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STIMULATION OF FRUIT AND BERRY RAW PRODUCTS EXTRACTION PROCESS

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Abstract. Currently, when consumers demand natural products, one of the objectives of manufacturers is to maximize the extraction of biologically active substances from vegetable raw materials with preservation of their ready-made food. The ordinary *Rosa cinnamomea* L. contain vitamins C, P, B₂, K, provitamins A, E, organic acids, sugars, pectin, tannins and flavonoids, thus widely used in the manufacture of beverages, including functional purpose. In the article the analysis of dependence of an output of the extraction substances and vitamin C by pretreatment of fruit mass ultrasound was made by multi-operated instrument “Muza”, the oscillation frequency is 22 kHz, the power is 70 WT. The influence of ultrasound exposure conditions on the retention of vitamin C in the extracts. Recommendations on obtaining semi-extracts for different forms of food products, including functional purpose.

Keywords: extract; intensification of extraction of biologically active substances; ultrasound.

Such issues as biological nutrition value increase, efficient use of raw material resources and development of new types of products are still important. Due to their diverse chemical composition wild plants have an ability to compensate for a shortcoming of some substances in a human organism especially vitamins. That's why they are so valuable.

One of the objectives of the food processing industry at the present stage is to maximize the recovery of biologically active substances from plant material from ready-made food products and functional purpose.

In connection with the above, was formulated a whole: to study the possibility of an intensification of process of extraction of fruit and berry raw materials on the example of rose hips common. To achieve this goal the following tasks:

- to estimate the values of the physico-chemical parameters of the ex-tracts obtained from the fruit of the wild rose in the traditional way as a control;
- to determine the optimal parameters of ultrasonic influence at the stage of preliminary processing of raw materials;



- to compare the organoleptic properties of extracts obtained with the reference sample;
- to formulate recommendations for obtaining semi-manufactures for different forms of food.

In Siberia's conditions a wild rose (*Rosa cinnamomea* L.) of a rose family is one of wide spread bushes, its fruits contain vitamins C, P, B₂, K, provitamins A and E and a great number of organic acids, sugars, pectin substances and tanning materials, flavonoids, macro- and microelements. Due to their value wild rose fruits are widely used as raw products for producing drinks.

In the vitamin composition of a wild rose ascorbic acid occupies a prominent place; this acid is easily decomposable, it decomposes in water solutions; air, light iron and cuprum traces increase its oxidation. At the same time it is well known that the ascorbic acid content in extracts depends greatly on technological factors [1].

One of the areas that is known to intensify the process of extraction of biologically

active substances from raw materials growing of origin, may be the use of ultrasound influence at the stage of maceration and preparation of extracts [2; 3].

Taking into account all these aspects we analyzed the ways of output increase in product extraction substances and vitamin C increase in infusions made by the two various methods: by traditional single infusion at room temperature within 14 days and by infusion with ultrasound pretreatment of the substance. 40 % vol. solution of alcohol in water was used as an extracting agent; the hydromodulus is 1:50. Infusing with ultrasound treatment was made by multi-operated instrument "Muza", the oscillation frequency is 22 kHz, the power is 70 WT. The treatment was held for 5 minutes then post infusing was made for 7 days at 25 °C temperature.

The raw material quality, the extractives content and vitamin C content in the extracts were defined by standard methods (Tab. 1).

Table 1

The extractives content and vitamin C content in wild rose fruits infusions

Infusion methods	Mass concentration of extractives content, g/100ml	Mass concentration of ascorbic acid, mg%
Single	3.8	29.2
Infusing with ultrasound pretreatment	18.2	5.8

Comparing the efficiency of the infusing methods showed that ultrasound treatment increases extractive substances significantly, though it reduces chemically labile ascorbic acid content by 5 times. Nevertheless organoleptic characteristics play a significant role in producing drinks.

Table 2 shows organoleptic characteristics of the infusions under study.

Visual analysis showed that ultrasound treatment makes the infusion cloudy due to decomposition of molecular bonds in biopolymers.



Table 2

Organoleptic characteristics of the infusions under study

Infusion methods	Organoleptic characteristics		
	External appearance	Smell (flavor)	Taste
Single	Transparent liquid with a golden glance	Bland flavor, typical for wild rose fruits	Typical for wild rose fruits, pleasant, a bit sour
Infusing with ultrasound pretreatment	Cloudy liquid with opalescence, straw-colored	Strong, typical for wild rose fruits	Typical but flat taste

Thus, the carried out research lets us recommend using wild rose infusions, prepared by the method of single infusing with ultrasound pretreatment, for products in which transparency of a drink is not an aspect determining their quality.

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