STUDIES REGARDING THE PRODUCTION OF ROMANIAN BITTER

CERCETĂRI PRIVIND PRODUCEA BĂUTURILOR DE TIP BITTER

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Abstract. *The present study has as main objective the evaluation of the methods of obtaining a bitter type curative beverage to evaluate the possibility of superior utilization of the medicinal plants. Aromatic and condimentary plants have been used. Among the plants used: Angelica archangelica, artichoke (Cynara scolymus), basil (Ocimum basilicum), Thymus serpyllum, Achillea millefolium, Juniperus communis, Hyssopus officinalis, Salvia officinalis, Origanum vulgare, Glycyrrhiza glabra, Mentha piperita, Melissa officinalis and Fir resin. The variants used were V1 - sweetening sugar, V2 - sweetening with liquorice V3 - unsweetened and V4 - alcohol of 50 %vol. The analyzes were performed according to scientific literature. Alcoholic strength, pH, phenolic compounds and sensory analysis were evaluated. The study shows that it is appropriate to prepare an herbal beverage. The medicinal plants used imprinted the beverage with hints of wild flowers, coniferous trees and other aromatic plants. The liquorice sweetened variant was the most appreciated by the tasters*

Key words: phenolic compounds; spectrophotometry; plate reader.

Rezumat. *Studiul de faţă are ca scop principal evaluarea metodelor de obţinere a unei băuturi tip bitter cu rol medicinal, curativ, de a evalua posibilitatea valorificării în mod superior a plantelor medicinale. Au fost folosite plante aromatice si condimentare Dintre plantele folosite se pot mentiona: angelica (Angelica archangelica), anghinare (Cynara scolymus), busuioc (Ocimum basilicum), cimbrişor (Thymus serpyllum), coada şoricelului (Achillea millefolium), ienupăr (Juniperus communis), isop (Hyssopus officinalis), salvie (Salvia officinalis), sovârf (Origanum vulgare), lemn dulce (Glycyrrhiza glabra), mentă (Mentha piperita), roiniţă (Melissa officinalis) şi răşină de brad. Variantele utilizate au fost V1 - îndulcire cu zahăr, V2 – îndulcire cu lemn dulce, V3 – neîndulcit şi V4 – alcool de 50 %vol . Analizele au fost efectuate pe baza metodelor din literatură de specialitate. Au fost analizate concentraţia alcoolică,*

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pH, compuşi fenolici şi analiză senzorială. În urma studiului efectuat se constată că este oportună preparea unui lichior din plante medicinale. Plante medicinale utilzate au imprimat băuturii o nuanţă de conifere, montană. Varianta îndulcită cu lemn dulce a fost cea mai apreciată de către degustători.

Cuvinte cheie: compuşi fenolici, spectrofotometrie, spectrofotometru cu microplăci

INTRODUCTION

According to the New Universal Dictionary of Romanian Language 2007, bitter is "a bitter beverage consumed as an appetizer." This term has multiple origins, coming from English, French or German, the original word coming from the Dutch word bitter.

Bitters are hydroalcoholic tinctures, macerations or infusions in which various spices and aromatic plants such as cinnamon, cloves, orange peel or cardamom are mixed (Hawkins, 2008). These flavors are enhanced in the presence of alcohol, quinine and medicinal plants such as wormwood, artichoke, dandelion, valerian, which have precious medicinal qualities (Vârban *et al.,* 2005). The aerial part of plants (leaves, flowers, buds, stem, seeds, bark) or underground (roots, tubers, rhizomes) can be used to prepare bitters.

One of the most popular beverages of this type consumed in the world is Campari. Many people consider it a liquor as it is sweet, but its producers insist on calling it bitter, connecting it to its bitter taste, given by quinine and wormwood in its composition. The bitter was first prepared in 1860 in Italy by Gaspar Campari. This drink has an intense red color and was colored at first with an extract from the female insect bodies of the *Coccinela* species (Trebent, 1978). Besides these ingredients, the recipe still contains 65 other plants such as root spices, shells and tree bark, macerated in hydroalcoholic solution.

The present article aims at highlighting the local resources that can be used for obtaining bitter-type beverages and to evaluate their quality.

MATERIALS AND METHODS

For the preparation of bitter, only plants found in the local spontaneous flora or coming from areas close to Romania and introduced into culture for a long time were chosen. These plants are: *Angelica archangelica, Cynara scolymus, Basilicum basil, Thymus serpyllum, Achillea millefolium, Juniperus communis, Hyssopus officinalis, Salvia officinalis, Origanum vulgare, Glycyrrhiza glabra, Mentha piperita, Melissa officinalis* and fir resin. The plant material used was harvested in 2017. The plants were harvested at the optimum time for each species. The plants were milled and then macerated in ethanol. After maceration, the solution was diluted to approximately 40 %vol and sweetened. The following variants were obtained: V1 - sugar sweetening, V2 - sweetening with liquorice, V3 - unsweetened and V4 - maceration with alcohol of

50% vol. All variants have passed through a sensorial evaluation but also in terms of alcoholic concentration, pH, acidity, sugar concentration, concentration in phenolic compounds, to determine which experimental variant is the most balanced. Chemical parameters analysis and sensorial evaluation were performed according to the International Organization of Wine and Wine Methods of Analysis.

RESULTS AND DISCUSSIONS

Table 1 presents the results of the main characteristics of the bitter-type beverage samples.

Table 1

Characteristics of the bitter-type beverage samples

Sample	Alc. Conc (%vol)	Sugars (g/l)	pH
V1	27.5	55.2	3.86
V2	28.8	41.2	3.6
V3	29.7	12.4	4
V4	27.7	25.2	3.89

It is clear that the dilution from adding sweetened solution, either sugar or liquorice, had its effect on the final alcoholic concentration of the samples. They range from 27.5% in V1- variant sweetened with sucrose solution to 29.7% in the unsweetened variant (V3). The sugars concentration varies between 12.4 g/L (V3) to 55.2 g/L (V1).

After sensorial evaluation (fig. 1 and fig. 2), the first olphactory characteristic most of the tasters felt was pine buds (forest, vegetal, coniferous) and, secondly, an aroma similar to tea leaves. Other major aromas were thyme, wild flowers and juniper. Therefore, the premises for creating a bitter-type beverage with a strong, herby aroma, are very promising. The mouthfeel brought forward the powerful bitter taste (juniper, *Achillea millefolium, Cynara scolymus*) that was very well complimented by the high alcoholic concentration and the floral indices, bringing thus a special freshness to all the analysed variants. Although, variant no. 3 was processed without any sweetener addition, it was considered to be the most equilibrated and pleasant, with a high persistency of the aroma profile.

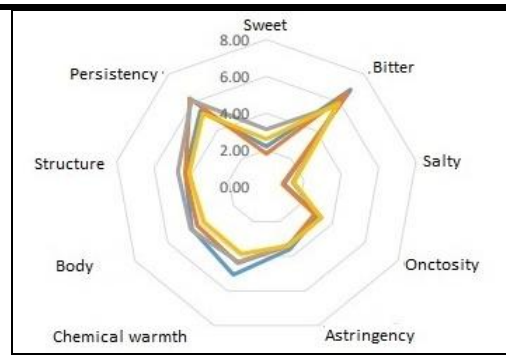

Fig. 1 Sensorial characteristics – mouthfeel indices

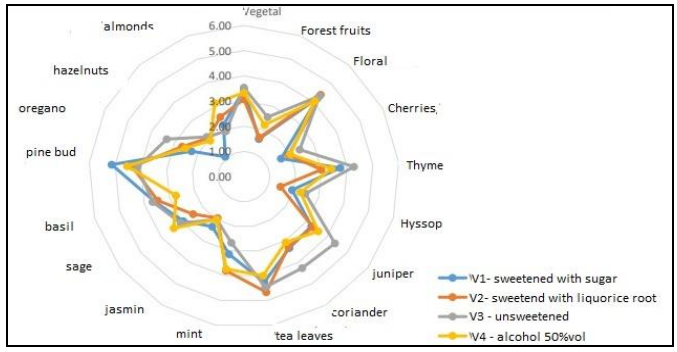

Fig. 2 Sensorial characteristics – aroma indices

CONCLUSIONS

The study shows that there are possibilities for obtaining locally sourced bitter-type beverages. The used plants have imprinted the beverage with hints of coniferous trees, vegetal and floral notes.

Sweetened variant was most appreciated by tasters while the opaque variant is not attractive from a commercial point of view, but it is the richest in aromatic phenolic compounds.

It can be concluded that the hydroalcoholic maceration produces a valuable beverage from the range of spirits, opening up a new potential for capitalizing on local medicinal plants.

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