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Utilization of dehydrated ginger in the preparation of herbal tea

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Abstract

The present study entitled “Utilization of dehydrated ginger in the preparation of herbal tea” was conducted with the objective to develop herbal tea using dried ginger and other types of ingredients, to assess the sensory accessibility of the prepared herbal tea, to determine the cost of prepared herbal tea. Ginger is used widely both as a seasoning and herbal medicine. The active compounds contained in ginger are divided into two groups: volatile essential oils and fragrant or harsh phenol compounds. Two types of ginger, fresh and dried, are used in the herbal medicine (Qin and Xu, 2008). Herbal Teas are commonly consumed for its therapeutic and energizing properties, since it can help to induce relaxation. Being able to aid with stomach or digestive problems, herbal teas can help provide cleansing properties to the body, and strengthens the immune system as well (Kumar, 2014). Herbal tea were prepared by using four treatments T₁ (Ginger 2.00gm, Cloves 1.00gm, Black pepper 1.00gm, Lemon Peels 0.50gm, Cinnamon 0.25gm, and Tulsi 0.25gm), T₂ (Ginger 2.50gm, Cloves 1.00gm, Black pepper 0.50gm, Lemon Peels 0.50gm, Cinnamon 0.25gm, and Tulsi 0.25gm), T₃ (Ginger 3.00gm, Cloves 0.50gm, Black pepper 0.50gm, Lemon Peels 0.50gm, Cinnamon 0.25gm, and Tulsi 0.25gm) and T₄ (Ginger 3.50gm, Cloves 0.25gm, Black pepper 0.25gm, Lemon Peels 0.50gm, Cinnamon 0.25gm, and Tulsi 0.25gm). Organoleptic evaluation of the prepared product in relation to sensory attributes was carried out using the nine point hedonic scale score card. All treatments were replicated three times and the data obtained during investigation were statistically analyzed by using analysis of variance (ANOVA) and critical difference (C.D.) techniques. On the basis of sensory acceptability it was found that T₂ was scored highest in terms of colour and appearance, consistency, flavor and taste and overall acceptability. The cost of the herbal tea per 5g of dry ingredients at the prevailing cost of the raw materials was highest in T₁ (Rs. 6.15) followed by T₄ (Rs. 6.13), T₂ (Rs. 6.11) and T₃ (Rs. 6.09). Ginger is loaded with antioxidants, compounds that prevent stress. They may help to body to fight against chronic diseases like high blood pressure, heart disease, and diseases of the lungs, plus promote healthy aging.

Keywords: Herbal tea, organoleptic evaluation, cost evaluation

1. Introduction

Ginger is a rhizome with a long history of use in traditional medicine, (Choi *et al.*, 2018) [1]. It belongs to Family Zingiberaceae and its botanical name *Zinger officinale*. It is a common herb used with tea and other food preparations. It has antiviral, antibacterial and anti-inflammatory properties. Ginger contains compounds like gingerols and gingerone that helps to prevent growth of the virus. It is most common used herb to protect respiratory system. Fresh ginger is more beneficial as in comparison to dried ginger. It is also used as anti inflammatory and in reducing muscle pain. It is good sources of antioxidants but do not provide calories or vitamin (Singh and Singh, 2020) [9]. Nutritive value of ginger in per 100g are Moisture 80.9g, Protein 2.3g, Fat 0.9g, Minerals 1.2g, Crude Fiber 2.4g, Carbohydrates 12.3g, Energy 67kcal, Calcium 20mg, Phosphorus 60mg and Iron 3.5mg (Gopalan *et al.*, 1989) [5]. It is a kind of herbal plant that can strengthen the body and treat disease. The rhizome of ginger is used widely both as a seasoning and herbal medicine. The active compounds contained in ginger are divided into two groups: volatile essential oils and fragrant or harsh phenol compounds. Two types of ginger, fresh and dried, are used in the herbal medicine. There exist differences in the chemical composition between fresh and dried gingers that might result in differences in medicinal functions of the herbs (Qin and Xu, 2008) [8]. It is known that ginger extract and its constituent components have anti-oxidant properties that could be attributed to their hydroxyl structure (Si *et al.*, 2018) [10]. Tea is consumed more than any other beverage worldwide (Ho *et al.*, 2008) [6].

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It is a hot water infusion of the dried, young leaves and/or buds of the evergreen *Camellia sinensis* plant. Infusions made from other plants such as herbs, berries, or flowers are known as tisanes (Chu and Juneja, 1997; Saberi, 2010) [2]. Herbal tea is a commonly consumed beverage brewed from the leaves, flowers, seeds, fruits, stems and roots of plants species rather than *Camellia sinensis* L., which has been widely used for health care and diseases prevention for centuries. With the increasing consumption of herbal tea, a number of public health issues e.g., efficacy, safety and quality assurance have attracted concern. Phytochemical analysis, as a key step to investigate the chemical composition of herbal tea and ensure the quality, is very important (Zhao *et al.*, 2013) [12]. Herbal Teas are commonly consumed for its therapeutic and energizing properties, since it can help to induce relaxation. Being able to aid with stomach or digestive problems, herbal teas can help provide cleansing properties to the body, and strengthens the immune system as well. It is important to note that different herbs might have different medicinal properties, which thus allows us to make our own herbal infusions according to how we want the cup of tea to benefit us (Kumar, 2014) [7].

2. Materials and Methods

The entire study was conducted in Nutrition Research Laboratory of Department of Food Nutrition and Public Health, Ethelind College of Home Science, Sam Higginbottom University of Agriculture, Technology and Sciences Prayagraj, Uttar Pradesh. Procurement of raw materials such as ginger, cloves, black pepper, lemon peels, cinnamon and basil leaves were purchased from the local market of Prayagraj, Uttar Pradesh. And, then dehydrated the

ingredients such as ginger, lemon peels and basil leaves (Tulsi) using the standard procedures. The calculated amounts of selected ingredients 5g were taken for preparation of tea. Four treatments were made by using different proportion of ginger, cloves, black pepper, lemon peels cinnamon and tulsi. The different treatments in the study treatments T₁ (Ginger 2.00gm, Cloves 1.00gm, Black pepper 1.00gm, Lemon Peels 0.50gm, Cinnamon 0.25gm, and Tulsi 0.25gm), T₂ (Ginger 2.50gm, Cloves 1.00gm, Black pepper 0.50gm, Lemon Peels 0.50gm, Cinnamon 0.25gm, and Tulsi 0.25gm), T₃ (Ginger 3.00gm, Cloves 0.50gm, Black pepper 0.50gm, Lemon Peels 0.50gm, Cinnamon 0.25gm, and Tulsi 0.25gm) and T₄ (Ginger 3.50gm, Cloves 0.25gm, Black pepper 0.25gm, Lemon Peels 0.50gm, Cinnamon 0.25gm, and Tulsi 0.25gm). All treatments were replicated three times. The prepared tea bag which 5g of selected ingredients was poured in 150ml of boiling water for three minutes and was used for sensory analysis. Product was judge by using the various sensory attributes like colour and appearance, consistency, flavour and taste and overall acceptability. The evaluation was done by on the 9 point Hedonic scale based score card (Srilakshmi, 2015) [11]. Cost of the prepared products was calculated by taking into account the cost of individual raw ingredients used in the preparation of the food product as the prevailing market price. The data was statistically analyzed by using analysis of variance (two way classification of ANOVA) and critical difference (C.D.) techniques (Fisher, 1995) [4].

3. Results and Discussion

The data collected and tabulated under the study are presented with appropriate illustration and discussed in this chapter.

Table 1: Average sensory scores for different parameters for herbal tea

Treatments	Colour and Appearance	Consistency	Flavour and Taste	Overall Acceptability
	Mean ± SE	Mean ± SE	Mean ± SE	Mean ± SE
T ₁	7.11 ± 0.01	6.70 ± 0.05	6.36 ± 0.08	7.15 ± 0.10
T ₂	7.81 ± 0.21	7.35 ± 0.52	7.68 ± 0.19	7.98 ± 0.20
T ₃	7.00 ± 0.07	6.01 ± 0.01	7.46 ± 0.03	6.97 ± 0.16
T ₄	6.81 ± 0.06	6.61 ± 0.14	6.44 ± 0.11	6.81 ± 0.09
Results	S	S	S	S

1. Colour and Appearance

F value = 8.81(4.16), Significant, P≤0.05, CD = 0.61

2. Consistency

F value = 5.72(4.60), Significant, P≤0.05, CD = 1.12

3. Flavour and Taste

F value = 12.01(4.71), Significant, P≤0.05, CD = 0.45

4. Overall Acceptability

F value = 13(4.71), Significant, P≤0.05, CD = 0.16s

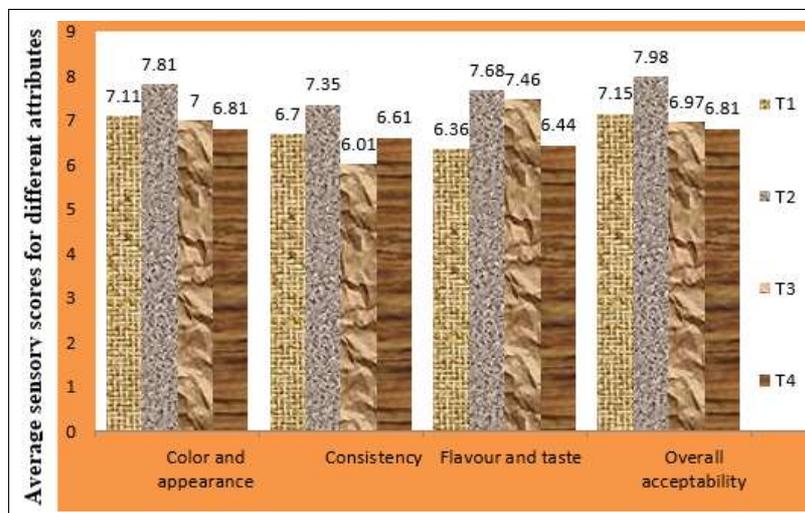


Fig 1: Average sensory scores for different attributes of herbal tea

- 1. Colour and appearance:** The above Table 1 and Figure 1 shows the mean scores of herbal tea indicates that T₂ (7.81) had the highest score followed by T₁ (7.11), T₃ (7.00) and T₄ (6.81) respectively. Scoring shows that the treatment T₂ was liked very much while T₁, T₃ and T₄ were moderately liked by the panel of judges. It indicates that the treatments have significant influence on the color and appearance of the herbal tea. The results are supported by the finding of (De-Heer *et al.*, 2013)^[3] the tea in general and herbal tea in particular are gaining increasing consumer attention due to a growing awareness of health benefits.
- 2. Consistency:** The above Table 1 and Figure 1 shows the mean scores of herbal tea indicates that T₂ (7.35) had the highest score followed by T₁ (6.70), T₄ (6.61) and T₃ (6.01) respectively. Scoring shows that the treatment T₂ was liked very much while T₁, T₃ and T₄ were moderately liked by the panel of judges. It indicates that the treatments have significant influence on the consistency of the herbal tea.
- 3. Flavour and taste:** The above Table 1 and Figure 1 shows the mean scores of herbal tea indicates that T₂ (7.68) had the highest score followed by T₃ (7.46), T₄ (6.44) and T₁ (6.36) respectively. Scoring shows that the treatment T₂ was liked very much while T₁, T₃ and T₄ were moderately liked by the panel of judges. It indicates that the treatments have significant influence on the flavour and taste of the herbal tea.
- 4. Overall acceptability:** The above Table 1 and Figure 1 shows the mean scores of antioxidant rich herbal tea indicates that T₂ (7.98) had the highest score followed by T₁ (7.15), T₃ (6.97) and T₄ (6.81) respectively. Scoring shows that the treatment T₂ was liked very much while T₁, T₃ and T₄ were moderately liked by the panel of judges. It indicates that the treatments have significant influence on the overall acceptability of the herbal tea.

Cost of the prepared antioxidant rich herbal tea per bag

The cost of the herbal tea per 5g of dry ingredients at the prevailing cost of the raw materials was Rs. 6.15 for T₁, Rs. 6.11 for T₂, Rs. 6.09 for T₃ and Rs. 6.13 for T₄. The incorporation levels of ginger and cloves increased the cost of the treatment T₁ and treatment T₃ has the lowest cost.

4. Conclusion

On the basis of finding it is concluded that ginger, cloves, black pepper, lemon peels, cinnamon and tulsi can be successfully used for the preparation of the herbal tea. On the basis of sensory acceptability it was found that T₂ (Ginger 2.50gm, Cloves 1.00gm, Black pepper 0.50gm, Lemon Peels 0.50gm, Cinnamon 0.25gm) was scored highest in terms of colour and appearance, consistency, flavor and taste and overall acceptability. The cost of the herbal tea per 5g of dry ingredients at the prevailing cost of the raw materials was highest in T₁ (Rs. 6.15) followed by T₄ (Rs. 6.13), T₂ (Rs. 6.11) and T₃ (Rs. 6.09).

5. Recommendation

Ginger is loaded with antioxidants, compounds that prevent stress. They may help to body to fight against chronic diseases like high blood pressure, heart disease, and diseases of the lungs, plus promote healthy aging. So, ginger is recommended for preparation of different types of products to boost immunity.

6. Acknowledgement

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