МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

КАФЕДРА ФАРМАКОГНОЗІЇ ТА БОТАНІКИ

НАУКА, ПРАКТИКА ТА ОСВІТА

PLANTA+

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НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ
ПРИВАТНИЙ ВИЩИЙ НАВЧАЛЬНИЙ ЗАКЛАД
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«PLANTA+. НАУКА, ПРАКТИКА ТА ОСВІТА»

Матеріали
IV Науково-практичної конференції з міжнародною участю,
до 20-річчя кафедри фармакогнозії та ботаніки
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Garden (Kyiv). The contents of macro elements, microelements, and trace metals were determined by the inductively coupled plasma optical emission spectroscopy (ICP-OES) by using an ICP-OES instrument (Ultima 2, Horiba Scientific, France). The contents of elements were expressed as mg kg^{-1} of dry weight.

Results and their discussion. Our results clearly indicate that leaves and fruits are a very good source of macronutrients. The leaves were distinguished by the content of Ca (10628 mg kg^{-1}), S (2325 mg kg^{-1}), Mg (2100 mg kg^{-1}), and Na (141 mg kg^{-1}). In contrast, fruits had more P (2095 mg kg^{-1}) and K (1288 mg kg^{-1}). Among the micronutrients in the leaves, the content of Fe (114 mg kg^{-1}), Mn (82.4 mg kg^{-1}) and Zn (43 mg kg^{-1}) prevailed. Fruits had slightly more Cu (9 mg kg^{-1}) than leaves (7 mg kg^{-1}). The results of our study on leaf micronutrients are consistent with those of other researchers except for Fe, Zn and Cu, where we noted higher values. This may be due to differences in the location and time of sampling.

Conclusions. Both fruits and leaves of sea buckthorn are a rich source of macro and micronutrients, necessary for a proper human diet. Berries have had a well-established position as an excellent source of nutrients and health-promoting ingredients for many years. Leaves, which are most often a waste element during fruit harvesting, should also be used in the production of dietary supplements.

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DETERMINATION OF THE SWELLING INDEX FOR THE PROMISING PLANT RAW MATERIALS AS THE SOURCES OF PECTIN SUBSTANCES

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Keywords: polysaccharides, pectin substances, swelling index

Introduction. Polysaccharides are high molecular weight compounds common in nature. One of the varieties of polysaccharides is pectin substances (PSs) – the most common carbohydrates in the world, which present in every plant product, in all fruits and berries, in the cell sap of fruits and vegetables, and filling the intercellular spaces.

At the end of XIX century, the first results of PSs research became known and even then, they attracted the attention of many scientists and doctors. The World Health Organization (WHO) has recognized pectin as a toxicologically safe product. Due to its properties and low toxicity, PSs are increasingly used in medicine, pharmacy, cosmetology, and food industry, replacing them with more unsafe substances and additives [2]. And, although pectin is a common polysaccharide, it is not cheap. According to the State Statistics Committee of Ukraine, Ukraine annually spends 3.5-5 million USD on the purchase of imported food additives. Pectin consumption in the world has increased from 18-19 thousand tons in the 1990s to 70 thousand tons in 2020 [3].

Therefore, now attention is paid to the problem of finding new sources of plant material to produce pectin, research, improvement, and development of new technologies for its production.

Ukraine has a large amount of pectin-containing plant materials, from which pure pectin can be obtained. Most often apple and citrus pomace, beet pulps are used for its production. The increasing recognition of pectin creates a demand, so the search for a new potential source of pectin is becoming an important topic. The relevance of the work is to expand the range of medicinal plant materials (MPM), which can be used as a source of PSs, at the expense of understudied food plants. The increase of pectin production depends on the search for cheap, easily accessible technological plant material.

The aim of the work was to determine the swelling index of fruits and fruits waste after juice obtaining of red currant, sea buckthorn, and feijoa.

Materials and methods. Dried fruits of red currant, sea buckthorn and feijoa, as well as fruits waste after juice extraction have been choose for the study. The fruits were harvested during the fruiting period in 2022. The country of origin of sea buckthorn and red currant is Ukraine, Transcarpathian region, Khust district. The country of origin of feijoa is Azerbaijan. After removing the juice from the fruit, the fruits waste was obtained. Whole fruits and fruits waste was dried at a temperature not exceeding 50°C. Feijoa fruits were pre-cut into pieces of 1 cm by 0.5 cm. Dried fruits and fruits waste were ground into powder. As a result, 12 types of plant raw materials were obtained

The swelling index was determined in accordance with the requirements of the State Pharmacopoeia of Ukraine [1].

Results and their discussion. The results of determining the swelling index are shown in *Fig. 1*.

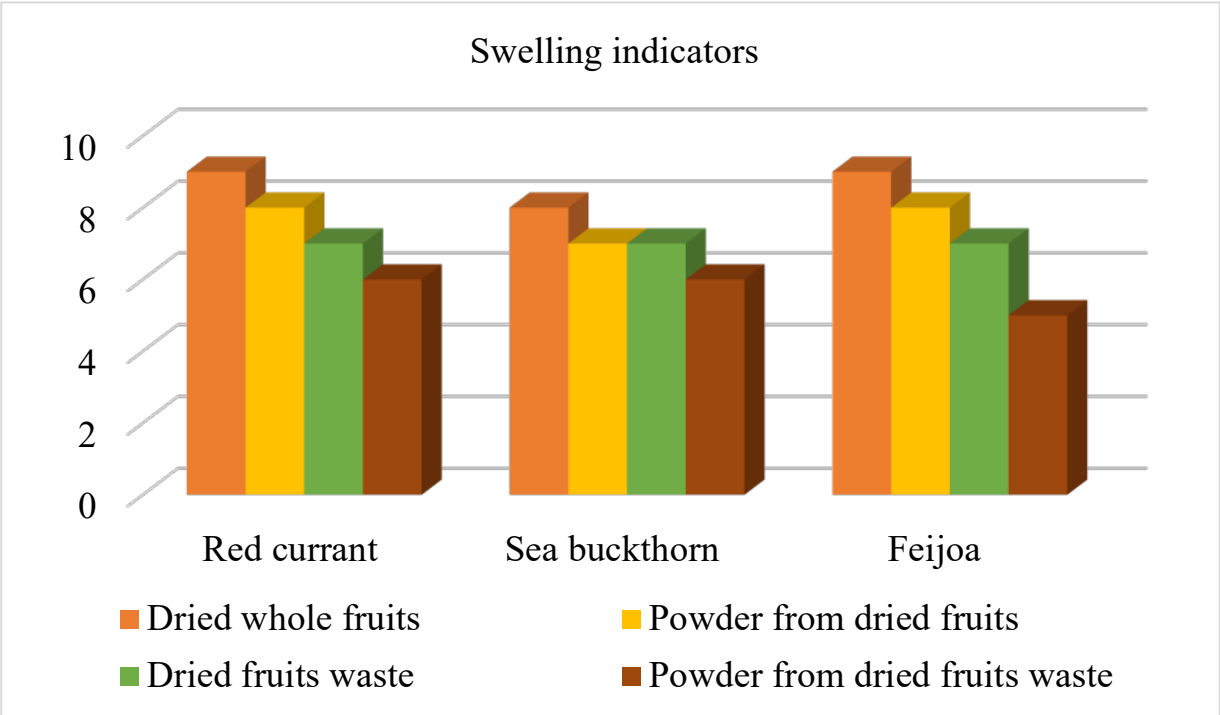

Figure 1. The results of the swelling index for dried whole and powdered fruits and fruits waste after juice extraction of red currant, sea buckthorn and feijoa

The highest swelling index was observed in dried whole fruits of red currant and dried cut fruits of feijoa – 9. For whole sea buckthorn fruits, the swelling index was 8. When grinding the fruit, the index decreased: red currant and feijoa – 8, sea buckthorn – 7. Dried cake had the same swelling index and was 7 for all types of raw materials. For the powdered fruits waste the swelling index decreased and was: red currant and sea buckthorn -6, feijoa – 5.

Conclusions. During the study it was found that grinding affects the swelling index for fruits, namely – reduces it. Comparison of the swelling index between fruits and fruits waste indicates a decrease in this parameter in fruits waste by at least 1 unit. This indicates the loss of pectin substances and polysaccharides during the extraction of fruit juice and the influence of grinding on swelling index.

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MICROSCOPIC STUDIES OF QUINCE AND JAPANESE QUINCE LEAF POWDERS

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Key words: microscopic analysis, quince, Japanese quince

Introduction. Japanese quince (*Chaenomeles japonica* (Thunb.) Lindl. Ex Spach) and quince (*Cydonia oblonga* Mill.) are cultivated fruit crops that are well known throughout the world. The leaves of japanese quince and quince have a diverse, valuable composition of biologically active substances [2,3].

The aim of work was a study of the anatomical structure of quince and japanese quince leaf powders according to SPhU to develop quality control methods for the leaves.

Materials and methods. The study of the anatomical structure of the leaves of *Chaenomeles japonica* and *Cydonia oblonga* was carried out by the method of light microscopy without special preparing and processing “like it is” [1]. We used dried raw materials harvested in May 2022 in the Kyiv region, Makarivskyi district. The