Standardization and Sensory Evaluation of Hibiscus Flower Petal Tea and Butterfly Pea Flower Petal Tea

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Abstract

Herbal tea is an infusion, a popular beverage made from the leaves, flowers, seeds, fruits, stems, or roots of plant species other than Camellia sinensis L that has been used for health care and illness prevention. Herbal tea offers a variety of therapeutic effects, including antioxidant, anti-inflammatory, antimicrobial, anticarcinogenic, cardioprotective, hepatoprotective, and neuroprotective properties, and can be used to promote human health and lower the risk of chronic diseases. In a pilot study 5 variants of Hibiscus flower petal tea and butterfly blue flower tea were developed. The sensory evaluation of the developed recipes was conducted. Hibiscus flower petal tea and butterfly blue flower petal with 15 grams of petals was selected in sensory evaluation by the 05 panel lists. Sensory evaluation of the developed recipes along with their 5 variants (5 gm, 10 gm 15 gm, 20 gm and 25gm) was carried out by the 05 panel lists with the help of 9 point hedonic scale. Thus, it can be concluded that Hibiscus flower petal tea and butterfly blue flower petal tea with 15gms of petals was accepted by all the panel members.

Keywords: Herbal tea, Hibiscus flower petal, butterfly blue flower petal and sensory evaluation.

Introduction

Tea is the second most popular beverage regularly consumed worldwide for refreshment and health benefits. Herbal tea made with Hibiscus is one of this with the highest specialty beverages universally existed (Ramirez *et al.,* 2010). Hibiscus sabdariffa usually known also as Roselle or Karkade is a herbaceous plant that belongs to the Malvaceae family native to Africa and widely distributed in the world (Paraíso *et al.,* 2021). Hibiscus is a seasonal crop; thus, appropriate processing is required in order to prolong its shelf life, which involves adopting suitable drying, milling, packaging, and storage technologies as well as incorporation in a new food product development to explore its economic and health benefits (Ahiduzza man *et al.,* 2021; M'be *et al.,* 2023).From this perspective, the development of Hibiscus-based functional beverages namely herbal tea can be a good alter-native for extensive utilization of Hibiscus (Mendonça *et al.,* 2021) in Ethiopia, where the experience of developing pop-ular functional beverages is occasional. Hibiscus is widely utilized in many countries including Senegal, Nigeria, and Sudan as a fresh or dried

extract ingredients for alternative cheap functional beverage preparation, natural pigments, and phytochemical sources (Bechoff *et al.,* 2014).

Butterfly pea flower has not been widely carried out because many people do not know the benefits of the Butterfly pea flower. The utilization of the Butterfly pea flower in the food sector has been carried out in several countries. The blue color of the Butterfly pea flower has been used as a blue dye in sticky rice in Malaysia.

It is also usually eaten as a vegetable in Kerala (India) and in the Philippines (Lee *et.al.,* 2011). Lately, Butterfly pea flowers are also being consumed by many people around the world because of the trend via social media in the UK as Butterfly Pea Tea (Andriani *et.al.,* 2016). Butterfly pea flower contains a lot of active ingredients that have pharmacological potential widely, including as an antioxidant, antimicrobial, antidiabetic, and anticancer (Budiasih, 2017). The processing method of tea herbal which is dried is same with the processing method of dried tea generally include picking, washing, withering and drying.

The objective of the study was

1) To standardize hibiscus flower petal tea and butterfly Pea flower petal tea.
2) To find out acceptability of developed Teas.

Hypothesis

1) Two teas have equal acceptability.
2) Increasing the amount of flower petals enhances taste and acceptability.

Review of Literature

1. The present investigation was aimed to development of value-added Toffee and Herbal tea with utilization of different proportions of Rose petals extracts, Hibiscus petals extracts, Guava pulp, Cardamom powder, Cinnamon powder and Lemon juice. The different formulation were carried out using Rose petals extracts, Hibiscus petals extracts, Guava pulp and Lemon juice in preparation of value added Toffee. For Herbal tea also different formulation were carried out using Rose petals extracts, Hibiscus petals extracts, Cardamom powder, Cinnamon powder and Lemon juice in preparation of Herbal tea. Prepared value-added Toffee and Herbal Tea then evaluated for sensory properties with respect to colour and appearance, body and texture, taste and flavor, and overall acceptability using 9- point hedonic scale. The results revealed that value added Toffee and Herbal tea prepared with utilization of Rose petals extracts, Hibiscus petals extracts, Guava pulp, Cardamom powder, Cinnamon powder and Lemon juice both treatment (T2) secured highest score (i.e. 8.8 and 8.6) was superior as compared to rest of samples. It was found that value added Toffee and Herbal tea prepared with Rose petals extracts, Hibiscus petals extracts, Cardamom powder, Cinnamon powder and Lemon juice was rich source of micronutrients including calcium, iron, phosphorus. The cost of the raw ingredients for preparing value added Toffee per 100 g were Rs.5.70 for T0, Rs.9.20 for T1,

Rs.11.50 for T2 and Rs.13.70 for T3 and cost of Herbal tea per 100 ml were Rs.3.50 for T0, Rs.9.0 for T1, Rs.11.50 for T2 and Rs.13.50 for T3. Thus, it can be concluded that utilization of Rose petals extracts, Hibiscus petals extracts, and Cinnamon and Lemon juice beneficial for growing children and adolescents due to the essential nutrient's contents like iron, calcium and phosphorus (Suryansh and Alka,2024).

2. Herbal tea is a term for herb flowers, leaves, seeds, roots or dried fruit that is not derived from the tea plant (Camellia sinensis). One of the plants that can be used as herbal teas are butterfly pea (Clitoria ternatea) and ginger (Zingiber officinale). Butterfly pea is known traditionally as an eye medicine, and a food coloring that gives it its blue color. Butterfly pea and ginger have benefits as antioxidants, antibacterial, anti-inflammatory, antidiabetic, anti-cancer, and immunomodulatory properties. The process of making herbal tea is carried out by a drying process using a Tray dryer with the aim of improving the quality and quality of the herbal tea. The method used is with a variation of the drying time of 2 hours; 2,5 hours; 3 hours; and 3,5 hours with a constant temperature of 60oC, and variations of ginger powder, namely 1%, 2%, and 3% per total weight of 1 gram per tea bag. The analysis carried out is in the form of organoleptic tests (color, taste and aroma), water content, ash content, and antioxidant activity. Based on the results of the analysis of making butterfly pea herbal tea, drying time of 3.5 hours with a concentration of 3% ginger powder is the best condition according to SNI 3836:2013 with the results of water content 4.25%, ash content 5.04%, and antioxidant activity 57.03% (Sofiah and Arizal, 2021).
3. Hibiscus rosasinensis Linn. (Family Malvaceae) is a plant which is widely distributed throughout the world. Its leaves, barks, roots and flowers have been used in the Indian traditional system as medicine to treat various diseases. Various research studies proved that the different parts of Hibiscus rosasinensis plants possesses Antioxidant, Antimicrobial, Antidiabetic, Antiulcer, Hepatoprotective, Antifertility, Antigen toxic and Anti-inflammatory, Anti-cancer properties, which helps in treatment of many diseases. Hibiscus rosasinensis has been used in many herbal teas and drinks. Many research studies conducted in animal modal evaluate Hibiscus rosasinensis flower petals and leaves as antidiabetic and antioxidant compounds. This review attempt to highlight the therapeutic application of Hibiscus rosasinensis with in combination with Ginseng, Cinnamon, Lemongrass, Clove, Dry ginger through herbal green tea (Pruthviraj and Harshal, 2024).
4. Clitoria ternatea, commonly known as butterfly pea or blue pea, is a perennial herbaceous plant from the Fabaceae family. It has recently attracted a lot of interest as it has potential applications both in recent medicine and agriculture, and as a rich source of flavonoids and antioxidants. Additionally, Clitoris ternatea, has been widely used in traditional medicine, particularly as a supplement to enhance cognitive functions and alleviate symptoms of numerous ailments including fever, inflammation, pain, and diabetes. The edible flower is Non-toxic and innocuous with health benefits consumed in the human daily diet. It contains beneficial nutrients for human health. Butterfly pea flower Sorbet was formulated and prepared using butterfly pea flower. The acceptability responses of the 25 semi-panel

lists were encouraging for 90 days interval periods up to 270 days. Accordingly, it was found that the product was accepted by the semi-trained panel (K. Thirumalaiselvi and C. Raja, 2025).

Materials and Methods

The experimental "Standardization and Sensory Evaluation of Hibiscus Flower Petal Tea and Butterfly Pea Flower Petal Tea". work will be carried out in research laboratory of Faculty of Home Science Chhatrapati sambhajinagar. The different material use in experiment and the techniques employed.

Method

- Collection of raw material
- Cleaning of raw material
- Standardization of Hibiscus flower petal tea and Butterfly blue flower tea.
- Sensory evaluation
- Statistical analysis

Collection of raw material: The flowers was collected from local garden of Chhatrapati sambhajinagar city and some other ingredients purchased from local market.

Cleaning of raw material: Raw material such as flower petals washed with clean water.

Standardization of Hibiscus flower petal tea and Butterfly blue flower tea

In order to produce the Hibiscus flower petal tea and Butterfly blue flower tea, raw materials such as hibiscus petals and Butterfly blue flower tea were included. There were five variations (V1, V2, V3, V4 and V5) where flower petals amount such as 5, 10, 15, 20 and 25gm were changed.

Sensory evaluation

Two teas namely Hibiscus tea and butterfly blue flower tea were developed. The five variations where different proportion of flower petals such as 5, 10,15,20 and 25 gm and the proportions of lemon drops and honey were kept constant in all variations (lemon drops-2ml, honey-3ml. A 9- point hedonic scale was utilized to assess the two teas. V1, V2, V3, V4 and V5 were the sample names assigned to tea. V1, V2, V3,V4 and V5 were variations containing 5 g, 10 g, 15 g,20 g and 25gm of flower petals respectively with constant lemon drops-2ml and honey-3ml. respectively. A panel consisting of five semi-trained members was chosen, and were instructed to rate the food items. Both hibiscus flower tea and butterfly pea flower tea with 15gm flower petals were accepted by panel member.

Statistical analysis

The data were collected, tabulated and analysed statistically using one way ANOVA method.

Result and discussion

Table 1: Trial for Hibiscus Flower Petal Tea

Recipe	Appearance	Colour	Texture	Aroma	Taste	Flavour	Sweetness	Mouth feel	Overall acceptability
	1	2	3	4	5	6	7	8	9
	Average	Average	Average	Average	Average	Average	Average	Average	Average
Sample A	6.600	5.800	6.200	6.000	6.000	5.600	6.200	6.000	7.000
Sample B	7.000	6.600	6.200	6.200	6.400	6.400	6.200	6.000	7.200
Sample C	**8.400**	**8.600**	**8.200**	**7.600**	**8.200**	**8.000**	**7.800**	**8.200**	**6.200**
Sample D	7.800	7.800	7.000	6.800	6.800	6.600	6.200	7.000	5.200
Sample E	5.000	5.400	4.600	4.600	5.000	4.400	4.600	4.600	6.600
Mean	6.960	6.840	6.440	6.240	6.480	6.200	6.200	6.360	6.440
SE(m)	0.415	0.415	0.525	0.400	0.477	0.456	0.514	0.510	0.718
C.D.	1.232	1.232	1.561	1.188	1.419	1.355	1.526	1.515	2.126
C.V.	13.324	13.558	18.241	14.334	16.477	16.448	18.531	17.927	24.942
F.Test	Significant	Significant	Significant	Significant	Significant	Significant	Significant	Significant	Non-Significant

The hibiscus flower petal amount was at the levels of 5 10, 15, 20 and 25 percent. Hibiscus flower petal at 15 gm increased the sensory scores of all organoleptic parameters. The statistical analysis of the data indicated that there was significant difference in the scores of appearance, color, texture, aroma, taste, flavor, sweetness, mouthfeel except overall acceptability they are statistically non significant. These results suggest that hibiscus flower petal tea can be successfully make with 15gm of petals.

Table 2: Trial for Butterfly Pea Flower Petal Tea

Recipe	Appearance	Colour	Texture	Aroma	Taste	Flavour	Sweetness	Mouth feel	Overall acceptability
	1	2	3	4	5	6	7	8	9
	Average	Average	Average	Average	Average	Average	Average	Average	Average
Sample A	5.800	6.600	5.800	6.800	6.600	5.800	5.600	5.800	5.400
Sample B	6.600	7.000	6.200	6.800	6.600	6.200	6.400	6.000	6.000
Sample C	**8.600**	**8.400**	**8.200**	**8.400**	**8.400**	**8.400**	**8.000**	**8.200**	**7.800**
Sample D	7.800	7.800	5.800	6.400	6.400	5.400	5.000	5.400	6.400
Sample E	5.400	5.000	5.000	5.200	5.200	4.400	4.000	4.400	5.000
Mean	6.840	6.960	6.200	6.720	6.640	6.040	5.800	5.960	6.120
SE(m)	0.415	0.415	0.502	0.385	0.369	0.482	0.379	0.490	0.390
C.D.	1.232	1.232	1.491	1.143	1.096	1.431	1.127	1.455	1.158
C.V.	13.558	13.324	18.105	12.801	12.419	17.832	14.630	18.380	14.245
F.Test	Significant	Significant	Significant	Significant	Significant	Significant	Significant	Significant	Significant

The butterfly pea flower petal amount was at the levels of 5 10, 15, 20 and 25 percent. Butterfly pea flower petal at 15 gm increased the sensory scores of all organoleptic parameters. The statistical analysis of the data indicated that there was significant difference in the scores of appearance, color, texture, aroma, taste, flavor, sweetness, mouthfeel and overall acceptability . These results suggest that butterfly pea flower petal tea can be successfully make with 15gm of petals.

Conclusion

Hibiscus flower petal tea and butterfly blue flower petal tea with 15gms of petals was accepted by all the panel members.

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