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Original Research Article

Consumer Acceptability of Dandelion Leaves and Ginger Tea

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Abstract: Tea is an aromatic beverage obtained by pouring hot or boiling water over cured or fresh leaves and bud of Camellia Sinensis. The study was aimed to produce tea from dandelion leaves and ginger and to analyze consumers' acceptability level of dandelion ginger tea when compared with green tea. Samples of tea were evaluated using sensory quality attributes such as color, aroma, taste, flavor, after taste and overall likeness. Sensory evaluation was done using seven-point Likert scale from disliked very much to liked very much. Four samples of tea were codified as ADG – Green Tea (control); BDG - 50% dandelion leaves and 50% ginger; CDG -75% dandelion leaves and 25% ginger and DDG - 25% dandelion leaves and 75% ginger. The results showed that, consumer panelist liked all the sensory quality attributes of experimental sample DDG and were willing to use the product.

Keywords: Dandelion leaves, Ginger, Green Tea, Quality Attributes, Sensory, Tea.

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1. INTRODUCTION

The leaves and buds of Camellia sinensis are used to make tea, which is the second most consumed beverage in the world, following coffee, beer, wine, and other carbonated soft drinks (Vishnoi, Bodla, Kant, & Bodla, 2020). Since 2000 years ago, tea has gained worldwide popularity. Many people consume tea as an everyday drink and as a therapeutic aid for many illnesses, due to its economic and social relevance. There is an increased interest in tea because consumers have become more aware of its health benefits (Sumi & Kabir, 2018).

In the northern hemisphere, the Dandelion is commonly found in the temperate zone of the Asteraceae family (Rolnik & Olas, 2021). In temperate regions of the world, it grows along roadsides and banks, as well as in damp areas (Li, Wang, Tan, Yu, Wang & Liu 2020). Various food products are made with dandelion leaves, roots, and flowers. In spite of the numerous conditions in which it has endured, it has shown widespread adaptability (Ferlemi & Lamari, 2016). Dandelion reveals high amounts of minerals, proteins, fiber and vitamins as well as a balanced combination of trace elements, making it an interesting source of micronutrients (Olas, 2022). In addition to acting as a diuretic, it also cleanses the blood and liver (Mahbourbi & Mahboubi, 2020). The dandelion confers numerous health benefits, including protection from anaemia, liver cirrhosis, and rheumatism as well as anti-cancer and anti-coagulant properties. Due to their chemical and pharmacological properties, dandelion leaves have attracted researchers' attention. Folk medicine uses it to treat boils, fevers, and sore throats (Kour, 2020).

In comparing the nutritional composition of dandelion with that of vegetables with similar culinary uses, it is found that dandelion contains more dietary fiber, proteins, amino acids, and vitamins and minerals. The dandelion is also a rich source of b-carotene. It is common for young leaves to be eaten in salads, either on their own or in combination with other plants, Rohini, Shanmugasundaram, & Pandiarana, (2017). They can also be boiled and drained, sprinkled with pepper and salt, and moistened with soup or butter. As well as this, dried leaves are employed in a number of dietary drinks (Shikov, Tsitsilin, Pozharitskaya, Makarov, & Heinrich, 2017). Roasted roots of dandelion are used as coffee substitutes and its flowers for desserts and wines, and some extracts are used as flavorings in food.

Ginger belongs to the Zingiberaceae family and commonly consumed as spice and for herbal medicine for a long time (Senthilkumar & Ilavenil, 2021). It is a flowering plant whose rhizome is obtained from the underground stems surrounded by the

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sheathing bases of two-ranked leaves that is used for culinary and medicinal purposes (Zadeh & Kor, 2014).

In recent years, ginger has been found to possess biological activities and accumulating studies have demonstrated that ginger possesses the potential to prevent and manage several diseases, such as neurodegenerative diseases (Kunnumakkara, *et al.*, 2018). It is also known to possess anti-inflammatory, anti -nausea, anti -carcinogenic, and antioxidant effects (Shahrajabian, Sun, & Cheng, 2019).

Currently, there is growing interest in the use of dandelion leaf as an ingredient in the preparation of tea. However, according to Wickramasinghe, Wickramasinghe, & Wijesekara (2020), dandelion made solely have poor sensory appeal, this may be due to the absence of distinctive flavor properties. It is therefore necessary to combine dandelion with ginger to improve its sensory appeal as consumers are generally unwilling to buy food with poor sensory appeal, irrespective of health or nutritional benefits (Tan, van den Berg, & Stieger, 2016). The combination of tea and ginger has also been reported to possess synergistic antioxidant effect Makanjuola, (2017), hence this study was aimed to produce and analyze the acceptability of dandelion and ginger tea.

According to Wickramasinghe, Wickramasinghe, and Wijesekara (2020), dandelion made solely has poor sensory appeal, which may be due to a lack of distinctive flavor properties. Because consumers are generally unwilling to buy food with poor sensory appeal, regardless of health or nutritional benefits, it is necessary to combine dandelion with ginger to improve its sensory appeal (Tan, van den Berg, & Stieger, 2016). Because the combination of tea and ginger has been reported to have a synergistic antioxidant effect Makanjuola, (2017), the purpose of this study was to create and evaluate the acceptability of dandelion and ginger tea.

2. MATERIALS AND METHOD

2.1 Materials

Organic ginger and fresh dandelion was harvested from the researcher's backyard garden to be used for the samples of tea.

2.2 Methods

2.2.1 Preparation of Dried Dandelion Leaves

Freshly harvested dandelion leaves (1kg) was sorted and washed meticulously to make it safe, drained to remove excess water, dehydrated at a temperature of 70^0 for 3hours, milled, packaged, and stored in an airtight container for further use as shown in Figure 1. The procedure was adopted with little modification from Sinija's (2007) procedure for soluble tea powder.

2.2.2 Preparation of Ginger Powder

Fresh ginger was sorted, washed to make it safe, peeled, washed again and then sliced (¼ inch). Sliced ginger was dehydrated at a temperature of 70^0 for 5hours and milled to powder. Ginger powder was packaged and stored in an airtight container for further use as showed in Figure 2 using an adopted procedure of ginger powder with little modification from Bag (2018).

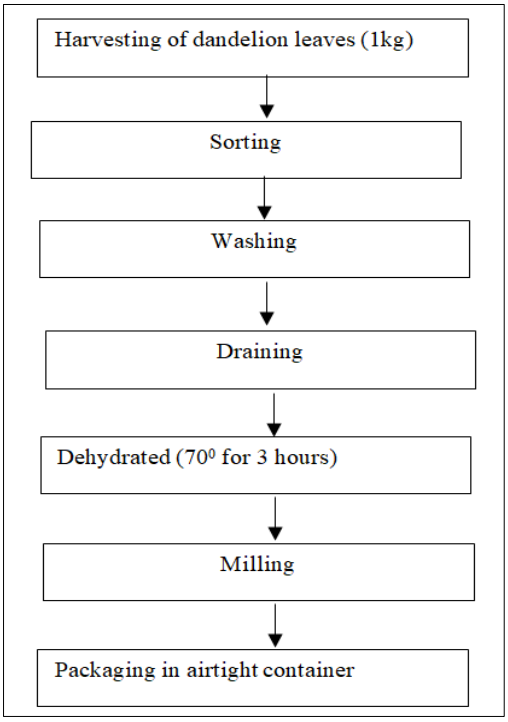

Figure 1: Flow chart for Processing of Dandelion Leaves Powder

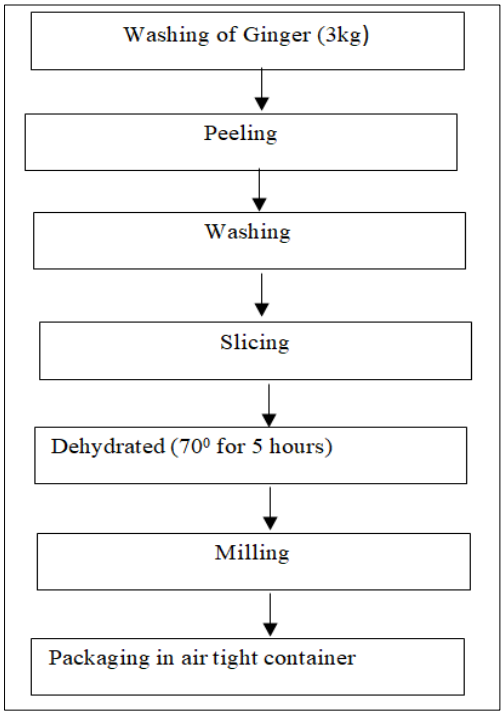

Figure 2: Flow chart for Processing of Ginger Powder

2.2.3 Preparation of Dandelion Ginger Tea

Dried dandelion and ginger powder were mixed, poured into individual pouches, sealed, and packed into boxes as showed in Figure 3. The samples used included BDG - 50% dandelion leaves powder and 50% ginger powder; CDG - 75% dandelion leaves powder and 25% ginger powder and DDG - 25% dandelion leaves powder and 75% ginger powder.

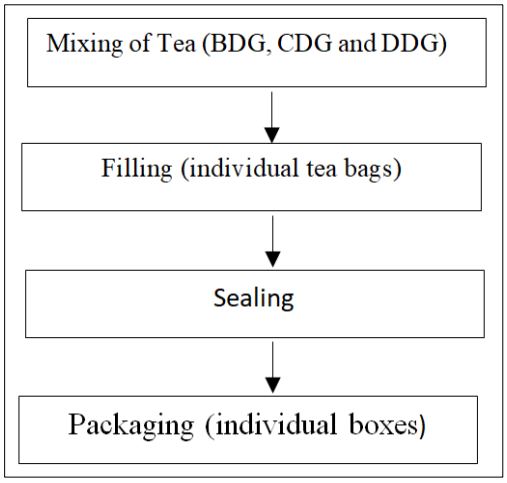

Figure 3: Flow chart for the Production of Dandelion leaves and Ginger Powder

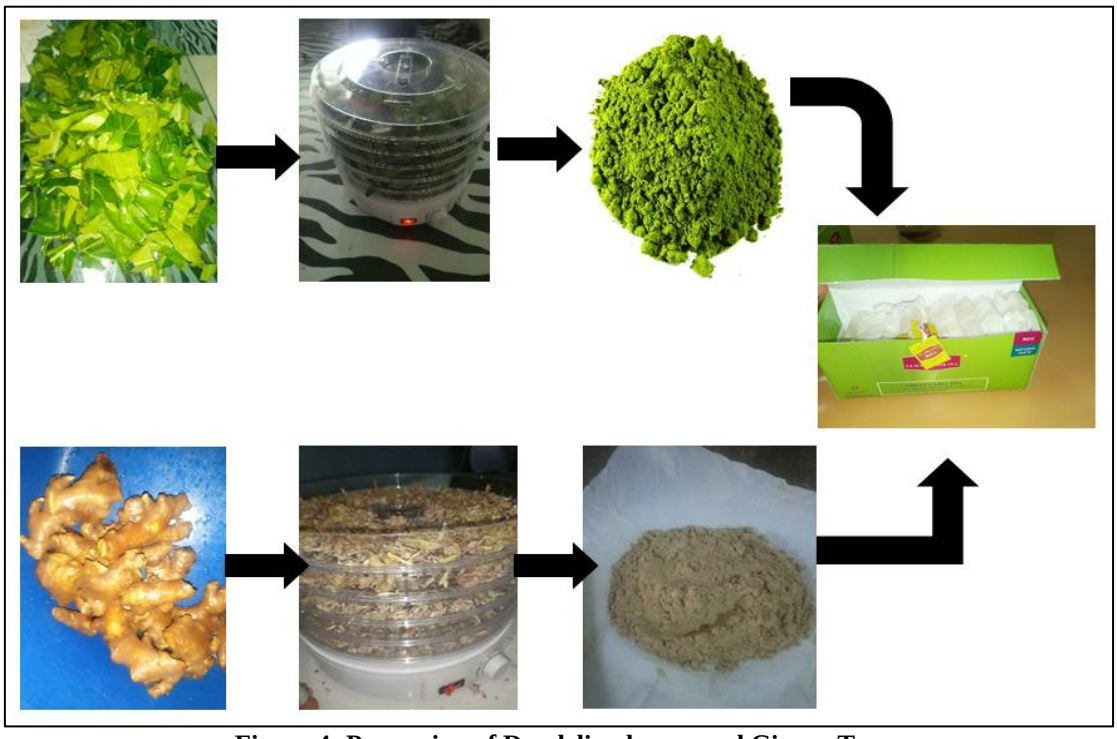

Figure 4: Processing of Dandelion leaves and Ginger Tea

2.3 Statistical Analysis

Data was analyzed using Statistical Package for Social Sciences (SPSS) Version 22 and Graphical representation was done by Microsoft Excel.

2.4 Sensory Analysis of Samples of Tea

Consumer acceptability test was carried out using 50 untrained panelists at the Takoradi Technical University, Ghana, specifically Department of Hospitality Management. An evaluation form having a seven-point Likert scale ranging from disliked very much to liked very much was used. Sensory quality attributes of samples of tea included color, aroma, taste, flavor and after taste and overall likeness. A total of four (4) samples comprising three (3) experimental products and one (1) control sample (Green Tea) were used for the study. Slices of cucumber and water were provided to panelist as a neutralizer. Samples of the product were coded as ADG- Green Tea as the control; BDG-50% dandelion leaves powder and 50% ginger powder; CDG- 75% dandelion leaves powder and 25%

ginger powder; DDG- 25% dandelion leaves powder and 75% ginger powder.

3. RESULTS AND DISCUSSION

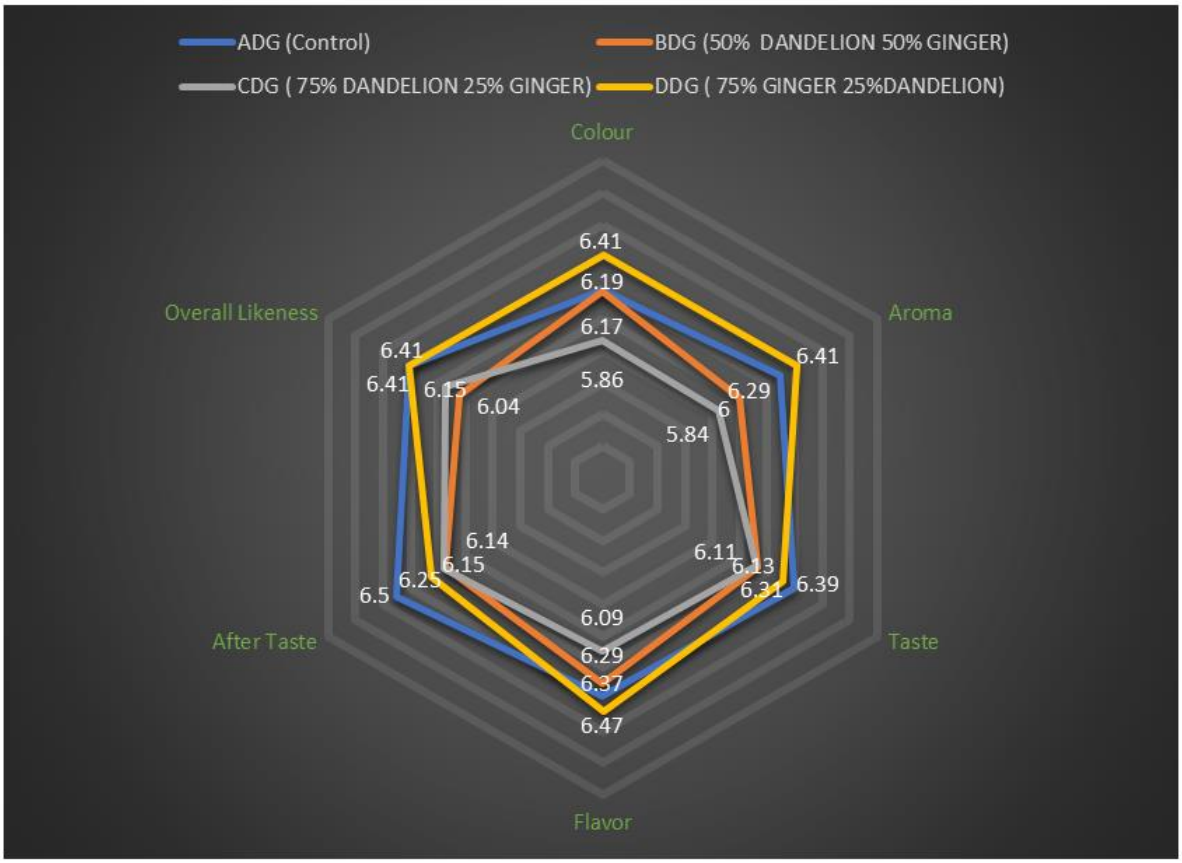

Figure 4: Sensory Quality Attributes of Four Samples of Tea

Scale: 0.5-1.45=1 Dislike very much, 1.5-2.45=2 Dislike moderately, 2.5-3.45=3 Dislike slightly, 3.5-4.45=4 Neither likeor dislike, 4.5-5.45=5 Like slightly, 5.5-6.45=6 Like moderately, 6.5-7.0=7 Like very much

Colour

In food and beverages colour affects the aesthetics, flavor, identification, perception and anticipated taste of a product (Spence, 2015). Research indicates that the expectations and experiences of consumers can be impacted by changes in the colour of food and beverage items. Data from Figure 4, shows that, consumer panelist moderatelty liked the colour of product DDG with a mean of 6.41 followed closely by sample ADG and BDG with the mean score of 6.19 and 6.17 respectively. The least preferred sample in terms of colour was product CDG with the coresponding mean of 5.86.

Aroma

From figure 4, consumer panelist moderately liked the aroma of sample DDG with the coresponding mean of (6.41) followed by sample ADG (6.29) and BDG (6.0), the least preferred sample in terms of aroma was CDG with the mean of (5.84) indicating the sample was slightly liked. Aroma in terms of smell, appreciate the fragrance of food essential to flavour gratitude. Sharif (2016), hinted that the pleasant smell of food makes them delicious.

Taste

Taste is a sensory experience that represents the perception of sensitivity, aroma and mouthfeel. In figure 4, it can be seen that consumer panelist moderately liked sample ADG which was the green tea (control), DDG, BDG and CDG followed with the mean score of (6.39, 6.31,6.13 and 6.11) respectively. This can be due to the fact that consumers are familiar with the taste of green tea which is the control which confirms the works of Sharif (2016) that, taste helps in identification, acceptance and appreciation of food and it is perceived by the taste buds on the tongue. Again, Yang & Lee (2019) found that consumers mostly preferred teas that are less bitter. This assertion by Yang & Lee explains the low response rate for the other products containing dandelions because of the presence of sesquiterpenes in the plant which makes it bitter (Kallas, 2003). This bitter taste according to Olas (2022) can be reduced by blanching the leaves before use in any food product.

Flavor

Flavor is the sensory impression of a food subatances dertermined mainly by the chemical senses of taste and smell. Figure 4 shows the results of flavors of samples of tea by cosumer panelist, it can be seen that, sample DDG was moderately liked with the mean score of (6.47), followed closely by sample ADG and BDG with the mean of (6.37 and 6.29). The least preferred sample in terms flavor was CDG with a coresponding mean of (6.09). this means that for flavor in terms of sensory attributes of samples of tea, sample DDG was most preferred by comsumer panelists.

Aftertaste

Aftertaste helps with the identification, acceptance and appreciation of food. From figure 4 it can be seen that, sample ADG was liked moderately with the mean of (6.50), DDG, CDG and BDG tea sample followed with the coresponding mean score of (6.25, 6.15 and 6.14) respectfully, which means that for after taste sample ADG (control) was preferred.

Overall Likeness

Consumers responses on the overall likeness of the samples prepared indicates that, sample DDG and ADG were liked moderately with the mean score of (6.41), sample BDG and CDG followed with the coresponding mean score of (6. 15 and 6.04) respectively. This means that for overall likeness consumer panelist wanted sample DDG and ADG.

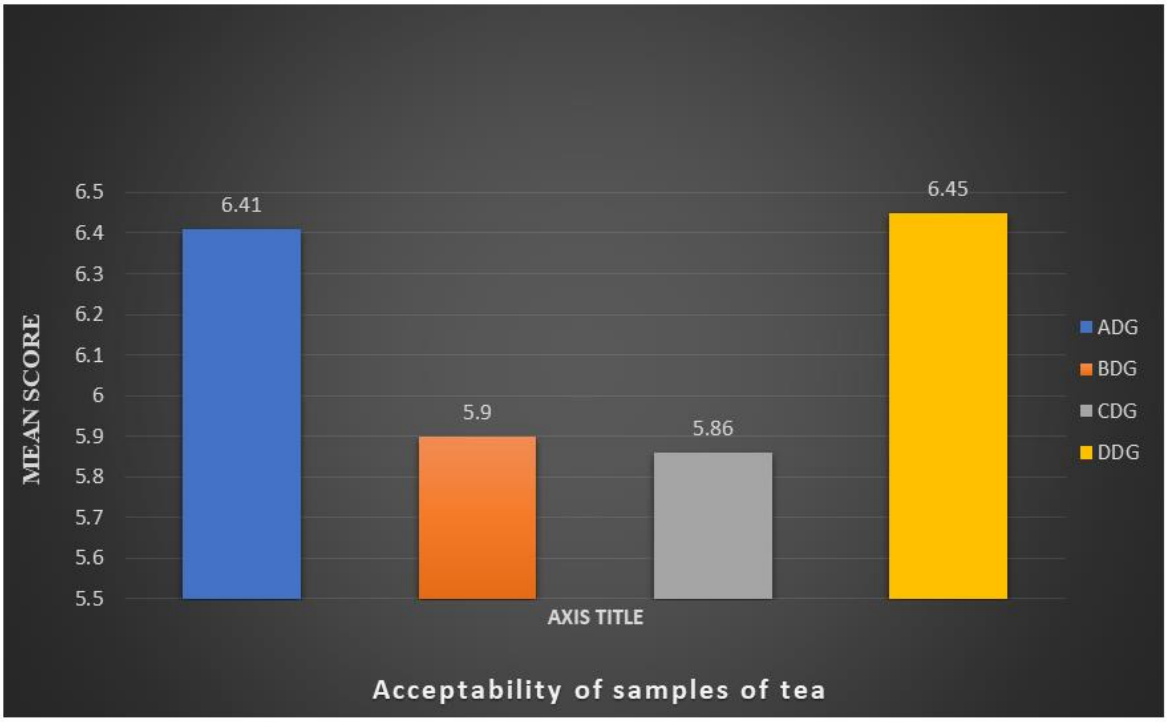

Figure 5: Consumer Acceptability of Samples of Tea

Scale: 0.5-1.45=1 Dislike very much, 1.5-2.45=2 Dislike moderately, 2.5-3.45=3 Dislike slightly, 3.5-4.45=4 Neither likeor dislike, 4.5-5.45=5 Like slightly, 5.5-6.45=6 Like moderately, 6.5-7.0=7 Like very much

4. Consumer's Acceptability of Dandelion and Ginger Tea

From figure 5 it can be perceived that consumers most acceptable tea sample was DDG (75% ginger and 25% dandelion) with the corresponding mean of (6.45), followed by sample ADG (green tea which was the control) with the mean of (6.41). However, the least preferred tea sample was CDG (75% dandelion 25% ginger). From the results it can be said that the experimental sample DDG was most preferred than the existing green tea consumers knew and can be concluded that, consumers are generally unwilling to buy food with poor sensory appeal, irrespective of health or nutritional benefits. This finding however contradicts Adonu *et al.,* (2018) findings on the use of turkey berry in the preparation of tea that consumers preferred the tea made from turkey berries to the other samples because of its nutrient content and not because of the taste.

5. CONCLUSIONS AND RECOMMENDATIONS

From the findings it can be concluded that, an acceptable tea can be produced using a mixture of dandelion leaves and ginger powder. It can be said that consumers are satisfied with the sensory assessment of tea sample DDG which is one of the experimental products (25% dandelion and 75% ginger powder) in terms of color, aroma, taste, flavor and after taste. Consumer panelists were willing to use tea sample DDG when produced in commercial quantities. The

study recommends that further works be done on the proximate and the shelf life of dandelion leaves and ginger tea.

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