

T2-P-5 Medicinal and aromatic herbs as functional ingredients for specialty beverages

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KEYWORDS: medicinal herbs; aromatic herbs; ingredients; beverages.

INTRODUCTION:

The quest for foods that have a health-promoting impact began many years ago as a functional food. Nowadays, the varieties of food products and food ingredients are more about how they impact the health and well-being of consumers. Throughout history, herbs have been used to add taste and/or preservation to foods. The creative use of herbs can make food much more enjoyable, and not less healthy. Various herbal infusions can be added to beverage compositions to increase nutritional qualities and health benefits while maintaining a sensory and pleasant balance throughout the fortification process.

OBJECTIVES:

The primary objective of the study was to develop and manufacture specialty drinks made from fruit juices and extracts of medicinal and aromatic plants that had a high concentration of biologically active chemicals and a high antioxidant activity. Three types of soft drinks have been developed: those with potentially targeted physiologically beneficial effects on metabolism, cardiovascular system, and body resistance, as well as those with medicinal and aromatic herbs whose positive healing effects have already been documented in previous research.

METHOD / DESIGN:

Fruit juices were made by mechanically processing mature fruits, that have not been fermented and have been preserved only via physical methods. The plant material was dried in ambient conditions and ground shortly before extraction. A single percolation method was used to create liquid plant extracts. Extracts of medicinal and aromatic herbs were mixed in combinations with specific functional characteristics sensory acceptable and compatible with fruit blends. Total flavonoid content, polyphenols, and antioxidant capacity were determined.

RESULTS:

Plant extracts and fruit juices were first classified in terms of total phenols, and their antioxidant activity was assessed using the FRAP and DPPH tests. The total antioxidant activity determined by the FRAP assay and the antioxidant activity determined by the DPPH test were correlated with the total phenol content. The number of phenolic compounds in tested herbal extracts and fruit juices differs significantly at the level of statistical significance of $p < 0.05$. Given that antioxidant activity is directly proportional to phenolic component concentration, the FRAP and DPPH test both demonstrated statistically significant antioxidant activity.

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CONCLUSIONS:

For the production of specialty beverages with targeted effects on accelerating metabolism, protection of the cardiovascular system, and strengthening the body's resistance. While it is evident that a wide range of medicinal and aromatic plants may be utilized to improve the functional and sensory characteristics of beverages, the results are often not favorable. Blending various medicinal and aromatic herbs can provide a remedy, specialty beverage. The most essential issue is to select the best plant composition so that maximum functional characteristics may be balanced with pleasant sensory features.

T2-P-6-ORAL **Suppression of ring artifacts in reconstructed holographic images using graph signal processing**

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KEYWORDS: ring artifacts; digital holography; graph signal processing; Taubin filter; optimal graph filter

INTRODUCTION:

Monitoring of pollen concentration is an important task that can help people suffering from pollen allergies. Currently, the most reliable methods for determining concentration and classification of pollen particles require a lot of time and labor. In recent years new devices based on reconstructed holographic images of pollen particles for pollen classification and automatic concentration monitoring have been introduced. Although it is possible to obtain high quality particle images, the acquisition process also introduces various artifacts such as ring artifacts which leads to wrong estimation of the final pollen concentration.

OBJECTIVES:

The aim of this research was to find a method to remove ring artifacts from pollen holographic image reconstructions while preserving important features of particles such as shape and size.

METHOD / DESIGN:

For removing ring artifacts, two methods based on graph signal processing¹⁸ framework were proposed: Taubin smoothing filter (TSF) and optimal graph filter (OGF). Both proposed methods represent translation of basic filter design concepts from classical digital signal processing into a graph domain. The reconstructed holographic images of pollen are modeled as a graph with a 2D lattice structure, where each vertex represents a pixel, and edges only exist between adjacent pixels. While TSF can be treated as a finite impulse response (FIR) filter which is iteratively applied to obtain better denoising results, OGF tends to achieve the same results through only one iteration and it can be considered as an infinite impulse response (IIR) filter.

RESULTS:

We evaluated the proposed methods by using visual inspection of filtered images and regions of interest (ROI) containing only pollen particles. As there are no reference images of pollen particles without artifacts, for objective evaluation it is

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¹⁸ *L. Stanković; D.P. Mandić; M. Daković; M. Brajović; B. Scalzo; S. Li; and A. G. Constantinides, Data analytics on graphs Part I: Graphs and spectra on graphs now, 2020*