



E-ISSN: 2278-4136  
P-ISSN: 2349-8234  
JPP 2019; 8(5): 138-140  
Received: 10-07-2019  
Accepted: 12-08-2019

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## Sensorial quality test in *Cymbopogon citratus* – Stapf. L

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and S Sahaya Sathish**

**Abstract**

The lemongrass (*Cymbopogon citratus* – Stapf. L) is a perennial grass belonging to family Poaceae and grouped under genus *Cymbopogon*. It is of indigenous origin and is a medicinal and aromatic plant. In general aromatic, flavors, flavonoids, and essential oil give aroma/smell to the lemongrass extract. The lemongrass has a very extensive required in food, therapeutic and flavoring making during ambient conditions. But it is not stored as fresh for a long time at ambient condition because of it rotten after long periods. The main characteristic losses to facilitate transpire next to storage is transform in color, texture, and flavor. The herbs, sealed in polyethylene bags, were stored at 4 °C for 12 days. The sensory valuation of quality characteristics color, texture, and flavor, on a scale of 1 to 5 was done in the 1st, 5th, 8th and 12th day. The results indicated that aroma of lemongrass powder extract scores in the initial day 7.25; later on a sensory profile was showed by the aroma of lemongrass powder extract score decrease from 7.82 to 7.50 during the 5th day using e-nose followed by 9 points Hedonic score method. The taste acuity possesses in all the days represent as 1% lemongrass powder altitude was improved in quality for preparation of tea/extract as resolute by the basis of 9 points Hedonic score method. This was also maintained and evaluate sensory test in triplicates manner along the storage period there were no statistically significant differences for any of the parameters understudies in the days has been determined.

**Keywords:** Lemon grass leaf, powder, minimally processed, sensory analysis

**Introduction**

Extensive diversity of plant materials with distinguishing sensory qualities subsist as a prospective component of herb tea which contains polyphenols, it has antioxidant scavenging properties. Lemongrass (*Cymbopogon citratus* Stapf) is a perennial bunchgrass, pertaining to 60 – 90 cm large. It belongs to the family Poaceae and is widely disseminated in the tropical and sub-tropical area of the humankind. It originates from India and is well-known by other names such as Citronella Grass or Fever Grass (Chisowa *et al.*, 1998). *Cymbopogon* is highly stress-tolerant plants which adapt easily to diverse edapho-climatic conditions, occurring widely throughout the tropics and subtropics (Sangwan *et al.*, 1993; Sangwan *et al.*, 1994) [1, 2]. The flavor is caused by receptors in the mouth and nose detecting chemicals found within food. These receptors respond by producing signals that are evaluated by the brain as sensations of taste and aroma. Certain taste and aroma combinations are characteristic of particular foods (Lawless and Heymann, 1998) [4]. Sensory evaluation is a basic science discipline used to evoke measure, analyze and interpret reactions to those characteristics of food and materials as they are perceived by the senses of sight, smell, taste, touch, and hearing (Meilgaard *et al.*, 2007) [5]. Sensory analysis, therefore, is indispensable and many food industries integrate this program in their research and development plan (Stone and Sidel. 2004) [3]. Lemongrass has been a preferred component of more cuisines for centuries because of its excellent aromatic properties. Infusion of lemongrass leaf gives an aromatic drink with a characteristic lemon flavor (Figueirinha *et al.*, 2008) [6]. The objective of the present study is to measure the sensory quality in the leaf of lemongrass. The main characteristic losses to facilitate transpire next to storage is transform in color, texture, and flavor. The herbs, seal in polyethylene bags, were stored at 4 °C for 12 days. The sensory valuation of quality characteristics color, texture, and flavor, on a scale of 1 to 5 was done in the 1st, 5th, 8th and 12th day. Infusion of the leaves gives an aromatic drink used in traditional cuisine for its lemon flavor (Figueirinha *et al.*, 2008) [6]. *C. citratus* leaf constitutes a source of essential oil for the flavor and fragrance industries.

## Reference samples for Lemon grass green tea

Sensory quality	Observation
Sweet taste	0.1% sucrose
Sour taste	0.035% citric acid
Bitter taste	0.05% caffeine
Astringency	0.1% tannic acid

Source: Chambers and Lee (2007)

### Material and Methods

Lemongrass tea leaves (*Cymbopogon citratus*) harvested in 2016 and 2017 shooting periods were purchased from the Adhiyamaan Agriculture college Farmlands, Krishnagiri and dried at 40 °C for 12 h in an oven. All samples were then ground into a fine powder with a mill. The powders dissolved in ethanol (1:20 w/v) and then extracted in a water bath with a shaker at 40 °C for 4 h. The extracts were filtered and concentrated in a rotary evaporator to get crude extracts.

### Sensory Evaluation

Sensory analysis was performed using 50 exclusives of trained panelists throughout each test. A total of 4-6 trials were performed (Lemongrass Leaf powder). A randomized block design with the affective test was carried out to make data for preference liking (Meilgaard *et al.*, 2007; Figueirinha *et al.*, 2008) [5, 6]. All panelists were provided with 1g of sample per treatment and were asked to drink lemongrass tea to clean his/her palette and wait at least 2 min prior to evaluating the next sample. Panelists were asked to evaluate each sample for preference liking based on the 9-point hedonic scale where 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, and 1 = dislike extremely. Commuter to the parameters for preference liking was: aroma, color, freshness, mouthfeel, flavor, and overall acceptability. Panelists were also asked to measure each sample for sensory attributes include pungency, browning, unpleasantness, off-odor, and sourness based on a 5- point hedonic scale where 1 was rated the lowest and 5 the highest (1 = not pungent, 2 = slightly pungent, 3 = moderately pungent, 4 = very pungent and 5 = extremely pungent).

Sensory evaluation was carried out in two phases – acceptance tests and descriptive tests. In the first phase, acceptance tests were conducted ten (10) sample infusions using fifty (50) untrained panelists. The second phase consisted of descriptive tests on three (3) selected samples using nine (9) trained panelists. A randomized complete block design was used for the descriptive tests with the order of serving the samples randomized to prevent any biasing effect.

### Scoring of samples

The panelists were instructed to score their acceptance for 6 attributes of the infusions: color, aroma, flavor, aftertaste, astringency and overall acceptability. Where a panelist did not clearly understand the meaning of a particular attribute, an explanation was provided. The panelists scored their acceptance of the attributes using a 5-point hedonic scale with 1 meaning 'dislike very much' and '5' meaning 'like very much'. From the results of the acceptance tests, two formulations were selected in addition to the control for further descriptive tests.

### Training of panelists

Panelist training consisted of research orientation, familiarization of panelists with test procedures, calibration of

the panel using reference samples for green tea, development, definition, and grouping of descriptors. Training duration was completed 9 h over a 3-day period.

Panelists were given an introduction to the investigate and rationale of the study. They were promoting to inform that an explanatory word seems to be increasing for lemongrass herb tea. Panelists were in use throughout the necessary principle of sensory evaluation. This assemblage lasted for more or less 1 h. Calibration of sheet and adjustment with test measures panelists were standardized by reference samples for lemongrass green tea (Chambers *et al.*, 2006) (Table.1). The panel was introduced to the 15-point numerical scale where '0' represents 'weak' and '15' represents 'strong' (Munoz and Civille, 1998). Most of the panel members were familiar with this test procedure. This lasted for approximately 4 h. The products were scored in triplicates.

### Statistical Analysis

Data are expressed using SPSS software, USA and Excel (2007) to carry out Analysis of Variance (ANOVA) on the data and graphical representation of the results. Where variations were observed among the samples at 5% statistical significance, Post-hoc tests (Turkey) were carried out to determine the sources of variation.

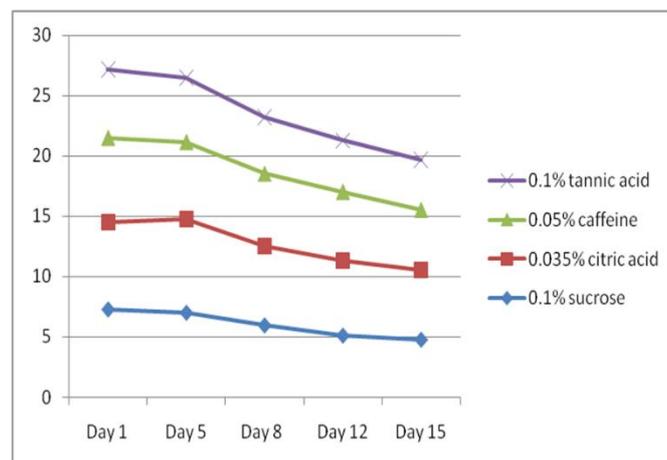


Fig 1: Sensory valuation of quality characteristics using Lemongrass Powder in different proportional range was tested with human subjects.

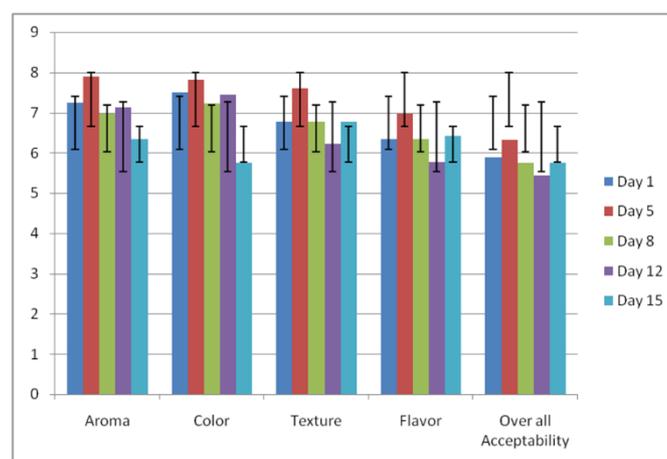


Fig 2: Lemongrass leaf powder extract Panel Test using e-nose – Sensory quality test with over all acceptability in human subjects.

### Results and Discussion

More than 75% of Lemongrass green tea samples revealed the tooth incise, even if the intensity frequently was insignificant.

Fig.1 determines about thirty percent of Lemongrass green tea samples had an overall aroma, color, flavor, and sweetness whose hedonic scale shows strong – Initial value is 7.25 which rise up to 8.00 in Day 1. An earlier study (Choi, 2000) [15] put advance that sweetness in lemongrass green tea metabolically obtained from amino acids and carbohydrates. The sensory attributes contain amino acids in lemongrass green tea leaves at 4–8% of dry weight, while the content of carbohydrates (fructose, glucose, sucrose) in green tea leaves can be 3–6% dry weight (Chen *et al.* 2002). Fig.2 represents the acceptability of 15-point numerical scale with half-point ascend was used, with 0 meaning “none” to 7.82 meaning “extremely strong in Day 5.” As green tea does not have a strong flavor because of citric acid flavor which compared with broad-spectrum food crop in the globe, reference was scored on a product-specific range to discriminate green tea samples on subtle flavor characteristics (Dudai, 2001) [16]. Four characteristic attributes (Sweet, sour, bitter and astringency) were present in only one to three samples and, thus, may not be needed when testing a more focused set of samples. When those attributes were removed from the lemongrass leaf possess citral and citronella, the variability explained increased from 72 to 85%. The mean scores for aroma were significantly different ( $P>0.05$ ) whose score show 7.98 may have produced a synergistic effect with the Lemongrass component, thereby resulting in its unexpected high aroma preference (Muñoz, and Civille, 1998) [11]. ANOVA and Posthoc tests of the P% data for all 50 judges in flavor, texture and overall acceptability there were no significant differences at ( $P>0.05$ ) during the day of evaluation 8, 12 & 15 (50% and 100% of correct responses in each tests) in the mean scores of products lemongrass green teas can be illustrated by means of this set of impartially firmed sensory attributes as an alternative of being judged intuitively by quality alone (Dudai, 2001; Ares *et al.*, 2010) [16, 14]. On the other hand, Lemongrass green tea contains polyphenols, citral which is also recorded the highest light petroleum extractive (5.4%) which indicated its potential to impart aromatic quality to herb tea. The anti-oxidant property of essential oils from lemongrass might be heartening to think about them as a natural oxidant in nutraceuticals efficient food and pharmaceutical measures.

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