

STUDY ON THE NUTRITIONAL VALUE OF SOME COFFEE SUBSTITUTES

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Abstract: *Although excessive coffee consumption is correlated with a negative influence on health, coffee still remains one of the most frequently consumed beverages. Coffee substitutes, which are commercially available as such or in the form of blends with different amounts of coffee, are a healthier alternative. This paper is a study on the nutritional value of some varieties of coffee substitutes, from the Romanian market. The most used coffee substitutes are: chicory, rye, barley, ganoderma mushroom, guarana, lupine, wheat spelled, hemp seed flour. Using the analyzer spectral fluorescence ray X (FRX), we determined the mineral content of the assortments taken in our study. Literature and our experimental research show that due to the high content of fiber, vitamins, minerals and the phytochemicals which gives them antioxidant properties, these products can be recommended for consumption, even for certain categories of consumers: children, pregnant women and the elderly.*

Key words: *FRX method, mineral content, consumers*

INTRODUCTION

Soluble coffee contain important amounts of minerals (8.8-10.0 g/100 g) [4]. The goal of this paper is a study on the nutritional value of some varieties of coffee substitutes.

The most used coffee substitutes are: chicory, rye, barley, ganoderma mushroom, guarana, lupine, wheat spelled, hemp seed flour.

Lupine has special nutritional properties, among legumes having one of the highest levels of protein and a very good amino acid profile. In addition, lupine contains fiber and indigestible carbohydrates [13].

We observe an increasing interest in using chicory to supplement food. Some chicory compounds, such as polyphenols, oligofructose, inulin and sesquiterpene lactones, are thought to be potentially responsible for the functional food and various antimicrobial effects [7, 8, 9, 10]. Chicory root is a rich source of inulin - a prebiotic fiber associated with accelerating the weight loss process as well as improving intestinal health [15].

Ganoderma lucidum is a mushroom of great importance due to the presence of numerous bio-active compounds in it [2]. Compared to regular coffee, it has a lower content of caffeine and a greater content of nutrients. Its health benefits are due to Ganoderma lucidum - or red reishi mushroom - which is one of its main ingredients [14]. In order to enhance the metabolic function and body immune system, G. lucidum products are being commercialized in the form of coffee, powder, tea, dietary supplements, etc [2].

Guarana (Paullinia cupana) has traditionally been consumed by indigenous communities in the Amazon region. It is mainly appreciated for its high caffeine content, which can be up to 6% in seeds [12]. Guarana has diuretic properties and benefic effects against headache and fever [3].

Hemp (Cannabis sativa L.) is a source of psychoactive compounds [1]. Hemp proteins have a protein digestibility-corrected amino acid score equal to or greater than certain nuts, grains and some pulses [5].

Many studies discovered that barley coffee protects tooth surfaces from *Streptococcus mutans*, having an inhibitory activity [6,11].

MATERIALS AND METHODS

In this study we evaluated from the nutritional point of view, 7 assortments of coffee substitutes from the Romanian market: Lupine coffee (type 1), Hemp seed coffee (type 2), Guarana coffee (type 3), Coffee with rye, barley, chicory and figs (type 4), Spelled coffee (type 5), Chicory and barley coffee (type 6) and Ganoderma coffee (type 7).

In order to analysis the samples for their mineral content by the FRX method, the coffee substitutes were dried until the constant weight.

The analysis of the mineral content of coffee substitutes assortments were made using X-MET8000 X-ray fluorescence analyzer device (figure 1) and the results were expressed in ppm (mg/kg dry weight).



Figure 1. The XRF analyzer device

RESEARCH RESULTS

The nutritional parameters of the 7 coffee substitutes assortments are presented in Table 1. Lupine coffee (type 1) is noted for its very low carbohydrate content and high protein content.

Table 1.

The nutritional parameters of the coffee substitutes assortments

Coffee types	Energetic value kcal/100g	Fats g/100g	Carbohydrates g/100g	Fiber g/100g	Proteins g/100g
1	300	6.4	2.1 g	30	32
2	350	9.7	29.8	36.3	17.8
3	361	11	33	39	13
4	362	0.2	81	0	3.7
5	349	0.1	74	8	5,9
6	353	0.2	77	13	4
7	333	0.1	66.7	6	33.3

The experimental results regarding K, Ca, Zn, Cu and Cr contents (ppm) of coffee substitutes types are shown in figures 2 and 3. We observe that Ganoderma Extract Coffee had the highest K content and Lupine coffee the highest Ca, Zn and Cr content. The highest content of Cu belongs to Hemp seed coffee.

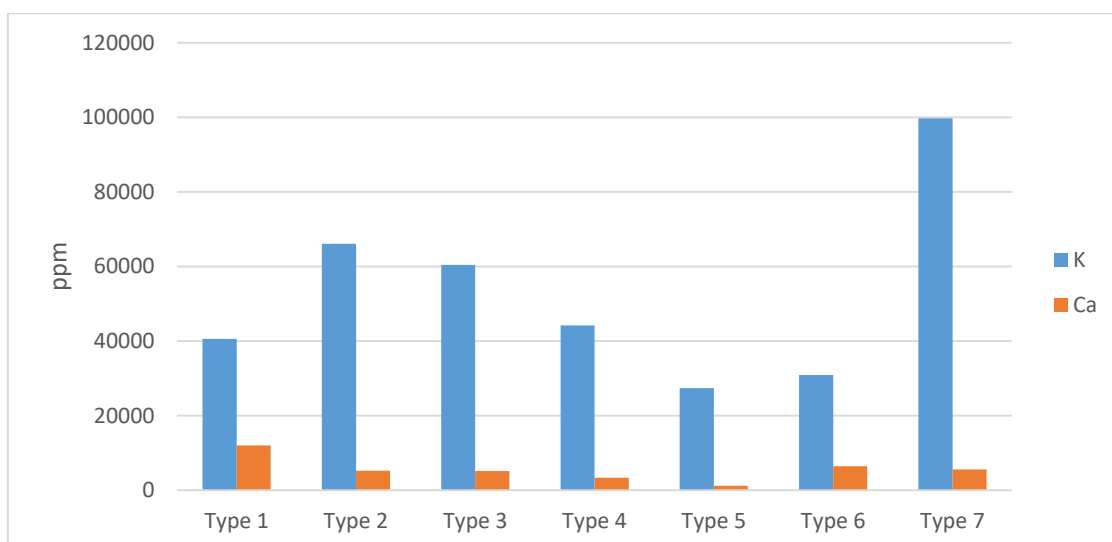


Figure 2. K and Ca contents (ppm) of coffee substitutes types

Spelled coffee registered the lowest values for the parameters: K, Ca, Zn, Cu compared to the other assortments studied.

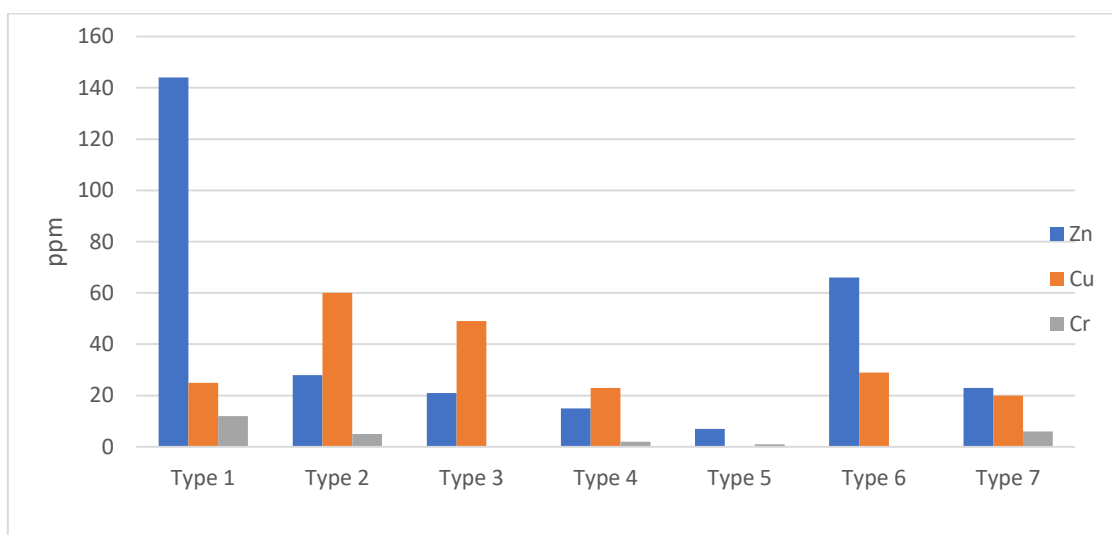


Figure 3. Zn, Cu and Cr contents (ppm) of coffee substitutes types

CONCLUSIONS

From the research results we can conclude that, due to the low sugar content, high protein content and the highest Ca, Zn and Cr contents, lupine coffee assortment has the best nutritional parameters. The highest content of Cu is recorded by Hemp seed coffee assortment. The product spelled coffee registered the lowest values for all parameters: K, Ca, Zn and Cu compared to the other assortments studied.

Literature and our experimental research show that due to the high content of fiber, vitamins, minerals and the phytochemicals which gives them antioxidant properties, these products can be recommended for consumption, even for certain categories of consumers: children, pregnant women and the elderly.

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