

Quantitative determination of substances that determine the aroma of the extract of a bay leaf

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Abstract – *It is established that during the chladone extraction of the bay leaves the color, smell and taste of the original plant material are preserved. The number of flavors of the chladone extracts of the bay leaf after the first and second extractions has been determined. It was shown that the content of aromatics in chladone extracts of the bay leaf is 3,6 ... 4,8 times more in comparison with water-alcoholic extracts.*

Keywords – bay leaf, additive, flavor number, liquified chladoni, extract.

Introduction

Laurel noble – a subtropical tree or shrub, all of which contain essential oils, tannins, resins, bitterness, which give them a typical aromatic odor and a pleasantly bitter taste. The composition of the bay leaf includes carbohydrates, fats, proteins, edible fibers, saturated fatty acids, vitamin C, macronutrients (calcium, magnesium, potassium, phosphorus) and trace elements (iron, zinc, copper, manganese) [1]. The content of essential oil in the leaves reaches 5.5%. The essential oil of the noble Laurel includes pineapple, cineole, myrcene, limonene, camphor, linalool, organic acids and other components [2-4].

The valuable chemical composition of the bay leaf causes its use in various food technologies. The prospect of using the water extract of a laurel leaf in the technology of bakery products as enrichers of the nutrient medium for the development and fermentation activity of yeast cells has been proven. The possibility of using a water-alcohol extract of a bay leaf as a natural antioxidant has been proven for the stabilization of carotenoids during the development of the technology of carotenoid additives in the form of finely divided powders [5]. It was shown that extraction of bay leaf with unrefined sunflower oil allows to obtain a spice-oil mixture with antibiotic activity [6]. The use of this mixture in food technology will stabilize microbiological processes while storing products.

Essential oil of the noble laurel is used during the production of sausage products, which allows not only to give them a pleasant aroma, but also to reduce the total number of foreign microorganisms and to restrain the process of oxidation of lipids during storage [7].

Analysis of literary data and problem statement

The main ways to get a laurel oil - is parodystillation and extraction with organic solvents. In the process of parodystillation, a significant disadvantage is the partial or complete destruction of thermolabious components at high temperature. The disadvantage of extraction with organic solvents is the chemical aggressiveness of solvents and the issue of removal of solvent residues from the final product is inevitable, which leads to additional costs and an increase in the complexity of the technology. Therefore, it is

important to search for alternative methods of obtaining essential oils, free from undesirable impurities, which store their composition, as close as possible to the native [8].

Liquefied gases, like solvents, are increasingly used to produce high-quality lipid extracts from different biological sources. This is due to the significant technological advantages of this method and the fact that the extracts completely preserve the native structure of the molecules, taste and aromatic qualitative indices of the raw material and contain less foreign impurities. Chladone extraction technologies, having a high extraction ability, allows the removal of a wide range of biological active substances and change the composition of the resulting fractions, which is especially important in the production of food products [9-10].

Liquified refrigerants, with a viscosity less than in traditional solvents, are characterized as extractants with the best diffusion properties. In chemical terms, they are indifferent to the lipid fractions that secrete. They are Non-toxic and fire- and explosion-proof. The low values of the heat of evaporation and the boiling point of liquefied gases allows you to quickly remove the gas from the extracts at a low temperature, which ensures the preservation of thermolabel molecular complexes in the final product [11].

The purpose of the work was to quantitatively determine the substances that determine the aroma of the cold-extract extract of the bay leaf.

Results and discussion

For the manufacture of the extract, dried leaves of the noble laurel, which grow in Georgia, were used. Technological stages of the process of chladone extraction included: preliminary crushing of the bay leaf to 250 microns, mixing with the chladone solvent in the extraction tank, extracting the extract in the process of diffusion, draining miscella of the dissolved extract, evaporating the solvent from the miscella, draining the laurel oil into the receiving vessel and sedimentation for removing the fines of finely divided meal. As result we obtained the first chladone extract of a bay leaf. To obtain the second extract, it was used the meal of the bay leaf after the first extraction. Results of determination of organoleptic parameters of the quality of bay leaf chladone extracts are given in Table 1.

Table 1

Characteristics of the quality of the extract of the bay leaf

Name of the indicator	Characteristics that value	
	1	2
Appearance	Viscous substance	
Color	Green	
Taste, smell	Well expressed, characteristic of a bay leaf, without any foreign smell and taste	

One of the quantitative characteristics of the substance content that determines the aroma of raw materials and food products is the number of flavors conventionally expressed in milliliters of sodium trioxoethiosulfate per 100 g of product. To determine the total content of substances that determine the aroma of chladone extract bay leaf, the method of determining the number of aromas given in GHOST 8756.7-70 has been adapted. The basis for determining the amount of aroma is the reaction of the interaction of essential oils with a chromium blend, during which their oxidation occurs.

Substances causing the aroma of the extract of a bay leaf were discharged with a water vapor in a chimney receiving chamber. The resulting distillate was boiled in a water bath for 1 hour, after

which it was cooled, 25 ml of a 10% solution of potassium iodide were added and left for 3 minutes in the dark. The iodine, which was isolated, was titrated with 0,2 N sodium trioxide thiosulfate solution. As a result of titration, the number of flavors was calculated.

It was found that the number of fragrances for the first and second chladone extraction of bay leaf is 1122 ± 20 ml and 833 ± 17 ml $\text{Na}_2\text{S}_2\text{O}_3$ / 100 g, respectively. The obtained values are exaggerated in 3.6 ... 4.8 times the value of this indicator for aqueous-alcoholic extract [5].

Conclusion

Thus, during the chladone extraction of the laurel leaves, the color, smell and taste of the original plant material are preserved. It was shown that carrying out extraction of a bay leaf with the help of chladones allows to obtain an extract with a higher content of aroma-forming substances in comparison with water-alcohol extraction. It is determined that the content of aromatics in the second chladone extract is sufficiently high, due to incomplete extraction of these substances during the first extraction. Therefore, further work will be carried out in the direction of establishing optimal regimes of the chladone extracting of bay leaves.

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