

FORMULATION AND DEVELOPMENT OF STRESS-RELIEVING HERBAL TEA

MANJULA KOLA, KALYANI BANDI and PARAVASTHU LEELAPRIYANKA

Professor, Food Science and Nutrition, Department of Home Science, Sri Venkateswara University, Tirupati, Andhra Pradesh, India

Date of Receipt : 03-10-2024

Date of Acceptance : 28-11-2024

ABSTRACT

The aim of the recent study was conducted in the year 2022 to formulate and develop stress relieving herbal tea with a combination of various herbs and spices. Formulated herbal tea was evaluated by organoleptic evaluation protocols. The sensory evaluation was done on 5-point scale of 'like very much' to 'dislike very much' by the untrained and semi trained panel members to know the acceptability of herbal mix by all groups. A randomized method was employed in the distribution of samples. Formulation of herbal tea with various compositions considered for further analysis. The sensory scores obtained for the herbal tea mix (code-199) were 4.23 for flavor, 4.06 for aroma, 3.96 for color, 4.43 for aftertaste, 3.86 for astringency and 4.33 for overall acceptability. The sample code 199 was found most acceptable among other samples. whereas with respect to code [316], scores were obtained against the flavour it was 2.86 followed by aroma (2.73) colour (3.66), aftertaste (2.80), astringency (2.33) and overall acceptability (3.00). The sample code 316 was found least acceptable.

Keywords: Evaluation, Herbs, Standardization, Stress and Tea

INTRODUCTION

Tea is ancient old traditional brewing drink; tea in India dates back to the scripts of Ramayana which states that the leaves of a certain plant in the Himalayas were used for healing which believe is the tea plant. Tea, the most popular beverage consumed by two-thirds of the world's population is made from the processed leaf of *Camellia sinensis*. Tea types, based on processing or harvested leaf development are black/fermented, green/non-fermented and oolong/semi-fermented tea. In recent year's different type of herbal teas was developed to overcome and manage the day-

to-day stress among all professionals (Pargman, 2006). Tea consequently belongs to a quickly intensifying marketplace of 'health beverages. India is one of the world's largest purchasers and producers of tea. By characterization, tea is an brew of the leaves or other parts of the timeless tea plant (*Camellia* sp). Tea is a beverage that can be enjoyed hot, warm, or iced. In certain instances, milk and/or sweeteners like honey or sucrose may be added prior to consumption (Kraujalyte *et al.*, 2016). Herbs refer to the leafy components of plants utilized in culinary practices, and they can be used either fresh or

dried. In contrast, other parts of the plant, which are typically dried, are classified as spices. These comprise, for sample, bark (cinnamon), berries (peppercorns), seeds (cumin), roots (turmeric), flower (chamomile), buds (cloves) and the stigma of a flower (saffron). Distinct out moded teas, herb teas are formulated from plants besides *Camellia*. Whether it's true tea extracted from the plant leaves of the *Camellia Sinensis* or an herbal infusion, tea has a wealth of benefits that can help fight the symptoms of anxiety and stress and promote peace of mind and relaxation (McKay and Blumberg, 2002). While the polyphenols or flavonoids are likely a key component contained in tea and herbs have been shown to have a positive effect in treating mental health issues, the ritual surrounding tea can be just as significant in terms of improving symptoms of stress and anxiety (Aoshim Hirata and Ayabe, 2007). As tea is an crucial drink, the tea stood formulated with numerous herbs which are having potential benefits and it can used as a stress reliever.

MATERIAL AND METHODS

Due to the increasing demands of health conscious among consumers, a herbal tea with various ingredients with stress relieving components was formulated, tested and developed. The formulation, standardization and evaluation work were done in the Food Science and Technology laboratory.

Materials: Procurement of Ingredients: The following herbs were carefully chosen such that they can provide taste along with numerous well-being aids mainly reducing stress. Each and every ingredient has unique functional components which is beneficial to health. Fresh spinach leaves and mint leaves are collected from the vegetable market in Gandhi Road, Tirupati. Dried lemon grass, thyme, rosemary, basil, cinnamon, ashwagandha, turmeric, cumin,

ginger, and nutmeg are collected from Nilgiris supermarket in Air Bypass Road, Tirupati.

Pre-Processing of Ingredients: Fresh mint and spinach leaves were washed, leaves are separated from the stalks. Leaves were layered delicately on paper and dehydrated in a solar drying for 3 days. Dried Lemon grass leaves and basil were collected free from foreign particles and ground in the motor pistol. The other herbs and spices ginger, turmeric, ashwagandha, cumin, cinnamon, thyme, rosemary, and nutmeg were cleaned and ensured that is free from foreign particles. The ingredients were crushed/ground in the cleaned motor pistol. The crushed samples were kept in glass bottles with close-fitting lids and labeled.

Product Formulation: The dried and crushed ingredients are taken and prepared the composition for different formulations. Prepared formulations were bagged in infusion tea bags. A piece of tea bag contained approximately 1.5 to 2.0g of produce. The tea bags were stored in glass containers with secure lids and clearly labelled for sensory evaluation. The milled and dehydrated herbs were mixed together in diverse amounts to obtain four different formulations. 2.0 gram each formulation was placed in infusion tea bags for sampling. The bagged samples were stored in glass jars, maintained at temperatures between 28°C and 34°C, and protected from direct sunlight. They were labelled for sensory evaluation. The herbal tea formulations were tabulated in table1.

Sensory evaluation

The testing was done on 5-point scale of 'like very much' to 'dislike very much' by the untrained and semi trained panel members to know the acceptability of herbal mix by all groups. A randomized method was utilized in the design inserving the samples to avoid any

Table.1. Formulation of Herbal Tea with Different Compositions

S.No.	Ingredients (g)	Sample 1 [199]	Sample 2 [316]	Sample 3 [629]	Sample 2 [997]
1	Lemongrass	0.150	0.200	0.200	0.150
2	Ginger	0.220	0.150	0.200	0.180
3	Cumin	0.110	0.070	0.160	0.170
4	Turmeric	0.150	0.200	0.160	0.100
5	Aswagandha	0.330	0.200	0.160	0.400
6	Mint	0.300	0.200	0.160	0.300
7	Spinach	0.100	0.200	0.160	0.300
8	Cinnamon	0.200	0.100	0.160	0.150
9	Basil	0.200	0.200	0.160	0.090
10	Thyme	0.085	0.080	0.160	0.070
11	Rosemary	0.095	0.200	0.160	0.050
12	Nutmeg	0.060	0.200	0.160	0.040
	Total (g)	2.00	2.00	2.00	2.00



Figure 1. Sample Codings

predetermining effect. The scores were presented for further examination.

Packaging: The perfect blend of freshly dried leaves infused with herbs was packed for a well-balanced cup of herbal tea. Packaging provides outstanding protection from environmental and storage conditions which cannot compromise the quality of the product.

RESULTS AND DISCUSSION

Four different combinations of herbal tea mixes were formulated, coding was specified

to the samples (figure 1) for sensory analysis to assess the flavour, aroma, colour, aftertaste, astringency, taste and overall acceptability was assessed using a 5-point hedonic scale. The sensory scores attained for the herbal tea mix (code-199) were 4.23 for flavor, 4.06 for aroma, 3.96 for color, 4.43 for aftertaste, 3.86 for astringency and 4.33 for overall acceptability, these sensory scores of herbal tea mix combination was found most acceptable.

The second combination of stress relieving herbal tea mix the sample code [316]

scores were the flavour 2.86, aroma 2.73, colour 3.66, aftertaste 2.80, astringency 2.33 and overall acceptability 3.00, sample code 316 was found least acceptable. For the third combination of stress relieving herbal tea mix, the sample code [629] scores were the flavour is 2.93, aroma 2.80, colour 3.23, aftertaste 3.26, astringency 2.70 and overall acceptability 3.06, scores of stress relieving herbal tea mix combination were found normal acceptable. For the fourth combination of stress relieving herbal tea mix the sample code [997] scores were the flavour 3.13, aroma is 2.93, colour 3.76, aftertaste 3.13, astringency 2.73 and overall acceptability 3.50. These sensory scores of stress relieving herbal tea mix combination were found average acceptable. The four formulations of stress relieving herbal tea mix were analyzed, based on the acceptable levels sample code 199 was more acceptable because of the pleasant blend of all the ingredients. The outcomes of each sensory parameter of all the formulations were discussed below.

Sensory Evaluation

A. Flavour: The sample products which are brewed teas with the most favored flavors for different samples were 199(127.00%) followed by 997(94.00%), 629(88.00%), and 316(86.00%) showed in Figure 2. Infusions from Bachieved the least score in flavor (Mishra



Figure 2. Flavor Acceptance Scores by Panelists

et al., 2000). Whereas the product that had a higher concentration of nutmeg was not preferred as the other formulations.

Conversely, products with medium proportions of all herbs some high amounts of ginger, and cinnamon based on other compositions required a more pleasing flavor. The volatile components found in different types of teas comprise over 50 aroma-active compounds, which can produce a range of characteristics such as nutty, popcorn-like, metallic, floral, meaty, fruity, potato, green, cucumber-like, and hay-like characteristics (Lee and Chambers, 2007) found that epigallocatechingallate and epigallocatechin appeared to significantly influence the sensory attributes of a processed green tea beverage. The impact of age and fermentation level on volatile flavor compounds is substantial. Teas produced from the youngest leaves usually exhibit higher concentrations of catechins and amino acids, potentially resulting in off-flavors.

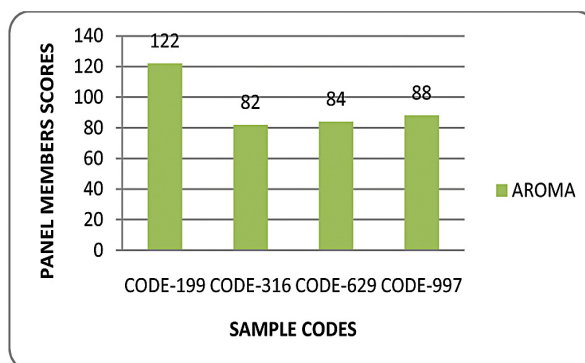


Figure 3. Aroma Acceptance Scores by Panelists

B. Aroma: Panelists showed that the greatest preference for the aroma of the product was 199 (122.00%) followed by 997(88.00%), 629(82.00%), and 316(82.00%) in the order (figure 3). where the least preferable aroma in 316(82.00%) due to significance presence of turmeric, rosemary, basil, and nutmeg, it was expected that sample

with a higher proportion of 316 (82.00%) would be less preferable than other samples in the aroma.

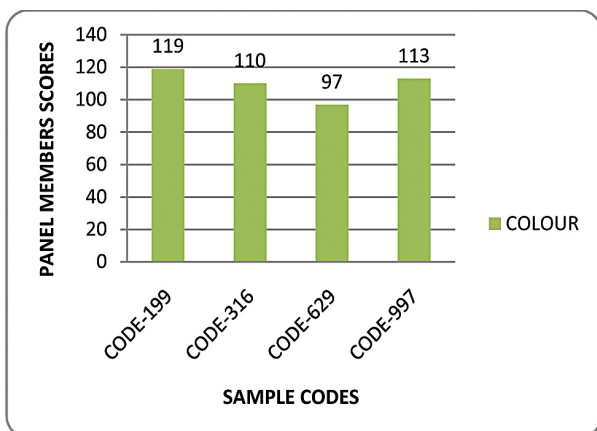


Figure 4. Color Acceptance Scores by Panelists

C. Colour: The color of food can either enhance or reduce consumer interest, as it often serves as a cue for the food's flavor (Ingrid *et al.*, 2010). The two utmost liked products are 199(119.00%) and 997(113.00%). Conversely the least preferred products 629(97.00%) and 316(110.00%) (Figure-4). 629(97.00%) contained an equal amount of all ingredients that may look dark in color due to the pigments that are present in the herbs and 316(110.00%) they contain high proportions of turmeric and nutmeg related to the other samples they may appear dark in color owed to the pigments that are present in these herbs.

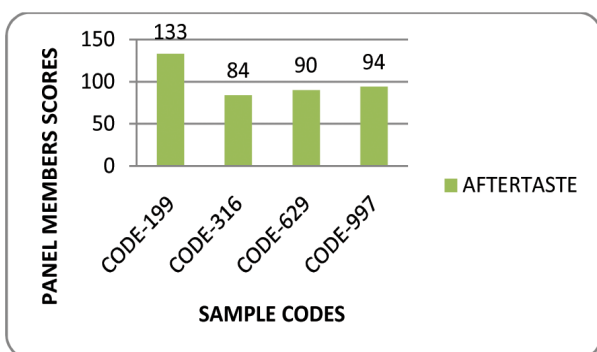


Figure 5. Aftertaste Acceptance Scores by Panelists

D. Aftertaste: It was depicted from the figure 5 that product 199 (133.00%) was however the most preferred product followed by 997 (94.00%), 629 (90.00%) and 316 (84.00%). The slightest chosen sample contains a high proportion of turmeric that gives bitterness to the sample.

E. Astringency: Similarly, product 199(116.00%) was the maximum chosen in astringency followed by 997(82.00%), 629 (74.00%) and 316(70.00%) as in figure-6. From the products with high rosemary, nutmeg proportions were least preferable in astringency. Xu *et al.* (2006) stated that astringency was generally recognized as a feeling of dryness or puckering that was not confined to a particular region of the mouth or

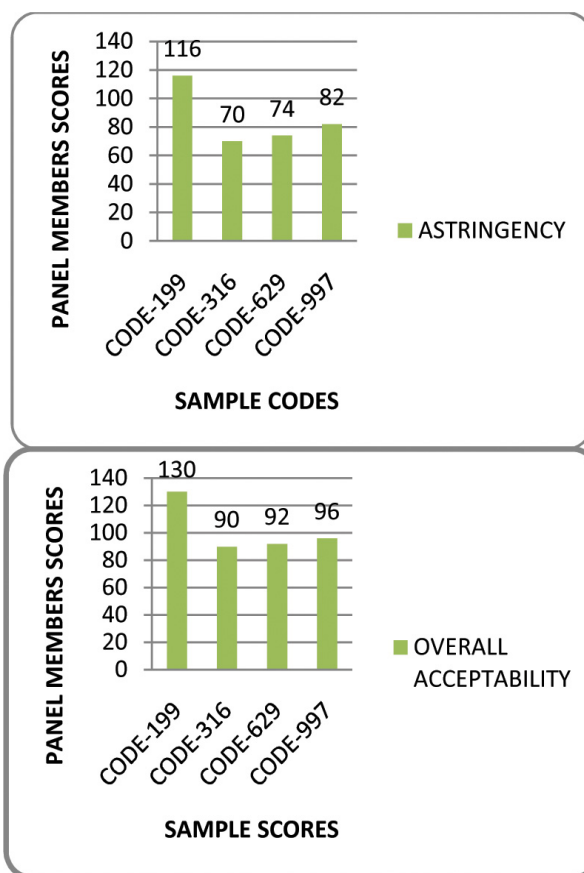


Figure -6. Astringency and Overall acceptability Acceptance Scores by Panelist

tongue but is experienced invariably as a diffuse stimulus.

F. Overall Acceptability: Product 199(130.00%) had the most preferable sample in overall acceptability. And the slight preferred formulation 316(90.00%) in flavor, aroma, aftertaste, and astringency. The overall acceptability of the products that are utmost chosen 199 (130.00%) followed by 997 (96.00%), 629 (92.00%) and 316 (90.00%) in order figure-6. Roychoudhury *et al.* (2017), utilized descriptive analysis to assess 10 different canned tea products by examining 17 various attributes, which included floral characteristics, lemon, roasted tea, roasted rice tea (artificial), sweet odor, green tea, oolong tea, black tea, boiled milk, arrowroot/rooty, sour taste, sweet taste, chestnut shell, oily, burnt leaf, bitter taste, and astringency. All studies utilized a limited selection of samples, which might not represent the wide array of available teas (Mishra *et al.*, 2000). Based on the sensory evaluation the panel members preferred the sample code no 199. In this sample the ingredients used are lemongrass (0.100g), ginger (0.200g), cumin (0.110g), turmeric (0.150g), aswagandha (0.311g), mint (0.200g), spinach (0.100g), cinnamon (0.200g), basil (0.100g), thyme (0.085g), rosemary (0.080g), nutmeg (0.060g). In this product the flavor and aroma are pleasant and the color is acceptable and the aftertaste and astringency are also good compared to other samples.

CONCLUSIONS

The formulated stress reliving herbal tea was subjected to sensory evaluation to study the acceptability. Based on the results, it was inferred that owed to strong concentration of turmeric, rosemary, basil, and nutmeg 316(82.00%) was least acceptable than other samples in aroma, color and astringency. Product 199(116.00%) was the highly accepted

in astringency. Product 199(130.00%) had the upper most liked sample in overall acceptability. This was expected as it was the most preferred in flavor, aroma, color, aftertaste, astringency, and overall acceptability. And the least preferred product was 316(90.00%) in flavor, aroma, aftertaste, and astringency. The results indicated that the well-blended combination of all the potential ingredients was more accepted. Hence the formulation code-199 was standardized and subjected to further studies. Sensory attributes of herbal teas have accredited comparatively modest explore attention inspite of the rising acceptance of herbal teas globally.

REFERENCES

- Aoshim Hirata, S and Ayabe, S. 2007. Antioxidative and anti-hydrogen peroxide activities of various herbal teas. Food Chemistry. Jan 1;103(2):617-22.
- Ingrid, B., Chiho, S., Yuko, U., Haruki, S., Carol, W., Laura, S., Steinar, D., Kari, H., Nega, B and Rune, B. 2010. The total antioxidant content of more than 3100 foods, beverages, spices, herbs and supplements used worldwide. BMC.
- Kraujalyte, V., Pelvan, E and Alasalvar, C. 2016. Volatile compounds and sensory characteristics of various instant teas produced from black tea. Food Chemistry. Mar 1;194:864- 872.
- Lee, J and Chambers, DH. 2007. A lexicon for flavor descriptive analysis of green tea. Journal of Sensory Studies. Jun;22(3):256-72.
- McKay, DL and Blumberg, JB. 2002. The role of tea in human health: an update. Journal of the American College of Nutrition. Feb 1;21(1):1-3.
- Mishra, L.C., Singh, B.B. and Dagenais, S. 2000. Scientific basis for the therapeutic

use of With aniasomnifera (ashwagandha): a review. Alternative medicine review. Aug 1;5(4):334-46.

Roychoudhury, S., Agarwal, A., Virk, G and Cho, CL. 2017. Potential role of green tea catechins in the management of oxidative stress-associated infertility. Reproductive biomedicine online. May 1;34(5):487-98.

Xu, Y., Ku, B., Tie, L., Yao, H., Jiang, W., Ma, X and Li, X. 2006. Curcumin reverses the effects of chronic stress on behavior, the HPA axis, BDNF expression and phosphorylation of CREB. Brain research. Nov 29;1122(1):56-64.

Manjula K., Kalyani B. and Leelapriyanka P. 2024. Formulation and Development of Stress-Relieving Herbal Tea. The Journal of Research ANGRAU 52(4) : 102-108.