"LUCIAN BLAGA" UNIVERSITY

FACULTY OF AGRICULTURE, FOOD INDUSTRY AND THE ENVIRONMENT

AREA: INDUSTRIAL ENGINEERING

PHD THESIS SUMMARY

PREPARATION AND CHARACTERIZATION OF A TONED FOOD PRODUCT THAT HARNESS THE POTENTIAL BIOACTIVE OF NATIVE PLANTS

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CHARACTERIZATION OF TONED BEVERAGES WHICH HARNESS THE BIOACTIVE POTENTIAL OF SOME INDIGENOUS PLANTS

SUMMARY

INTRODUCTION

Since ancient times wine and wine-based products have accompanied human existence. Along with bread and oil, they are part of a sacred triad of mankind. Use of wine is recorded in various scenes carved, etched, painted, drawn and is mentioned in ancient writings - hieroglyphics, cuneiform, etc. In recent decades, and culinary food market has become extremely dynamic. This trend is explained by the increasing diversification of consumer needs and demands, so manufacturers are challenged to develop and acquire new products that correspond in all respects with the requirements.

Beverages as an important component of nutrition, serving both the food preparation, as well to quench thirst, being used in the daily diet, but also on occasions related to traditions and customs. Tonic wine and gastronomy are used, where the vast variety can join the countless dishes, from appetizer to dessert, not the food itself, but as a caregiver. Pairing wines with various dishes is a true science, which created the specialists in this field. The chemical composition of wine, very complex, and energy has favorable effects on the body.

Polyphenols from wine-based drinks have antiviral, antibacterial, protective role against atherosclerosis and promotes biochemical reactions that protect the cardiovascular system. Recent findings show that procyanidins, in addition to the antioxidant effect of vitamin C and favoring the action speeds up clearance of cholesterol and resveratrol has the ability to inhibit the spread of cancer cells to other parts (metastasis).

Consuming populations recorded increases in longevity of life, reductions in mortality from diseases of the cardiovascular system and a lower percentage of alcoholics.

Keywords: indigenous plants, macerated, toned drinks.

The purpose and objectives of the thesis

This doctoral thesis aims at harnessing the potential of bioactive plants indigenous to obtain tonifinate drinks with harmonious qualities. In order to achieve this goal it has been proposed to be made following scientific objectives:

- Identification and quantification of polyphenols in potentially bioactive native plants.

- Evaluation of aromatic compounds important in potentially bioactive native plants.

-Identify and quantification of phenolic acids in bioactive beverages balms that leverages the potential of native plants.

CHAPTER I

CHARACTERIZATION OF INDIGENOUS PLANTS WITH BIOACTIVE POTENTIAL

1.1. Identification and quantification of phenolic acids in plants indigenous potentially bioactive

1.1.2. Materials and methods

-plante potentially bioactive.

The quantitative evaluation of phenolic acids was carried out by the Folin-Ciocalteu method modified: Folin-Ciocalteu method is based on the oxidation of phenols using a solution of molibdo-tungstate (Na2WO4 / Na2MoO4). O2 result of this reaction, which reacts with molybdate to form ion (Mo4 +) (blue), whose absorbance is followed spectrophotometrically in the range 420-1000. The maximum absorbance was detected at 280 nm, the reaction taking place in a basic medium. It was used as a standard gallic acid.

1.1.3. Results and discussions

The concentration of phenolic acids is between a minimum of 1,247 mg / L which are recorded on bilberry (Vaccinium myrtillus L.) (leaves) and a maximum amount of 67 937 mg / L at fairies phenolic acids (Galium mullugo L.).

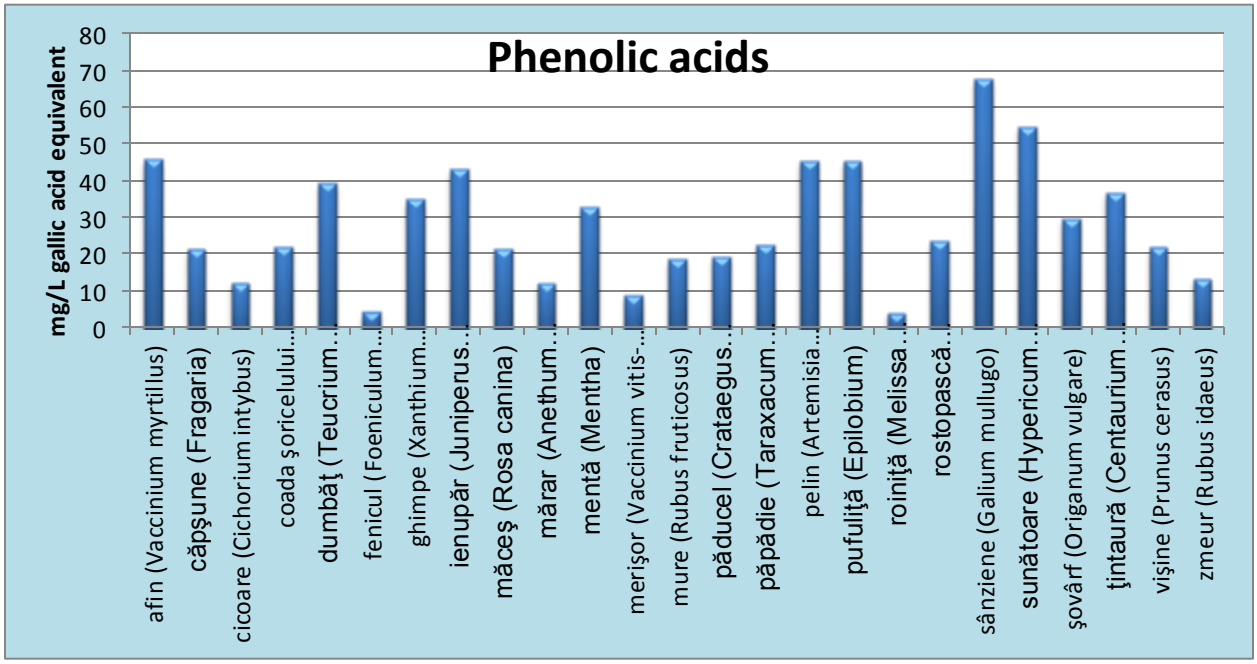

Figure 1. Evaluation of phenolic acids concentration of potentially bioactive plant extracts: bilberry (leaves and fruits) (Vaccinium myrtillus L.), strawberries (Fragaria L.), chicory (Cichorium intybus L.), yarrow (Achillea millefolium L .), dumb (Teucrium chamaedrys L.), fennel (Foeniculum vulgare Mill.), thorn (Xanthium spinosum L.), juniper (Juniperus communis L.), wild rose (Rosa canina L.), dill (Anethum graveolens L.) , mint (Mentha L.), cranberry (branches and fruits) (Vaccinium vitis-idaea L.), blackberries (Rubus fruticosus L.), hawthorn (Crataegus monogyna Jacq.), dandelion (Taraxacum officinale FH Wigg.), wormwood (Artemisia absinthium L.), willow herb (Epilobium L.), lemon balm (Melissa officinalis L.), celandine (Chelidonium majus L.), Lady's bedstraw (Galium mullugo L.), St. John's wort (Hypericum perforatum L.), oregano (Origanum vulgare L .), centaury (Centaurium erythraea Rafn.), cherry (Prunus cerasus L.) raspberry (leaves and fruits) (Rubus idaeus L.).

1.1.4. Conclusion

Average values of the concentration of phenolic acids have been noted in oregano (Origanum vulgare L.), the celandine (Chelidonium majus L.), and dandelion (Taraxacum officinale F. H. Wigg.). The highest concentration of phenolic acids was registered with fairies (Galium mullugo L.), the minimum in terms of the concentration of phenolic acids was observed in bilberry (Vaccinium myrtillus L.) (leaves).

CHAPTER II

CHARACTERIZATION BEVERAGE toned EC harness the potential of bioactive SOME INDIGENOUS PLANTS

2.1. Identification and quantification of polyphenols in bioactive beverages balms that leverages the potential of native plants

2.1.2. Materials and methods

-Drinking toning denoted by B1, B2, B3, B4, B5, B6,

For the determination of polyphenol Folin-Ciocalteu method is used, the reading is performed with the aid of a UV-VIS equipment at a wavelength of 750 nm, a calibration curve is made using successive levels of gallic acid.

2.1.3. Results and discussions

Beverages studied determine the amount of polyphenols is between 995 620 mg / L in drinking B4 and 2225.760 mg / L in drinking B5.

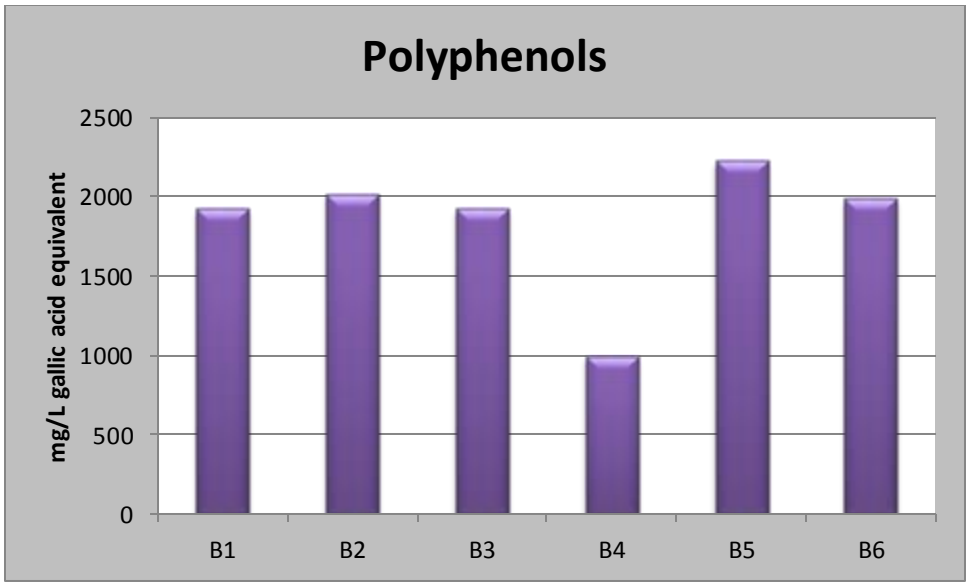

Figure 74. The content of gallic acid equivalent expressed in polyphenols of the drink recipes six B1, B2, B3, B4, B5, B6

2.1.4. Conclusion

All six drinks obtained important polyphenol content. It is noted that a maximum content of polyphenols in the beverage were determined B5.

2.2. Evaluation of aroma compounds in beverages balms made from native plants potentially bioactive

2.2.2. Materials and methods

Tonic beverages made from plant denoted by B1, B2, B3, B4, B5, B6

Evaluation aromatic profile of the six drinks toning was performed using the system GC / FID (gas chromatograph coupled with ionisation flame. The system included gas chromatograph Varian 450 GC coupled with Varian 240 MS model mass spectrometer (Varian Inc - California , USA) equipped with a capillary column TG-WAXMS Thermo Scientific (Waltham, MA USA) (60m x 0.32 x 0.25 pm).

It has been followed the concentration of methanol, acetaldehyde and ethyl acetate.

2.2.3. Results and discussions

As shown in figure 3, the concentration of methanol in the six samples is between 6.1901 mg / L to B4 and a maximum of 27.0132 mg / L to the sample B3. B2 and B6 samples showed values close to 16.5809 mg / L respectively 15.2745 mg / L. Samples B1 and B5 showed accumulations of methanol 22.1858 mg / L respectively 24.3814 mg / L.

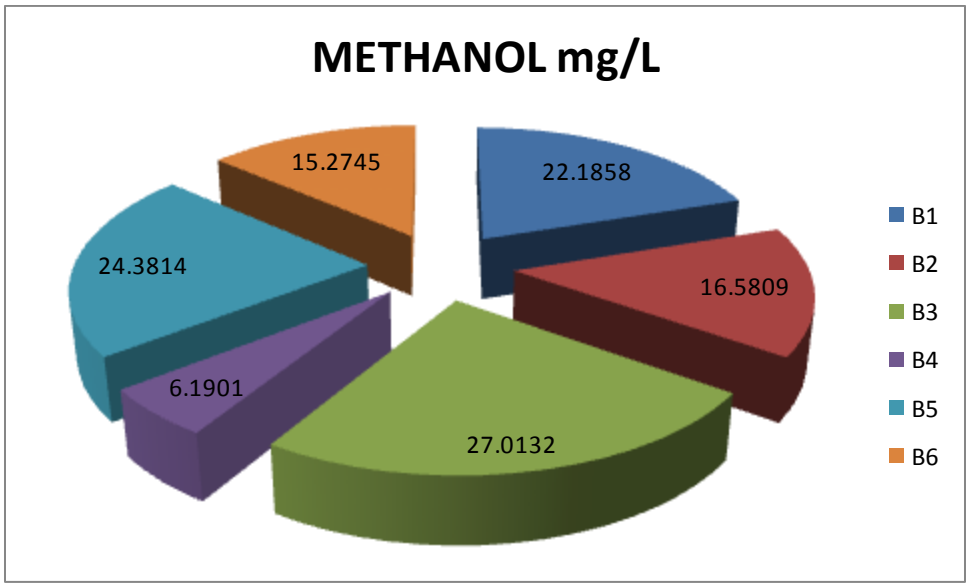

Figure 3. Assessment of methanol concentration in the six drinks balms

In figure 4 it is noted evolution of acetaldehyde and ethyl acetate in the six beverage under study. Acetaldehyde values range between 0.0015 mg / L in sample 1, 0.0019 mg / L in sample 2, and 0.0201 mg / L in the sample 4. Double observed values for sample B3 where they are at a rate of 0.0053 mg / L. Halfway maximum B5 and B6 lies evidence showing amounts of 0.0098 mg / L respectively 0.0122 mg / L.

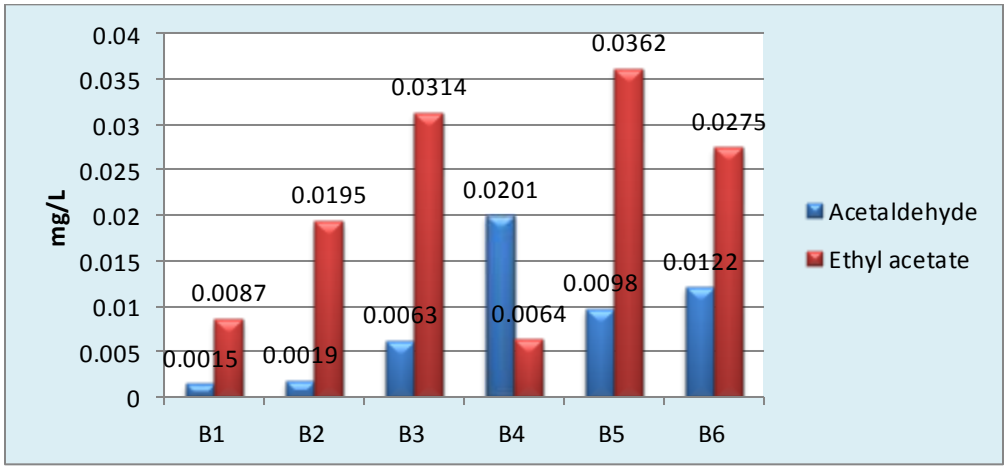

Figure 4. Assessment of acetaldehyde concentration and ethyl acetate in the six drinks balms

The ethyl acetate shows values that are between 0.0064 mg / L (B4) and 0.0362 mg / L (B5) the intermediate values seen in the samples B1 to 0.008 mg / L, B2 0.0195 mg / L B3 to 0.0314 mg / L and B6 0.0275 mg / L.

2.2.4. Conclusion

Values of methanol fluctuates in the six samples, but below the maximum allowed by law.

Esters (acetate) is at values that lead to pleasant fragrances, suave, yet astringent.

CONCLUSIONS

- We identified and quantified polyphenols in potentially bioactive native plants.

All plants surveyed contain polyphenols in varying amounts.

- We evaluated some aromatic compounds important in potentially bioactive native plants.

In the category of aromatic compounds were revealed esters, higher alcohols, aldehydes and terpene compounds.

-I Identified and quantified phenolic acids in bioactive beverages balms that leverages the potential of some native plants.

The six beverage toning phenolic acids have in their composition at concentrations ranging from one product to another.