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RESEARCH ARTICLE

FORMULATION OF ANTIOXIDANT TEA BY UTILIZING POMEGRANATE PEEL & SPICES

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ABSTRACT

The use of plants as food and medicinal remedies since ancient times is partially attributed to the biological efficacy of secondary metabolites that possess antioxidant activities such as phenolic compounds, vitamins C and E, and carotenoids. Tea extracts are powerful antioxidants due to the presence of chemical compounds such as epigallocatechin gallate (EGCG), epicatechin gallate (ECG), epigallocatechin (EGC) and epicatechin (EC). The waste materials such as the peels and pomace are a source of sugars, minerals and organic acids, dietary fibers and phenolics which have a wide range of actions which includes antioxidants, antimutagenic, cardio preventive, antibacterial and antiviral activities. In recent years, due to a incredible growth in processed food and fruit-processing industries, tones of by-products are produced. These by-products are potential sources of both antioxidant and nutraceutical components that can be explored. The pomegranate (*Punica granatum* L.) has been regarded as a "healing food" with numerous beneficial effects in several diseases. Indeed, the pomegranate was commonly used in folk medicine, for eliminating parasites, as an anthelmintic and vermifuge, and to treat and cure aphthae, ulcers, diarrhea, acidosis, dysentery, hemorrhage, microbial infections, and respiratory pathologies. Pomegranate peels yield more of the powerful antioxidants such as flavonoids, phenolics, and proanthocyanins than what the pulp yields. Cinnamon bark of a variety of cinnamon species is one of the most important and accepted spices used worldwide not only for cooking, but as well in traditional and modern medicines. Cinnamon has several health benefits such as anti-inflammatory, antiemetic, nematocidal, mosquito larvicidal (Cheng *et al.*, 2004), insecticidal, ant mycotic and anticancer agent. Lemon peels contain about 5 to 10 times more vitamins than lemon juice they contain high amounts of calcium and vitamin C, lemon peels have been shown to aid preventing osteoporosis, inflammatory polyarthritis, and rheumatoid arthritis.

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INTRODUCTION

By description, tea is an infusion of the leaves or other parts of the evergreen tea plant (*Camellia* sp). Teas have been traditionally characterized into green, oolong and black teas according to the processing conditions employed during manufacturing (Kirk and Sawyer (1997). Some of the chemical constituents of tea contributing to the quality attributes along with others are strong antioxidants. Antioxidants are substances that, at low concentrations, put off or retard the oxidation of easily oxidisable bio molecules such as lipids, proteins and DNA. Antioxidants chiefly define as substances which counteract free radicals, thus preventing oxidative damage. Tea extracts are powerful antioxidants due to the presence of chemical compounds such as epigallocatechin gallate (EGCG), epicatechin gallate (ECG), epigallocatechin (EGC) and epicatechin (EC) (Raghad Shakir Shayea Al-Obaidi and Dina Hamid Sahib (2015). Waste product which is thrown

into the environment has a very good antimicrobial and antioxidant potentiality (Joshi *et al.*, 2012). The waste materials such as the peels and pomace are a source of sugars, minerals and organic acids, dietary fibers and phenolics which have a wide range of actions which includes antioxidants, antimutagenic, cardio preventive, antibacterial and antiviral activities. Use of waste as a source of polyphenols and antioxidants may have substantial economic benefit to food processors. The pomegranate fruit could be considered a functional food because it has valuable compounds indifferent parts of the fruit that display functional and medicinal effects. These can act as antioxidant (C,am *et al.* (2009), as antitumoral or antihepatotoxic agents, and improve cardiovascular health (Davidson *et al.*, 2009). Cinnamon involves a variety of beneficial many compounds, including cinnamaldehyde, cinnamate, cinnamic acid, and essential oil (Senanayake, 1987). Cinnamon has several health benefits such as anti-inflammatory, antiemetic, nematocidal, mosquito larvicidal, insecticidal, antimycotic and anticancer agent. Lemon peels contain about 5 to 10 times more vitamins

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than lemon juice they contain high amounts of calcium and vitamin C, lemon peels have been shown to aid preventing osteoporosis, inflammatory polyarthritis, and rheumatoid arthritis. The present study was done to explore with the objective of utilizing the waste product of fruit such as peel which are abundant source of antioxidant and polyphenols by the formulation of antioxidant rich tea by utilizing peel and cinnamon stem.

Objective

To develop antioxidant rich tea pallets of pomegranate peels and spices.

MATERIALS AND METHODS

Collection of ingredients: Pomegranate fruit of large size, cinnamon stem, tea packet & sugar were purchased from local market of Lucknow area.

Procurement of raw material

The pomegranate peel and cinnamon stem was used as a base material for the preparation of tea pallet with reduced amount of tea powder and other ingredients used in the preparation of tea pallet included, sugar powder and water. All ingredients were purchased from local market of Lucknow city in bulk, to avoid varietal difference.

Preparation of pomegranate peel powder

The pomegranate fruits were taken from market. Then pomegranate peels and its seeds were separated and afterward peel were washed manually. After washing, the peels were cut into pieces. The peel was dried in the sunlight for 14-16 hrs. Dried pomegranate peels were ground in the grinder to reduce the particle size. The ground material is then allowed to pass through sieve size 30 mesh; the larger particle on the sieve was again taken for grinding and passed through the sieve. The peel powder was then packed in the air tight polyethylene pouch separately and stored.

Preparation of cinnamon, tea and sugar powder

All the three ingredients were grounded in the grinder separately to reduce their particle size. The all three powder was then packed in the air tight polythene pouch separately and stored.

Preparation of lemon rind powder

Lemon were washed & its rind were cut into small pieces. The pieces were put through for drying in sunlight. The dried pieces of lemon were grounded in the grinder to reduce the size for making it in a powder form.

Preparation of experiment

Dissoluble tea pallet was prepared using pomegranate peel powder with the addition of sugar powder, cinnamon powder, small quantity of lemon rind powder & a very small amount of tea powder. The pomy tea was prepared by boiling water at 100°C followed by addition of tea pallets developed. Then the tea is sieve into a cup.

Treatments

- T1-** 15 gms of sugar powder with addition of 5gms of pomegranate peel powder, 1.25gms of cinnamon and 1.25 gms of tea powder, 0.25gms of lemon rind powder.
- T2-** 20gms of sugar powder with the incorporation of 15gms of pomegranate peel powder, 1.66gms of cinnamon powder and 1.25gms of tea powder, 0.25gms of lemon rind powder.
- T3-** 25gms of sugar powder with the addition of 10gms of pomegranate peel powder, 2.5gms of cinnamon powder, 1.25gms of tea powder, 0.25gms of lemon rind powder.
- T4-** 10gms of sugar powder with the mixing of 2.5gms of pomegranate peel powder, 1.66gms of cinnamon & 1.66gms of tea powder, 0.25gms of lemon rind powder.
- T5-** 15 gms of sugar crystal with addition of 5gms of pomegranate peel powder, 1.25gms of cinnamon powder, 1.25gms of tea powder, 0.25gms of lemon rind powder.

The said treatments were used for making different types of tea pallet (total no. 5) for making pomy tea. The assigned values T1, T2, T3, T4, T5, were prepared with various proportion of pomegranate peel, leafy tea, sugar powder, cinnamon powder, lemon rind powder.

RESULTS AND DISCUSSION

The experimental tea product developed by utilizing pomegranate peel powder, tea powder, cinnamon powder, lemon rind powder were characterised as developed product in the present study. The various parameters were incorporated for product development to reach acceptability & edible for human population. For that sensory evaluation process was done by set of panellist constitute 5 members in the expertise field of nutrition. For evaluating, a 9-point hedonic scale which is one of the sensory evaluation method used to evaluate any product.

Four parameters were used to analyse the acceptability of developed product these are as below-

- Body and Texture
- Color and Appearance
- Flavor and Taste
- Overall Acceptability

The total average of individual product was calculated and found that the T3 treatment scored maximum with highest average and least Standard Deviation which indicate its highest acceptability among the five prepared experimental samples.

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