Baker's yeast (*Saccharomyces cerevisiae*) and fermented for two

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Table 1: Evaluation of sensory parameters of wine.

Type of wine	Colour of wine	Depth of colour	Optical Density	Aroma	Intensity of aroma	Taste	Flavour intensity
Tomato	Yellow	Pale	Clear	Yes	Low	Sour	Medium
Bitter gourd	Yellow	Pale	Clear	Yes	Medium	Sweet	Strong
Ginger	Brown	Medium	Clear	Yes	High	Sweet	Strong
Guava	Greenish white	Pale	Opaque	Yes	Medium	Sweet	Low
Commercial	Brown	Dark	Opaque	Yes	Medium	Sweet	Medium

Table 2: Evaluation of pH, ethanol, Glucose and Ascorbic acid content in wine.

Type of wine	Ethanol (µg/ml)	Glucose (mg/ml)	Ascorbic acid (µg/ml)	pH
Tomato	9.8	18	15.19	3.86
Guava	14.8	42	10.86	2.77
Bitter gourd	59	49	13.88	4.04
Ginger	64	45	19.53	4.31
Commercial	34.5	29	32.6	2.95

months. The wine obtained was filtered and evaluated for sensory parameters by volunteers recruited from our Institution. Evaluation of pH was done using a pH meter (ELICO digital pH meter). Ethanol by Potassium di chromate method [9], Glucose by DNS method (Dinitrosalicylic) [10] and Ascorbic acid content [11] were analyzed in respective wine samples and compared.

Results

Table 1 summarizes the sensory parameters of wine from different sources. All the wines were found to be aromatic, with ginger wine showing high intensity of aroma. With respect to color all wines were pale except ginger. Bitter gourd and ginger wine showed strong flavor intensity. Except tomato other wines were sweet to taste. pH, ethanol, glucose and ascorbic acid content are summarized in Table 2. The pH of Tomato wine is 3.86, Bitter gourd wine is 4.04, Guava wine is 2.77, Ginger wine 4.31 and commercial wine is 2.95. Guava wine was more acidic than other wines. Tomato (9.8 µg/ml) and Guava (14.8 µg/ml) wines had the lower ethanol content when compared to bitter gourd (59 µg/ml), ginger (64 µg/ml) and commercial wine (34.5 µg/ml). Glucose content was found to be lower in tomato wine (18 mg/ml) than commercial (29 mg/ml), however guava (42 mg/ml), bitter gourd (49 mg/ml), and ginger wine (45 mg/ml) had higher glucose content than commercial wine. Ginger (19.53 µg/ml) and tomato (15.19 µg/ml) wines had high ascorbic acid concentration as compared to guava (10.86 µg/ml) and bitter gourd (13.88 µg/ml), however the ascorbic acid content was highest in commercial wine (32.6µg/ml).

Conclusion

The study mainly focused on preparing homemade wine and experimental investigation was aimed at studying the variation of pH, ethanol, glucose and ascorbic acid content in homemade and commercially available wine. Homemade tomato and guava wine were found to have lower ethanol content and tomato wine had lower glucose content than commercial wine. These homemade wines were prepared without added preservatives and additives, therefore they are not harmful for health and can be taken daily in moderation. Further analysis and processing may take the study a step closer to production on industrial scale.

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