TECHNOLOGICAL ASPECTS OF PRODUCTION OF THE CANDIED LEAVES FROM TRADITIONAL RAW MATERIAL

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Abstract. The article describes the main technological operations pertaining to processing of traditional candied products. The biochemical indicators of the obtained new products have been studied. It was established that the candied fruit possess the appropriate physical and chemical indicators and original organoleptic properties resulting in a demand by consumers. The results of the taste evaluation of the experimental specimen confirmed a high quality of the products.

Keywords: leaves, candied products, technology.

Аннотация. В статье описаны основные технологические операции, связанные с переработкой традиционных кондитерских изделий. Изучены биохимические показатели полученных новых продуктов. Установлено, что цукаты обладают соответствующими физико-химическими показателями и оригинальными органолептическими свойствами, что обуславливает спрос у потребителей. Результаты вкусовой оценки опытного образца подтвердили высокое качество продукции.

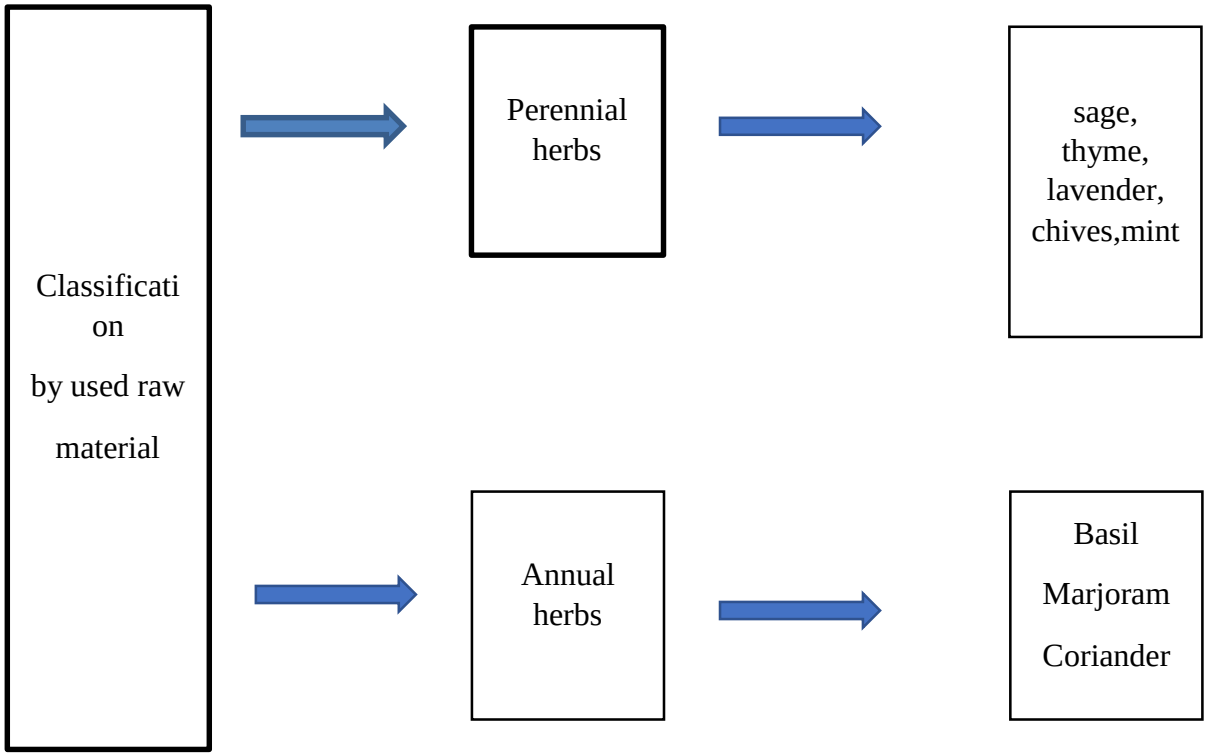
Ключевые слова: листья, цукаты, технологии.

Annotatsiya. Maqolada an'anaviy qandolat mahsulotlarini qayta ishlash bilan bog'liq asosiy texnologik operatsiyalar tasvirlangan. Olingan yangi mahsulotlarning biokimyoviy ko'rsatkichlari o'rganildi. Aniqlanishicha, shakarlangan mevalar tegishli fizik-kimyoviy ko‘rsatkichlarga va original organoleptik xususiyatlarga ega bo‘lib, bu iste’molchilarning talabini belgilaydi. Prototipning ta'mini baholash natijalari mahsulotning yuqori sifatini tasdiqladi.

Kalit so'zlar: barglar, shakarlangan mevalar, texnologiyalar.

Introduction. The food industry of Uzbekistan increases output of sweet products rather dynamically [1]. Candied leaves made of traditional raw products such as leaves of herbs used for cooking desserts is a promising direction for extending the product range, upgrading their nutritional value and improvement of the organoleptic indicators of such kind of products. Candied leaves product range in Uzbekistan market is limited and presents, basically, the products made of fruit and berries. Besides, some of them contain artificial colouring agents that make it impossible to refer them to the healthy food category. As prices of candied leaves are high, a wide circle of consumers cannot afford it. Therefore, production of such a dessert out of a traditional raw material that is cultivated in Uzbekistan make it

possible to enhance the range of candied of domestic production. The existing techniques of cooking such products are lasting and necessitate rigid processing modes; that is why it is desirable to apply such a processing technology for making ready products, which leads to preservation of nutrients. The existing methods of candied leaves production are characteristic of longer lasting processes, particularly of blank boiling, considerable energy consumption, loss of vitamins and other biologically active agents. It is possible to shorten the raw material processing time by implementing new processing methods that allow of reducing consumption of resources for candied leaves production and enhance the ready product quality. Candied leaves mean those products that are made of leaves, saturated with sugar and/or natural sweeteners added or not added with edible acids, flavours and colouring agents, dried, dusted with sugar powder or glazed [2]. Candied leaves are classified according to the used raw material, is shown in Fig.1.



This paper was aimed at developing a technology of candied leaves, namely, the mint and basil leaves, which widens the range of such products that acquire original taste and high nutritional value. The chemical composition of candied products depends both on the raw material used and on the production technology. When processing leaves, namely, when making such mechanical operations as cutting and shredding the raw material becomes darker which influences considerably not only organoleptic properties of ready products but also leads to a loss of their nutritional value because of the redox enzyme action which activity becomes higher in the presence of ambient oxygen [3]. Therefore, in order to reduce losses of nutritional substances and improve the organoleptic properties of dishes based on mint and basil leaves, it is advisable to apply certain techniques aimed at inactivation of such enzymes as polyphenol oxidase, ascorbate oxidase

and peroxidase. To preclude darkening and stabilize colouring, a technology has been developed that provides for soaking whole leaves in 1 % citric acid solution at once after cutting. To facilitate diffusion and osmotic processes as well as to soften the raw material before boiling in sugar syrup, steam cooking was applied which, in its turn, made it possible to preserve water-soluble vitamins and other biologically active agents [4]. The developed technology for producing candied mint is shown in Fig. 2.

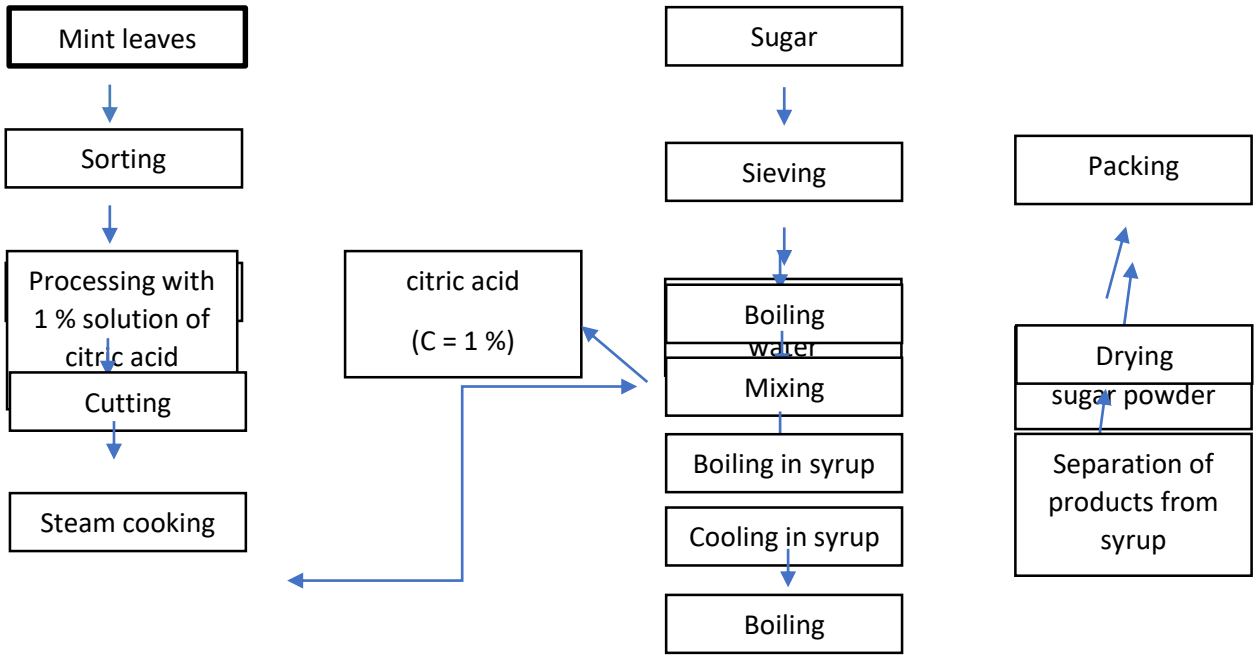


Table 1 – Biochemical composition of candied leaves (as absolutely dry substance) [5,6]

Description of indicator	Mint leaves	Basil leaves
crude protein	375.2 g kg−1	208.8 g kg−1
ether extract		11.21 g kg−1
crude fiber	801.3 g kg−1	45.91 g kg−1
sugar	0 g	readily hydrolyzed
Mg	83.8 μg g−1	79.8 μg g−1
Ca	2438 μg g−1	1278 μg g−1
K	568.3 μg g−1	2135 μg g−1
Na	31.28 μg g−1	218.5 μg g−1
Fe	74.31 μg g−1	26.31 μg g−1
Cu	1.09 μg g−1	1.95 μg g−1
Mn	5.13 μg g−1	8.56 μg g−1
Zn	11.14 μg g−1	45.14 μg g−1

Besides its culinary uses, mint is also used in traditional systems of medicine. Mints are mainly used to cure gastrointestinal disorders, but the spectrum of medical activities is broader. Mint was originally used as a medicinal herb to treat

stomachache and chest pains, and it is commonly used in the form of tea as a home remedy to stimulate digestion; alleviate stomach pain; and treat biliary disorders, dyspepsia, enteritis, flatulence, gastritis, gastric acidities, aerophagia, intestinal colic, and spasms of the bile duct, gallbladder, and gastrointestinal tract. Mint also aids digestion, notably of fats; in recent years, it has been often recommended for treating obesity. Mint tea is also a strong diuretic [5].

Basil may provide health benefits in the diet, as herbal medicine, and as an essential oil. Traditional uses Trusted Source include the treatment of snakebites, colds, and inflammation within nasal passages — a common effect of colds, for example. Basil provides some macronutrients, such as calcium and vitamin K, as well as a range of antioxidants. Sweet basil, for example, has a high concentration of the chemical agent eugenol. This gives it a clove-like scent. Lime and lemon basils have high concentrations of limonene, which give them a citrusy scent [6].

Conclusions. Proposed is a developed technology for producing candied mint and basil leaves according to the shortened processing cycle. The obtained products possess original organoleptic indicators and high nutritional value. The resulting candied products meet the requirements of standards according to microbiological indicators. New products will allow of extending the range of such products.

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