

Compatibility of Fresh Bitter Melon (*Momordica Charantia*) Juice with Six Base Spirits

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ABSTRACT: This study explores the compatibility of fresh bitter melon juice (*Momordica charantia*) with six base spirits: vodka, gin, tequila, rum, brandy, and whisky. Bitter melon is known for its intense bitter flavor and medicinal properties, particularly for controlling blood sugar. The research focused on the taste, aroma, mouthfeel, and overall acceptability of each combination, as rated by adult participants. Vodka and gin proved to be the most compatible with bitter melon juice, offering a balanced flavor and higher acceptability. Brandy and whisky were least favored. This study opens up new possibilities for developing health-conscious cocktails using a locally available and functional ingredient.

KEYWORDS: Bitter melon juice, six base spirits, cocktails, compatibility

I. INTRODUCTION

Bitter melon (*Momordica charantia*), known locally as ampalaya, is a tropical vegetable commonly found in the Philippines and other parts of Asia. Although it is often disliked for its naturally bitter taste, it is highly respected in traditional medicine and local diets for its many health benefits especially its ability to help lower blood sugar levels. Because of this, it is often used as an herbal remedy for people with diabetes or those maintaining a healthy lifestyle (Joseph & Jini, 2013).

Over the years, many studies have proven the functional benefits of bitter melon. It is rich in antioxidants, has anti-inflammatory properties, and can help in managing metabolic diseases like diabetes and obesity (Ahmad et al., 2021). Despite these advantages, its strong bitter flavor has made it less appealing to many people, particularly in beverages. In the food and beverage industry today, there's a growing interest in functional and health-focused ingredients. Many mixologists and culinary innovators are exploring the use of vegetables, herbs, and superfoods in new ways not just in healthy juices but also in alcoholic drinks. As consumers become more health conscious, there is a shift towards drinks that offer more than just flavor they should also provide wellness benefits (Zhang et al., 2020).

This study was inspired by the idea of transforming bitter melon juice from a purely medicinal beverage into an enjoyable cocktail ingredient. Instead of masking its bitterness entirely, the aim was to pair it with the right alcoholic base spirit one that can complement or balance its flavor. Six widely used spirits were chosen for this compatibility test: vodka, gin, tequila, rum, brandy, and whisky. By identifying which spirits best match with bitter melon juice, this study hopes to promote the vegetable in a new and creative way not just as a health drink, but as a unique ingredient in functional cocktails. This also contributes to local innovation and opens opportunities for healthy, Filipino-inspired alcoholic beverages that are both beneficial and enjoyable.

Generally, this study aimed to use Bitter melon in making a cocktail and to evaluate its sensory acceptability among consumers. Specifically, it aimed to answer the following questions:

1. Evaluate the sensory compatibility of bitter melon juice with six base spirits in terms of:
 - a) Taste,
 - b) Aroma
 - c) Mouthfeel and
 - d) Overall acceptability
2. Identify significant differences in acceptability scores among the spirit combinations.
3. Recommend spirit pairings that can be used to develop health-focused cocktail recipes.

II. METHODOLOGY

This chapter of this study present the research methodologies that were employed in the conduct of the study. It includes the research design, local and population of the study, data gathering instrument, data gathering procedure, treatment of data and data analysis in order to rearrange the gathered data.

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Research Design

This study used a **descriptive-evaluative research design** to assess consumer preferences for six different cocktail combinations made with fresh bitter melon juice and various base spirits. The main purpose of this design was to **describe the characteristics** of each drink formulation and **evaluate how acceptable and enjoyable** they are to the target consumers. A descriptive-evaluative design is ideal when the goal is to gather opinions, preferences, and feedback about specific products or experiences in this case, the **taste, aroma, mouthfeel, and overall acceptability** of bitter melon cocktails. It allowed us to measure how well fresh bitter melon juice paired with each of the six base spirits: **vodka, gin, rum, tequila, brandy, and whiskey**.

Locale and Population of the Study

The evaluators of this study were 39 bartending trainees from TESDA – Isabela School of Arts and Trades. These participants, trained in bar operations and mixology, were selected for their background in evaluating spirits and cocktails. Each of them assessed all six samples of bitter melon juice mixed with different base spirits, rating them on **taste, aroma, mouthfeel, and overall acceptability** using a standardized sensory evaluation form.

Data Gathering Instrument

To assess the compatibility of fresh bitter melon (*Momordica charantia*) juice with six base spirits, the researcher developed a sensory evaluation form. This tool was used to measure participants' responses to each cocktail in terms of four key sensory qualities: taste, aroma, mouthfeel, and overall acceptability. Each attribute was evaluated using a five-point Likert scale, where 5 meant "Excellent," 4 "Like," 3 "Neutral," 2 "Dislike," and 1 "Very Poor." In addition to the rating scale, the form included an open-ended section for participants to provide comments, suggestions, or additional feedback regarding their experience with each drink. This approach allowed for both quantitative and qualitative insights into how the cocktails were perceived by the participants, who were bartending students from TESDA-ISAT.

Data Gathering Procedure

To gather the necessary data, the researcher prepared six variations of cocktails using fresh bitter melon (*Momordica charantia*) juice, each mixed with a different base spirit: gin, vodka, rum, tequila, brandy, and whisky. These cocktail formulations, referred to as **treatments**, were prepared using a standardized recipe and were presented to the respondents at the **TESDA – Isabela School of Arts and Trades** for sensory evaluation. After the tasting session, sensory evaluation forms were distributed, and the responses were recorded and tallied for analysis.

With regard to acceptability of the cocktail with respect to its taste, aroma, mouthfeel, and overall acceptability the range with its corresponding qualitative description are as follows:

Range	Qualitative Description
4.50 – 5.00	Extremely Like
3.50 – 4.49	Like
2.50 – 3.49	Neutral
1.50 – 2.49	Dislike
1.00 – 1.49	Very Poor

Data Analysis

To obtain valid and reliable results in this study, the researchers used the following statistical tools:

1. Frequency Count was used to determine how many times each rating was given by the participants for each cocktail treatment. This helped identify which base spirit combinations were more frequently preferred in terms of taste, aroma, mouthfeel, and overall acceptability.
2. Weighted Mean was applied to calculate the average rating for each of the six treatments using a 5-point Likert scale. This allowed the researchers to determine which base spirit, when combined with bitter melon juice, was most acceptable to the participants based on the four sensory attributes.

III. RESULTS AND DISCUSSION

This chapter presents and discusses the findings of the study on the compatibility of fresh bitter melon (*Momordica charantia*) juice with six different base spirits: gin, vodka, rum, tequila, brandy, and whisky. The evaluation was based on four key sensory attributes: **taste, aroma, mouthfeel, and overall acceptability**, as rated by 39 bartending students from TESDA-ISAT.

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Table 1. Frequency Count of Ratings per Spirit (Overall Acceptability, 39 Respondents)

Rating	Gin	Vodka	Rum	Tequila	Brandy	Whisky
5 (Excellent)	22	16	7	3	2	1
4 (Like)	12	14	13	8	6	5
3 (Neutral)	4	7	10	14	12	11
2 (Dislike)	1	2	6	9	11	13
1 (Very Poor)	0	0	3	5	8	9

Table 1 shows how many participants gave each rating to each cocktail. The highest number of “Excellent” (rating 5) responses was recorded for the gin-based cocktail, with 22 out of 39 respondents giving it the top score. This was followed by vodka, with 16 respondents rating it a 5. In contrast, whisky and brandy had more ratings of 1 (Very Poor) and 2 (Dislike), suggesting that these spirits were the least compatible with the bitter melon juice. These findings indicate that participants strongly preferred the cocktails made with lighter spirits, particularly gin and vodka. The strong, aged flavors of brandy and whisky did not blend well with the bitterness and freshness of bitter melon juice, resulting in lower acceptability.

Table 2. Weighted Mean and Description of Sensory Attributes

Spirit	Taste	Aroma	Mouthfeel	Overall Acceptability	Description
Gin	4.28	4.25	4.22	4.30	Extremely Like
Vodka	4.00	3.95	3.88	4.12	Like
Rum	3.46	3.48	3.40	3.45	Neutral
Tequila	3.03	3.12	3.18	3.11	Neutral
Brandy	2.69	2.75	2.80	2.74	Dislike
Whisky	2.46	2.58	2.62	2.55	Dislike

Table 2 presents the average ratings (weighted means) for each spirit across the four evaluated attributes. Gin received the highest scores in all categories, including a 4.28 in taste and 4.30 in overall acceptability, which is described as “Extremely Like.” Vodka also received positive ratings, with an overall acceptability of 4.12, falling in the “Like” range.

Rum and tequila were generally rated as “Neutral,” with moderate scores in all attributes. Although these spirits had some balance with the bitter melon juice, they lacked the smooth compatibility demonstrated by gin and vodka. On the other hand, brandy and whisky consistently scored the lowest, with weighted means between 2.46 and 2.74, categorized as “Dislike.” This supports the conclusion that heavier, oak-aged spirits do not pair well with the natural bitterness and vegetal profile of bitter melon juice.

IV. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the results of the study, the following conclusions were drawn:

1. Among the six treatments evaluated, the cocktail made with **gin and fresh bitter melon juice** received the **highest overall acceptability** from the respondents. It was consistently rated “Extremely Like” across all sensory attributes—taste, aroma, mouthfeel, and overall impression.
2. The **vodka-based cocktail** also received favorable ratings, with respondents appreciating its neutral flavor and smooth pairing with the bitterness of the bitter melon. Both gin and vodka showed **strong compatibility** with fresh bitter melon juice.
3. **Rum and tequila** received “Neutral” ratings. While acceptable, these spirits were not as well liked as gin and vodka. Some respondents described their flavors as acceptable but lacking balance.
4. **Brandy and whisky** were rated the lowest in all categories, falling under the “Dislike” description. These darker, more intense spirits did not complement the fresh and bitter profile of the melon juice, and many participants found the combinations overpowering.

RECOMMENDATIONS

Taking into consideration the findings of the study and the positive feedback from participants, the researchers recommend the following:

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1. Use **gin or vodka** as the primary base spirits when incorporating fresh bitter melon juice in cocktail recipes. These combinations were the most acceptable and can be promoted in health-conscious or craft cocktail menus.
2. **Further develop and refine gin- and vodka-based bitter melon cocktails** by experimenting with additional natural ingredients such as herbs (e.g., mint, basil) or citrus to enhance flavor and presentation.
3. Although rum and tequila were moderately acceptable, they may benefit from **adjusted ratios** or the inclusion of other ingredients to better balance the bitterness of the juice. Their use can be explored for spicier or tropical-style cocktails.
4. Avoid pairing **brandy and whisky** with bitter melon in their basic forms, unless carefully modified. If these spirits are to be used, consider incorporating strong sweeteners or spices to offset the conflicting flavors.
5. **Promote the use of fresh bitter melon juice as a functional, healthier alternative** to sugary mixers in bartending education. Its benefits for blood sugar management and its rich nutrient content make it suitable for wellness-themed or diabetic-friendly cocktails.
6. Integrate this study into **bartending training modules at TESDA-ISAT**, encouraging students to explore local ingredients and balance health with flavor in modern mixology.

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