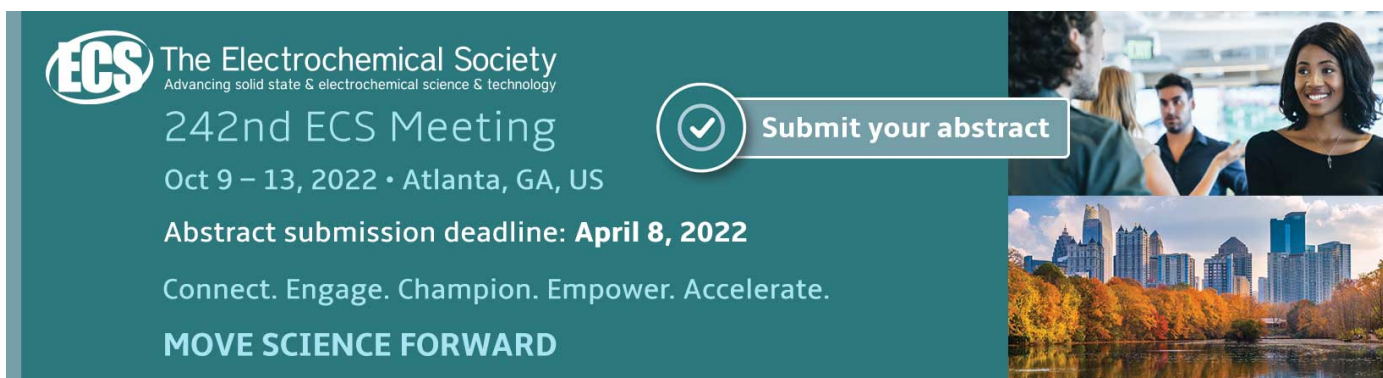


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To cite this article: S Ya Inagamov *et al* 2022 *IOP Conf. Ser.: Earth Environ. Sci.* **979** 012100

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Composition and technology of drying fruit of the medicinal plant "Capparis spinosa L." and its study

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Abstract. This paper considers the study of the composition and development of technology for drying the fruit of the medicinal plant "spiny capers - Capparis spinosa L." grown in the Namangan region (Uzbekistan). The conducted experiments proved the presence in the composition of the medicinal plant fruit "spiny capers - Capparis spinosa L." of vital vitamins, macro- and microelements. For ease and convenience of transportation, as well as for long-term storage, a technological drying process has been developed to dry the fruit of the medicinal plant "spiny capers - Capparis spinosa L." The process of drying the fruit of the medicinal plant "spiny capers - Capparis spinosa L." was carried out at the installation of a multi-belt dryer by supplying a heat carrier with a temperature of 55-60°C for 120-180 minutes. Hot air is used as a heat carrier. Also, the optimum temperature for drying the fruit of the medicinal plant "spiny capers - Capparis spinosa L." was studied. As a result of the experiments, it was shown that burning in the fruits of spiny capers medicinal plant is observed when dried at a temperature of 80°C and above. It has also been proven that the drying temperature of the fruit of the studied medicinal plant in the range of 60-70°C is optimal.

1. Introduction

Currently, the production of dried agricultural products and their supply to the population are becoming more and more popular. In a dried state, the fruit retains its condition well, does not ferment, retains its taste, vitamins, microelements and macroelements for a long time. In addition, samples of the rich flora of our republic, recommended by our great ancestors in ancient medical practice, scientifically grounded and confirmed by clinical research, today find their place in pharmaceuticals [1-2].

One of these medicinal plants is spiny capers - Capparis spinosa L. Currently, the medicinal plant spiny capers is used not only as a medicinal raw material, but also as a wonderful spice, a fragrant food product [3-4].

This paper is devoted to the study of the composition and development of technology for drying the fruit of the medicinal plant "spiny capers - Capparis spinosa L." "Spiny capers - Capparis spinosa L." is a perennial, thorny plant, belongs to the caper family (Capparidaceae). The homeland of capers is Asia, currently this plant is cultivated in Africa, Algeria, France, Spain, Italy, the countries of the Balkan Peninsula. It also grows in the Caucasus, and in the southern regions of Central Asia and in the Crimea. It should be noted that the purpose of drying a medicinal product is, firstly, for convenience,



to facilitate and reduce the cost of transportation of the obtained dry products, and secondly, drying of many medicinal products ensures their conservation and storage, and thirdly, drying is necessary for the subsequent grinding of medicinal plants products. And also in the industrial technology of drugs, drying as the final stage of production has a significant effect on the quality of the products. It can also be reminded that in the industrial technology of medicines, drying is the final stage of production [5].

Spiny capers - "Capparis Spinosa L." is a perennial plant best known for its edible flower buds. The obtained experimental data showed that the composition of the fruit of the medicinal plant "spiny capers - Capparis spinosa L." contains such vital vitamins, macro- and microelements, which are given in the paper [5-8].

Extractives, glycosides, steroid saponins, rutin, ascorbic acid, coloring substances and a fairly large amount of iodine (up to 28.5 mg/100 g in dry weight terms) were found in the fruits, which is an important fact in the creation of drugs for the treatment of endocrine diseases (figures 1a and 1b) [9-11].



Figure 1. Buds (a) and fruits in the bushes of the medicinal plant "spiny capers - Capparis Spinosa L." (b).

2. Materials and methods

In this paper, as an object of research, we used a medicinal plant spiny capers - Capparis spinosa L. grown in the Namangan region. A technology for drying the fruits of spiny capers has been developed. Experiments were carried out to study the drying of the fruits of spiny capers from room temperature to 120 °C.

The proposed air heating installation works as follows: freshly harvested fruits of the medicinal plant "spiny capers - Capparis spinosa L." are sorted, cleaned from various weeds, impurities, washed out dust and cleaned from other contaminants. The sorted fruits are sent to a water bath for washing. Then the sorted fruits are transferred to the cutting section. Washed fruits are cut to the required size on a special cutting machine "FAM-250": 3x3, 4x4, 5x5, 7x7 and 10x10 mm.

3. Results

As shown in [3], the medicinal preparation "spiny capers – Capparis Spinosa L." fruit contains such vitamins as Folic acid - 23 µg, Pantothenic acid - 27 µg, Nicotinic acid - 652 µg and Ascorbic acid - 4300 µg Beta-carotene - 83 µg, Thiamine - 18 µg, Riboflavin - 139 µg, Choline - 6500 µg, Tocopherol - 880 µg, Pyridoxine - 25 µg. For the life of the human body, it has another class of substances - vitamins which are present in the form of many compounds, in the form of ions in the blood and intercellular fluids. Experimental studies have shown that in the composition of "spiny capers – Capparis Spinosa L." there are such macro- and microelements as Potassium - 40 mg, Calcium - 40

mg, Phosphorus - 10 mg, Magnesium - 33 mg, Sodium - 2964 mg, iron - 1.67 μg , copper - 33 μg , zinc - 0.32 μg , manganese - 0.078 μg and selenium - 0.0012 μg [9-11].

Thus, the experimental data have shown that the fruits of the medicinal plant "spiny capers – *Capparis Spinosa* L." contain such vital macro-, microelements and vitamins as thioglycosides, saponins, ascorbic acid, sugar, essential oils, vitamin C, iodine, Myrosin enzyme, red pigment and organic acids.

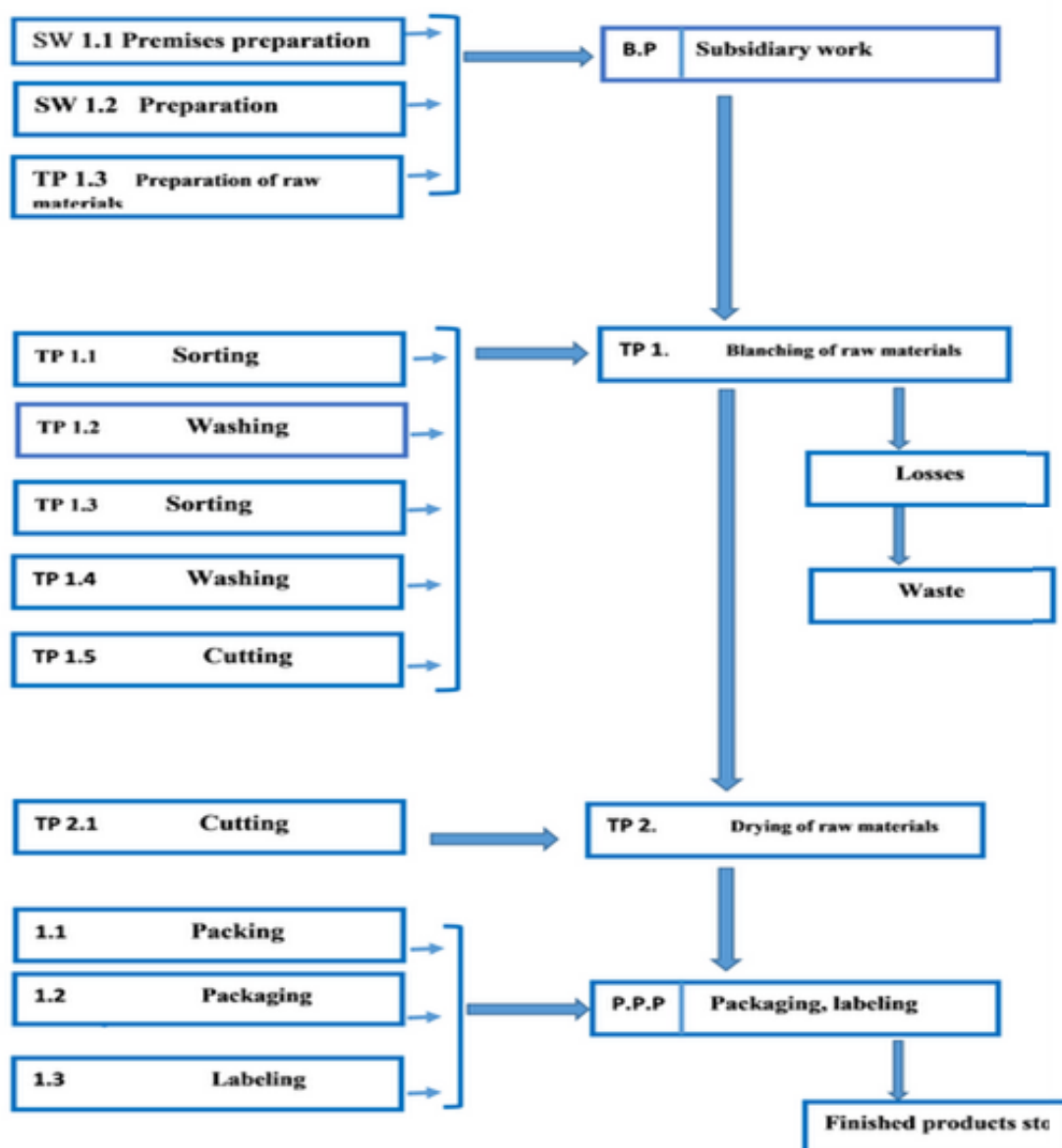


Figure 2. Technological scheme for drying the fruits of the medicinal plant "spiny capers - *Capparis spinosa* L.".

4. Discussion

To preserve biologically active substances, direct sunlight is excluded. Before drying, the sliced pieces of spiny capers are evenly placed on stainless steel mesh trays (each with a usable area of 25 m²) (figure 2). Drying process of "spiny capers - *Capparis spinosa* L." is carried out by filing coolant (bottom-up) with a temperature of 55-60°C for 120-180 minutes. Hot air is used as a heat carrier,

which is supplied from outside. The results of the experiment showed that the optimal drying temperature for the fruits of the medicinal plant, according to preliminary data, is 60-70°C. The dried product enters the final drying section, a section with a lower temperature (40°C).



Figure 3. General view of the technological installation for drying fruits of "spiny capers - *Capparis spinosa* L.".

5. Conclusion

Thus, the technology of drying the fruits of the medicinal plant "spiny capers - *Capparis spinosa* L." has been developed. The optimum temperature for drying the medicinal plant "spiny capers - *Capparis spinosa* L." is 60-70°C.

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